

Executive Summary

The global financial crisis of the late 2000s precipitated an economic downturn of such magnitude and reach that many now refer to the period as the “Great Recession.” According to the International Monetary Fund, global economic output, which had grown at an annual rate of 3.3 percent from 1993 to 2007, actually shrank by 2 percent from 2008 to 2009. A precarious economic recovery is now underway.

Aggregate views of the global economy, however, mask the distinct experiences of its real hubs—major metropolitan areas. Metro areas, which are economically integrated collections of cities, suburbs, and often surrounding rural areas, are centers of high-value economic activity in their respective nations and worldwide. And because metros form the fundamental bases for national and international economies, understanding their relative positioning before, during, and after the Great Recession provides important evidence on emerging shifts in the location of global economic resilience and future growth. The *Global MetroMonitor* examines data on economic output and employment in 150 of the world’s largest metropolitan economies, located in 53 countries, from 1993 to 2010, and makes the following findings:

The global economy is metropolitan-led

The 150 metropolitan economies profiled in the Global MetroMonitor exhibit highly diverse stages of development. Their per capita measures of Gross Value Added (GVA) range widely, from under \$1,000 in Hyderabad and Kolkata, India, to roughly \$70,000 in San Jose, U.S.A. and Zürich, Switzerland.

What is consistent about these metropolitan areas, however, is their function as locations for high-value economic activity in their respective nations and world regions. Nearly four in five boast average incomes (as proxied by per capita GVA) that exceed averages for their nations. This is particularly true in rapidly emerging areas of Eastern Europe and Asia, where major metro incomes exceed those for nations by average margins of at least 80 percent.

As a result, these metro areas punch above their weight in national and global economic output. In 2007, they accounted for just under 12 percent of global population, but generated approximately 46 percent of world GDP.

Downturn and recovery are shifting growth

Virtually no place completely escaped the effects of the global financial crisis and ensuing economic downturn in the late 2000s. Yet impacts across the 150 global metropolitan areas were highly uneven, as illustrated through the *Global MetroMonitor’s* focus on the combined income and employment performance of these places during three distinct economic periods from the past two decades:

Pre-recession

Between 1993 and 2007, roughly half of the metro areas that achieved the strongest growth in GVA per capita and employment were located in rising nations of Asia, Latin America, and the

Middle East that benefited from new heights of global economic integration. Metro areas such as Shenzhen, China and Bangalore, India roughly tripled their income, and employment in Singapore and Belo Horizonte, Brazil grew by more than half over the 14-year period.

Portions of the world's more industrialized regions, including the United States and Europe, also registered strong metro performers during that time. Eastern European metros such as Sofia and Krakow, as well as Dublin in Western Europe, achieved rapid growth in income. In the United States, Las Vegas, Phoenix, and Austin posted major employment gains over the same period. Overall, however, U.S. metros on average ranked slightly behind their European counterparts, and well behind their counterparts in the rest of the world, on economic performance through much of the 1990s and early- to mid-2000s.

Recession

The negative impact of the global economic downturn, commencing in 2008, was widespread among the 150 metro areas. Roughly seven in eight lost either employment or income in at least one year between 2007–2008 and 2009–2010.

But for several global metropolitan areas, the late 2000s marked more of a temporary slowdown than a Great Recession. The top-ranked metro performers for the most part experienced no decline in either employment or income from 2007 to 2010. Fully 28 of the 30 top-ranked metros during that period were located outside of the United States and Europe, with China accounting for the top five. Australian metros (Melbourne, Brisbane, and Sydney) registered strong performance, due to their important economic linkages with stable East Asian economies. Latin American metros proved resilient as well, with Lima, Buenos Aires, Bogota, and three Brazilian metros ranking among the top 30.

By contrast, many of the metros in the United States and Europe that flew highest before the recession experienced tremendous falls. Dublin, Madrid, and the three Baltic capitals (Riga, Tallinn, and Vilnius), along with Las Vegas and Riverside (California) in the United States, moved from the top 30 spots pre-recession to the bottom 30 spots during the recession. These regions exhibited significant asset bubbles in the 2000s, as evidenced by the fall in home prices in their respective nations in recent years. Overall, the Great Recession appeared to hit U.S. metros hardest, while it improved the relative position of metros outside the United States and Europe.

Recovery

The most recent year, from 2009 to 2010, appears to have further strengthened the relative economic standing of metro areas in the rising nations of Asia, Latin America, and the Middle East. Of the top 30 ranked metros in this period, a diverse group of 29 was located outside the United States and Europe. China and India alone accounted for 10, Latin America registered seven, and the Middle East and North Africa recorded four. Most of these metros posted annual growth rates of at least 2.5 percent in employment, and 5 percent in income, in the first year of worldwide recovery.

While the recession hit U.S. metros harder than their European counterparts, the recovery seems slower to take hold in European than American metros. Metros along Europe's western, eastern, and northern peripheries, from Porto and Valencia, to Thessaloniki and Sofia, to Helsinki and Stockholm, anchor the bottom 30 economic performers from 2009 to 2010. Meanwhile, several U.S. metros that suffered severe economic declines during the recession, such as Detroit and Cleveland, posted significant rebounds in their rankings on the strength of robust income growth, even as metros such as Atlanta and Las Vegas await a stronger recovery.

The upshot: The past two decades have seen lower-income metro areas in the global East and South "close the gap" with higher-income metros in Europe and the United States, and the worldwide economic upheaval has only accelerated the shift in growth toward metros in those rising regions of the world.

National context and industrial patterns shape metro performance

Beyond indicating economic opportunities within broad world regions and different stages of development, metros' recent performance also reflects intrinsic factors such as their industrial base, and the impact of national fiscal, monetary, and trade policies.

First, the presence and magnitude of certain industries within metro areas related strongly to economic performance, though these differed by period and world region. Metros with high shares of their output in *construction* performed much better than average in the pre-recession period, particularly in the United States, but much worse than average in the recovery, particularly in Western Europe and other high-income regions. Before the recession, an *energy and manufacturing* focus was associated with strong performance of lower-income metro areas, particularly in China and the Middle East, and weaker performance of U.S. metros. Higher-income *financial and business services* centers in the Asia/Pacific and North American regions performed less well than others in the pre-recession and recession periods. And high output in *non-market services*, such as government, health, and education, was a boon for European and American metros during the recession, signaling that those industries remained relatively healthy amid market turmoil.

Second, national context does matter. In any given period, roughly half to three-quarters of metro economic performance was associated with respective national economic performance. For example, the analyses above point to distinct economic dynamics among U.S. metros that made their recession generally deeper than in other world regions, but that may also account for the stronger rebound some U.S. metros are posting compared to their European counterparts. Examining national economies alone, however, overlooks the important variations in metro performance that separated nearby metros such as Leipzig (#77) and Berlin (#144) in the pre-recession period; Abu Dhabi (#16) and Dubai (#97) during the recession period; and Cleveland (#49) and Buffalo (#120) in the recovery period.

As global metro areas emerge from the shadow of the Great Recession, they also find themselves in markedly different places along their own growth trajectories. Many in Asia and Latin America were scarcely affected by the recession at all, or have posted a full recovery.

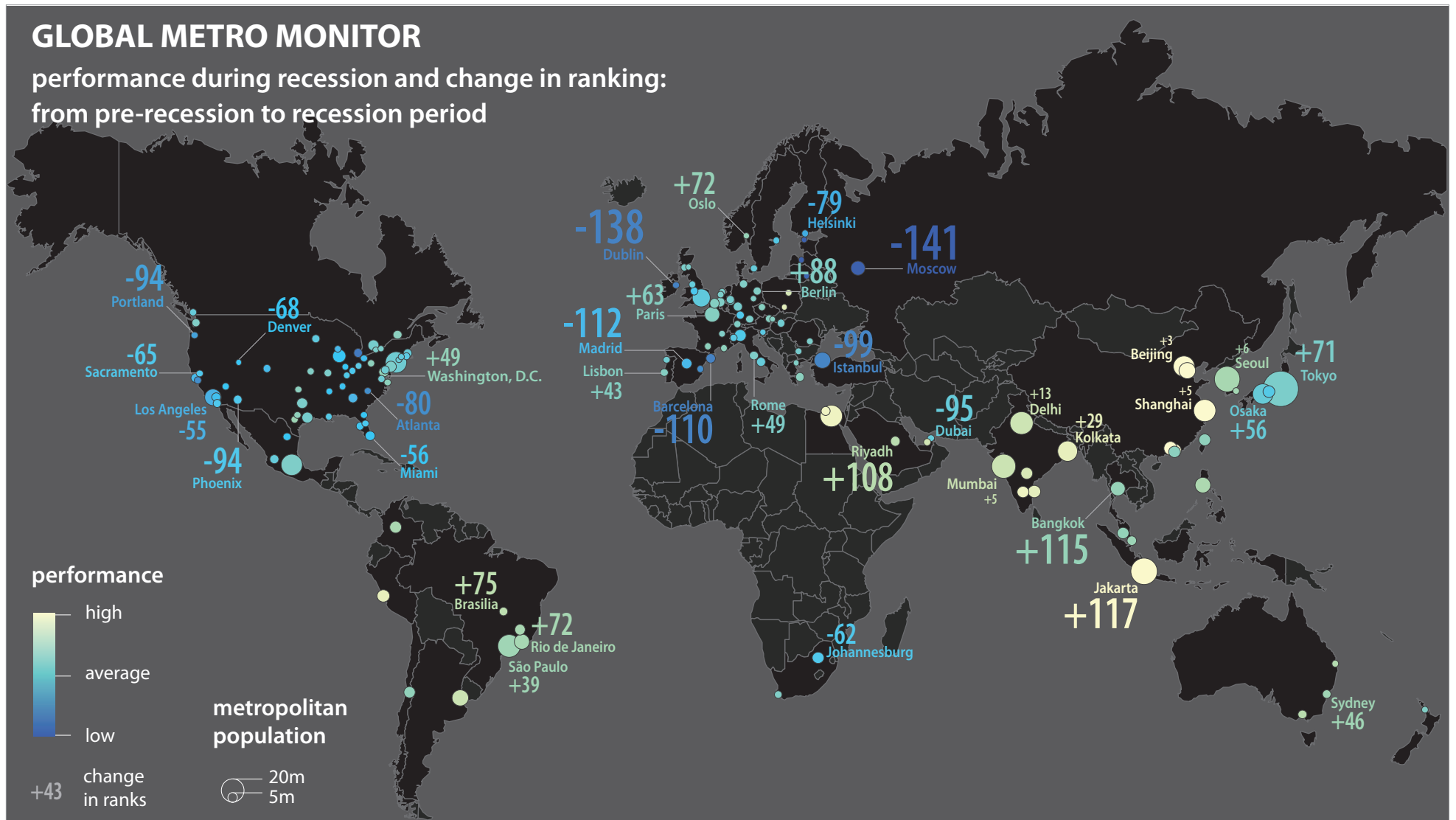
Several in the United States and other high-income regions have rebounded to their prior employment or income level, but not yet both. About half of the 150 continue to lose ground on one of the key measures, in most cases employment, and the bulk of these metros are in Western Europe and the United States. And a small handful of metros, most in Europe, continued to decline in both employment and income through 2010 as the recession raged on.

The *Global MetroMonitor* thus portrays a world economy whose continued transition will be driven in large part by the distinct experiences of its powerful network of major metropolitan economies. As metropolitan leaders worldwide confront the challenges and opportunities that accompany continued global economic integration, and many seek new growth models to replace the old ones, the shifting metro map points toward an emerging array of productive, metro-based economic relationships that could drive regional and national prosperity in the decades to come.

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GLOBAL METRO MONITOR

performance during recession and change in ranking:
from pre-recession to recession period



Lower-Income Asian and Latin American Metro Areas are Leading Growth in the Global Recovery

Metro Economic Performance Rankings, Pre-Recession (1993-2007), Recession (2007-2010), and Recovery (2009-2010) Periods

Pre-Recession	Recession	Recovery		Pre-Recession	Recession	Recovery	
44	143	1	Istanbul	71	75	39	Dallas
1	4	2	Shenzhen	30	17	40	New Delhi
16	11	3	Lima	58	124	41	Monterrey
18	33	4	Singapore	109	89	42	Baltimore
41	38	5	Santiago	5	16	43	Abu Dhabi
8	3	6	Shanghai	98	102	44	Minneapolis
3	2	7	Guangzhou	76	30	45	Sydney
4	1	8	Beijing	147	146	46	Detroit
34	24	9	Manila	9	150	47	Moscow
100	28	10	Rio de Janeiro	61	129	48	Nashville
15	14	11	Hyderabad	135	131	49	Cleveland
24	19	12	Mumbai	79	60	50	Seattle
7	9	13	Bangalore	78	32	51	San Antonio
47	22	14	Melbourne	143	72	52	Tokyo
69	98	15	Guadalajara	65	141	53	Charlotte
39	10	16	Kolkata	133	68	54	St. Louis
31	12	17	Chennai	26	52	55	Bratislava
12	5	18	Tianjin	38	15	56	Warsaw
60	18	19	Buenos Aires	94	92	57	Boston
123	6	20	Jakarta	146	109	58	Nagoya
53	39	21	Taipei	89	29	59	Busan
42	27	22	Belo Horizonte	149	93	60	Osaka
17	37	23	Kuala Lumpur	91	84	61	Houston
129	21	24	Riyadh	118	118	62	Cincinnati
70	31	25	Sao Paulo	67	82	63	Toronto
25	40	26	Austin	27	23	64	Brisbane
74	45	27	Montreal	29	73	65	Bucharest
36	8	28	Alexandria	107	121	66	Memphis
37	7	29	Cairo	48	123	67	Salt Lake City
72	48	30	Hong Kong	20	114	68	Phoenix
46	25	31	Bogota	103	90	69	Richmond
95	20	32	Brasilia	110	91	70	Bridgeport
32	26	33	Seoul	139	110	71	Louisville
88	66	34	Mexico City	43	112	72	San Diego
150	35	35	Bangkok	105	103	73	Providence
92	42	36	Virginia Beach	83	120	74	Tampa
85	36	37	Washington	73	142	75	San Jose
23	13	38	Krakow				

Source: Analysis of data from Oxford Economics, Moody's Economy.com, and Cambridge Econometrics

Pre-Recession	Recession	Recovery	
132	46	76	Oklahoma City
90	88	77	New York
66	122	78	Miami
33	50	79	Prague
52	44	80	Toulouse
111	104	81	Columbus
115	127	82	Chicago
141	135	83	Milwaukee
64	132	84	Denver
40	119	85	Orlando
84	43	86	Marseille
148	107	87	New Orleans
122	49	88	Vienna
126	85	89	Dusseldorf
80	125	90	Jacksonville
55	55	91	Auckland
63	95	92	Vancouver
93	63	93	Lyon
127	61	94	Hamburg
50	115	95	Sacramento
114	51	96	Paris
104	54	97	Lille
106	34	98	Oslo
77	65	99	Leipzig
101	99	100	Copenhagen
142	58	101	Zurich
45	139	102	Portland
137	105	103	Turin
131	81	104	Cologne
57	86	105	Budapest
116	67	106	Rome
28	130	107	Riverside
134	113	108	Stuttgart
102	76	109	Munich
120	111	110	Milan
144	56	111	Berlin
96	53	112	Lisbon
130	83	113	Frankfurt

Pre-Recession	Recession	Recovery	
81	106	114	Ljubljana
62	70	115	Edinburgh
82	137	116	Los Angeles
75	64	117	Cape Town
13	147	118	Vilnius
86	79	119	Glasgow
117	69	120	Buffalo
138	101	121	Hartford
124	59	122	Kansas City
68	100	123	London
59	138	124	Helsinki
112	133	125	San Francisco
125	71	126	Rotterdam
119	78	127	Philadelphia
136	77	128	Rochester
128	41	129	Pittsburgh
87	108	130	Stockholm
121	117	131	Birmingham
113	74	132	Amsterdam
97	62	133	Brussels
108	96	134	Manchester
140	94	135	Naples
10	80	136	Sofia
99	126	137	Indianapolis
21	149	138	Tallinn
56	136	139	Atlanta
145	87	140	Oporto
19	47	141	Athens
22	134	142	Madrid
54	116	143	Johannesburg
11	148	144	Riga
49	140	145	Valencia
14	128	146	Las Vegas
51	57	147	Thessaloniki
35	145	148	Barcelona
2	97	149	Dubai
6	144	150	Dublin

Introduction

The global financial crisis of the late 2000s precipitated an economic downturn of such magnitude and reach that many now refer to the period as the “Great Recession.” According to the International Monetary Fund, global economic output, which had grown at an annual rate of 3.3 percent from 1993 to 2007, actually shrank by 2 percent from 2008 to 2009.¹ A precarious economic recovery is now underway.

Aggregate views of the global economy, however, mask the distinct experiences of its most important hubs—major metropolitan areas. These economically integrated collections of cities and their surrounding areas are centers of high-value economic activity in their respective nations and worldwide. They play different but complementary economic roles in national and international contexts, by virtue of location, stage of development, industrial base, demographics, and local and national policies that set the conditions for economic performance.²

Because metropolitan areas form the fundamental bases for national and international economies, understanding their relative positioning before, during, and after the Great Recession provides important evidence on emerging shifts in the location of global economic resilience and future growth, and the underlying factors that might propel and sustain that growth.

Building on the Brookings Metropolitan Policy Program’s MetroMonitor, which tracks the economic performance of U.S. metro areas over the course of the recession and recovery, the Brookings and LSE Cities at the London School of Economics partnered to produce this Global MetroMonitor, which examines data on economic output and employment in 150 of the world’s largest metropolitan economies, located in 53 countries on six continents.³ They include the 50 largest metropolitan economies in the United States; the national capital economies of the 25 E.U. member states plus the 25 largest other metro economies in Europe; and 50 of the largest metro economies in the remainder of the world, including representatives in Asia, Australia/New Zealand, Latin America, Canada, and Africa.

The Global MetroMonitor is by no means the only report to ever study a cross-section of global metropolitan areas. Organizations worldwide produce various world city rankings on a regular basis. For instance, in 2010, *Foreign Policy* magazine published a Global Cities Index, ranking 65 large metro areas worldwide on a variety of economic, social, cultural, and political dimensions.⁴ The Partnership for New York City publishes an annual report examining how 21 global cities perform as centers of business opportunity.⁵ Brookings has published research in

¹ IMF World Economic Outlook Database, October 2010.

² Cite needed on importance of city-regional economies worldwide; see also Alan Berube, “MetroNation: How U.S. Metropolitan Areas Fuel American Prosperity” (Washington: Brookings Institution, 2007).

³ See the Data and Methods section for more on these metropolitan areas and how they were chosen.

⁴ “Metropolis Now: The Global Cities Index 2010.” *Foreign Policy*, September/October 2010.

⁵ “Cities of Opportunity” (Partnership for New York City and PriceWaterhouse Coopers, 2010).

the past examining the position of U.S. cities and others in a “world city network” based on the location of multinational advanced-services firms. And Boston Consulting Group recently published a report that classified cities in what it calls “emerging markets,” by their role in the international and regional economies.⁶ This report differs from those in focusing purely on key economic outcomes for global metro areas, not just the cities at their core, and examining a range of factors that may help explain their recent economic performance. The Global Urban Competitiveness Report, published by a team of Chinese and American researchers, offers a comprehensive analysis of economic indicators for 500 metros worldwide, but stops short of analyzing the Great Recession and its aftermath for these global centers.⁷ In these ways, the Global MetroMonitor makes a unique and important contribution to understanding these 150 metro areas’ contemporary economic performance and position.

Not surprisingly, these metro areas, like their respective nations, exhibit highly diverse stages of development. Their per capita Gross Value Added (GVA), a measure of income per person, ranged widely in 2007, from under \$1,000 in Hyderabad and Kolkata, India, to roughly \$70,000 in San Jose, USA and Zürich, Switzerland.

These metropolitan areas do, however, consistently function as locations for high-value economic activity in their respective nations and world regions. Nearly 80 percent of the metros boast income (proxied by per capita GVA) above their respective national averages. The “metro edge” is particularly large in rapidly emerging economies such as Eastern Europe, Asia, Latin America, and the Middle East, where the income in major metros exceeds national incomes by average margins of at least 80 percent (Figure 1-1).⁸

As a result, these metro areas punch above their weight economically at the national and global scale. In 2007, they accounted for just under 12 percent of global population, but contained XX percent of global jobs, and generated an astonishing 47 percent of world GDP (Figure 1-2).

