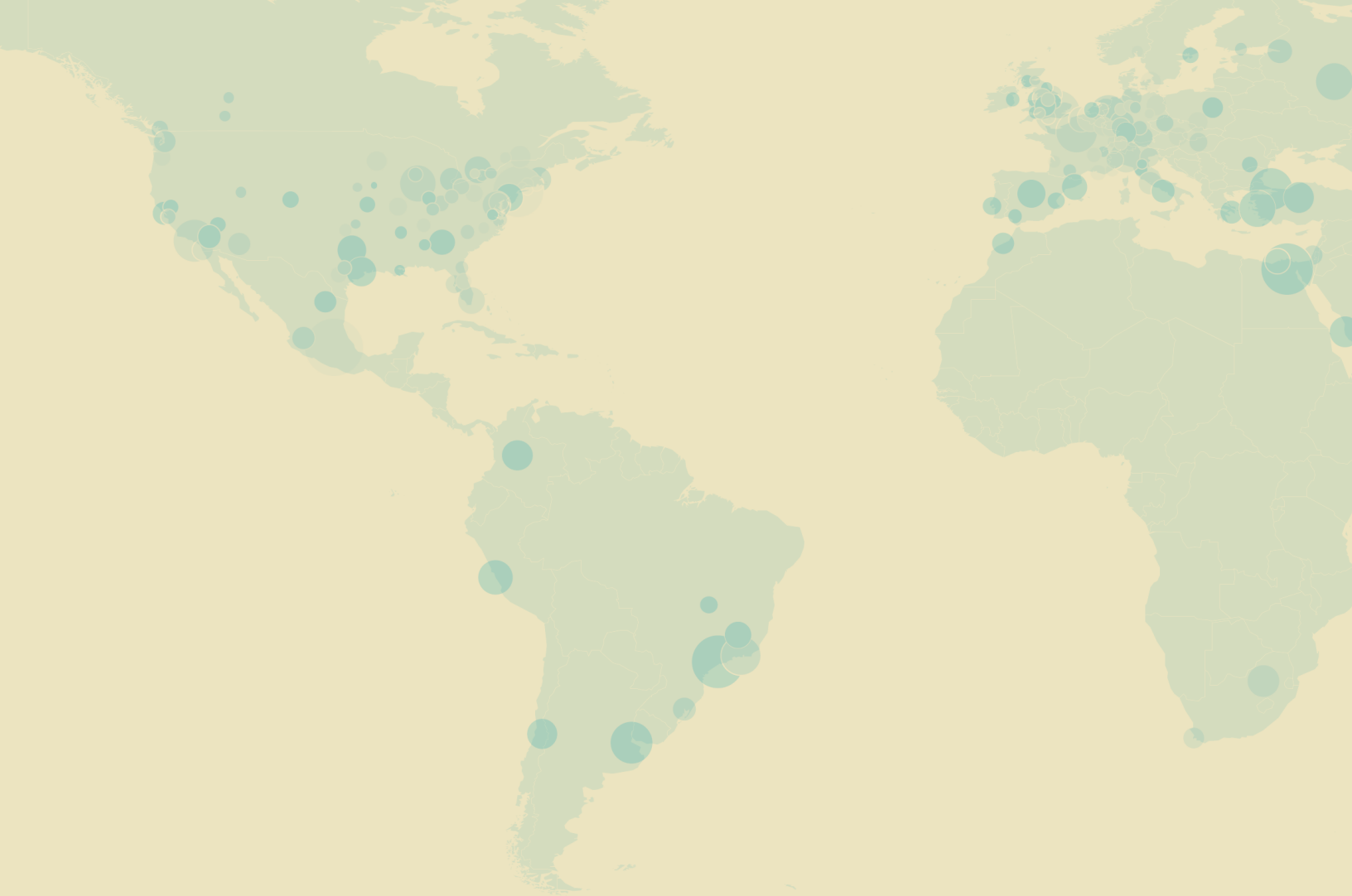




**GLOBAL METROMONITOR** 20  
VOLATILITY, GROWTH, AND RECOVERY 11



# GLOBAL METROMONITOR 2011

## VOLATILITY, GROWTH, AND RECOVERY

EMILIA ISTRATE, ALAN BERUBE, AND CAREY ANNE NADEAU

### FINDINGS

An analysis of per capita GDP (income) and employment changes in the 2010 to 2011 period for 200 of the world's largest metropolitan economies, which account for nearly one-half (48 percent) of global output but contain only 14 percent of world population and employment, reveals that:

- ▶ **Ninety (90) percent of the fastest-growing metropolitan economies among the 200 largest worldwide were located outside North America and Western Europe.** By contrast, 95 percent of the slowest-growing metro economies were in the United States, Western Europe, and earthquake-damaged Japan.
- ▶ **In nearly every global region, metro areas generated disproportionate shares of national increases in output and employment.** Many U.S. metro areas significantly outperformed the national average on income growth, while several others significantly underperformed on employment growth.
- ▶ **Employment growth accelerated in about three-fourths of metro areas from the 2009 to 2010 period, but income growth slowed in two-thirds, particularly in the Asia-Pacific and Latin American regions.** Income and employment grew much faster in 2011 than the year before in Eastern European metro areas such as Bucharest, Prague, and Warsaw, and in several North American metro areas including Houston, Calgary, Seattle, and Milwaukee. Growth rates fell considerably in Chinese metro areas and their trading partners such as Manila, Perth, and Lima.
- ▶ **Less than one-half of the 200 metro areas surpassed their pre-recession levels of employment and/or income by 2011.** While nearly all developing Asia-Pacific and Latin American metro areas achieved new highs in both income and employment in 2011, only one North American metro area did so. Most metro areas also posted slower employment and income growth rates in 2010-2011 than they did over the long-run, pre-recession period from 1993 to 2007.
- ▶ **Metro areas specializing in commodities and business and financial services within their countries exhibited the strongest performance.** By contrast, metro areas with high concentrations of local/non-market services (education, health care, administrative services, government) or construction registered only sluggish growth last year. Manufacturing accounted for the largest share of output growth in 59 metro areas from 2010 to 2011, including many in which it does not rank as the largest industry.

2011 marked the latest year in a volatile period for the global economy, reflected in the distinct experiences of its leading metropolitan economies. A slowdown in the recovery did not alter the continued ascendance of emerging-market metro areas as hubs for production, consumption, and trade. The relatively stronger recent growth of business and financial services and manufacturing capitals suggests that metropolitan areas most focused in high-value export industries may be better positioned to respond to the opportunities offered by worldwide recovery and future global urban growth.

# INTRODUCTION

2011 marked the fourth consecutive year of global economic turmoil, characterized by a deep worldwide recession between 2008 and 2009, followed by a year of strong recovery. At the beginning of 2011, the economy seemed poised to continue the growth pattern it exhibited in 2010. In that “two-speed recovery,” emerging markets would keep up their high growth rate, while the United States, Europe, and other developed markets would recover more slowly.<sup>1</sup> In January 2011, the International Monetary Fund forecasted global output to expand by about 4.5 percent over the year.<sup>2</sup> As 2011 progressed, however, the global recovery lost some momentum. By September, the IMF lowered its global GDP growth forecast to 3.9 percent.

A series of events across the globe—natural disasters, political unrest, and policy tensions—led to slower growth in both developed and developing countries in 2011. The “Arab Spring” protests, notwithstanding their stunning political achievements, put short-term economic growth on hold in several countries such as Egypt, Tunisia, Libya, Yemen, and Syria, and contributed to instability in world oil markets. In March, Japan suffered the worst earthquake and tsunami in its history, which deeply affected the Japanese economy and worldwide supply chains. Protracted fiscal discussions in the United States heightened uncertainty in world markets.<sup>3</sup> In parallel, problems with sovereign debt in the Eurozone exploded in the fourth quarter, without a clear resolution reached by the end of the year. Thailand’s widespread floods in the second half of 2011 disrupted trade in computer and electronics products around the world.<sup>4</sup> And China, in the process of cooling down its overheating real estate market, managed to slow down its entire economy.<sup>5</sup>

Most of the best performing metro economies during the recession were from developing countries in Asia and Latin America, while the bottom performers were almost all from the United States and Europe.

These regional and national trends, while important, do not capture the complete picture of today’s dynamic global economy. Understanding the economic situation of metropolitan areas—the growth centers of national economies—complements that outlook and provides a more granular perspective of the world economy. The *Global MetroMonitor* provides this view by examining growth patterns in metro areas around the world during the 2010 to 2011 period.

This edition of the *Global MetroMonitor* updates and builds on the results of the first edition, which was released in November 2010 and co-produced by Brookings and the London School of Economics Cities Program.<sup>6</sup> That edition illustrated a variety of economic performance across the world’s largest metropolitan economies, reflecting a range of factors. National context mattered, but metropolitan industrial structure and other local factors often resulted in different economic performance among metro areas in the same country.<sup>7</sup> The *Global MetroMonitor* also builds on the model of the U.S. MetroMonitor, which tracks on a quarterly basis key economic trends in the 100 largest U.S. metropolitan areas.<sup>8</sup>

The 2010 *Global MetroMonitor* showed that recession and recovery came in waves across metropolitan areas around the world. In many large metropolitan areas in developing countries, economic growth slowed, but neither employment nor income declined. Most of the best performing metro economies during the recession were from developing countries in Asia and Latin America, while the bottom performers were almost all from the United States and Europe. The 2009 to 2010 period reinforced this growth pattern, accelerating the marked shift in growth toward the global East and South.

This 2011 *Global MetroMonitor* identifies large metropolitan areas that led or lagged on economic growth from 2010 to 2011, the latest year of a still-volatile period for the global economy. It further explains how and why metropolitan performance shifted in 2011 versus previous years, and identifies metro areas that have fully recovered from the Great Recession, those still in recovery mode, and those that continued to lose ground last year.

Ultimately, results from the *Global MetroMonitor* can assist metropolitan leaders, media, and the public to better understand the growth patterns of metropolitan areas in the global economy, and help to build a knowledge base to support international metro-to-metro economic relationships.



## BACKGROUND

### Why do metropolitan areas exist, and what makes them important places in which to study global economic growth?

In most countries around the globe, metropolitan areas generate the majority of economic activity. Metropolitan areas are regional economies defined by cities and their surrounding, economically integrated areas. For example, the largest 100 metropolitan areas in the United States produce three-quarters of the nation's gross domestic product. In other countries with less urban diversity, one or two metropolitan areas generate most of the national product. The Lima metropolitan area, for instance, accounts for 53 percent of Peru's economy, while housing only 30 percent of the country's population.

Economic activity concentrates in metropolitan areas through interactions on the ground among businesses, people, and governments. By locating in metropolitan areas, businesses benefit from large labor markets, public infrastructure, and deep pools of consumers. Firms also profit from close proximity, which spurs specialization, innovation, higher productivity, and ultimately economic growth.<sup>9</sup> As a result, metropolitan areas have the unique economic advantage in which area population growth results in more than a proportional growth of output, patents, bank deposits, and other wealth creation and innovation factors.<sup>10</sup>

By locating in metropolitan areas, businesses benefit from large labor markets, public infrastructure, and deep pools of consumers.

Regional innovation (industrial) clusters best exemplify these local interactions. Clusters are geographic concentrations of interconnected businesses, suppliers, service providers, coordinating intermediaries, and associated institutions like universities or community colleges in a particular field. Strong clusters yield a virtuous cycle of innovation, of knowledge sharing and entrepreneurship; higher productivity, income, and employment growth in industries; and enhanced regional economic performance.<sup>11</sup>

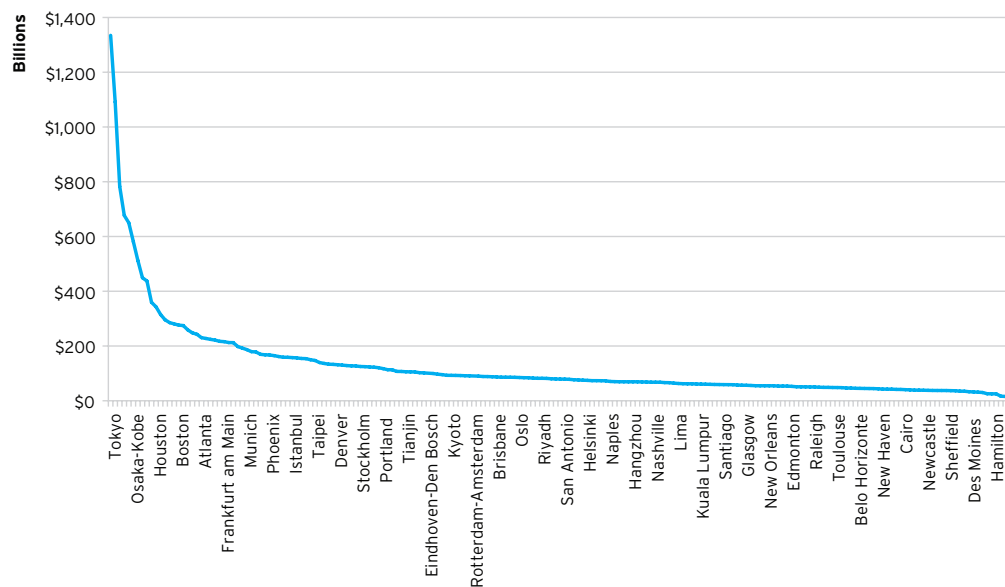
Urbanization and economic development go hand-in-hand. No country has reached middle-income status without industrialization and urbanization.<sup>12</sup> As a country grows richer, location becomes

more important for economic production. The shift from an agrarian economy to an industry-based economy, and ultimately to a service-driven economy enhances the importance of metropolitan economies. The World Bank estimates that as a country grows from low-income to lower-middle-income status (about \$3,500 GDP per capita), its urban share of population rises from about 10 percent to 50 percent. Urbanization continues with economic development, but slows once a country reaches high-income status.<sup>13</sup>

This second edition of the *Global MetroMonitor* confirms this pattern of economic concentration in global metropolitan areas. The largest 200 metropolitan economies examined here account for 14 percent of world population and employment, but generate more than 48 percent of global GDP.<sup>14</sup> This pattern is accentuated in rapidly growing areas of the world. For example, the 24 metro areas in developed Asia-Pacific countries profiled in this report account for 64 percent of both their countries' total population and GDP. By contrast, the 18 large metro areas in developing Asian countries produce almost one-quarter of their countries' GDP, despite housing only 7.5 percent of total population.

## FIGURE 1. GDP IS CONCENTRATED AMONG THE VERY LARGEST GLOBAL METROPOLITAN AREAS

GDP, 200 Largest Metropolitan Areas, 2011



Source: Brookings analysis of data from Oxford Economics, Moody's Analytics, and U.S. Census Bureau

This update examines performance trends for the world's largest 200 metropolitan economies (See next section for more details on selection method). Most of these metro areas are in high-income countries, with only a little more than one-fifth in developing countries. While the metro economies in developing countries represented only 14 percent of the GDP of all 200 metro areas in 2011, they have gained quickly on developed metro areas during the last few years. The Great Recession accelerated the shift of economic growth toward metro areas in developing countries. From 1993 to 2007, the 42 metro economies in developing countries added 2.5 percent to the GDP of the entire sample, but then added another 2.2 percent in just the four years from 2007 to 2011.

The 200 largest metropolitan economies are a diverse lot, both in terms of sheer size and relative wealth. Even though Tokyo's GDP shrank by about 3 percent from 2007 to 2011, it still possesses the largest metropolitan economy in the world, valued at roughly \$1.3 trillion, in 2005 dollars. New York has the world's second-largest metro economy—equal in size to that of the nation of South Korea. The other largest metro economies are located in Western Europe (London, Paris, Köln-Düsseldorf), Asia (Osaka, Seoul), and the United States (Chicago, Los Angeles, Washington, D.C.). These 10 metro areas represent 27 percent of the combined GDP of the world's 200 largest metro economies (Figure 1).<sup>15</sup> In contrast, eight of the ten largest metro areas by population are found in developing countries, and include three in China (Chongqing, Shanghai, Beijing), two others in Asia (Jakarta, Mumbai), two in Latin America (Mexico City and São Paulo), and one in Africa (Cairo). Together, those 10 metro areas house about one-quarter of the combined population of the 200 metro areas.

**TABLE 1. INCOMES VARY TREMENDOUSLY ACROSS THE WORLD'S LARGEST METROPOLITAN AREAS**

Highest and Lowest Per-Capita GDP, 200 Largest Metropolitan Economies, 2011

<i>Highest</i>			<i>Lowest</i>				
	<b>Metro Area</b>	<b>Region</b>	<b>Income (\$)</b>		<b>Metro Area</b>	<b>Region</b>	<b>Income (\$)</b>
1	Hartford	North America	75,086	181	<b>Izmir</b>	Eastern Europe and Central Asia	8,560
2	Oslo	Western Europe	74,057	182	<b>Santiago</b>	Latin America	8,494
3	San Jose	North America	68,141	183	<b>Kuala Lumpur</b>	Developing Asia-Pacific	8,472
4	Abu Dhabi	Middle East and Africa	63,859	184	<b>Cape Town</b>	Middle East and Africa	8,463
5	Bridgeport	North America	63,555	185	<b>Saint Petersburg</b>	Eastern Europe and Central Asia	8,235
6	Zurich	Western Europe	63,236	186	<b>Tianjin</b>	Developing Asia-Pacific	7,982
7	Washington	North America	62,943	187	<b>Beijing</b>	Developing Asia-Pacific	7,657
8	Stockholm	Western Europe	61,458	188	<b>Rio de Janeiro</b>	Latin America	7,636
9	Boston	North America	60,074	189	<b>Wuhan</b>	Developing Asia-Pacific	7,434
10	San Francisco	North America	58,783	190	<b>Lima</b>	Latin America	6,961
11	New York	North America	57,329	191	<b>Bogota</b>	Latin America	6,950
12	Seattle	North America	56,601	192	<b>Xi'an</b>	Developing Asia-Pacific	4,232
13	Houston	North America	56,050	193	<b>Manila</b>	Developing Asia-Pacific	4,181
14	Dublin	Western Europe	55,578	194	<b>Jakarta</b>	Developing Asia-Pacific	3,468
15	Des Moines	North America	55,335	195	<b>Casablanca</b>	Middle East and Africa	3,450
16	Paris	Western Europe	54,430	196	<b>Chongqing</b>	Developing Asia-Pacific	2,819
17	Calgary	North America	54,080	197	<b>Colombo</b>	Developing Asia-Pacific	2,697
18	Munich	Western Europe	54,078	198	<b>Alexandria</b>	Middle East and Africa	2,248
19	Buffalo	North America	52,454	199	<b>Mumbai</b>	Developing Asia-Pacific	1,990
20	Los Angeles	North America	52,391	200	<b>Cairo</b>	Middle East and Africa	1,989

Source: Brookings analysis of data from Oxford Economics, Moody's Analytics, and U.S. Census Bureau; developing metro areas shown in bold

The wealth of these metro economies, represented by their GDP per capita (see next section), differs markedly across the sample. Nineteen of the 20 highest-income metro areas are located in North America and Western Europe (Table 1), led by Hartford at roughly \$75,000. Some, such as Calgary and Des Moines, are small economies overall, but contain particularly high-value industries like commodities and finance. The 20 lowest-income metro areas are found in rising economies in the Developing Asia-Pacific, Latin America, Middle East and Africa, and Eastern Europe and Central Asia regions. Cairo and Mumbai, the least wealthy of the 200 metro areas, have per-capita incomes of only about \$2,000.

Most large metro areas generate higher incomes per capita than their respective countries, regardless of their own income levels. Developing Asian metro areas exhibit the largest differences, with incomes about three times higher than national averages. Income levels in Eastern European metro areas are almost twice those of their countries. In developed economies with high levels of urbanization, metro incomes are closer to national averages. For example, the income level of the 57 U.S. metro areas is about 15 percent higher than U.S. GDP per capita.

These data make clear that the world's largest metro economies start from very different positions in the Global MetroMonitor's analysis of economic growth. Thus, the key indicators presented here do not necessarily represent the overall strength or importance of individual metropolitan areas on the global stage. Rather, they aim to capture how metro areas are responding to continued volatility in the world economy, and to illuminate the underlying factors contributing to their diverse performance.



## DATA AND METHODS

The *Global MetroMonitor* joins a growing panoply of research reports aimed at understanding the performance and position of cities and metropolitan areas worldwide.<sup>16</sup> These reports answer the demand among local, national, and international audiences for comparative information on urban areas. Some of this demand reflects the growth of cities worldwide, and the fact that more than half of humanity now lives in urban and metropolitan areas.<sup>17</sup> In an increasingly competitive and dynamic global economy, leaders are seeking information about how their metropolitan areas are positioned for production, investment, innovation, and trade. These reports also help to illuminate how the success of cities relates to prosperity in nations, regions, and the world.

Amid this chorus of studies, the *Global MetroMonitor* is unique in a number of ways. First, as the name of the report indicates, its geographical unit of analysis is not the administrative city proper, but the metropolitan area, which includes cities and surrounding suburban and rural areas that together form an integrated regional economy. As described above, these areas are the true building blocks of national economies.<sup>18</sup>

Second, this research focuses exclusively on metropolitan economic dynamics, ranking the sampled metro areas based on their growth rates of GDP per capita—which this report terms “income”—and employment (see “Key Terms”). While this edition of the *Global MetroMonitor* concentrates primarily on the most recent year of data (2010 to 2011), it draws on information regarding the economic performance of metropolitan areas dating back to 1993. In addition to ranking metropolitan areas based on recent economic performance, this report analyzes the relationship between a metro area’s performance and its world region, national economy, and key industries.

Third, the *Global MetroMonitor* portrays as current a picture as possible of the position and trajectory of the world’s major metropolitan economies, through 2011. To do so, it relies on forecasted data from major economic consultancies. While such data should be viewed with appropriate caution, they offer a critical window on contemporary global economic dynamics from the vantage point of the world’s most important economic centers.

This second edition of the *Global MetroMonitor* largely follows the methodology used in the first edition, developed in collaboration with LSE Cities.<sup>19</sup> Therefore, this section focuses primarily on changes introduced in this year’s update. (For more details on definitions, methodology, and data, see Appendix A.)

