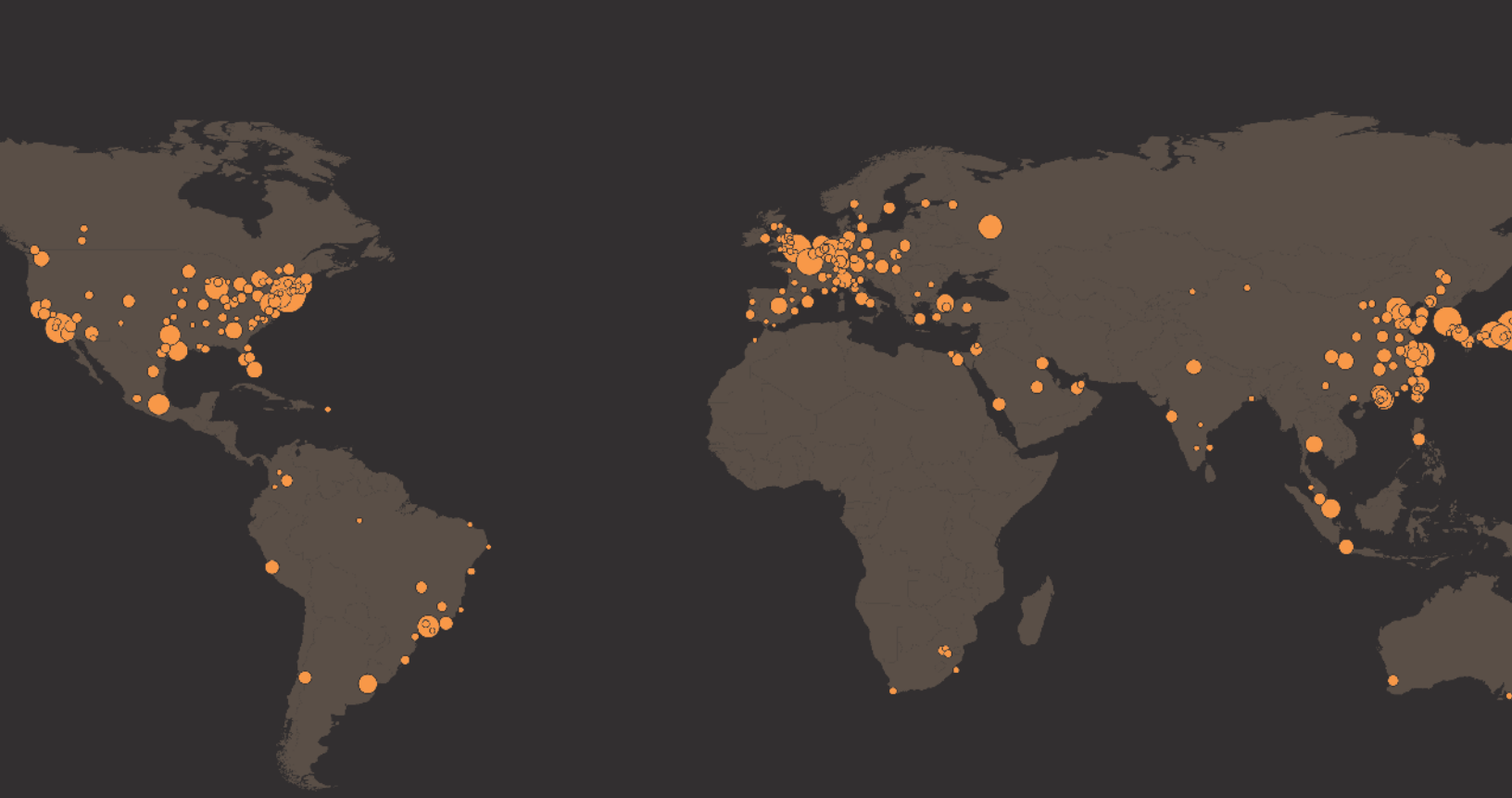

GLOBAL METROMONITOR 2014

AN UNCERTAIN RECOVERY

Metropolitan Policy Program
at BROOKINGS

GLOBAL METROMONITOR 2014

AN UNCERTAIN RECOVERY

JOSEPH PARILLA, JESUS LEAL TRUJILLO, AND ALAN BERUBE WITH TAO RAN

FINDINGS

The economic growth trajectories of the world's major metropolitan areas continued to diverge in 2014, reflecting a still uncertain global recovery. An analysis of employment and GDP per capita growth in the world's 300 largest metropolitan economies—which accounted for 20 percent of the world's population and 47 percent of its output in 2014—finds the following:

- **Metropolitan economies with the fastest growth rates in 2014 were concentrated in the developing world.** Three-quarters of the fastest-growing metropolitan economies were located in the Developing Asia-Pacific and Eastern Europe and Central Asia regions. By contrast, 83 percent of the slowest-growing metro economies were in Western Europe, North America, and Developed Asia-Pacific.

- **Metropolitan areas continue to power national economic growth; most registered faster GDP per capita or employment growth in 2014 than their respective countries.** Last year, one-third of the world's 300 largest metropolitan economies were "pockets of growth," outpacing their national economies in both indicators. Developing Asia-Pacific led this category with 29 metro areas, followed by North America (27) and Western Europe (17).

- **A majority of the world's metropolitan areas (60 percent) have recovered to pre-recession levels of employment and GDP per capita.** Of those, half are located in Developing Asia-Pacific and North America. About one-fifth of metro areas have not recovered on either indicator; nearly all of those are located in North America and Western Europe. Comparing the post-recession (2009 to 2014) to the pre-recession (2000 to 2007) period, GDP per capita growth rates dropped in developed metro areas and held steady in developing metro areas, while employment growth rates declined in both.

- **Metropolitan areas specializing in commodities registered the highest rates of GDP per capita and employment growth in 2014.** Utilities, trade and tourism, and manufacturing specializations were also associated with higher growth rates. By contrast, metro areas with high concentrations of business, financial, and professional services grew more slowly.

The global map of metropolitan economic performance in this year's *Global MetroMonitor* reveals a still-tentative and uneven recovery. With half of the world's economic output centered in these 300 regions, their individual and collective progress will continue to shape prospects for more sustainable and broadly shared growth. Their actions bear watching.

INTRODUCTION

In 2014, an uneven global recovery persisted amid significant economic uncertainty in both advanced economies and emerging markets. Growth accelerated in the United States and United Kingdom but stalled in Japan and the Euro Area. China maintained strong growth relative to the rest of the world, even as it cooled off by its own recent torrid pace, while growth in China's BRIC counterparts Brazil and Russia slowed significantly.[1] As the year progressed, the International Monetary Fund revised its annual projections downward, citing lingering challenges from the financial crisis and more pessimistic future growth prospects.[2]

Global and national assessments, although important, fail to document the distinctive contributions to growth and prosperity made by the world's economic engines: major cities and metropolitan areas. Today, more than half of the world's population lives in cities and metro areas and, together, the world's 300 largest metropolitan economies accounted for nearly half of all global output in 2014.

In addition to their collective economic clout, these places are also highly differentiated based on their development stage, world region, and industrial specializations. Measuring the individual trajectories of the world's large metropolitan economies offers new insights into sources of growth that national or regional assessments tend to obscure. Global comparisons of metro area performance can also inform city- and region-led economic strategies. These subnational actors increasingly have greater latitude to pursue economic reforms and investments, as political gridlock hinders efforts by national and supranational governments and multilateral institutions to improve the economy.

This is the fourth edition of the *Global MetroMonitor*, a report that compares growth patterns in the world's 300 largest metropolitan economies on two key economic indicators: annualized growth rate of real GDP per capita and annualized growth rate of employment.[3] These are by no means the only metrics that should guide economic policymakers in cities; for instance, the distribution of economic growth across societies and the effects of growth on the environment are also important considerations, albeit outside the scope of this report. That noted, the two key metrics in the *Global MetroMonitor* reflect the importance that policymakers and the public attach to achieving rising incomes and standards of living (GDP per capita), as well as generating widespread labor market opportunity (employment).[4]

This report uses these two indicators to measure the 2014 performance of the world's 300 largest metropolitan areas in three key dimensions: relative to one another; relative to their respective countries; and relative to their own previous performance, including the extent of their recovery since the downturn. These rankings do not attempt to measure which metro areas are most competitive, wealthy, or livable, as incredible differences in wealth and prosperity exist within the sample (Table 1). Rather, they aim to capture how metro areas are responding to continued change in the world economy, and to illuminate the underlying factors contributing to their diverse performance.


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TABLE 1. INCOMES VARY SIGNIFICANTLY ACROSS THE WORLD'S 300 LARGEST METROPOLITAN ECONOMIES

Highest and Lowest GDP Per Capita, 300 Largest Metropolitan Economies, 2013

Highest				Lowest			
Rank	Metro	Region	GDP per Capita	Rank	Metro	Region	GDP per Capita
1	Zurich	Western Europe	$82,410	281	Kunming	Developing Asia-Pacific	$6,680
2	Oslo	Western Europe	$82,040	282	Xuzhou	Developing Asia-Pacific	$6,550
3	San Jose	North America	$77,440	283	Shijiazhuang	Developing Asia-Pacific	$6,540
4	Hartford	North America	$76,510	284	Manila	Developing Asia-Pacific	$6,160
5	Geneva	Western Europe	$74,580	285	Medellin	Latin America	$5,940
6	Paris	Western Europe	$70,760	286	Wenzhou	Developing Asia-Pacific	$5,630
7	Boston	North America	$70,390	287	Chongqing	Developing Asia-Pacific	$5,590
8	Bridgeport	North America	$68,570	288	Casablanca	Middle East and Africa	$5,400
9	Washington DC	North America	$68,530	289	Jakarta	Developing Asia-Pacific	$5,020
10	Seattle	North America	$67,830	290	Nanning	Developing Asia-Pacific	$4,860
11	Macau	Developed Asia-Pacific	$67,780	291	Shantou	Developing Asia-Pacific	$4,150
12	San Francisco	North America	$66,790	292	Delhi	Developing Asia-Pacific	$3,580
13	Perth	Developed Asia-Pacific	$65,500	293	Ho Chi Minh City	Developing Asia-Pacific	$3,300
14	Calgary	North America	$64,540	294	Cairo	Middle East and Africa	$2,980
15	New York	North America	$64,460	295	Alexandria	Middle East and Africa	$2,680
16	Portland	North America	$64,370	296	Mumbai	Developing Asia-Pacific	$1,990
17	Munich	Western Europe	$64,180	297	Chennai	Developing Asia-Pacific	$1,870
18	Houston	North America	$63,730	298	Hyderabad	Developing Asia-Pacific	$1,430
19	Dublin	Western Europe	$63,600	299	Bangalore	Developing Asia-Pacific	$1,420
20	Luxembourg-Trier	Western Europe	$63,350	300	Kolkata	Developing Asia-Pacific	$1,110

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

DATA AND METHODS

This update of the ***Global MetroMonitor*** largely follows the methodology used in previous editions.[5] Therefore, this section focuses primarily on changes introduced in this year's report. (For more details on definitions, methodology, and data see Appendix B.)

This study defines a metropolitan area as an economic region including one or more cities and their surrounding areas, all linked by economic and commuting ties (see Appendix B). This year's sample is comprised of the 300 largest metropolitan economies in the world for which industry trend data were available, based on the size of their economies in 2014 at purchasing power parity (PPP) rates. Much like previous editions, the 2014 *Global MetroMonitor* employs a few key variables to assess the economic performance of metropolitan areas: gross domestic product (GDP), employment, and population from 2000 to 2014.[6] In addition, the study uses gross value added (GVA) and employment by major industry sector.[7] To analyze economic circumstances in the current year (2014), this study employs nominal GDP and GVA data in U.S. dollars at PPP rates. For trend analysis, it uses GDP and GVA data at 2009 prices and expressed in U.S. dollars.

KEY TERMS USED IN *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.

GDP per capita: The size of an economy relative to population. It is not personal income or household income, and does not reflect the distribution of income, but proxies the average standard of living in an area.

Population: The number of residents of a metropolitan area or country.

The report focuses on metropolitan performance on two key economic indicators: annualized growth rate of real GDP per capita, and annualized growth rate of employment. These indicators are combined into an economic performance index by which the 300 metro areas are ranked for 2014 (see Appendix B).[8]

The 2014 *Global MetroMonitor* examines the extent of the economic downturn and subsequent recovery at the metropolitan level, comparing 2014 levels of real GDP per capita and employment to 2007 levels. Along these lines, it classifies metro economies into three performance categories:

- ***Recovered***: economies that have equal or higher GDP per capita and employment in comparison to 2007 levels
- ***Partially Recovered***: economies that have recovered their 2007 levels in either GDP per capita or employment, but not both
- ***Not Recovered***: economies with lower levels for both indicators

To interpret metropolitan economic performance, this report classifies metropolitan areas by their respective countries' income levels and world region. The 300 metropolitan areas are classified as "developed" and "developing" based on their primary country's 2013 gross national income (GNI) per capita.[9] Using the World Bank's 2014 list of economies, "developed" status is equivalent to "high income" level, or GNI per capita in excess of $12,746.[10] "Developing" metro areas are located in countries with GNI per capita below that level. Of the 300 metropolitan areas in this study's sample, 204 are in developed countries and 96 are in developing countries.[11]

Based on World Bank and International Monetary Fund (IMF) definitions, this study identifies seven world regions in which the sampled metropolitan areas lie:

- ***Western Europe:*** 68 metro areas in countries that were members of the European Union before the 2004 enlargement (EU-15), plus Norway and Switzerland
- ***North America:*** 80 U.S. and eight Canadian metro areas
- ***Developed Asia-Pacific:*** 33 metro areas in higher-income Asia-Pacific countries (Australia, Hong Kong, Japan, Macau, New Zealand, Singapore, South Korea, and Taiwan)

- ***Developing Asia-Pacific:*** 60 metro areas in lower-income Asian nations (China, India, Indonesia, Malaysia, Philippines, Thailand, and Vietnam)
- ***Latin America:*** 22 metro areas in Argentina, Brazil, Chile, Colombia, Mexico, Peru, Puerto Rico, and Venezuela
- ***Eastern Europe and Central Asia:*** 14 metro areas in Bulgaria, Czech Republic, Hungary, Kazakhstan, Poland, Romania, Russia, and Turkey
- ***Middle East and Africa:*** seven metro areas in Middle Eastern countries (Israel, Kuwait, the United Arab Emirates, and Saudi Arabia) and eight metro areas in African nations (Egypt, Morocco, and South Africa); this study includes only five sub-Saharan African metro areas (all in South Africa), due to the small size of their metro economies and severely limited data availability/reliability for other metropolitan areas in this region[12]

The 2014 edition follows the same industrial categorization as the 2012 *Global MetroMonitor*, comprised of seven major industrial sectors for which GVA and employment data are available at the metropolitan level (see Appendix B).

FINDINGS

A. Metropolitan economies with the fastest growth rates in 2014 were concentrated in the developing world.

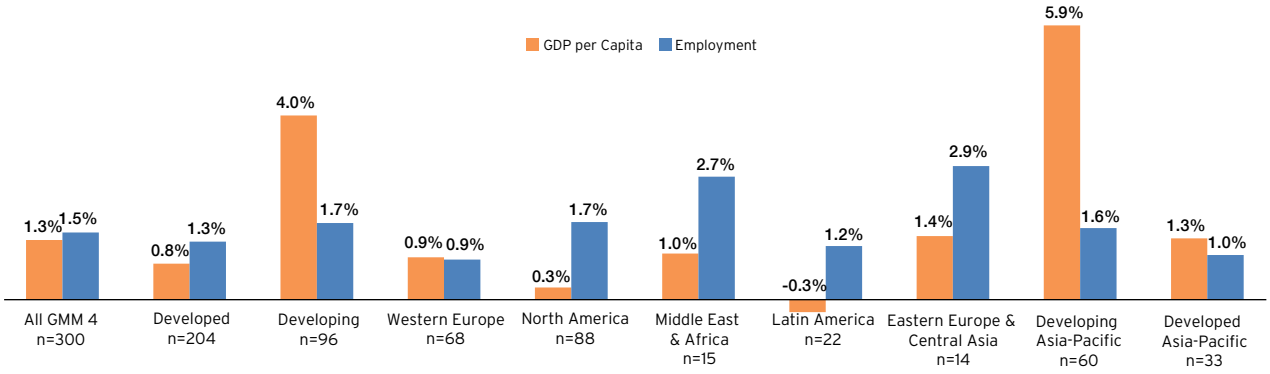
Economic activity and growth in 2014 remained disproportionately concentrated in the world's major metropolitan areas. The 300 largest metropolitan economies housed 20 percent of both the world's population and its employment, but accounted for 47 percent of output and 38 percent of output growth. Global GDP per capita and employment growth were both a relatively sluggish 1.4 percent in 2014. Overall, GDP per capita in the top 300 metro areas grew by 1.3 percent in 2014, compared to 1.6 percent in 2013. Employment grew at 1.5 percent in 2014, the same as in 2013.