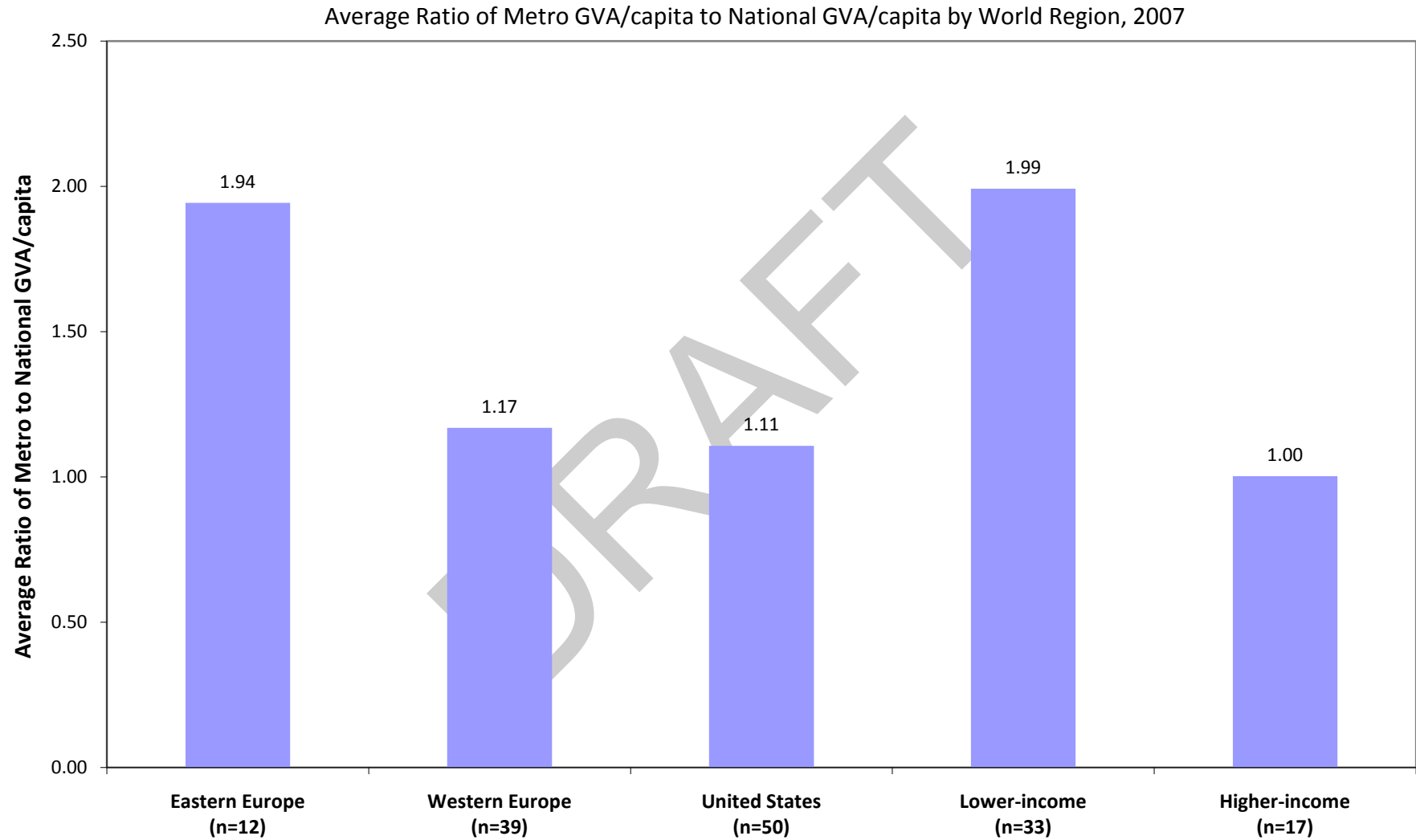
For all their economic might, almost none of these places completely escaped the effects of the global financial crisis and ensuing economic downturn in the late 2000s. Yet as this report illustrates, the recession’s impacts across the 150 global metropolitan areas were highly uneven. For some, it was no more than a glancing blow. For others, the downturn appears to have fundamentally upended the prevailing growth model. Still, the individual and combined trajectories of these metropolitan areas going into, and coming out of, the Great Recession

⁶ David Jin and others, “Winning in Emerging-Market Cities: A Guide to the World’s Largest Growth Opportunity” (Boston Consulting Group, 2010).

⁷ Pengfei Ni and Peter Karl Kressl, *The Global Urban Competitiveness Report—2010* (Cheltenham, UK: Edward Elgar, 2010). The *GUCR* focuses much more on the basic economic structures and competitiveness of city-regions worldwide, and is thus much more a look into past trends than the Global MetroMonitor, which focuses more on contemporary metropolitan trajectories.

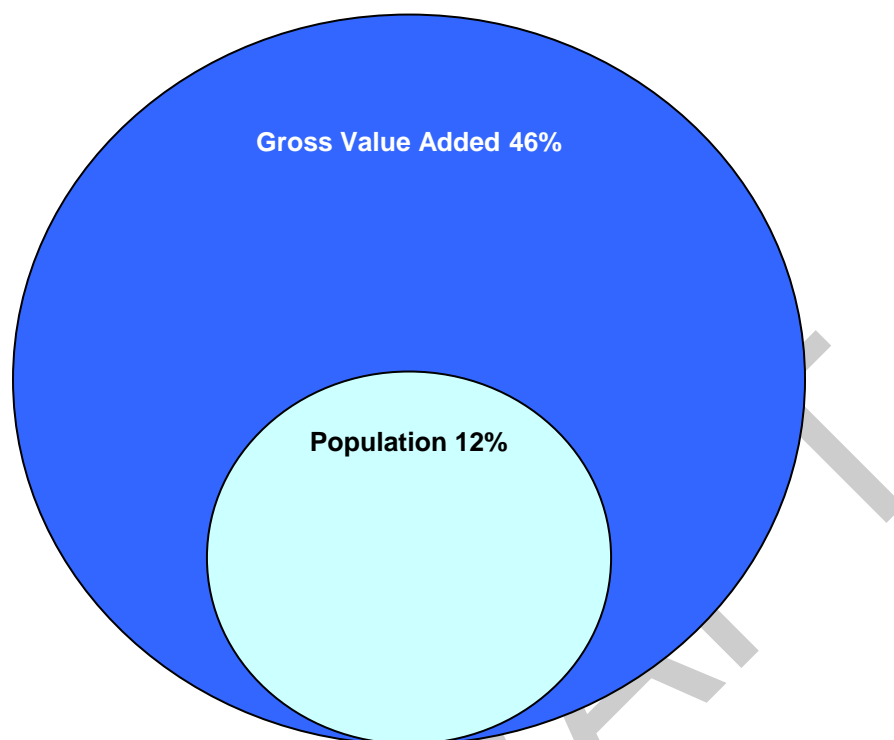
⁸ In addition to indicating the power of agglomeration economies in these world regions, much higher incomes in large metros than other areas of these nations may also reflect the relative lack of national or super-national policies to redistribute income to smaller or lower-income places, exemplified in industrialized regions by programs such as the European Regional Development Funds.

Figure 1-1: Metro Incomes Exceed National Incomes in Most World Regions



Source: Analysis of Oxford Economics, Moody's Economy.com, and Cambridge Econometrics data

Figure 1-2. Major Global Metros Punch Above Their Weight Economically
Share of World Total in 150 Metro Areas by Category, 2010



Source: Analysis of Oxford Economics, Moody's Economy.com, and Cambridge Econometrics data. Some values based on forecasted estimates, please see Data and Methods section for further details

offer crucial signals about the present and future direction of the global economy, including how its growth may be distributed among different types of places.

The Global MetroMonitor proceeds from here in five sections. The **Data and Methods** section describes the sources of information for this report and how they are used to rank, describe, and explain metropolitan economic performance. The three sections that follow—**Pre-Recession**, **Recession**, and **Recovery**—examine patterns of economic performance among the 150 metropolitan areas by world region, and by key metropolitan characteristics, for three time periods before, during, and after the global economic downturn. A final section, **Looking Back and Looking Ahead**, offers insights on metropolitan performance across the recession and early stages of recovery, including what the results indicate for the future economic prospects of global metropolitan areas, and policies to support their success.

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Data and Methods

The *Global MetroMonitor* assesses the economic performance of 150 metropolitan areas worldwide. It builds on the *MetroMonitor*, a quarterly Brookings publication focused on the economic performance of the 100 largest U.S. metropolitan areas during the recent recession and ongoing recovery. As the report demonstrates, these global metro areas, which include cities and surrounding rural and urban areas that together form integrated regional economies, account for significant shares of national and global output and jobs, and represent an important lens through which to view the uneven trajectory of economic growth worldwide.

Selection and Definition of Metropolitan Areas

The *Global MetroMonitor* evaluates 150 of the largest metro economies worldwide, as measured by their total economic output, while it also portrays metro economic performance in a broad cross-section of world regions (Figure 2-1). The United States and Europe are each represented with 50 metros.⁹ An additional 50 metro areas were selected from other regions of the world and include 28 in Asia and Australia/New Zealand, 14 in North and South America, and eight in Africa and the Middle East. In each of these three world regions, the priority was to select the largest metro economies for which complete, comparable data were available.¹⁰

The 50 U.S. metropolitan areas represent the largest regional economies in the U.S., as measured by gross metropolitan product (GMP) in 2008 (the most recent year for which public data are available). In the United States, metro areas are defined by the federal Office of Management and Budget (OMB) to include one or more large urban cores plus outlying areas that have social and economic linkages to the urban core(s). The 50 U.S. metro areas in this report vary in size from just more than 900,000 residents in the Bridgeport-Stamford-Norwalk, CT metropolitan area to more than 19 million residents in the New York-Northern New Jersey-Long Island, NY-NJ-PA metropolitan area, and their average size is 3.4 million residents.

In Europe, there is no officially accepted metropolitan area standard, as there is with the OMB standard used in the United States. Among existing definitions of European metropolitan areas, the approach developed by ESPON was deemed most appropriate.¹¹ It is based on the aggregation of E.U. Tier 3 (NUTS 3) administrative regions which range from 150,000 to 800,000 inhabitants. The Nomenclature of Territorial Units of Statistics (NUTS) is developed by Eurostat

⁹ The United States and the European Union together account for roughly 50 percent of world G.D.P. (IMF World Economic Outlook Database, October 2010). Thus, their metro areas are somewhat over-represented in this analysis, which reflects in part the greater availability of comparable metropolitan data within these regions versus ones outside Europe and the United States. Regional analysis in the report treats Moscow as an Eastern European metro, and Istanbul (in the E.U. candidate country of Turkey) as a lower-income metro.

¹⁰ The metros featured in *Global MetroMonitor* include, for example, 87 ranked among the 100 largest by GDP in 2008 in John Hawksworth, Thomas Hoehn, and Anmol Tiwari, "Which Are the Largest City Economies in the World and How Might This Change by 2025?" PriceWaterhouseCoopers *UK Economic Outlook*, November 2009. That list excludes a number of U.S. metro areas featured here, such as Sacramento and Kansas City, that by our estimates would also rank among the 100 largest worldwide.

¹¹ ESPON is the European Observation Network for Territorial Development and Cohesion.

based on the administrative divisions of European nations and the NUTS regions are thus comparable across European countries. Defining metro areas in this way is desirable because it relies on consistently defined underlying geographies and enables us to ensure basic comparability with U.S. metro areas. Our sample of European metros includes 23 capital metro areas and 27 other large metropolitan areas based on population size and area. In terms of population, the largest European metropolitan area is London with 14.8 million residents, the smallest is Ljubljana with just over a half million inhabitants, and the average is 3 million inhabitants.

The 50 metropolitan areas outside the United States and Europe were selected with respect to both size and geographic spread in Asia, Oceania, Africa, Latin America, and non-U.S. North America. Here, the final choice of metro areas was heavily dependent on data availability and comparability, and the lack of reliable economic data explains the unfortunate absence of some of the world's largest and fastest growing metropolitan areas including Dhaka, Karachi, Kinshasa, and Lagos. Particularly in Africa and Asia, not all countries have created administrative areas or at least statistical boundaries that yield reliable economic estimates for metropolitan areas. In certain countries or areas where this problem exists (such as India), data from the administrative city are used if only a small proportion of the metropolitan area's population is thereby discarded.¹² Similarly, the wider province or region is chosen as a proxy for the metropolitan area if it is not much larger in terms of population. The average population of this final set of 50 metropolitan areas is just over 10 million, given the much larger average size of Asian metro areas.¹³

Data Sources

To assess the economic performance of 150 metropolitan areas, the Global MetroMonitor focuses on the following baseline data: Gross Value Added (GVA), employment, and population (which allows us to assess GVA per capita) from 1993 to 2010. In addition, GVA and employment are broken down by major industry sector (see below). Data availability and comparability precluded expanding the investigation to other economic indicators of interest, such as house prices and unemployment rates.

There are two major technical considerations with respect to the data in this analysis. The first stems from this report's focus on the recent impact of the recession and the resulting need to analyze data for 2008, 2009, and 2010 that are not yet available through most national statistical offices. Three data providers supplied these estimates: Moody's Economy.com for the United States, Cambridge Econometrics for Europe, and Oxford Economics for the rest of the world.¹⁴

¹² The metro population used in these cases was the population of the corresponding Urban Agglomeration, as published in the UN's World Urbanisation Prospects Database, 2009 revision.

¹³ Tokyo, in particular, alone increases the average size of Asian metros by 680,000 inhabitants, given its population of 35 million.

¹⁴ Brookings subscribes to a Moody's Economy.com metropolitan economic database for the U.S. *MetroMonitor* and related efforts; LSE subscribes to a Cambridge Econometrics database for similar data in the European context.

By its very nature, relying on forecasted data introduces a measure of uncertainty into any analysis. While the degree of uncertainty involved cannot be known, it is ultimately determined by the quality of the forecasting model used by each data provider. Furthermore, because each data provider uses a different model, our comparisons may be affected by differences in model only. While each provider used the best available data to model the recent economic performance of these metropolitan areas, the nature of the exercise demands some caution when interpreting the results. Findings regarding metropolitan performance that are based on estimates for 2009 and 2010 should thus be treated as preliminary in nature, and subject to further revision as national statistical agencies compile and publish official metro-level estimates in the coming year(s).

The second major technical consideration results from the international scope of our analysis. While our data are conceptually consistent across countries, we are limited to the data collection and statistical methods utilized by each country's statistical agencies. Consequently each indicator may be calculated slightly differently on a country-by-country basis.

For U.S. metropolitan areas, employment data come from the U.S. Bureau of Labor Statistics' Local Area Unemployment Statistics (LAUS) program. LAUS data are model-based, relying on data from the Current Population Survey (CPS, the source for our U.S. level employment estimates) as the primary input. Employment is measured as of July in each year.¹⁵ Population data come from the U.S. Census Bureau's Population Estimates Program, which are model-based estimates that rely on decennial census data as primary inputs; the Census Bureau measures population as of July 1st of each year.¹⁶ Moody's Economy.com supplies the GVA data, which are derived from the Bureau of Economic Analysis' (BEA) gross domestic product by state estimates. They parcel out state-level GDP data to counties on an industry-by-industry basis according to each county's share of state employment and sum the resulting county totals to arrive at a metropolitan total.¹⁷ The last year of available data from BEA was 2008 and so data for 2009 and 2010 have been forecasted. Moody's Economy.com also provides GVA by industry data, classified according to the North American Industry Classification Standard (NAICS).

For European metros, Cambridge Econometrics relies primarily on the Eurostat REGIO database for underlying economic data, and the International Labour Organization (ILO) for population and labor force data. The forecasting model used by CE is called the European Regional Economic Model (EUREGM), which has a "medium-term focus and tries to capture a variety of

Brookings and LSE jointly contracted with Oxford Economics to supply data on 50 metro areas outside Europe and the United States.

¹⁵ At the time of this analysis, July was the most recent month for which revised employment data were available from BLS.

¹⁶ The most recent data available were for July 1, 2009. To estimate the population in 2010, the annual average growth rate from 2007 to 2009 was applied to the 2009 estimate.

¹⁷ In the United States, metropolitan areas are aggregations of counties, which are local levels of government below the state level, but typically above the municipal level.

factors that can lead to both regional divergence and convergence.” A primary input to this model is a metric of “economic potential” which “can be viewed as closeness to markets and to suppliers, with a high economic potential associated with enhanced production, supply and distribution conditions.” Forecasts for GVA rely primarily on industry structure, population density, and “economic potential” to predict future output levels. Forecasts for employment proceed in a similar fashion, but depend on estimates of GVA by sector and assumptions about technological trends. Cambridge Econometrics provides GVA by industry data, classified according to the ISIC Rev.3.1 standard into the following categories: Agriculture (A), Energy and Manufacturing (C,D,E), Construction (F), Distribution, Hotel & Restaurants, Transport, Storage and Communications (G,H,I), Financial Intermediation, Real Estate, Renting and Business Activities (J,K) and Non-Market Services (L,M,N,O,P).¹⁸

Oxford Economics data are based on a wide variety of sources, including national statistical agencies or other data providers where available. Where data were not available, Oxford Economics relies upon its national-level forecasts provided by the Oxford Economics Global Economic Model to provide a forecast based on the historical relationship between metropolitan area industry data and the national level figure. According to Oxford Economics, “the forecast for each metropolitan area is essentially shaped by how strong demand is likely to be for each industry in that location.”

Time Periods

Three time periods between 1993 and 2010 were identified in order to measure the performance of all metropolitan areas in three distinct economic contexts, which the report refers to as *pre-recession*, *recession*, and *recovery*.

- The *pre-recession* period gives an indication of the long term, underlying economic trend each metropolitan area followed prior to the recession. It further serves as the baseline period from which to assess the degree to which metros were affected by the crisis. For the pre-recession period, a fixed timeframe from 1993 to 2007 was used, based on the availability of data across all metros extending back to 1993, and the start of the recession

¹⁸ In the United States, industries are classified according to the North American Industry Classification System (NAICS) while for much of the rest of the world industries are classified according to the International Standard Industrial Classification (ISIC). Certain ISIC sectors align very well with their NAICS counterparts, as is the case with the “Hotels and restaurants” industry (ISIC) and the “Accommodation and Food Services” industry (NAICS). In other cases, such as manufacturing, the match is quite poor. ISIC defines manufacturing much more broadly than NAICS does—a large portion of what is considered to be construction under the NAICS scheme is considered to be manufacturing under ISIC. To address these kinds of discrepancies, we used detailed NAICS-based industry data from Moody’s Economy.com to approximate ISIC sectors. In the case of the manufacturing mismatch, having detailed industry data allowed us to reassign several NAICS-based construction industries to the ISIC-based manufacturing sector, providing for more comparable definitions of the manufacturing sector between datasets. At the national level for most sectors, this strategy works well; the largest error is associated with our NAICS-based approximation of the ISIC construction sector, which is roughly 10 percent larger than it otherwise would be if the data were originally defined using the ISIC scheme.

in the United States in December 2007.¹⁹ Therefore, 2007 is treated as the last year in which all countries worldwide were not yet affected by the Great Recession, though clearly some metros, countries, and world regions suffered recessions of their own during this period.

- The *recession* period measures the impact of the recent worldwide economic downturn on each metro area. For this period, the year of minimum annual growth rate (for GVA per capita and employment) between 2007 and 2010 was identified for each metro. This method takes into account differences in when the recession affected each metro area or world region. Selecting the minimum one-year growth rate means comparing exactly the same thing everywhere, and avoids averaging out the recession drop across the years that preceded or followed it (as usual peak-to-trough calculations would).²⁰ This method also makes it easier to account for the many metropolitan areas that did not experience actual declines in GVA per capita and/or employment over the recession period, but whose growth rates still fell compared to their long-term average.
- The *recovery* period refers to 2009 to 2010, a period during which most of the 150 metro areas analyzed experienced growth in the wake of a downturn, or accelerated growth relative to the recession period. Assessing both recession and recovery periods then allows for some preliminary conclusions on how the recent recession may have changed the global metro economic landscape. Using this fixed period further helps identify metropolitan areas that are still in recession, and how well metropolitan areas are recovering compared to their respective nations.

The terms *pre-recession*, *recession*, and *recovery* thus refer to the condition of the broader global economy during each of these periods, and not necessarily to the experience of all metropolitan areas studied here. For instance, some American metropolitan areas such as Detroit were losing jobs and output well before the onset of the worldwide downturn. Large employment losses came a bit later to certain parts of Europe than to the rest of the world, extending into 2009-2010. And as the analysis explains, several metro areas in Asia and Latin America (and two Polish metro areas) experienced no decline in either output or employment in any year from 2007 to 2010. In this way, the *Global MetroMonitor* provides a snapshot of metro performance at key stages leading up to, during, and after the global economic crisis, but does not attempt to measure the specific effects of the crisis on each metro area.

Indicators, Scoring and Ranks

¹⁹ The start of the period in 1993 also reflects the end of an initial period of volatility in Europe associated with the collapse of the Soviet regime and transition of the former Eastern Bloc countries.

²⁰ Note that we did attempt to calculate peak-to-trough/slowed growth measures for metro areas during the recession period, and that the ultimate ranking of metro areas by this method was very similar to that achieved using the minimum annual growth rate method.

The report measures the economic performance of metropolitan areas using two main indicators: the annual growth rate of real GVA per capita; and the annual growth rate of employment. Therefore, this study is concerned with the dynamics of metropolitan economies, and how metros compare in terms of their growth performance and potential, rather than their absolute performance levels.²¹ These two indicators reflect the importance that people and policy makers attach to achieving rising incomes and standards of living (GVA per capita), and generating widespread labor market opportunity (employment). GVA per capita, unlike absolute GVA, controls for contributions to GVA that follow from population growth alone (especially over longer time periods). Throughout the report, we refer to GVA per capita as “income,” and change in the measure as “income growth.”

In order to create a ranking of metropolitan areas in each of the three periods, the *Global MetroMonitor* combines calculations of each metro area’s performance on income and employment growth, giving equal weight to each sub-measure. In order to combine these annual growth rates, each is standardized using the inter-decile range standardization method. This method compares each value of a variable (X_i) to the median (X_{med}), which is then divided by the distance between the value of that variable at the 90th percentile of the distribution (X_{90}) and the 10th percentile (X_{10}):

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

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. 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.

Standardized scores are obtained by applying the inter-decile range standardization to annual income and employment growth rates, then adding those values together to yield a final score for each period for each metro area. That score is used to rank the 150 metropolitan areas according to their performance during each of the three periods.

Additional Analysis

²¹ Employment growth does not take into account changes in the size of the labor force, in the way that GVA per capita accounts for changes in population. This choice reflects the lack of comparable data across metro areas on the size of the labor force over time, which would enable one to calculate the employment rate.