### KEY TERMS USED IN THE *GLOBAL METROMONITOR*

**Gross Domestic Product (GDP):** the sum of the market value of goods and services produced in an economy, such as a metropolitan area, country, or the world.

**Output (Gross Value Added) of an industry:** the difference between an industry’s gross output and its intermediary purchases, domestic or imported.

**Employment:** the number of people who performed any work at all in the reference period, for pay or in-kind, or who were temporarily absent from a job for such reasons as illness, maternity or parental leave, holiday, training, or industrial dispute.

**Income:** per capita GDP for an economy. It is not personal income or household income, and does not reflect the distribution of income distribution, but proxies the average standard of living in an area.

**Population:** the number of residents of a metropolitan area or country.

This study defines a metropolitan area as an economic region with one or several cities and their surrounding areas, all linked by economic and commuting ties (see Appendix A). It employs the size of a metropolitan economy as the main selection criterion, given the focus on metropolitan economic performance. The sample is comprised of the largest 200 metropolitan economies in the world, based on the size of their economy in 2007, at market exchange rates. The sample is based on McKinsey Global Institute's Cityscope 1.1 database, which provides 2007 estimates and 2025 forecasts of a series of economic and socio-demographic variables for more than 2,000 metropolitan areas worldwide.<sup>20</sup>

This edition employs two main data sources: Moody's Analytics for metropolitan areas in the United States, and Oxford Economics for the rest of the sample. For the United States, this study also uses the U.S. Census Bureau's population estimates. Similar to the first edition, this *Global MetroMonitor* employs a few key variables to assess the economic performance of metropolitan areas: Gross Domestic Product (GDP), employment, population, and income (or GDP per capita), from 1993 to 2011 (see Appendix A).<sup>21</sup> In addition, the study uses Gross Value Added (GVA) and employment by major industry sector.<sup>22</sup> GDP and GVA data are adjusted for inflation, and are expressed in U.S. dollars at 2005 prices.

The report focuses on the economic performance of metropolitan areas on two key indicators: annualized growth rate of real income (GDP per capita); and annualized growth rate of employment (see Appendix A). These two indicators reflect the importance that people and policymakers attach to achieving rising incomes and standards of living (GDP per capita), and generating widespread labor market opportunity (employment).

The time period analyzed stretches from 1993 to 2011 to capture metropolitan area performance measures before, during, and after the Great Recession. This arc reflects the condition of the global economy rather than the actual trajectory of the metropolitan economies in our sample.

- ▶ The period from 1993 to 2007 provides the *long-run, pre-recession* trend each metropolitan area followed prior to the recession.<sup>23</sup> It provides a benchmark for assessing the degree to which metro areas have returned to their long-run growth trends during 2010-2011.
- ▶ The *recession* period shows the maximum impact of the recent economic volatile period on each metro area. As in the last edition of the *Global MetroMonitor*, this edition identifies the recession for each metro area based on its minimum annual growth rate (for income and employment separately) between 2007 and 2010.
- ▶ Finally, and most prominently, the report assesses performance from 2010 to 2011, the latest year in our time series. It compares metropolitan performance in this latest year to the 2009 to 2010 period, identifying metro areas that are undergoing a sustained upturn, slowing recovery, or decline.

To interpret metro economic performance, this report classifies metropolitan areas by their countries' income levels and world region. The 200 metropolitan areas are classified as "developed" and "developing" based on their primary country's 2010 gross national income (GNI) per capita.<sup>24</sup> Using World Bank's 2011 list of economies, "developed" status is equivalent to "high income" level, or GNI per capita in excess of \$12,276.<sup>25</sup> "Developing" metro areas are in countries with national income (GNI) per capita under that level. Of the 200 metropolitan areas in our sample, 158 are in developed countries and 42 are in developing countries.<sup>26</sup>

Based on the World Bank and the International Monetary Fund geographical regions, this study employs seven world regions in which the sampled metropolitan areas lie (for a full list of the metro areas, see the data appendix):

- ▶ **Western Europe:** 60 metro areas in the European Union member countries before the 2004 enlargement (EU-15), plus Norway and Switzerland;
- ▶ **North America:** 57 U.S. and 7 Canadian metro areas;
- ▶ **Developed Asia-Pacific:** 24 metro areas in higher-income Asia/Pacific countries (Australia, Hong Kong, Japan, New Zealand, Singapore, South Korea, Taiwan);
- ▶ **Developing Asia-Pacific:** 18 metro areas in lower-income Asian nations (China, India, Indonesia, Malaysia, Philippines, Sri Lanka and Thailand);
- ▶ **Latin America:** 12 metro areas in Argentina, Brazil, Chile, Colombia, Mexico and Peru;
- ▶ **Eastern Europe and Central Asia:** 11 metro areas in the Czech Republic, Hungary, Kazakhstan, Poland, Romania, Russia, and Turkey;
- ▶ **Middle East and Africa:** 6 metro areas in Middle Eastern countries (Israel, Kuwait, the United Arab Emirates, and Saudi Arabia) and 5 metro areas in African nations (Egypt, Morocco, and South Africa).<sup>27</sup>

This edition attempts to increase consistency among industrial sectors across metro areas and nations. It identifies eight major industrial sectors for which GVA and employment data are available at the metropolitan level:

- ▶ Commodities (agriculture and mining, including oil extraction)
- ▶ Manufacturing
- ▶ Utilities
- ▶ Construction
- ▶ Trade (wholesale and retail) and tourism
- ▶ Transportation
- ▶ Business, financial, insurance, and real estate services
- ▶ Local/non-market services (education, health care, administrative services, and government).<sup>28</sup>

While the industry concepts are largely consistent within these categories, industry GVA and employment may be calculated slightly differently on a country-by-country basis.

Based on their industrial specialization and economic performance in 2010-2011, this study classifies the 200 metropolitan areas into several categories. Metro areas are grouped based on their 2010-2011 growth rates of metropolitan income and employment, and the industry with the highest location quotient among industries with at least 5 percent of metropolitan output in 2010 (see Appendix A).<sup>29</sup> While industry specialization is identified for each of eight metro industries, metro areas with high specializations in transportation or utilities are grouped together, as are metro areas with strong specializations in local/non-market services or construction. As a result, each metro area is assigned one of six industrial characterizations.

For purposes of the metro typology, a metro economy is growing if its income and employment increased in 2010-2011; has mixed growth, if either indicator declined; and declining, if both indicators decreased. Coupled with the industrial profile, 184 metro areas from the sample are grouped into 16 categories (See Appendix A). To be sure, these “growing/mixed growth/ declining” patterns refer to short-term changes, rather than long-term trends in industrial centers.

# FINDINGS

## **A. Ninety (90) percent of the strongest-performing metropolitan economies among the 200 largest worldwide were located outside North America and Western Europe.**

The global economy grew at a modest rate in 2011, reflecting a tepid recovery from the Great Recession and lingering market uncertainty in many parts of the developed world, with continued but slowing expansion in developing regions. Yet global, regional, and even national analyses overlook important variation in economic

**The pace of growth in living standards in developing metro areas signifies their rising prominence as centers of consumption and production.**

performance among major metropolitan areas that reveal the places and industries that are driving—or holding back—broader recovery and growth.

The 200 largest metro economies worldwide recorded aggregate income growth of 1.5 percent from 2010 to 2011, slightly below the global average of 1.6 percent. Metropolitan employment grew at about the same rate as income, 1.7 percent.

In each major world region, metro areas achieved aggregate growth on both income and employment, with developing Asia-Pacific and Eastern Europe and Central Asia metro areas recording the fastest growth in both categories. On income, 149 of 200 metro areas experienced growth, 15 experienced decline, and 36 experienced little change. Similarly on employment, 140 metro areas registered growth, 12 had declines, and 48 saw little change.

As was the case in 2010, metro areas outside the United States and Europe set the pace for economic growth in 2011. Ranked on this study's performance index, which combines metropolitan income and job growth into a standardized indicator, metro areas that ranked in the top quintile (the 40 best-performing) included 36 located in the Asia-Pacific, Latin America, Middle East and Africa, and Eastern Europe and Central Asia regions (Map 1). The top performer was Shanghai, where income grew at a brisk 9.8 percent rate in 2010-2011, and employment expanded at a 5.8 percent rate. Only Shenyang achieved faster income growth, and only Riyadh achieved faster employment growth, than Shanghai last year (figure, left panel).

Developing Asian metro areas ranked among the top performers. All 12 Chinese metro areas among the world's 200 largest ranked in the top quintile for 2010-2011 performance, from Shanghai at number one to Chongqing at number 35. Mumbai, Jakarta, Kuala Lumpur, and Bangkok also ranked among the 40 strongest metro economies last year. Eight of 12 Latin American metro areas populated the top ranks, headed by Santiago at number 9 (see sidebar). And three Turkish metro areas (Izmir, Ankara, and Istanbul) cracked the top 10, headlining strong performance in that national economy, and among Eastern European and Central Asian metro economies more generally.

Only four metro areas in North America and Western Europe—Houston, Dallas, Stuttgart, and Stockholm—managed to rank among the 40 strongest economies in 2010-2011. These developed metro economies exhibited a healthy diversity that buoyed their recent performance relative to regional peers, including expansion in high value commodities, manufacturing, and business and financial services sectors.

The 40 lowest-performing economies in 2010-2011 were the reverse image of their strongest-performing counterparts. Fully 31 of the 40 were located in the United States and Western Europe, joined by seven metro areas in earthquake-affected Japan, and Cairo and Alexandria in an Egyptian economy slowed by that country's political revolution (Table 2, right panel).

The bottom performer, not surprisingly, was Athens, ground zero in the continuing European fiscal and financial crisis during 2011. Metro representatives from Western Europe's other troubled peripheral economies—Portugal, Ireland, Italy, and Spain—also populated the bottom economic performers. Lisbon, Dublin, Seville, Madrid, Naples, Barcelona, and Valencia joined Athens among the 10 lowest-ranked metro economies, reflecting in part the European fiscal and monetary crises that inhibited growth in their respective nations. Still, performance differed among metro areas even within these countries. In Italy, for example, Venice-Padova posted modest growth in income and employment thanks to a strengthening business and financial services sector, ranking it 130th overall, even as Naples shed jobs and stagnated on income, ranking it 194th overall.

**TABLE 2. DEVELOPING METRO AREAS LED THE LIST OF FASTEST-GROWING GLOBAL METROPOLITAN AREAS IN 2011**

Highest and Lowest Economic Performance Index Rankings, 200 Largest Metropolitan Areas, 2010-2011

Highest		Change, 2010-2011 (%)		Lowest		Change, 2010-2011 (%)	
Metro Area	Region	Income	Employment	Metro Area	Region	Income	Employment
1 Shanghai	Developing Asia-Pacific	9.8	5.8	161 Nottingham-Derby	Western Europe	0.7	0.0
2 Riyadh	Middle East and Africa	7.8	6.3	162 Philadelphia	North America	0.7	0.0
3 Jiddah	Middle East and Africa	7.0	5.5	163 Florence	Western Europe	0.6	0.0
4 Izmir	Eastern Europe and Central Asia	5.5	5.6	164 Rotterdam-Amsterdam	Western Europe	1.0	-0.2
5 Hangzhou	Developing Asia-Pacific	5.8	5.5	165 Glasgow	Western Europe	0.7	0.0
6 Ankara	Eastern Europe and Central Asia	5.4	5.7	166 Newcastle	Western Europe	0.5	0.0
7 Istanbul	Eastern Europe and Central Asia	5.3	5.6	167 Bologna	Western Europe	0.4	0.0
8 Shenzhen	Developing Asia-Pacific	6.5	4.9	168 Fukuoka-Kitakyushu	Developed Asia-Pacific	-0.2	0.4
9 Santiago	Latin America	5.7	4.9	169 Birmingham, UK	Western Europe	0.6	-0.1
10 Shenyang	Developing Asia-Pacific	11.6	1.7	170 Riverside	North America	0.2	0.1
11 Wuhan	Developing Asia-Pacific	9.8	2.5	171 Memphis	North America	0.4	-0.1
12 Nanjing	Developing Asia-Pacific	9.3	2.7	172 Des Moines	North America	-0.2	0.2
13 Mumbai	Developing Asia-Pacific	6.2	4.3	173 Cardiff-Newport	Western Europe	0.4	-0.1
14 Tianjin	Developing Asia-Pacific	8.4	2.2	174 Denver	North America	-0.9	0.5
15 Foshan	Developing Asia-Pacific	6.7	3.0	175 Birmingham, US	North America	0.3	-0.1
16 Buenos Aires	Latin America	7.3	2.5	176 Nagoya	Developed Asia-Pacific	-0.8	0.4
17 Jakarta	Developing Asia-Pacific	5.5	3.0	177 Liverpool	Western Europe	0.2	-0.1
18 Casablanca	Middle East and Africa	3.3	3.8	178 Sapporo	Developed Asia-Pacific	-0.1	0.0
19 Houston	North America	5.5	2.5	179 Las Vegas	North America	-0.3	0.1
20 Kuala Lumpur	Developing Asia-Pacific	1.0	4.9	180 Kyoto	Developed Asia-Pacific	-0.4	0.1
21 Guangzhou	Developing Asia-Pacific	5.5	2.5	181 Osaka-Kobe	Developed Asia-Pacific	-0.6	0.1
22 Monterrey	Latin America	3.1	3.6	182 Hiroshima	Developed Asia-Pacific	-0.4	0.0
23 Hong Kong	Developed Asia-Pacific	4.6	2.8	183 Indianapolis	North America	0.3	-0.4
24 Xi'an	Developing Asia-Pacific	8.4	0.6	184 Sendai	Developed Asia-Pacific	-1.1	0.2
25 Lima	Latin America	4.7	2.5	185 Alexandria	Middle East and Africa	-0.4	-0.3
26 Taichung	Developed Asia-Pacific	4.7	2.5	186 New Orleans	North America	-3.6	1.4
27 Beijing	Developing Asia-Pacific	3.0	3.3	187 San Francisco	North America	-0.6	-0.2
28 Belo Horizonte	Latin America	3.1	3.2	188 Cairo	Middle East and Africa	-0.5	-0.3
29 Bogota	Latin America	4.0	2.6	189 Atlanta	North America	0.4	-0.9
30 Ulsan	Developed Asia-Pacific	4.6	2.2	190 Kansas City	North America	-0.6	-0.5
31 Stuttgart	Western Europe	5.1	1.9	191 Richmond	North America	0.2	-1.0
32 Bucharest	Eastern Europe and Central Asia	1.0	4.0	192 Valencia	Western Europe	-0.2	-0.9
33 Warsaw	Eastern Europe and Central Asia	5.2	1.7	193 Barcelona	Western Europe	0.2	-1.2
34 Brasilia	Latin America	2.6	3.1	194 Naples	Western Europe	-0.1	-1.1
35 Chongqing	Developing Asia-Pacific	8.1	0.0	195 Madrid	Western Europe	0.1	-1.4
36 Dallas	North America	3.7	2.4	196 Sacramento	North America	-0.8	-1.0
37 Sao Paulo	Latin America	3.0	2.6	197 Seville	Western Europe	-0.3	-2.0
38 Bangkok	Developing Asia-Pacific	3.3	2.4	198 Dublin	Western Europe	-0.3	-3.0
39 Singapore	Developed Asia-Pacific	3.5	2.3	199 Lisbon	Western Europe	-2.8	-2.4
40 Stockholm	Western Europe	4.0	2.0	200 Athens	Western Europe	-4.8	-3.5

Source: Brookings analysis of data from Oxford Economics, Moody's Analytics, and U.S. Census Bureau

The United States and United Kingdom collectively accounted for one-half of the bottom 40 metro performers, which registered either lackluster growth or small losses in income and employment. Overall, U.K. economic growth in 2011 was very modest, reflecting continued weakness in domestic demand and the housing market, effects of public sector spending cuts, and instability among European trading partners. Yet Sheffield (ranked 141st) managed

**MAP 1. DEVELOPING ASIAN AND LATIN AMERICAN METRO AREAS GREW FASTEST ECONOMICALLY IN 2011**

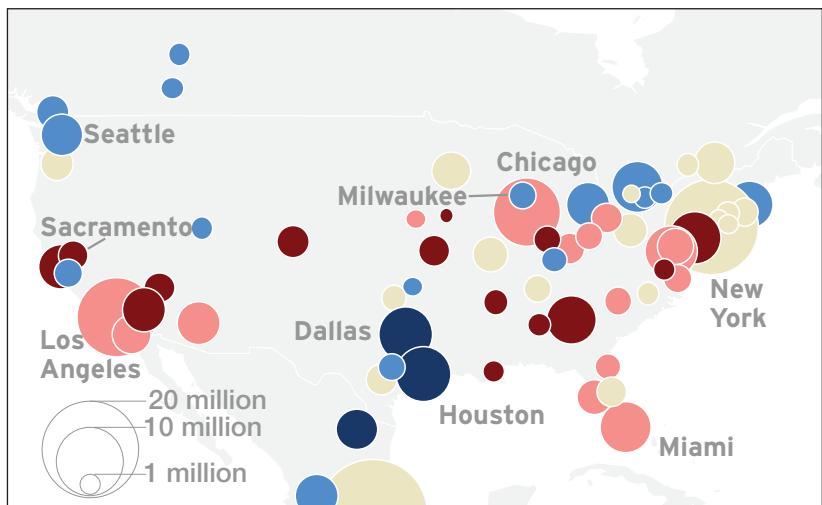
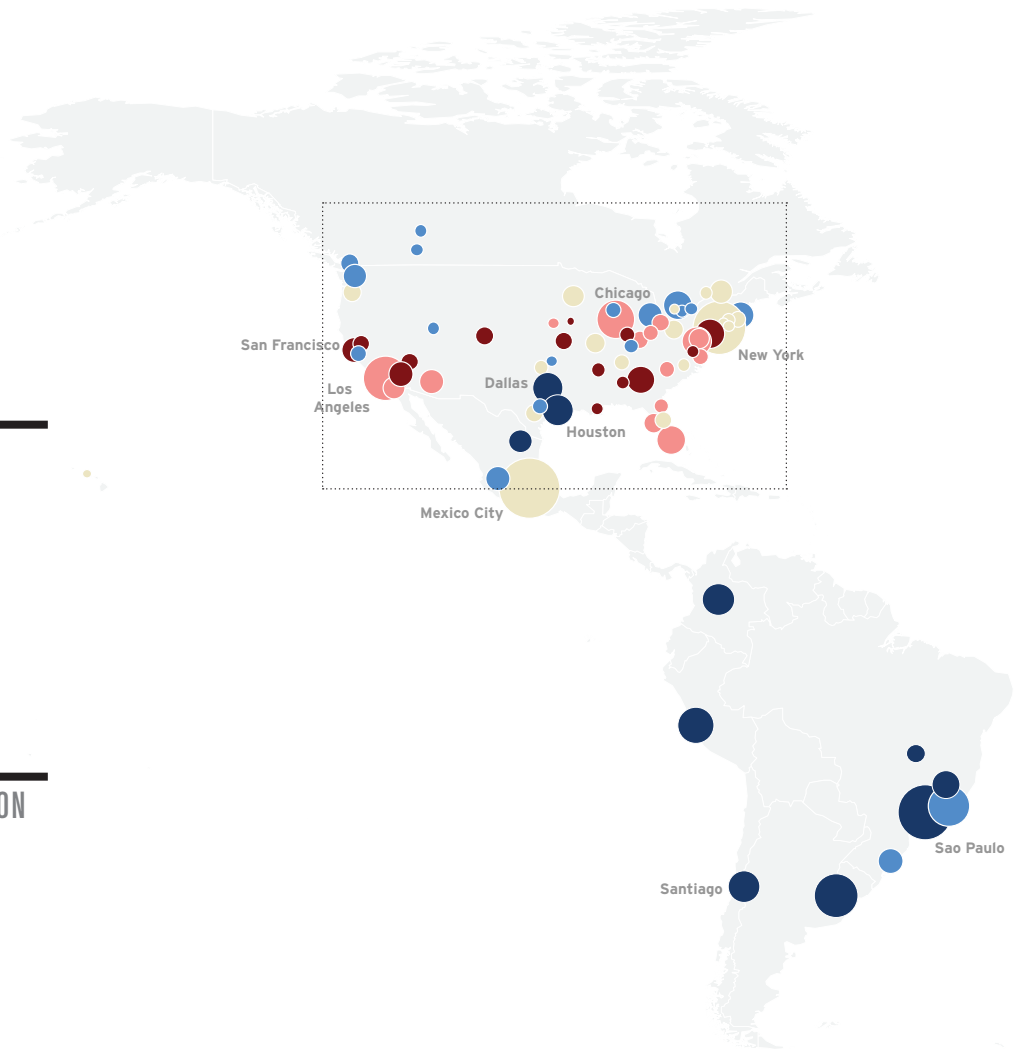
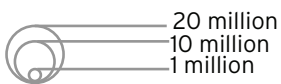
GDP, 200 Largest Metropolitan Areas, 2011

