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Global metro monitor: the path to economic recovery: a preliminary overview of 150 global metropolitan economies in the wake of the great recession

Report

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GLOBAL METRO MONITOR

THE PATH TO ECONOMIC RECOVERY

A PRELIMINARY OVERVIEW OF 150 GLOBAL METROPOLITAN ECONOMIES IN THE WAKE OF THE GREAT RECESSION

B | Metropolitan Policy Program
at BROOKINGS

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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 3.2 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 Led by Metropolitan Economies

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 Zurich, 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 90 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.

The Global Downturn and Recovery are Accelerating a Shift in Growth Toward Lower-Income Metropolitan Areas in Asia and Latin America

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 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 and 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 other regions 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, Bogotá 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 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.

Metro Performance Ranking Before, During and After the Great Recession

RECOVERY 2009–2010		PRE-RECESSION 1993–2007	RECESSION YEAR OF MINIMUM GROWTH 2007–2010	RECOVERY 2009–2010		PRE-RECESSION 1993–2007	RECESSION YEAR OF MINIMUM GROWTH 2007–2010
1	Istanbul	44	143	38	Krakow	23	13
2	Shenzhen	1	4	39	Dallas	71	75
3	Lima	16	11	40	New Delhi	30	17
4	Singapore	18	33	41	Monterrey	58	124
5	Santiago	41	38	42	Baltimore	109	89
6	Shanghai	8	3	43	Abu Dhabi	5	16
7	Guangzhou	3	2	44	Minneapolis	98	102
8	Beijing	4	1	45	Sydney	76	30
9	Manila	34	24	46	Detroit	147	146
10	Rio de Janeiro	100	28	47	Moscow	9	150
11	Hyderabad	15	14	48	Nashville	61	129
12	Mumbai	24	19	49	Cleveland	135	131
13	Bangalore	7	9	50	Seattle	79	60
14	Melbourne	47	22	51	San Antonio	78	32
15	Guadalajara	69	98	52	Tokyo	143	72
16	Kolkata	39	10	53	Charlotte	65	141
17	Chennai	31	12	54	St. Louis	133	68
18	Tianjin	12	5	55	Bratislava	26	52
19	Buenos Aires	60	18	56	Warsaw	38	15
20	Jakarta	123	6	57	Boston	94	92
21	Taipei	53	39	58	Nagoya	146	109
22	Belo Horizonte	42	27	59	Busan	89	29
23	Kuala Lumpur	17	37	60	Osaka	149	93
24	Riyadh	129	21	61	Houston	91	84
25	São Paulo	70	31	62	Cincinnati	118	118
26	Austin	25	40	63	Toronto	67	82
27	Montreal	74	45	64	Brisbane	27	23
28	Alexandria	36	8	65	Bucharest	29	73
29	Cairo	37	7	66	Memphis	107	121
30	Hong Kong	72	48	67	Salt Lake City	48	123
				68	Phoenix	20	114
31	Bogotá	46	25	69	Richmond	103	90
32	Brasilia	95	20	70	Bridgeport	110	91
33	Seoul	32	26	71	Louisville	139	110
34	Mexico City	88	66	72	San Diego	43	112
35	Bangkok	150	35	73	Providence	105	103
36	Virginia Beach	92	42	74	Tampa	83	120
37	Washington	85	36	75	San Jose	73	142

