## **METRO MONITOR**

An index of inclusive economic growth in the 100 largest U.S. metropolitan areas

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## SUMMARY

Today's economy appears to be booming, as judged by continued job growth, household income gains, and historically high stock prices. Yet underneath the headline numbers America's progress remains uneven: economic divides are growing between the coasts and the heartland, technology and other sectors, and the rich and the poor. This uneven progress reflects the accelerating pace of economic change that people and places across the nation now confront. Leaders in our major cities and metropolitan areas, centers of economic disruption and opportunity, are looking for insights and strategies to adapt.

To help inform their efforts, the annual Metro Monitor measures communities' progress on *inclusive* economic growth and prosperity. The report's Inclusive Growth Index charts the performance of the nation's 100 largest metropolitan areas across economic indicators in three broad categories that define economic success: growth, prosperity, and inclusion. It finds considerable variation in how different metro areas fared in their progress toward inclusive economic growth and prosperity in 2016, the most recent year for which complete data are available:

 Growth was widespread among large metropolitan areas. Ninety-six (96) of the 100 largest metro areas added jobs over the course of the year, 93 posted increases in regional economic output (gross metropolitan product, or GMP), and 85 saw an increase in the number of jobs at young firms. Overall, 97 large metro areas posted positive changes on at least one of the three growth measures and 83 posted positive changes on *all* three. Construction, hospitality, health care, and high-tech industries fueled the fastestgrowing metropolitan economies while energy, manufacturing, and government contributed to slower growth in most metro areas.

2. Few large metropolitan areas posted consistent gains in prosperity. Eighty-seven (87) of the 100 largest metro areas increased their standard of living, 79 posted increases in their average wage, and 36 increased their productivity. Overall, 91 large metro areas posted positive changes on *at least one* of the three prosperity measures but only 31 posted positive changes on *all* three. The faster hiring in less productive and lowpaying sectors like hospitality and health care made it more difficult for large metropolitan areas to achieve consistent increases across prosperity measures.

- 3. Most large metropolitan areas posted at least modest improvements in economic inclusion. Eighty-three (83) of the 100 largest metro areas increased the employment rate, 73 posted increases in the median wage, and 54 improved the rate of relative earnings poverty. Overall, 93 large metro areas posted positive changes on at least one of the three of the inclusion measures but only 37 posted positive changes on all three measures. Tightening labor markets contributed to a banner year for middle-class wage growth but more uneven progress for workers near the bottom of the earnings distribution. And although many metro areas improved inclusion outcomes for both whites and people of color, few also reduced disparities between them.
- 4. Despite progress on several fronts, inclusive economic growth and prosperity proved elusive for most large metropolitan areas in 2016. Only 11 metro areas-Cincinnati, Des Moines, Detroit, Greenville, Madison, Minneapolis-St. Paul, Portland, Providence, San Francisco, Spokane, and Washington, D.C.-achieved improvements on each of the core measures under growth, prosperity, and inclusion. Just two of these metro areas-Cincinnati and Greenville-also made consistent progress in narrowing racial economic disparities. Meanwhile, although consistent progress was rare, almost every large metro area made at least some gains. Only Bakersfield, a place hit hard by declining energy prices, saw across-the-board declines in growth, prosperity, and inclusion.

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## INTRODUCTION

As 2018 begins, the national economy appears in many ways to be booming. Despite the occasional hiccup, the bull market that began in 2009 continues, leading to record-breaking highs in U.S. stock indices. The economy has just posted its 88th consecutive month of job growth. The end of 2017 marked the seventh consecutive year the nation added more than two million jobs.<sup>1</sup> As the labor market continues to tighten, wages are rising. Middle class households have at last recovered their pre-recession income levels.<sup>2</sup>

Underneath these headline numbers, however, economic progress remains uneven. Job growth is widespread but continues to favor places throughout the Sun Belt and on the coasts as much of the heartland struggles. Despite the stock market's performance, few sectors of the economy appear to be making investments that lead to greater prosperity. Moreover, although more individuals and families are beginning to share in the benefits of a booming economy, disparities are growing.

This uneven progress reflects the accelerating pace of economic change people and places across the nation are now confronting. Just as the assets that drive the economy vary across places, so too do consequences of its changes. If leaders are to steer their communities toward more sustainable and inclusive growth amid the constant shifts and dislocations that are hallmarks of today's economy, they need to understand their economic progress and its drivers.

To help inform these leaders' efforts, this annual report from the Metro Monitor series considers how ongoing economic change affects communities' progress on *inclusive economic growth and prosperity*. The report charts the performance of the nation's 100 largest metropolitan areas across economic indicators in three broad categories: growth, prosperity, and inclusion. The following findings refer to metro areas' progress in 2016, the most recent year for which complete data are available.

This year's Metro Monitor reveals that many of the nation's largest metro areas saw changes in the sources of their growth and prosperity in 2016. Growth was widespread and metro areas extended its benefits to more people. Yet the sectors that drove this progress played varying roles depending on the measure and metro area. Construction, hospitality, and health care sectors continued to contribute to growth but held back productivity. High-skilled sectors like professional services, finance, and information contributed to prosperity but, for the most part, not jobs. Meanwhile, sectors like manufacturing, government, and education were less reliable, holding back job growth in some places. These shifting sources of growth often undermined concerted gains in prosperity and contributed to widening disparities.

These findings suggest that underneath the nation's headline growth, metro areas are confronting new challenges, requiring new solutions that create a more advanced economy that works for all.

## THE INCLUSIVE GROWTH INDEX

The Metro Monitor's Inclusive Growth Index tracks the economic performance of the nation's 100 largest metropolitan areas along three dimensions critical to successful economic development: **growth**, **prosperity**, and **inclusion**.<sup>3</sup> Economic development should put a metropolitan economy on a higher trajectory of long-run growth (*growth*) by improving the productivity of individuals and firms in order to raise local standards of living (*prosperity*) for all people (*inclusion*).<sup>4</sup> This Metro Monitor includes indicators within each of these categories that track a metropolitan area's progress toward shaping an advanced economy that works for all. The index measures change in these indicators over three periods–one year, five years, and 10 years–to capture short-, medium-, and long-term progress.<sup>5</sup>

### **MEASURING GROWTH**

Growth indicators measure change in the size of a metropolitan area economy and the economy's level of entrepreneurial activity. Growth creates new opportunities for individuals and can help a metropolitan become economy more efficient. Entrepreneurship plays a critical role in growth, creating new jobs and new output; entrepreneurial activity can also indicate investors' confidence in future growth and prosperity.<sup>6</sup> The economic dynamism associated with entrepreneurship contributes to productivity and wage growth.<sup>7</sup> The Metro Monitor measures growth in gross metropolitan product, number of jobs, and

number of jobs at young firms.

- Change in gross metropolitan product (GMP). Like gross domestic product, GMP measures the total value of goods and services produced in a metropolitan area, including wages and profits.
- Change in the number of jobs. Jobs measure the total number of occupied full- and part-time wage and salaried employment positions in a metropolitan economy.

 Change in the number of jobs at young firms. Change in the total number of full- and part-time wage and salaried jobs at young, private-sector firms age five years or less measures the employment impact of entrepreneurship in a metropolitan area. Changes in these indicators are measured as the percent change in values from the initial to final year of analysis. Change in GMP is measured in inflation-adjusted terms. Data on GMP and jobs are from Moody's Analytics, and data on jobs at young firms are from the U.S. Census Bureau's Longitudinal Employer-Household Dynamics program.

### MEASURING PROSPERITY

Prosperity captures changes in the average wealth and income produced by an economy. When a metropolitan area grows by increasing the productivity of its workers, through innovation or by upgrading workers' skills, for example, the value of those workers' labor rises. As the value of labor rises, so can wages. Increases in productivity and wages are what ultimately improve living standards for workers and families and the competitiveness of metropolitan economies.