**ECONOMIC INDEX RANK  
2010 TO 2011**

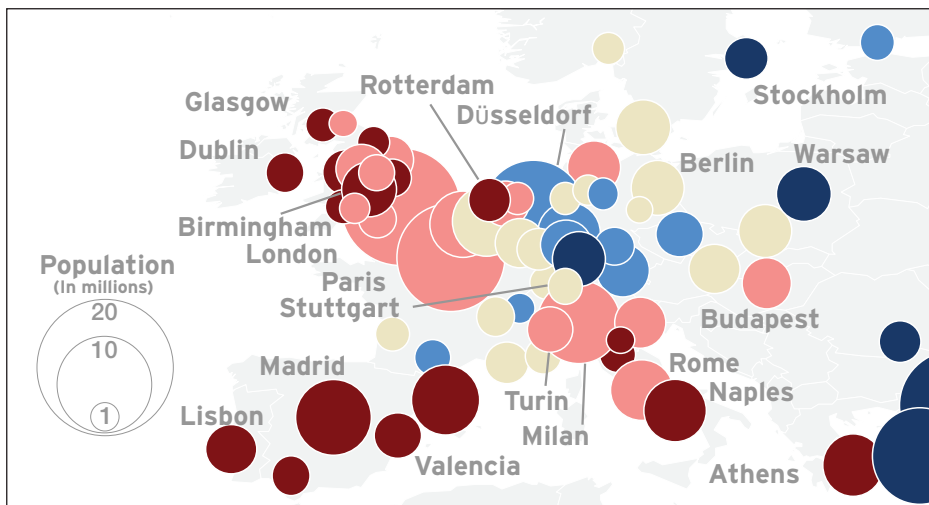
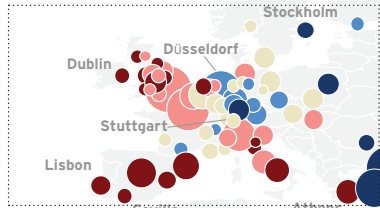
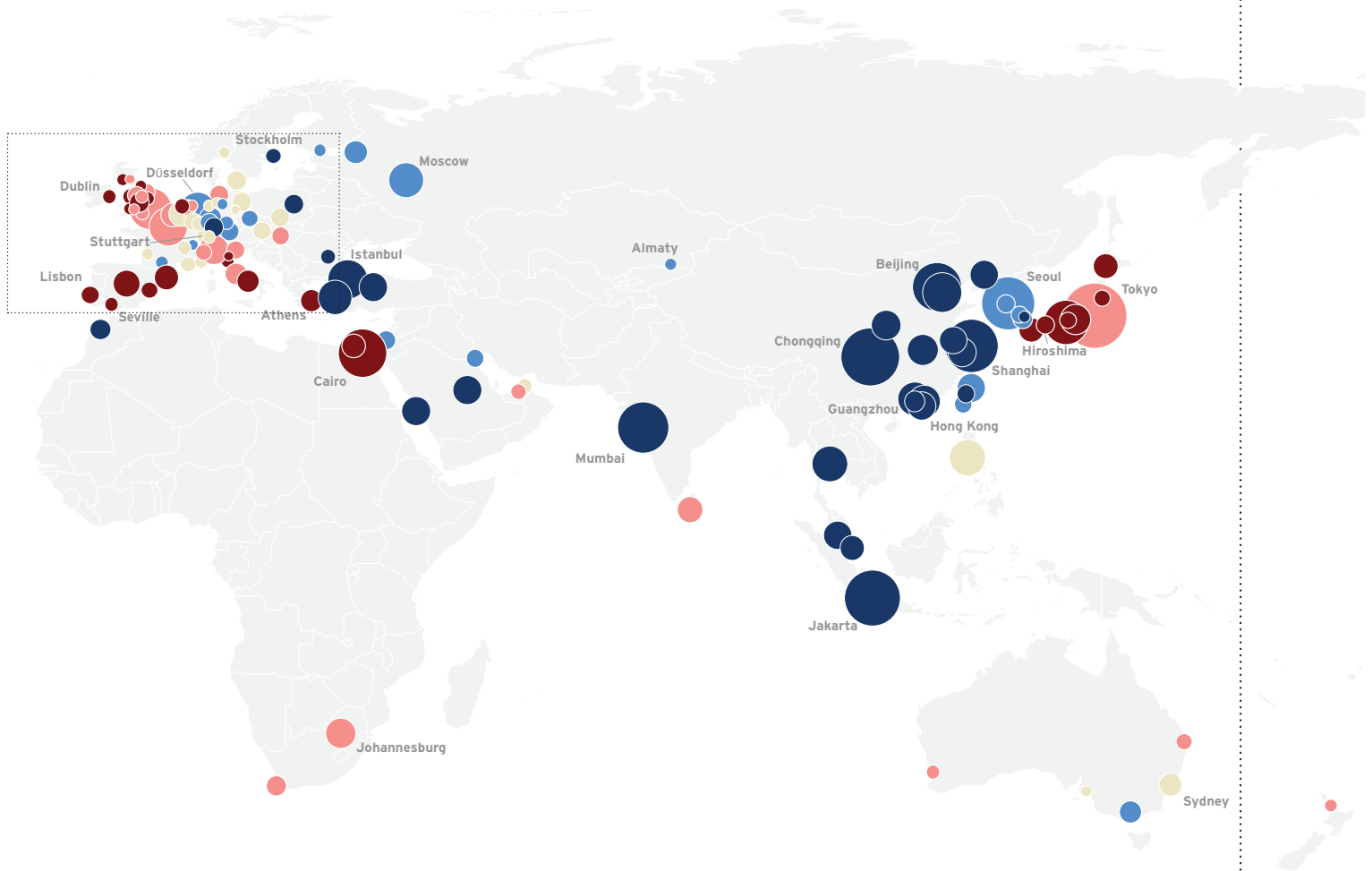
- Top quintile
- Second quintile
- Middle quintile
- Fourth quintile
- Bottom quintile

**METROPOLITAN POPULATION**

2011 estimates

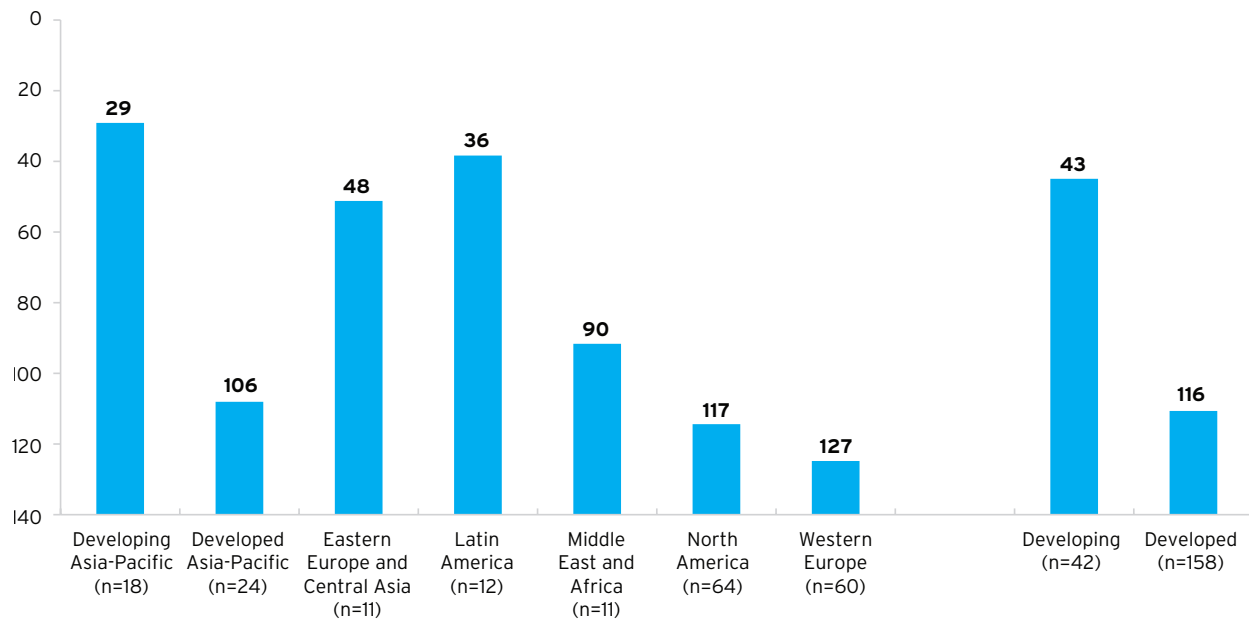


Source: Brookings analysis of data from Oxford Economics, Moody's Analytics, and U.S. Census Bureau



## FIGURE 2. DEVELOPING ASIA-PACIFIC AND LATIN AMERICAN METRO AREAS RANKED MUCH HIGHER THAN THEIR NORTH AMERICAN AND WESTERN EUROPEAN COUNTERPARTS

Average Economic Performance Index Ranking by Region, 200 Largest Metropolitan Areas, 2010-2011



Source: Brookings analysis of data from Oxford Economics, Moody's Analytics, and U.S. Census Bureau

to eke out small job and income gains, while Liverpool (ranked 177th) stagnated. Performance differences in the United States were even wider, from Dallas and Houston in the top quintile to Richmond and Sacramento in the bottom 10. The weakest-performing U.S. metro areas reflected a mix of places hamstrung by poor housing market conditions (e.g., Riverside, Las Vegas, Atlanta), dependent on trade with fragile European partners (e.g., Indianapolis, Philadelphia), and concentrated in state government services that faced steep cuts in 2011 (e.g., Richmond and Sacramento).

The average rankings of metro areas by world region reflect the metro economies populating the top and bottom of the performance table in 2010-2011 (Figure 2). The 18 Developed Asia-Pacific metro areas posted an average rank of 29, followed by counterparts in Latin America (36), and Eastern Europe and Central Asia (48). Middle East and Africa metro economies followed with an average rank of 90, disguising significant differences between oil-producing Saudi Arabian metro areas (Riyadh and Jiddah, ranked second and third) versus struggling Egyptian and South African metro areas. Similarly, the aftermath of the March 2011 Japanese earthquake weighed heavily on the average performance of Developed Asia-Pacific metro areas (106), masking strong growth in Hong Kong, Singapore, and several Taiwanese and Korean metro areas. North America (117) and Western Europe (127), as in 2009-2010, significantly underperformed other regions on average, though—as noted above—their large number of metro areas spanned a wide spectrum of economic growth and decline. Differences were evident by development status as well, with metro areas in developing national economies ranking far higher on average (43) than their counterparts in developed nations (116).

These trends highlight that developing metro economies among the world's 200 largest continue to close a significant income gap with their developed counterparts. In 2011, the 42 metro areas in lower-income nations had combined GDP per capita of \$7,993, about one-fifth of the \$39,094 value for the 158 metro areas in higher-income nations. Collectively, the developing metro areas experienced income growth of 4.8 percent in 2010-2011, about four times the 1.2 percent rate in developed metro areas. Because the gap remains so large, however, even if the 2010-2011 rate differential continued over time, it would take approximately 46 years for the incomes of developed and developing metro areas to fully converge. Nevertheless, the pace of growth in living standards in developing metro areas signifies their rising prominence as centers of consumption and production.<sup>30</sup>



## SANTIAGO: A STANDOUT LATIN AMERICAN PERFORMER IN 2011

Located along the western edge of South America, Santiago serves as Chile's capital city. The Santiago metropolitan region, home to nearly 7 million people, is the engine of the Chilean economy, accounting for 40 percent of the country's economic output. As a result, Chile's growth is deeply intertwined with development in Santiago.

Santiago has developed rapidly over the past two decades and recovered quickly after its economic downturn in 2009. Since 1993, GDP per capita has increased 66 percent in the Santiago metro area. Between 2010 and 2011, Santiago's economy experienced strong growth. Its income rose by 5.7 percent and employment by 4.9 percent, easily besting worldwide averages and ranking the metro area's economic performance ninth among the world's 200 largest metro areas, and first among Latin American metro areas.

After a devastating 8.8 magnitude earthquake on February 27, 2010, President Sebastián Piñera's "Let's Get to Work" plan helped accelerate the growth of the Chilean economy. The earthquake occurred 200 miles southwest of Santiago, destroying more than 200,000 homes, almost a thousand miles of roads, as well as ports, hospitals, schools and other buildings. The reconstruction effort that has taken place in the wake of the \$30 billion disaster has boosted consumption spending, as well as construction and infrastructure investments.<sup>31</sup> As a result, Chile's economy grew by 6.3 percent in 2011, even faster than in its first year of recovery.

But Santiago's growth patterns surpass national trends. The metropolitan region grew slightly faster than the country as a whole in 2010-2011, driven by its largest sector, business and financial services. Santiago has a strong financial district, including large banks such as Banco Santander-Santiago, the Chilean headquarters of the European multinational. Santiago is also strong in industries that have been expanding more rapidly than their national counterparts, such as transportation, trade and tourism, and local/nonmarket services. Indeed, trade (including wholesale and retail trade) and tourism is Santiago's third-largest industry, accounting for 16 percent of the metro's output. Driven by higher consumption spending, this sector was responsible for a disproportionate share of Santiago's economic growth—26 percent—between 2010 and 2011.

While growing overall, Santiago's economic performance was volatile between 2007 and 2011. Future changes in commodity markets and trade patterns will influence the metro area's trajectory. Commodities represent a small share of Santiago's economy, but any major fluctuations in the price of Chile's top export, copper, will have wide repercussions across the country, including Santiago. Chile's top export market, China, has witnessed a cooling housing market, which could dampen copper consumption there.<sup>32</sup>



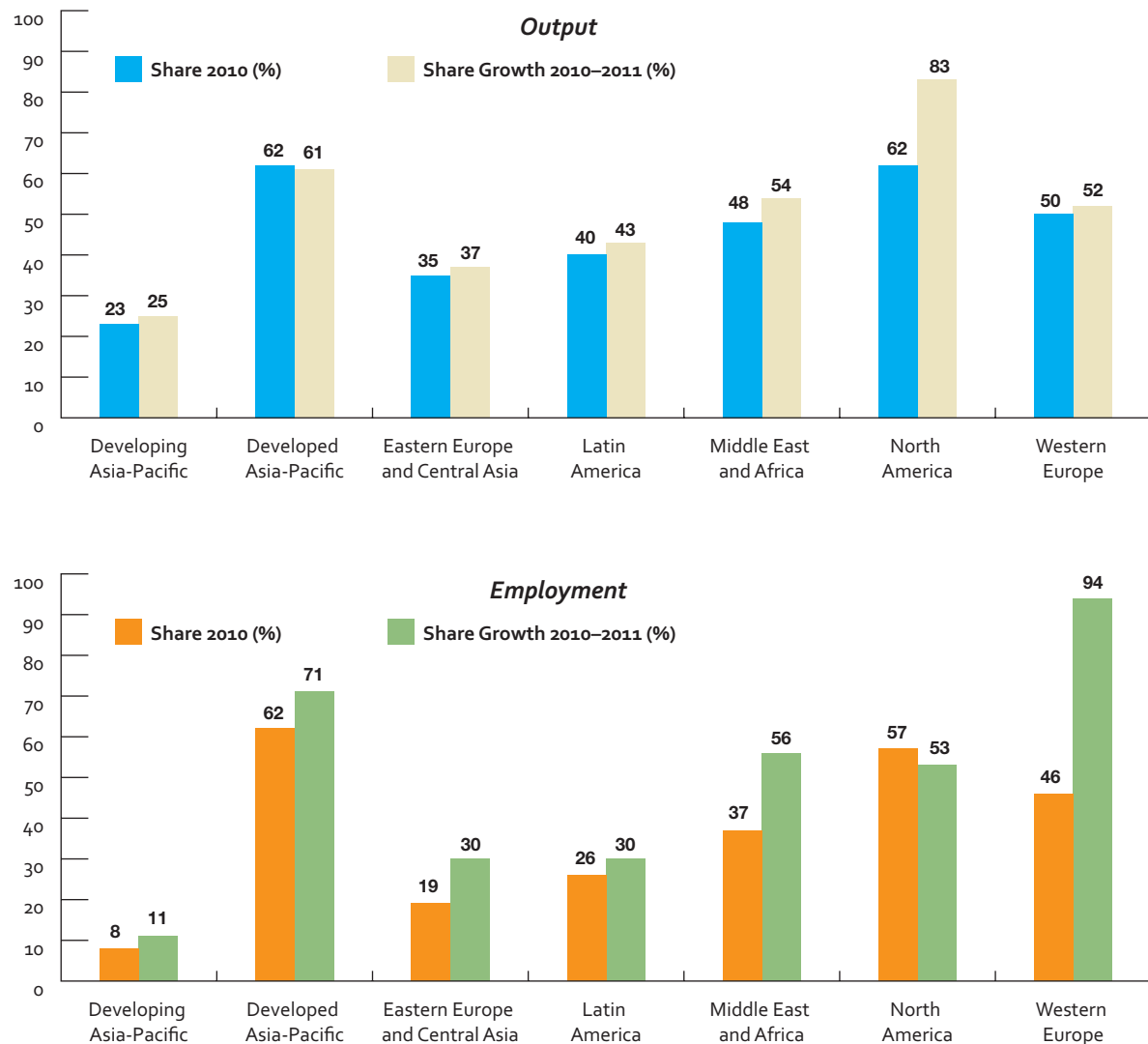
**B. In nearly every global region, metro areas generated disproportionate shares of national increases in output and employment.**

National factors clearly help shape the context for metropolitan economic growth. National governments pull the levers on monetary policy, as well as most fiscal, trade, and regulatory policies, which set the economic platform for metro areas. Yet, the concentration of national employment and wealth in metropolitan areas, as well as the distinct functions metro areas play in domestic and international economies, often propel metro economies on different trajectories than their broader national economies.

Overall, income and employment growth rates for the 197 metro areas (excluding three metro areas whose boundaries coincide with their nations') lagged national averages by small margins. Metro areas posted 1.5 percent growth rates for both income and employment from 2010 to 2011, versus 1.8 percent income and 1.7 percent

**FIGURE 3. METRO AREAS DROVE MORE THAN THEIR SHARE OF GAINS IN OUTPUT AND EMPLOYMENT IN 2011**

Share of National GDP and Employment, 2010, and Share of National GDP and Employment Growth, 2010-2011, 197 Large Metropolitan Areas by Region



Source: Brookings analysis of data from Oxford Economics, Moody's Analytics, and U.S. Census Bureau

Note: Three metro areas coincide with national borders and are excluded here.

employment growth rates for their nations. Slightly less than half (95) of the 197 metro areas outperformed their respective nations on income growth, while more than six in ten (117) led their nations on employment growth. In many nationally prominent metro areas such as Lisbon, metropolitan economic performance reflected and contributed to broader national and regional dynamics (see sidebar).

Metro areas' longstanding concentrations of national employment and income considerably shaped the overall economic and job growth trajectories of their nations in 2011. Metro gains in both developed and developing markets propelled national gains in both total output and employment in 2010-2011 (Figure 3). In North America, for instance, the 64 metro areas combined represented 62 percent of U.S. and Canadian GDP in 2010, but captured 83 percent of GDP growth in those countries over the subsequent year. Of the meager employment growth that occurred in the 17 Western European countries represented in this study's dataset, fully 94 percent accrued to the 60 metro areas located in that region, even though they contained just 46 percent of their countries' total employment in 2010.

However, metro areas often perform quite differently within countries. This is most obvious in large countries like the United States, where metro rankings in 2010-2011 ranged from number 19 (Houston) all the way down to number 196 (Sacramento), but also in middle-sized countries like Germany where metro areas ranged from number 31 (Stuttgart) to number 123 (Hamburg).<sup>33</sup>

Some metro areas significantly over-performed or under-performed their nations economically (Table 3). On income growth, six U.S. metro areas, including three manufacturing centers in the Great Lakes region (Buffalo, Detroit, and Rochester), ranked among the ten metro areas that outpaced their nations by the largest margins. Those metro areas that lagged their nations by the greatest degree on this measure included three in China (Beijing, Guangzhou, and Hangzhou) as well as three others in the Pacific Rim with important trading ties to that

**TABLE 3. SOME METRO AREAS LED OR LAGGED THEIR NATIONS ON GROWTH BY LARGE MARGINS IN 2011**

Largest Differences between Metro and National Income and Employment Growth Rates, 2010 to 2011

Income Growth Rate (%)				Employment Growth Rate (%)				
Faster in Metro Areas				Faster in Metro Areas				
	Metro	Nation	Difference		Metro	Nation	Difference	
1	Houston	5.5	0.9	4.7	<b>Shanghai</b>	5.8	2.4	3.4
2	<b>Shenyang</b>	11.6	8.2	3.4	<b>Hangzhou</b>	5.5	2.4	3.1
3	Riyadh	7.8	4.8	3.1	<b>Mumbai</b>	4.3	1.9	2.4
4	Buffalo	3.9	0.9	3.0	<b>Shenzhen</b>	4.9	2.4	2.4
5	Dallas	3.7	0.9	2.8	<b>Monterrey</b>	3.6	1.7	1.9
6	Rochester	3.3	0.9	2.4	Houston	2.5	0.9	1.6
7	Jiddah	7.0	4.8	2.2	Riyadh	6.3	4.7	1.6
8	Stuttgart	5.1	3.1	2.0	Toulouse	2.2	0.6	1.6
9	Detroit	2.6	0.9	1.8	Dallas	2.4	0.9	1.5
10	New York	2.6	0.9	1.7	<b>Casablanca</b>	3.8	2.3	1.5
Slower in Metro Areas				Slower in Metro Areas				
188	<b>Kuala Lumpur</b>	1.0	3.1	-2.1	Naples	-1.1	0.1	-1.2
189	Dubai	-2.7	-0.6	-2.1	<b>Colombo</b>	-1.7	-0.5	-1.2
190	Hamburg	0.9	3.1	-2.2	Indianapolis	-0.4	0.9	-1.3
191	<b>Hangzhou</b>	5.8	8.2	-2.4	Kansas City	-0.5	0.9	-1.3
192	Brisbane	-2.1	0.5	-2.6	Atlanta	-0.9	0.9	-1.8
193	<b>Almaty</b>	3.1	5.7	-2.6	<b>Xi'an</b>	0.6	2.4	-1.9
194	<b>Guangzhou</b>	5.5	8.2	-2.6	Sacramento	-1.0	0.9	-1.9
195	Perth	-3.0	0.5	-3.5	Richmond	-1.0	0.9	-1.9
196	New Orleans	-3.6	0.9	-4.5	<b>Chongqing</b>	0.0	2.4	-2.4
197	<b>Beijing</b>	3.0	8.2	-5.2	Abu Dhabi	1.0	3.5	-2.5

Source: Brookings analysis of data from Oxford Economics, Moody's Analytics, and U.S. Census Bureau; developing metro areas shown in bold.

Note: Three metro areas coincide with national borders and are excluded here.