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

UNITED STATES WESTERN EUROPE EASTERN EUROPE OTHER LOWER-INCOME OTHER HIGHER-INCOME

Recovery 2009–2010	City	Pre-Recession 1993–2007	Recession Year of Minimum Growth 2007–2010
76	Oklahoma City	132	46
77	New York	90	88
78	Miami	66	122
79	Prague	33	50
80	Toulouse	52	44
81	Columbus	111	104
82	Chicago	115	127
83	Milwaukee	141	135
84	Denver	64	132
85	Orlando	40	119
86	Marseille	84	43
87	New Orleans	148	107
88	Vienna	122	49
89	Dusseldorf	126	85
90	Jacksonville	80	125
91	Auckland	55	55
92	Vancouver	63	95
93	Lyon	93	63
94	Hamburg	127	61
95	Sacramento	50	115
96	Paris	114	51
97	Lille	104	54
98	Oslo	106	34
99	Leipzig	77	65
100	Copenhagen	101	99
101	Zurich	142	58
102	Portland	45	139
103	Turin	137	105
104	Cologne	131	81
105	Budapest	57	86
106	Rome	116	67
107	Riverside	28	130
108	Stuttgart	134	113
109	Munich	102	76
110	Milan	120	111
111	Berlin	144	56
112	Lisbon	96	53
113	Frankfurt	130	83
114	Ljubljana	81	106
115	Edinburgh	62	70
116	Los Angeles	82	137
117	Cape Town	75	64
118	Vilnius	13	147
119	Glasgow	86	79
120	Buffalo	117	69
121	Hartford	138	101
122	Kansas City	124	59
123	London	68	100
124	Helsinki	59	138
125	San Francisco	112	133
126	Rotterdam	125	71
127	Philadelphia	119	78
128	Rochester	136	77
129	Pittsburgh	128	41
130	Stockholm	87	108
131	Birmingham	121	117
132	Amsterdam	113	74
133	Brussels	97	62
134	Manchester	108	96
135	Naples	140	94
136	Sofia	10	80
137	Indianapolis	99	126
138	Tallinn	21	149
139	Atlanta	56	136
140	Porto	145	87
141	Athens	19	47
142	Madrid	22	134
143	Johannesburg	54	116
144	Riga	11	148
145	Valencia	49	140
146	Las Vegas	14	128
147	Thessaloniki	51	57
148	Barcelona	35	145
149	Dubai	2	97
150	Dublin	6	144

1. 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 3.2 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

Figure 1-1. Metro Incomes Exceed National Incomes
Average Ratio of Metro to National GVA per Capita by World Region, 2007

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

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 Institution 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 25 European countries plus the 25 largest other metro economies in Europe; and 50 of the largest metro economies in other regions 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 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, U.S.A. and Zurich, Switzerland.
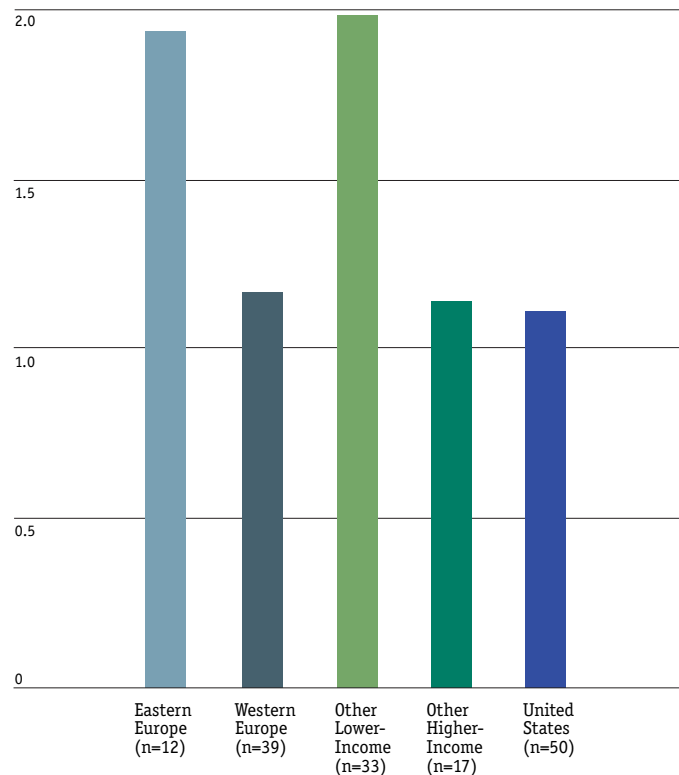
These metropolitan areas do, however, consistently function as locations for high-value economic activity in their respective nations and world regions. Nearly 80 percent of the metros boast income (proxied by per capita GVA) above their respective national averages. The "metro edge" is particularly 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 generated an astonishing 46 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 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.