 Change in the average wage. Aggregate annual wages paid to workers divided by the total number of jobs yields the average annual wage per job in a metropolitan economy.

- Change in productivity. GMP, from above, divided by the total number of jobs, from above, yields average GMP per job, a crude measure of a metropolitan economy's productivity.
- Change in the standard of living. GMP, from above, divided by total metropolitan population yields GMP per capita, which reflects a metropolitan economy's average standard of living.

Changes in these indicators are measured as the percent change in inflation-adjusted values from the initial to final year of analysis. Data on GMP, jobs, and aggregate wages are from Moody's Analytics, and data on population are from the U.S. Census Bureau's Population Estimates program.

### MEASURING INCLUSION

Inclusion indicators measure how the benefits of growth and prosperity in a metropolitan economy–specifically, changes in employment and income–are distributed among individuals. Inclusive growth enables more people to invest in their skills and to purchase more goods and services. Thus, inclusive growth can increase human capital and raise aggregate demand, boosting prosperity and growth. Ensuring that all people can contribute to and benefit from growth and prosperity also helps sustain widespread support for the policies on which growth and prosperity depend.

- Change in the employment rate. The employment-to-population ratio measures the share of individuals age 18 to 64 who are currently employed.<sup>8</sup>
- Change in the median wage. Median wage measures the annual wage earned by the person in the middle of a metropolitan area's income distribution (among people at least 16 years old).
- Change in the relative earnings poverty rate. Commonly used to measure poverty in other countries, relative earnings poverty measures the share of people earning less than half of the local median wage (among people at least 16 years old).

Change in the median wage is measured as the percent change in inflation-adjusted values from the initial to final year of analysis. Changes in relative income poverty and employment rates are measured as the percent change in those rates from the initial to final year of analysis. Data for inclusion indicators are from the Census Public-Use Microdata Series (PUMS) for the 2006 through 2016 American Community Survey (ACS) 1-year estimates. Estimates derived from survey data come with estimates of survey error, which are reported in the Metro Monitor web interactive.

These same inclusion indicators, data sources, and methods are also used to estimate differences in inclusion outcomes by education and by race and ethnicity. The values of each of the three inclusion indicators are estimated for people with different levels of educational attainment and people of different races and ethnicities. The educational attainment categories include high school diploma or equivalent, some college or associate degree, and baccalaureate degree or higher. Race and ethnicity categories include non-Hispanic whites, non-Hispanic blacks, non-Hispanic Asians, Hispanics, and people of other races or two or more races. Estimates are also provided for people of color, a designation that includes these latter four racial and ethnic groups. Detailed metro-level estimates of inclusion by educational attainment and race and ethnicity are available on the Metro Monitor website. Inclusion by educational attainment and race and ethnicity are not included in composite ranks.

### COMPOSITE RANKS FOR GROWTH, PROSPERITY, AND INCLUSION

Metropolitan areas are assigned composite ranks in each of the three categories of the index: growth, prosperity, and inclusion. A metropolitan area's composite rank in a category is determined by the sum of its standard scores for each indicator in that category. A standard score measures how a metropolitan area's value on a particular indicator varies from the values of all large metropolitan areas. The rank of a metropolitan area's summed standard scores in a category is its composite rank for the category. Composite ranks for each category are provided for three periods of time: one year (2015-2016), five years (2011-2016), and 10 years (2006-2016).

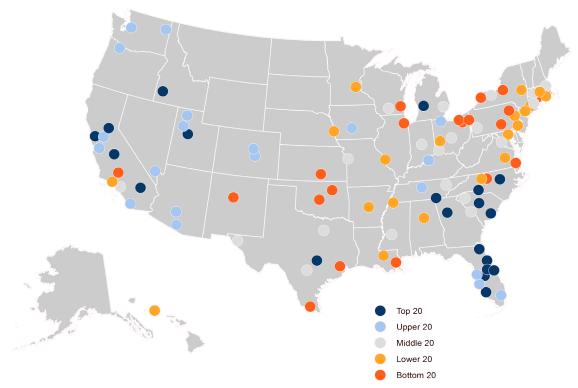
## GROWTH

**Growth was widespread among large metropolitan areas.** Ninety-six (96) of the 100 largest metro areas added jobs from 2015 to 2016, 93 posted increases in GMP, and 85 saw an increase in the number of jobs at young firms less than five years old. Overall, 97 large metro areas posted positive changes on *at least* one of the Metro Monitor's three growth measures, and 83 posted positive changes on *all* three measures. The metro areas that performed the best on growth include a few established and emerging high-tech economies, like Atlanta, Austin, the Bay Area, Boise, Nashville, the Research Triangle, Seattle, and metro areas along Utah's Wasatch Front. Several large metro areas with strong housing markets, like those in Florida and Inland California, also performed strongly on growth. The slowest-growing metro areas include several older industrial cities in the Northeast and Midwest like Cleveland and those with specializations in government or defense spending (Hartford, Jackson, and Virginia Beach) or energy (Bakersfield, McAllen, Houston, Oklahoma City, and Tulsa).



MAP1

**Composite growth rankings among the 100 largest U.S. metropolitan areas** 2015-2016



Source: Brookings analysis of Moody's Analytics estimates and U.S. Census Bureau's Longitudinal Employer-Household Dynamics program statistics

Construction and professional services related to high-tech industries fueled an outsized share of metropolitan areas' growth in gross metropolitan product from 2015 to 2016 while energy and government tended to be a drag. GMP growth was strongest in metropolitan areas along the Pacific Coast, and in the Intermountain West, Florida, and the Carolinas. Atlanta, Des Moines, Grand Rapids, Nashville, and Toledo also performed strongly. The construction, finance and insurance, high-tech, and logistics sectors fueled an outsized share of GMP growth in these high-performing places. Meanwhile, oil and gas extraction, government, and some types of manufacturing tended to hold back GMP growth. Manufacturing output actually declined in 42 of the 100 largest metro areas. This contributed to the weaker performance of certain metro areas in the Northeast and Great Lakes (Harrisburg,

Milwaukee, Cleveland, Scranton, Albany, and Rochester), and in parts of the South, including Texas and Oklahoma. Seven metro areas– Bakersfield, Buffalo, Harrisburg, McAllen, Oklahoma City, Tulsa, and Virginia Beach–saw GMP contract in 2016.

Construction and certain professional services industries also buoyed job growth in Sun Belt metropolitan areas throughout California and Florida while the energy sector held back job growth in Oklahoma and along the Gulf Coast. Patterns of job growth closely resemble patterns of GMP growth. Metro areas along the Pacific Coast (especially in California), throughout the Intermountain West, Florida, and the Southeast saw among the fastest rates of job growth, supported by strong growth in construction, professional services, retail, and hospitality.