Subsequent sections of this report examine metro economic performance during one of the three time periods: pre-recession, recession, and recovery. Each section first examines the top- and bottom-performing metro areas based on their standardized scores, with particular focus on those ranking 1 through 30 (the top fifth) and 121 through 150 (the bottom fifth). Each section also examines relationships between metropolitan economic performance and other potentially important metro characteristics, including:²²

- *Population Size*: Are smaller metro areas growing faster economically than larger ones? Can large metro areas more easily absorb economic shocks given their diversity and larger internal demand for goods and services? The role of metro population and population growth are examined here²³
- *Income*: Are poorer metro areas catching up with wealthier ones economically, and are the recession and recovery altering longstanding trends? GVA per capita in 2007 is used here to examine the relationship between income levels and growth in employment and income in each period²⁴
- *National context*: How closely does metro economic performance track national economic performance?²⁵ Which metro areas are leading or lagging their respective countries over the long and short runs? Differences between metro and national income and employment growth by period are examined here, taking into account the share of national GVA for which different metros account²⁶
- *Industrial structure*: How did metropolitan output shares in different industry sectors relate to broader performance in the three time periods? The association between metro

²² In most cases, the report uses simple correlation analysis to measure the magnitude and statistical significance of the relationship between two continuous variables of interest.

²³ Note again that metros were selected for analysis based primarily on the size of their economies, not the number of inhabitants. For example, Chongqing (with almost 8 million residents) and some 80 other Chinese and 40 Indian metros with populations of at least 1 million are not included. Nevertheless, the metros profiled here are relatively large and established places, and exclude many “emerging-market cities” that are developing rapidly.

²⁴ GVA data were provided in 2000 constant dollars for the United States metros, 2000 constant Euros for the EU metros, and constant local currencies normalized to a variety of years for the rest of the metro areas. To calculate comparable income levels, we first normalized these data to the year 2000 using metro- and country-specific GDP deflators. Next we used 2007 market exchange rates to convert all currencies to dollars. Finally, we used a modified Jenks Natural Breaks Classification method to categorize metro areas into 5 income groups based on GVA per capita in 2007.

²⁵ The relationship between national performance and metro performance, especially in the recession and recovery periods, likely reflects not only actual correspondence between the two, but also statistical correspondence, in that models of metropolitan income (from both national statistical agencies and our data forecast providers) are based in part on national trends. This is a limitation of the current analysis that Brookings and LSE intend to revisit in future updates to the *Global MetroMonitor* based on official government data on metropolitan performance.

²⁶ Two metro areas in this analysis, Hong Kong and Singapore, are treated as coincident with national boundaries and thus excluded from metro/national comparisons.

economic performance levels and shares of output in each of five industry categories are analyzed here.

- *Housing price shocks*: How does metro performance relate to the existence and magnitude of housing price “bubbles” in certain nations and world regions? Data from the Bank for International Settlements (BIS) are used to classify metro areas by the extent of a national housing price shock in recent years, and test differences in the severity of the recession and pace of recovery

In the regional analysis and subsequent analysis of metro characteristics in each section, Important patterns are identified within and across five main world regions in which the 150 global metro areas are situated:²⁷

- *Eastern Europe*: 12 metro areas in former Eastern Bloc nations of the European Union, plus Moscow;
- *Western Europe*: 39 metro areas in the remainder of the European Union, plus Norway and Switzerland;
- *United States*: 50 metro areas;
- *Lower-Income*: 32 metro areas outside Europe and the United States with GVA per capita under \$15,000 in 2007²⁸
- *Higher-Income*: 17 metro areas outside Europe and the United States with GVA per capita over \$15,000 in 2007²⁹

Finally, the report offers short case profiles of example global metro areas to illustrate the range of specific economic dynamics behind the performance scores in the three periods, and to portray either a dominant pattern for that metro’s world region, or examine a very particular and unexpected performance.

²⁷ The rankings and analysis within these world regions reflect patterns for the 150 metropolitan areas studied, and not necessarily those outside the sample that might have performed different during the three periods, such as slightly smaller but very fast-growing emerging-market metros such as Chengdu, China; Hanoi, Vietnam; and Campinas, Brazil. See Jin and others, “Winning in Emerging-Market Cities.”

²⁸ These are: Buenos Aires, Argentina; Belo Horizonte, Brasilia, Rio de Janeiro, and Sao Pãulo, Brazil; Santiago, Chile; Beijing, Guangzhou, Shanghai, Shenzhen, and Tianjin, China; Bogota, Colombia; Alexandria and Cairo, Egypt; Bangalore, Chennai, Hyderabad, Kolkata, Mumbai, and New Delhi, India; Jakarta, Indonesia; Kuala Lumpur, Malaysia; Guadalajara, Mexico City, and Monterrey, Mexico; Lima, Peru; Manila, Philippines; Riyadh, Saudi Arabia; Cape Town and Johannesburg, South Africa; Bangkok, Thailand; and Istanbul, Turkey. The term “Latin America” in this report refers generally to metro areas in Mexico and South America, while “Middle East” refers to the region encompassing North Africa and West/Central Asia. Eight of the 12 Eastern European metros had GVA per capita under \$15,000 in 2007; the regional location of those metros and their membership in the European Union argued, however, for treating them as distinct from lower-income metros elsewhere.

²⁹ An analysis of GDP data from IMF’s 2010 World Economic Outlook at the national level yields a grouping of nations by income that mirrors this metro grouping.

Pre-Recession Period

The period from 1993 to 2007 was one of tremendous growth and change in the global economy. Political shifts, technological transformation, reduced barriers to trade, and the emergence of a highly integrated global financial system greatly broadened participation in that economy. As the chief hubs of national and international commerce and governance, major metropolitan areas stood at the forefront of those trends. Some metros witnessed unprecedented levels of growth throughout the 14-year period. For others, these trends challenged their economic identity and prosperity as never before. This section explores the longer-run metro economic backdrop against which the Great Recession and the recovery thus far have occurred.

Regional Summary

In the decade and a half before the crisis, the 150 metro areas posted a median employment growth rate of 1.4 percent annually, and a somewhat faster growth rate of 2.3 percent in income. Among the 150, seven registered a loss in employment between 1993 and 2007, and income dipped in two. For the most part, however, these metro areas became larger and richer in their economic profile in the long lead-up to the Great Recession.

The metro growth spectrum was nonetheless wide during this period. The highest performing metropolitan areas from 1993 to 2007 achieved typical employment growth of 3 percent per year, and typical income growth of over 5 percent per year (Figure 3-1). By contrast, employment rose only 0.5 percent annually, and income only 1.3 percent annually, in the lowest performing metro areas over that time.

The top and bottom metro performers also reflected important economic distinctions across and within world regions (Figure 3-2). In general, two types of metro areas occupied the top spots. The first included rapidly emerging Asian, Middle Eastern, and Eastern European metro areas that benefited from recent integration into the expanding world economy, in many cases aided by national political and economic policy reforms. All five Chinese metro areas in the dataset, for instance, ranked among the top performers, as did four of six Indian metros. Some of these metros achieved astonishing rates of growth. Guangzhou's economy, for instance, was roughly three times larger per capita in 2007 as in 1993, and Shenzhen more than doubled its employment during that time. Meanwhile, eight of 12 Eastern European metro areas posted scores among the 30 highest. Most of those metros experienced relatively anemic employment growth, but underwent sweeping industrial transformation that boosted their incomes by rates of 6 percent annually or more.

The second type of high-performing metro in the pre-recession period could be found in portions of the United States, Western Europe, and other high-income areas of the globe. Four U.S. metros in the South and West (Austin, Las Vegas, Phoenix, Riverside) joined Athens, Dublin, and Madrid in Europe, Abu Dhabi and Dubai in the United Arab Emirates, and Brisbane,

Figure 3-1: Metros Occupied a Wide Growth Spectrum in the Pre-Recession Period

Top and Bottom 30 Metro Areas by Pre-Recession Performance Ranking (1993 to 2007)

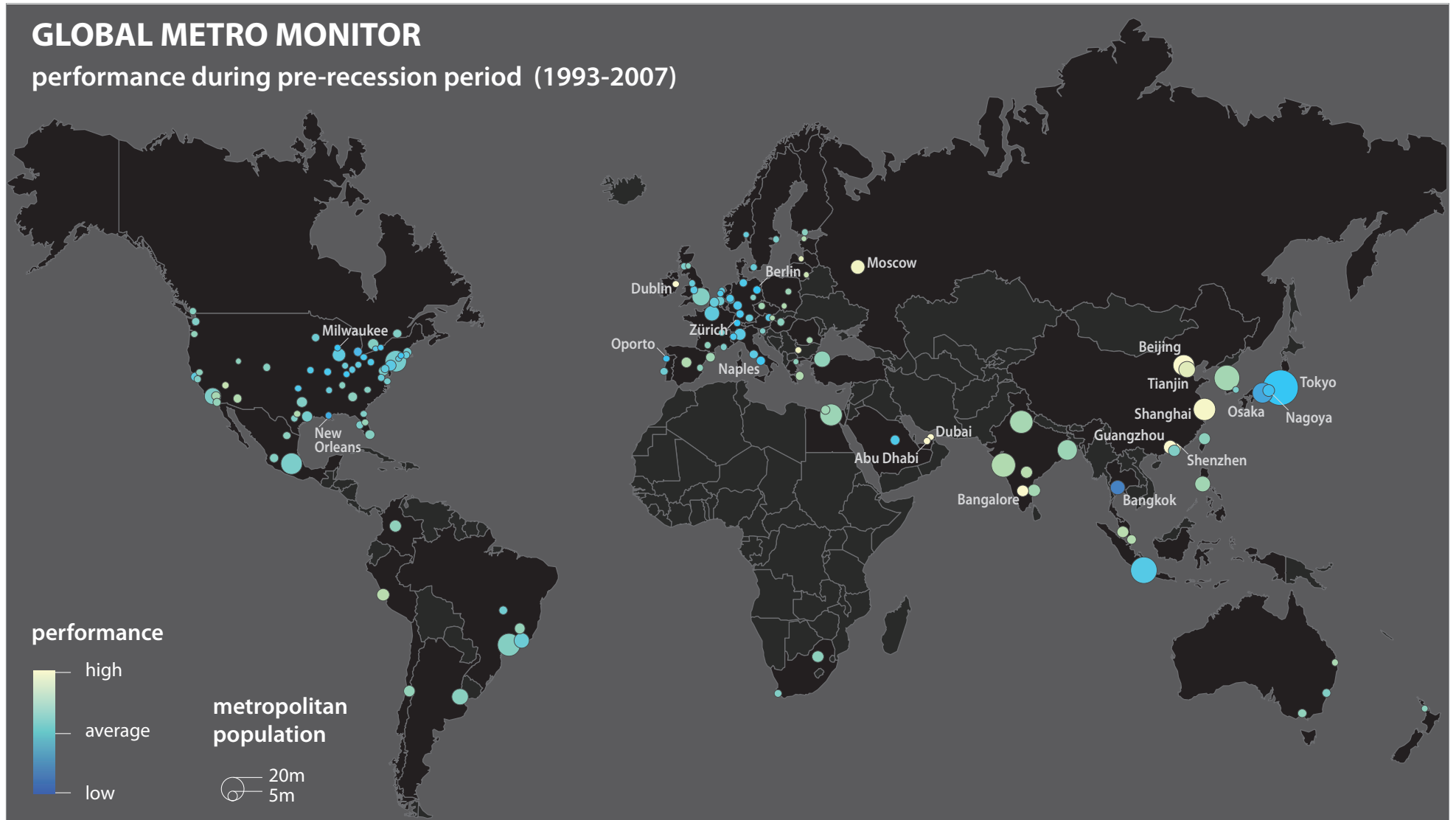
<i>Strongest Performers</i>						<i>Weakest Performers</i>					
Rank	Metro Area	Country	World Region*	Annual Employment Change (%)	Annual GVA/capita change (%)	Rank	Metro Area	Country	World Region*	Annual Employment Change (%)	Annual GVA/capita change (%)
1	Shenzhen	China	Low	9.4	8.2	121	Birmingham	United Kingdom	West	0.5	2.2
2	Dubai	Uae	High	10.9	4.8	122	Vienna	Austria	West	0.7	1.8
3	Guangzhou	China	Low	4.3	10.4	123	Jakarta	Indonesia	Low	1.5	0.4
4	Beijing	China	Low	4.0	8.7	124	Kansas City	United States	Usa	0.9	1.4
5	Abu Dhabi	Uae	High	6.9	2.2	125	Rotterdam	Netherlands	West	0.2	2.5
6	Dublin	Ireland	West	4.5	5.9	126	Dusseldorf	Germany	West	0.9	1.3
7	Bangalore	India	Low	2.9	7.5	127	Hamburg	Germany	West	1.0	1.2
8	Shanghai	China	Low	1.4	9.8	128	Pittsburgh	United States	Usa	0.2	2.4
9	Moscow	Russia	East	1.1	9.9	129	Riyadh	Saudi Arabia	Low	3.2	-2.6
10	Sofia	Bulgaria	East	3.3	6.2	130	Frankfurt	Germany	West	0.9	1.2
11	Riga	Latvia	East	0.5	10.2	131	Cologne	Germany	West	1.3	0.5
12	Tianjin	China	Low	-0.6	11.8	132	Oklahoma City	United States	Usa	0.8	1.3
13	Vilnius	Lithuania	East	0.8	8.6	133	St. Louis	United States	Usa	0.6	1.6
14	Las Vegas	United States	Usa	4.9	1.5	134	Stuttgart	Germany	West	0.8	1.3
15	Hyderabad	India	Low	2.3	5.4	135	Cleveland	United States	Usa	0.4	1.8
16	Lima	Peru	Low	2.8	4.4	136	Rochester	United States	Usa	-0.2	2.6
17	Kuala Lumpur	Malaysia	Low	2.8	4.5	137	Turin	Italy	West	0.8	1.0
18	Singapore	Singapore	High	3.1	3.8	138	Hartford	United States	Usa	0.3	1.8
19	Athens	Greece	West	2.0	5.4	139	Louisville	United States	Usa	0.6	1.0
20	Phoenix	United States	Usa	3.6	2.8	140	Naples	Italy	West	0.6	1.0
21	Tallinn	Estonia	East	0.3	8.1	141	Milwaukee	United States	Usa	0.2	1.6
22	Madrid	Spain	West	3.7	2.5	142	Zurich	Switzerland	West	0.3	1.4
23	Krakow	Poland	East	3.1	3.5	143	Tokyo	Japan	High	0.4	1.0
24	Mumbai	India	Low	2.7	4.2	144	Berlin	Germany	West	0.9	0.1
25	Austin	United States	Usa	3.1	3.4	145	Oporto	Portugal	West	0.0	1.4
26	Bratislava	Slovakia	East	1.1	6.6	146	Nagoya	Japan	High	0.2	1.0
27	Brisbane	Australia	High	3.3	2.7	147	Detroit	United States	Usa	0.0	0.9
28	Riverside	United States	Usa	2.9	3.2	148	New Orleans	United States	Usa	-0.6	1.4
29	Bucharest	Romania	East	-0.6	9.0	149	Osaka	Japan	High	-0.3	0.8
30	New Delhi	India	Low	3.6	2.0	150	Bangkok	Thailand	Low	0.2	-1.5

*East = Eastern Europe; Low = Lower-income regions outside the United States and Europe; High = Higher-income regions outside the United States and Europe; USA = United States; West = Western Europe

Source: Analysis of Oxford Economics, Moody's Economy.com, and Cambridge Econometrics data

GLOBAL METRO MONITOR

performance during pre-recession period (1993-2007)



Australia among the top 30 performers.³⁰ These places attracted both robust population and employment growth from 1993 to 2007; Dublin's income more than doubled in that time.

Like those at the top of the list, the weakest 30 performers pre-recession fell into two general categories. The majority were older industrial regions of the United States and Central/Southern Europe. Low-performing U.S. metros were exemplified by manufacturing centers such as Detroit, Cleveland, St. Louis, and Pittsburgh. In Europe, Stuttgart, Turin, Naples, and Porto exhibited similarly weak performance; six of the eight German metros in the dataset ranked among the bottom 30.³¹ A smaller second category of Asian metros struggled during the pre-recession period, too. Weak performance by the three Japanese metros (Tokyo, Nagoya, Osaka) reflected their entire country's decade of economic stagnation, and the late 1990s financial crisis in Southeast Asia dragged Jakarta and Bangkok toward the bottom of the rankings. With a few exceptions, metros at the bottom of the list experienced increases in both employment and GVA per capita from 1993 to 2007, but growth rates tended to be anemic, less than 1 percent annually in most cases.

Across the complete set of 150 metro areas, those metros in emerging economies outperformed others by significant margins during the pre-recession period. Eastern European metros achieved an average performance rank of 29, followed by lower-income metros outside of Europe and the United States at 49. U.S. and Western European metros posted similarly low average rankings, at 91 and 96, respectively (Figure 3-3). Notwithstanding these differences, the period was marked by a measure of regional diversity among both high and low metro performers.

Metro Performance Factors

Beyond regional location, other factors may help explain the disparate economic performance of global metro areas in the 14 years preceding the Great Recession.

Population Size and Growth

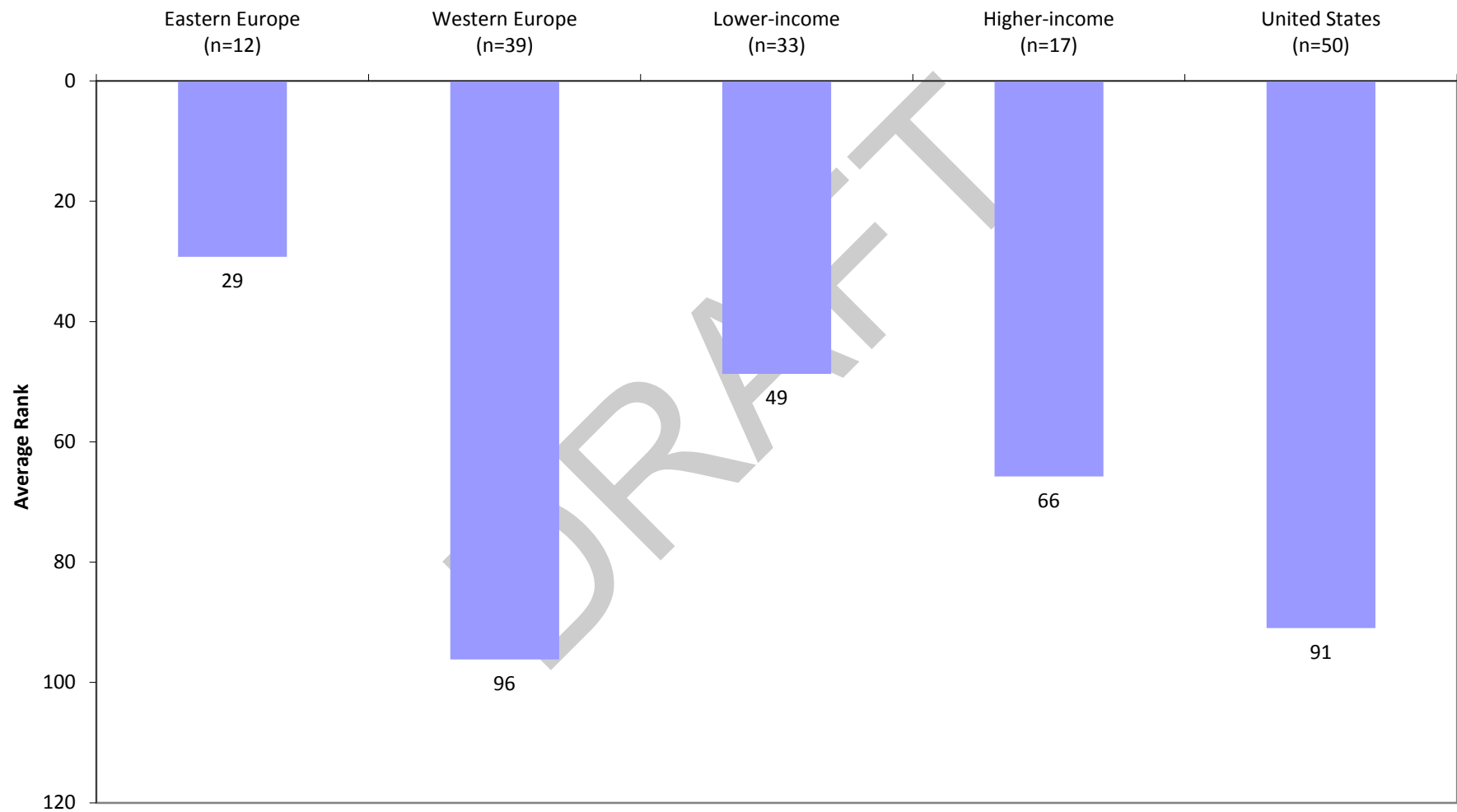
A metro area's population level did not appear to relate to its performance level in the pre-recession period. No significant association existed between population and overall performance, either for all 150 metro areas or for metro areas within their respective regional groupings. Metros with faster growing populations were stronger performers overall, although this was largely a function of their stronger employment growth, which naturally accompanies population growth.³²

³⁰ As the next section indicates, many of these high performers outside Asia and Latin America experienced house-price bubbles in the lead-up to the recession.

³¹ The relatively weak performance of German metros could be explained in part by the fact that the analysis period (1993 to 2007) began soon after the "unification boom" ended, and the price for restructuring the country (by, e.g., allowing for wage convergence between East and West) was paid in somewhat lower rates of economic growth.