Figure 1-2. Major Global Metros Punch Above Their Weight Economically
Share of World Population and Output in 150 Metro Areas, 2007

Gross Value Added 46%

Population 12%
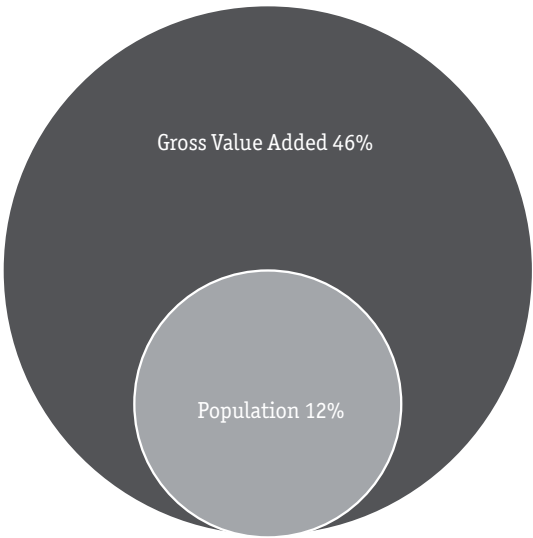
Source: Analysis of Oxford Economics, Moody's Economy.com, and Cambridge Econometrics data.

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1 IMF World Economic Outlook Database, October 2010.
2 See UN Habitat, *State of the World's Cities Report 2008/09, Harmonious Cities* (London: Earthscan, 2008), and World Bank, *World development report 2009: reshaping economic geography* (2009); 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).
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.

2. 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 based on the administrative divisions of European nations and the NUTS regions are thus comparable across European countries. Our sample of European metros includes 25 capital metro areas and 25 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 3.1 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]

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

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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.

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 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

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. 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.
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). Detailed NAICS-based industry data from Moody's Economy.com were used to approximate ISIC sectors. 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 an estimated 10 percent larger than it otherwise would be if the data were originally defined using the ISIC scheme.

2007 was used, based on the availability of data across all metros extending back to 1993, and the start of the recession 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

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.

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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.

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.

Additional Analysis

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 here [23]

- *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 period [24]

- *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 account [26]

- *Industrial structure:* How did metropolitan output shares in different industry sectors relate to broader performance in the three time periods? The association between metro 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

- Other Lower-Income: 32 metro areas outside Europe and the United States with GVA per capita under $15,000 in 2007 [28]

- Other Higher-Income: 17 metro areas outside Europe and the United States with GVA per capita over $15,000 in 2007 [29]

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.

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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.

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 São Paulo, Brazil; Santiago, Chile; Beijing, Guangzhou, Shanghai, Shenzhen, and Tianjin, China; Bogotá, 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.

Figure 2-1. 150 Metropolitan Regions

The Global MetroMonitor tracks the economic performance of 150 major global metropolitan areas, integrated collections of cities and surrounding areas that form functional regional economies. The 150 metro areas include the 50 largest economies in the United States, 25 national capitals plus another 25 large metros in Europe, and 50 other large metro areas in North and South America, Africa, and the Asia/Pacific region.

Vancouver
Seattle
Portland
Toronto
Montreal
Boston
Chicago
San Francisco
New York
Los Angeles
Dallas
Washington
Atlanta
Houston
Miami
Mexico City
Bogotá
Lima
Brasilia
Rio de Janeiro
São Paulo
Santiago
Buenos Aires

Metropolitan Population
2010 estimates

20 m
5 m

Source: Oxford Economics, Cambridge Econometrics data, and U.S. Census Bureau.

3. 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 3-4). 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 3-5). 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 four times larger per capita in 2007 as in 1993, and Shenzhen more than tripled 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, 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 income from 1993 to 2007, but growth rates tended to be anemic, typically 0.5 percent annually for employment and 1.3 percent annually for income.

Across the complete set of 150 metro areas, those metros in emerging economies out-performed 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 3-1). Notwithstanding these differences, the period was marked by a measure of regional diversity among both high and low metro performers.