### Best- and worst-performing metropolitan areas by change in growth, 2015-2016

|      | Change in:                                   |                                       |                                     |                   |      | Change in:  |                                       |                                     |                   |  |  |
|------|--|---------------------------------------|-------------------------------------|-------------------|------|---|---------------------------------------|-------------------------------------|-------------------|--|--|
| Rank | Metropolitan<br>statistical area             | Gross<br>metro-<br>politan<br>product | Hiring by<br>firms 0-5<br>years old | Number<br>of jobs | Rank | Metropolitan<br>statistical area                  | Gross<br>metro-<br>politan<br>product | Hiring by<br>firms 0-5<br>years old | Number<br>of jobs |  |  |
|      | Top 20                                       |                                       |                                     |                   |      | Bottom 20   |                                       |                                     |                   |  |  |
| 1    | Provo-Orem; UT                               | 6.0%                                  | 12.1%                               | 5.6%              | 81   | Milwaukee-Waukesha-<br>West Allis; WI             | 0.5%                                  | 4.5%                                | 0.8%              |  |  |
| 2    | Grand Rapids-Wyoming;<br>MI                  | 3.1%                                  | 29.1%                               | 3.1%              | 82   | Chicago-Naperville-<br>Elgin; IL-IN-WI            | 1.3%                                  | -1.0%                               | 1.3%              |  |  |
| 3    | Cape Coral-Fort Myers;<br>FL                 | 4.9%                                  | 15.7%                               | 4.5%              | 83   | New Orleans-Metairie;<br>LA                       | 1.9%                                  | 1.7%                                | 0.1%              |  |  |
| 4    | Fresno; CA                                   | 2.5%                                  | 21.7%                               | 3.4%              | 84   | Buffalo-Cheektowaga-<br>Niagara Falls; NY         | -0.1%                                 | 4.3%                                | 1.1%              |  |  |
| 5    | Deltona-Daytona<br>Beach-Ormond Beach;<br>FL | 3.3%                                  | 12.1%                               | 4.5%              | 85   | Akron; OH   | 2.5%                                  | -5.0%                               | 0.8%              |  |  |
| 6    | Boise City; ID                               | 3.7%                                  | 6.3%                                | 4.3%              | 86   | Greensboro-High<br>Point; NC                      | 0.5%                                  | 1.9%                                | 1.0%              |  |  |
| 7    | Orlando-Kissimmee-<br>Sanford; FL            | 3.5%                                  | 8.0%                                | 4.1%              | 87   | Hartford-West<br>Hartford-East<br>Hartford; CT    | 1.2%                                  | 2.5%                                | 0.2%              |  |  |
| 8    | Jacksonville; FL                             | 3.7%                                  | 9.9%                                | 3.3%              | 88   | Cleveland-Elyria; OH                              | 0.6%                                  | 1.0%                                | 1.1%              |  |  |
| 9    | Lakeland-Winter Haven;<br>FL                 | 2.8%                                  | 14.5%                               | 3.1%              | 89   | Syracuse; NY                                      | 0.4%                                  | 1.7%                                | 0.9%              |  |  |
| 10   | SacramentoRoseville<br>Arden-Arcade; CA      | 3.0%                                  | 11.3%                               | 3.5%              | 90   | Albuquerque; NM                                   | 0.3%                                  | -2.5%                               | 1.8%              |  |  |
| 11   | Charleston-North<br>Charleston; SC           | 3.7%                                  | 7.9%                                | 3.7%              | 91   | Wichita; KS                                       | 0.2%                                  | 1.7%                                | 0.6%              |  |  |
| 12   | Columbia; SC                                 | 2.2%                                  | 17.9%                               | 2.3%              | 92   | Youngstown-Warren-<br>Boardman; OH-PA             | 0.4%                                  | 2.6%                                | -0.5%             |  |  |
| 13   | Austin-Round Rock; TX                        | 3.2%                                  | 7.5%                                | 3.8%              | 93   | Harrisburg-Carlisle; PA                           | -0.4%                                 | -1.9%                               | 1.2%              |  |  |
| 14   | Riverside-San<br>Bernardino-Ontario; CA      | 3.4%                                  | 7.2%                                | 3.6%              | 94   | ScrantonWilkes-<br>BarreHazleton; PA              | 0.7%                                  | -5.5%                               | 0.9%              |  |  |
| 15   | San Francisco-Oakland-<br>Hayward; CA        | 3.8%                                  | 5.2%                                | 3.5%              | 95   | Virginia Beach-<br>Norfolk-Newport News;<br>VA-NC | -0.2%                                 | -1.1%                               | 0.6%              |  |  |
| 16   | Charlotte-Concord-<br>Gastonia; NC-SC        | 3.2%                                  | 6.4%                                | 3.7%              | 96   | McAllen-Edinburg-<br>Mission; TX                  | -1.1%                                 | -4.3%                               | 1.9%              |  |  |
| 17   | Raleigh; NC                                  | 3.5%                                  | 3.9%                                | 3.7%              | 97   | Houston-The<br>Woodlands-Sugar<br>Land; TX        | 0.1%                                  | -1.8%                               | 0.1%              |  |  |
| 18   | Chattanooga; TN-GA                           | 1.6%                                  | 15.6%                               | 2.6%              | 98   | Oklahoma City; OK                                 | -1.2%                                 | -3.9%                               | -0.2%             |  |  |
| 19   | Atlanta-Sandy Springs-<br>Roswell; GA        | 3.9%                                  | 3.6%                                | 3.4%              | 99   | Tulsa; OK   | -2.2%                                 | -2.1%                               | -0.7%             |  |  |
| 20   | Palm Bay-Melbourne-<br>Titusville; FL        | 4.2%                                  | 0.5%                                | 3.7%              | 100  | Bakersfield; CA                                   | -2.4%                                 | -2.2%                               | -0.6%             |  |  |

Source: Brookings analysis of Moody's Analytics estimates and U.S. Census Bureau's Longitudinal Employer-Household Dynamics program statistics

Manufacturing contributed to better job growth on average but, as with GMP, 41 of the 100 largest metro areas in 2016. Metro areas in the Northeast, parts of the Great Lakes, Oklahoma, and along the Gulf Coast saw among the slowest rates of job growth. Oil and gas extraction also tended to inhibit job growth, including in Bakersfield, Oklahoma City, Tulsa, and Youngstown, each of which saw their total number of jobs decline from 2015 to 2016.

The growth of jobs at young firms played an outsized role in total job growth in a majority of large metropolitan areas, especially slowergrowing ones throughout the Northeast and along the Gulf Coast. Jobs at young firms grew faster than total jobs in 66 of the 100 largest metro areas from 2015 to 2016. Metro areas where construction, health care, and hospitality played an important role in job growth from 2015 to 2016, like those in Inland California and Florida, saw among the largest increases in the number of jobs at young firms. However, many of the other metro areas that performed strongly on GMP and/or job growth did not perform as well on job growth within young firms. Las Vegas, Nashville, Palm Bay, Salt Lake City, Seattle, and Toledo all performed well on GMP and job growth but were among the weakest performers on job growth within young firms. Conversely, Bridgeport, Jackson, New Haven, and Rochester-among the weakest performers on total job growth-emerged as top performers on job growth at young firms. Growth of jobs at young firms vastly outpaced total job growth in these metro areas in what could be a promising sign of new investment and economic restructuring in these slower-growing places.

Overall, households, consumers, and hightech industries fueled the fastest-growing metropolitan economies from 2015 to 2016 while energy, manufacturing, and government contributed to consistently sub-par growth across measures in a large set of places.

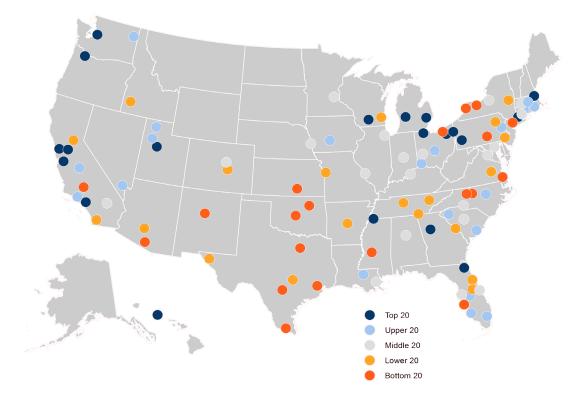
- Twenty-six (26) large metro areas performed better than the large metro area average on each of the three growth measures of GMP, total jobs, and jobs at young firms. Of these 26 metro areas, 18 are in the Sun Belt states of California, Florida, Georgia, and the Carolinas where consumer-oriented sectors like construction, retail, and hospitality grew especially fast from 2015 to 2016. The Intermountain West metro areas of Boise, Denver, and Provo also performed consistently well. Professional services industries related to high-tech also played an outsized role in the growth of these Mountain metro areas, those along the Pacific Coast, and in Austin, Des Moines, and Indianapolis. Finally, Grand Rapids also achieved consistently high growth performance due in large part to its expanding manufacturing and health care sectors.
- Thirty (30) large metro areas performed worse than the national large metro area average on each of the three growth measures. Declines in energy prices were a heavy drag on metro areas that specialize in oil and gas extraction or distribution along the Gulf Coast and in Oklahoma, including in Bakersfield, Birmingham, Houston, McAllen, New Orleans, Oklahoma City, and Tulsa. Three of these metro areas-Bakersfield, Tulsa, and Oklahoma City-saw declines in each of the three measures. And after years of top-flight growth, Houston's GMP and total jobs grew by just 0.1 percent from 2015 to 2016. In other slower-growing metro areas, especially those in the Northeast, modest growth or contraction in manufacturing, government, and/or logistics led to weaker overall performance.