Developing metropolitan economies continued to be the sites of faster growth, further converging with their more developed peers. Employment in developing metro areas grew by 1.7 percent in 2014, slightly higher than the 1.3 percent registered in developed metro economies. GDP per capita growth differences were starker, expanding by a healthy 4.0 percent in developing metro areas, compared to 0.8 percent in developed metro economies.

Broad comparisons between developed and developing metropolitan economies alone miss important trends observable between major world regions (Figure 1). Developing Asia-Pacific metro areas achieved rapid GDP per capita growth (5.9 percent); in employment growth, metro economies across Eastern Europe and Central Asia (2.9 percent) and the Middle East and Africa (2.7 percent) set the pace. Growth rates in Western European metro areas were slow, while North American metro areas exhibited strong job growth (1.7 percent) but almost no growth in GDP per capita (0.3 percent). Latin America was the only region that registered a decrease in either indicator: a 0.3 percent decline in GDP per capita.

Metropolitan area distribution across this study's performance index brings differences by development status into sharper relief (Figure 2). As in previous years, developing metro areas dominated the top quintile of performers, accounting for 48 of 60 spots (80 percent). Metro areas in this quintile experienced a 4.8 percent increase in real GDP per capita and a 2.6 percent increase in employment (Figure 2). Chinese metro areas account for over half of the top quintile. As in 2012, Macau—one of China's special autonomous regions—was the top performing metro area in the composite index (Table 2). Trade and tourism, anchored by the region's gaming industry, was responsible for the largest share of output growth in Macau in 2014.[13]

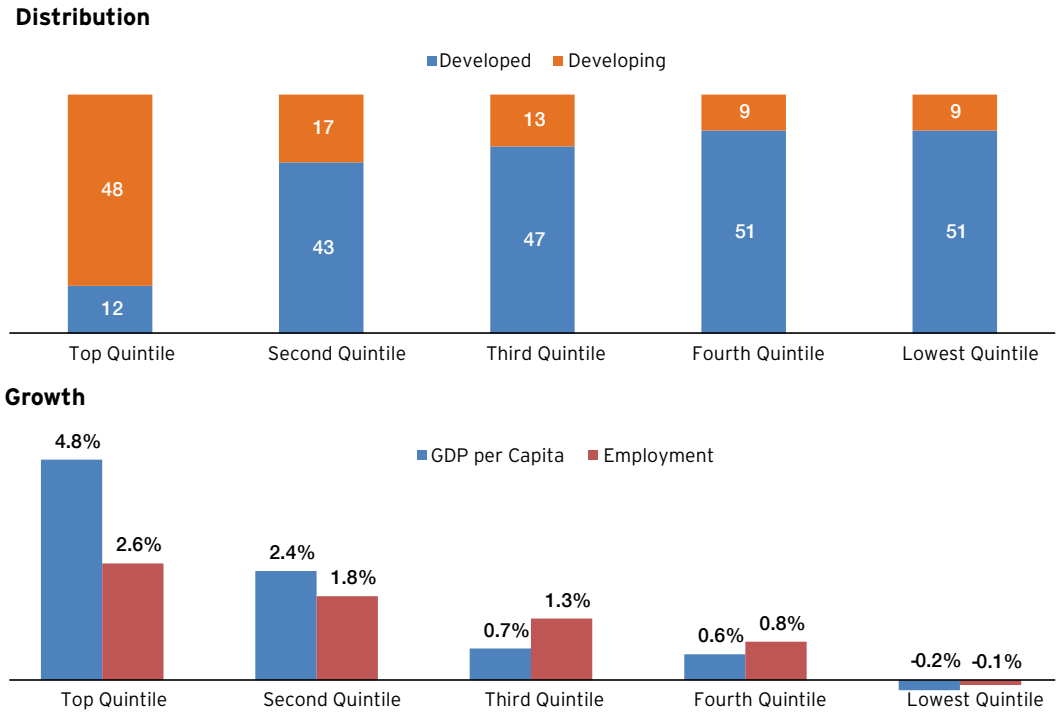
FIGURE 1. METROPOLITAN GDP PER CAPITA AND EMPLOYMENT GROWTH RATES BY REGION AND DEVELOPMENT STATUS, 300 LARGEST METROPOLITAN ECONOMIES, 2013-2014



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

FIGURE 2. DEVELOPING METROPOLITAN ECONOMIES ARE GROWING FASTEST

Distribution of Developed and Developing Metropolitan Economies and Growth Rates by Quintile of the 2014 Economic Performance Index, 300 Largest Metro Areas



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

TABLE 2. DEVELOPING METRO AREAS LED THE LIST OF FASTEST GROWING ECONOMIES IN 2014

Highest Performers on Economic Performance Index, 300 Largest Metropolitan Economies, 2013-2014

Highest			Change, 2013-2014			
Rank '13-'14	Metro	Region	GDP per Capita	Employment	Rank '12-'13	Ranking Change
1	Macau	Developed Asia-Pacific	8.0%	4.2%	1	0
2	Izmir	Eastern Europe and Central Asia	2.0%	6.6%	6	4
3	Istanbul	Eastern Europe and Central Asia	2.0%	6.5%	52	49
4	Bursa	Eastern Europe and Central Asia	1.8%	6.4%	4	0
5	Dubai	Middle East and Africa	4.5%	4.7%	18	13
6	Kunming	Developing Asia-Pacific	8.1%	2.9%	2	-4
7	Hangzhou	Developing Asia-Pacific	7.0%	3.3%	15	8
8	Xiamen	Developing Asia-Pacific	8.6%	2.6%	8	0
9	Ankara	Eastern Europe and Central Asia	1.1%	5.7%	38	29
10	Fuzhou	Developing Asia-Pacific	8.0%	2.7%	11	1
11	Wulumuqi	Developing Asia-Pacific	7.4%	2.7%	5	-6
12	Budapest	Eastern Europe and Central Asia	2.4%	4.7%	201	189
13	Wuhan	Developing Asia-Pacific	9.3%	1.9%	33	20
14	Ningbo	Developing Asia-Pacific	6.8%	2.8%	21	7
15	Changsha	Developing Asia-Pacific	8.6%	1.8%	20	5
16	Chengdu	Developing Asia-Pacific	8.1%	1.9%	12	-4
17	Wenzhou	Developing Asia-Pacific	6.6%	2.5%	31	14
18	Delhi	Developing Asia-Pacific	4.4%	3.3%	7	-11
19	Kuala Lumpur	Developing Asia-Pacific	4.1%	3.4%	3	-16
20	Hefei	Developing Asia-Pacific	9.5%	1.0%	44	24
21	Nanning	Developing Asia-Pacific	7.2%	1.9%	16	-5
22	Nantong	Developing Asia-Pacific	6.9%	1.9%	10	-12
23	Ho Chi Minh City	Developing Asia-Pacific	3.9%	3.1%	55	32
24	Xuzhou	Developing Asia-Pacific	6.9%	1.8%	9	-15
25	Riyadh	Middle East and Africa	1.9%	3.9%	62	37
26	London	Western Europe	2.5%	3.6%	58	32
27	Jinan	Developing Asia-Pacific	7.1%	1.7%	50	23
28	Suzhou	Developing Asia-Pacific	6.7%	1.7%	14	-14
29	Qingdao	Developing Asia-Pacific	7.1%	1.6%	28	-1
30	Sofia	Eastern Europe and Central Asia	2.5%	3.4%	226	196

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

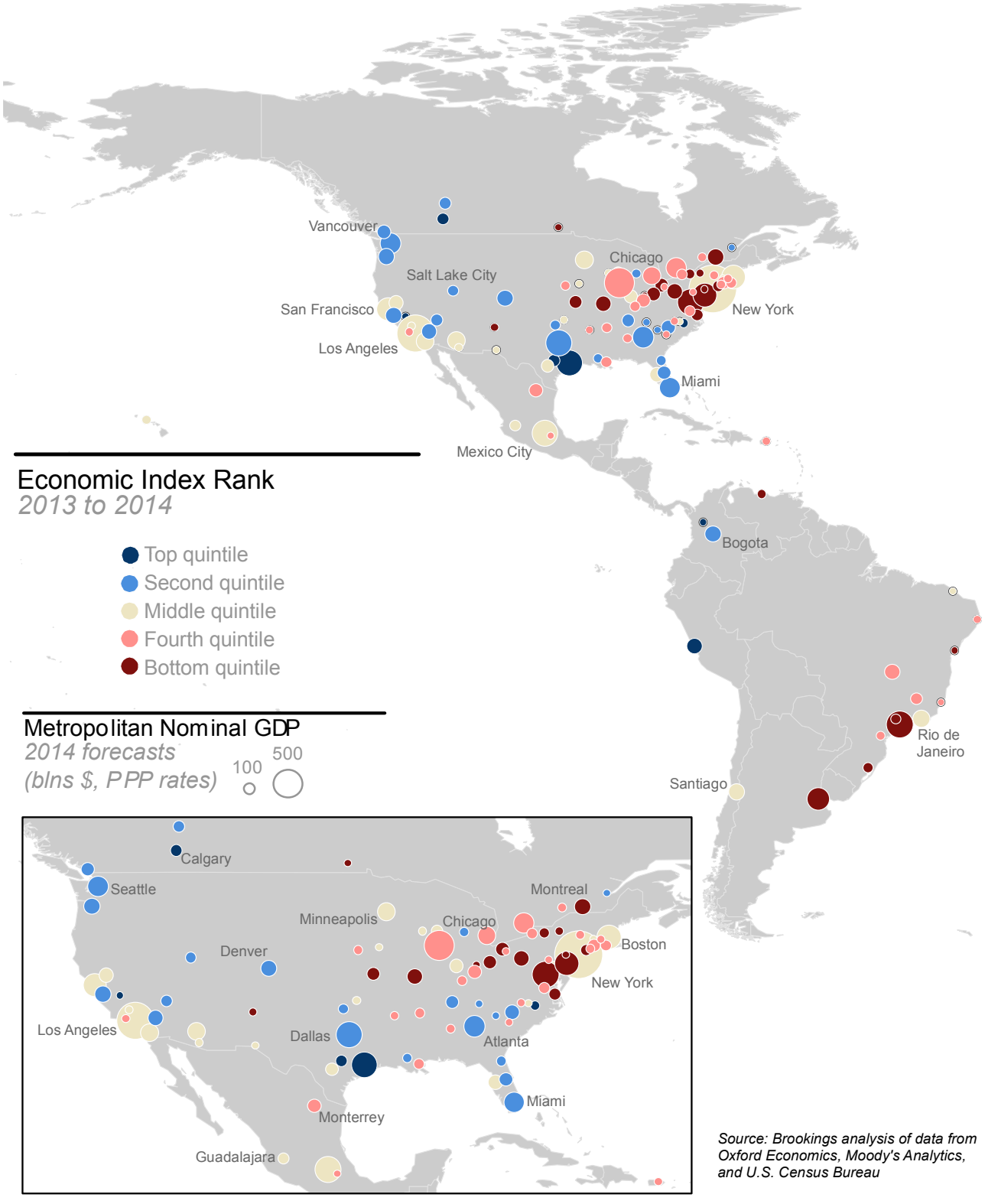
TABLE 2. DEVELOPED METRO AREAS LED THE LIST OF SLOWEST GROWING ECONOMIES IN 2014 (continued)

Lowest Performers on Economic Performance Index, 300 Largest Metropolitan Economies, 2013-2014

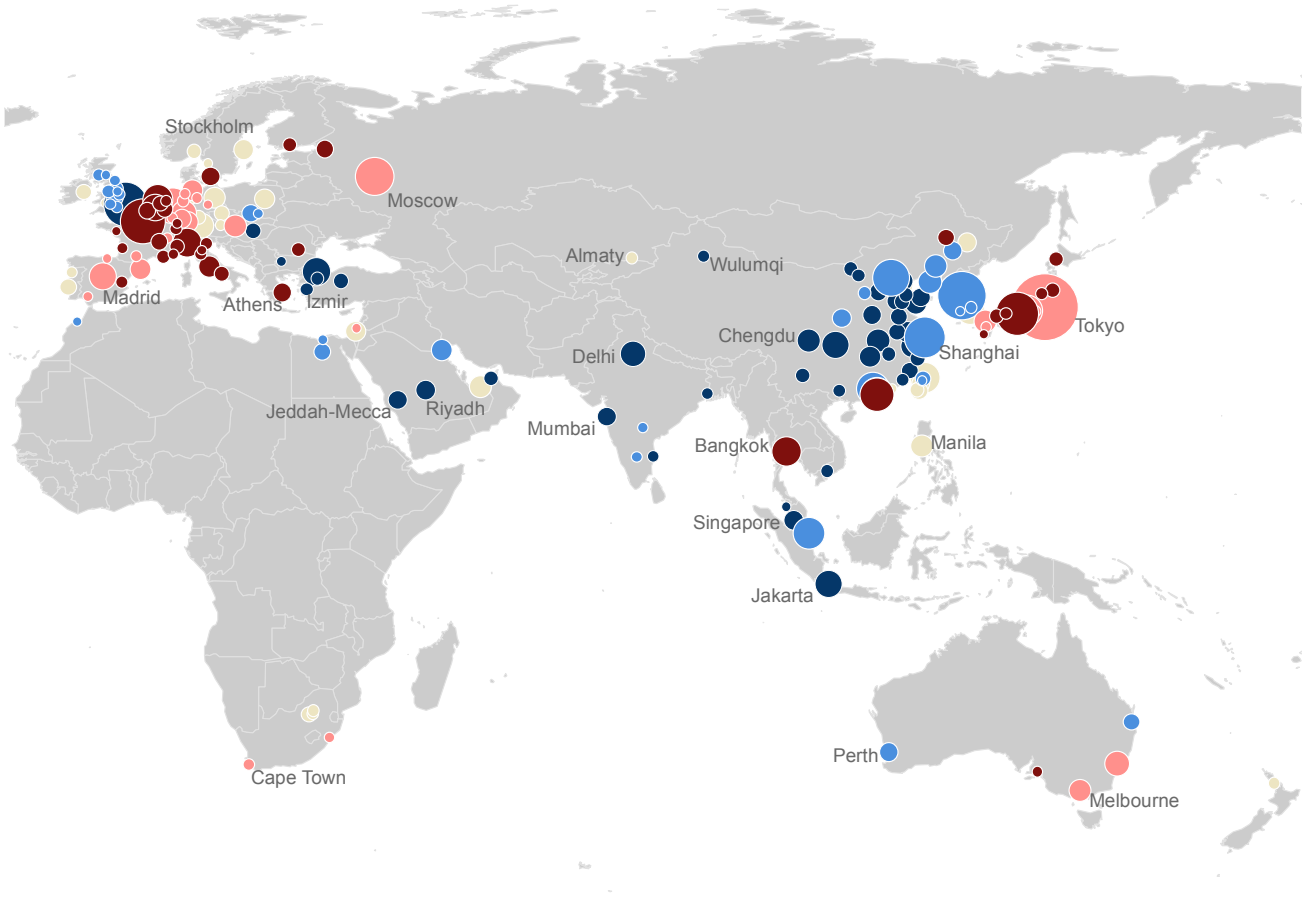
Lowest			Change, 2013-2014			
Rank '13-'14	Metro	Region	GDP per Capita	Employment	Rank '12-'13	Ranking Change
271	Bucharest	Eastern Europe and Central Asia	1.7%	-0.7%	221	-50
272	Allentown	North America	-0.3%	0.1%	165	-107
273	Columbus	North America	-1.3%	0.4%	95	-178
274	Rome	Western Europe	-0.8%	0.1%	286	12
275	Washington	North America	-1.5%	0.3%	245	-30
276	Bologna	Western Europe	-0.4%	-0.1%	287	11
277	Milan	Western Europe	-0.5%	-0.2%	288	11
278	Venice-Padova	Western Europe	-0.6%	-0.2%	289	11
279	Winnipeg	North America	-0.2%	-0.4%	168	-111
280	Athens	Western Europe	0.3%	-0.6%	300	20
281	Virginia Beach	North America	-1.0%	-0.1%	219	-62
282	Helsinki	Western Europe	-0.5%	-0.3%	284	2
283	Turin	Western Europe	-0.7%	-0.3%	290	7
284	Sao Paulo	Latin America	-1.5%	0.0%	181	-103
285	Montreal	North America	0.7%	-0.9%	69	-216
286	Buenos Aires	Latin America	-2.8%	0.5%	170	-116
287	Dayton	North America	-1.7%	0.0%	269	-18
288	Eindhoven-Den Bosch	Western Europe	0.7%	-1.1%	283	-5
289	Florence	Western Europe	-0.6%	-0.6%	292	3
290	Porto Alegre	Latin America	-1.7%	-0.2%	158	-132
291	Campinas	Latin America	-2.2%	0.0%	175	-116
292	Rotterdam-Amsterdam	Western Europe	0.3%	-1.2%	282	-10
293	Daqing	Developing Asia-Pacific	4.0%	-2.8%	278	-15
294	Syracuse	North America	-1.2%	-0.7%	263	-31
295	Arnhem-Nijmegen	Western Europe	0.0%	-1.2%	281	-14
296	Caracas	Latin America	-3.5%	0.1%	129	-167
297	Naples	Western Europe	-0.7%	-1.0%	293	-4
298	Albuquerque	North America	-2.2%	-0.6%	238	-60
299	Adelaide	Developed Asia-Pacific	-1.2%	-1.1%	275	-24
300	Bangkok	Developing Asia-Pacific	-0.5%	-1.7%	246	-54