³² Western Europe was the only region in which population growth and income growth at the metro level were significantly related, but this seems largely attributable to Dublin, which experienced 23 percent population growth and 5.9 percent annual GVA per capita growth from 1993 to 2007.

Figure 3-3: Eastern European Metros Achieved Higher Performance Rankings than Other Metros in the Pre-Recession Period



Source: Analysis of Oxford Economics, Moody's Economy.com, and Cambridge Econometrics data

Income

In general, lower-income metro areas performed better than middle- and higher-income metro areas. This follows from the regional findings, with Asian, Latin American, Middle Eastern, and Eastern European metros achieving higher performance rankings than their counterparts elsewhere. Metro income levels related more strongly to long-run metro income (GVA per capita) growth than employment growth, suggesting that the 1993 to 2007 period was one in which lower-income metros narrowed the wealth gap with middle- and higher-income metros.

Within world regional categories, however, the relationship between metro income and overall economic performance was limited. Only in Eastern Europe was the relationship statistically significant, with lower-income capitals in the Baltic states and Bulgaria generally outpacing wealthier (yet still successful neighbors) such as Warsaw and Ljubljana. In the United States, higher-income metro areas outpaced others in income growth, but not employment, pointing to the emergence of deeper regional income inequalities throughout the nation during the 14-year period.

National performance

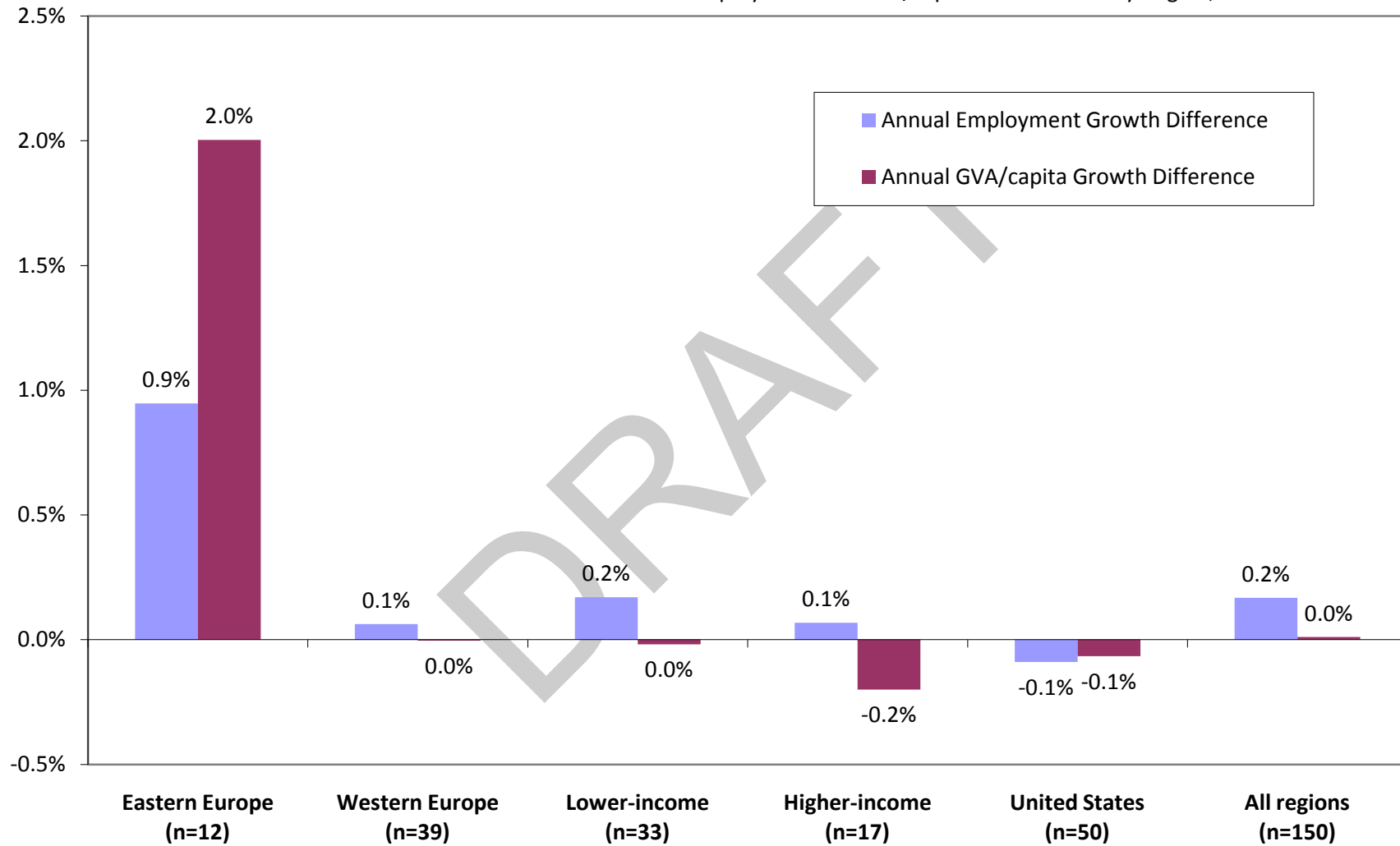
Across all global metro areas studied from 1993 to 2007, the typical metro experienced slightly faster employment growth than its corresponding nation, and comparable GVA per capita growth (Figure 3-4). The relationship between metro and national performance differed among regions, however. In particular, metro areas in Eastern European nations well outpaced national averages on both indicators. Sofia, for instance, achieved annual growth of 3.3 percent in employment, and 6.2 percent in GVA per capita, compared to Bulgarian averages of 0.5 percent and 3.5 percent, respectively. Outside of Europe and the United States, the typical lower-income metro posted slightly greater employment gains than its nation, while the typical higher-income metro posted slightly smaller GVA per capita gains.

These typical experiences, of course, do not capture the underlying variation in performance among metro areas that exist within the same nation. For instance, Munich outpaced German national averages on both employment and GVA per capita growth, while Stuttgart lagged the nation on both measures. Given its sheer size, the United States exhibited a wide range of metro experience, sometimes even within its own states. In Tennessee, for example, Nashville exceeded U.S. averages on employment and income growth, while Memphis fell behind.

Still, national rates of economic growth do appear to set an important platform for metro-level performance. Controlling for the share of national output that each metropolitan area contributes, the average rate of employment growth at the national level explained a little under half of the variation in metro employment growth from 1993 to 2007. The average rate of income growth nationally explained even more of the underlying metro variation across the

Figure 3-4: Metros and Nations Performed Similarly in Most Regions in the Pre-Recession Period

Median Difference between Metro and National Annual Employment and GVA/capita Growth Rate by Region, 1993-2007



Source: Analysis of Oxford Economics, Moody's Economy.com, and Cambridge Econometrics data

period, about three-quarters.³³ In short, metro economic performance in the lead-up to the recession was not independent of national economic performance.

Industrial structure

The contribution of certain economic sectors to overall output was, in some regions, associated with stronger or weaker metro performance in the pre-recession period. Because, for example, manufacturing industries in China are quite distinct from those in central Europe and the U.S. Midwest, these sectoral relationships are examined within the specific contexts of world regions (Figure 3-5):

- In Eastern Europe, metros with large shares of output in logistics, communications, and hospitality performed better, perhaps reflecting the rapid growth of trade and tourism in the region over the period. At the same time, performance was weaker in metros with a significant focus in non-market services such as government, health, and education, including Bratislava and Budapest
- In Western Europe, metros with relatively high levels of construction output experienced more rapid economic growth pre-recession, perhaps reflecting the inward flow of population and investment to regions including Thessaloniki, Dublin, Toulouse, Valencia, and Madrid. This was also the case in high-income metros outside the United States and Europe including Brisbane, Sydney, and Seoul
- A similar dynamic prevailed in the United States, where rapidly growing Western metros such as Las Vegas, Riverside, and Phoenix had much of their pre-recession output concentrated in the construction sector. On the other hand, metro areas with a significant manufacturing presence underperformed others, reflecting long-run employment struggles of older industrial areas in portions of the U.S. Northeast and Midwest regions
- The reverse was true for lower-income energy and manufacturing-specialized metros, which outperformed their counterparts largely on the strength of Chinese metros' rapid emergence in the global trade of manufactured goods, and expanding utility sectors in countries with rapidly developing middle-class consumers

Summary

The decade and a half leading up to the Great Recession found fairly widespread growth of metropolitan economies across the globe, but particularly in lower-income regions, most notably Eastern Europe, that benefited greatly from new frontiers in global economic integration. U.S. and Western European metros exhibited a wide range of economic performance both across and within their nations, but achieved similar average levels of performance, generally well below those in other parts of the globe.

³³ The results are largely the same when the 50 U.S. metros are excluded from the analysis.

Figure 3-5: Construction and Logistics-Focused Metro Areas Performed Well Pre-Recession

	Construction	Logistics. Leisure, Communications	Energy and Manufacturing	Financial and Business Services	Non-market Services
All Metros (n=150)	+	+	+	—	—
East (n=12)		++			--
West (n=39)	+				
Lower-income (n=31)*			+		
Higher-income (n=12)*	++			--	
United States (n=50)	++	+	—		

Symbols indicate direction of statistically significant correlation between metro performance score and share of GVA in industry

Two symbols indicate strong correlation ($r \geq 0.5$)

* Japanese and South Korean metros, and Belo Horizonte, Brazil excluded from this analysis due to data quality issues.

Source: Analysis of data from Oxford Economics, Moody's Economy.com, and Cambridge Econometrics

Deconstructing Metro Performance: Employment versus Income Growth [SIDEBAR]

The basic measure of metro economic performance in the *Global MetroMonitor* combines indicators of employment and GVA per capita growth, reflecting the value that the public and policy makers attach to achieving both outcomes on behalf of people and places. Although these indicators depend to some degree on one another, they do not always move in unison. On the one hand, some metros that appear quite good on income growth may not generate new jobs, reflecting increased productivity but not necessarily growing employment opportunities. On the other hand, metros can grow employment, but not the type of employment that boosts incomes and standards of living for the broader population.

Unlike In the recession and recovery periods examined below, there is only a weak relationship at the metro level between employment and income growth in the pre-recession period, particularly in the United States, Eastern Europe, and lower-income metros elsewhere in the world. How different would the top and bottom 30 metro areas look if their performance were judged separately on these sub-measures?

Overall, about one-third of the strongest and weakest pre-recession-era metro performers change if employment growth and income growth are analyzed separately. On employment, Eastern European metros in particular fall out of the top performers, as their rapid income increases resulted from industrial transformation, rather than boosts in labor supply. At the same time, central and southern European metros, particularly in Germany, performed somewhat better on employment growth during this period than their bottom ranks indicate, perhaps reflecting the effects of an influx of less-skilled labor from Eastern Europe and elsewhere abroad.

On income growth, the bloom is off the rose a bit in high-ranked American metros such as Phoenix and Las Vegas, where much of the baseline employment growth was concentrated in industries like construction. The same was true for the fast-growing metros of Brisbane and Madrid, where GVA per capita growth was merely average from 1993 to 2007. At the same time, many American and Western European metros at the bottom of the ranks, including Birmingham, Rotterdam, Pittsburgh, St. Louis, Cleveland, and Rochester posted somewhat stronger income gains than those low ranks would indicate. This is likely attributable to long-run productivity increases in their important manufacturing sectors that occurred alongside slow and steady declines in the number of people employed in those sectors.

Recession Period

Unprecedented levels of global economic integration that propelled growth in major metropolitan economies in the lead-up to 2007 amplified the worldwide effects of what transpired soon thereafter. A mild employment downturn began in the United States in early 2008, amid signs of weakness in the housing sector. By autumn of that year, the problem had morphed into a full-blown financial crisis implicating regional institutions and markets worldwide, sparking the deepest global recession in over 60 years. While no metropolitan area completely escaped the effects of this Great Recession, the downturn was far from uniform in its impacts across and within world regions.³⁴

Regional Patterns

This section measures metro economic performance during the Great Recession based on its minimum year-over-year employment and GVA per capita growth from 2007 to 2010.³⁵ Most of these measures derive from forecasts based on official government metro-level estimates for 2008 or earlier years, and should thus be treated as preliminary in nature, and indicative of metro performance rather than precise in their implications. For the vast majority of the 150 metro areas, the minimum year of employment and income growth was between 2008 and 2009.³⁶ Thirty-one (31) metro areas, however, registered their greatest employment losses, or smallest employment gains, in the most recent year from 2009 to 2010.

In a sharp reversal from baseline performance before the recession, the typical metro area in the dataset saw a one-year employment decline of 1.7 percent during the recession period, and an even more dramatic annual income decline of 4.0 percent. Yet the variation around this typical performance was vast, from a more than 17 percent employment drop in Moscow to a gain of more than 4 percent in Lima; and from a 16 percent income loss in Tallinn to a rise of more than 6 percent in Tianjin. Overall, 114 metros shed employment, and 127 lost income, in the year of the Great Recession's deepest impact.

Moreover, the top and bottom-performing metros during the recession period reflected several dramatic changes from the pre-recession period (Figures 4-1 and 4-2). China posted the top five performers in this period, led by Beijing, which still managed 4 percent growth in employment and 5 percent growth in income at the nadir of its growth. The top 12 performing metro areas during this time, and 23 of the top 30, were lower-income metros outside the United States and Europe. All six Indian metros ranked among the top 30, as did six Latin American metros, up from just one in the pre-recession period. All of these top-performing lower-income metro areas added employment during the Great Recession, and just a handful experienced dips in GVA per capita.

³⁴ As noted in the "Data and Methods" section, the recession period did not mark an actual decline in employment or GVA per capita in all 150 metros; see the "Looking Back and Looking Ahead" section for further analysis.

³⁵ For some metro areas, these minimums occurred in different years.

³⁶ Of the 150 metro areas, 104 experienced their minimum employment change from 2008 to 2009, and 136 experienced their minimum GVA per capita change that year.

Figure 4-1: Lower-Income Metros Weathered the Recession Well, While U.S. Metros Were Severely Impacted

Top and Bottom 30 Metro Areas by Recession Performance Ranking (Minimum Annual Growth 2007-2010)

Strongest Performers						Weakest Performers					
Rank	Metro Area	Country	World Region*	Annual Employment Change (%)	Annual GVA/capita change (%)	Rank	Metro Area	Country	World Region*	Annual Employment Change (%)	Annual GVA/capita change (%)
1	Beijing	China	Low	3.9	5.1	121	Memphis	United States	Usa	-4.8	-4.7
2	Guangzhou	China	Low	2.5	6.4	122	Miami	United States	Usa	-4.6	-5.0
3	Shanghai	China	Low	2.3	6.4	123	Salt Lake City	United States	Usa	-3.5	-6.5
4	Shenzhen	China	Low	2.3	4.6	124	Monterrey	Mexico	Low	-0.8	-10.1
5	Tianjin	China	Low	0.8	6.4	125	Jacksonville	United States	Usa	-4.8	-5.1
6	Jakarta	Indonesia	Low	2.1	4.2	126	Indianapolis	United States	Usa	-5.9	-3.8
7	Cairo	Egypt	Low	2.1	3.0	127	Chicago	United States	Usa	-5.0	-5.2
8	Alexandria	Egypt	Low	2.2	2.9	128	Las Vegas	United States	Usa	-4.9	-5.4
9	Bangalore	India	Low	1.2	4.0	129	Nashville	United States	Usa	-5.1	-5.3
10	Kolkata	India	Low	0.7	4.3	130	Riverside	United States	Usa	-6.0	-4.4
11	Lima	Peru	Low	4.2	-0.4	131	Cleveland	United States	Usa	-4.4	-6.5
12	Chennai	India	Low	0.7	4.0	132	Denver	United States	Usa	-4.3	-6.9
13	Krakow	Poland	East	2.1	1.9	133	San Francisco	United States	Usa	-4.9	-6.2
14	Hyderabad	India	Low	1.0	2.4	134	Madrid	Spain	West	-5.7	-5.1
15	Warsaw	Poland	East	0.8	2.4	135	Milwaukee	United States	Usa	-5.2	-6.0
16	Abu Dhabi	Uae	High	3.6	-1.4	136	Atlanta	United States	Usa	-5.5	-5.9
17	New Delhi	India	Low	1.6	1.0	137	Los Angeles	United States	Usa	-5.5	-6.3
18	Buenos Aires	Argentina	Low	1.7	0.5	138	Helsinki	Finland	West	-2.8	-9.9
19	Mumbai	India	Low	1.5	0.8	139	Portland	United States	Usa	-5.1	-7.8
20	Brasilia	Brazil	Low	1.2	0.2	140	Valencia	Spain	West	-7.1	-6.2
21	Riyadh	Saudi Arabia	Low	2.1	-1.1	141	Charlotte	United States	Usa	-8.0	-5.1
22	Melbourne	Australia	High	0.0	1.4	142	San Jose	United States	Usa	-5.3	-8.5
23	Brisbane	Australia	High	0.9	-0.2	143	Istanbul	Turkey	Low	-5.0	-9.6
24	Manila	Philippines	Low	1.0	-0.9	144	Dublin	Ireland	West	-6.3	-8.1
25	Bogota	Colombia	Low	0.8	-1.1	145	Barcelona	Spain	West	-7.3	-6.9
26	Seoul	South Korea	High	0.1	-0.3	146	Detroit	United States	Usa	-8.1	-6.4
27	Belo Horizonte	Brazil	Low	1.1	-1.6	147	Vilnius	Lithuania	East	-4.0	-13.3
28	Rio de Janeiro	Brazil	Low	0.2	-0.8	148	Riga	Latvia	East	-3.1	-15.7
29	Busan	South Korea	High	-0.8	0.2	149	Tallinn	Estonia	East	-10.0	-16.0
30	Sydney	Australia	High	-0.4	-0.6	150	Moscow	Russia	East	-17.4	-15.1

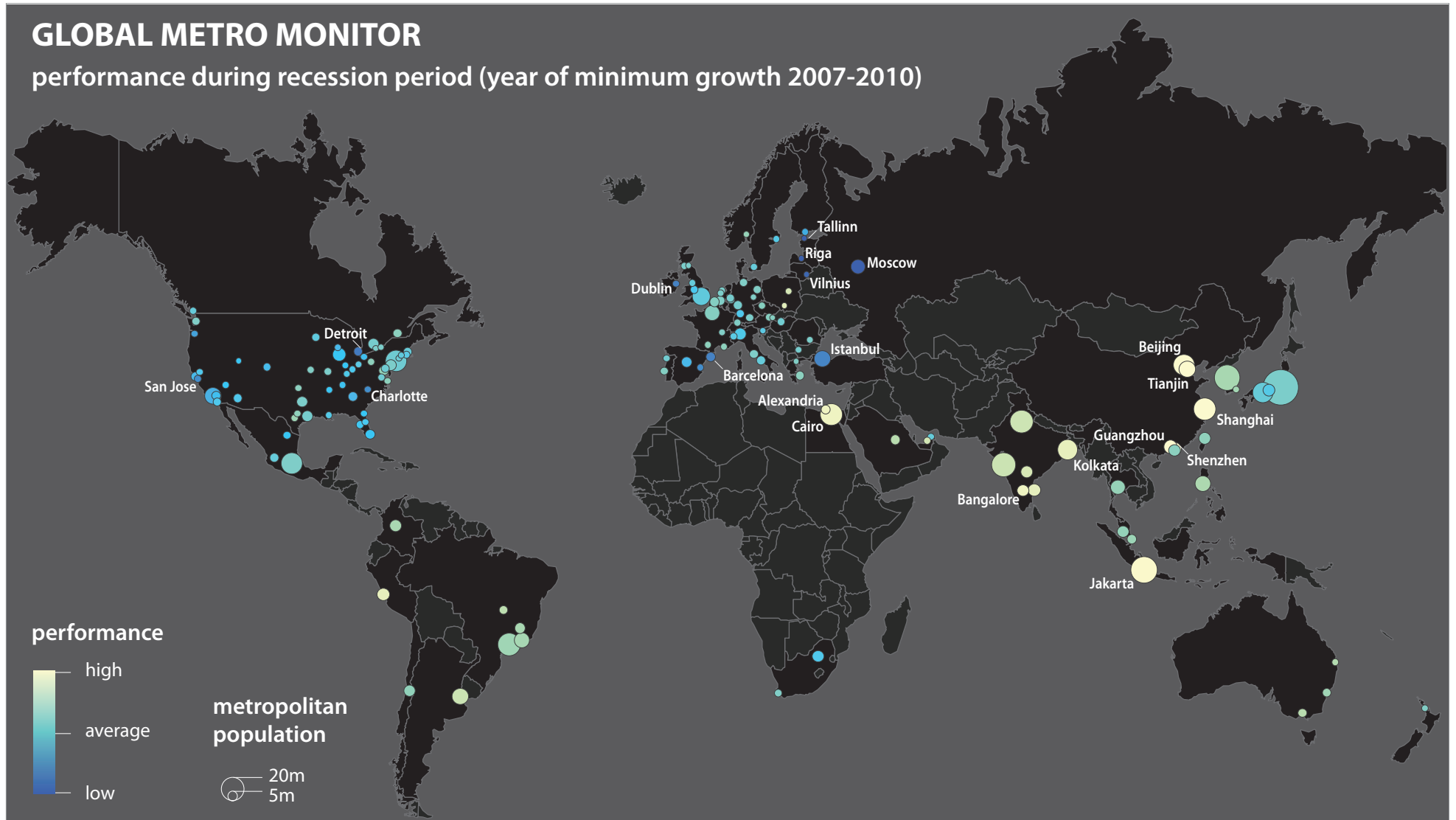
*East = Eastern Europe; Low = Lower-income regions outside the United States and Europe; High = Higher-income regions outside the United States and Europe; USA = United States;

West = Western Europe

Source: Analysis of Oxford Economics, Moody's Economy.com, and Cambridge Econometrics data

GLOBAL METRO MONITOR

performance during recession period (year of minimum growth 2007-2010)



Among the metro areas from other world regions that posted top-30 ranks were Warsaw and Krakow in Poland, the three Australian metros (Brisbane, Melbourne, and Sydney), the two South Korean metros (Seoul and Busan), and Abu Dhabi. None, notably, came from the United States or Western Europe, which together had placed six metros within the top 30 performers in the pre-recession period. In addition, Eastern Europe's representation among the top-ranked metros was reduced from eight in the pre-recession period to just two during the recession period.