## LISBON: REFLECTING PORTUGAL'S AND THE EUROZONE'S BROADER CHALLENGES IN 2011

Lisbon, the capital of Portugal, is the center of Europe's westernmost metropolitan area. The Lisbon metro area has 2.8 million people, about one-fourth of Portugal's entire population, and contributes disproportionately to the Portuguese economy, delivering one-third of its output. This high concentration of national economic activity in the capital region at once makes Lisbon highly dependent on Portugal's macroeconomic conditions, and Portugal reliant on Lisbon to power its national economy.

The Lisbon metro area's income grew at about 2 percent annually between 1993 and 2007, with particularly high rates at the end of 1990s. The 2000s were a slower decade for Lisbon, ending in a deep recession. And just like the Portuguese economy, Lisbon remained in full recession in 2011, shedding both jobs and income. For the fourth year in a row, income in Lisbon declined, by 2.8 percent, and by 2011 equaled its 1999 level. Employment dropped by 2.4 percent in 2011, continuing a downward trend started in 2008-2009. In the 2011 index, Lisbon ranked second only to Athens among the weakest metro economic performers.

Similar to Dublin and Athens, Lisbon's economy suffers because of poor national and regional macroeconomic conditions. Unable to finance its budget deficit on commercial financial markets, Portugal sought and obtained a bailout from the International Monetary Fund and the European Union in May 2011. The €78 billion (\$111 billion) loan is for three years, based on passing periodical reviews. The package came with strict conditions of fiscal austerity, and measures to stabilize the banking sector and improve the long-term competitiveness of Portugal's economy.<sup>34</sup>

To reduce the national budget deficit, Portugal implemented deep cuts in government spending, layoffs of public employees, and cuts to public-sector wages and pensions.<sup>35</sup> Coupled with larger capital requirements for banks, and uncertainty in the labor market and the economy as a whole, all drivers of the Portuguese economy declined, except exports. As a result, Portugal's GDP plunged in 2011, after posting gains in 2010.

Similar to Memphis in the United States and Rotterdam in the Netherlands, Lisbon specializes in transportation, particularly around a port that has great historical significance for the nation. The transportation industry witnessed declining employment in Lisbon during 2011, but other industries—particularly business and financial services—drove the decline in Lisbon's output in 2011. Meanwhile, cuts in public-sector employment and local/non-market services accounted for 40 percent of Lisbon's job losses in 2011. Lisbon's concentration in these heavily affected sectors helps explain its even faster declines in income and employment last year than Portuguese averages.

Notwithstanding a brief increase in 2009-2010, output levels have not been especially volatile in Lisbon in recent years. That relatively stable, negative trend, along with wider instability in Europe, may indicate tough times ahead for Lisbon and Portugal. Further implementation of fiscal austerity measures will likely depress economic growth. Sovereign debt and currency crises in the Eurozone will affect Lisbon disproportionately, given

the large share of its economy in the financial sector. In addition, a Europe-wide recession in 2012 would slow significantly the only driver of growth in Portugal in 2011 (exports), and reduced port activity could further shrink the metro area's important transportation cluster. In this way, the economic fate of Lisbon remains highly intertwined with that of Portugal and Europe as a whole.



nation (Brisbane, Kuala Lumpur, and Perth). Employment growth differentials between metro areas and their nations were somewhat smaller at the extremes, though still sizable in a handful of Chinese metro areas that outperformed the national average (Shanghai, Hangzhou, Shenzhen), and in U.S. metro areas that lost jobs even as the nation posted a modest gain (Atlanta, Indianapolis, Kansas City, Richmond, Sacramento).

As a subsequent section details, these metro/national differences on income and employment growth may reflect not only specific local factors, but also important industrial patterns across world regions that are fueling growth in metro areas specialized in expanding sectors, while holding back growth in metro areas specialized in stagnant or faltering sectors.

### **C. Employment growth accelerated in about three-fourths of metro areas from the 2009 to 2010 period, but income growth slowed in two-thirds, particularly in the Asia-Pacific and Latin American regions.**

Relative to 2010, 2011 was a mixed year for the world's largest metro economies overall. On the positive side, trends in metro employment reflect a strengthening recovery in 2011. As noted above, the 200 largest metro economies posted 1.7 percent employment growth from 2010 to 2011, which outpaced their growth rate of 1.4 percent from 2009 to 2010. Metro areas in the Developing and Developed Asia-Pacific, Eastern Europe and Central Asia, Western Europe, and North America regions posted faster gains in total employment in 2011 than in the year prior (Figure 4).

Employment growth rates slipped, while still remaining positive, in the Middle East and Africa and Latin America regions. Altogether, three-fourths (151) of major metro areas worldwide saw employment expand faster, or contract more slowly, in 2010-2011 than in 2009-2010.

Income growth across major metro areas tells a different story about 2011, however. The pace of recovery on this indicator weakened, as income growth across the 200 metropolitan areas dropped from an aggregate 2.4 percent rate in 2009-2010 to 1.5 percent in 2010-2011. The slowdown was especially pronounced in Latin America and both Developing and Developed Asia-Pacific metro areas (Figure 4). Income growth

actually quickened in Middle East and Africa metro areas, while remaining stable in Western Europe and North America metro areas overall. Only 63 of the 200 largest metro economies recorded faster income growth (or slower income decline) in 2010-2011 than 2009-2010. Several of the factors highlighted in the Introduction—fiscal and monetary crises in Europe, curbed growth in China, and a major natural disaster in Japan—and their cascading effects on international trading partners help account for the slower pace of GDP and income recovery in 2011.

As these regional patterns suggest, income growth rates in both developed and developing metro areas slowed last year, but they dropped by a greater magnitude in developing metro areas. In 2009-2010, income in developing metro areas grew at a rapid 7.2 percent rate, far above the 2.0 percent rate in developed metro areas. From there, income growth in developed metro areas dropped by about three-quarters of a percentage point to 1.2 percent in 2010-2011, but by 2.4 percentage points in developing metro areas to 4.8 percent that year. That narrowing growth rate differential extended the hypothetical income “catch-up” period for developing metro areas from roughly 32 years in 2010 to 46 years in 2011.

The metro areas experiencing the most significant slowdowns in income and employment growth from 2009-2010 to 2010-2011 include several in the Developing Asia-Pacific region (Table 4). Income growth rates in a handful of Chinese metro areas (Chongqing, Tianjin, Xi'an) fell back to earth from double-digit heights the year before. As

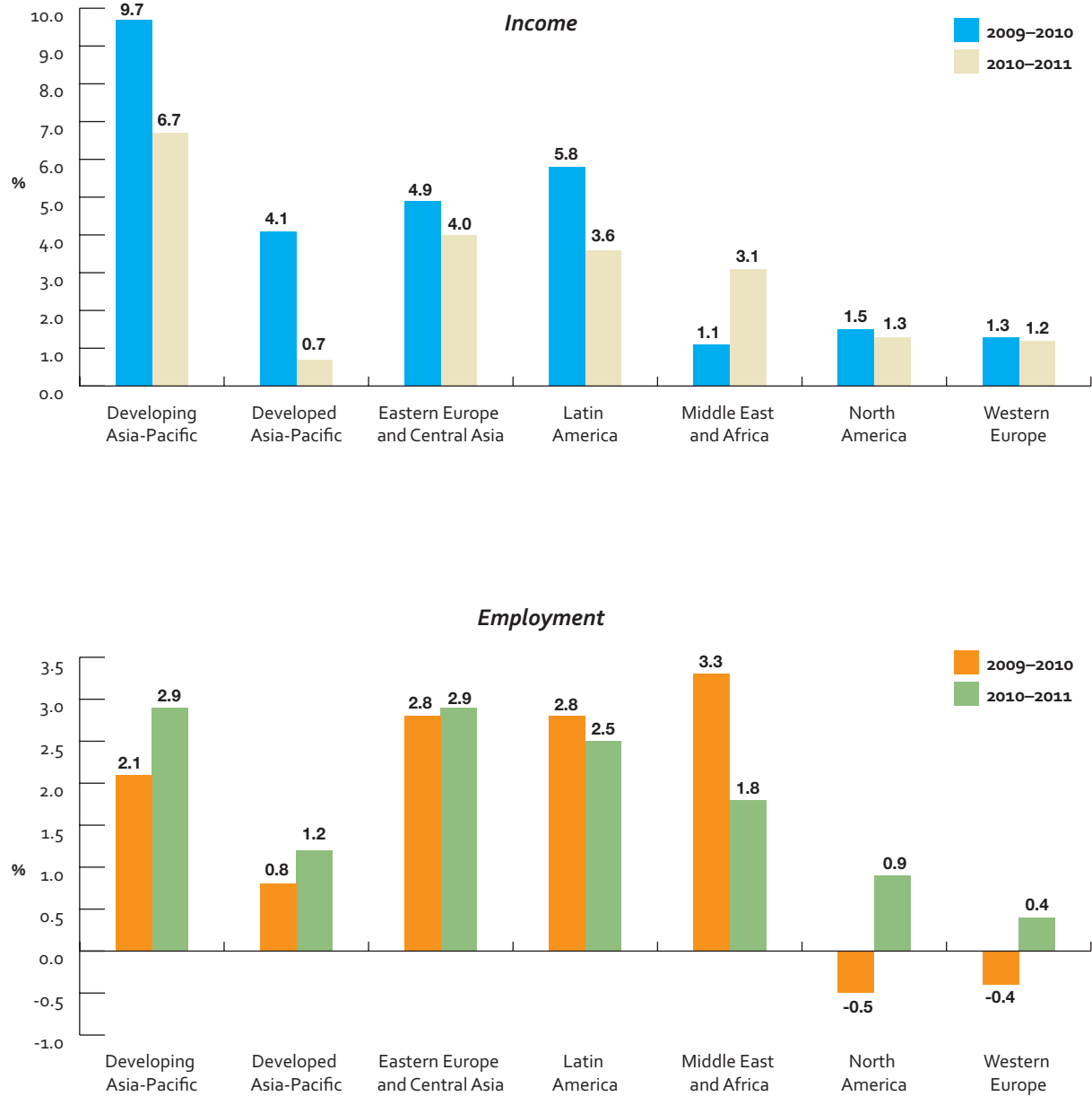
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**Income growth actually quickened in Middle East and Africa metro areas, while remaining stable in Western Europe and North America metro areas overall.**

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## FIGURE 4. METRO INCOME GROWTH SLOWED, AND EMPLOYMENT GROWTH ACCELERATED, IN MOST REGIONS IN 2011

Metropolitan Income and Employment Growth Rates by Region, 2010-2011 and 2009-2010



Source: Brookings analysis of data from Oxford Economics, Moody's Analytics, and U.S. Census Bureau

**TABLE 4. GROWTH SLOWED CONSIDERABLY IN SOME ASIAN AND LATIN AMERICAN METRO AREAS, AND ACCELERATED IN SOME NORTH AMERICAN METRO AREAS IN 2011**

Largest Changes in Income and Employment Growth Rates, 200 Largest Metropolitan Economies, 2009-2010 to 2010-2011

Income Growth Rate (%)				Employment Growth Rate (%)				
Gains				Gains				
		2010-2011	2009-2010	Change		2010-2011	2009-2010	Change
1	Abu Dhabi	0.5	-7.0	7.5	<b>Bucharest</b>	4.0	-2.3	6.3
2	Houston	5.5	-0.2	5.7	<b>Bangkok</b>	2.4	-3.1	5.6
3	Riyadh	7.8	3.4	4.4	<b>Shanghai</b>	5.8	0.3	5.5
4	Jiddah	7.0	2.7	4.3	<b>Cape Town</b>	0.6	-4.3	4.9
5	<b>Bucharest</b>	1.0	-2.7	3.7	Calgary	2.7	-1.4	4.0
6	Warsaw	5.2	1.8	3.4	Tulsa	2.0	-1.8	3.8
7	<b>Shanghai</b>	9.8	6.5	3.3	Edmonton	2.4	-0.8	3.3
8	Zurich	1.6	-1.2	2.8	Seattle	1.7	-1.5	3.1
9	Dallas	3.7	1.1	2.6	Las Vegas	0.1	-3.0	3.1
10	Edmonton	1.2	-1.3	2.5	Phoenix	1.1	-1.9	3.0
Losses				Losses				
191	<b>Manila</b>	2.0	7.7	-5.7	Melbourne	2.1	4.3	-2.2
192	Nagoya	-0.8	5.3	-6.0	<b>Lima</b>	2.5	4.8	-2.3
193	Kaohsiung	4.2	10.4	-6.2	Singapore	2.3	4.6	-2.3
194	<b>Xi'an</b>	8.4	14.7	-6.3	Adelaide	0.8	3.3	-2.5
195	<b>Belo Horizonte</b>	3.1	9.4	-6.4	<b>Chongqing</b>	0.0	3.1	-3.1
196	Perth	-3.0	3.4	-6.4	<b>Izmir</b>	5.6	9.3	-3.6
197	Taichung	4.7	11.5	-6.9	<b>Manila</b>	0.5	5.0	-4.5
198	<b>Tianjin</b>	8.4	15.6	-7.2	<b>Cairo</b>	-0.3	5.2	-5.6
199	<b>Chongqing</b>	8.1	16.0	-7.9	<b>Alexandria</b>	-0.3	5.3	-5.6
200	Singapore	3.5	12.5	-8.9	<b>Colombo</b>	-1.7	4.1	-5.8

Source: Brookings analysis of data from Oxford Economics, Moody's Analytics, and U.S. Census Bureau; developing metro areas shown in bold.

they did, a broader group of Asian metro trading partners in Taiwan, Singapore, the Philippines, and Australia felt the effects. Several of these metro areas retain high rankings in the economic performance index, but did not grow nearly as fast last year as in the first year of the global recovery.

Metro areas in North America and Eastern Europe and Central Asia figured prominently among those posting significant gains in their performance rankings between 2009-2010 and 2010-2011 (Map 2). Bucharest climbed the farthest, from ranking 196th in 2009-2010 to 32nd last year, as income and employment bounced back from deep recessionary declines (Table 4). Prague and Warsaw also made substantial leaps in Eastern Europe, thanks in part to their countries' strong export ties to economically healthy Germany. In North America, oil extraction and services capitals such as Houston, Calgary, Edmonton, Tulsa, and Dallas moved up the ranks dramatically due to high prices in that sector, while a resurgence in manufacturing redounded to the benefit of Seattle, Milwaukee (see sidebar), and Hamilton. Even Phoenix, which remained among the slower-growing metro areas in 2010-2011, improved its ranking by nearly 50 places as it turned around job losses from 2009-2010.

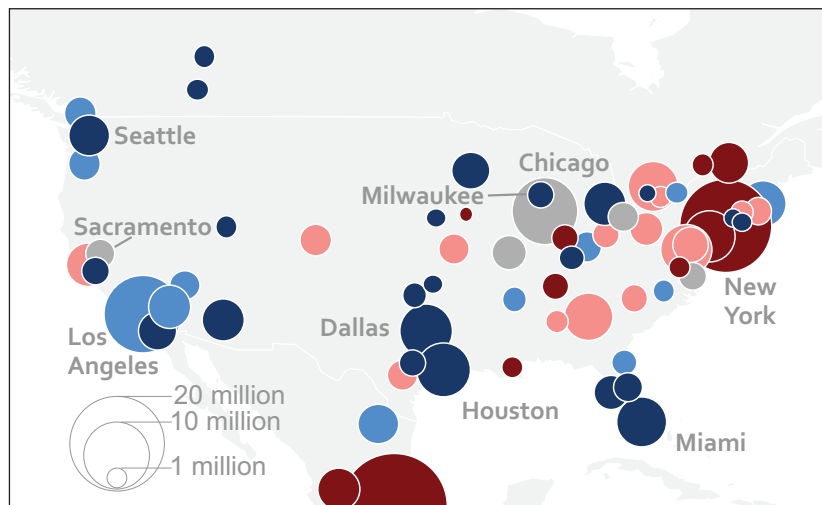
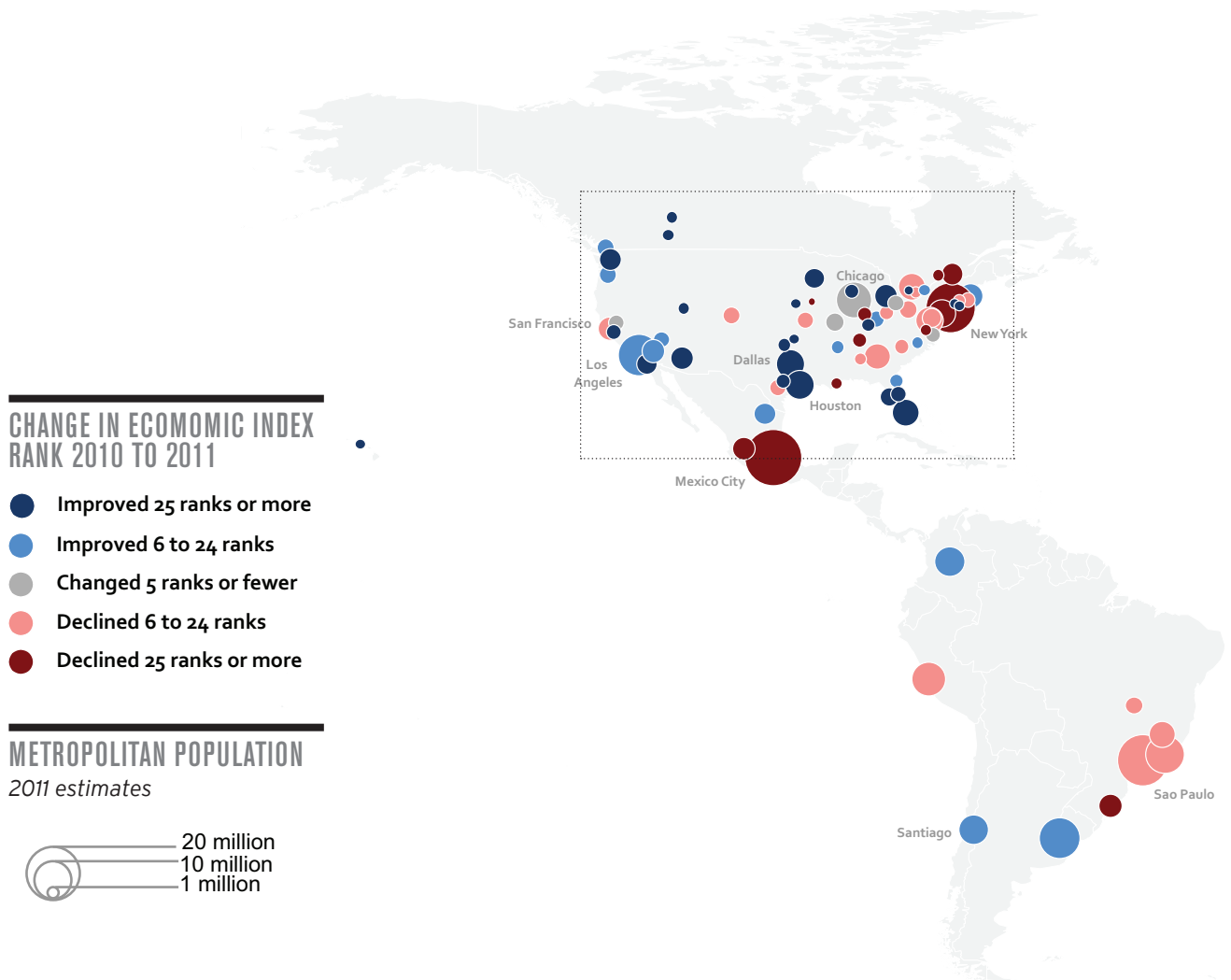
Several metro areas in North America could also be found among those plummeting farthest down the ranks in 2010-2011. While public-sector employment may have helped buoy their performance through the recession, Atlanta and Indianapolis seem to have suffered disproportionately from national and state budget cuts enacted over the past year.

Developed Asia-Pacific metro areas populated the ranks of the largest decliners in 2010-2011 as well. Japanese metro areas endured the significant shock of natural disaster, losing some ground on income. Australian metro areas including Perth, Adelaide, and Brisbane felt the effects of slowing growth in their Asian trading partners, especially China and Japan. (Sydney and Melbourne appeared more insulated from those dynamics.)

Overall, the shift in metro area rankings from 2009-2010 to 2010-2011 provide a snapshot of slowing growth in Developing Asia and Latin America, stronger performance in Eastern Europe and Central Asia, and progress in North America—especially as compared to Western Europe. North America accounted for 14 of the bottom-quintile performers in 2010-2011, down from 20 the previous year, while Western Europe accounted for 17 in both years.