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

MAP 1. 2013-2014 ECONOMIC PERFORMANCE INDEX RANKINGS, BY QUINTILE, 300 LARGEST METROPOLITAN ECONOMIES



Source: Brookings analysis of data from Oxford Economics, Moody's Analytics, and U.S. Census Bureau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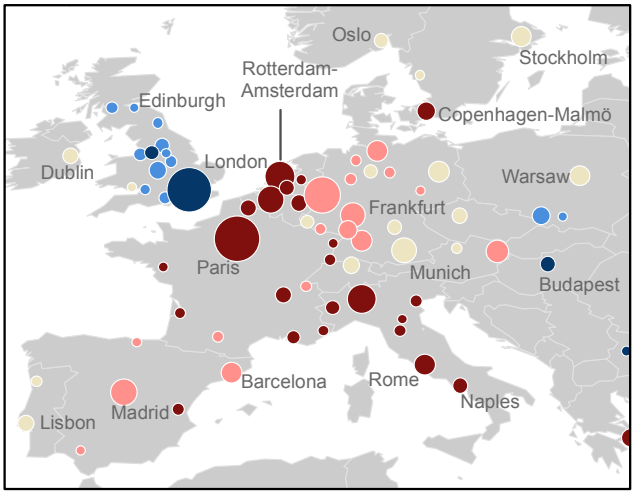
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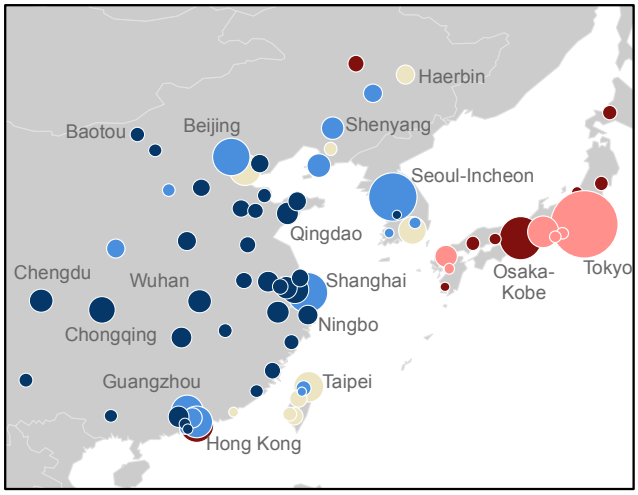
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Ningbo
Chongqing
Guangzhou
Taipei
Hong Kong

Despite national security concerns, Turkish metropolitan areas had an exceptional 2014, with Izmir, Istanbul, and Bursa each placing among the world's top five performers, led by strong expansions in business and financial services. Five North American metro areas (Austin, Houston, Raleigh, Fresno, Calgary) and two western European metro areas (London and Manchester) also managed to rank among the 60 fastest growing in the world. Business and financial services accounted for the largest shares of output growth in Austin, London, and Raleigh; commodities led in Calgary and Houston; and local/non-market services predominated in Fresno.

The metropolitan areas in the last quintile registered a reduction in GDP per capita of 0.2 percent and a decline of 0.1 percent in employment. The weakest-performing metro economy in 2014 was Bangkok, where anemic manufacturing and trade and tourism sectors led to declines in employment and GDP per capita of 1.7 and 0.5 percent, respectively.[14] Meanwhile, 25 metro areas in Western Europe reflected the continent's continued economic malaise by placing in the bottom performance quintile. Poor performance was not limited to the developed world, however. Almost one-third of Latin American metro areas ranked in the lowest quintile, due in part to lagging growth in local/non-market services in Argentina and Venezuela and manufacturing in Brazil.[15]

B. Metropolitan areas continue to power national economic growth; most registered faster GDP per capita or employment growth in 2014 than their respective countries.

National monetary, fiscal, trade, and regulatory policies matter for metro growth, but the specific characteristics of metropolitan economies often differentiate their economic performance from that of their respective countries.

In 2014, a clear majority of the 296 metropolitan areas (excluding four that are coterminous with national boundaries) in the sample outperformed their respective national economies.[16] Over 60 percent of metro areas outperformed their national economies in employment creation. Developing Asia-Pacific (50) and North American (43) accounted for more than half of the metro areas in this category. Edmonton led with an employment growth rate of 4.0 percent, compared to a rate of 0.6 for Canada; local/non-market services drove 41 percent of new jobs added. Hangzhou (led by business and financial services), Fresno (local/non-market services), and Kunming (trade and tourism) also outpaced their nations. In Daqing, by contrast, employment declined 2.7 percent compared to 0.4 percent growth across China (Table 3).

Almost half of the metropolitan areas (140) registered higher GDP per capita growth rates than their national economies, led by North America, where 39 of 88 metro areas exceeded national growth. Developing Asia-Pacific followed closely behind—34 of its 60 metro areas grew faster in GDP per capita than their national economies.

No metropolitan area grew faster relative to its national economy than Dubai, where the business and financial services sector helped drive 4.5 percent growth in GDP per capita, versus 1.6 percent growth for the United Arab Emirates as a whole.[17] Hefei (led by manufacturing), Wuhan (manufacturing), Vancouver (business and financial services), and Calgary (energy) rounded out the top five in this category. Many Chinese metro areas exhibited staggering gains in GDP per capita that far outpaced the country's 6.7 percent growth in 2014, accounting for five of the top ten metro areas worldwide on this metric. However, Tianjin registered an increase of only 3.3 percent, revealing that subnational growth patterns differ significantly in China (see Special Feature).

> "Led by metro areas in China and Turkey, developing metro economies led the world in employment and income growth, while many metro areas in the United States and the United Kingdom registered significant improvements."

In 2014, one-third of the world's 300 largest metropolitan economies were "pockets of growth," growing faster than their national economies in both indicators (Map 2). Developing Asia-Pacific led this category with 29 metro areas, followed by North America (27) and Western Europe (17).

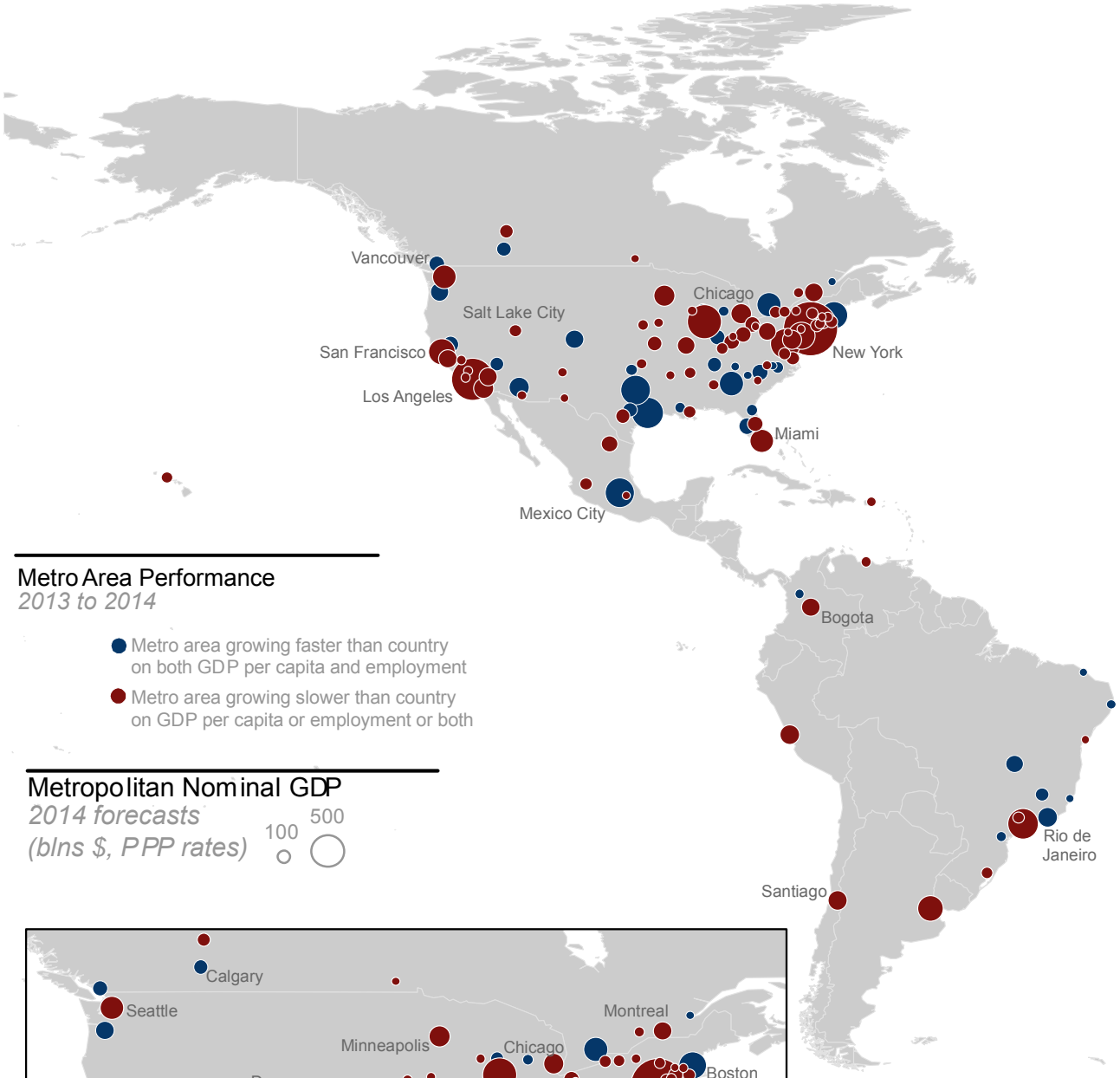
TABLE 3. SOME METRO AREAS LED OR LAGGED THEIR NATIONS ON GROWTH BY LARGE MARGINS IN 2014

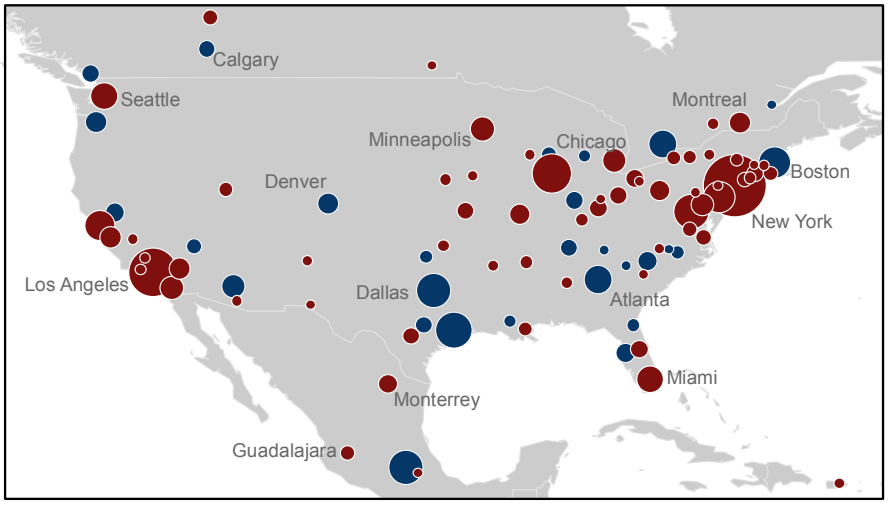
Largest Differences Between Metro and National Income and Employment Growth Rates, 2013-2014

GDP Per Capita Growth Rate *Faster in Metro Areas*					Employment Growth Rate *Faster in Metro Areas*			
		Metro	**Nation**	**Difference**		**Metro Area**	**Nation**	**Difference**
1	Dubai	4.5%	1.6%	2.9%	Edmonton	4.0%	0.6%	3.4%
2	Hefei	9.5%	6.7%	2.8%	Hangzhou	3.3%	0.4%	3.0%
3	Wuhan	9.3%	6.7%	2.6%	Fresno	4.5%	1.6%	2.9%
4	Vancouver	3.7%	1.2%	2.5%	Kunming	2.9%	0.4%	2.6%
5	Calgary	3.1%	1.2%	1.9%	Ningbo	2.8%	0.4%	2.4%
6	Xiamen	8.6%	6.7%	1.9%	Raleigh	4.0%	1.6%	2.4%
7	Changsha	8.6%	6.7%	1.8%	Fuzhou	2.7%	0.4%	2.3%
8	Perth	3.4%	1.9%	1.5%	Wulumuqi	2.7%	0.4%	2.3%
9	Austin	1.9%	0.4%	1.5%	Xiamen	2.6%	0.4%	2.2%
10	Chengdu	8.1%	6.7%	1.4%	Wenzhou	2.5%	0.4%	2.1%
Slower in Metro Areas					***Slower in Metro Areas***			
		Metro	Nation	Difference		Metro	Nation	Difference
287	Brisbane	-0.4%	1.9%	-2.3%	Detroit	0.3%	1.6%	-1.3%
288	Zhuhai	4.4%	6.7%	-2.3%	Haerbin	-1.1%	0.4%	-1.4%
289	New Orleans	-2.0%	0.4%	-2.4%	Allentown	0.1%	1.6%	-1.5%
290	St. Louis	-2.1%	0.4%	-2.5%	Montreal	-0.9%	0.6%	-1.5%
291	Shantou	4.0%	6.7%	-2.7%	Dayton	0.0%	1.6%	-1.6%
292	Albuquerque	-2.2%	0.4%	-2.7%	Virginia Beach	-0.1%	1.6%	-1.7%
293	Daqing	4.0%	6.7%	-2.8%	Adelaide	-1.1%	1.0%	-2.0%
294	Bakersfield	-2.4%	0.4%	-2.8%	Albuquerque	-0.6%	1.6%	-2.2%
295	Adelaide	-1.2%	1.9%	-3.1%	Syracuse	-0.7%	1.6%	-2.3%
296	Tianjin	3.3%	6.7%	-3.5%	Daqing	-2.8%	0.4%	-3.1%