## PROSPERITY

Most large metropolitan areas achieved gains in prosperity despite weak productivity growth. Eighty-seven (87) of the 100 largest metro areas experienced an increased standard of living from 2015 to 2016, 79 posted increases in the average wage, and 36 saw productivity increase. Overall, 91 large metro areas posted positive changes on at least one of the Metro Monitor's three prosperity measures, but only 31 posted positive changes on all three measures. Many of the established or emerging hightech economies that did well on growth also performed well on prosperity, including Atlanta, the Bay Area, Cape Coral, Grand Rapids, Jacksonville, Seattle, and metro areas along Utah's Wasatch Front. A number of older industrial cities and/or logistics hubs like Akron, Detroit, Pittsburgh, Stockton, Toledo, Worcester, and Youngstown also performed strongly on prosperity. Meanwhile, a diverse set of metro areas in New York state, Oklahoma, Eastern Pennsylvania, and Texas performed poorly on prosperity for a variety of reasons. Two emerging tech hubs, Boise and Nashville, are nearer the bottom of the list, suggesting that even as they add high-tech jobs they are also adding less-productive and lower-paying jobs.



**Composite prosperity rankings among the 100 largest U.S. metropolitan areas** 2015-2016



Source: Brookings analysis of Moody's Analytics estimates and Census Population Estimates program statistics

A majority of large metropolitan areas extended recent gains in average wages in **2016.** Productivity growth was only weakly associated with average wage growth from 2015 to 2016. For example, of the 20 best-performing metro areas on productivity growth, only seven were also among the 20 best-performing metro areas on average wage growth: Atlanta, Honolulu, Madison, Portland, Provo, San Jose, and Seattle. Another five were among the 20 worst performing metro areas on average wage growth, each of which in fact saw average wage declines: Baton Rouge, Birmingham, New Orleans, Palm Bay, and Pittsburgh. Metro areas' performance on average wage growth looks quite different from productivity in part because the sectors that contributed to slower productivity growth often boosted average wage growth. Sectors that are less productive also tend to pay lower wages. But whereas productivity growth did not keep pace with job growth in these sectors, average wage growth often exceeded it. In metro areas with large gains in average wages and middling or low productivity gains, sectors like construction, logistics, and health care, which held back productivity growth, contributed to average wage growth because these sectors increased wages at least as fast as they hired in most metro areas. Smaller professional services industries associated with high-tech also contributed to higher rates of average wage growth. Meanwhile, the metro areas with the weakest average wage growth include state capitals (Baton Rouge, Boise, Harrisburg, Nashville, and Oklahoma City), those specializing in oil and gas (Bakersfield, Birmingham, New Orleans, Houston, and Tulsa),

### Best- and worst-performing metropolitan areas by change in prosperity, 2015-2016

|      | Change in:                              |                   |                        |                       |           | Change in:  |                   |                        |                       |  |
|------|---|-------------------|------------------------|-----------------------|-----------|---|-------------------|------------------------|-----------------------|--|
| Rank | Metropolitan<br>statistical area        | Produc-<br>tivity | Avg.<br>annual<br>wage | Standard<br>of living | Rank      | Metropolitan<br>statistical area                  | Produc-<br>tivity | Avg.<br>annual<br>wage | Standard<br>of living |  |
|      | Тор 20                                  |                   |                        |                       | Bottom 20 |   |                   |                        |                       |  |
| 1    | San Jose-Sunnyvale-<br>Santa Clara; CA  | 0.9%              | 3.4%                   | 3.5%                  | 81        | North Port-Sarasota-<br>Bradenton; FL             | -0.6%             | 0.7%                   | 0.1%                  |  |
| 2    | Toledo; OH                              | 1.7%              | 1.1%                   | 4.3%                  | 82        | New York-Newark-<br>Jersey City; NY-NJ-PA         | -0.8%             | 0.4%                   | 0.8%                  |  |
| 3    | Seattle-Tacoma-<br>Bellevue; WA         | 0.8%              | 3.7%                   | 2.3%                  | 83        | Jackson; MS                                       | -0.7%             | 0.6%                   | 0.3%                  |  |
| 4    | Pittsburgh; PA                          | 2.9%              | -0.9%                  | 3.4%                  | 84        | Greensboro-High<br>Point; NC                      | -0.6%             | 0.6%                   | -0.1%                 |  |
| 5    | Akron; OH                               | 1.7%              | 1.2%                   | 2.7%                  | 85        | San Antonio-New<br>Braunfels; TX                  | -1.1%             | 1.1%                   | -0.2%                 |  |
| 6    | Urban Honolulu; HI                      | 0.9%              | 2.2%                   | 2.2%                  | 86        | Rochester; NY                                     | -0.5%             | -0.6%                  | 0.8%                  |  |
| 7    | Provo-Orem; UT                          | 0.4%              | 2.2%                   | 2.9%                  | 87        | Dallas-Fort Worth-<br>Arlington; TX               | -0.8%             | 0.4%                   | 0.3%                  |  |
| 8    | Madison; WI                             | 1.1%              | 2.2%                   | 1.7%                  | 88        | Cleveland-Elyria; OH                              | -0.5%             | -0.5%                  | 0.8%                  |  |
| 9    | Atlanta-Sandy Springs-<br>Roswell; GA   | 0.5%              | 1.5%                   | 2.3%                  | 89        | Virginia Beach-<br>Norfolk-Newport News;<br>VA-NC | -0.8%             | 0.6%                   | -0.4%                 |  |
| 10   | Portland-Vancouver-<br>Hillsboro; OR-WA | 0.5%              | 1.9%                   | 1.7%                  | 90        | Buffalo-Cheektowaga-<br>Niagara Falls; NY         | -1.1%             | -0.5%                  | 0.2%                  |  |
| 11   | Los Angeles-Long<br>Beach-Anaheim; CA   | 0.1%              | 1.9%                   | 2.3%                  | 91        | Wichita; KS                                       | -0.3%             | -1.4%                  | 0.0%                  |  |
| 12   | Detroit-Warren-<br>Dearborn; MI         | 0.4%              | 1.3%                   | 2.4%                  | 92        | Tucson; AZ  | -1.3%             | -0.1%                  | -0.7%                 |  |
| 13   | San Francisco-Oakland-<br>Hayward; CA   | 0.2%              | 0.9%                   | 3.0%                  | 93        | Albuquerque; NM                                   | -1.5%             | -0.3%                  | -0.2%                 |  |
| 14   | Stockton-Lodi; CA                       | -0.2%             | 2.7%                   | 1.5%                  | 94        | Winston-Salem; NC                                 | -1.0%             | -1.7%                  | -0.1%                 |  |
| 15   | Bridgeport-Stamford-<br>Norwalk; CT     | 1.1%              | 1.1%                   | 1.3%                  | 95        | Harrisburg-Carlisle; PA                           | -1.6%             | -0.5%                  | -0.9%                 |  |
| 16   | Jacksonville; FL                        | 0.3%              | 1.6%                   | 1.6%                  | 96        | Houston-The<br>Woodlands-Sugar<br>Land; TX        | 0.0%              | -2.0%                  | -1.7%                 |  |
| 17   | Boston-Cambridge-<br>Newton; MA-NH      | 0.5%              | 1.2%                   | 1.8%                  | 97        | Oklahoma City; OK                                 | -1.0%             | -1.0%                  | -2.3%                 |  |
| 18   | Youngstown-Warren-<br>Boardman; OH-PA   | 0.9%              | 1.0%                   | 1.3%                  | 98        | McAllen-Edinburg-<br>Mission; TX                  | -2.9%             | 0.8%                   | -2.3%                 |  |
| 19   | Grand Rapids-Wyoming;<br>MI             | 0.0%              | 1.2%                   | 2.3%                  | 99        | Bakersfield; CA                                   | -1.8%             | -0.4%                  | -3.0%                 |  |
| 20   | Memphis; TN-MS-AR                       | -0.1%             | 1.9%                   | 1.5%                  | 100       | Tulsa; OK   | -1.5%             | -2.3%                  | -2.9%                 |  |