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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.
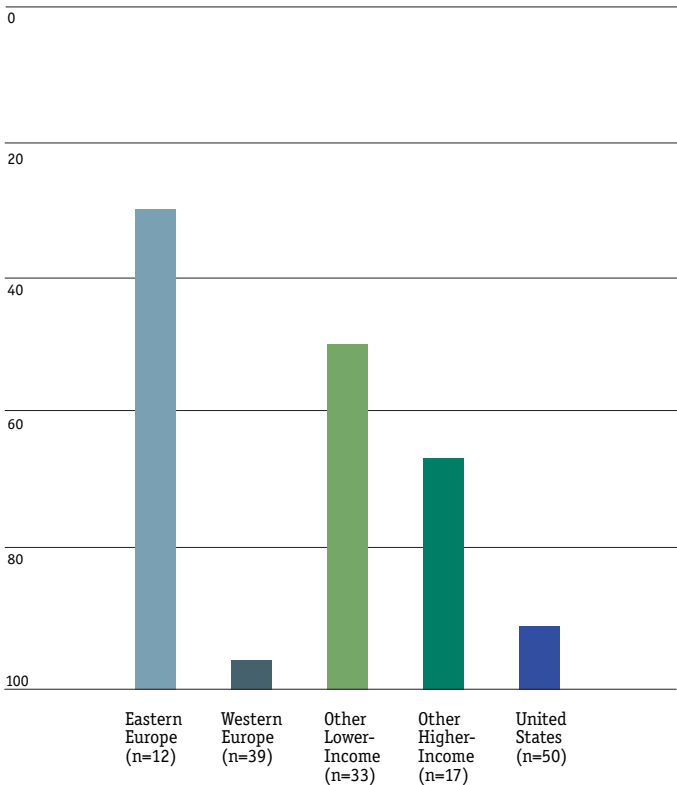
Metro Performance Factors

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.[32] 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.[33]

Figure 3-1. Eastern European Metros Achieved Higher Performance Rankings than Other Metros in the Pre-Recession Period

Average Rank out of 150

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 most 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 3-2). 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.

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32   One exception was that larger metros in Eastern Europe tended to perform worse in the recession than smaller ones.
33   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.

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 period, about three-quarters.[34] 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 3-3):

- 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

Figure 3-2. Metro and Nations Performed Similarly in Most Regions in the Pre-Recession Period

Median Difference Between Metro and National Annual Employment and GVA per Capita Growth Rate by Region, 1993-2007
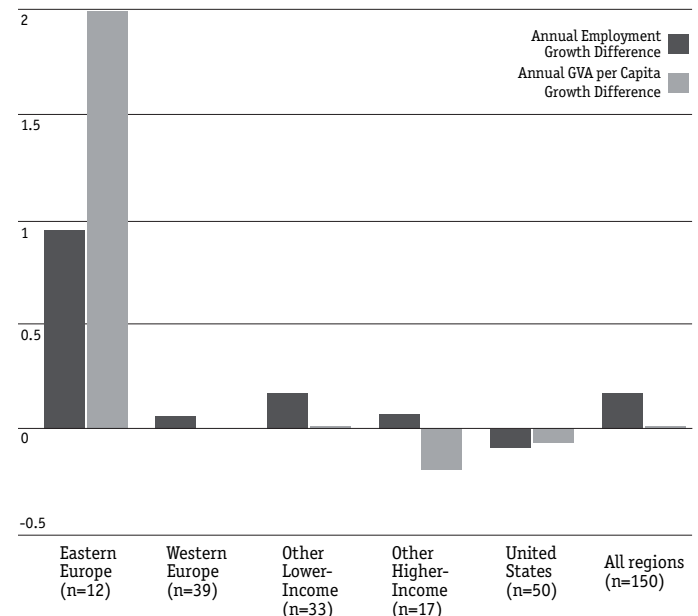
Source: Analysis of Oxford Economics, Moody's Economy.com, and Cambridge Econometrics data

Figure 3-3. Construction and Logistics-Focused Areas Performed Well Pre-Recession