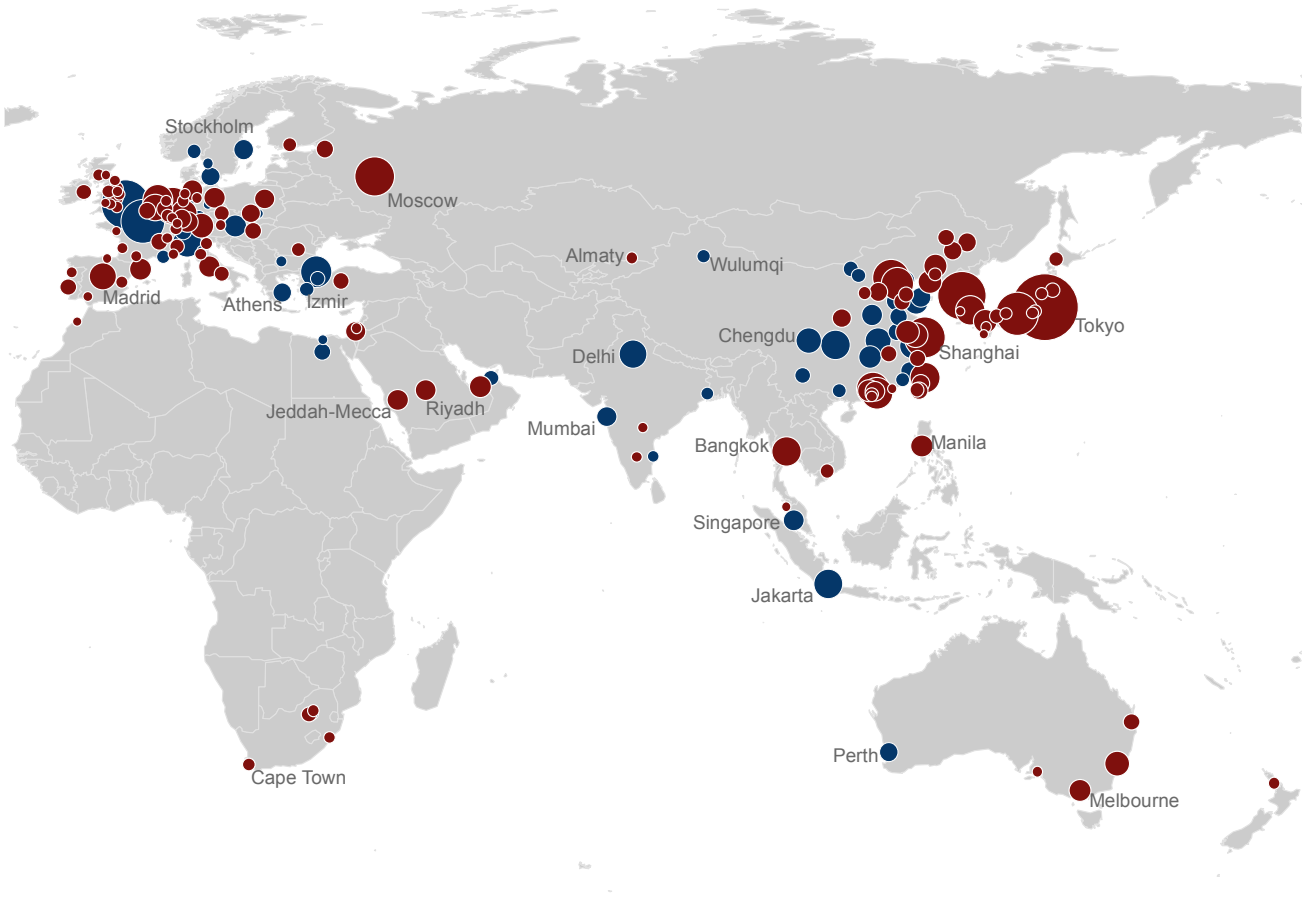
Source: Brookings analysis of data from Oxford Economics, Moody's Analytics, and U.S. Census Bureau.

MAP 2. METRO ECONOMY-COUNTRY GROWTH DIFFERENTIAL, 296 LARGEST METROPOLITAN ECONOMIES, 2013-2014





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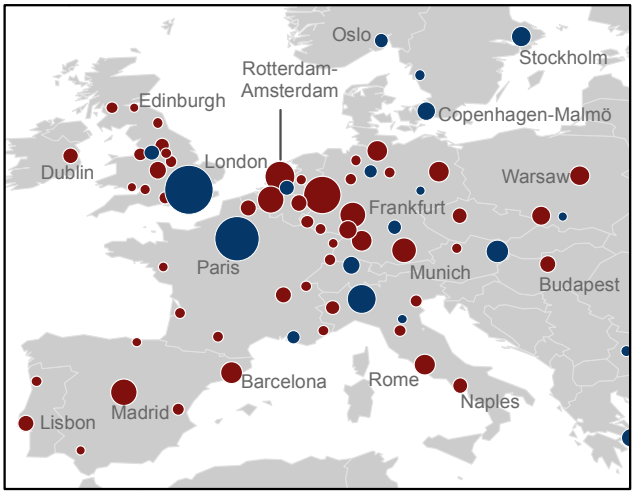
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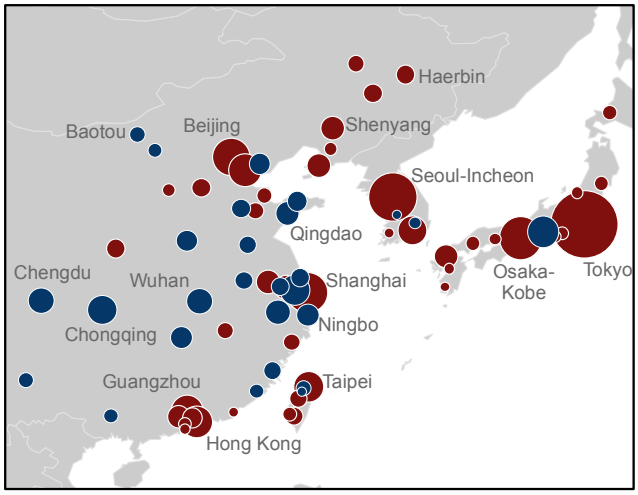
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Chongqing
Guangzhou
Taipei
Hong Kong

METRO CHINA: ECONOMIC PERFORMANCE IN THE NATION'S LARGEST METROPOLITAN AREAS

Special Feature

Although it is still growing rapidly by global standards, new doubts emerged in 2014 as to whether China's export-focused and investment-oriented economic strategy had reached its limit after decades of historically high growth. Amid changing national economic conditions, an understanding of where and how economic growth is occurring within China is critical. This special feature provides an analysis of GDP per capita and employment changes in China's 48 largest metropolitan areas, which together account for 28 percent of China's population but 56 percent of its national GDP.[18]

1. Compared to national averages, over three-quarters of China's metropolitan areas achieved higher levels of GDP per capita or employment growth in 2014.

China's 48 large metropolitan areas accounted for 73 percent of employment growth and 60 percent of output growth in 2014. Nearly half (23) of the 48 metro areas were "pockets of growth," meaning they exceeded national averages for both GDP per capita and employment growth.

On GDP per capita growth, 25 Chinese metro areas exceeded the country's 6.7 percent growth in 2014. Hefei led all Chinese metro areas with 9.5 percent growth, followed by Wuhan, Xiamen, and Changsha. All of these fast-growing metros, except Xiamen, are located in the central part of China. Top-ranked cities from this region also include Huhehaote (8th), Zhengzhou (9th), and Baotou (10th), marking a shift from 2013 when western China contained most of the nation's fastest-growing metro areas.

Growth in GDP per capita was slower in other parts of China. In Guangdong province in southeastern China, growth rates in Shenzhen (5.1 percent) and Guangzhou (4.9 percent) lagged national averages; each was weighed down by underperforming commodities and utilities sectors. Several other metro areas in Guangdong province—including Dongguan, Zhuhai, and Shantou—also experienced slower growth. However, GDP per capita growth was slowest in Tianjin (3.3 percent), China's fourth-largest metro economy, where production in heavy industries such as steel and petrochemicals slowed.[19]

Employment growth displayed a slightly different pattern across China's major metropolitan areas, which collectively accounted for 19 percent of national employment in 2014. In 41 of 48 Chinese metro areas, employment grew faster than the national average of 0.4 percent. Three metro areas from the eastern province of Zhejiang—Hangzhou, Ningbo, and Wenzhou—led on employment growth (ranking 1st, 3rd, and 7th, respectively) in 2014. Zhejiang boasts a strong concentration of small and medium-sized enterprises, which, according to the National Development and Reform Commission, generate more than 75 percent of employment in Chinese urban areas.[20] The central Chinese metro areas that led on GDP per capita growth ranked in the middle of the overall distribution on employment growth, suggesting that living standards may be rising absent growth in jobs.

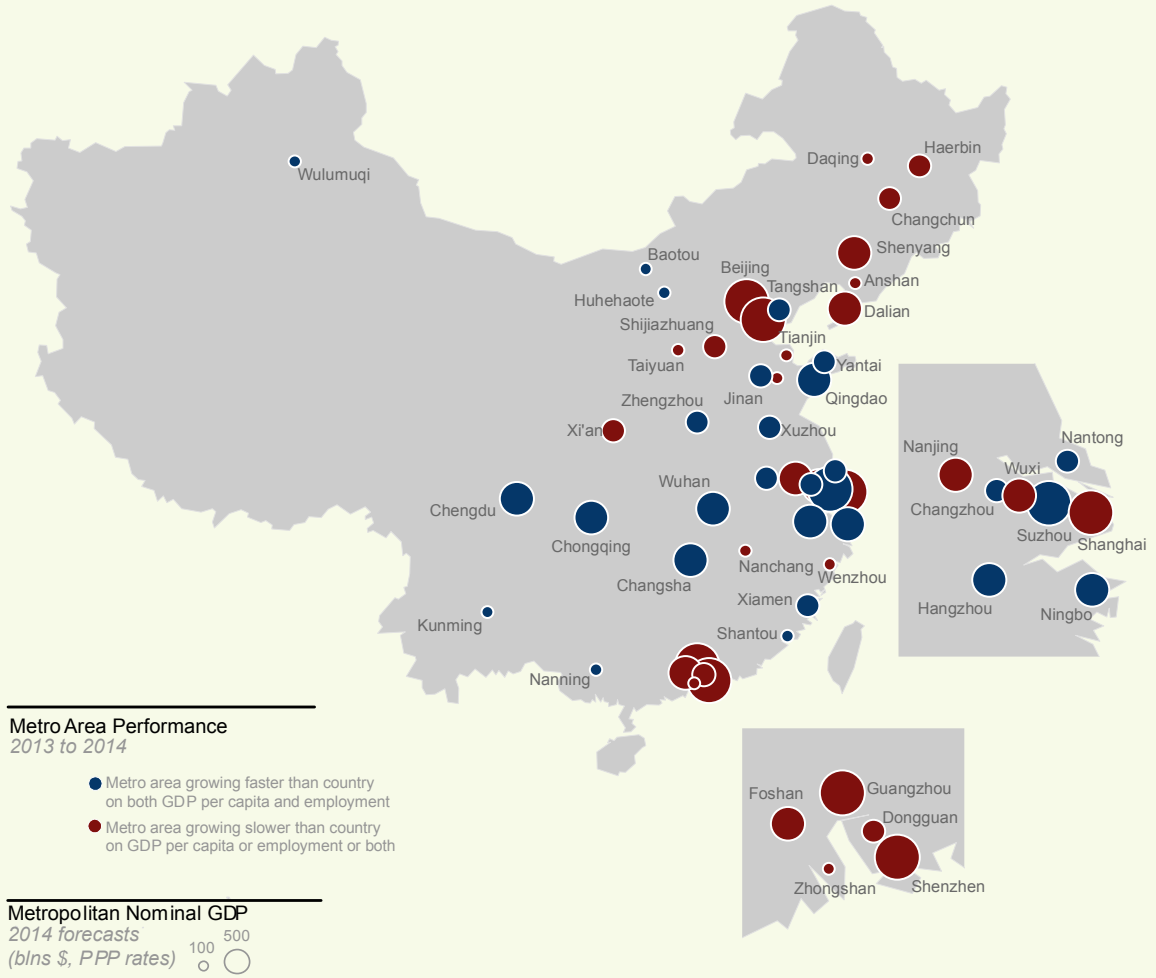
A small number of Chinese metropolitan areas experienced shrinking employment in 2014, including Shenyang, Xi'an, Changchun, Dalian, Anshan, Haerbin, and Daqing. With the exception of Xi'an, all of these metro areas are in northeastern China, one of the country's main industrial centers. Relatively inflexible and poorly managed industrial state-owned enterprises in that region have struggled in recent years amid increased global competition.

2. Among the 300 largest metropolitan economies worldwide, two-thirds of Chinese metro areas rank among the fastest-growing group.

China is slowing down—annual GDP per capita growth fell from an average of 9.0 percent from 2007–2010 to 7.4 percent during 2010–2014—but Chinese metropolitan areas continue to outperform their global peers. On a performance index ranking the world's top 300 metro areas, Kunming (6th), Hangzhou (7th), Xiamen (8th), and Fuzhou (10th) landed among the top 10 performers. Of the 48 Chinese metro areas in the sample, two-thirds (32) ranked in the top quintile (60 strongest performers) and another one-fifth (11) were in the second highest-performing quintile.

China's metro areas outperformed global peers largely due to much faster GDP per capita growth. GDP per capita growth in these Chinese metro areas reached 6.4 percent, while the world's 300 largest metro economies experienced a 1.3 percent overall increase. Rapid productivity gains, buoyed by urbanization, continue to drive income growth in China's cities, but employment growth in Chinese metro areas was more modest compared to the rest of the world. Employment grew by 1.4 percent in 2014, lower than the average employment growth among all metro areas in the sample.

MAP 3. METRO ECONOMY-COUNTRY GROWTH DIFFERENTIAL, CHINA'S 48 LARGEST METROPOLITAN ECONOMIES, 2013-2014



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

3. Metropolitan growth patterns in China differ by scale of the economy, geographic location, and industrial specialization.

The size (GDP) of metropolitan economies varies significantly within China's top 48 metro areas, ranging from Shanghai ($594 billion) to Shantou ($39 billion). There are 22 metro areas that account for at least 1 percent of China's output, and the country's seven largest metro areas (Shanghai, Beijing, Guangzhou, Tianjin, Shenzhen, Suzhou, and Chongqing) alone account for 20 percent of the national economy. While these urban areas rival some nations in terms of economic size, China is so large that no metro area accounts for more than 4 percent of national GDP. China's metro areas are critical economic engines, but the country's growth does not rely on only one or two large places.

Classifying China's 48 metro areas into tiers based on economic size reveals differences in growth. First-tier cities such as Guangzhou and Shenzhen achieved below-average GDP per capita growth rates in 2014. By comparison, second-tier cities, which include provincial capitals and other economic centers, exhibited stronger performance on GDP per capita. Over the past five years, the ten fastest-growing Chinese metro areas are all from the second tier.