Source: Brookings analysis of Moody's Analytics estimates and Census Population Estimates program statistics

and several older industrial cities around the Great Lakes (Buffalo, Cleveland, Rochester, and Pittsburgh).

Weak productivity growth, a hallmark of the current economic expansion, continued among a majority of the nation's largest metropolitan areas and within many sectors in 2016. Only seven large metro areas posted productivity growth of better than 1 percent. Another 29 saw more modest gains. The remaining 64 large metro areas saw their overall productivity decline, in large part because less productive sectors increased their share of jobs in these metro areas without also increasing their productivity. For example, construction tends to be slightly less productive than average in metro areas. Construction fueled job growth in the metro areas of Inland California, South Florida, and the Carolinas. However, the construction sector did not increase its productivity as fast as it added jobs. As a result, construction hiring contributed to slower productivity growth or even declines in some places. State and local government, health care, and higher education also contributed to subpar productivity growth, especially in state capitals and cities with large universities or hospitals like Cleveland or the metro areas of Upstate New York. Meanwhile, highly productive, capital-intensive sectors like information, manufacturing, and finance contributed to strong productivity growth in Boston, Bridgeport, Des Moines, Hartford, Madison, Omaha, Pittsburgh, Portland, Provo, San Jose, and Seattle. Oil and gas, along with these other capital-intensive sectors, also provided a boost to productivity in Akron, Baton Rouge, Birmingham, and New Orleans, even as it constrained productivity growth in Bakersfield, McAllen, Oklahoma City, and Tulsa.

A majority of large metropolitan areas increased their standard of living. The metropolitan areas

that managed to achieve productivity growth also tended to achieve higher rates of growth in their standard of living. Of the 20 top performing metro areas on changes in standard of living, 11 were also among the 20 top performing metro areas on changes in productivity: Akron, Atlanta, Boston, Honolulu, Madison, Palm Bay, Pittsburgh, Provo, San Jose, Seattle, and Toledo. Another five saw at least some productivity growth. Rising employment rates also contributed to stronger increases in metro areas' standard of living. Of the 87 metro areas that achieved increases in the standard of living in 2016, in 71 either increasing productivity, increasing employment rates, or some combination of these two factors drove increases in the standard of living. Meanwhile, in each of the 13 metro areas where the standard of living declined in 2016, productivity also declined. This list of metro areas with a declining standard of living includes several metro areas with large oil and gas sectors, including Bakersfield, Houston, McAllen, Oklahoma City, and Tulsa.

Sectoral trends help explain metro areas' uneven progress on prosperity in 2016. Capital-intensive sectors such as manufacturing and technology drove productivity growth in metro areas. Yet these sectors did not expand or increase wages to a degree that contributed meaningfully to average wage growth. (Certain high-tech metro areas like Madison, Portland, San Jose, and Seattle are an exception). Instead, less productive, larger sectors like construction, health care, retail, and hospitality helped drive average wage growth in many metro areas, even as their expansion drove down productivity growth.

 Only 21 metro areas posted above-average improvements in all three prosperity measures. These places include high-tech metro areas, such as Atlanta, Boston, Honolulu, Madison, Portland, Provo, San Francisco, San Jose, and Seattle. Other metro areas specializing in high-capital industries, including Bridgeport and Worcester, also posted consistent improvements in prosperity measures. The list was rounded out by a few metro areas in the Great Lakes area, including Akron, Detroit, Grand Rapids, Toledo, and Youngstown, and two Florida metro areas, Cape Coral and Jacksonville. Most of these metro areas also performed well on growth measures.

Twenty-six (26) large metro areas performed ٠ consistently below the large metro average on each prosperity measure. Some are fastgrowing places like Austin, Chattanooga, North Port-Bradenton-Sarasota, and Colorado Springs. But most were slowergrowing places in the Mid-Atlantic and Midwest. Nine metro areas, including several that specialize in oil and gas, lost ground on all three prosperity measures: Albuquerque, Bakersfield, Harrisburg, Houston, Oklahoma City, Tucson, Tulsa, Wichita, and Winston-Salem.

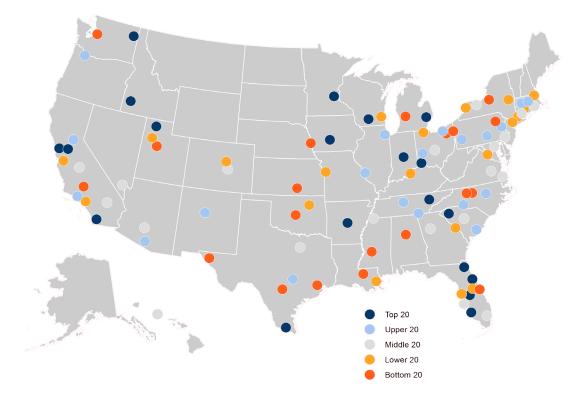
## INCLUSION

Most large metropolitan areas posted modest improvements in inclusion. Eighty-two (82) of the 100 largest metro areas saw the employment rate among working-age adults increase from 2015 to 2016, 73 posted increases in the median wage, and 55 experienced declines in the rate of relative earnings poverty. Overall, 93 large metro areas posted positive changes on at least one of the three of the Metro Monitor's inclusion measures, but only 37 posted improvements on all three measures. Overall, the places that did well on inclusion include a few of the Sun Belt metro areas that also did well on growth-Lakeland, Cape Coral, Deltona, Stockton, San Diego, and Jacksonville. However, other Sun Belt places that posted lackluster growth and prosperity gains ranked highly on inclusion, including Little Rock and Knoxville. The list of top inclusion performers included some high-tech metro areas, but not nearly as many as did well on growth and prosperityonly San Francisco, Madison, Spokane, Ogden, and Boise. A smattering of places around the Midwest completed the list, including Indianapolis, Des Moines, Minneapolis, Cincinnati, and Detroit, but for the most part, these places performed modestly well on growth and prosperity.



MAP 3

**Composite inclusion rankings among the 100 largest U.S. metropolitan areas** 2015-2016



Source: Brookings analysis of American Community Survey microdata

A majority of large metropolitan areas achieved at least incremental improvements in their employment rate from 2015 to 2016. Of the 82 large metro areas that saw rising employment rates, 36 saw rates rise by at least one percentage point. Neither geography nor sectoral factors provide consistent explanations for the sizeable increases in employment rates several large metro areas achieved. Instead, the metro areas that saw the greatest increases in employment tended to start from low employment rates. McAllen, Deltona, Stockton, Spokane, Lakeland, and Cape Coral started with among the 10 lowest employment rates in 2015, but each ranked among the 20 metro areas that posted the greatest improvement in that indicator in 2016. Greenville, Jacksonville, Little Rock, and Virginia Beach also posted significant gains. Faster hiring

in construction and consumer-oriented sectors contributed to rising employment rates in some of these top performers, like those in Florida and Inland California. However, most experienced broad-based but slower-than-average job growth. Though a majority of large metro areas saw increases in employment rates in 2016, most gains were far more modest than those among the top performers–a sign that many metro areas had achieved nearly full labor market recoveries prior to 2016. Meanwhile, no major metro area registered a statistically significant decline in its employment rate.