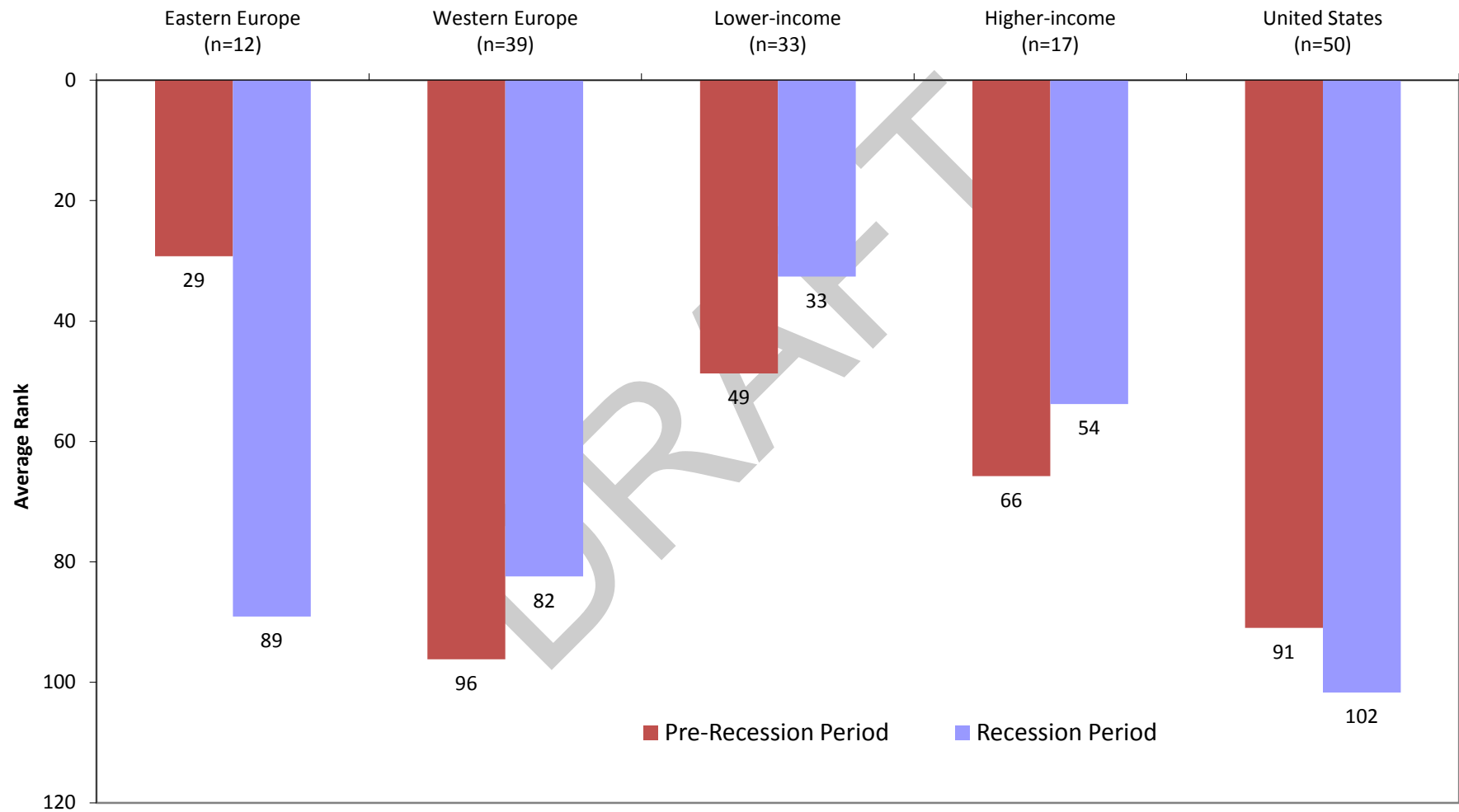
Not only did several American and European metro areas fall out of the top-performing category they had occupied pre-recession, but also many ended up among the *bottom* recession-era performers. Moscow and the Baltic capitals (Riga, Tallinn, and Vilnius) occupied the bottom four spots in the metro rankings. In Western Europe, former top performers Dublin and Madrid fell into the lowest-ranking metros, as did Las Vegas and Riverside in the United States.

This pattern of dramatic "top to bottom" metro performance shifts during the recession reflected a broader trend in the United States and Western Europe. While the relative performance of a few older industrial metros such as Detroit, Cleveland, and Birmingham changed little from the pre-recession period, several other metros, particularly in the United States, faltered substantially. San Jose, Charlotte, Portland, Atlanta, Denver, Nashville, and Salt Lake City, all strong growers from the 1990s through the mid-2000s, plummeted at least 50 positions to the bottom of the metro rankings as the recession took hold. Barcelona, Valencia, and Helsinki followed a similar trajectory in Western Europe. Overall, U.S. metros occupied 19 of the bottom 30 spots during this period.

Average metro performance rankings by region suggest a much deeper impact of the Great Recession on U.S. metros, in contrast to its relatively light touch on lower-income metros outside the United States and Europe (Figure 4-3). The 50 U.S. metros achieved a very low average rank of 102 during the recession period, down from 91 pre-recession. Western European metro areas actually improved slightly relative to others, while Eastern European metros saw their average ranking plummet from 29 to 89. As a result, the recession appeared to strengthen the relative position of metro economies outside Europe and the United States, with their higher-income (from 66 to 54) and lower-income (from 49 to 33) metros moving up on average.

The relationship between individual metro performance before the recession, and metro performance during the recession, varied considerably by world region. In lower-income non-U.S. and European metro areas, strong performance before the recession was associated with strong performance during it. The opposite held true in Eastern and Western Europe, where

Figure 4-3: Metro Areas Outside the United States and Europe Outranked Others on Economic Performance During the Great Recession



Source: Analysis of Oxford Economics, Moody's Economy.com, and Cambridge Econometrics data

weaker performance during the recession was associated with stronger performance beforehand.³⁷

Metro Performance Factors

While region-specific dynamics clearly contributed to the disparate performance of global metro areas during the Great Recession, some structural metro- and national-level factors appeared to be important as well.

Population Size and Growth

While across the 150 metro areas larger places performed better during the recession than smaller places, this seemed primarily to reflect the stronger showing of big Asian metro areas, and the weaker showing of small Eastern European metro areas. Thus, being big in and of itself did not seem to insulate a metro from the economic downturn.³⁸ Similarly, population growth across all metros was associated with stronger recession performance, but this was again the product of growth differences across regions, not within them. Only in high-income metros outside the United States and Europe was population growth associated with stronger recession performance, and then only through larger employment gains (or smaller employment losses).

Income

As the metro rankings suggest, lower-income metro areas seemed to weather the recession better than others. This was equally true with respect to employment and income growth. The very lowest-income metros (those with GVA per capita under \$10,000) performed the best, but as with population this also seemed to reflect region-specific patterns, and not necessarily the value of having lower income for subsequent growth.³⁹

National Performance

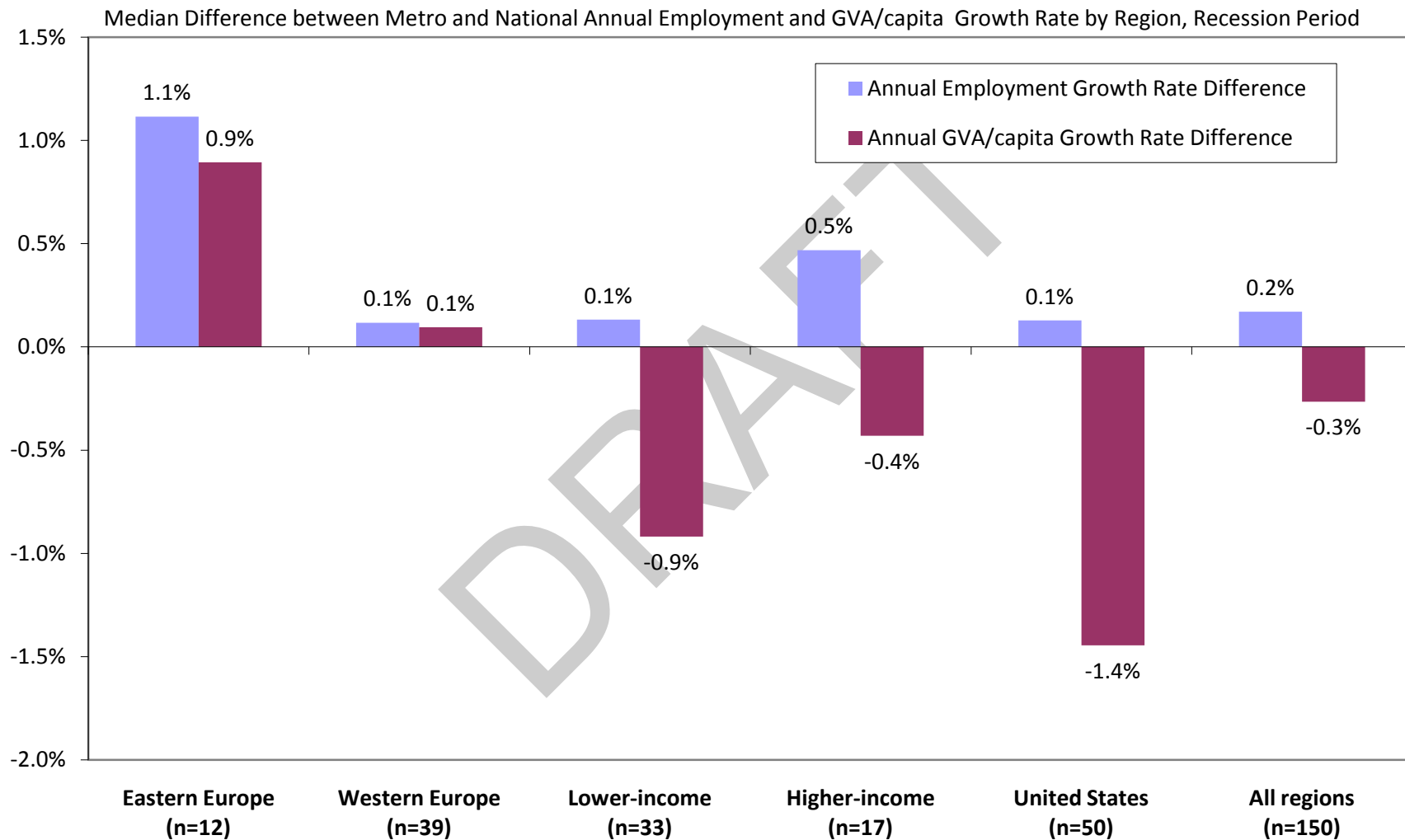
How metros did compare to their nations during the recession indicates something about their broader role within national economies. Across all global metro areas, the typical metro shed employment at a slightly lower rate than the national average, but lost income at a slightly higher rate (Figure 4-4). The difference was even starker within world regions. In Eastern Europe, for instance, the typical rate of employment loss in large metros was over 1 percentage point lower than at the national level, while the typical rate of income loss was nearly 1 percentage point higher. The typical U.S. metro narrowly outperformed the national average on employment, but experienced an income decline nearly 1.5 percentage points greater than the nation. It may be that the high value-added nature of jobs in these global centers meant that their more modest employment declines during the Great Recession nevertheless produced larger-than-average income losses. Metros themselves may also have shed high-

³⁷ There was no statistically significant relationship between pre-recession and recession performance (combined employment and income growth) for U.S. metro areas.

³⁸ Among the five world regions, only within Eastern Europe was metro population significantly associated with recession-era performance, as bigger metros on average did worse than other metros.

³⁹ Within the five regions, there was no statistically significant relationship between metro income and either metro overall economic performance, or growth in employment or income, during the recession period.

Figure 4-4: Metros in Most Regions Led Their Nations on Employment Growth, But Lagged Their Nations on Income Growth, During the Recession



Source: Analysis of Oxford Economics, Moody's Economy.com, and Cambridge Econometrics data

value jobs at a disproportionate rate during this recession, due to the greater susceptibility of those jobs to the impacts of the financial crisis on capital markets.

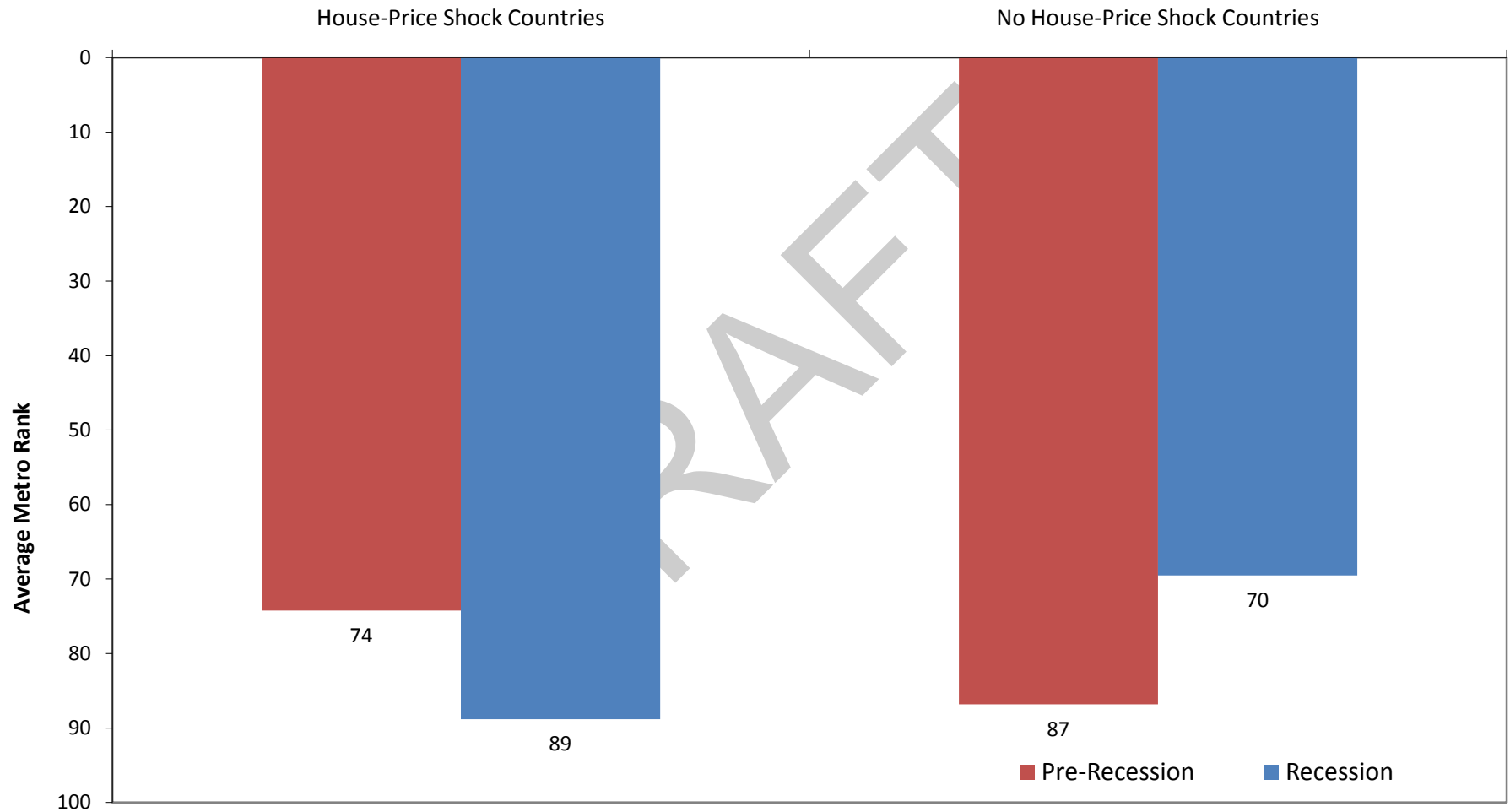
The contribution of national context to metropolitan performance appeared to be at least as important during the recession as beforehand. Once again, a little under half of metropolitan employment change could be explained by national employment change, controlling for each metro's contribution to national output. An even greater share—over 80 percent—of a metro's income change during the recession could be attributed to the national trend than in the pre-recession period. The strong relationship between national economic performance and metro economic performance during this period may reflect the enhanced influence of the health of national financial and debt status and related national financial and fiscal policies in the context of a severe global downturn, which exist outside the scope and powers of individual metropolitan areas.⁴⁰

The condition of national housing markets before and during the recession also helps to explain some of the dramatic changes in metropolitan performance between the two periods. Deutsche Bank Research, using data from the Bank for International Settlements (BIS), classified 36 of the 53 countries in which the 150 metropolitan areas sit into two groups based on international house price data: those that experienced negative house-price shocks coincident with the recession, and those that did not. Those that did experience a shock contain many of the metros that were performing well above-average in the pre-recession period, but performed well below-average during the recession (Figure 4-5). From an average performance ranking of 75 before the recession, metro areas in nations experiencing house-price shocks dropped to an average rank of 87 during the recession. By contrast, those in nations that avoided severe house price declines saw their average rank rise from 89 to 70 between the two periods. Significant deterioration in housing market conditions thus appears to help explain the rapid descent of metro areas such as Dublin, Riga, Valencia, Las Vegas, and Phoenix as the Great Recession took hold.⁴¹

⁴⁰ The stronger relationship may also reflect the statistical influence of national trends in the models that forecast metropolitan-level performance through 2009. That noted, historical government estimates of metro-level output in, for example, the United States are themselves derived in part from national GDP statistics. This suggests that the statistical relationship between metro and national economic performance, while probably stronger in the forecasted data, is not necessarily unique to the more recent periods. See Matthew J. McCormick, Sharon D. Panek, and Ralph M. Rodriguez, "Gross Domestic Product by Metropolitan Area." *Survey of Current Business*, October 2009, pp. 100–131.

⁴¹ Countries identified as experiencing or having experienced house-price shocks according to BIS data include: Bulgaria, China, Denmark, Estonia, France, Hong Kong, Latvia, Lithuania, Norway, New Zealand, Russia, Slovakia, Spain, United Kingdom, United States. Countries not experiencing significant house-price shocks include: Austria, Australia, Belgium, Czech Republic, Finland, Germany, Greece, Hungary, India, Indonesia, Israel, Italy, Korea, Malaysia, Netherlands, Portugal, Sweden, South Africa, Switzerland, Thailand. The observed impact of housing price bubbles on metro performance would likely be greater if one were able to identify house-price shocks at the sub-national level, especially in the United States; comparable sub-national data on house prices were not available on an international basis, however.

Figure 4-5: Metros in Countries Experiencing House-Price Shocks Performed Stronger than Others Pre-Recession, but Weaker During the Recession



For 36 of 53 countries where house-price data were available, see text for details

Source: Analysis of data from Bank for International Settlements, Oxford Economics, Moody's Economy.com, and Cambridge Econometrics

Industrial structure

Shares of output in four industry groupings were associated with stronger or weaker metro economic performance during the recession in different world regions (Figure 4-6):

- In Western Europe, metros with large shares of output in *construction* performed worse than others during the recession, a reversal from the pre-recession relationship, and an indication of the impact of house-price shocks and associated sharp declines in construction activity on the economy in metros such as Dublin and Madrid
- Metros in Western Europe with significant *energy and manufacturing* output, such as Milan, Stuttgart, and Birmingham, also exhibited weaker recession performance, reflecting at least as much the long-run economic difficulties of these metros as the impact of reduced global demand on their export industries
- *Financial and business services* centers had different trajectories in different regions during the recession. In Eastern Europe, metros with larger shares of output in those industries—particularly Warsaw—tended to out-perform their peers. In high-income metros outside Europe and the United States, however, financial and business service centers-oriented metros such as Vancouver, Toronto, Osaka, and Tokyo tended to under-perform other metros, due perhaps to their higher degree of integration with the struggling global capital markets
- In Eastern and Western Europe and the United States, metros with significant representation of *non-market services* performed significantly better than others, indicating the greater stability of sectors such as government, health care, and education in the face of the Great Recession

Period Summary

For some major metro economies, the Great Recession reinforced existing growth patterns. Lower-income metros in Asia, Latin America, and the Middle East were much less affected by the downturn than Western European and American metros, and posted even stronger relative performance during the recession. In other respects, the crisis marked a dramatic shift in growth, particularly in Eastern European metros that had been among the strongest performers prior to the recession. There and in corners of the United States and Western Europe, steep drops in housing prices reversed metro trajectories, and challenged the growth models that had propelled those economies prior to the downturn. The severity of the recession pointed to a long road back for many of these metro areas and their respective nations, as explored in the next section.