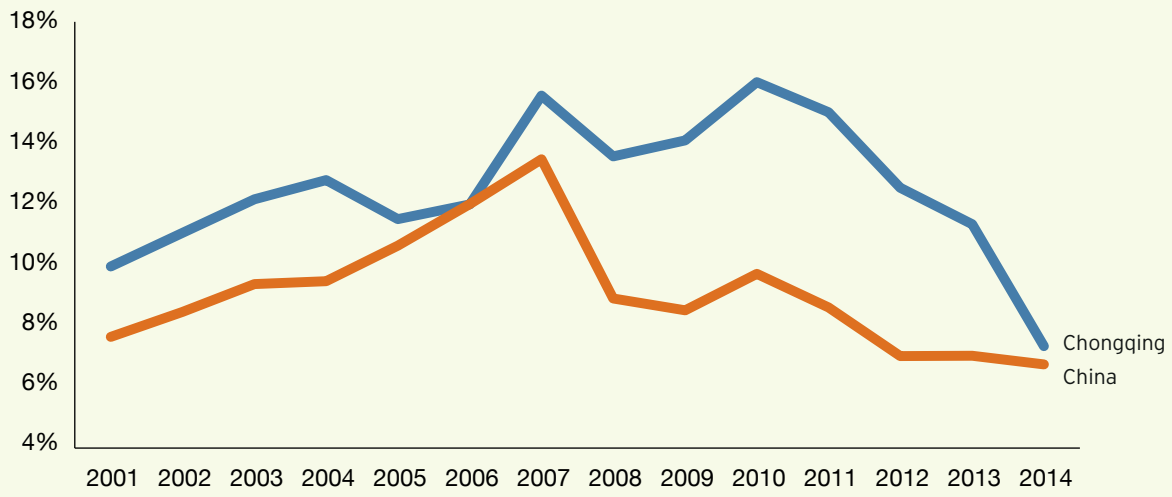
METRO CHINA: ECONOMIC PERFORMANCE IN THE NATION'S LARGEST METROPOLITAN AREAS (continued)

The geography of growth in China has also shifted. From 2000 to 2007, GDP per capita growth was fastest in coastal metro areas like Dongguan, Yantai, Zhongshan, Zibo, and Qingdao. Then, as the central government ramped up investment in heavy industries in Northeastern China, growth shifted to places like Anshan, Dalian, and Changchun. From 2010 to 2014, patterns changed again. Coastal and northeastern regions gave way to higher growth in inland metro areas such as Chongqing, Hefei, Kunming, Wulumuqi, and Chengdu, which benefited from the central government's efforts to connect these regions to the coast through significant infrastructure investment.[21]

The distinct economic structures of Chinese metro areas—particularly their industrial specializations—also affect their performance. Chongqing, located in Central China, offers an illustrative example. From 2000–2007, Chongqing ranked 28th among China's 48 largest metro areas in terms of GDP per capita growth, but leaped to sixth from 2007–2010 and to first from 2010–2014. Chongqing's rapid emergence reflects the ascent of its manufacturing sector. As labor costs rose in coastal cities, Chongqing attracted labor-intensive manufacturing seeking large supplies of workers and, in the process, its GDP per capita grew five-fold between 2000 and 2014 (Figure 3).[22]

FIGURE 3. CHONGQING HAS OUTPACED CHINA ON GDP PER CAPITA GROWTH

GDP Per Capita Growth, 2000–2014



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

Advanced services are also driving growth in Chinese metropolitan areas. Hangzhou, a metro near Shanghai with a population of about 8.9 million, led all Chinese metro economies in 2014 with employment growth of 3.3 percent. The fastest-growing industry in Hangzhou was business, financial, and professional services. A rapidly growing e-commerce sector, anchored by Alibaba's headquarters, has created a large demand for educated labor in this human-capital-intensive industry.[23]

C. A majority of the world's metropolitan economies (60 percent) have recovered to pre-recession levels of employment and GDP per capita.

The financial crisis and subsequent recession drastically altered regional growth patterns and therefore remain important reference points for benchmarking metropolitan performance in the global economy. The extent to which the world's major metro economies weathered or recovered from the recession since 2007 differs significantly.

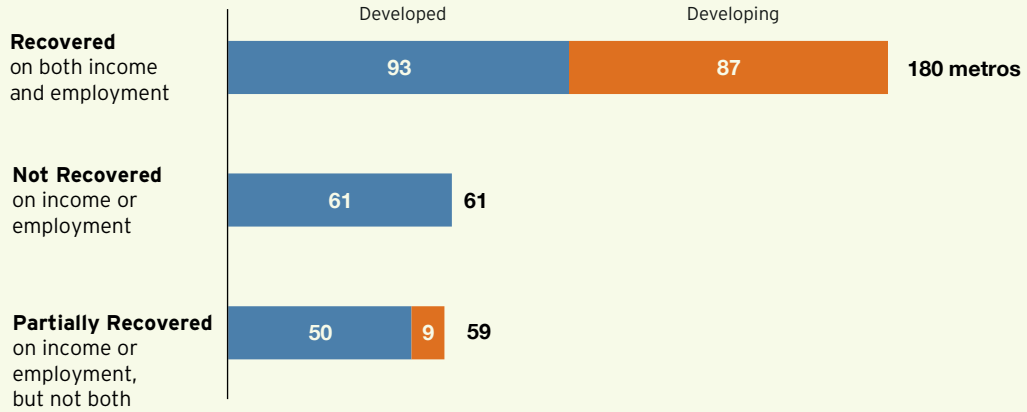
More than half (180) of the 300 metro economies in the sample are "fully recovered"; these places have higher employment *and* GDP per capita in 2014 than in 2007. Half of these metro areas are located in Developing Asia-Pacific and North America. In Developing Asia-Pacific, large metro areas like Beijing, Chengdu, and Shanghai never experienced a recession, while North American metro economies such as Boston, New York, and Seattle suffered through the downturn but have since recovered on both indicators. In Latin America, 86 percent (19 of 22) of metropolitan economies have recovered to previous peaks, thanks to a quick rebound in GDP per capita and employment growth immediately following the economic crisis (Figure 4).

At the other end of the spectrum, just over one-fifth (61) of metro areas are "not recovered" in either indicator; this group is composed entirely of developed metro economies. Despite significant progress in North America and Western Europe, metro areas in these regions still account for 90 percent of these low performers. Among the 28 Western European metro areas in this group, average GDP per capita is 8 percent lower and employment is 7 percent lower than in 2007. North American metro areas like Chicago, Detroit, and Los Angeles have posted post-recession growth in both employment and GDP per capita, but have not yet made up the large losses suffered during the crisis. A subset of these metro areas also suffered declines on both indicators in 2014. This group is comprised of Italian metro areas (Naples, Turin, Venice, and Florence), U.S. metro areas (Virginia Beach, Syracuse, Albuquerque, and Dayton), and Arnhem-Nijmegen in the Netherlands. In Venice, GDP per capita in 2014 was 13 percent short of its 2007 level, while employment in Naples fell 10 percent during the same period.

A third category of metropolitan areas (59) is "partially recovered." This group has recovered on either GDP per capita or employment, but not on both indicators. North American and Latin American metro areas have mostly recovered in employment levels, while Developed Asia-Pacific and Developing Asia-Pacific metro areas have recovered in GDP per capita levels.

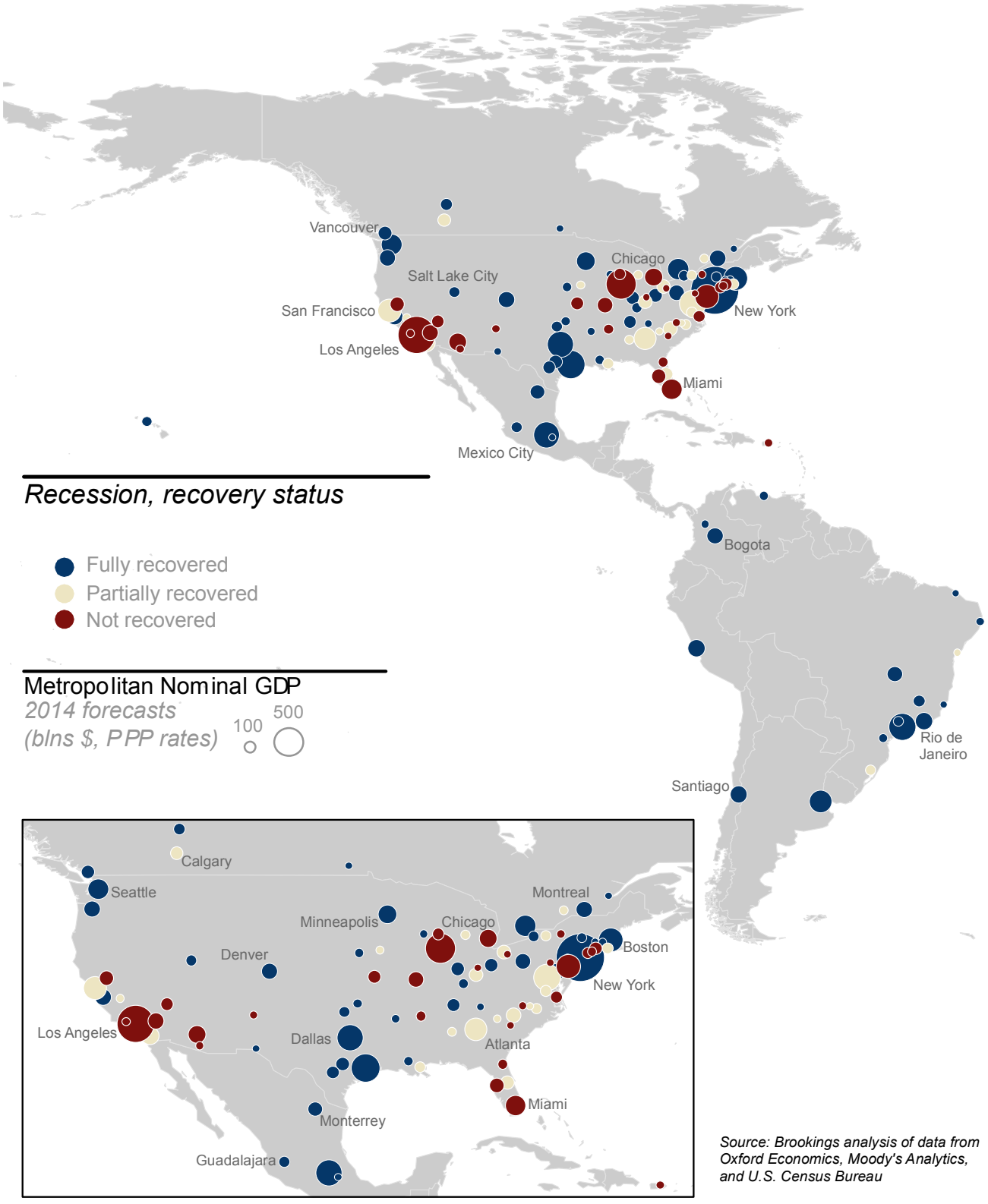
FIGURE 4. MOST METROPOLITAN AREAS HAVE RECOVERED TO 2007 INCOME AND EMPLOYMENT LEVELS

Recovery Status on GDP Per Capita and Employment, 2014

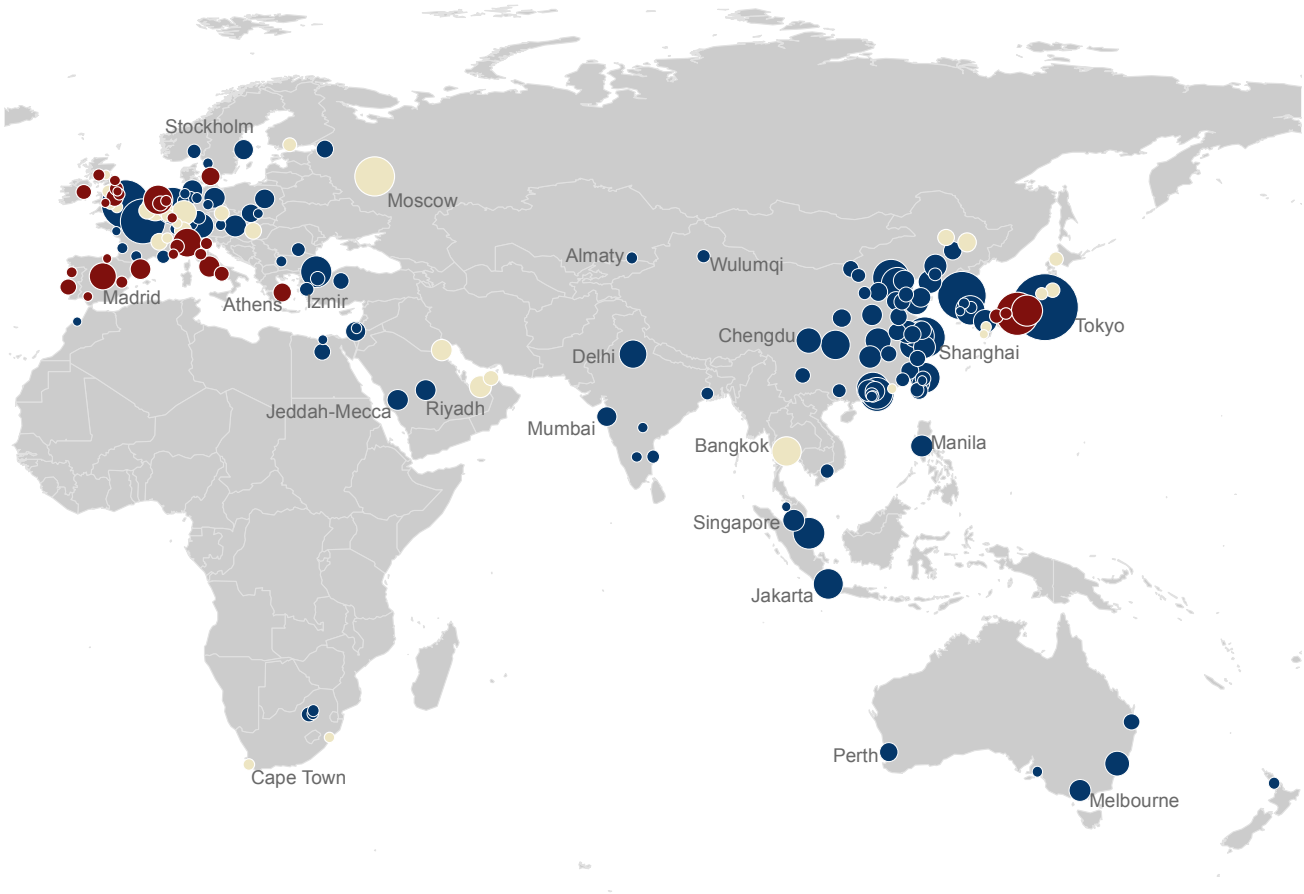


Source: Brookings analysis of data from Oxford Economics, Moody's Analytics, and U.S. Census Bureau.