	CONSTRUCTION	LOGISTICS, LEISURE, COMMUNICATIONS	ENERGY AND MANUFACTURING	FINANCIAL AND BUSINESS SERVICES	NON-MARKET SERVICES
All Metros (n=144)*	+	+	+	–	–
Eastern Europe (n=12)		+ +			– –
Western Europe (n=39)	+				
Other Lower-Income (n=31)*			+		
Other Higher-Income (n=12)*	+ +			– –	– –
United States (n=50)	+ +	+	–		

Notes: Symbols indicate direction of statistically significant correlation between metro performance score and share of GVA in industry ; Two symbols indicate strong correlation ($r^2 >= 0.5$); * Japanese and South Korean metros, and Belo Horizonte, Brazil excluded from this analysis due to data quality issues. Source: Analysis of Oxford Economics, Moody's Economy.com, and Cambridge Econometrics data.

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

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.

Deconstructing Metro Performance: Employment versus Income Growth

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, the overall relationship within the 150 metros between employment and income growth in the pre-recession period was weak. How different would the top and bottom 30 metro areas look if their performances 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 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.

Figure 3-4. Pre-Recession Performance Ranking 1993-2007

RANK		ANNUAL CHANGE (%) Income	Employment	RANK		ANNUAL CHANGE (%) Income	Employment
1	Shenzhen	8.2	9.4	38	Warsaw	5.1	1.3
2	Dubai	4.8	10.9	39	Kolkata	4.1	1.9
3	Guangzhou	10.4	4.3	40	Orlando	2.2	2.9
4	Beijing	8.7	4.0	41	Santiago	3.5	2.0
5	Abu Dhabi	2.2	6.9	42	Belo Horizonte	1.7	3.0
6	Dublin	5.9	4.5	43	San Diego	3.7	1.9
7	Bangalore	7.5	2.9	44	Istanbul	2.6	2.5
8	Shanghai	9.8	1.4	45	Portland	4.1	1.6
9	Moscow	9.9	1.1	46	Bogotá	1.9	2.8
10	Sofia	6.2	3.3	47	Melbourne	2.7	2.3
11	Riga	10.2	0.5	48	Salt Lake City	2.7	2.2
12	Tianjin	11.8	-0.6	49	Valencia	2.0	2.6
13	Vilnius	8.6	0.8	50	Sacramento	2.4	2.4
14	Las Vegas	1.5	4.9	51	Thessaloniki	2.8	2.1
15	Hyderabad	5.4	2.3	52	Toulouse	2.0	2.5
16	Lima	4.4	2.8	53	Taipei	4.1	1.2
17	Kuala Lumpur	4.5	2.8	54	Johannesburg	1.9	2.5
18	Singapore	3.8	3.1	55	Auckland	1.6	2.7
19	Athens	5.4	2.0	56	Atlanta	1.2	2.9
20	Phoenix	2.8	3.6	57	Budapest	6.0	-0.1
21	Tallinn	8.1	0.3	58	Monterrey	2.8	1.9
22	Madrid	2.5	3.7	59	Helsinki	2.4	2.1
23	Krakow	3.5	3.1	60	Buenos Aires	2.6	1.9
24	Mumbai	4.2	2.7	61	Nashville	2.5	2.0
25	Austin	3.4	3.1	62	Edinburgh	3.2	1.5
26	Bratislava	6.6	1.1	63	Vancouver	1.6	2.5
27	Brisbane	2.7	3.3	64	Denver	2.0	2.1
28	Riverside	3.2	2.9	65	Charlotte	1.8	2.3
29	Bucharest	9.0	-0.6	66	Miami	2.1	2.1
30	New Delhi	2.0	3.6	67	Toronto	1.1	2.6
				68	London	3.1	1.4
31	Chennai	4.6	1.9	69	Guadalajara	2.1	2.0
32	Seoul	4.8	1.8	70	São Paulo	1.6	2.3
33	Prague	6.2	1.0	71	Dallas	2.3	1.9
34	Manila	3.4	2.6	72	Hong Kong	2.7	1.6
35	Barcelona	2.4	3.1	73	San Jose	5.0	0.2
36	Alexandria	2.6	3.0	74	Montreal	2.1	1.9
37	Cairo	2.5	2.9	75	Cape Town	1.4	2.3

Source: Analysis of Oxford Economics, Moody's Economy.com, and Cambridge Econometrics data; see Data and Methods section for further details.