Figure 4-6: Metros with Large Non-Market Services Sectors Performed Better During the Recession

	Construction	Logistics, Leisure, Communications	Energy and Manufacturing	Financial and Business Services	Non-market Services
All Metros (n=150)			+	-	
East (n=12)				++	++
West (n=39)	-		--		+
Lower-income (n=31)*					
Higher-income (n=12)*				--	
United States (n=50)					+

Symbols indicate direction of statistically significant correlation between metro performance score and share of GVA in industry

Two symbols indicate strong correlation ($r \geq 0.5$)

* Japanese and South Korean metros, and Belo Horizonte, Brazil excluded from this analysis due to data quality issues.

Source: Analysis of data from Oxford Economics, Moody's Economy.com, and Cambridge Econometrics

Recovery Period

The 2009-2010 period marked the beginning of economic recovery for most, but not all, global metropolitan areas from the Great Recession. Where growth resumed, the pace differed markedly from one metro area to another, reflecting the disparate regional and industry impacts of the downturn, and the degree to which metro economies were poised to seize new growth opportunities in a still-tentative global marketplace.

This section explores evidence on metro performance during the first year of what will in many places be a multi-year path to full economic recovery. Because the metropolitan-level data underlying this portion of the analysis are projected forward at least one to two years from official national government estimates, using the techniques outlined in the “Data and Methods” section, they should be viewed as providing preliminary indications of metros’ growth and positioning in the global recovery.⁴²

Regional Patterns

Employment and income growth measures from 2009-2010 point to a tepid recovery in global metropolitan areas. The typical metropolitan area among the 150 saw a small but continued employment decline of 0.4 percent during the year, while income began to grow again, at a 1.7 percent annual rate. Similar to the recession period, however, a wide range of experiences surrounded that median performance. Istanbul’s employment grew by more than 7 percent, while Johannesburg’s dipped more than 4 percent. Income growth in Shanghai and Guangzhou topped 7 percent as well, even as the measure dipped nearly 8 percent in Dubai.

As these figures indicate, and as explored in the Recession Period section, 2009-2010 did not mark the beginning of economic recovery for all metro areas. There were 31 metro areas in the dataset that experienced their greatest employment decline, or lowest employment growth, in that year. And there were additional metro areas in which the worst impacts of the recession had subsided, but economic weakness clearly remained. Indeed, a majority—86 of 150—of metro areas lost employment from 2009 to 2010, including all 39 Western European metro areas, and 35 of 50 U.S. metro areas. A further 20 metro areas, half in Western Europe, experienced declines in income that year.⁴³

While a slow recovery took hold in global metro areas overall, a group of high-performing metro areas came out of the recession in relatively strong shape. The top-ranked performers in the recovery period reflect an even more pronounced shift toward lower-income global metros than during the recession, which accounted for 24 of the 30 highest-ranked places (Figure 5-1). In particular, Latin American metro areas asserted themselves economically, placing eight members among the top 30, led by Lima (ranked third) and Santiago (ranked fifth).

⁴² Brookings and LSE intend to revisit the assessment of metropolitan recession and recovery performance later in 2011/2012 when official government estimates for 2009 and 2010 metropolitan employment and output are published.

⁴³ The rate of income decline in 17 of these 20 metro areas was lower in 2009-2010 than in 2008-2009.

Figure 5-1: Asian and Latin American Metro Areas Were the Strongest Performers in the Recovery, While Western European Metros Lagged

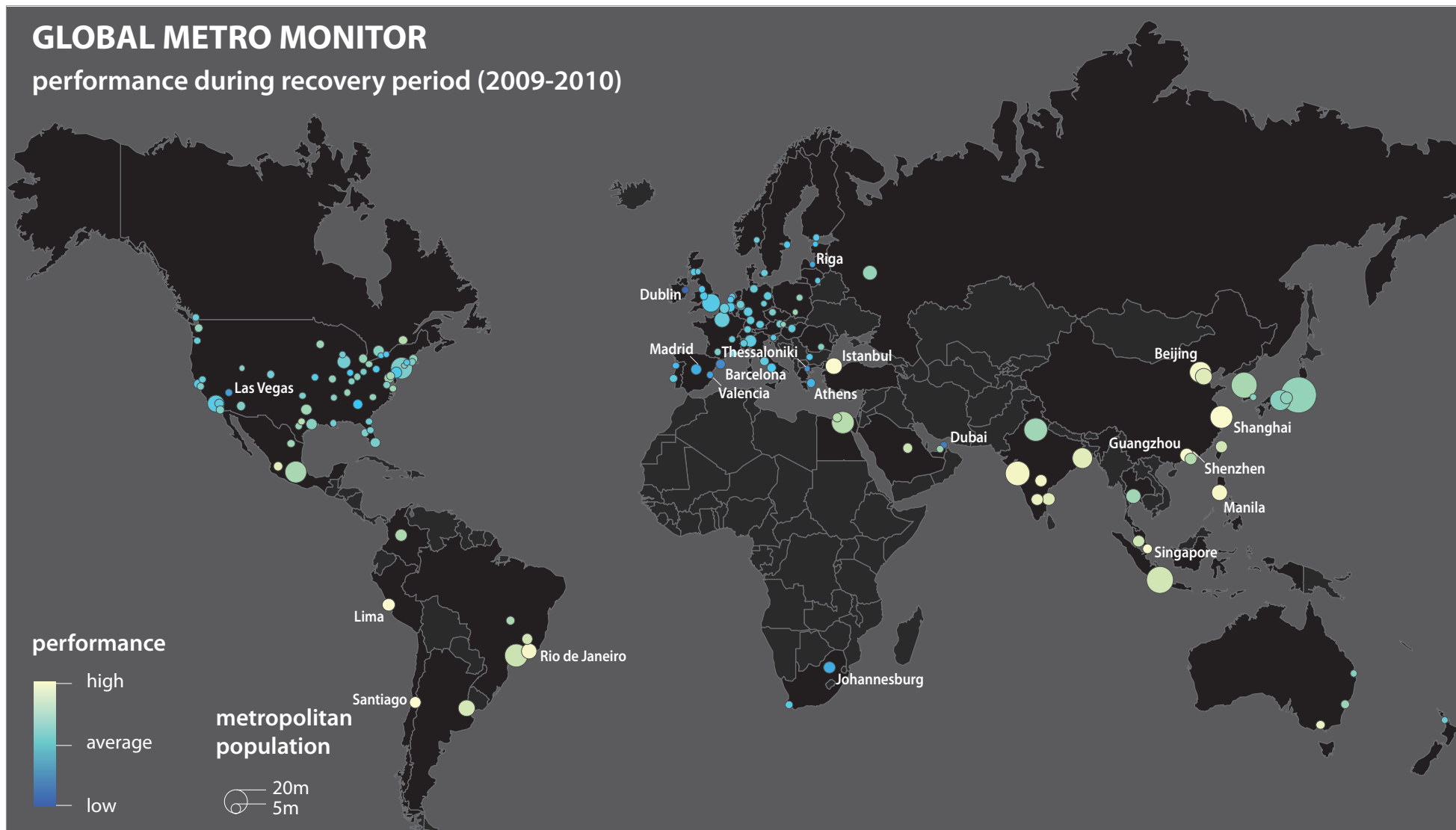
Top and Bottom 30 Metro Areas by Recovery Performance Ranking (2009-2010)

Strongest Performers						Weakest Performers					
Rank	Metro Area	Country	World Region*	Annual Employment Change (%)	Annual GVA/capita change (%)	Rank	Metro Area	Country	World Region*	Annual Employment Change (%)	Annual GVA/capita change (%)
1	Istanbul	Turkey	Low	7.3	5.5	121	Hartford	United States	Usa	-2.0	1.6
2	Shenzhen	China	Low	5.9	5.9	122	Kansas City	United States	Usa	-2.8	2.7
3	Lima	Peru	Low	5.7	5.6	123	London	United Kingdom	West	-1.5	0.8
4	Singapore	Singapore	High	4.6	6.6	124	Helsinki	Finland	West	-1.0	0.2
5	Santiago	Chile	Low	6.2	4.3	125	San Francisco	United States	Usa	-1.5	0.9
6	Shanghai	China	Low	3.1	7.5	126	Rotterdam	Netherlands	West	-1.4	0.7
7	Guangzhou	China	Low	2.5	7.4	127	Philadelphia	United States	Usa	-2.1	1.5
8	Beijing	China	Low	3.9	5.4	128	Rochester	United States	Usa	-1.3	0.4
9	Manila	Philippines	Low	4.0	5.3	129	Pittsburgh	United States	Usa	-1.2	0.3
10	Rio de Janeiro	Brazil	Low	3.2	6.2	130	Stockholm	Sweden	West	-1.6	0.7
11	Hyderabad	India	Low	2.4	7.2	131	Birmingham	United Kingdom	West	-1.7	0.9
12	Mumbai	India	Low	2.8	6.4	132	Amsterdam	Netherlands	West	-1.3	0.3
13	Bangalore	India	Low	2.6	6.3	133	Brussels	Belgium	West	-1.2	0.2
14	Melbourne	Australia	High	3.8	4.8	134	Manchester	United Kingdom	West	-1.6	0.6
15	Guadalajara	Mexico	Low	2.1	6.3	135	Naples	Italy	West	-0.8	-0.7
16	Kolkata	India	Low	2.1	6.3	136	Sofia	Bulgaria	East	-1.0	-0.5
17	Chennai	India	Low	2.1	6.0	137	Indianapolis	United States	Usa	-3.2	2.2
18	Tianjin	China	Low	1.8	6.4	138	Tallinn	Estonia	East	-2.4	1.1
19	Buenos Aires	Argentina	Low	3.1	4.2	139	Atlanta	United States	Usa	-2.4	0.9
20	Jakarta	Indonesia	Low	2.1	5.3	140	Oporto	Portugal	West	-1.6	-1.2
21	Taipei	Taiwan	High	1.3	6.4	141	Athens	Greece	West	-1.8	-1.7
22	Belo Horizonte	Brazil	Low	2.8	4.3	142	Madrid	Spain	West	-1.7	-1.8
23	Kuala Lumpur	Malaysia	Low	2.2	5.0	143	Johannesburg	South Africa	Low	-4.2	1.4
24	Riyadh	Saudi Arabia	Low	4.3	2.2	144	Riga	Latvia	East	-1.5	-2.2
25	Sao Paulo	Brazil	Low	1.6	5.5	145	Valencia	Spain	West	-2.4	-1.9
26	Austin	United States	Usa	3.2	2.7	146	Las Vegas	United States	Usa	-3.0	-1.2
27	Montreal	Canada	High	2.6	3.5	147	Thessaloniki	Greece	West	-1.7	-3.0
28	Alexandria	Egypt	Low	2.2	4.0	148	Barcelona	Spain	West	-2.5	-2.4
29	Cairo	Egypt	Low	2.1	4.0	149	Dubai	Uae	High	1.1	-7.8
30	Hong Kong	Hong Kong	High	0.8	5.5	150	Dublin	Ireland	West	-2.6	-4.4

*East = Eastern Europe; Low = Lower-income regions outside the United States and Europe; High = Higher-income regions outside the United States and Europe; USA = United States; West = Western Europe

Source: Analysis of Oxford Economics, Moody's Economy.com, and Cambridge Econometrics data

performance during recovery period (2009-2010)



Employment declines were somewhat more widespread among high performers in 2009-2010 than during the recession, but all 30 experienced income growth, reflecting in part the increased flow of capital to emerging economies as the worldwide recovery began.⁴⁴ Istanbul, the top-ranked metro in this period, posted significant gains on both measures, bouncing back strongly from a ranking of 143 in the recession period. Outside the higher-income Asia/Pacific Rim metros of Singapore, Hong Kong, Taipei, and Melbourne, only Austin and Montreal managed to post relatively strong performances from 2009 to 2010 among high income metros, and both did so while still shedding employment amid further economic restructuring.

The bottom of the ranking table shifted more significantly than the top, this time with Western European metros taking the place of U.S. metros that had performed weakly during the recession. Western Europe posted 16 of the 30 weakest-performing metros in the recovery period, with Dublin falling to the bottom spot as it continued to lose both employment and income. All of those metros shed employment, and most managed no more than 1 percent growth in GVA per capita from 2009 to 2010. Las Vegas remained the weakest U.S. metro performer, joining eight other American metro areas among the bottom 30. Just two metro areas outside the United States and Europe, Dubai and Johannesburg, ranked among the weakest-performing metros in the recovery period.

The relatively weaker position of Western European metros, and the somewhat stronger position of American metros, is evident from the average ranking of metros by region in the recovery. The average Western European metro area ranked number 116, the lowest average ranking of any region in any of the three periods, and down considerably from its average metro rank of 82 during the recession (Figure 5-3). Toulouse was the highest-ranked metro area in the region during the recovery period, at only number 80. Tepid growth in Western Europe during 2010 reflected in part the effects of the sovereign debt crisis that took hold in the spring, which put the brakes on broader economic recovery.⁴⁵

In contrast, the average American metro jumped to number 80 in the rankings, up from 102 during the recession. All 50 U.S. metros experienced their minimum employment and GVA per capita growth from 2008 to 2009, while about a third of Western European metros actually bottomed out on employment from 2009 to 2010. A few American metros achieved strong turnarounds, moving from the bottom 50 to the top 50 in the rankings between the recession and recovery periods, including Charlotte, Cleveland, Detroit, and Minneapolis. Their experiences are consistent with stronger performance in the U.S. banking, manufacturing, and business services sectors in 2010.⁴⁶

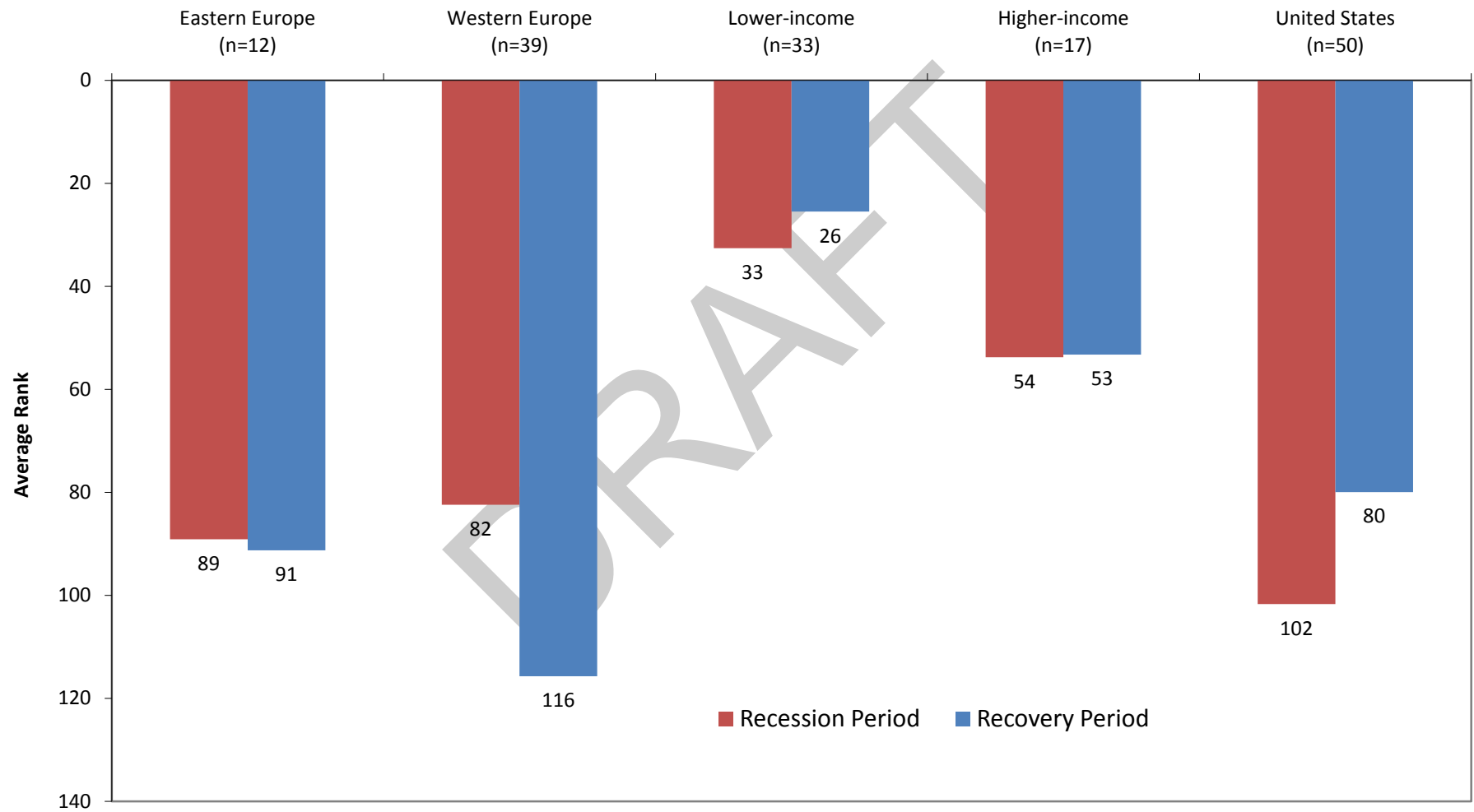
The real story, however, was the continued rise of lower-income metros relative to others. Their average rank in the recovery year was 26, up from 33 in the recession and 49 in the pre-

⁴⁴ IMF *World Economic Outlook: Rebalancing Growth* (April 2010).

⁴⁵ IMF *World Economic Outlook: Recovery, Risk, and Rebalancing* (October 2010).

⁴⁶ See, e.g., Bob Tita, "Industrial Companies Report Improving Markets." *The Wall Street Journal*, April 20, 2010; Phil Mattingly, "Good News on Bank Earnings, But Not Failure Risk." *The Washington Post*, September 1, 2010.

Figure 5-3: Lower-Income Metro Areas Outside the United States and Europe Outranked Others by a Wide Margin in the First Year of Recovery



Source: Analysis of Oxford Economics, Moody's Economy.com, and Cambridge Econometrics data

recession period. Outside of the South African metros of Cape Town and Johannesburg, New Delhi was the lowest-ranked metro in this group during the recovery, at a still-strong number 40. All 30 of those metro areas posted gains in both employment and GVA per capita from 2009 to 2010.

In four of the five world regions (Eastern Europe excepted), there was a strong relationship between metro performance during the recession and during the recovery. That is, places that were most heavily impacted by the recession tended to recover slower than others, while those that averted a severe downturn posted more robust subsequent growth.

Metro Performance Factors

Population Size and Growth

As in the prior two periods, a metropolitan area's size had little bearing on its performance during the recovery within world regions. Bigger places did better overall, but largely because those places tended to be high-performing Asian metros, while smaller European metros posted weaker performance. Long-run population growth was associated with *weaker* metro recovery performance in Western Europe and other high-income nations, particularly with respect to income growth, suggesting that rapid in-migration to these regions may have been attributable to house price bubbles whose bursting has held back growth in the recovery period.

Income

While lower-income metro areas clearly continued to outpace others economically in the recovery, this may also have been a function of their regional location and industry profile, rather than an advantage conferred by their lower incomes. The only region within which performance was significantly related to income was Western Europe, where higher-income metro areas tended to post better income growth. Relatively wealthy metros such as Lyon, Dusseldorf, Copenhagen, and Stuttgart posted GVA per capita gains of more than 1 percent from 2009 to 2010, while lower-income metros in Spain, Greece, and Portugal continued to experience declines. Again, these differences may reflect the lack of house price bubbles in the former metros and their presence in the latter.

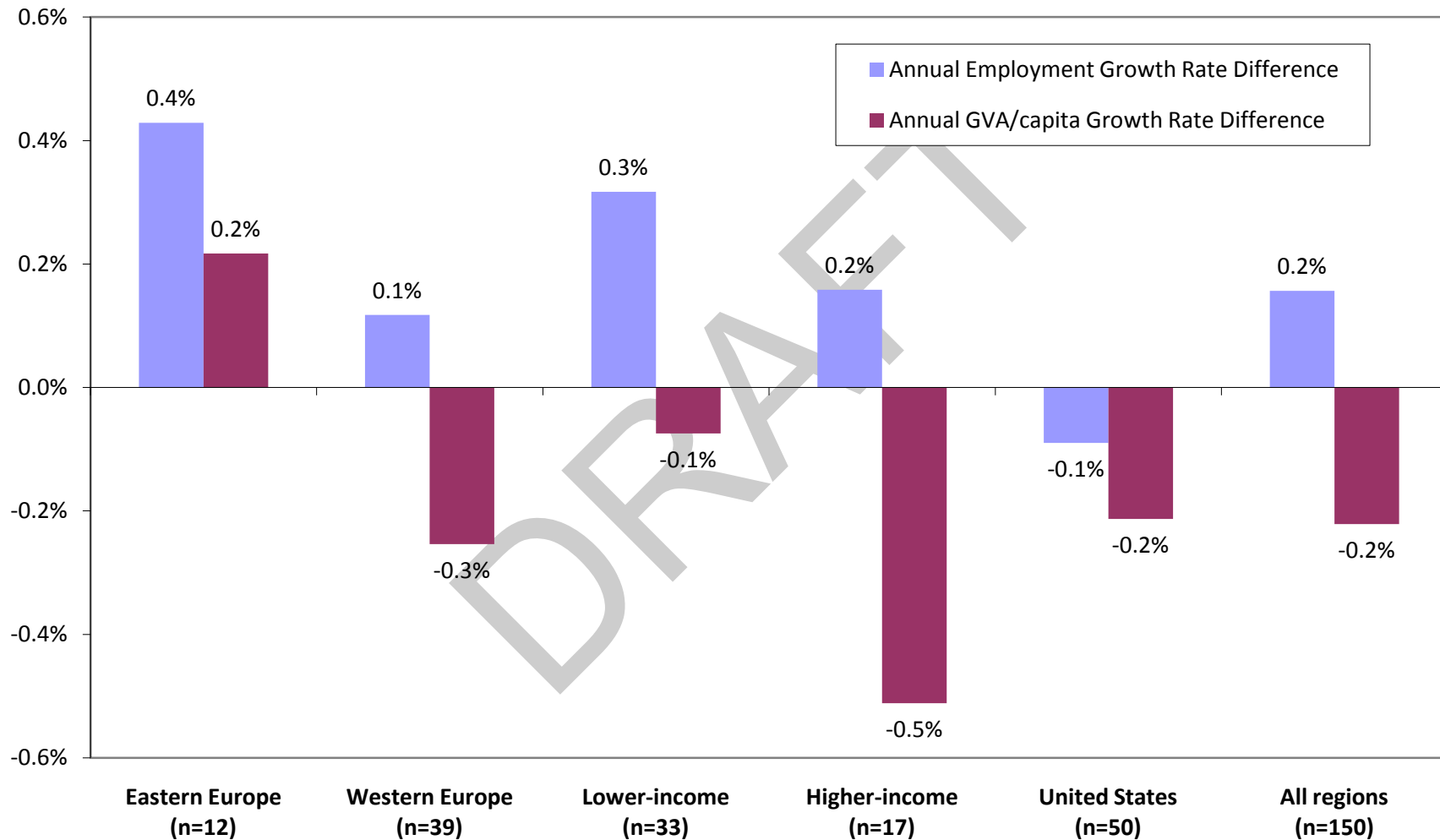
National Performance

Compared to the recession period, the performance differences between metros and their respective nations within world regions moderated in the recovery. The typical metro area shed jobs, and added income, more slowly than national averages (Figure 5-4). The national advantage over metros in income growth was smaller than in the recession period, although the typical Western European metro began to lag national averages on this indicator in the recovery period. Meanwhile, in the United States, metros "caught up" significantly to national averages on income growth compared to their relatively weak standing during the recession.