MAP 4. RECESSION/RECOVERY STATUS, 300 LARGEST METROPOLITAN AREAS, 2014



Source: Brookings analysis of data from Oxford Economics, Moody's Analytics, and U.S. Census Bureau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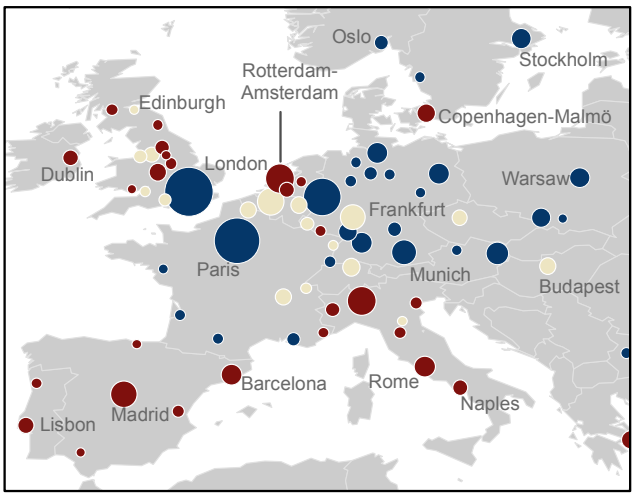
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Naples
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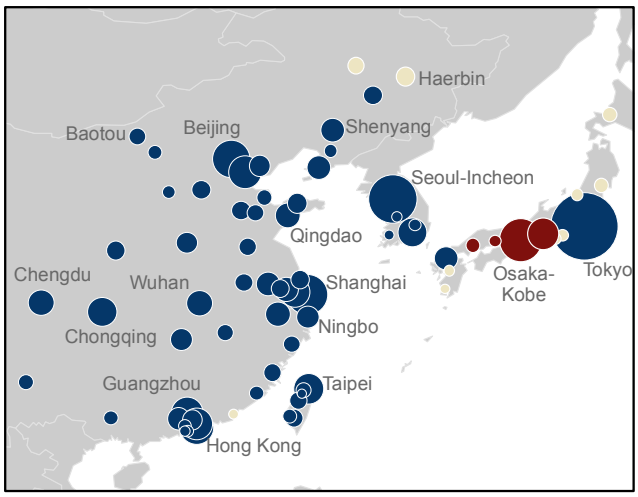
Lisbon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Ningbo
Chongqing
Guangzhou
Taipei
Hong Kong

Taking a slightly longer view, the period from 2009 to 2014 revealed differences from before the recession between developed and developing metro areas in GDP per capita performance. While GDP per capita growth declined in developed metropolitan economies—from an annual average of 1.6 percent from 2000–2007 to 0.2 percent from 2009–2014—it held relatively steady in developing metro areas, at 6.1 percent growth in 2000–2007 and 5.7 percent in 2009–2014.

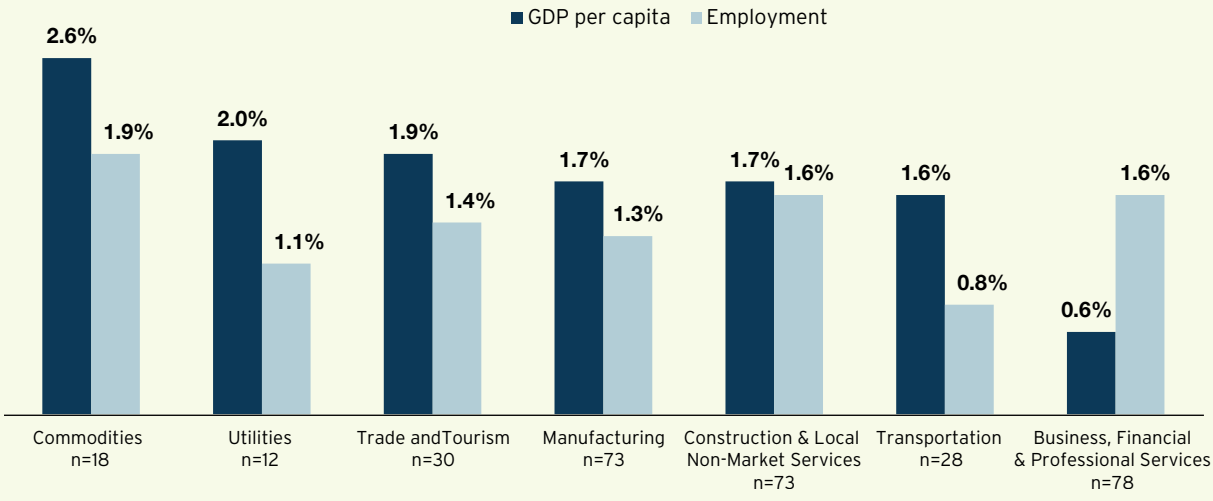
A more concerning trend is the slowdown in job creation, even in the developing world. Employment in developed metro areas grew 1.1 percent from 2000 to 2007, and 0.5 percent from 2009 to 2014. In developing metro areas, the rate of job growth decreased from 3.4 percent to 2.6 percent in the 2009–2014 period. It is not clear whether growth in GDP per capita can persist in developing metro areas, or recover in developed ones, if employment growth continues to falter.

D. Metropolitan areas specializing in commodities registered the highest rates of GDP per capita and employment growth in 2014.

Examining metropolitan performance by industry provides further insights into the drivers of job creation and GDP per capita growth. To examine these trends, this analysis assigned 296 metropolitan areas (minus four that coterminous with national boundaries) one of seven industrial specializations: business, financial, and professional services; commodities; construction and local/non-market services; manufacturing; trade and tourism; transportation; and utilities. Industrial specializations were assigned using location quotients, which are based on the ratio of an industry's share of metropolitan real GVA to its share of national real GVA.

FIGURE 5. METRO AREAS SPECIALIZED IN COMMODITIES GREW FASTER THAN OTHER METRO AREAS IN 2013-2014

GDP per Capita and Employment Change by Metro Industrial Specialization, 296 Metro Areas, 2013–2014



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

Commodities-focused metropolitan areas registered the strongest performance in 2014. Across these 18 metro areas, GDP per capita grew by 2.6 percent and employment grew by 1.9 percent—both well above average—even as commodities prices fell worldwide. The recent rise in oil and gas production in North America partly explains the success of metropolitan areas like Calgary, Denver, Houston, and Tulsa, which are epicenters of the region's shale revolution.[24] Metro areas specializing in the utilities sector—including electric power, natural gas, steam supply, water supply, and sewage removal—also experienced above average per capita GDP growth (2 percent), but also saw below average employment expansion (1.1 percent).

Metropolitan areas with a specialization in trade and tourism benefited from sustained growth in global flows of goods and people. Following years of sluggish expansion, international trade accelerated in 2014, helping spur growth in infrastructure hubs such as Atlanta, Jinan, and Qingdao.[25] Similarly, tourist destinations such as Las Vegas, Miami, and Orlando benefited from an estimated 4.5 percent expansion in global tourism in 2014.[26]

Metropolitan economies specializing in manufacturing—the second largest specialization across the 296 metropolitan areas—also grew at above average rates for income (1.7 percent) and employment (1.6 percent), but significant differences exist between developed and developing manufacturing hubs. Developing metro areas with this specialization experienced a healthy expansion of 5.6 percent in manufacturing value-added in 2014, nearly three times the growth rate of developed manufacturing regions (1.8 percent). China accounts for much of this difference, particularly its manufacturing hubs in the Pearl River Delta region (Fuzhou, Zhongshan, Foshan, and Zhuhai) that continued to move up the value-added chain in 2014.

"Commodities-focused metropolitan areas registered the strongest performance in 2014, including North American oil and gas production centers such as Calgary, Denver, Houston, and Tulsa."

Business, financial, and professional services accounted for the largest share of metropolitan industrial specializations, together generating 44 percent of the total GDP of the 296 metropolitan areas analyzed. Metro economies in this category displayed mixed performances, growing slightly above average on employment (1.6 percent) but experiencing only modest expansion in GDP per capita (0.6 percent). Despite this overall trend, developed metro economies such as London, Oslo, Paris, Tel Aviv, Vancouver, and Zurich registered above average income growth.

CONCLUSION

The economic growth trajectories of the world's major metropolitan areas continued to diverge in 2014, reflecting a still uncertain global recovery. Many large metro economies are growing faster than their respective nations, drawing on concentrations of workers, firms, and industrial clusters to spur gains in employment and living standards. Together, the 300 largest metropolitan areas accounted for 47 percent of total global GDP in 2014.

"The uneven pace of economic growth in the world's major metro areas continued to diverge in 2014, reflecting a still uncertain global recovery."

Continued growth means that, six years after the global financial crisis, a majority of the world's metropolitan economies have met or exceeded their pre-recession levels of GDP per capita and employment. However, that recovery is not evenly distributed. Fifty-seven percent of metro areas in North America and 65 percent in Western Europe have yet to achieve full recovery, suggesting that healthy national growth in places like the United States and the United Kingdom has not touched all parts of each country.

Optimism in Western economies has been tempered by newfound concerns in emerging markets. Still, even as growth rates cooled in Chinese and Latin American metro areas in 2014, the locus of worldwide growth in jobs and living standards remained decidedly in the South and East. Less wealthy developing metro areas continued to converge with their more developed peers in Europe and North America.

The global map of metropolitan economic performance in this year's *Global MetroMonitor* reveals a still-tentative and uneven recovery. With half of global economic output centered in these 300 regions, their individual and collective progress will continue to shape prospects for more sustainable and broadly shared growth. Their actions bear watching.

APPENDIX A. 300 LARGEST METROPOLITAN ECONOMIES 2013–2014

Rank Economic Performance 2013-2014	Metro	Country	Development Status	GDP per Capita Change 2013-2014	Employment Change 2013-2014	Rank Economic Performance 2009-2014	Recession Status
1	Macau	Macau	Developed	8.0%	4.2%	10	recovered
2	Izmir	Turkey	Developing	2.0%	6.6%	8	recovered
3	Istanbul	Turkey	Developing	2.0%	6.5%	17	recovered
4	Bursa	Turkey	Developing	1.8%	6.4%	20	recovered
5	Dubai	UAE	Developed	4.5%	4.7%	172	partially recovered
6	Kunming	China	Developing	8.1%	2.9%	9	recovered
7	Hangzhou	China	Developing	7.0%	3.3%	6	recovered
8	Xiamen	China	Developing	8.6%	2.6%	1	recovered
9	Ankara	Turkey	Developing	1.1%	5.7%	27	recovered
10	Fuzhou	China	Developing	8.0%	2.7%	13	recovered
11	Wulumuqi	China	Developing	7.4%	2.7%	15	recovered
12	Budapest	Hungary	Developing	2.4%	4.7%	160	partially recovered
13	Wuhan	China	Developing	9.3%	1.9%	29	recovered
14	Ningbo	China	Developing	6.8%	2.8%	21	recovered
15	Changsha	China	Developing	8.6%	1.8%	25	recovered
16	Chengdu	China	Developing	8.1%	1.9%	18	recovered
17	Wenzhou	China	Developing	6.6%	2.5%	26	recovered
18	Delhi	India	Developing	4.4%	3.3%	36	recovered
19	Kuala Lumpur	Malaysia	Developing	4.1%	3.4%	4	recovered
20	Hefei	China	Developing	9.5%	1.0%	14	recovered
21	Nanning	China	Developing	7.2%	1.9%	2	recovered
22	Nantong	China	Developing	6.9%	1.9%	12	recovered
23	Ho Chi Minh City	Vietnam	Developing	3.9%	3.1%	46	recovered
24	Xuzhou	China	Developing	6.9%	1.8%	5	recovered
25	Riyadh	Saudi Arabia	Developed	1.9%	3.9%	79	recovered
26	London	United Kingdom	Developed	2.5%	3.6%	85	recovered
27	Jinan	China	Developing	7.1%	1.7%	53	recovered
28	Suzhou	China	Developing	6.7%	1.7%	7	recovered
29	Qingdao	China	Developing	7.1%	1.6%	24	recovered
30	Sofia	Bulgaria	Developing	2.5%	3.4%	261	recovered
31	Huhehaote	China	Developing	7.8%	1.2%	33	recovered
32	Kolkata	India	Developing	4.7%	2.5%	68	recovered
33	Changzhou	China	Developing	6.8%	1.6%	16	recovered
34	Jakarta	Indonesia	Developing	4.3%	2.6%	42	recovered
35	Jeddah-Mecca	Saudi Arabia	Developed	2.4%	3.4%	153	recovered
36	Tangshan	China	Developing	6.9%	1.5%	37	recovered
37	Dongying	China	Developing	6.5%	1.7%	11	recovered

APPENDIX A. 300 LARGEST METROPOLITAN ECONOMIES 2013-2014 (continued)

Rank Economic Performance 2013-2014	Metro	Country	Development Status	GDP per Capita Change 2013-2014	Employment Change 2013-2014	Rank Economic Performance 2009-2014	Recession Status
38	Austin	USA	Developed	1.9%	3.6%	65	recovered
39	Houston	USA	Developed	1.6%	3.7%	74	recovered
40	Chongqing	China	Developing	7.3%	1.2%	28	recovered
41	Raleigh	USA	Developed	0.8%	4.0%	112	partially recovered
42	Baotou	China	Developing	7.5%	1.1%	23	recovered
43	Yantai	China	Developing	6.8%	1.4%	30	recovered
44	Nanjing	China	Developing	6.5%	1.5%	22	recovered
45	Zhongshan	China	Developing	5.8%	1.8%	19	recovered
46	Medellin	Colombia	Developing	4.2%	2.4%	57	recovered
47	George Town	Malaysia	Developing	3.8%	2.6%	52	recovered
48	Lima	Peru	Developing	2.9%	2.9%	54	recovered
49	Fresno	USA	Developed	-0.9%	4.5%	196	partially recovered
50	Zibo	China	Developing	6.6%	1.3%	35	recovered
51	Wuxi	China	Developing	6.4%	1.3%	3	recovered
52	Mumbai	India	Developing	4.6%	2.1%	67	recovered
53	Calgary	Canada	Developed	3.1%	2.7%	115	partially recovered
54	Zhengzhou	China	Developing	7.8%	0.7%	38	recovered
55	Nanchang	China	Developing	6.6%	1.2%	40	recovered
56	Shijiazhuang	China	Developing	6.5%	1.2%	45	recovered
57	Chennai	India	Developing	5.2%	1.7%	66	recovered
58	Foshan	China	Developing	5.6%	1.5%	61	recovered
59	Daejon	South Korea	Developed	3.0%	2.6%	90	recovered
60	Manchester	United Kingdom	Developed	2.6%	2.8%	236	partially recovered
61	Singapore	Singapore	Developed	1.8%	3.1%	48	recovered
62	Edmonton	Canada	Developed	-0.6%	4.0%	71	recovered
63	Dallas	USA	Developed	0.8%	3.4%	94	recovered
64	Shenzhen	China	Developing	5.1%	1.6%	31	recovered
65	Baton Rouge	USA	Developed	1.5%	3.0%	138	recovered
66	Oklahoma City	USA	Developed	1.8%	2.9%	103	recovered
67	Beijing	China	Developing	4.7%	1.6%	58	recovered
68	Las Vegas	USA	Developed	1.3%	3.0%	210	not recovered
69	Grand Rapids	USA	Developed	0.6%	3.3%	73	partially recovered
70	Dongguan	China	Developing	5.2%	1.4%	80	recovered
71	Edinburgh	United Kingdom	Developed	1.5%	2.9%	187	partially recovered
72	San Jose	USA	Developed	0.2%	3.4%	72	recovered
73	Orlando	USA	Developed	0.1%	3.5%	147	partially recovered

APPENDIX A. 300 LARGEST METROPOLITAN ECONOMIES 2013–2014 (continued)

Rank Economic Performance 2013-2014	Metro	Country	Development Status	GDP per Capita Change 2013-2014	Employment Change 2013-2014	Rank Economic Performance 2009-2014	Recession Status
74	Vancouver	Canada	Developed	3.7%	1.9%	132	recovered
75	Perth	Australia	Developed	3.4%	2.1%	64	recovered
76	Hyderabad	India	Developing	4.2%	1.7%	82	recovered
77	Guangzhou	China	Developing	4.9%	1.4%	34	recovered
78	Alexandria	Egypt	Developing	0.9%	3.0%	170	recovered
79	Bristol	United Kingdom	Developed	2.1%	2.5%	269	partially recovered
80	Quebec City	Canada	Developed	2.1%	2.4%	145	recovered
81	Liverpool	United Kingdom	Developed	2.4%	2.3%	217	partially recovered
82	Cairo	Egypt	Developing	0.7%	3.0%	41	recovered
83	Jacksonville	USA	Developed	0.6%	3.0%	194	not recovered
84	Nottingham-Derby	United Kingdom	Developed	2.6%	2.2%	226	not recovered
85	Taiyuan	China	Developing	5.6%	0.9%	55	recovered
86	Nashville	USA	Developed	0.7%	2.9%	76	recovered
87	Bangalore	India	Developing	4.3%	1.4%	98	recovered
88	Bogota	Colombia	Developing	3.2%	1.8%	60	recovered
89	Gwangju	South Korea	Developed	2.8%	2.0%	89	recovered
90	Zhuhai	China	Developing	4.4%	1.3%	50	recovered
91	Portsmouth-Southampton	United Kingdom	Developed	2.1%	2.2%	227	partially recovered
92	Shanghai	China	Developing	5.2%	0.9%	129	recovered
93	Daegu	South Korea	Developed	3.1%	1.8%	84	recovered
94	Taoyuan	Taiwan	Developed	3.7%	1.5%	59	recovered
95	Denver	USA	Developed	0.8%	2.7%	116	recovered
96	Birmingham	United Kingdom	Developed	2.2%	2.1%	206	not recovered
97	Kuwait	Kuwait	Developed	0.6%	2.7%	77	partially recovered
98	Xi'an	China	Developing	7.2%	0.0%	49	recovered
99	Knoxville	USA	Developed	1.3%	2.4%	183	recovered
100	Atlanta	USA	Developed	1.5%	2.3%	169	partially recovered
101	Glasgow	United Kingdom	Developed	2.6%	1.8%	290	not recovered
102	Changchun	China	Developing	7.2%	-0.1%	44	recovered
103	Riverside	USA	Developed	0.2%	2.8%	182	not recovered
104	Portland	USA	Developed	0.6%	2.6%	91	recovered
105	Seoul-Incheon	South Korea	Developed	2.7%	1.7%	88	recovered
106	Leeds-Bradford	United Kingdom	Developed	2.0%	2.0%	271	not recovered
107	Casablanca	Morocco	Developing	1.9%	2.1%	146	recovered
108	Cracow	Poland	Developed	3.7%	1.3%	257	recovered