As labor markets tightened, the median wage continued to rise in a majority of large metropolitan areas. Tightening labor markets appear to have enabled higher median wage

### Best- and worst-performing metropolitan areas by change in inclusion, 2015-2016

|      | Change in:                                   |                                       |                |                                       |      | Change in:                                 |                                       |                |                                       |  |  |
|------|--|---------------------------------------|----------------|---------------------------------------|------|--|---------------------------------------|----------------|---------------------------------------|--|--|
| Rank | Metropolitan<br>statistical area             | Employment-<br>to-population<br>ratio | Median<br>wage | Relative<br>income<br>poverty<br>rate | Rank | Metropolitan<br>statistical area           | Employment-<br>to-population<br>ratio | Median<br>wage | Relative<br>income<br>poverty<br>rate |  |  |
|      | Top 20                                       |                                       |                |                                       |      | Bottom 20                                  |                                       |                |                                       |  |  |
| 1    | Spokane-Spokane<br>Valley, WA                | 5.6%                                  | 3.2%           | -10.5%                                | 81   | San Antonio-New<br>Braunfels, TX           | 1.5%                                  | 0.1%           | 3.2%                                  |  |  |
| 2    | Lakeland-Winter Haven,<br>FL                 | 3.5%                                  | 10.0%          | -4.5%                                 | 82   | Akron, OH                                  | 1.6%                                  | -0.4%          | 3.1%                                  |  |  |
| 3    | Indianapolis-Carmel-<br>Anderson, IN         | 2.3%                                  | 12.8%          | -1.8%                                 | 83   | Syracuse, NY                               | 0.7%                                  | -0.5%          | 0.3%                                  |  |  |
| 4    | Greenville-Anderson-<br>Mauldin, SC          | 5.1%                                  | 3.5%           | -4.2%                                 | 84   | Houston-The<br>Woodlands-Sugar<br>Land, TX | -0.4%                                 | 0.0%           | -2.4%                                 |  |  |
| 5    | McAllen-Edinburg-<br>Mission, TX             | 4.9%                                  | 0.8%           | -7.8%                                 | 85   | Grand Rapids-<br>Wyoming, MI               | 0.1%                                  | -0.7%          | -1.3%                                 |  |  |
| 6    | Boise City, ID                               | 2.4%                                  | 6.7%           | -7.9%                                 | 86   | Seattle-Tacoma-<br>Bellevue, WA            | 1.0%                                  | 1.1%           | 5.1%                                  |  |  |
| 7    | Stockton-Lodi, CA                            | 3.8%                                  | 6.4%           | -4.0%                                 | 87   | Baton Rouge, LA                            | -0.3%                                 | 0.0%           | 0.1%                                  |  |  |
| 8    | Cape Coral-Fort Myers,<br>FL                 | 5.6%                                  | 6.8%           | 2.7%                                  | 88   | Birmingham-Hoover,<br>AL                   | -0.4%                                 | 0.0%           | 0.1%                                  |  |  |
| 9    | Madison, WI                                  | 0.5%                                  | 12.5%          | -5.3%                                 | 89   | ScrantonWilkes-<br>BarreHazleton, PA       | -1.4%                                 | -0.8%          | -3.4%                                 |  |  |
| 10   | Des Moines-West Des<br>Moines, IA            | 2.2%                                  | 2.4%           | -9.7%                                 | 90   | Omaha-Council Bluffs,<br>NE-IA             | -0.9%                                 | -0.2%          | -0.6%                                 |  |  |
| 11   | Knoxville, TN                                | 2.6%                                  | 3.5%           | -6.9%                                 | 91   | Jackson, MS                                | -1.0%                                 | -0.1%          | 0.0%                                  |  |  |
| 12   | Jacksonville, FL                             | 3.3%                                  | 9.1%           | 2.8%                                  | 92   | Provo-Orem, UT                             | 0.0%                                  | -3.3%          | 0.2%                                  |  |  |
| 13   | Minneapolis-St. Paul-<br>Bloomington, MN-WI  | 0.9%                                  | 7.6%           | -6.3%                                 | 93   | Youngstown-Warren-<br>Boardman, OH-PA      | -0.8%                                 | 5.8%           | 8.7%                                  |  |  |
| 14   | Deltona-Daytona<br>Beach-Ormond Beach,<br>FL | 3.5%                                  | 7.1%           | 1.5%                                  | 94   | Wichita, KS                                | -0.3%                                 | 5.7%           | 10.9%                                 |  |  |
| 15   | San Francisco-Oakland-<br>Hayward, CA        | 1.0%                                  | 9.6%           | -2.6%                                 | 95   | Winston-Salem, NC                          | 1.9%                                  | -2.1%          | 8.9%                                  |  |  |
| 16   | Cincinnati, OH-KY-IN                         | 2.0%                                  | 7.8%           | -1.4%                                 | 96   | Oklahoma City, OK                          | -0.3%                                 | 1.6%           | 7.3%                                  |  |  |
| 17   | Little Rock-North Little<br>Rock-Conway, AR  | 3.2%                                  | 3.7%           | -2.0%                                 | 97   | El Paso, TX                                | -0.3%                                 | -1.0%          | 9.1%                                  |  |  |
| 18   | Ogden-Clearfield, UT                         | 1.2%                                  | 2.8%           | -8.8%                                 | 98   | Greensboro-High<br>Point, NC               | -1.2%                                 | -2.4%          | 6.0%                                  |  |  |
| 19   | Detroit-Warren-<br>Dearborn, MI              | 2.9%                                  | 3.2%           | -2.4%                                 | 99   | Bakersfield, CA                            | -2.3%                                 | -0.8%          | 5.7%                                  |  |  |
| 20   | San Diego-Carlsbad, CA                       | 0.8%                                  | 5.9%           | -5.9%                                 | 100  | Palm Bay-Melbourne-<br>Titusville, FL      | -1.9%                                 | -0.5%          | 8.1%                                  |  |  |

Source: Brookings analysis of American Community Survey microdata

growth in 2016 than in previous years. Of the 73 metro areas with median wage gains, 65 also saw their employment rates rise. And more than half of the metro areas with the greatest median wage growth saw above-average increases in employment rates from 2015 to 2016. As was the case with employment rates, strong job growth was not required for median wage gains in 2016, as evidenced by high wage growth in Indianapolis (12.8 percent), Madison (12.5 percent), Worcester (9.8 percent), and Harrisburg (9.5 percent). Albuquerque, Allentown, Cincinnati, Minneapolis, New Haven, and St. Louis also saw modest hiring but impressive median wage growth. Twentyseven (27) metro areas posted small median wage declines, none statistically meaningful.

Tightening labor markets and rising wages contributed to modest declines in relative earnings poverty. Metro areas that saw rising employment rates as a result of broad-based job growth tended to achieve larger declines in their rate of relative poverty. Of the 55 places that saw relative poverty fall, 49 experienced increases in their employment rate. Several metro areas that posted among the largest jumps in their employment rate also saw among the largest declines in relative poverty, including Boise, Greenville, Knoxville, Lakeland, McAllen, Spokane, Springfield, and Stockton. Each of these eight places, and 15 others, saw their rates of relative earnings poverty fall by at least 1 percentage point. Spokane's fell by 3 points. Places with high rates of relative poverty in 2015, including Bridgeport, Madison, Springfield, Spokane, and Providence, posted among the largest declines in relative poverty in 2016. For the most part, however, changes in relative poverty were modest. Thirtytwo (32) large metro areas saw relative poverty decline by less than 1 percentage point and 30 saw it increase by less than 1 point. And most of these modest changes are statistically insignificant. Many of the metro areas where relative poverty appears to have increased the most in 2016 also ranked poorly on changes in their employment rate and median wages.