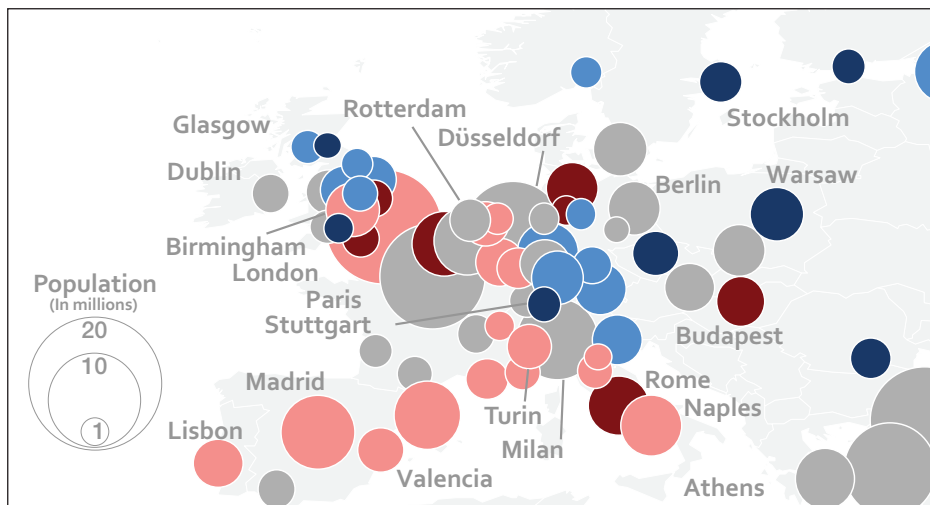
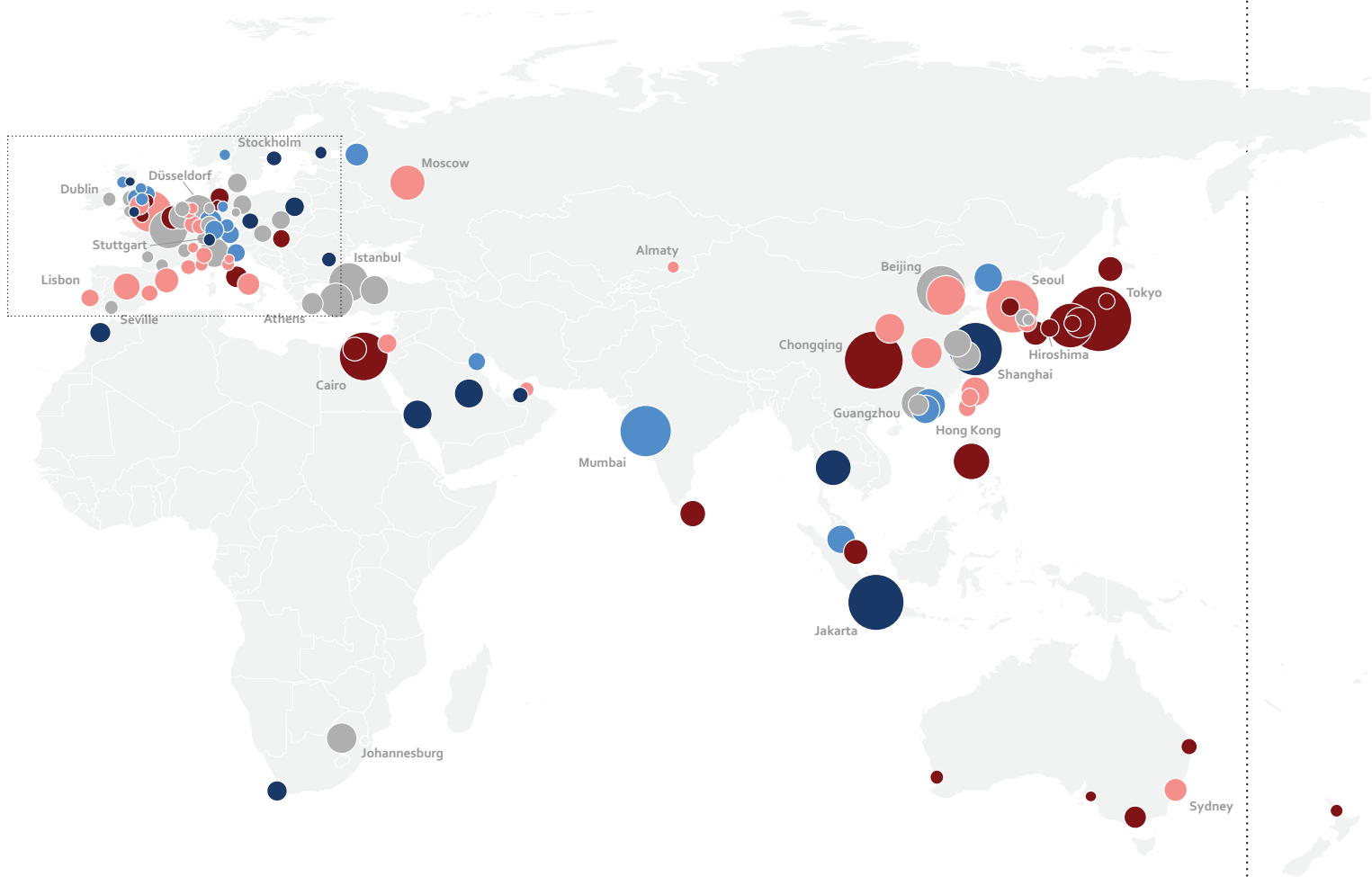
## MAP 2. MANY METRO AREAS CLIMBED THE GROWTH RANKS, OR DROPPED CONSIDERABLY, LAST YEAR

Change in Economic Index Rank, 200 Largest Metropolitan Areas, 2009/2010 to 2010/2011



Source: Brookings analysis of data from Oxford Economics, Moody's Analytics, and U.S. Census Bureau





## MILWAUKEE: BOUNCING BACK IN 2011 ON THE STRENGTH OF MANUFACTURING

Located in the U.S. Midwest, on the Southwestern shore of Lake Michigan, the Milwaukee metropolitan area is the largest regional economy in the state of Wisconsin, home to 1.6 million people, and the 114th largest economy among the 200 profiled in this report. The city and region have a strong industrial heritage, exemplified in locally headquartered Fortune 500 firms such as Johnson Controls and Harley-Davidson.

Similar to the U.S. economy, the Milwaukee area suffered its largest decline between 2008 and 2009. Since then, the metro area has achieved a partial recovery in employment and income. While not surpassing pre-recession levels, Milwaukee saw faster growth in 2010-2011 than in 2009-2010. The metro area added jobs at a 2.4 percent rate, reversing declines that started in 2007. Milwaukee's income growth also picked up in 2010-2011, driven by 2.2 percent growth in output, almost double the rate of the previous year.

While not the largest industry in the Milwaukee economy, manufacturing contributed more than 62 percent to the metro area's output growth between 2010 and 2011. Industries producing machinery, electrical equipment, and fabricated metal products drove this manufacturing rebound. Business and financial services output, which represents 34 percent of the metro economy, continued to decline in 2011. Continued weakness in real estate largely drove this downward trend, as reflected in third-quarter metro area house prices at more than 22 percent below peak levels.<sup>36</sup>

For the first year since 2007, Milwaukee area added jobs between 2010 and 2011. Local/non-market services - education, health care, administrative services, and government - delivered almost three-quarters of job growth. Milwaukee is a strong health care center, with several systems in the region (e.g. Milwaukee Regional Medical Complex, Aurora Health Care, and Wheaton Franciscan Healthcare). General Electric has two business units in Milwaukee (Healthcare Diagnostic Imaging and Clinical Systems) that support this cluster.

While Milwaukee benefited from a growing U.S. economy in 2010-2011, its stronger performance owes more to the evolution of local industries. Three of its largest industries—local/non-market services, manufacturing, and trade and tourism—grew at a faster pace

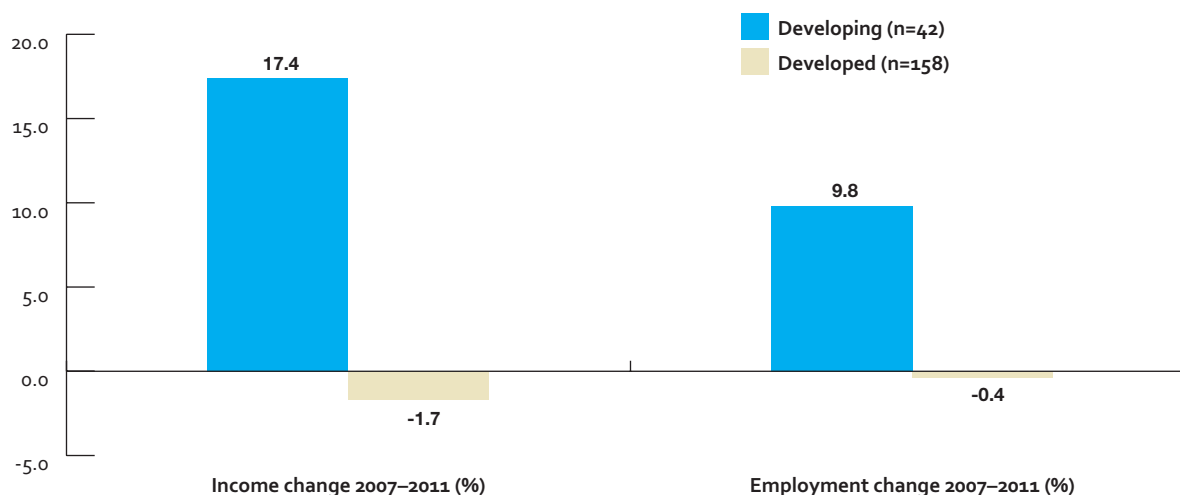
than national industries. These three sectors represented 59 percent of Milwaukee's output and 79 percent of its employment in 2011. The metro area's strengthening performance accounts for its rapid rise in the *Global MetroMonitor* rankings, from 139th in 2009-2010 to 56th in 2010-2011.

Since 2007, Milwaukee metro area output has seen little volatility, compared with other large metropolitan areas in the world. Encouraging news emerges from the latest quarterly developments in the regional housing and labor market. House prices reached bottom in the second quarter of 2011, increasing slightly in the third quarter, and the unemployment rate dropped to 7.6 percent in September 2011 from 7.8 percent a year earlier.<sup>37</sup> While faster growth is needed for Milwaukee to recoup pre-recession levels, positive growth rates in 2011 are a step in the right direction, and an example of the important role manufacturing played in worldwide metro growth last year.



## FIGURE 5. DEVELOPING METRO AREAS GREW INCOME AND EMPLOYMENT ACROSS THE RECESSION AND RECOVERY

Combined Income and Employment Change by Development Status, 200 Largest Metropolitan Economies, 2007-2011



Source: Brookings analysis of data from Oxford Economics, Moody's Analytics, and U.S. Census Bureau

### D. Less than one-half of the 200 metro areas surpassed their pre-recession levels of employment and/or income by 2011.

Global income, which grew at a 1.9 percent annual clip from 1993 to 2007, plunged 3.5 percent between 2008 and 2009 at the height of the downturn. Two years later, income finally exceeded its global 2008 level in 2011. Global employment continued to grow throughout the recession, though at a slower rate from 2007 to 2010 (under 1.0 percent annually) than the long-run, pre-recession annualized rate of 1.7 percent.<sup>38</sup>

Not all metro economies followed the global path, however. Uneven growth across the largest metro areas reflects the depth and variability of the Great Recession. Combined, the 200 metro economies had about 12.6 million more jobs in 2011 than in 2007 (they also had 42 million more people). Their income, however, was at exactly the same level as in 2008 (\$25,515), and down slightly from its level in 2007 before the downturn (\$25,586).

Developing metro areas grew jobs and income overall even as developed metro areas lost ground during the recession and recovery. From 2007 to 2011, those 42 metro areas added a combined 13.7 million jobs, a nearly 10 percent increase, while the 158 developed metro areas shed 1.0 million jobs, a 0.4 percent decrease (Figure 5). Similarly, the combined per capita income of the developing metro areas in 2011 was 17.4 percent above its 2007 level, while income in developed metro areas remained 1.7 percent below its 2007 level.

Regional differences in metro areas' standing over time also reflect the uneven progress of the global recovery (see Map 3). Comparing income and employment levels in 2011 to their peaks from 2007 to 2010, metro areas range from having experienced no downturn at all in income or employment to continuing to lose ground on both indicators in 2011.

In 2011, 16 of 18 metro areas in Developing Asia had higher income and employment than at their peak from 2007 to 2010. Of those 16, 14 skirted the recession altogether, experiencing no annual decline in either income or employment. Similarly, 10 of 12 Latin American metro areas have more jobs and higher income today than at their previous peaks, with most only having experienced a "minor recession" that reduced income or jobs, but not both.

Contrast those developing metro experiences with the progress of their counterparts in North America and Western Europe. Not one of the 124 metro areas in the latter regions managed to avoid income and employment loss altogether between 2007 and 2011. Rather, all experienced some degree of recession, with the vast majority suffering a "major recession" that at some point triggered annual job and income declines. In 2011, only nine—seven in Germany, plus Brussels and Montreal—registered new peaks in both income and employment, which signaled "full recovery." The dominant pattern in both regions in 2010-2011 was one of "partial recovery," with 83 of the 124 metro

# MAP 3. VERY FEW NORTH AMERICAN AND WESTERN EUROPEAN METRO AREAS HAVE FULLY RECOVERED FROM THE RECESSION

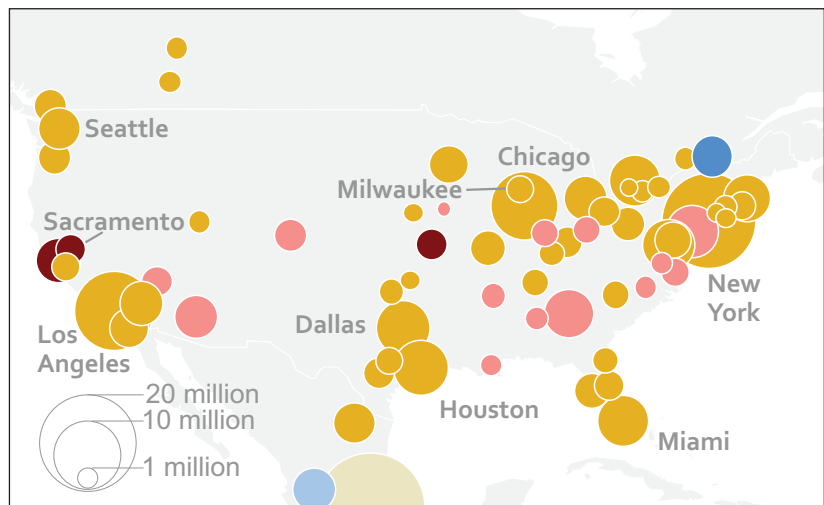
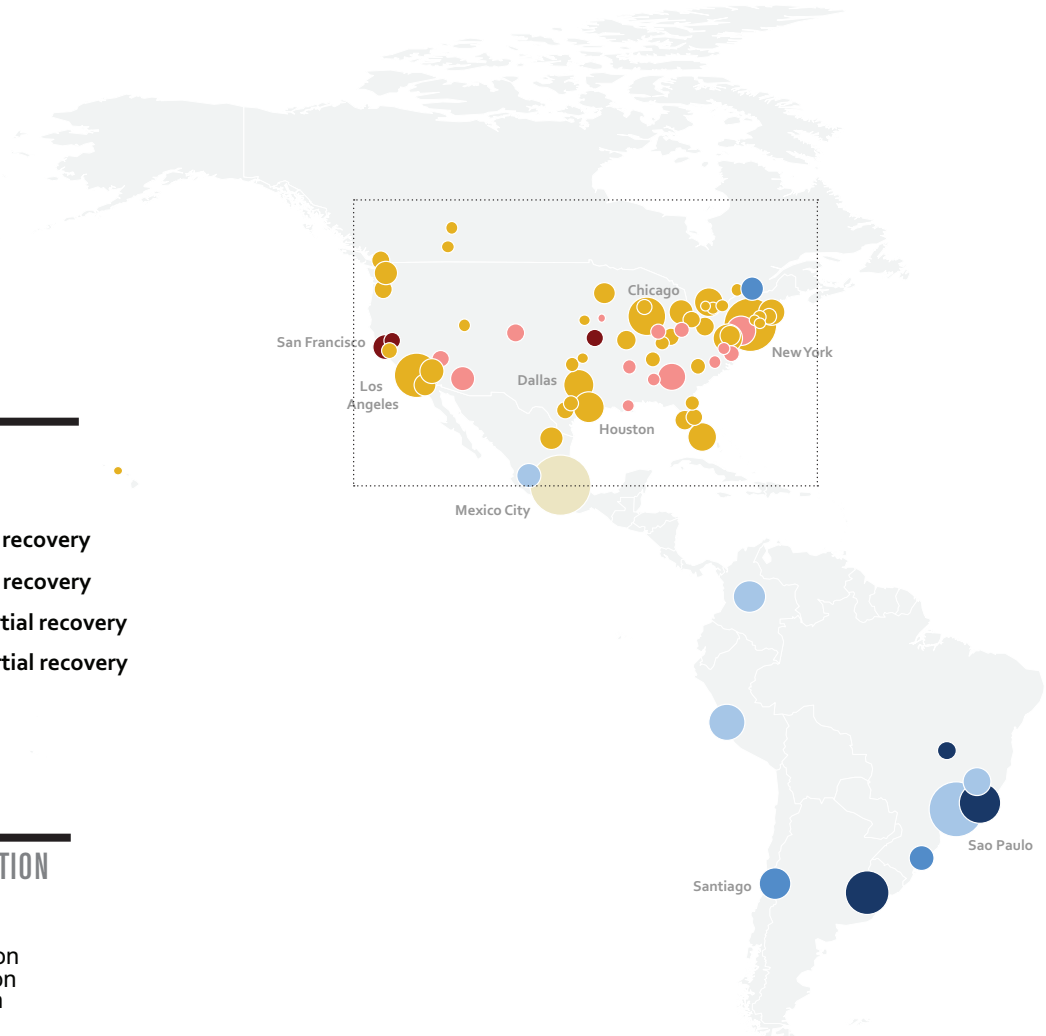
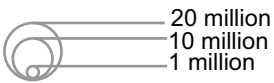
Recession/Recovery Status, 200 Largest Metropolitan Areas, 2011

## RECESSION/RECOVERY STATUS, 2011

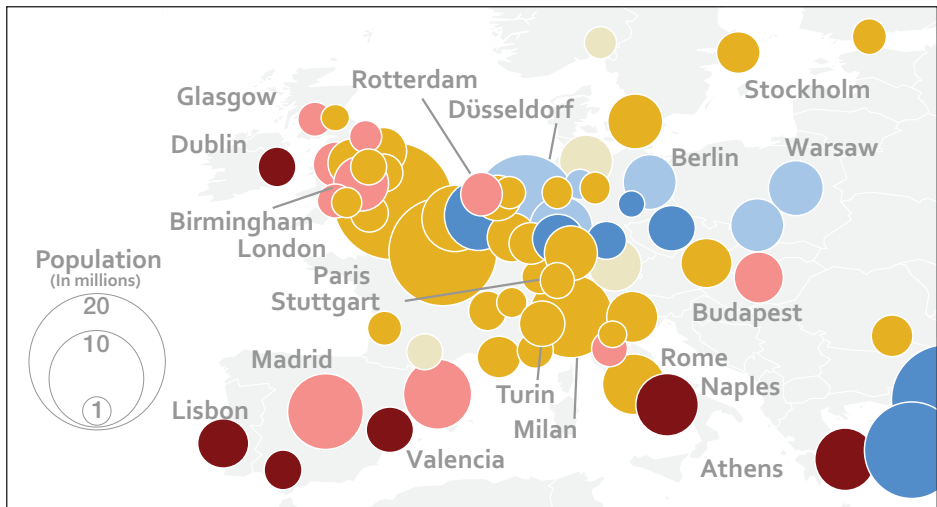
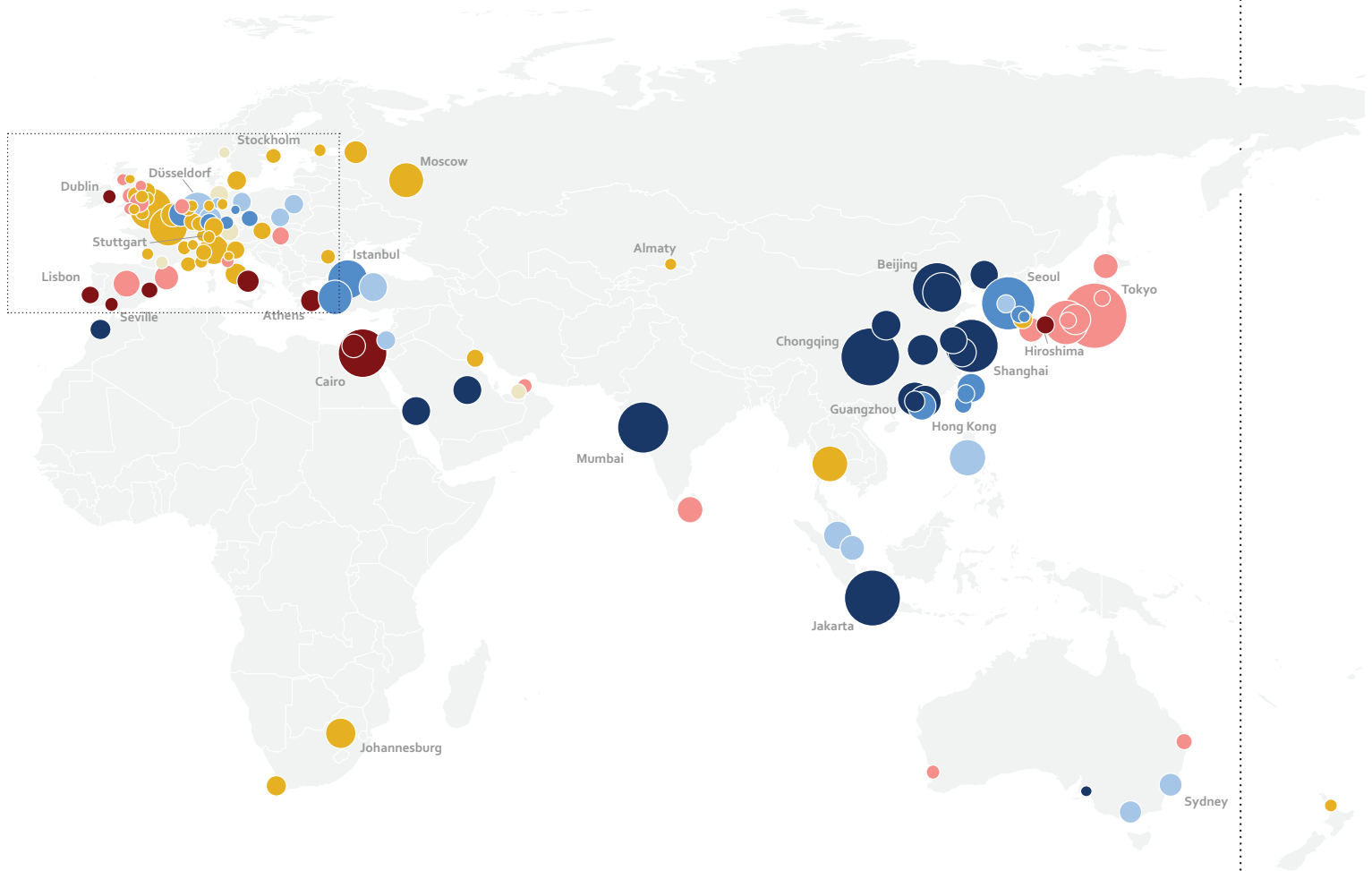
- Major recession / full recovery
- Minor recession / full recovery
- Major recession / partial recovery
- Minor recession / partial recovery
- Partial recession
- Full recession