APPENDIX A. 300 LARGEST METROPOLITAN ECONOMIES 2013–2014 (continued)

Rank Economic Performance 2013-2014	Metro	Country	Development Status	GDP per Capita Change 2013-2014	Employment Change 2013-2014	Rank Economic Performance 2009-2014	Recession Status
109	Shenyang	China	Developing	6.7%	0.0%	39	recovered
110	Charlotte	USA	Developed	1.1%	2.3%	110	partially recovered
111	Greenville	USA	Developed	0.7%	2.4%	121	partially recovered
112	Sheffield	United Kingdom	Developed	2.1%	1.8%	273	not recovered
113	Newcastle	United Kingdom	Developed	1.9%	1.9%	240	not recovered
114	Brisbane	Australia	Developed	-0.4%	2.8%	180	recovered
115	Seattle	USA	Developed	0.1%	2.5%	137	recovered
116	Miami	USA	Developed	-0.5%	2.8%	161	not recovered
117	Hsinchu	Taiwan	Developed	3.5%	1.1%	70	recovered
118	Salt Lake City	USA	Developed	-0.2%	2.7%	97	recovered
119	Katowice-Ostrava	Poland	Developed	3.5%	1.1%	163	recovered
120	Dalian	China	Developing	6.5%	-0.2%	32	recovered
121	Busan-Ulsan	South Korea	Developed	2.8%	1.3%	106	recovered
122	Sacramento	USA	Developed	1.1%	2.0%	216	not recovered
123	Lisbon	Portugal	Developed	1.3%	2.0%	292	not recovered
124	Cardiff-Newport	United Kingdom	Developed	1.7%	1.7%	272	not recovered
125	San Francisco	USA	Developed	-0.5%	2.6%	118	partially recovered
126	Anshan	China	Developing	6.3%	-0.3%	47	recovered
127	Tainan	Taiwan	Developed	3.6%	0.9%	93	recovered
128	Taichung	Taiwan	Developed	3.1%	1.0%	87	recovered
129	Porto	Portugal	Developed	1.0%	1.9%	294	not recovered
130	Kaohsiung	Taiwan	Developed	3.5%	0.9%	101	recovered
131	San Antonio	USA	Developed	-0.2%	2.4%	107	recovered
132	Warsaw	Poland	Developed	1.9%	1.5%	127	recovered
133	Phoenix	USA	Developed	0.7%	2.0%	159	not recovered
134	Dublin	Ireland	Developed	1.7%	1.5%	288	not recovered
135	Taipei	Taiwan	Developed	2.9%	1.0%	86	recovered
136	Milwaukee	USA	Developed	1.3%	1.6%	211	not recovered
137	Abu Dhabi	UAE	Developed	0.3%	2.1%	78	partially recovered
138	Durham	USA	Developed	1.2%	1.7%	231	partially recovered
139	Manila	Philippines	Developing	4.1%	0.5%	69	recovered
140	Indianapolis	USA	Developed	0.6%	1.9%	144	recovered
141	Tampa	USA	Developed	0.7%	1.8%	171	not recovered
142	San Diego	USA	Developed	-0.4%	2.3%	162	partially recovered

APPENDIX A. 300 LARGEST METROPOLITAN ECONOMIES 2013–2014 (continued)

Rank Economic Performance 2013-2014	Metro	Country	Development Status	GDP per Capita Change 2013-2014	Employment Change 2013-2014	Rank Economic Performance 2009-2014	Recession Status
143	Shantou	China	Developing	4.0%	0.4%	56	partially recovered
144	Madison	USA	Developed	0.3%	2.0%	168	recovered
145	Auckland	New Zealand	Developed	2.4%	1.1%	105	recovered
146	Des Moines	USA	Developed	0.0%	2.0%	139	partially recovered
147	Mexico City	Mexico	Developing	1.6%	1.4%	96	recovered
148	Los Angeles	USA	Developed	0.1%	2.0%	164	not recovered
149	Tucson	USA	Developed	1.2%	1.4%	228	not recovered
150	Guadalajara	Mexico	Developing	0.8%	1.5%	114	recovered
151	Baltimore	USA	Developed	1.0%	1.5%	157	recovered
152	Tianjin	China	Developing	3.3%	0.5%	43	recovered
153	Boston	USA	Developed	0.5%	1.6%	149	recovered
154	Stockholm	Sweden	Developed	0.9%	1.5%	130	recovered
155	Oslo	Norway	Developed	1.4%	1.2%	166	recovered
156	Almaty	Kazakhstan	Developing	2.6%	0.7%	51	recovered
157	East Rand	South Africa	Developing	0.1%	1.8%	131	recovered
158	Tulsa	USA	Developed	0.8%	1.4%	202	recovered
159	Springfield	USA	Developed	1.7%	1.0%	175	recovered
160	Santiago	Chile	Developed	1.2%	1.2%	62	recovered
161	Prague	Czech Republic	Developed	1.9%	0.9%	265	partially recovered
162	Rio de Janeiro	Brazil	Developing	-0.2%	1.8%	133	recovered
163	Pretoria	South Africa	Developing	-0.9%	2.0%	150	recovered
164	Tel Aviv	Israel	Developed	1.4%	1.0%	75	recovered
165	Gothenburg	Sweden	Developed	1.0%	1.1%	141	recovered
166	Minneapolis	USA	Developed	-0.1%	1.6%	148	recovered
167	Munich	Germany	Developed	0.9%	1.1%	124	recovered
168	Honolulu	USA	Developed	1.4%	1.0%	185	recovered
169	Nürnberg-Fürth	Germany	Developed	1.6%	0.9%	135	recovered
170	Zurich	Switzerland	Developed	0.4%	1.3%	174	partially recovered
171	Berlin	Germany	Developed	1.1%	1.0%	143	recovered
172	Haerbin	China	Developing	6.1%	-1.1%	95	partially recovered
173	Johannesburg	South Africa	Developing	-1.3%	2.0%	152	recovered
174	Fortaleza	Brazil	Developing	-0.2%	1.6%	158	recovered
175	El Paso	USA	Developed	0.6%	1.2%	109	recovered
176	New York	USA	Developed	0.1%	1.4%	176	recovered
177	Luxembourg-Trier	Luxembourg	Developed	1.4%	0.9%	181	partially recovered

APPENDIX A. 300 LARGEST METROPOLITAN ECONOMIES 2013–2014 (continued)

Rank Economic Performance 2013-2014	Metro	Country	Development Status	GDP per Capita Change 2013-2014	Employment Change 2013-2014	Rank Economic Performance 2009-2014	Recession Status
178	Bakersfield	USA	Developed	-2.4%	2.4%	108	partially recovered
179	Hannover	Germany	Developed	1.4%	0.8%	188	recovered
180	Linz	Austria	Developed	0.8%	1.1%	167	recovered
181	Curitiba	Brazil	Developing	-0.5%	1.6%	119	recovered
182	Madrid	Spain	Developed	1.4%	0.8%	295	not recovered
183	Vienna-Bratislava	Austria	Developed	0.6%	1.2%	213	recovered
184	Worcester	USA	Developed	0.9%	1.0%	155	recovered
185	Genève-Annemasse	Switzerland	Developed	0.3%	1.3%	128	partially recovered
186	Louisville	USA	Developed	0.2%	1.3%	142	recovered
187	Belo Horizonte	Brazil	Developing	-0.3%	1.5%	102	recovered
188	Cape Town	South Africa	Developing	-1.2%	1.9%	179	partially recovered
189	Leipzig-Halle	Germany	Developed	1.5%	0.7%	156	recovered
190	Richmond	USA	Developed	-0.3%	1.5%	186	partially recovered
191	Hamburg	Germany	Developed	0.8%	1.0%	199	recovered
192	Karlsruhe	Germany	Developed	1.2%	0.8%	165	recovered
193	Grande Vitoria	Brazil	Developing	-0.1%	1.3%	122	recovered
194	Braunschweig-Wolfsburg	Germany	Developed	1.4%	0.7%	92	recovered
195	San Juan	Puerto Rico	Developed	0.4%	1.1%	289	not recovered
196	Harrisburg	USA	Developed	0.2%	1.2%	246	not recovered
197	Toronto	Canada	Developed	1.4%	0.7%	117	recovered
198	Akron	USA	Developed	-0.5%	1.4%	200	not recovered
199	Durban	South Africa	Developing	-1.2%	1.7%	235	partially recovered
200	Recife	Brazil	Developing	0.2%	1.1%	63	recovered
201	Tokyo	Japan	Developed	0.7%	0.9%	204	recovered
202	Bremen	Germany	Developed	1.2%	0.7%	190	recovered
203	Chicago	USA	Developed	0.7%	0.8%	198	not recovered
204	Bilbao	Spain	Developed	1.7%	0.4%	297	not recovered
205	Frankfurt am Main	Germany	Developed	0.7%	0.8%	203	partially recovered
206	Sydney	Australia	Developed	1.4%	0.5%	151	recovered
207	Bielefeld-Detmold	Germany	Developed	1.2%	0.6%	134	recovered
208	Köln-Düsseldorf	Germany	Developed	1.0%	0.7%	215	recovered
209	Brasilia	Brazil	Developing	-0.7%	1.4%	99	recovered
210	Stuttgart	Germany	Developed	1.1%	0.6%	140	recovered

APPENDIX A. 300 LARGEST METROPOLITAN ECONOMIES 2013–2014 (continued)

Rank Economic Performance 2013-2014	Metro	Country	Development Status	GDP per Capita Change 2013-2014	Employment Change 2013-2014	Rank Economic Performance 2009-2014	Recession Status
211	Oxnard	USA	Developed	-1.0%	1.5%	222	not recovered
212	Greensboro	USA	Developed	0.7%	0.7%	250	not recovered
213	Cincinnati	USA	Developed	-1.2%	1.5%	178	partially recovered
214	Little Rock	USA	Developed	0.5%	0.8%	224	recovered
215	Barcelona	Spain	Developed	1.2%	0.4%	296	not recovered
216	Omaha	USA	Developed	-0.1%	1.0%	191	recovered
217	Birmingham	USA	Developed	0.4%	0.8%	220	partially recovered
218	Moscow	Russia	Developed	0.0%	0.9%	120	partially recovered
219	Monterrey	Mexico	Developing	0.5%	0.7%	113	recovered
220	Saarbrucken	Germany	Developed	1.4%	0.3%	225	not recovered
221	Haifa	Israel	Developed	1.5%	0.3%	81	recovered
222	Hamamatsu	Japan	Developed	1.7%	0.2%	244	partially recovered
223	Shizuoka	Japan	Developed	1.7%	0.1%	245	partially recovered
224	Nagoya	Japan	Developed	1.0%	0.4%	252	not recovered
225	New Haven	USA	Developed	0.5%	0.6%	223	not recovered
226	Providence	USA	Developed	-0.7%	1.1%	207	partially recovered
227	Melbourne	Australia	Developed	1.1%	0.3%	154	recovered
228	Columbia	USA	Developed	-0.1%	0.8%	205	not recovered
229	Ottawa	Canada	Developed	0.1%	0.7%	238	partially recovered
230	Puebla	Mexico	Developing	0.0%	0.8%	83	recovered
231	Kumamoto	Japan	Developed	1.3%	0.2%	232	partially recovered
232	Kitakyushu-Fukuoka	Japan	Developed	0.9%	0.3%	219	recovered
233	Toulouse	France	Developed	-0.1%	0.7%	197	recovered
234	New Orleans	USA	Developed	-2.0%	1.5%	229	partially recovered
235	Memphis	USA	Developed	-0.2%	0.7%	270	not recovered
236	Albany	USA	Developed	0.1%	0.6%	234	recovered
237	Detroit	USA	Developed	0.8%	0.3%	104	not recovered
238	Buffalo	USA	Developed	-0.1%	0.6%	230	recovered
239	Hartford	USA	Developed	0.3%	0.4%	258	not recovered
240	Seville	Spain	Developed	0.9%	0.1%	299	not recovered
241	Sendai	Japan	Developed	0.8%	0.2%	268	partially recovered
242	Hong Kong	Hong Kong	Developed	1.2%	0.0%	100	recovered

APPENDIX A. 300 LARGEST METROPOLITAN ECONOMIES 2013–2014 (continued)

Rank Economic Performance 2013-2014	Metro	Country	Development Status	GDP per Capita Change 2013-2014	Employment Change 2013-2014	Rank Economic Performance 2009-2014	Recession Status
243	Kagoshima	Japan	Developed	1.3%	0.0%	208	partially recovered
244	Nantes	France	Developed	-0.2%	0.6%	201	recovered
245	Okayama	Japan	Developed	1.1%	0.1%	266	not recovered
246	Copenhagen-Malmö	Denmark	Developed	0.7%	0.2%	256	not recovered
247	Osaka-Kobe	Japan	Developed	0.6%	0.2%	267	not recovered
248	Basel-Mulhouse	Switzerland	Developed	0.4%	0.3%	214	recovered
249	St. Louis	USA	Developed	-2.1%	1.3%	253	not recovered
250	Philadelphia	USA	Developed	-0.5%	0.7%	248	not recovered
251	Bordeaux	France	Developed	-0.2%	0.5%	212	recovered
252	Valencia	Spain	Developed	0.9%	0.1%	298	not recovered
253	Pittsburgh	USA	Developed	0.0%	0.4%	192	recovered
254	Sapporo	Japan	Developed	0.9%	0.0%	274	partially recovered
255	Niigata	Japan	Developed	1.2%	-0.1%	242	partially recovered
256	Rochester	USA	Developed	-0.1%	0.4%	237	partially recovered
257	Bridgeport	USA	Developed	-0.2%	0.4%	241	not recovered
258	Cleveland	USA	Developed	-0.9%	0.7%	189	partially recovered
259	Marseille	France	Developed	0.1%	0.3%	263	recovered
260	Paris	France	Developed	0.3%	0.2%	247	recovered
261	Saint Petersburg	Russia	Developed	-0.2%	0.4%	125	recovered
262	Brussels	Belgium	Developed	0.4%	0.0%	262	partially recovered
263	Aachen-Liège	Belgium	Developed	0.7%	-0.1%	243	partially recovered
264	Kansas City	USA	Developed	-1.3%	0.7%	233	not recovered
265	Lille	France	Developed	0.4%	0.0%	264	partially recovered
266	Salvador	Brazil	Developing	-0.9%	0.5%	218	partially recovered
267	Hiroshima	Japan	Developed	0.5%	-0.1%	275	not recovered
268	Lyon	France	Developed	-0.2%	0.2%	239	partially recovered
269	Nice	France	Developed	0.0%	0.1%	277	not recovered
270	Strasbourg	France	Developed	0.0%	0.1%	260	partially recovered
271	Bucharest	Romania	Developing	1.7%	-0.7%	173	recovered
272	Allentown	USA	Developed	-0.3%	0.1%	193	recovered
273	Columbus	USA	Developed	-1.3%	0.4%	126	recovered
274	Rome	Italy	Developed	-0.8%	0.1%	284	not recovered