Given that metros seemed to hew a bit more closely to national performance during the recovery, it is not surprising that national employment and income change explained a great

Figure 5-4: Metros Continued to Lead Their Nations on Employment Growth and Lag Their Nations on Income Growth During the Recovery Period

Median Difference between Metro and National Annual Employment and GVA/capita Growth Rate by Region, 2009-2010



Source: Analysis of Oxford Economics, Moody's Economy.com, and Cambridge Econometrics data

deal of metro performance on those indicators in 2009-2010. Controlling for each metro's contribution to national output, 70 percent of a metropolitan area's employment change, and 65 percent of its GVA per capita change, could be attributed to its respective national trend. The importance of national context for these factors was even stronger (81 percent and 76 percent) outside of the United States.⁴⁷ As during the recession, it may be that national responses to the economic emergency, or lack thereof, established the baseline parameters for metropolitan economies' pathway to recovery.

Industrial Structure

The economic functions of metro areas within broad world regions exerted less influence on their performance in 2009-2010 than in previous periods. Still, the presence and magnitude of two industry sectors helped to explain the recent performance of Western European metros⁴⁸:

- Several of the continent's *financial and business services* centers, such as Zürich, Paris, and Munich, performed considerably better than cities with a smaller presence in those industries, including Athens, Valencia, Porto, Helsinki, and Rotterdam
- By contrast, those metros with significant shares of output in *construction* continued to perform worse than other metro areas, as they grappled with the after-effects of the house-price crash in metros such as Thessaloniki, Valencia, Barcelona, and Madrid. A similar dynamic seemed to affect Dubai, where a glut of investment in new construction before the recession yielded a significant economic hangover as worldwide recovery began

Digging Deeper on the Role of Industrial Structure: U.S. Metros [SIDEBAR]

One limitation of the metro data analyzed in this report concerns the aggregations of output data by industry. These aggregations must accommodate data reported at different levels of specificity, for different industrial categories, in different areas of the world. While the analysis strives to create consistent and meaningful categories by which to examine the relationship between industrial focus and economic performance across metro areas, industry combinations such as energy/manufacturing, and government/health/education, may at times blur important lines between quite distinct sectors. With these limitations in mind, data for U.S. metro areas alone were examined, using major industrial sectors reported under the North American Industrial Classification System (NAICS), to see whether basic results would mirror those from the 150-metro analysis.

Fortunately, results of the U.S.-only analysis were quite similar to those derived using the more aggregated industry data. The sections above find that in the pre-recession period in the

⁴⁷ As noted in the Recession Period section, these relationships may also reflect to some degree the role of national trends in the metropolitan economic forecast models employed here.

⁴⁸ In addition, metro centers of *logistics, leisure, and communications* within the United States recovered more slowly; this, however, likely reflected the concentrations of that industry in housing "bubble" markets in the southeastern and southwestern portions of the country.

Figure 5-5: Western European Metros With Large Construction Sectors Continued to Under-Perform During the Recovery Period

	Construction	Logistics, Leisure, Communications	Energy and Manufacturing	Financial and Business Services	Non-market Services
All Metros (n=150)			+	-	
East (n=12)				++	
West (n=39)	--				+
Lower-income (n=31)*					
Higher-income (n=12)*	--				
United States (n=50)		-			

Symbols indicate direction of statistically significant correlation between metro performance score and share of GVA in industry

Two symbols indicate strong correlation ($r \geq 0.5$)

* Japanese and South Korean metros, and Belo Horizonte, Brazil excluded from this analysis due to data quality issues.

Source: Analysis of data from Oxford Economics, Moody's Economy.com, and Cambridge Econometrics

United States, metro areas with high shares of output in construction performed better, and those with a focus in energy and manufacturing performed worse. Results using NAICS data support these contentions, with correlation coefficients between metro pre-recession performance scores and output shares of +0.69 for construction, and -0.43 for manufacturing. The U.S. analysis, like the analysis above, also confirms a strong positive relationship (correlation coefficient of +0.49) between metro recession performance and share of output in government services. These results strongly suggest that, at least in the case of one major world region, more precise data support the relationships identified in this report between metro industry structure and period-specific economic performance.

Period Summary

A look at the first year of the worldwide recovery from the metro perspective reveals a highly uneven landscape, but one in which lower-income regions are clearly leading the way even more than before as centers of global economic growth. Recovery has taken hold earlier in U.S. than Western European metros, but it remains unclear when output growth in either region will give way to significant employment growth. The negative after-effects of over-investment in the housing sector are still evident in several corners of both the United States and Europe, and challenge those metro areas to find a new model for growth that perhaps relies less on domestic demand and more on emerging demand in other world metro markets.

Looking Back and Looking Ahead

The economic performance of metropolitan areas across the three periods reveal important changes in the relative positions of these economies before, during, and after the Great Recession. At the same time, metros themselves are still understanding how the recession affected their individual trajectories, and how far they have come in the recovery, or whether recovery has even started. This concluding section examines where individual metros stand today as compared to before the recession, and suggests what these trends imply for efforts to achieve widespread, sustainable metro economic growth in the years to come.

Metro Economies, Before and After

From the perspective of most U.S. and European metros, the worldwide economic downturn truly was the Great Recession. In some other regions of the world, however, metros felt the recession only modestly, or recovered from it quickly. Along this dimension, the 150 metro areas split into four basic categories discussed below.⁴⁹

Category 1—No Recession/Full Recovery

At one end of the spectrum sit 34 metro areas that have higher levels of employment and income in 2010 than when the global downturn began in late 2007. They include mostly lower-income metro areas of Asia, Latin America, and the Middle East; only three metro areas in Europe and the United States (Krakow, Warsaw, and San Antonio) are in this group.

For more than half of these metro areas, the Great Recession was not really a recession at all. Nineteen (19) of the 34 experienced no downturn in employment or income between 2007 and 2010, although most (all except Hyderabad and Mumbai) experienced a slowdown in growth on one or both of these measures at some point between 2007 and 2010. The other 15 metros in this group experienced a modest drop in either employment or income (or both) from 2008 to 2009, but each had more than made up for its losses by 2010.

Across all 34 of these metro areas, typical one-year minimum growth rates between 2007 and 2010 were significantly lower than the typical long-run growth rates, but positive for both employment (1.0 percent) and income (0.7 percent) (Figure 6-1). Some metros like Beijing and Lima posted continued strong growth on employment during the recession period (minimum growth rates of 3.9 percent and 4.2 percent), while all five Chinese metros achieved minimum income growth rates during this time of at least 4 percent. Typical growth for these 34 metro areas was much stronger in the recovery period, at 2.3 percent for employment, and 5.2 percent for income.

Category 2—Road to Full Recovery

⁴⁹ Because of differences in the periods and indicators examined, the categories in which U.S. metros fall here may differ from those implied by the statistics tracked for these same areas in Brookings' quarterly *MetroMonitor* publication, which focuses on the 100 largest U.S. metro areas.

Figure 6-1: Global Metros Differ Greatly in the Impact of the Recession and the Progress of Recovery

Recession/ Recovery Category		No Recession/Full Recovery		Road to Full Recovery		Mixed Decline/Recovery			Still in Decline	
Metros		Alexandria	Lima	Austin	Moscow	Abu Dhabi	Hamburg	Oslo	Athens	Naples
		Bangalore	Manila	Boston	Nagoya	Amsterdam	Hartford	Paris	Barcelona	Porto
		Bangkok	Melbourne	Bratislava	Nashville	Atlanta	Helsinki	Philadelphia	Buffalo	Riga
		Beijing	Mumbai	Charlotte	Osaka	Auckland	Houston	Pittsburgh	Dublin	Rome
		Belo Horizonte	New Delhi	Dallas	Phoenix	Baltimore	Indianapolis	Portland	Las Vegas	Sofia
		Bogota	Rio de Janeiro	Detroit	Providence	Berlin	Jacksonville	Prague	Lisbon	Thessaloniki
		Brasilia	Riyadh	Guadalajara	St. Louis	Birmingham	Johannesburg	Richmond	Madrid	Valencia
		Buenos Aires	San Antonio	Istanbul	San Diego	Bridgeport	Kansas City	Riverside		
		Cairo	Santiago	Mexico City	San Jose	Brisbane	Leipzig	Rochester		
		Chennai	São Paulo	Minneapolis	Singapore	Brussels	Lille	Rotterdam		
		Guangzhou	Seoul	Monterrey	Tokyo	Bucharest	Ljubljana	Sacramento		
		Hong Kong	Shanghai	Montreal	Toronto	Budapest	London	Salt Lake City		
		Hyderabad	Shenzhen			Busan	Los Angeles	San Francisco		
		Jakarta	Sydney			Cape Town	Louisville	Seattle		
		Kolkata	Taipei			Chicago	Lyon	Stockholm		
		Krakow	Tianjin			Cincinnati	Manchester	Stuttgart		
		Kuala Lumpur	Warsaw			Cleveland	Marseille	Tallinn		
						Cologne	Memphis	Tampa		
						Columbus	Miami	Toulouse		
						Copenhagen	Milan	Turin		
						Denver	Milwaukee	Vancouver		
						Dubai	Munich	Vienna		
						Dusseldorf	New Orleans	Vilnius		
						Edinburgh	New York	Virginia Beach		
						Frankfurt	Oklahoma City	Washington		
						Glasgow	Orlando	Zürich		
		Metros lost no employment or income during recession, or made full recovery by 2010		Metros made at least partial recovery of recession losses in employment and income by 2010		Metros made at least partial recovery of recession losses in either employment or income, but continued to decline in the other, in 2010			Metros lost employment and income in 2010	
Median Employment Change										
Pre-recession		2.3%		1.7%		1.0%			2.1%	
Recession		1.0%		-2.4%		-2.1%			-3.1%	
Recovery		2.3%		1.0%		-0.9%			-1.7%	
Median GVA/capita Change										
Pre-recession		3.4%		2.4%		2.1%			2.6%	
Recession		0.7%		-5.2%		-4.7%			-4.8%	
Recovery		5.2%		2.7%		1.1%			-1.5%	
Maximum Recession Impact										
Employment		Hong Kong -0.6%		Moscow -17.4%		Tallinn -10.0%			Dublin -6.3%	
GVA/capita		Kuala Lumpur -4.0%		Moscow -15.1%		Tallinn -16.0%			Riga -15.7%	
Minimum Recession Impact										
Employment		Lima 4.2%		Singapore 1.9%		Abu Dhabi 3.6%			Rome -1.1%	
GVA/capita		Guangzhou 6.4%		St. Louis -0.7%		Virginia Beach 0.3%			Athens -1.7%	

Source: Analysis of Oxford Economics, Moody's Economy.com, and Cambridge Econometrics data

A second group of 24 metro areas experienced declines in either employment or income (or both) during the recession, and have posted at least a partial recovery in both measures. Half the members of this group were located in the United States (12), with Japan (3), Mexico (3), and Canada (2) also represented by multiple metros.

In general, these metro areas were affected significantly by the Great Recession, but have bounced back more strongly than others. The typical metro in this category experienced annual declines of 2.4 percent in employment and 5.2 percent in GVA per capita at the height of the recession, somewhat larger than the median declines across all 150 metro areas. In 2009-2010, however, they posted typical growth in employment of 1.0 percent—slightly below their pre-recession average—and in GVA per capita of 2.7 percent, slightly ahead of their pre-recession average.

While these 24 metro areas have all at least “turned the corner” on both measures, some have much farther to go to recovery than others. Three (Charlotte, Detroit, and Moscow) had one-year employment declines during the recession of at least 8 percent, with Moscow posting a 17.4 percent decline. Income losses of at least 8 percent also occurred in Guadalajara, Istanbul, Monterrey, Moscow, and San Jose. By contrast, Singapore did not experience a loss in employment during the recession, and had nearly fully recovered its income losses by 2010.

Category 3—Mixed Decline/Recovery

In a third group of 78 metro areas, declines in either employment or GVA per capita persist alongside partial or full recovery (or no recession at all) in the other measure. The vast majority of metros in this category (65) recovered on income in 2009-2010, but continued to lose employment. That subset included nearly equal numbers of Western European (28) and American (27) metro areas, regions in which economic recoveries remain largely “jobless” thus far. Six other U.S. metros, including Baltimore, Washington, and Seattle, continued to lose employment despite recession-era gains or full recovery of losses in GVA per capita.⁵⁰

Across the 78 metro areas, the recession was roughly similar in magnitude to that affecting the “Road to Full Recovery” group described above. At the recession’s peak, these metros registered annual declines of 2.1 percent in employment and 4.7 percent in GVA per capita. The recovery, however, has been weaker. While most began to add GVA per capita in 2009-2010, median growth in the measure was just 1.1 percent. Employment continued to fall at a typical rate of just under 1 percent annually. For the typical metro area, rates of employment and GVA growth in the recovery lagged pre-recession averages.

A good deal of variation pervaded this group as well. All were moving in at least the right direction on one important measure, but U.S. metros such as Riverside, Orlando, Atlanta, and Indianapolis had not yet begun to make up ground on employment losses of at least 5 percent from 2008 to 2009, while declines in Houston and Hamburg continued at a very modest pace.

⁵⁰ Busan and Virginia Beach also experienced no loss of GVA per capita during the recession but lost employment in 2009-2010.

Tallinn, Vilnius, and Helsinki, meanwhile, began to gain back GVA per capita in 2009-2010, but not nearly enough to recover losses of 10 percent or more during the recession period, even as Abu Dhabi, New Orleans, and Vancouver posted new highs on the measure in 2010.

Category 4—Still in Decline

The final group comprises 14 metro areas that in 2009-2010 were still in economic decline, losing both employment and GVA per capita. Twelve of these metros were in Europe, including two in Greece, two in Italy, two in Eastern Europe, and other housing “bubble” markets in Spain and Ireland. Las Vegas and Buffalo in the United States also remained in recession in 2009-2010. With the exception of the Greek metros, however, rates of decline in both employment and GVA per capita in these metro areas moderated in the past year.

The typical metro in this group experienced significant declines in both employment (3.1 percent) and GVA per capita (4.8 percent) in their minimum growth year during the recession period. These moderated to declines of 1.7 percent and 1.5 percent, respectively, in 2009-2010. Yet they still mark a sharp departure from robust pre-recession growth rates of 2.1 percent and 2.6 percent in this group’s typical metro. When recovery begins to arrive, many of these metro areas will have a long road back. The three Spanish metros (Barcelona, Madrid, and Valencia) each saw employment drop more than 5 percent in the course of a year, while GVA per capita dropped by 8.1 percent in Dublin and a staggering 15.7 percent in Riga.

Metros Looking Ahead

In light of the very different recovery stages in which these global metro areas find themselves in 2010, they look to the future with a complex and varied set of prospects and concerns for stimulating and sustaining economic growth and prosperity.

Lower-income metro areas in the emerging markets of Asia, Latin America, and portions of the Middle East led growth in the pre-recession period, largely evaded the worst effects of the recession, and are now setting the pace in recovery. Global transformations such as the increased international mobility of capital, and accompanying market reforms in these regions, drove outsourcing and offshoring of activities from higher-income regions that yielded rapidly increasing employment, incomes, or both in these places. During the Great Recession and its immediate aftermath, many of these metros were havens for capital that fled weakened markets in the United States and Europe.

As these metro areas continue for the foreseeable future to “close the gap” with higher-income metro areas, they will face a series of new challenges and opportunities. Their growing middle classes will begin to exercise demand for consumer goods and services, which may in turn provide an opportunity for local and regional industries to service expanding domestic markets. Growing incomes will also result in demand for improved public services and living environments, placing a premium on policies and investments that better accommodate and capitalize on rapid urban growth: improved infrastructure, higher environmental quality, wider educational opportunities, and increasingly responsive and representative political systems. At the same time, these metro areas will need to steer clear of asset bubbles that recent influxes

of international investment could create, and which fueled the economic crisis in higher-income regions. The even more rapid growth of smaller (but still very large) second-tier metros in countries like China, India, and Brazil may provide “escape valves” that relieve inevitable pressures on the larger, more globally influential metros profiled in this report.

Higher-income metros, particularly in the United States and portions of Western Europe, face a wholly different set of challenges and opportunities as they emerge from economic crisis. Consumption-led growth in the run-up to the recession left these countries with significant debt overhangs, and many of their major metros with a glut of housing, diminished productive capacity, or both. Many also inherit legacy systems of governance ill-suited for keeping pace with fast-paced global economic changes, and not attuned to the metropolitan scale of those dynamics. If they fail to pursue new models for economic growth, and new institutions to support it, they could ultimately fall even further behind in an ever-more integrated global economy.

Fortunately, the growth of emerging-market metros, and their constituent consumers, businesses, and governments, represent real opportunities for these higher-income metro areas. Estimates suggest that by 2020, more than a quarter of the global middle class will live in Brazil, India, and China alone, and most within their major metropolitan areas.⁵¹ If advanced metro economies in the United States, Europe, and elsewhere hope to help satisfy that demand, they must build from their endemic market strengths, continuously improve their rates of innovation, advance their leadership in the emerging low-carbon economy, and most of all, embrace the potential of exports—most of which originate in these very metros—to generate wealth and high-quality jobs. This approach will likewise require these countries and their metros to upgrade the skills of their workforces, in order to remain at the forefront of innovation and deployment.

Across the globe, a sustainable economic recovery will depend on active strategies at both the *macro* and *metro* levels to chart a path forward. Macro-level trade and currency policies must support a rebalancing of global demand that reduces both trade deficits in advanced economies and trade surpluses in emerging economies. National policies must also invest in fundamental drivers of metropolitan economies—innovative institutions, infrastructure, human capital—to align with metropolitan goals. At the same time, major global metros themselves must connect better to one another to identify specific opportunities to strengthen economic relationships, and to exchange policy ideas and practices that set the platform for productive economic growth. Viewing the continued evolution of the global economy through a metropolitan prism makes clear that these places can fuel a new era of widespread growth and prosperity, if they have a grounded vision of their role in the next economy and the national supports necessary to achieve it.

⁵¹ Emilia Istrate, Jonathan Rothwell, and Bruce Katz, “Export Nation: How U.S. Metros Lead National Export Growth and Boost Competitiveness” (Washington: Brookings Institution, 2010), citing Homi Kharas and Geoffrey Gertz, “The New Global Middle Class: A Cross Over from West to East.” In Cheng Li, ed., *China’s Emerging Middle Class: Beyond Economic Transformation* (Washington: Brookings Institution, 2010).

Metro Performance Profile: AUSTIN

The Austin-Round Rock, TX metropolitan area is the capital region for the state of Texas, located in the southern United States. The metropolitan region is comprised of the core city, Austin, that together with nearby suburbs comprises a population of 1,763,000 in 2010. From 1993 to 2007, Austin's population increased by 68 percent, and it was the sixth fastest-growing large U.S. metro area in the 2000s.

	Population 2010 (mil)	GVA/capita 2007 (\$)	Pre-recession (1993-2007)		Recession (2008-2009)		Recovery (2009-2010)	
			GVA/cap change	Emp. change	GVA/cap change	Emp. change	GVA/cap. change	Emp. change
Austin	1,763	43,860	3.4%	3.1%	-3.1%	0.1%	2.7%	3.2%
USA	309,756	37,928	1.3%	2.1%	-3.3%	-4.0%	2.4%	-0.7%

Pre-recession

Prior to the recession, Austin outperformed the United States on indicators of income and employment growth. Both rose by more than 3 percent annually during this period, compared with more modest U.S. annual growth of 1.3 percent in GDP and 2.1 percent in employment. The Austin metro ranked 25th overall in the Global MetroMonitor for the pre-recession period.