## METROPOLITAN POPULATION

2011 estimates



Source: Brookings analysis of data from Oxford Economics, Moody's Analytics, and U.S. Census Bureau



**TABLE 5. TURKISH AND LATIN AMERICAN METRO AREAS OUTPERFORMED, AND HOUSING BUBBLE METRO AREAS UNDERPERFORMED, LONG-RUN GROWTH AVERAGES**

Largest Changes in Income and Employment Growth Rates, 200 Largest Metropolitan Economies, 1993-2007 to 2010-2011

Income Growth Rate (%)					Employment Growth Rate (%)			
Gains					Gains			
		2010-2011	1993-2007	Change		2010-2011	1993-2007	Change
1	Riyadh	7.8	1.7	6.1	Shenyang	1.7	-3.0	4.7
2	<b>Buenos Aires</b>	7.3	2.2	5.1	<b>Izmir</b>	5.6	1.0	4.6
3	<b>Jakarta</b>	5.5	0.6	4.8	<b>Bucharest</b>	4.0	-0.4	4.3
4	Jiddah	7.0	2.6	4.4	<b>Shanghai</b>	5.8	1.5	4.3
5	Houston	5.5	1.5	4.0	<b>Santiago</b>	4.9	1.3	3.6
6	Stuttgart	5.1	1.4	3.7	<b>Ankara</b>	5.7	2.5	3.2
7	<b>Izmir</b>	5.5	2.5	3.0	<b>Istanbul</b>	5.6	2.6	3.1
8	<b>Santiago</b>	5.7	2.9	2.8	<b>Nanjing</b>	2.7	0.0	2.7
9	<b>Ankara</b>	5.4	2.7	2.8	<b>Foshan</b>	3.0	0.4	2.6
10	<b>Bogota</b>	4.0	1.5	2.5	<b>Wuhan</b>	2.5	0.1	2.4
Losses					Losses			
191	<b>Bucharest</b>	1.0	5.9	-4.9	Barcelona	-1.2	3.3	-4.5
192	New Orleans	-3.6	1.6	-5.2	Seville	-2.0	3.0	-5.1
193	Brisbane	-2.1	3.2	-5.3	Madrid	-1.4	3.7	-5.1
194	<b>Beijing</b>	3.0	8.7	-5.7	Las Vegas	0.1	5.9	-5.8
195	Dublin	-0.3	5.6	-5.9	Athens	-3.5	2.2	-5.8
196	<b>Hangzhou</b>	5.8	11.9	-6.1	Kuwait	2.8	9.2	-6.3
197	<b>Foshan</b>	6.7	13.0	-6.3	Abu Dhabi	1.0	7.5	-6.5
198	Perth	-3.0	3.6	-6.6	<b>Colombo</b>	-1.7	5.2	-6.9
199	<b>Guangzhou</b>	5.5	12.2	-6.7	Dublin	-3.0	4.3	-7.2
200	Athens	-4.8	4.3	-9.1	Dubai	3.0	10.7	-7.6

Source: Brookings analysis of data from Oxford Economics, Moody's Analytics, and U.S. Census Bureau; developing metro areas shown in bold.

areas still gaining back jobs and/or income lost during the downturn. Thirty-eight (38) of those managed to post a new high in one of the two indicators, but another 45 were still clawing back toward pre-recession levels on both fronts. None of the 57 U.S. metropolitan areas among the 200 largest worldwide had fully recovered its recession-induced losses by 2011.

More troubling is that 32 Western European and North American metro areas saw either employment or income, or both, contract between 2010 and 2011. Twenty-three (23) were in "partial recession," losing ground on one of the two measures. The 12 metro areas worldwide that suffered a "full recession" that year, with losses in both indicators, included six in Western Europe (Athens, Dublin, Seville, Naples, Lisbon, Valencia), three in North America (Sacramento, Kansas City, San Francisco), Cairo and Alexandria in Egypt, and Hiroshima in Japan. In the North American and Western European metro areas, those losses in 2010-2011 merely continued patterns from previous years, signaling that they have yet to fully break the Great Recession's grip.

Whether metro areas have gained back their pre-recession levels of jobs and income provides one measure of recovery's progress. Another important measure is whether they are achieving their long-run, pre-recession rates of job and income growth, which signals the strength of the recovery. On this count, too, most metro areas continued to fall short in 2010-2011. Fewer than half (84) of the 200 metro areas achieved an employment growth rate that year that met or exceeded its annualized growth from 1993 to 2007, and only a little more than one-quarter (55) registered income growth greater than or equal to the long-run, pre-recession annualized growth.<sup>39</sup>

Metro areas that leapt or lagged their long-run growth rates in 2010-2011 by the largest margins reveal important trends in both developing and developed regions (Table 5). On income growth, metro areas in Saudi Arabia, Turkey,

## SHANGHAI: BUCKING THE CHINESE SLOWDOWN IN 2011

With an economy the size of Finland's, Shanghai stands out in China's large and diverse metropolitan landscape. Located in the Yangtze River Delta in Eastern China, the Shanghai metropolitan area has 23 million inhabitants, making it the second largest Chinese metropolitan area after Chongqing. Shanghai is China's economic capital, concentrating 5 percent of the country's economy, almost one and a half times larger than the official capital, Beijing.



Shanghai was a standard-bearer for Chinese economic reforms started in the 1980s. The metropolitan area's Pudong District was one of China's early Special Economic Zones, which benefited from experimentation with preferential policies on a wide range of market-based economic development tools.<sup>40</sup> Since 1990, Shanghai's output has grown eleven-fold, and its per-capita income has expanded by a factor of six. Neither income nor employment fell in Shanghai during the past few volatile years, and as China's economic growth cooled in 2011, Shanghai posted even higher growth rates than in previous years. Between 2010 and 2011, income in Shanghai grew by almost 10 percent, and employment increased by 6 percent, making it the best performer among the largest 200 metropolitan areas in the world.

Manufacturing, Shanghai's largest industry, accounts for 40 percent of the metro area's output and delivered one-third of its economic growth in 2010-2011. Business and financial services, Shanghai's second-largest industry and a full 13 percent of all such industry in China, contributed a further 20 percent to recent growth. With these tradable sectors growing rapidly, local non/market services (education, health care, administrative services

and government) contributed 40 percent to employment growth in Shanghai.

Given the highly centralized nature of economic planning and development in China, it is no surprise that national economic trends have a significant effect on Shanghai's performance. Yet local factors led to a better growth year in Shanghai than elsewhere in China. Most of Shanghai's industries are growing at a faster pace than those industries nationwide. Shanghai's business and financial services; trade and tourism; and local/non-market services industries expanded twice as fast as their national counterparts in 2010-2011.

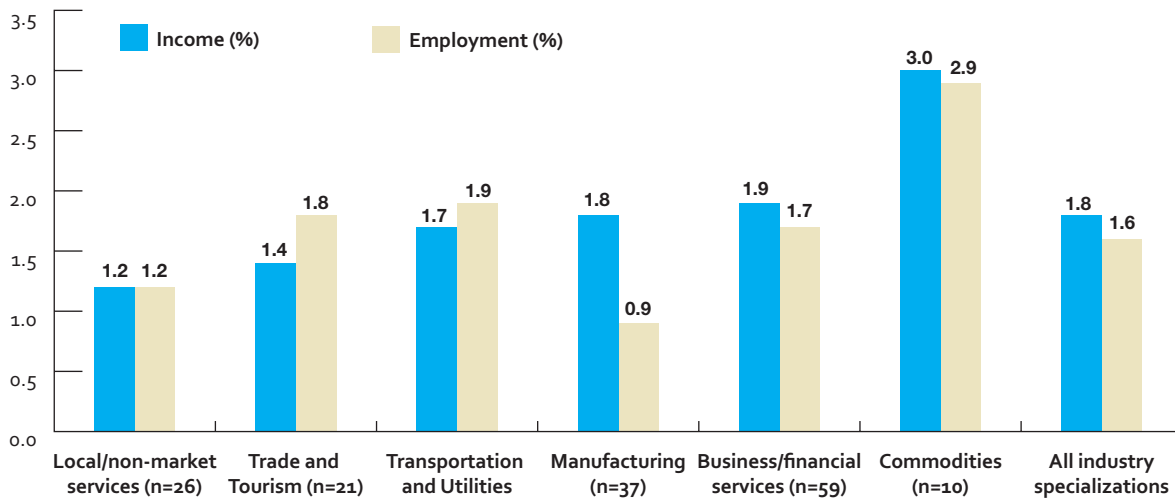
Shanghai has witnessed significant volatility in its output level from 2007 to 2011. While the metro economy slowed to about 8 percent growth between 2008 and 2009, from 2010 to 2011 growth accelerated to more than 12 percent. China's export-driven growth strategy helped spur rapid growth in Shanghai over the last two decades, given its large port and its strength in manufacturing. If Chinese economic policy reorients toward domestic consumption, the potential exists to strengthen Shanghai's fast-growing services industries.

and Latin America that suffered no downturn, or have fully recovered, all significantly out-performed their long-run annualized growth rates. Yet so, too, did Stuttgart and Houston, each of which lost jobs and income during the recession. Some metro areas that remained in recession in 2011 greatly under-performed their long-run income growth trend (Athens, Perth, Dublin, New Orleans), but so did Chinese metro areas where income is no longer growing at the double-digit rates that prevailed in the 1990s and 2000s, when market reforms were taking root.

By the same token, several Chinese metro areas, including Shanghai, rank among those that are adding jobs at rates farthest above their 1993-2007 annualized growth rates (see sidebar). And metro areas where job growth has slowed most from its longer-run trend include many "bubble" regions, like Dublin, Barcelona, Abu Dhabi, and Las Vegas, many of which remained in partial or full recession in 2011. Construction fueled employment gains in those places through much of the 1990s and 2000s, but has since ground to a halt amid weakness in the housing and credit markets.

## FIGURE 6. METRO AREAS SPECIALIZED IN COMMODITIES AND BUSINESS SERVICES GREW FASTER THAN OTHER METRO AREAS IN 2010-2011

Income and Employment Change by Strongest Metro Industrial Specialization, 184 Metro Areas, 2010-2011



Source: Brookings analysis of data from Oxford Economics, Moody's Analytics, and U.S. Census Bureau

### E. Metro areas specializing in commodities and business and financial services within their countries exhibited the strongest performance.

As previous findings indicate, recent economic performance is influenced by metro areas' locations in the world and their countries' development status. The distinct economic structures of metro areas, particularly their industrial specializations, also affect their performance.

Among the six metro industrial specializations described in the Data and Methods section, metro areas that specialized in commodities registered the strongest performance in 2010-2011. On average, these 10 metro areas ranked 84th among the 184 metro areas analyzed, achieving combined income growth of 3.0 percent, and combined employment growth of 2.9 percent (Figure 6). Rising demand for commodities as the global economy recovered fueled expansion in a handful of regions across the globe such as Abu Dhabi, Houston, and Xi'an (Map 4). Geopolitical events such as the Arab Spring that spurred oil price increases also benefited these metro areas.<sup>41</sup>

Business and financial services metro areas were another strong group of performers. The average rank among these 59 metro areas was close behind the commodities metro areas at 87th, and they posted combined income growth of 1.9 percent and employment growth of 1.7 percent in 2010-2011. The concentration of 10 of 12 Chinese metro areas in this category, given their role as business and financial service centers for China and increasingly broader Asia, helps explain the result. Together with other developing Asian business and financial service-specialized metro areas such as Jakarta and Kuala Lumpur, their incomes and employment grew considerably faster than in their North American and European counterparts, where 2010-2011 gains matched regional averages across all industrial categories.

Manufacturing-oriented metro areas also posted above-average income gains in higher-income countries. The economic growth of areas such as Stuttgart, Rochester, Milwaukee, and Hamilton in 2010-2011 largely reflected the rebound of their manufacturers. Few of these metro areas added jobs at a rapid clip, however, signaling that manufacturing firms ramped up output without significant additional hiring.<sup>42</sup>



Manufacturing industries not only seemed to boost growth in metro areas specialized in that sector, but also drove economic expansion in 2010-2011 in a wider array of places. Across 187 metro areas analyzed, manufacturing represented the largest share of output in 23. However, manufacturing accounted for the most output growth in 59 metro areas in 2010-2011 (Map 4). Included among these were important manufacturing capitals like Portland, Stuttgart, Taichung, and Ulsan, but also areas with smaller manufacturing sectors such as Basel-Mulhouse, Brussels, Copenhagen, and Phoenix. The ramp-up of production that accompanied worldwide economic recovery clearly redounded to the benefit of a diverse set of places. Consistent with the overall pattern, however, manufacturing drove employment growth in a much more limited set of metro areas.

Transportation and utilities-focused metro areas grew at average rates overall, but at very different speeds between lower- and higher-income places. The continued growth of trade in developing metro markets such as Bangkok, Belo Horizonte, Bucharest, and Wuhan helped drive strong overall performance in those places. At the same time, developed metro ports and logistics hubs such as Brisbane, Lisbon, Memphis, and Rotterdam grew slowly or declined, reflecting in many cases sluggish demand among domestic and foreign trading partners.

Growth in 2010-2011 was slowest in metro areas specializing in local/non-market services or construction. These 26 metro areas (5 developing and 21 developed) posted below-average growth in both income and employment.

Metro areas such as Arnhem, Cardiff, Honolulu, Ottawa, and Sacramento have large local/non-market services concentrations that, while helping their metro areas to avoid the worst initial effects of the Great Recession, failed to fuel growth last year amid fiscal retrenchment at the state/provincial and national levels (see sidebar). Indeed, the average ranking of metro areas specialized in local/non-market services or construction fell precipitously between the recession (90) and 2010-2011 (114). Those sectors accounted for the largest share of 2010-2011 employment growth in about one-third of metro areas studied, but led growth in output in only 14 metro areas.

Even within these industrial specialization categories, however, important differences in metropolitan economic outcomes remain. No specialization category saw all of its metro areas achieve growth in 2010-2011 (Figure 7). Reasons for metro area growth or decline differed somewhat within each industrial/performance category. For instance, distinct dynamics accounted for struggles of the business and financial services centers of Dublin and Philadelphia, and growth in the transportation hubs of Louisville and Porto Alegre. Yet these groupings usefully demonstrate that the basic function and trajectory of metro areas can transcend national and regional borders.

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**Growth in 2010-2011 was slowest in metro areas specializing in local/non-market services or construction.**

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**FIGURE 7. METRO ECONOMIES WITH SIMILAR INDUSTRIAL SPECIALIZATIONS VARIED IN THEIR ECONOMIC PERFORMANCE IN 2010-2011**

Industrial Specialization and 2010-2011 Growth Trajectory, 184 Large Metropolitan Areas

Commodities		Business and Financial Services					
<p><b>Growing</b></p> <p>Abu Dhabi Calgary Edmonton Houston <b>Izmir</b> Katowice Oklahoma City Tulsa</p>	<p><b>Declining</b></p> <p>New Orleans Perth</p>	<p><b>Hangzhou</b> Hartford Jakarta Kaohsiung <b>Kuala Lumpur</b> London Los Angeles Melbourne <b>Mexico City</b></p>	<p><b>Growing</b></p> <p>Minneapolis <b>Moscow</b> Munich <b>Nanjing</b> New Haven New York Oslo Paris Pittsburgh</p>	<p><b>Prague</b> Salt Lake City San Diego Sao Paulo Seoul <b>Shanghai</b> <b>Shenyang</b> <b>Shenzhen</b> <b>Stockholm</b></p>	<p><b>Sydney</b> Tel Aviv <b>Tianjin</b> Toronto <i>Xi'an</i> Zurich</p>	<p><b>Mixed</b></p> <p>Budapest Columbus Des Moines Philadelphia Raleigh Richmond</p>	<p><b>Declining</b></p> <p>Dublin San Francisco</p>
Local/Non-Market Services		Manufacturing					
<p><b>Growing</b></p> <p><b>Manila</b> Ottawa <b>Rio de Janeiro</b> Saarbrücken San Antonio Seattle <b>St. Louis</b> Toulouse Washington Luxembourg</p>	<p><b>Declining</b></p> <p>Kansas City Naples Sacramento Seville</p>	<p><b>Adelaide</b> Austin Bielefeld-Detmold Bologna Braunschweig-Wolfsburg Cincinnati Cleveland Dallas Detroit</p>	<p><b>Eindhoven- Den Bosh</b> Hamilton <b>Johannesburg</b> Leeds-Bradford Lille Manchester Mannheim-Ludwigshafen Milan</p>	<p><b>Milwaukee</b> <b>Monterrey</b> Montreal Nottigham-Derby Nürnberg-Fürth Portland Rochester <b>Saint Petersburg</b> San Jose Sheffield</p>	<p><b>Stuttgart</b> Taichung Tur in Ulsan Venice-Padova</p>	<p><b>Mixed</b></p> <p>Barcelona Indianapolis Liverpool Newcastle</p>	<p><b>Declining</b></p> <p>Valencia</p>
Trade and Tourism		Transportation and Utilities					
<p><b>Growing</b></p> <p>Nice <b>Guadalajara</b> Helsinki <b>Istanbul</b> Jacksonville Köln- Düsseldorf Miami Nashville</p>	<p><b>Atlanta</b> Birmingham, UK Dubai Florence Las Vegas Phoenix</p>	<p><b>Foshan</b> Hamburg Hannover Incheon Jiddah Lyon</p>	<p><b>Louisville</b> Marseille Omaha <b>Porto Alegre</b> Riyadh Rome</p>	<p><b>Taipei</b> Vancouver Vienna Warsaw <i>Wuhan</i></p>	<p><b>Birmingham, US</b> Glasgow Madrid Memphis Rotterdam- Amsterdam</p>	<p><b>Declining</b></p> <p>Athens Brisbane Lisbon</p>	

Note: Analysis excludes metro areas with insufficiently detailed industrial data. Some metro names are abbreviated; see Data Appendix for full names; developing metro areas shown in bold. Source: Brookings analysis of data from Oxford Economics, Moody's Analytics, and U.S. Census Bureau

## SACRAMENTO: HELD BACK BY A SHRINKING GOVERNMENT SECTOR AND WEAK HOUSING MARKET IN 2011

Sacramento is the capital city of California, the most populous state in the United States. Home to 2.2 million people, Sacramento is only the fifth largest metropolitan area in California, and anchors the northern end of the state's inland Central Valley. While the metro economy ranks 78th among the largest 200 metropolitan areas in the world, it is only about one-seventh the size of greater Los Angeles.

Between 1993 and 2007, Sacramento grew quickly. While the United States recorded 1.4 percent annualized growth in employment, Sacramento's employment grew at almost double that rate, as many households and businesses migrated to the region from the higher-cost, adjacent San Francisco Bay Area. Income and output growth in greater Sacramento also outpaced national averages as the economy diversified and added higher-value business services. At the same time, the region's population growth fueled rapid investment in the housing sector.

Like the nation as a whole, Sacramento suffered declines in employment and output in 2007-2008, and steeper losses in 2008-2009. Unlike the nation, however, recovery continues to elude the metro area. Sacramento ranked among the bottom tier of the 200 largest metropolitan areas in the recession, 2009-2010, and 2010-2011. For 2011,

it ranked higher than metro areas in the peripheral economies of the Eurozone (Seville, Dublin, Lisbon, and Athens).

Between 2010 and 2011, Sacramento's employment and income each fell at about a 1 percent rate. Output grew, but more slowly than population. For the first time since 1990, Sacramento's income level dropped below the U.S. average. Cuts in government jobs drove the downward trend in metro employment; 60 percent of the decline in employment originated in local/non-market services, of which government employment accounts for about half. Job growth was weak across the Sacramento economy. None of the metro area's major sectors grew faster than its national counterpart, and two of Sacramento's largest sectors (local/

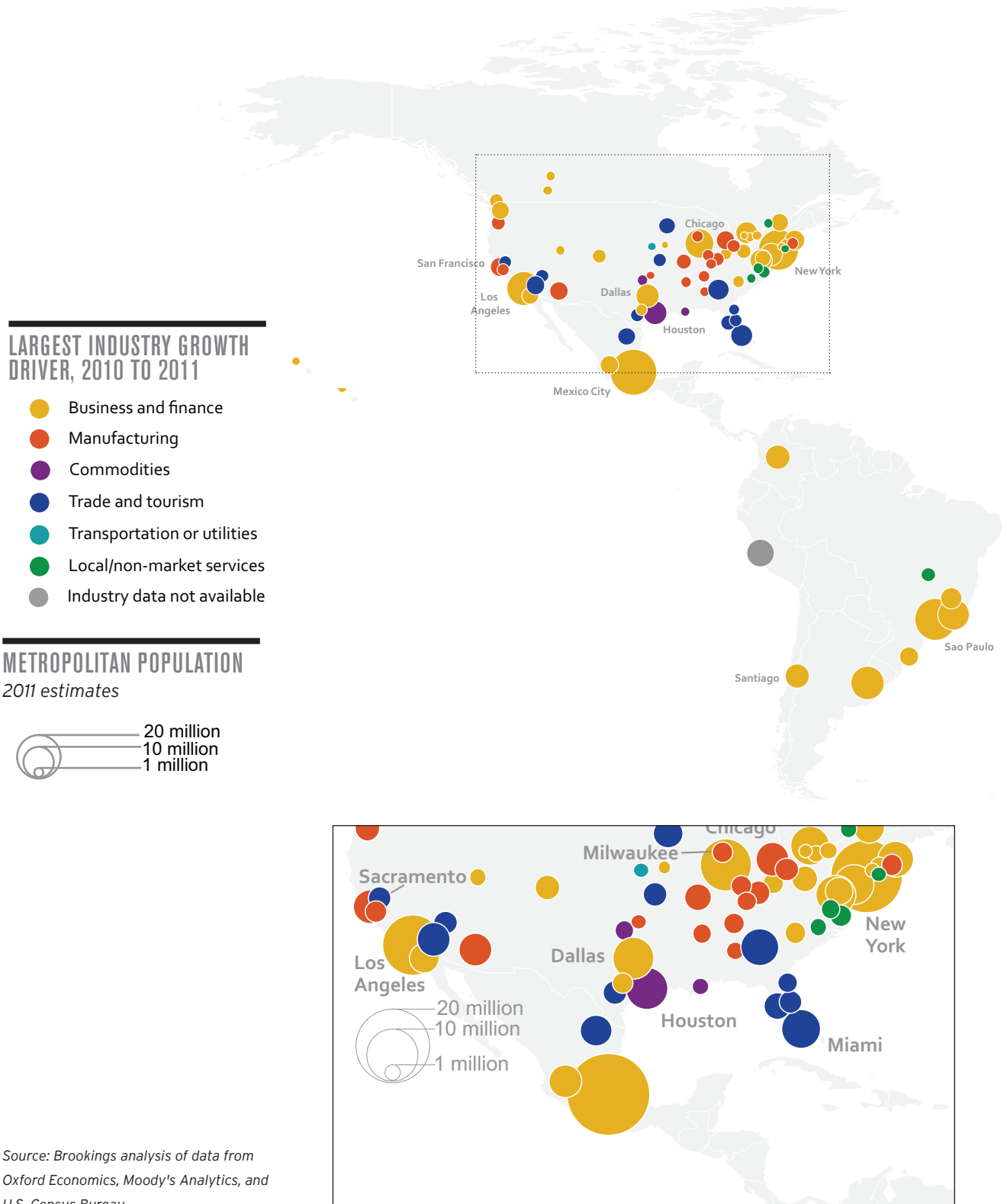
non-market and business and financial services) shed jobs in 2011. Housing foreclosure rates remain among the highest in the country, and house prices remain well below their peak.