APPENDIX A. 300 LARGEST METROPOLITAN ECONOMIES 2013–2014 (continued)

Rank Economic Performance 2013-2014	Metro	Country	Development Status	GDP per Capita Change 2013-2014	Employment Change 2013-2014	Rank Economic Performance 2009-2014	Recession Status
275	Washington	USA	Developed	-1.5%	0.3%	251	partially recovered
276	Bologna	Italy	Developed	-0.4%	-0.1%	255	partially recovered
277	Milan	Italy	Developed	-0.5%	-0.2%	283	not recovered
278	Venice-Padova	Italy	Developed	-0.6%	-0.2%	280	not recovered
279	Winnipeg	Canada	Developed	-0.2%	-0.4%	221	recovered
280	Athens	Greece	Developed	0.3%	-0.6%	300	not recovered
281	Virginia Beach	USA	Developed	-1.0%	-0.1%	279	not recovered
282	Helsinki	Finland	Developed	-0.5%	-0.3%	278	partially recovered
283	Turin	Italy	Developed	-0.7%	-0.3%	282	not recovered
284	Sao Paulo	Brazil	Developing	-1.5%	0.0%	136	recovered
285	Montreal	Canada	Developed	0.7%	-0.9%	184	recovered
286	Buenos Aires	Argentina	Developing	-2.8%	0.5%	123	recovered
287	Dayton	USA	Developed	-1.7%	0.0%	254	not recovered
288	Eindhoven-Den Bosch	Netherlands	Developed	0.7%	-1.1%	281	not recovered
289	Florence	Italy	Developed	-0.6%	-0.6%	291	not recovered
290	Porto Alegre	Brazil	Developing	-1.7%	-0.2%	177	partially recovered
291	Campinas	Brazil	Developing	-2.2%	0.0%	195	recovered
292	Rotterdam-Amsterdam	Netherlands	Developed	0.3%	-1.2%	287	not recovered
293	Daqing	China	Developing	4.0%	-2.8%	111	partially recovered
294	Syracuse	USA	Developed	-1.2%	-0.7%	276	not recovered
295	Arnhem-Nijmegen	Netherlands	Developed	0.0%	-1.2%	286	not recovered
296	Caracas	Venezuela	Developing	-3.5%	0.1%	209	recovered
297	Naples	Italy	Developed	-0.7%	-1.0%	293	not recovered
298	Albuquerque	USA	Developed	-2.2%	-0.6%	285	not recovered
299	Adelaide	Australia	Developed	-1.2%	-1.1%	249	recovered
300	Bangkok	Thailand	Developing	-0.5%	-1.7%	259	partially recovered

APPENDIX B: METHODS

Selection and Definition of Metropolitan Areas

The fourth edition of the *Global MetroMonitor* employs the size of each metropolitan economy as the main selection criterion, given the focus on metropolitan economic performance. As with previous installments of the series, the sample is composed of the 300 largest metropolitan areas for which economic and industrial data were available, based on the size of their respective economies in 2014 at purchasing power parity rates. The sample of metropolitan areas is based upon a list of international metros provided by Oxford Economics, as well as a list of the largest metropolitan economies in the United States built with data provided by Moody's Analytics.

This study uses the general definition of a metropolitan area as an economic region with one or more 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.[27] 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.[28] This study uses the most accurate metropolitan area compositions of European metro areas, because the current ESPON 2013 database employs commuting data at the municipal level to define functional urban areas, the building blocks of metropolitan areas.[29] This identification method is most consistent with the U.S. definition of metro areas based on commuting links, with the possibility of a metro area crossing jurisdictional borders, and having multiple cities included.

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 properly reflect regional economies, but the federal city (Moscow, St. Petersburg, Caracas), provincial-level and prefecture-level cities in China, municipality (Ho Chi Minh City), or administrative region (Casablanca).

Baseline Variables and Data Sources

This *Global MetroMonitor* employs several key variables to assess the economic performance of metropolitan areas: gross domestic product (GDP), employment, population, and GDP per capita, all from 2000 to 2014. In addition, the study uses gross value added (GVA) and employment by major industry sector. For static analysis, this study employs nominal GDP and GVA data at purchasing power parity rates. For trends analysis, it uses GDP and GVA data at 2009 prices and expressed in U.S. dollars.[30] Data availability and comparability at metropolitan level precluded expanding the economic analysis to other indicators of interest, such as housing prices, employment rates, unemployment rates, and income distributions.

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.

To generate GDP by metropolitan area, this study sums county-level GDP estimates from Moody's Analytics using county-based metropolitan area definitions.[31] Oxford Economics collects data from national statistics bureaus in each country or from providers such as Haver, ISI Emerging Markets, and Eurostat. It then calculates forecasted metropolitan GDP as the sum of forecasted industry GVA at the metropolitan level.[32]

For population, this study uses the U.S. Census Bureau's intercensal population estimates for the United States and data collected by Oxford Economics from relevant national statistical agencies for the rest of the sample. To forecast 2014 population for U.S. metro areas, annualized growth rates from 2008 to 2013 are applied to 2013 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 44 of the 48 Chinese metropolitan areas included in the report, Brookings took an additional step to process the industry-level employment estimates. China's National Bureau of Statistics generates industry-level employment, as well as a general category called 'private and individual employees.' Given the high volatility that characterizes this latter series, Brookings employed an autoregressive moving average model.[33] This model applied a weighted moving average filter with one lag period, one current period, and one future period, and assigned weights of 1, 1.5, and 1, respectively. Once private employment was smoothed, Brookings allocated total private and individual employees to the industry-level employment categories in proportion to their share of the total for that

metropolitan area. This process was repeated for all of the metro areas with private and individual employees, for all years between 2000 and 2014.

For industry analysis, this report collected industry-level data and estimates for metropolitan employment and GVA. This edition uses the eight major industrial sectors from the previous edition of *Global MetroMonitor,* for which GVA and employment data were available at the metropolitan level (see Table A1). In large part, this industrial identification was driven by data availability, with the goal of reaching a balance between industry disaggregation and consistency of categories across metros and countries.

TABLE A1. INDUSTRY CATEGORIES IN GLOBAL METROMONITOR 2014

Industry	Category	Approximate NAICS Code
Commodities	Agriculture, Forestry, Fishing and Hunting	11
	Mining, Quarrying, 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, Financial and Professional Services	Finance and Insurance	52
	Real State and Rental and Leasing	53
	Professional, Scientific and Technical Services	54
	Management of Companies and Enterprises	55
Local non-Market Services	Administrative and Support and Waste Management and Remediation Services	56
	Educational Services	61
	Health Care and Social Assistance	62
	Arts, Entertainment and Recreation	71
	Other Services (Except Public Administration)	81
	Government (Public Administration)	92
	Information	51

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 metro areas, Oxford Economics collects GVA and employment by industry, based on the Statistical Classification of Economic Activities in the European Community (NACE) version 2. For metro areas outside of the United States and Europe, Oxford Economics reports data available from local and national statistical agencies.

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 metro areas, 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 industry's growth in a particular metro area compared with the respective national average. Public services 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 GDP per capita and the annualized growth rate of employment. These two indicators reflect the importance that people and policymakers attach to achieving rising incomes and standards of living (GDP per capita), as well as generating widespread labor market opportunity (employment). Identifying economic data available across the entire sample of 300 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}):

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

Each of the two indicators (annualized growth rates of income [GDP per capita] and employment) is standardized using this method for the time period corresponding to 2013–2014, as well as for compound growth rates for both indicators for the 2009–2014 period. Once standardized, the scores for each of the two indicators are added for each metro area, thereby yielding a total score and ranking for each metro area for each time period.

Inter-decile range standardization helps 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.

Comparison across Regions, Industries, and Specializations

In the report we present comparisons of metropolitan areas grouped by industries, regions, development status, and industry specializations. To conduct this analysis rather than present the average of an indicator (income or employment growth) by category, we calculate the absolute level of that indicator according to the category of analysis. For example, when calculating income growth by development status, this study did not average the growth rate of all metro areas in developing countries; rather, it summed the real GDP of all metros in that category and divided it by total population of metros in the same category. This approach was selected because it reduces the weight of observations with extreme values in a specific indicator, but with a small share in the total.

Metropolitan Specialization

Based on their industrial mix in 2013–2014, this study classifies metropolitan areas into seven industrial specializations, reflecting the eight categories described above, with construction and local non-market services grouped into one category. Industrial specializations were assigned using location quotients, which are based on the ratio of an industry's share of real GVA divided by the industry's share of national real GVA. The industry specialization was determined by the highest location quotient, as long as this ratio was higher than 1.25 and that industry represented more than 5 percent of metropolitan output in 2014. The location quotient was determined based on real GVA industrial data, rather than employment, due to better data quality. Four metropolitan areas were excluded because they coincide with the country baseline (Singapore, Kuwait, Hong Kong, and Macau).

While industry specialization in a particular metro area relative to the world or other metro areas 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.

ENDNOTES

1. The International Monetary Fund, "World Economic Outlook: Legacies, Clouds, Uncertainties" (Washington: International Monetary Fund, 2014).

2. Ibid.

3. Alan Berube and Philipp Rode, "Global MetroMonitor" (Washington and London: Brookings Institution and London School of Economics, 2010).

4. Data are currently unavailable to compare the distribution of income gains across global metropolitan areas. Employment growth, in addition to GDP per capita growth, provides an indirect measure of whether increased labor market opportunity is accompanying growth in the average standard of living.

5. Berube and Rode, "Global Metro Monitor."

6. Data for 2014 are forecasts based on annual trends and data for the first two quarters of 2014.

7. Sources for definitions: U.S. Bureau Analysis, International Labor Organization, United Nations Department of Economic and Social Affairs.

8. Economic performance in this study refers to how well an economy is doing in terms of growth of GDP per capita and employment.

9. Some European metro areas straddle 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.

10. See World Bank list of economies as of July 1, 2014. The income classifications are in effect until July 1, 2015.

11. 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.

12. These geographical regions are not identical to the regions used by the World Bank and the International Monetary Fund, given the insufficient number of metropolitan areas in this study's sample from certain regions.

13. Fan Feifei, "Tourism aids Macao's growth after its return to motherland," *China Daily*, December 10, 2014.

14. Dennis Domrzalski, "Brookings: Albuquerque in double-dip recession," *Albuquerque Business First*, June 25, 2014

15. IMF, "World Economic Outlook."

16. The four excluded metro economies are Hong Kong, Kuwait, Macau, and Singapore. See Appendix B for more details.

17. Mario Toneguzzi, "RBC says outlook strong for Alberta's economy," *Calgary Herald*, September 10, 2014.

18. It is important to take into consideration the nature of the available data for population and employment for Chinese cities. The current methodology measures levels of employment using provincial-level and prefecture-level city definitions. The geographic footprint of Chinese cities also varies significantly, especially the extent to which formally defined municipalities incorporate large surrounding areas that may include additional cities that may not be considered a traditional metropolitan commuter sheds. As a result these estimates do not necessarily reflect employment levels of traditional metropolitan area but of a larger geographic unit. Additionally, for 44 of the 48 Chinese metros included in this report, statistics on employment are divided in two categories: private employment and employment in government-owned companies. The private employment is subject to high volatility due (among other factors) to significant levels of migration from rural to urban areas. Chinese authorities in different localities and at different administrative levels count rural migrants as urban residents at different paces, thus creating high variation in employment levels from one year to the other. To control for some of that volatility, Brookings employed an autoregressive moving average model (see Appendix B).

19. "Tianjin economy slows after rise to top GDP per capita," *Want China Times*, July 24, 2014.

20. Juan Zhao, "Research on the Financing of Small and Medium Enterprises," *International Journal of Business and Management* (3)11 (2008): 171–174. Liu Xiangfeng, "SME Development in China: A Policy Perspective on SME Industrial Clustering," in Hank Lim, ed., *SMEs in Asia and Globalization*, (Economic Research Institute for ASEAN and Asia, 2008).

21. Nancy Huang, Joie Ma, and Kyle Sullivan, "Economic Development Policies for Central and Western China," *China Business Review*, November 1, 2010.

22. "The next China," *The Economist*, July 29, 2010.

23. "City partners with Alibaba on E-commerce expo," available at: www.hangzhou.gov.cn/main/zpd/English/CityNews/T497363.shtml (December 2014).

24. Oil prices have collapsed more than 40 percent over the past six months. "The new economics of oil," *The Economist*, December 6, 2014.

25. World Trade Organization, "World Trade Report 2014" (2014).

26. United Nations World Tourism Organization, "Annual Report 2013" (2014).

27. For this installment of the *Global MetroMonitor*, Brookings used the 2013 metropolitan statistical areas delineations defined by the U.S. Office of Management and Budget. U.S. Office of Management and Budget, *Revised Delineations of Metropolitan Statistical Areas, Micropolitan Statistical Areas, and Combined Statistical Areas, and Guidance on Uses of the Delineations of These Areas*, OMB BULLETIN NO. 13-01 (U.S. Office of Management and Budget, 2013).

28. 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/.

29. ESPON Database 2013 and Personal Communication from Didier Peeters, researcher, the Institute for Environmental Management and Land-use Planning, Free University of Brussels, May 2012. For a discussion of metropolitan areas and functional urban areas in Europe, see Didier Peeters, "The Functional Urban Areas Database Technical Report" (European Observation Network for Territorial Development and Cohesion (ESPON), March 2011).

30. The purchasing power parity (PPP) rates come from a variety of sources such as the International Monetary Fund, the European Central Bank, and other national statistics agencies. 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 2009 for consistency, and then applied the 2009 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.

31. The GDP by county, estimated or forecasted, is obtained by 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 of Labor Statistics Quarterly Census of Employment and Wages (QCEW) as basis for the county employment estimates. For real GDP, Moody's uses chain-weighting for every industry.

32. It is also important to mention that Moody's Analytics GDP figures are lower than what other international agencies such as the IMF publish for the United States. This results in a more accurate depiction of the state of the U.S. economy, but results in an underestimation of economic performance when compared to other countries and metropolitan peers.

33. Philip Hans Franses, *Time Series Models for Business and Economic Forecasting*, (Cambridge: Cambridge University Press, 1998).

GLOBAL CITIES INITIATIVE
A Joint Project of Brookings and JPMorgan Chase

ABOUT THE GLOBAL CITIES INITIATIVE

The Global Cities Initiative aims to equip metropolitan leaders with the information, policy ideas, and global connections they need to bolster their position within the global economy. Combining Brookings' deep expertise in fact-based, metropolitan-focused research and JPMorgan Chase's longstanding commitment to investing in cities, this initiative aims to:

- Help city and metropolitan leaders in the United States and abroad better leverage their global assets by unveiling their economic starting points on such key indicators as advanced manufacturing, exports, foreign direct investment, freight flow, and immigration.
- Provide metropolitan area leaders with proven, actionable ideas for how to expand the global reach of their economies, building on best practices and policy innovations from across the nation and around the world.
- Create a network of leaders from global cities intent upon deepening global trade relationships.

The Global Cities Initiative is chaired by Richard M. Daley, former mayor of Chicago and senior advisor to JPMorgan Chase, and directed by Bruce Katz, Brookings' vice president and co-director of the Metropolitan Policy Program, which aims to provide decisionmakers in the public, corporate, and civic sectors with policy ideas for improving the health and prosperity of cities and metropolitan areas.

Launched in 2012, the Global Cities Initiative will catalyze a shift in economic development priorities and practices resulting in more globally connected metropolitan areas and more sustainable economic growth. Core activities include:

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