Metro areas that posted broad-based job growth and rising average wages tended to see greater and more consistent gains in inclusion from 2015 to 2016.

- Thirty-seven (37) metro areas posted ۲ across-the-board improvements on inclusion measures. Of these, 13 achieved above-average improvements on each measure: Boise, Cincinnati, Detroit, Greenville, Indianapolis, Knoxville, Lakeland, Little Rock, Pittsburgh, Sacramento, San Francisco, Spokane, and Stockton. All of these places grew GMP, jobs, and jobs at young firms in 2016. And most also saw improvements on their average wage and standard of living. Boise, Lakeland, Sacramento, and Stockton saw faster growth powered largely by households and consumers. But improvements in economic inclusion did not require dramatic growth. For example, Cincinnati, Detroit, Greenville, Little Rock, and Pittsburgh each saw subpar job growth and above-average gains on inclusion measures.
- Just 16 metro areas had consistently subpar performance across all three inclusion indicators. Only seven of these metro areas– Bakersfield, Baton Rouge, Birmingham, El Paso, Greensboro, Jackson, and Palm Bay– saw declines on each of the three inclusion indicators (although none of the changes are statistically meaningful). With few exceptions, metro areas that performed consistently poorly on inclusion measures achieved middling performance at best on growth and prosperity measures in 2016.

### INCLUSION BY RACE AND ETHNICITY

Many large metropolitan areas narrowed economic disparities between whites and people of color. Racial disparities in economic inclusion outcomes shrank in about half of the 100 largest metro areas. Fifty-three (53) metro areas reduced disparities in employment rates between whites and people of color, 45 reduced disparities in median wages between whites and people of color, and 48 reduced disparities in relative poverty rates between whites and people of color. However, fewer metro areas reduced disparities by making everyone better off. And only a handful of metro areas made consistent progress in reducing racial economic disparities across inclusion measures.

- Tightening labor markets more often increased employment rates for whites than for people of color. Seventy-two (72) metro areas increased the employment rate among whites, 66 increased the employment rate among people of color, and 41 increased the employment rate among both whites and people of color. But in only 26 metro areas did rising employment rates among both groups also shrink disparities between them.
- Rising employment rates were often accompanied by rising median wages for both whites and people of color. Seventynine (79) large metro areas posted median wage increases among whites, 75 posted

median wage increases among people of color, and 62 posted median wage increases among both groups. Yet in only 28 of those 62 metro areas did employment disparities between the groups decrease.

- Fewer metro areas managed to reduce relative earnings poverty among different racial and ethnic groups. Fifty-six (56) metro areas had a declining relative poverty rate among whites, 52 had a declining relative poverty rate among people of color, and just 32 saw a declining rate among both groups. In only 21 of those 32 metro areas did the disparity in relative poverty rates between whites and people of color narrow.
- Ultimately, few metro areas consistently • reduced racial disparities across all inclusion measures. Just nine large metro areas saw racial disparities in employment rates and median wages fall as a result of gains among both whites and people of color: Chicago, Cincinnati, Dallas, Dayton, Deltona, Detroit, Greenville, McAllen, and Ogden. Relative poverty fell among people of color in all nine of these metro areas and among whites in five. However, declines in relative poverty reduced disparities in relative poverty rates between whites and people of color in only Cincinnati and Greenvilletwo places that also saw across-the-board improvements on overall inclusion.

## CONCLUSION

## Truly inclusive economic growth and prosperity proved elusive for most large metropolitan areas in 2016. Progress was widespread.

On each of the nine core measures of the Inclusive Growth Index, except for productivity, more than half of the 100 largest metro areas notched positive change. However, despite this broad-based progress, only 11 metro areas achieved inclusive economic growth and prosperity by posting improvements across every measure: Cincinnati, Des Moines, Detroit, Greenville, Madison, Minneapolis-St. Paul, Portland, Providence, San Francisco, Spokane, and Washington, D.C. For the most part, these places saw modest but broad-based growth in 2016 driven by a broad array of sectors. They all achieved productivity growth above the large metro area average in 2016, but that growth would rank only 33rd fastest out of the last 39 years of U.S. history.9

These 11 places did tend to post stronger gains on overall inclusion measures, however, And all but Portland and Spokane made at least some progress on narrowing gaps in racial economic inclusion. Ultimately, out of the 100 largest metro areas, Cincinnati and Greenville emerge as the only two that not only made consistent progress in overall growth, prosperity, and inclusion, but also reduced disparities in racial inclusion by improving employment, wages, and poverty among both whites and people of color. Meanwhile, almost every large metro area made at least some progress within the Inclusive Growth Index in 2016. Only Bakersfield, a place hit hard by the energy price collapse, saw declines on each of the core measures under growth, prosperity, and inclusion.

## APPENDIX

This Metro Monitor draws on data from Moody's Analytics and the U.S. Census Bureau to produce estimates in the indicators that make up the Inclusive Growth Index. Moody's Analytics provides proprietary estimates of jobs, wages, and gross product by industry that are based upon official statistics published by the U.S. Bureau of Labor Statistics and the U.S. Bureau of Economic Analysis. The Metro Monitor uses data from two U.S. Census Bureau programs: the Longitudinal Employer Household Dynamics (LEHD) program and American Community Survey (ACS) Public Use Microdata Series (PUMS). These two Census Bureau sources and the methods of their use are described in more detail here.

### **CENSUS LEHD**

The Metro Monitor uses Quarterly Workforce Indicators (QWI) data from the Census Bureau's LEHD program to examine the number of jobs at firms by the firms' age by county.<sup>10</sup> (The authors aggregated county-level QWI data into metropolitan areas.) Though illuminating, using the LEHD's QWI data requires some care. First, states' participation in the LEHD is optional. As a result, time coverage varies across states. Notably, data for Massachusetts first appear in the QWI series in the first guarter of 2010 and reliable firm-age data from Wyoming are not available through the first quarter of 2016. The second challenge is that these data are seasonally unadjusted. Finally, the data have a one-guarter lag between data release and adjustment of the firm age series. To account for these facets of the data, the authors use the period from the first guarter of 2006 to the first quarter of 2016 to examine 10-year differences

in hiring by young firms for most metro areas.<sup>11</sup> Because there are only seven years of complete data for Massachusetts, a 10-year indicator for the four metropolitan areas with portions within Massachusetts (Boston, Springfield, Providence, and Worcester) are not reported. Similarly, no indicator is reported for the United States as a whole, due to the lack of reliable firm-age data for all states in 2016.

### **CENSUS ACS**

The Metro Monitor uses Census Bureau microdata to examine inclusion outcomes in metropolitan areas, including by race and education. The authors use microdata from the 2006 to 2016 ACS, which come from the Census Bureau's PUMS files.<sup>12</sup> Data from the ACS one-year estimates were collected throughout the course of the year in question but refer to the survey respondent's employment status and wages during the last 12 months.

The authors used several techniques for analyzing the microdata that merit description:

Each observation in the microdata from the ACS is assigned to a unit of geography called a Public Use Microdata Area (PUMA). PUMAs represent the smallest, most detailed level of geography available in the public use files, with each PUMA covering an area of at least 100,000 people to preserve survey respondents' anonymity. PUMAs do not overlap; they fully partition each state into contiguous areas. Depending on the population in a region, PUMAs can encompass entire counties and groups of counties or cover part of a county.<sup>13</sup>

always perfect) approximations of metropolitan areas. This can be achieved by assigning PUMAs to counties, and counties to metro areas. PUMAs were assigned to metropolitan areas for this study using the Office of Management and Budget's 2013 metropolitan area definitions. The Census Bureau permits changes to PUMA definitions every few years. For each year of data, the authors assigned PUMAs to metropolitan areas using the Office of Management and Budget's 2013 metropolitan area definitions.