The 1990s were a boom period for Austin, with major technology firms such as Dell Computer, IBM, and Texas Instruments anchoring their operations in the area. They employed tens of thousands of young and highly educated workers who moved to the region for economic opportunity and the city's renowned cultural fare. By 2000 the region had the highest share of population between the ages of 25 and 34 among the 50 largest metros in the United States.⁵²

As a result of its technology focus, the region was hit harder than most during the "dot-com bust" of the early 2000s, but rebounded to post robust 4 percent annual employment growth from 2003 to 2007. By 2007, the Austin metro produced 27 patents per 10,000 employees, third-highest among the 100 largest U.S. metro areas.⁵³ Its innovative capacity owes in part to its high level of college degree attainment (38 percent, 8th in the nation) and the fact that it is home to the University of Texas flagship campus, one of the nation's largest and highest-rated public universities.

Recession

During the recession, GVA per capita in Austin dropped precipitously (-3.1 percent from 2008 to 2009), mirroring the nationwide decline. Employment stagnated, but did not fall considerably as it did nationwide. The region was buoyed by its concentration in education and government services (22 percent of jobs, versus 18 percent across all U.S. metros), industries that were not as impacted by the downturn. At the height of the recession from 2008 to 2009, Austin still

⁵² Joe Cortright, "The Young and the Restless in a Knowledge Economy" (CEOs for Cities, 2005).

⁵³ Brookings analysis of U.S. Patent and Trademark Office data.

registered net in-migration of more than 25,000 residents, the third-highest metro total in the nation. It also benefited from location in Texas, where relatively conservative state lending regulations reduced the prevalence of speculative mortgages that, in other parts of the nation, produced rampant home foreclosures and severe house price and employment declines.⁵⁴ Austin ranked 40th among the 150 global metros during the recession, third-highest among American metros.

Recovery

During the recovery, Austin's income grew (2.7 percent) somewhat faster than the national average (2.4 percent). Unlike the United States as a whole, which continued to shed employment in 2009-2010, Austin returned to employment growth rates comparable to its pre-recession performance (3.2 percent). Sectors such as professional and business services, education and health, leisure and hospitality, and government all posted strong job gains in the Austin metro from 2009 to 2010.⁵⁵ As a sign of the area's continued strength, Facebook made its first major U.S. expansion outside California in Austin in 2010.⁵⁶

In sum, Austin's continued attraction and retention of high-skilled human capital, its diverse set of export-based industries, and its avoidance of the worst U.S. housing market excesses of the 2000s help explain its stronger-than-national performance throughout the three periods.

⁵⁴ Alyssa Katz, "The Lone Star Secret: How Texas Avoided the Worst of the Real Estate Meltdown." *The Big Money*, March 30, 2010.

⁵⁵ According to U.S. Bureau of Labor Statistics Current Employment Statistics data.

⁵⁶ Kirk Ladendorf, "Facebook Friends Austin to Support Its Rapid Growth." *Austin American Statesman*, April 10, 2010.

Metro Performance Profile: JOHANNESBURG

The Johannesburg metropolitan region, capital of the broader Gauteng Province in northeastern South Africa, had a population of 7.3 million people in 2010, or about 15 per cent of the country's total population. Johannesburg is the hub for South Africa's wholesale and retail sector, contributing nearly a third of its retail output. The Gauteng region is South Africa's financial center, with a 40 share of the country's financial industries.⁵⁷ It is also the leading industrial hub within Sub-Saharan Africa and features established manufacturing (particularly machinery and equipment and petroleum and chemicals) and mining industries (gold, platinum, diamonds, and other metals).

	Population 2010 (mil)	GVA/capita 2007 (\$)	Pre-recession (1993-2007)		Recession (2008-2009)		Recovery (2009-2010)	
			GVA/cap change	Emp. change	GVA/cap change	Emp. change	GVA/cap change	Emp. change
Johannesburg	7,261	8,507	1.9%	2.5%	-3.7%	-4.8%	1.4%	-4.2%
South Africa	49,173	5,052	2.0%	0.8%	-2.6%	-4.2%	2.4%	-3.3%

Pre-recession

The period from 1993 to 2007 coincided with the years following South Africa's emergence from decades of apartheid rule, and the lifting of punitive economic sanctions that had isolated the country from the international marketplace. After stagnating through most of the 1990s, both Johannesburg and South Africa began to experience significant growth in income and employment from 2000 onward. Income growth for Johannesburg was comparable to the national growth rate from 1993 to 2007, while the region outperformed the nation in employment growth (2.5 percent versus 0.8 percent). These rates placed the region 54th among the 150 metro areas.

Recession and recovery

The Johannesburg metropolitan region holds the unfortunate distinction of being among the few metros outside Europe and the United States that were hit hardest by the recession. Johannesburg dropped 62 positions in its ranking among the 150 metro areas between the pre-recession and recession periods, and another 27 positions from the recession to recovery period, when the metro placed 143rd overall.

From 2008 to 2009, employment contracted by 4.8 percent and income fell by 3.7 percent in Johannesburg. The following year, income rose modestly in Johannesburg but at a rate below the national average. Meanwhile, the metro continued to lose employment at a rate (4.2 percent) similar to that during the recession.

⁵⁷ *State of South African Cities Report* (Johannesburg: South African Cities Network, 2006).

The less-than-stellar performance of the Johannesburg metropolitan region during the recession and recovery owes largely to underlying labor market problems. Johannesburg's labor market has been unable to absorb an increasing supply of labor leading to high youth unemployment and an overall skills mismatch. In 2005, unemployment in Johannesburg was at 23.5 percent.⁵⁸ By 2009, unemployment in Gauteng province had increased to 27 percent.⁵⁹ The impact was strongest in manufacturing industries, which in the first half of 2009 lost 200,000 jobs in Gauteng alone.

Johannesburg's relatively poor performance is especially unfortunate given the economic boost that the country had hoped to receive from hosting the 2010 FIFA World Cup. In response, the construction industry expanded, from 4 percent of employment in 2002 to 7 percent in 2009. Within South Africa, a significant amount of construction spending for the FIFA World Cup was related to infrastructure within Gauteng where about a third of all matches played during the competition. Overall, the World Cup was expected to contribute about 0.5 per cent of South Africa's GDP in 2010.⁶⁰

⁵⁸ Ibid.

⁵⁹ *Provincial Economic Outlook* (Gauteng Government, 2010).

⁶⁰ *Consolidated Government Budget 2010* (National Treasury of South Africa).

Metro Performance Profile: LAS VEGAS

The Las Vegas-Paradise, NV metropolitan area is located in southern Nevada, in the Intermountain West region of the United States. The metropolitan region is comprised of the core city, Las Vegas, and surrounding Clark County in Nevada, which in 2010 had a population of 1.94 million. The Las Vegas metro population grew by 104 percent from 1993 to 2007, the fastest rate of any U.S. metro area, and the third-fastest among the 150 global metro areas studied.

	Population 2010 (mil)	GVA/capita 2007 (\$)	Pre-recession (1993-2007)		Recession (2008-2009)		Recovery (2009-2010)	
			GVA/cap change	Emp. change	GVA/cap change	Emp. change	GVA/cap. change	Emp. change
Las Vegas	1,940	40,465	1.5%	4.9%	-5.4%	-4.9%	-1.2%	-3.0%
United States	309,756	37,928	1.3%	2.1%	-3.3%	-4.0%	2.4%	-0.7%

Pre-recession

Las Vegas is the gaming capital of the United States, and a major center for tourism and international business conventions. While the metro area is the 30th largest in the United States by population, its airport is the seventh busiest.⁶¹

In the decade and a half prior to the Great Recession, Las Vegas added employment at a torrid 4.9 percent annual pace, as local construction, real estate, and gaming industries boomed. From 1990 and 2007, the metro area added roughly 470,000 housing units, and inflation-adjusted house prices nearly doubled.⁶² People moved to the metro by the hundreds of thousands, so that by 2007, 56 percent of Las Vegas residents were born outside the state of Nevada, and a further 22 percent were born outside the United States altogether.⁶³

Recession

Las Vegas was at the epicenter of the U.S. house-price bubble and ensuing crash. Between 2007 and 2009, metropolitan house prices fell by more than half, leading to massive dislocations in the construction industry and a huge slump in consumption-related industries, which provided 53 percent of the region's output in 2007, far higher than in any other U.S. metro area.⁶⁴ Employment in Las Vegas dropped by 4.9 percent from 2008 to 2009, compared to 4.0 percent nationally. Most job losses came in construction (-28,000) and leisure/hospitality (-19,000), two of the region's most important industries. GVA per capita fell even faster, by 5.4

⁶¹ Richard N. Velotta, "Moves should keep McCarran seventh busiest through 2015." *Las Vegas Sun*, November 12, 2010.

⁶² 1990 Census and 2007 Population Estimates Program data; Case-Shiller Home Price Index.

⁶³ Analysis of 2007 American Community Survey data.

⁶⁴ Including accommodation and food services, leisure and hospitality, construction, real estate, and retail. Mark Muro and Robert Lang, "Metropolitan Las Vegas: Challenges, Opportunities, and a Vision." University of Las Vegas, September 8, 2009.

percent, reflecting the region's additional loss of high-value jobs in financial and business services, many of which supported local real estate and tourism industries.

The nationwide drop in consumer spending and home buying radically upended Las Vegas' economic growth model. Between 2008 and 2009, a region that had gained a net average of 40,000 residents annually from other parts of the country actually saw net out-migration of 1,300 residents.

Recovery

A patchy recovery took hold in most U.S. metros from 2009 to 2010, but not in Las Vegas. The metro experienced a continued decline in GVA per capita (1.2 percent) despite an increase nationally, and employment dipped a further 3 percent, much greater than the national decline of 0.7 percent.

One factor that continues to hold back recovery in Las Vegas is its high number of foreclosed properties. The metro had the second-highest share of bank-owned homes in the country in June 2010, a reflection of the inflated prices, easy credit, and exotic mortgages that pervaded the housing market during the 2000s, as well as the metro's current wider economic distress.⁶⁵ Two-thirds or more of residential mortgage holders in the state of Nevada now owe more on their mortgages than their home is worth.⁶⁶

With tens of thousands of construction jobs likely not to return to the region anytime soon, a drive to diversify the Las Vegas metro economy is underway. As it and other comparable U.S. metros such as Phoenix and Riverside struggle to recover from the Great Recession, existing public and private centers of innovation, such as the Solar Solutions and Advanced Clinical Training and Research centers at the University of Nevada Las Vegas, represent potential pillars for more sustainable economic growth.⁶⁷ Raising Las Vegas' low rate of college degree attainment (22 percent of adults in 2009) will also be crucial to facilitating that long-run transition.

⁶⁵ Howard Wial and Richard Shearer, "MetroMonitor: Tracking Economic Recession and Recovery in America's 100 Largest Metro Areas" (Washington: Brookings Institution, September 2010).

⁶⁶ Alan Mallach, communication with Brookings Metropolitan Policy Program, November 2010.

⁶⁷ Mark Muro and Sarah Rahman, "Centers of Invention: Leveraging the Mountain West Innovation Complex for Energy System Transformation" (Washington: Brookings Institution, 2010).

Metro Performance Profile: LIMA

The Lima metropolitan region comprises a population of approximately 8.5 million people in 2010, and is the capital region of Peru, as well as the fourth largest metro area in South America. The Lima metro area contains almost 30 per cent of Peru's population, and generates more than 50 percent of the nation's GDP. Lima acts as a trading, financial, and business services hub for Peru's commodity-focused economy.

	Population 2010 (mil)	GVA/capita 2007 (\$)	Pre-recession (1993-2007)		Recession (2008-2009)		Recovery (2009-2010)	
			GVA/cap change	Emp. change	GVA/cap change	Emp. change	GVA/cap. change	Emp. change
Lima	8,476	5,498	4.4%	2.8%	-0.4%	4.3%	5.6%	5.7%
Peru	29,496	2,989	3.5%	3.6%	-0.3%	1.3%	5.1%	2.3%

Pre-recession

In the pre-recession period, the Lima metropolitan area outperformed the Peruvian national average on income growth, and lagged the national average slightly on employment growth. Both employment and income growth in Lima were strong in the international context, although per-capita GVA in 2007 reached just \$5,500, 18th lowest among the 150 metro areas. Still, given its strong expansion, Lima ranked among the highest global metro economic performers (16th overall), and was the only metropolitan area in South America to place among the top 30 from 1993 to 2007.

Lima's and Peru's strong growth during the pre-recession period has been attributed to policies that liberalized trade and foreign direct investment starting in the early 1990s. This strengthened the region as a center of international production for agriculture; minerals such as gold, copper, lead, and zinc; and manufactured goods derived from these inputs.

Recession

The recession only bolstered Lima's position as one of the best performing metros globally. It climbed to rank 11th among all 150 metros during the recession period. The downturn led to only a slight reduction in income (-0.4 percent), comparable to the national decline. Meanwhile, however, employment rose at a dramatic rate of 4.3 percent, well above the national average, and highest among the 150 metro areas studied.

The broader national and global economic context worked toward the Lima metropolitan region's advantage during this period. There has been relatively little contagion of the recession to South American countries, where exposure to the banking crisis has been perceived as low due to higher financial sector regulation. This "safe haven" condition had the effect of driving a reallocation of capital from markets hit by the recession to countries like

Peru.⁶⁸ Within Peru, Lima's role as the primary engine for economic growth meant that public and private investments by far exceeded those of any other metropolitan area.

Recovery

Following the recession, Lima's income and employment soared at comparable annual rates of 5.6 percent and 5.7 percent respectively, outpacing national averages in both cases. While Lima continued to outperform all other South American metropolitan areas during this period, five others joined Lima among the strongest performing metro areas from 2009 to 2010 including: Santiago, Chile; Buenos Aires, Argentina; and Sao Paulo, Rio de Janeiro, and Belo Horizonte, Brazil.

Whether these growth rates will persist once the economic recovery is more widespread remains to be seen. To its advantage, Peru has gradually reduced its dependency on U.S. and European markets for its exports, while it has established several trading agreements with Asian countries. Given its economic base, however, Lima's productivity growth still depends highly on external demand and commodity prices, particularly for mining and agro-industries. It has a minimal number of high-tech industries and, as in countries like Spain prior to the recession, construction has been the most rapidly expanding economic sector for the last decade. Construction output is estimated to grow by at least 16 percent in 2010, while manufacturing's share of GDP continues a slow decline.⁶⁹

Thus, while Lima was largely able to escape the impact of the Great Recession, and is one of the leading growers in its wake, the metro area and its residents may still benefit from a forward-looking strategy to achieve sustainable growth through expansion of its competitive economic base.

⁶⁸ José Antonio Ocampo, "Latin America and the Global Financial Crisis." *Cambridge Journal of Economics* (33)(4)(2009): 703–24.

⁶⁹ Instituto Nacional de Estadística e Informática, 2010.

Metro Performance Profile: SHENZHEN

Shenzhen is located in southeastern China on the South China Sea, very near the Hong Kong and Guangzhou metropolitan regions. The Shenzhen metropolitan region, home to 9.5 million inhabitants in 2010, is part of the larger Pearl River Delta mega-region of over 120 million people. Like many other Chinese metropolitan areas, Shenzhen is experiencing rapid population growth, expanding by 22 percent from 2007 to 2010 alone due to continued in-migration from the country's rural inland region.

	Population 2010 (mil)	GVA/capita 2007 (\$)	Pre-recession (1993-2007)		Recession (2008-2009)		Recovery (2009-2010)	
			GVA/cap change	Emp. change	GVA/cap change	Emp. change	GVA/cap change	Emp. change
Shenzhen	9,501	10,598	8.2%	9.4%	4.6%	2.3%	5.9%	5.9%
China	1,354,146	2,011	9.3%	1.0%	8.0%	0.0%	8.7%	1.3%

Pre-recession

Shenzhen is one of the top performers across all periods in the Global MetroMonitor. In the 1993 to 2007 period, It achieved the highest ranking among all 150 metro areas, posting annual income growth of 8.2 percent, and annual employment growth of 9.4 percent. The former measure was in line with the national average over this time, while the latter far outstripped growth rates in other major Chinese metros (Beijing, Shanghai, Guangzhou, Tianjin) and the nation as a whole.

Shenzhen became China's inaugural Special Economic Zone in the early 1980s, permitting market capitalism to flourish within its borders well before much of the rest of the nation. As a result, the region became an attractive location for manufacturing in China, not only for former Hong-Kong based industries but also for many Taiwanese and Japanese electronics companies. Manufacturing and energy output now accounts for roughly 58 percent of Shenzhen's economy.

Recession and recovery

Shenzhen avoided exposure to the recession. While its growth rates slowed as compared to long-run averages, neither employment nor income dropped during the worldwide downturn. While income grew at a slower rate than the national average, employment growth remained positive and higher than in China as a whole.

Growth sped up in Shenzhen in 2009-2010, as it did nationwide. Shenzhen's income and employment growth rates of 5.9 percent ranked the metro second overall among the 150 studied. Its growth rates have not rebounded to their prior levels, but it is unclear how sustainable those pre-recession growth rates were.

The impact of the worldwide downturn on Shenzhen was muted in part by the area's growing role as a manufacturing and service hub for mainland China. From 2006 to 2009, the

contribution of exports to Guangdong province's economic output declined from 92 percent to 62 percent.⁷⁰

Shenzhen, Pearl River Delta, and China more generally, are improving and expanding their industries to achieve a competitive edge in the international marketplace. Extremely high levels of population growth have allowed Shenzhen to contract exports while continuing to achieve high rates of GVA and employment growth.

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⁷⁰ Deutsche Bank Research: China's Provinces. Online at [www.dbresearch.com/servlet/reweb2.ReWEB?rwdspl=0&rwnode=DBR_INTERNET_EN-PROD\\$RMLCHPM&rwsite=DBR_INTERNET_EN-PROD](http://www.dbresearch.com/servlet/reweb2.ReWEB?rwdspl=0&rwnode=DBR_INTERNET_EN-PROD$RMLCHPM&rwsite=DBR_INTERNET_EN-PROD) [accessed October 2010]. This reflects decreased global demand for exports amid the economic crisis, as well as growing domestic demand for Shenzhen's manufactured goods.

Metro Performance Profile: WARSAW

With a total population of 2.4 million people in 2010, the Warsaw metropolitan area is Poland's largest, and contains the national capital. The metropolitan area is strategically located at intersecting transport corridors within Eastern Europe. Unlike some of its Eastern European counterparts, however, Warsaw does not dominate Poland economically—the metro area contains less than 7 percent of the national population and generates about 15 percent of national GDP.

	Population 2010 (mil)	GVA/capita 2007 (\$)	Pre-recession (1993-2007)		Recession (2009-2010) ⁷¹		Recovery (2009-2010)	
			GVA/cap change	Emp. change	GVA/cap change	Emp. change	GVA/cap. change	Emp. change
Warsaw	2,473	18,242	5.1%	1.3%	2.4%	0.8%	2.4%	0.8%
Poland	XXX	7,760	3.0%	0.3%	1.9%	-0.2%	2.2%	-0.2%

Pre-recession

Warsaw's economic performance outpaced that of most other regions in Europe. It ranked 38th among the 150 metros for economic performance from 1993 to 2007, comparable to other Eastern European capitals but well above most Western European metros. While Warsaw's annual employment growth rate (1.3 percent) was relatively modest compared to other high-performing metro areas, it experienced rapid income growth of 5.1 percent. On both counts, Warsaw significantly outperformed Polish national averages.

The integration of Eastern Europe into the global marketplace, and Poland's more recent entry into the European Union, helped to transform the region economically. From then on, Warsaw has ranked among the fastest growing OECD metro regions, fuelled by an expanding and diversifying services industry including telecommunications, information technology, financial services, insurance, and trade. The region has received significant foreign investment and has become particularly attractive for the location of IT services, research and development, and service facilities.⁷²

Recession and recovery

Together with Krakow, the other Polish metro included in this report, Warsaw was the only European metropolitan area that did not experience a decline in either GVA per capita or employment during the recession. Its minimum year of growth in both indicators was 2009-2010, when GVA per capita expanded by 2.4 percent, and employment rose 0.8 percent. Once again, Warsaw outperformed Poland as a whole on both measures.

⁷¹ Poland's GVA per capita growth rate bottomed out in 2008-2009; its employment growth, and both GVA per capita and employment growth for Warsaw, experienced their minimums in 2009-2010.

⁷² *Poland Territorial Review* (OECD, 2008).

Much of Warsaw's economic success and strong performance during the global downturn ultimately stem from wider national dynamics. Three factors stand out.

First, in 2004, aware of potential risks related to cheap credit, the National Bank of Poland focused its policy on fiscal stability by setting clear targets for loan to value ratios. This prevented Warsaw from overextending its credit market, as occurred in many other Eastern and Western European nations.

Second, Warsaw's diversified economic base limited the impact of the recession. Poland depends less on particular industry sectors than other Eastern European countries, and its large share of highly flexible small and medium-sized enterprises (SMEs) rely more on Poland's internal market than exports and international expansion. This structure has ensured that there is no major economic orientation around cyclical industries.

Third, Poland's unemployment rate before the recession (18 percent) was considerably higher than the Eastern European average (13 percent), in part due to earlier fiscal austerity policies. This induced significant emigration of younger, less-skilled Poles to other parts of the European Union, leaving behind a labor pool that was better matched to available opportunities. At the same time, the population of Poland remains young by regional standards; more than one-third is under age 25. This young pool of workers has facilitated economic transitions, most recently towards services, while also maintaining more labor-intensive manufacturing.

Taken together, Warsaw's national fiscal policies, diverse labor market and dynamic labor supply helped shield it from the effects of the Great Recession and have positioned it well among its European counterparts in the beginning of economic recovery.