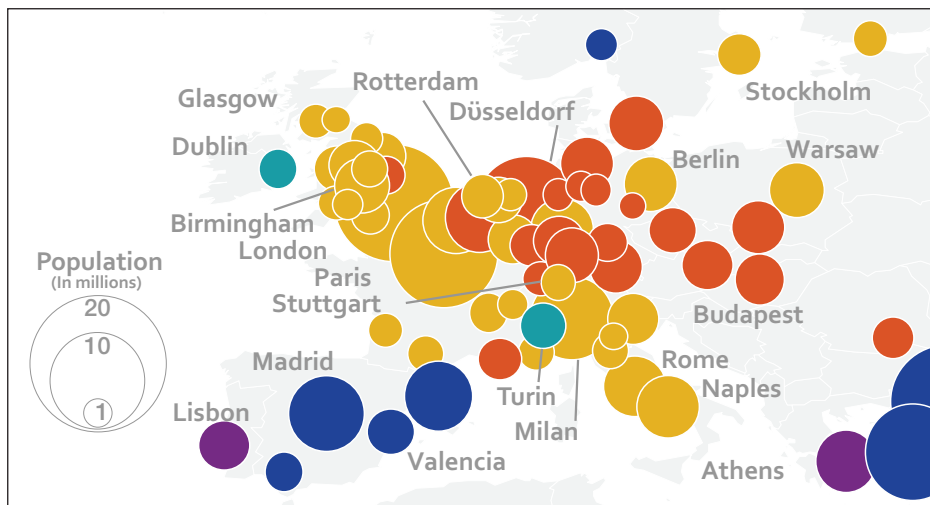
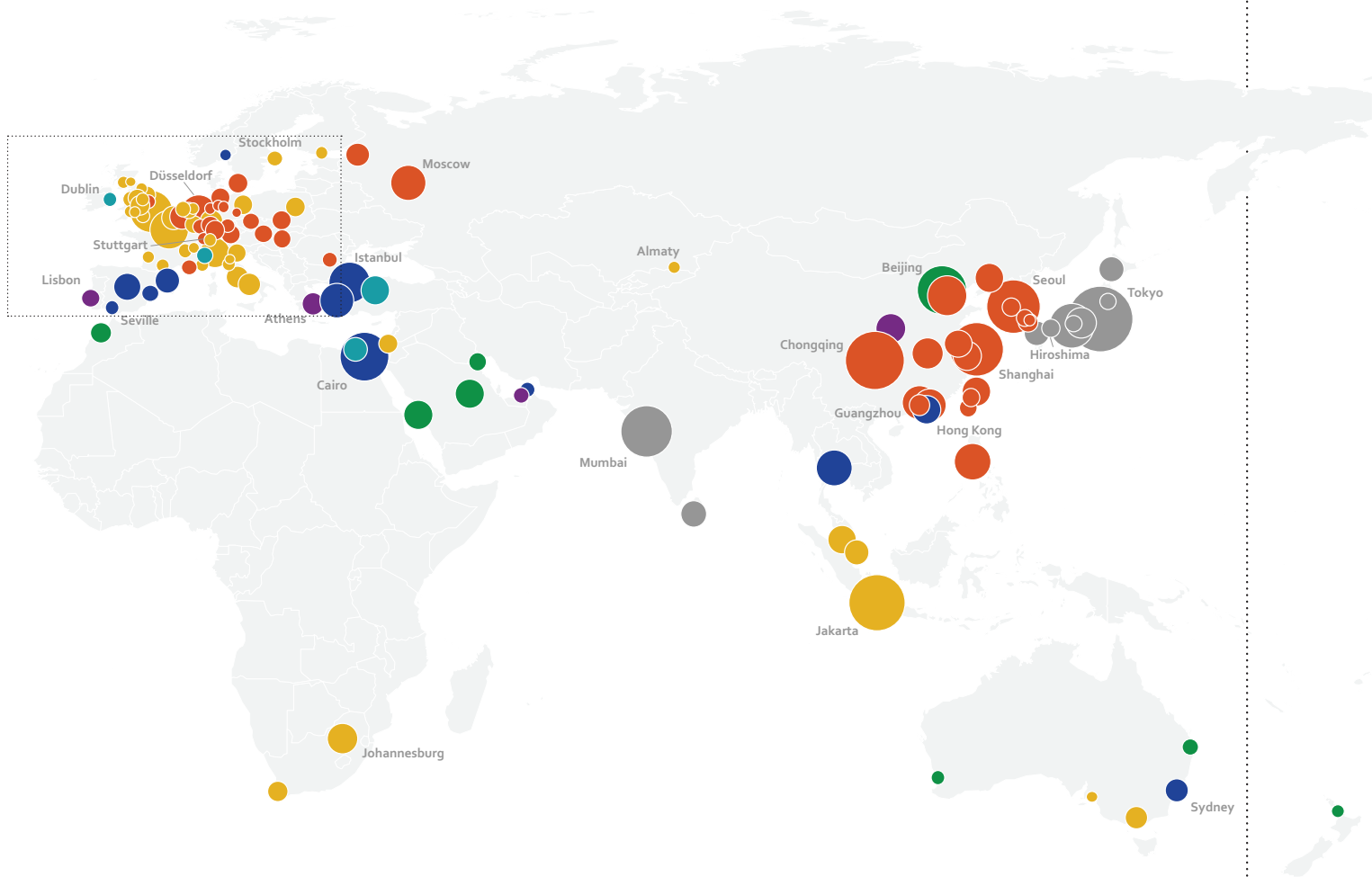
Sacramento's output was not particularly volatile between 2007 and 2011, which when coupled with its contraction over the period, may indicate an unfavorable outlook. With 13 percent of its labor force employed by the state, and many others in jobs that support government work, the metropolitan area depends heavily on California state spending. But the state's fiscal picture looks increasingly grim given legislative gridlock in the capital.<sup>43</sup> Sacramento may need to focus on other industries that are growing elsewhere to develop a sustainable solution to its lingering economic problems. One hopeful indicator is that between 2003 and 2010, Sacramento added 13,857 jobs in the "clean economy," placing it seventh among the 100 largest U.S. metropolitan areas.<sup>44</sup>



## MAP 4. BUSINESS SERVICES AND MANUFACTURING DROVE GROWTH IN MANY GLOBAL METRO AREAS IN 2011

Largest Industry Contribution to Economic Growth, 200 Largest Metropolitan Areas, 2010 to 2011





# CONCLUSION

This analysis of economic growth patterns across 200 of the world's largest metropolitan areas in 2011 portrays a global economy whose recovery from the Great Recession showed signs of faltering. Overall metropolitan employment growth accelerated modestly from the previous year, but income growth dropped markedly. Yet it also reveals a constellation of metropolitan economies that, beneath those worldwide aggregates, varied tremendously in their trajectories due to a mix of regional, national, industrial, and local factors.

As was the case in 2010, developing metro areas, particularly those in Asia and Latin America, continued to lead the global recovery. The overwhelming majority of the fastest-growing metro areas on our 2010-2011 economic index were from those regions. Many were untouched or only slightly grazed by the recession, and continued in 2011 to close the income gap with their developed metro counterparts. Indeed, developing metro areas experienced combined growth in employment and income from 2007 to 2011, while developed metro areas lost ground in aggregate.

To be sure, developing metro areas remain much less wealthy than those in higher-income countries. Only 42 metro areas from developing nations were large enough to rank among the 200 metro economies profiled here. Their combined income in 2011 was about \$8,000, only a little more than one-fifth of income in the developed markets.

Yet many have grown so fast in recent years, or are now becoming wealthy enough, that they should no longer escape the attention of public- and private-sector leaders in slower-growing, richer metro areas. Income in Chinese metro areas such as Foshan, Guangzhou, and Shenzhen has multiplied at least fourfold over the last 15 years. Incomes in Almaty, Moscow, and Mumbai have doubled, and risen 50 percent or more in Buenos Aires, Jiddah, and Kuala Lumpur. Several of these metro areas today are at or beyond the point where developed counterparts in South Korea, Taiwan, and Eastern Europe were 15 years ago.

Especially in light of the highly uncertain near-term growth prospects for regions like Western Europe and the United States, metro leaders in high-income countries will benefit from looking at these rising metro areas as sites for more than production alone, and position themselves for a more diverse set of export and inward Foreign Direct Investment (FDI) relationships. Those relationships are at least as important for rising metro areas in Asia, Latin America, and elsewhere. The World Bank notes how congestion costs cause economic growth in prosperous places to spill over to developing places, but only to those places well-connected to their higher-income counterparts.<sup>45</sup>

This edition of the *Global MetroMonitor* offers some initial evidence on the importance of exports and tradable sectors for powering metropolitan recovery. In both developing and developed markets, metro areas specializing in export-intensive industries such as commodities, business and financial services, manufacturing, and transportation out-performed metro areas more focused in local/non-market services or construction. Even in metro areas not otherwise specialized in business services or manufacturing, those industries often drove output growth in 2010-2011. Metro areas that can cultivate these more outward-oriented sectors may over time expose themselves to greater market fluctuations, but in doing so, gain access to a much wider set of growth levers and wealth-building opportunities.

Metro areas are hardly free agents in the global economy. Not only is their performance influenced by their own economic histories and structures, but also national governments set the context for their growth through monetary, fiscal, and trade policies. Metro economies are also affected by the strength or weakness of their geographic neighbors and key trading partners. Nowhere was this clearer last year than in Western Europe, where crises affecting the Eurozone hampered growth across many of the continent's metropolitan areas.

The evidence from recent trends nevertheless underscores that metropolitan-level factors matter importantly to growth. Income and employment growth rates often differed dramatically among metro areas within the same country, such as Stuttgart and Hamburg, or with similar industrial specializations, such as Taipei and Brisbane. In fact, a handful of metro areas bucked the prevailing trend within their nations and among their industrial peers, either growing faster than average with an under-performing national and industrial profile, or slower than average in an over-performing country and industrial category (Figure 8).<sup>46</sup> Four metro areas—Bordeaux, Nashville, Orlando, and Seattle—achieved high growth rates on both income and employment despite being in slower-growing countries (France and the United States) and specialized in slower-growing industries like trade and tourism and local/non-market services or construction. Future research might probe the specific local factors that helped these and other metro economies overcome growth-limiting circumstances in 2010-2011.

No matter where metro areas lie on the development continuum, however, their concentrations of high-value

**FIGURE 8. SOME METRO AREAS OVER- OR UNDER-PERFORMED EXPECTATIONS BASED ON THEIR NATIONAL AND INDUSTRIAL PROFILES**

<p><b>OVER</b> (below-average growth for country and industry, above-average in metro)</p>	<p><b>INCOME</b> Baltimore Bordeaux Louisville Lyon Nashville Orlando Providence Seattle</p>	<p><b>EMPLOYMENT</b></p> <table border="0"> <tr> <td>Austin</td> <td>Honolulu</td> <td>Phoenix</td> <td>San Diego</td> </tr> <tr> <td>Bordeaux</td> <td>Milwaukee</td> <td>Pittsburgh</td> <td>San Jose</td> </tr> <tr> <td>Boston</td> <td>Minneapolis</td> <td>Portland</td> <td>Seattle</td> </tr> <tr> <td><b>Brasilia</b></td> <td><b>Monterrey</b></td> <td>Raleigh</td> <td>Tampa</td> </tr> <tr> <td><b>Casablanca</b></td> <td>Nashville</td> <td>Rochester</td> <td>Toulouse</td> </tr> <tr> <td>Cincinnati</td> <td>Nice</td> <td>St. Louis</td> <td></td> </tr> <tr> <td>Dallas</td> <td>Orlando</td> <td>Salt Lake City</td> <td></td> </tr> <tr> <td>Detroit</td> <td>Oslo</td> <td>San Antonio</td> <td></td> </tr> </table>				Austin	Honolulu	Phoenix	San Diego	Bordeaux	Milwaukee	Pittsburgh	San Jose	Boston	Minneapolis	Portland	Seattle	<b>Brasilia</b>	<b>Monterrey</b>	Raleigh	Tampa	<b>Casablanca</b>	Nashville	Rochester	Toulouse	Cincinnati	Nice	St. Louis		Dallas	Orlando	Salt Lake City		Detroit	Oslo	San Antonio	
Austin	Honolulu	Phoenix	San Diego																																		
Bordeaux	Milwaukee	Pittsburgh	San Jose																																		
Boston	Minneapolis	Portland	Seattle																																		
<b>Brasilia</b>	<b>Monterrey</b>	Raleigh	Tampa																																		
<b>Casablanca</b>	Nashville	Rochester	Toulouse																																		
Cincinnati	Nice	St. Louis																																			
Dallas	Orlando	Salt Lake City																																			
Detroit	Oslo	San Antonio																																			
<p><b>UNDER</b> (above-average growth for country and industry, below-average in metro)</p>	<p><b>Almaty</b> <b>Beijing</b> Eindhoven-Den Bosch Genève-Annemasse</p>	<table border="0"> <tr> <td><b>Bangkok</b></td> <td>Hamburg</td> <td>Katowice</td> <td>Vienna</td> </tr> </table>				<b>Bangkok</b>	Hamburg	Katowice	Vienna																												
<b>Bangkok</b>	Hamburg	Katowice	Vienna																																		

*OVER: Metro areas that exceeded average income or employment growth rates for their development status despite below-average growth rates in their country and industrial specialization.*

*UNDER: Metro areas that lagged average income or employment growth rates for their development status despite above-average growth rates in their country and industrial specialization.*

*Source: Brookings analysis of data from Oxford Economics, Moody's Analytics, and U.S. Census Bureau; developing metro areas shown in bold.*

jobs and economic activity mean that they make outsized contributions to output and job growth for their national economies. The 64 North American metro areas examined generated 62 percent of U.S. and Canadian GDP in 2010, but accounted for 83 percent of national output growth over the next year. The 11 profiled metro areas in the Middle East and Africa had 37 percent of their nations' jobs in 2010, but captured 56 percent of net job growth from 2010 to 2011. Disproportionate metropolitan contributions to growth characterized all of the major world regions examined. As a result, the direction of an unsteady global recovery thus rests on the future performance of the world's major metropolitan economies.

2012 dawns amid tremendous uncertainty on the global economy's direction. Key questions include whether policymakers can stabilize the Eurozone, China can stop the slowdown of economic growth, and the United States can sustain and accelerate a fragile labor market recovery. These issues in turn implicate the fate of national and regional economies all over the world that trade with these enormous markets.

The *Global MetroMonitor* offers important reminders that along with these macro considerations, global and national leaders must also invest strategically to grow "micro" assets, those that power the 200 metropolitan areas that account for fully half of the global economy—their distinct and innovative clusters of firms, infrastructure to support their trade flows, and institutions that provide them with skilled and adaptable labor forces. As fiscal tightening continues to limit the scope of national investment in coming years, metropolitan leaders will face new imperatives to innovate from the ground up, forging new trade and investment relationships with their global metropolitan partners to achieve sustained recovery and prosperity.

# METHODOLOGICAL APPENDIX

## Selection and Definition of Metropolitan Areas

This second edition of the *Global MetroMonitor* employs the size of metropolitan economy as the main selection criterion, given the focus on metropolitan economic performance. It increases to 200 the number of studied metro areas, up from 150 in the inaugural report. As a result, the sample is comprised of the largest 200 metropolitan economies in the world, based on the size of their economy in 2007, at market exchange rates. The sample is based on McKinsey Global Institute's Cityscope 1.1 database.<sup>47</sup>

Data were not available for five metros included among McKinsey's top 200: San Juan, Puerto Rico; Tehran, Iran; Caracas, Venezuela; Campinas, Brazil; and Doha, Qatar. In order to replace these missing observations and to better represent developing countries in the sample, we add seven metropolitan areas: Prague, Czech Republic; Almaty, Kazakhstan; Cape Town, South Africa; Alexandria, Egypt; Casablanca, Morocco; Kuala Lumpur, Malaysia; and Colombo, Sri Lanka. These metros closely follow the 200 largest metro areas in GDP. The smallest two U.S. metro areas among the 200 largest were also excluded to enhance geographic representativeness. The majority of the metropolitan areas studied (136 out of 150) in the first *Global MetroMonitor* are included in this edition as well.

This study uses the general definition of a metropolitan area as an economic region with one or several cities and their surrounding areas, all linked by economic and commuting ties. In the United States, metro areas are defined by the federal Office of Management and Budget (OMB) to include one or more urbanized areas of at least 50,000 inhabitants plus outlying areas connected by commuting flows.<sup>48</sup> For the European Union countries, Switzerland and Norway, the European Observation Network for Territorial Development and Cohesion (ESPON) defines metro areas as having one or more functional urban areas of more than 500,000 inhabitants.<sup>49</sup> A functional urban area is comprised of an urban core and the adjacent area economically integrated with the center.<sup>50</sup> Some of these metropolitan areas cross country borders (e.g. Lille metropolitan area in France and Belgium) or include several functional urban areas that would qualify on their own as metropolitan areas, but are close or contiguous (polycentric metropolitan areas such as the Randstad Holland/Delta metropolis in the Netherlands, which includes Amsterdam, Utrecht, Leiden, Hague, Delft, and Rotterdam). For metropolitan areas outside of the United States and Europe, this study uses the official metropolitan area definition from national statistics. Not all countries, especially developing ones, have created statistical equivalents of a metropolitan area. Due to data limitations, some metropolitan areas in this report do not reflect properly regional economies, but the administrative city (Moscow, Mumbai) or administrative region (Casablanca).

## Baseline Variables and Data Sources

This *Global MetroMonitor* employs a few key variables to assess the economic performance of metropolitan areas: Gross Domestic Product (GDP), employment, population, and income (or GDP per capita), from 1993 to 2011. In addition, the study uses Gross Value Added (GVA) and employment by major industry sector. GDP and GVA data are adjusted for inflation, and are expressed in U.S. dollars at 2005 prices.<sup>51</sup> Data availability and comparability at metropolitan level precluded expanding the economic analysis to other indicators of interest, such as housing prices, employment rates and unemployment rates.

This edition employs two main databases for analysis: Moody's Analytics for metropolitan areas in the United States, and Oxford Economics for the rest of the sample. For the United States, this study also uses the U.S. Census Bureau's population estimates.

Moody's Analytics derives GDP by metropolitan area (estimated and forecasted) based on the U.S. Bureau of Economic Analysis' (BEA) GDP by state estimates.<sup>52</sup> Oxford Economics collects data from national statistics bureaus in each country or from providers such as Haver, ISI Emerging Markets, and Eurostat. It calculates forecasted metro GDP as the sum of forecasted industry GVA at the metropolitan level.

For population, this study uses the U.S. Census Bureau's intercensal population estimates for the United States and Oxford Economics' collected data from national statistical agencies. To forecast 2011 population for U.S. metro areas, annualized growth rates from 2007 to 2010 are applied to 2010 estimates. Oxford Economics forecasts metropolitan population based on official population projections produced by national statistical agencies and/or organizations such as Eurostat, adjusting migration assumptions on a case-by-case basis.



For industry analysis, this report collected industry-level data and estimates for metropolitan employment and GVA. This edition attempts to increase the consistency among industrial sectors across metros and nations. It identifies eight major industrial sectors for which GVA and employment data were available at the metropolitan level (see Table A). In large part, this industrial identification was driven by data availability. For example, the trade and tourism sector groups a local consumption industry (retail and wholesale trade) with a more tradable one (accommodation and food services) because industry data provided by Oxford Economics was reported in this way for several metro areas (e.g. Tel Aviv, Johannesburg, Riyadh). The goal was to strike a balance between industry disaggregation and consistency of categories across metros and countries.

**TABLE A. INDUSTRY CATEGORIES IN *GLOBAL METROMONITOR***

Industry Category	Corresponding Industry for U.S. Metros	NAICS 2007
Commodities (agriculture and mining)	Agriculture, Forestry, Fishing and Hunting	11
	Mining, Quarrying, and Oil and Gas Extraction	21
Manufacturing	Manufacturing	31-33
Utilities	Utilities	22
Construction	Construction	23
Trade and tourism	Wholesale Trade	42
	Retail Trade	44-45
	Accommodation and Food Services	72
Transportation	Transportation and Warehousing	48-49
Business and financial services	Finance and Insurance	52
	Real Estate and Rental and Leasing	53
	Professional, Scientific, and Technical Services	54
	Management of Companies and Enterprises	55
	Administrative and Support and Waste Management and Remediation Services	56
Local/non-market services	Educational Services	61
	Health Care and Social Assistance	62
	Arts, Entertainment, and Recreation	71
	Other Services (except Public Administration)	81
	Government	92
	Information	51

This industry identification was applied to a subset of the overall 200 metropolitan economies due to lack of detailed industrial data in some metropolitan areas. The metropolitan areas excluded are: Mumbai, Lima, Colombo for industry GVA and Mumbai, Lima, Colombo, and Bogota for industry employment. Further, the local/non-market services category composition does not include consistently across metros all the industries identified for the U.S. metros, given the lack of data. While the industry concepts might be consistent across these categories, the industry GVA and employment may be calculated slightly differently on a country-by-country basis.