To protect the anonymity of survey respondents, the Census Bureau masks wages of some individuals in the published microdata. This masking creates certain inconsistencies. To address this, the authors calculated median wages from the microdata by interpolating between author-defined earnings bins immediately less than and greater than the 50th percentile in earnings for each metro area. This interpolation method is analogous to one used by the Bureau of Labor Statistics to calculate quarterly median wages from the Community Population Survey.<sup>14</sup> Within each metro, incomes of residents are adjusted to 2016 dollars using the Bureau of Economic Analysis's Personal Consumption Expenditure (PCE) index and grouped into \$500 bins.<sup>15</sup> The proportions of metro residents whose incomes fall into each income bin and those below it are summed to find the cumulative frequency associated with each bin. Using linear interpolation, the authors find the midpoint between the maximum income in the greatest income bin whose cumulative frequency is less than 50 percent, and the maximum income in the least income bin whose cumulative frequency is greater than 50 percent.

The above measure of the median wage is used to calculate the relative income poverty rate, which is defined as the share of residents with incomes less than half of a metro's median income among all workers.

As a survey of a sample of the U.S. population, the ACS is subject to sampling error. Moreover, to avoid disclosing the identities of survey respondents, the Census Bureau releases a subset of the full ACS sample for public use. This means that the PUMS-based estimates are subject to sampling error. The authors computed measures of this error as part of this study to assess statistical significance of estimates.

For median earnings, the employment-topopulation ratio, and the relative income poverty rate, standard errors were calculated using Census-provided replicate weights. Each observation in the ACS microdata stand in for a variable number of people, depending on demographic characteristics of the individuals sampled. Individual respondents are assigned weights that represent the number of people for whom they stand. The ACS microdata files come with 80 sets of these weights, each of which is an alternative to the main weight. These replicate weight estimates often differ from estimates computed using the main weights. To calculate standard errors, the authors computed estimates for each replicate weight, in addition to the reported estimate calculated using the main set of weights. The variability between the reported estimate and the estimates yielded by each of the 80 replicate weights were used to compute a standard error for each metric.<sup>16</sup>

## ENDNOTES

1. Total nonfarm employment and earnings from the Current Employment Statistics Survey provided by the Bureau of Labor Statistics, <u>https://data.bls.gov</u> (accessed January 2018).

2. Race of Head of Household by Median and Mean Income - All Races provided by the Census Bureau, <u>https://www.census.gov/data/tables/</u> <u>time-series/demo/income-poverty/historical-</u> <u>income-households.html</u> (accessed January 2018).

3. The Metro Monitor uses the U.S. Office of Management and Budget's 2013 metropolitan statistical area definitions for the entire period of analysis and identifies the top 100 largest U.S. metropolitan areas based on their population in 2010 as reported in the 2010 Decennial Census. In the text of this report we have omitted state names for metro areas because metro areas can fall in two or more states.

4. This definition of "successful economic development" is adapted from arguments put forward in a 2015 report to the U.S. Economic Development Administration authored by Maryann Feldman and others titled, "Economic Development: A Definition and Model for Investment." It is also influenced by Michael Spence's discussion of the economic and political dynamics of growth and development in his book, "The Next Convergence: The Future of Economic Growth in a Multispeed World" (New York: Farrar, Straus, and Giroux, 2011).

5. As with any analysis of change over time, this Metro Monitor analysis is sensitive to the choice of the start and end dates. Our choice of 2016 as the end year for the analysis reflects availability of the most recent, complete data for most of the indicators used here. Our choice of start years was influenced by a desire to assess progress not from one month or one quarter to the next, but over the longer periods of time that capture broader economic transformation. However, using fixed 10-, five-, and one-year increments does not capture the different timing and impact of business cycles upon metropolitan economies' performance. The Metro Monitor series website contains detailed data on metropolitan areas' economic progress within and across time periods.

Theories about the importance 6. of entrepreneurship to economic growth emerged from the writings of Adam Smith and David Ricardo in the 18th century. Each saw investment in new ventures as both a precursor to and outcome of wealth creation. As Smith and Ricardo's theories have become more formalized over the past 250 years empirical evidence on the positive role of new businesses in economic growth has also emerged. For example, Jed Kolko found that new firms accounted for 56 percent of gross job gains nationwide from 1992 to 2006 in his study, "Business Relocation and Homegrown Jobs, 1992-2006" (San Francisco, CA: Public Policy Institute of California, 2010). Kolko's study also finds that young firms also account for a majority of job losses due to their high failure rate relative to mature firms, which grow more slowly. Their net effect is still positive in the long run, however. Steven Davis and others found that firms aged less than five years saw average annual net job growth of 20 percent while mature firms had modestly negative net job growth rates between 1981 and 2001 (see Steven J. Davis, John Haltiwanger, Ron Jarmin, and Javier Miranda, "Volatility and Dispersion in Business Growth Rates: Publicly Traded vs. Privately Held Firms," (NBER Working Paper 12354, 2006).

7. A number of studies suggest that the recent decline in business dynamism, measured as the ratio of firm births plus deaths to the number of all firms, is directly related to declining labor market mobility and aggregate wage stagnation. The studies show that the remarkable volatility of young firms in terms of hires, layoffs, and job gains and losses associated with firm births and deaths are important to workers' job and occupational mobility. This is because without the business dynamism associated with entrepreneurship, there are fewer opportunities for workers to take new jobs. Studies have also shown that the job and occupational mobility associated with this sort of labor market churn is a crucial channel for individual and aggregate wage growth. For more information, see: Mike Konczal and Marshall Steinbaum, "Declining Entrepreneurship, Labor Mobility, and Business Dynamism: A Demand-Side Approach," (New York, NY: Roosevelt Institute, 2016); Economic Innovation Group, "Dynamism in Retreat: Consequences for Regions, Markets, and Workers," (Washington, 2017); Mary Daly, Bart Hobijn, and Theodore Wiles, "Dissecting Aggregate Real Wage Fluctuations: Individual Wage Growth and the Composition Effect," (Working Paper no. 2011-23, Federal Reserve Bank of San Francisco, 2012).

8. We refer to this indicator-the employmentto-population ratio-as the "employment rate" in the text, for narrative ease. In labor market economics, the term "employment rate" is typically used to indicate the share of the labor force in work. 9. Brookings analysis of Moody's Analytics data.

10. Quarterly Workforce Indicators Data provided by the LED Program of the Census Bureau, <u>https://lehd.ces.census.gov/data/</u> (accessed January 2018).

11. For more information, see "Data Availability" in <u>https://lehd.ces.census.gov/doc/QWI\_101.pdf</u>.

12. U.S. Census Bureau American Community Survey Public Use Microdata Sample, <u>https://</u> www.census.gov/programs-surveys/acs/data/ pums.html (accessed October 2017).

13. For more information, see <u>https://www.</u> <u>census.gov/programs-surveys/acs/technical-</u> <u>documentation/pums/about.html</u> and <u>https://usa.ipums.org/usa-action/variables/</u> <u>PUMA#description\_section.</u>

14. For more information, see "Median Earnings" in <u>https://www.bls.gov/cps/eetech\_methods.pdf</u>.

15. Personal Consumption Expenditure Index provided by the Bureau of Economic Analysis, <u>https://www.bea.gov/iTable/iTable.cfm?reqid=1</u> <u>9&step=2#reqid=19&step=3&isuri=1&1921=surv</u> <u>ey&1903=63</u> (accessed November 2017).

16. For a detailed description of the replicate weights methodology, see pp. 16-17 in <u>https://www2.census.gov/programs-surveys/acs/tech\_docs/pums/accuracy/2016AccuracyPUMS.pdf</u>.

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