For U.S. metro areas, Moody's Analytics provides GVA and employment by industry, using the North American Industry Classification System (NAICS) 2007. For European metros, Oxford Economics collects GVA and employment by industry, based on the Statistical Classification of Economic Activities in the European Community (NACE) version 1. For metro areas outside of the United States and Europe, Oxford Economics reports data available from local and national statistical agencies.

This update provides more detailed Chinese industrial data at the metropolitan level, by including separate GVA and employment estimates of mining, manufacturing and utilities, usually reported as a single "secondary industry." Based on Chinese official data on GVA and employment of 38 component industries of the "secondary industry" category at the provincial level, this study estimated shares of GVA and employment for mining, manufacturing, and utilities for the sampled Chinese metropolitan areas and China's economy. These shares were applied to secondary industry data collected and estimated by Oxford Economics in order to obtain a consistent time-series of GVA and employment for these sectors.<sup>53</sup>

Moody's Analytics bases industry employment forecasts for U.S. metro areas on two U.S. Bureau of Labor Statistics series: the monthly **Current Employment Statistics** (CES) and the **Quarterly Census of Employment**

**and Wages** (QCEW). In forecasting industry GVA and employment for metros, Oxford Economics employs different methods depending on the type of industry. For tradable sectors (primary industries and business and financial services), the GVA forecasts take into account the historical relationship between the growth of the industry in a metro area compared with the respective national average. Public services industries forecasts follow the same method, adding metro population to reflect the nature of demand for local services. GVA forecasts for trade and tourism, and transportation are modeled against the performance of the previous two categories of industries (tradable sectors and public services), to reflect local multiplier effects. Industry employment forecasts are based on GVA industry forecasts and trends in labor productivity.

### **Metro Economic Performance Score**

The report focuses on the economic performance of metropolitan areas using a standardized score composed of two indicators: the annualized growth rate of real income (GDP per capita); and the annualized growth rate of employment. These two indicators reflect the importance that people and policy makers attach to achieving rising incomes and standards of living (GDP per capita), and generating widespread labor market opportunity (employment). Identifying economic data available across the entire sample of 200 metro areas limited the choice and number of additional indicators to be included in the standardized score. For example, while changes in the employment rate or the unemployment rate may better indicate labor market opportunity, there are no consistent data on the number of unemployed people or the size of the labor force across metropolitan areas worldwide.

The scoring method compares each value of a variable ( $X_i$ ) to the median ( $X_{med}$ ), then divides their difference by the distance between the value of that variable at the 90th percentile of the distribution ( $X_{90}$ ) and the 10th percentile ( $X_{10}$ ):

$$\text{Standardized score} = \frac{X_i - X_{med}}{X_{90} - X_{10}}$$

Each of the two indicators (annualized growth rates of income (GDP per capita) and employment) is standardized using this method for each time period (1993-2007, minimum year of growth 2007-2010, 2010-2011). Once standardized, the scores for each of the two indicators are added for each metro area, therefore yielding a total score and ranking for each metro area for each time period.

Inter-decile range standardization helps to minimize the influence of outliers by using the 90th and the 10th percentile values instead of the minimum and maximum values, and best reflects the non-normal distribution of metro economic growth rates. This method was judged more appropriate for these data than Z-score standardization, which compares each value of a variable to the mean and divides their difference by the standard deviation, as they do not follow a normal distribution. It was also preferred to range standardization (which compares each value of a variable to the minimum and divides their residual by the distance between the minimum and the maximum) because of the sensitivity of this latter method to outliers.

### **Metropolitan Typology**

Based on their industrial mix and economic performance in 2010-2011, this study classifies the 200 metropolitan areas into a series of metro categories. The metros were grouped based on their growth indicators (2010-2011 growth rates of metropolitan income and employment), and industry specialization (the industry with the highest location quotient among industries with at least 5 percent of metropolitan output in 2010). The industry specialization is based on the ratio of the share of a metro industry out of the metro GVA to the share of the corresponding national industry out of national GVA. While industry specialization of a metro versus the world or other metros in its world region might be more appropriate for the scope of this report, the available data limits such classification. There is a larger degree of consistency in the data collection and estimation methodology for the industry output of a metro and its country than across metros in different countries.

The location quotient was determined based on GVA industrial data, rather than employment, due to better data quality. Sixteen metropolitan areas were excluded, because of lack of detailed industrial data (Colombo, Mumbai, Lima), quality of industrial data (eight Japanese and two Egyptian metros) and because they coincide with the country (Singapore and Kuwait). Hong Kong was also excluded, because it was treated as a separate national unit from mainland China.

## Case Studies

Finally, the study offers profiles of metropolitan economies that illustrate the findings of the analysis or factors contributing to especially high or low rankings for economic performance. In addition to methods employed in the main analysis, the case studies also use the results of a volatility analysis. Metro economic volatility is measured using a coefficient of variation of metropolitan output between 2007 and 2011. Coupled with the trend in the growth of the metro output for the 2007 to 2011 period, this analysis indicates the level of stability of the growth/decline path of the metro economy.

Table B summarizes the similarities and differences between this year's and last year's edition of the *Global MetroMonitor*.

**TABLE B. COMPARISON OF DATA AND METHODS BETWEEN THE 2010 AND 2011 EDITIONS OF THE GLOBAL METROMONITOR**

Item	GMM1	GMM2	Why the Change
Number of metro areas	150	200	Increase sample size
Selection of metro areas	<ul style="list-style-type: none"> <li>▫ Equal geographical weighting between the United States, Europe, and the rest of the world</li> <li>▫ Priority given to the largest metro economies for which complete, comparable data were available</li> </ul>	The largest 200 metropolitan economies worldwide for which data were available	<ul style="list-style-type: none"> <li>▫ More clearly identify large metro economies</li> <li>▫ Use McKinsey's Cityscope, which includes GDP estimates for 2,000 metro areas worldwide, and became available in 2011</li> </ul>
Data sources	<ul style="list-style-type: none"> <li>▫ Moody's Analytics</li> <li>▫ Oxford Economics</li> <li>▫ Cambridge Econometrics</li> </ul>	<ul style="list-style-type: none"> <li>▫ Moody's Analytics</li> <li>▫ Oxford Economics</li> </ul>	Increase consistency in the estimation and forecasting method across metros
Indicators to evaluate metro	Standardized score composed of two indicators: the annualized growth rate of real income (GDP per capita); and the annualized growth rate of employment	Same	
Time periods	<ul style="list-style-type: none"> <li>▫ Pre-recession (1993-2007)</li> <li>▫ Recession (minimum year of growth 2007-2010)</li> <li>▫ 2009-2010</li> </ul>	<ul style="list-style-type: none"> <li>▫ Pre-recession (1993-2007)</li> <li>▫ Recession (minimum year of growth 2007-2010)</li> <li>▫ 2010-2011</li> </ul>	Analyze latest year of data for each edition
World region	<ul style="list-style-type: none"> <li>▫ Western Europe</li> <li>▫ Eastern Europe</li> <li>▫ United States</li> <li>▫ Other metro areas with GDP per capita over \$15,000 in 2007</li> <li>▫ Other metro areas with GDP per capita under \$15,000 in 2007</li> </ul>	<ul style="list-style-type: none"> <li>▫ Western Europe</li> <li>▫ North America</li> <li>▫ Developed Asia-Pacific, based on country income</li> <li>▫ Developing Asia-Pacific, based on country income</li> <li>▫ Latin America</li> <li>▫ Eastern Europe and Central Asia</li> <li>▫ Middle East and Africa</li> </ul>	Follow more closely international organizations' (World Bank and IMF) world regions and income classifications
Industry	<ul style="list-style-type: none"> <li>▫ Construction</li> <li>▫ Logistics, leisure, communications</li> <li>▫ Energy and manufacturing</li> <li>▫ Financial and business services</li> <li>▫ Non-market services</li> </ul>	<ul style="list-style-type: none"> <li>▫ Commodities (agriculture and mining);</li> <li>▫ Manufacturing;</li> <li>▫ Utilities;</li> <li>▫ Construction;</li> <li>▫ Trade (wholesale and retail) and tourism;</li> <li>▫ Transportation;</li> <li>▫ Business, financial, insurance, and real estate services; and</li> <li>▫ Local/non-market services (education, health care, administrative services, and government)</li> </ul>	Increase industrial coverage and better specify industry categories
Metro typology	Based on income and employment dynamics, 2009-2010	Based on income and employment dynamics, 2010-2011 and industry specialization	Bring additional information into metro characterization

# ENDNOTES

1. The International Monetary Fund, "World Economic Outlook: Tensions from the Two Speed Recovery: Unemployment, Commodities, and Capital Flows" (Washington: The International Monetary Fund, April 2011).
2. The International Monetary Fund, "World Economic Outlook: Global Recovery Advances but Remains Uneven" (Washington: The International Monetary Fund, January 2011).
3. The Organization for Economic Co-operation and Development (OECD), "Economic Outlook, Vol. 2011/2012" (OECD, 2011).
4. Hiawatha Bray, "Thailand Floods Send PC Hard Drive Prices Soaring," *Boston Globe*, December 14, 2011.
5. Simon Rabinovitch, "Housing Prices Fall in Chinese Cities," *Financial Times*, November 18, 2011.
6. Alan Berube and Philipp Rode, *Global MetroMonitor* (Washington and London: Brookings Institution and London School of Economics, 2010).
7. For example, at the height of the recession in the United States (2008-2009), employment in Austin merely stagnated, while Las Vegas lost nearly 5 percent of its jobs. See Austin and Las Vegas case studies in Alan Berube and Philipp Rode, *Global MetroMonitor*.
8. Howard Wial, Siddharth Kulkarni and Richard Shearer "MetroMonitor: Tracking Economic Recession and Recovery in America's 100 Largest Metropolitan Areas" (Washington: Brookings Institution, 2011). The *Global MetroMonitor* findings for U.S. metros may differ from those of the MetroMonitor because of differences in metropolitan coverage, data sources, indicators used, and use of annual rather than quarterly data.
9. David B. Audretsch and Maryann Feldman, "R&D Spillovers and the Geography of Innovation and Production," *American Economic Review* 86 (3) (1996): 630-40; Antonio Ciccone and Robert E. Hall, "Productivity and the Density of Economic Activity," *American Economic Review* 86 (1) (1996): 54-70; Stuart Rosenthal and William Strange, "Evidence on the Nature and Sources of Agglomeration Economies," in J.V. Henderson and J. F. Thisse, ed., *Handbook of Regional and Urban Economics*, vol. 4 (Amsterdam: North-Holland, 2004).
10. Bettencourt and others test the relationship between metropolitan population and a series of output, innovation, and wealth creation variables for a sample of U.S., European, and Chinese metropolitan areas. Bettencourt and others, "Growth, innovation, scaling, and the pace of life in cities," *Proceedings of the National Academy of Sciences of the United States of America* 104 (17) (2007): 7301-6.
11. Lobo and others test the relationship between population and output based on data for 363 metropolitan areas in the United States from 2005 to 2007. Jose Lobo and others, "The Economic Productivity of Urban Areas: Disentangling General Scale Effects from Local Exceptionality." Working Paper 11-09-46 (Santa Fe Institute, 2011).
11. Mark Muro and Bruce Katz, "The New 'Cluster Moment': How Regional Innovation Clusters Can Foster The Next Economy" (Washington: Brookings Institution, 2010).
12. The World Bank, *World Development Report 2009: Reshaping World Geography* (Washington: The World Bank, 2009).
13. Ibid.
14. Global employment estimates from International Labor Organization, *Key Indicators of the Labor Market 2011* (International Labor Organization, 2011). Estimates for 2011 not yet available.
15. However, these metro economies do not follow a rank-size distribution (Zipf's law), as found among metros in high-income countries. The Pareto exponent (the coefficient of the log of GDP) is greater than one. While the ranking is dominated by a few metros, the GDP levels of the ranked metros are much closer to each other than Zipf's law would predict.
16. For an excellent overview of these studies, see Greg Clark and Tim Moonen, "The Business of Cities: City Indexes in 2011." [available at [www.gregclark.com](http://www.gregclark.com)], 2011 Examples include: McKinsey Global Institute, *Urban World: Mapping the Economic Power of Cities* (McKinsey Global Institute, 2011); "Metropolis Now: The Global Cities Index 2010." *Foreign Policy*, September/October 2010; "Cities of Opportunity" (Partnership for New York City and PricewaterhouseCoopers, 2010); David Jin and others, "Winning in Emerging-Market Cities: A Guide to the World's Largest Growth Opportunity" (Boston Consulting Group, 2010); Pengfei Ni and Peter Karl Kressl, *The Global Urban Competitiveness Report-2010* (Cheltenham, UK: Edward Elgar, 2010).
17. For the first time, in 2009 more than half of world population lives in urban areas. Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat, *World Population Prospects: The 2008 Revision and World Urbanization Prospects: The 2009 Revision*.
18. World Bank, *World Development Report 2009: Reshaping Economic Geography* (The International Bank for Reconstruction and Development / The World Bank, 2009); Alan Berube, "MetroNation: How U.S. Metropolitan Areas Fuel American Prosperity" (Washington: Brookings Institution, 2007).
19. Berube and Rode, "Global MetroMonitor."

20. McKinsey Global Institute Cityscope 1.1 database, available at [www.mckinseyquarterly.com/Economic\\_Studies/Productivity\\_Performance/Cities\\_the\\_next\\_frontier\\_for\\_global\\_growth\\_2758?gp=1](http://www.mckinseyquarterly.com/Economic_Studies/Productivity_Performance/Cities_the_next_frontier_for_global_growth_2758?gp=1) 2011
21. Data for 2011 are based on forecasts through the third quarter of 2011.
22. Sources for definitions: U.S. Bureau Analysis, International Labor Organization, United Nations Department of Economic and Social Affairs.
23. This study uses 1993 as the beginning of the pre-recession period instead of 1989, a business cycle peak, due to data availability and the volatility between 1990 and 1993 in Eastern European countries.
24. Some European metro areas cross national borders; for purposes of this analysis, these metro areas are considered to lie in the country in which most of the population resides or where the namesake city lies.
25. See World Bank list of economies as of July 1, 2011. The Income classifications are in effect until July 1, 2012.
26. While the World Bank explains that a country's classification by income does not necessarily reflect development status, it does note that countries with lower- and middle-income levels are sometimes referred to as "developing," for the convenience of the term.
27. These geographical regions are not identical with the regions used by the World Bank and the International Monetary Fund, given the lack of a sufficient number of metropolitan areas in our sample from certain regions, such as Sub-Saharan Africa, due to small metro size and limited data availability/reliability.
- 28.
29. Metro location quotients are calculated relative to national averages, rather than global averages, to control for inherent differences in industrial specialization by development status, and to ensure that metro industries are judged relative to industries defined in exactly the same way (versus across nations, where small differences in industrial definitions would introduce additional error into calculations).
30. Development status, it should be noted, was not a perfect predictor of metro income growth in 2010-2011. Several higher-income metro areas, including Houston, Stuttgart, Warsaw, Hong Kong, and Ulsan recorded annual income growth rates near to or above the developing metro growth rate (4.8 percent). At the same time, the lower-income metro areas of Kuala Lumpur and Bucharest posted income growth rates below the developed metro growth rate (1.2 percent).
31. Balance de Reconstrucción, A un año del 27-F available at [www.minvu.cl/incjs/download.aspx?glb\\_cod\\_nodo=20100827194336&hdd\\_nom\\_archivo=Balance\\_de\\_Reconstrucción\\_27F.pdf](http://www.minvu.cl/incjs/download.aspx?glb_cod_nodo=20100827194336&hdd_nom_archivo=Balance_de_Reconstrucción_27F.pdf)
32. Chile export data from the Economist Intelligence Unit, "Country Data Annual Series," December 2011.
33. Because the relationship between metro and national economic growth runs in both directions, metro areas that accounted for very large share of their nations' output or employment naturally deviated less from national averages on income and employment growth. For instance, the average (absolute) difference from national income growth rates in the 32 metro areas that generated at least 25 percent of their nations' GDP was 0.6 percentage points, versus 0.8 percentage points in metro areas that accounted for smaller shares of national GDP.
34. The Economist Intelligence Unit, Portugal- Country Report, May 2011 (London: The Economist Intelligence Unit, 2011).
35. Ibid.
36. Howard Wial, Siddharth Kulkarni, and Richard Shearer, "MetroMonitor Third Quarter 2011" ( Washington: Brookings Institution, December 2011).
37. Ibid.
38. Global employment estimates from International Labor Organization, *Key Indicators of the Labor Market 2011*. Estimates for 2011 not yet available.
39. Trends over the slightly longer 2009-2011 period tell a similar story; 74 of 200 metro areas achieved their pre-recession income growth rates over that period, and 74 attained their prior employment growth rates.
40. Wanda Guo and Yueqiu Feng, "Special Economic Zones and Competitiveness," PRM Policy Note Series, No. 2, (Asian Development Bank: 2007).
41. Energy Information Administration, "Crude oil prices react to a variety of geopolitical and economic events" (2011).
42. Some researchers have documented reliability issues with U.S. manufacturing output data owing to inadequate accounting for domestic and foreign outsourcing and offshoring, which may inflate industry productivity estimates. See Susan Houseman, "Outsourcing, Offshoring, and Productivity Measurement in U.S. Manufacturing" (Kalamazoo, MI: Upjohn Institute for Employment Research, 2007). It is not clear to what extent similar problems

may affect manufacturing output data from other countries, or local/non-market services that increasingly engage in significant outsourcing and offshoring.

43. Amy Nilson, "California's 2012 Billion Dollar Deficit" *San Jose Green Business Examiner*, December 30, 2011.
44. Mark Muro, Jonathan Rothwell, and Devashree Saha, "Sizing the Clean Economy: A National and Regional Green Jobs Assessment" (Washington: Brookings Institution, 2011).
45. World Bank, *World Development Report 2009: Reshaping Economic Geography*.
46. Metropolitan growth rates in this analysis are compared to combined averages for other metro areas in the same income category (developing or developed).
47. McKinsey Global Institute Cityscope 1.1 database.
48. U.S. Office of Management and Budget, *Update of Statistical Area Definitions and Guidance on Their Uses*, OMB BULLETIN NO. 10-02 (U.S. Office of Management and Budget, 2009).
49. European Observation Network for Territorial Development and Cohesion (ESPON), Study on Urban Functions, ESPON Project 1.4.3 (European Observation Network for Territorial Development and Cohesion, 2007). ESPON is a European Commission program, funded by the Commission, the European Union member countries, Iceland, Lichtenstein, Norway and Switzerland. See ESPON, ESPON 2013 Programme, available at [www.espon.eu/main/Menu\\_Programme/Menu\\_Mission/](http://www.espon.eu/main/Menu_Programme/Menu_Mission/)
50. European Observation Network for Territorial Development and Cohesion (ESPON), *Potentials for Polycentric Development in Europe* (European Observation Network for Territorial Development and Cohesion, 2005).
51. If national and metropolitan GDP and industry GVA data were available both in current and constant prices, Oxford Economics rebased the constant price series to 2005 for consistency, and then applied the 2005 USD exchange rate (which come from various national statistics offices) to the whole series. Where constant price series were not available for a metropolitan area, Oxford Economics used the respective national industry deflators to create constant price series for that specific metropolitan area.
52. Moody's Analytics estimates GDP by metropolitan area as the sum of the GDP of component counties. The GDP by county, estimated or forecasted, is obtained through allocating U.S. Bureau of Economic Analysis' state GDP to component counties based on the counties' share of employment in the state employment. Moody's Analytics uses the Bureau Labor of Statistics Quarterly Census of Employment and Wages (QCEW) as basis for the county employment estimates.
53. Provincial-level industry GVA and employment data come from China National Bureau of Statistics, *China Yearly Industrial Data 1999-2002* and *China Yearly Industrial Data 2003- 2009*, accessed through China Data Online, China Data Center at the University of Michigan.

## ACKNOWLEDGMENTS

The authors thank colleagues at LSE Cities and Deutsche Bank Research for helping to conceive the first *Global MetroMonitor* in 2010, and in particular, for developing much of the methodology that continues to underpin this edition of the report. We thank the McKinsey Global Institute for sharing information that helped us to identify the world's 200 largest metropolitan economies. For data on metropolitan areas outside the United States, we are indebted to Anthony Light, Dimitry Gruzinov, and colleagues at Oxford Economics. For comments on a draft of the report, we thank Greg Clark, Tobias Just, Homi Kharas, Amy Liu, Mark Muro, Philipp Rode, Jaana Remes, Jonathan Rothwell, Julie Wagner, and Howard Wial. We also thank Chris Ingraham for assistance with graphics, Susan Kellam for editorial assistance, and Maria Sese Paul for design and layout.

Support for the *Global MetroMonitor* was generously provided by JPMorgan Chase. The Global Cities Initiative: A Joint Project of Brookings and JPMorgan Chase aims to equip U.S. metropolitan leaders with the data and research, policy ideas, and global connections necessary to make strategic decisions and investments as they work to realize their potential and bolster their metro's position within the global economy.

The Brookings Metropolitan Policy Program would also like to thank the John D. and Catherine T. MacArthur Foundation, the Heinz Endowments, F.B. Heron Foundation, and the George Gund Foundation who provide general support for the Program's research and policy efforts. Finally, we would like to thank the Metropolitan Leadership Council, a network of individual, corporate, and philanthropic investors that provide us financial support but, more importantly, are true intellectual and strategic partners.

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