RANK		ANNUAL CHANGE (%) Income	Employment		RANK		ANNUAL CHANGE (%) Income	Employment
76	Sydney	2.3	1.7		114	Paris	1.9	1.0
77	Leipzig	2.7	1.4		115	Chicago	1.8	0.9
78	San Antonio	2.1	1.8		116	Rome	1.2	1.2
79	Seattle	2.3	1.6		117	Buffalo	3.0	0.1
80	Jacksonville	1.5	2.1		118	Cincinnati	1.4	1.0
81	Ljubljana	4.3	0.4		119	Philadelphia	1.8	0.8
82	Los Angeles	2.8	1.3		120	Milan	1.2	1.1
83	Tampa	2.4	1.5					
84	Marseille	2.2	1.5		121	Birmingham	2.2	0.5
85	Washington	2.1	1.6		122	Vienna	1.8	0.7
86	Glasgow	3.0	1.0		123	Jakarta	0.4	1.5
87	Stockholm	2.9	1.0		124	Kansas City	1.4	0.9
88	Mexico City	2.1	1.5		125	Rotterdam	2.5	0.2
89	Busan	5.4	-0.5		126	Dusseldorf	1.3	0.9
90	New York	2.6	1.1		127	Hamburg	1.2	1.0
91	Houston	1.6	1.7		128	Pittsburgh	2.4	0.2
92	Virginia Beach	2.4	1.2		129	Riyadh	-2.6	3.2
93	Lyon	2.3	1.3		130	Frankfurt	1.2	0.9
94	Boston	3.2	0.7		131	Cologne	0.5	1.3
95	Brasilia	0.5	2.3		132	Oklahoma City	1.3	0.8
96	Lisbon	2.7	0.9		133	St. Louis	1.6	0.6
97	Brussels	2.4	1.1		134	Stuttgart	1.3	0.8
98	Minneapolis	2.1	1.2		135	Cleveland	1.8	0.4
99	Indianapolis	1.7	1.4		136	Rochester	2.6	-0.2
100	Rio de Janeiro	1.6	1.4		137	Turin	1.0	0.8
101	Copenhagen	2.2	1.0		138	Hartford	1.8	0.3
102	Munich	1.9	1.2		139	Louisville	1.0	0.6
103	Richmond	1.3	1.5		140	Naples	1.0	0.6
104	Lille	2.1	1.0		141	Milwaukee	1.6	0.2
105	Providence	2.4	0.8		142	Zurich	1.4	0.3
106	Oslo	1.2	1.5		143	Tokyo	1.0	0.4
107	Memphis	1.8	1.1		144	Berlin	0.1	0.9
108	Manchester	2.5	0.7		145	Porto	1.4	0.0
109	Baltimore	2.1	0.9		146	Nagoya	1.0	0.2
110	Bridgeport	3.2	0.2		147	Detroit	0.9	0.0
111	Columbus	1.3	1.4		148	New Orleans	1.4	-0.6
112	San Francisco	2.2	0.8		149	Osaka	0.8	-0.3
113	Amsterdam	2.3	0.7		150	Bangkok	-1.5	0.2

Figure 3-5. Metro Performance During Pre-Recession Period (1993–2007)

The strongest-performing metros in the pre-recession period could be found in emerging nations of Asia and Latin America, as well as in the American Southwest and Eastern Europe.

The weakest-performing metros were split among these same world regions, including many older industrial areas of the United States and Western Europe, as well as Japanese and Southeast Asian economies that experienced economic difficulties in the 1990s.

Labeled metro areas are the 15 top and bottom ranked performers.
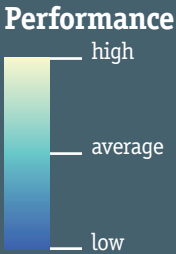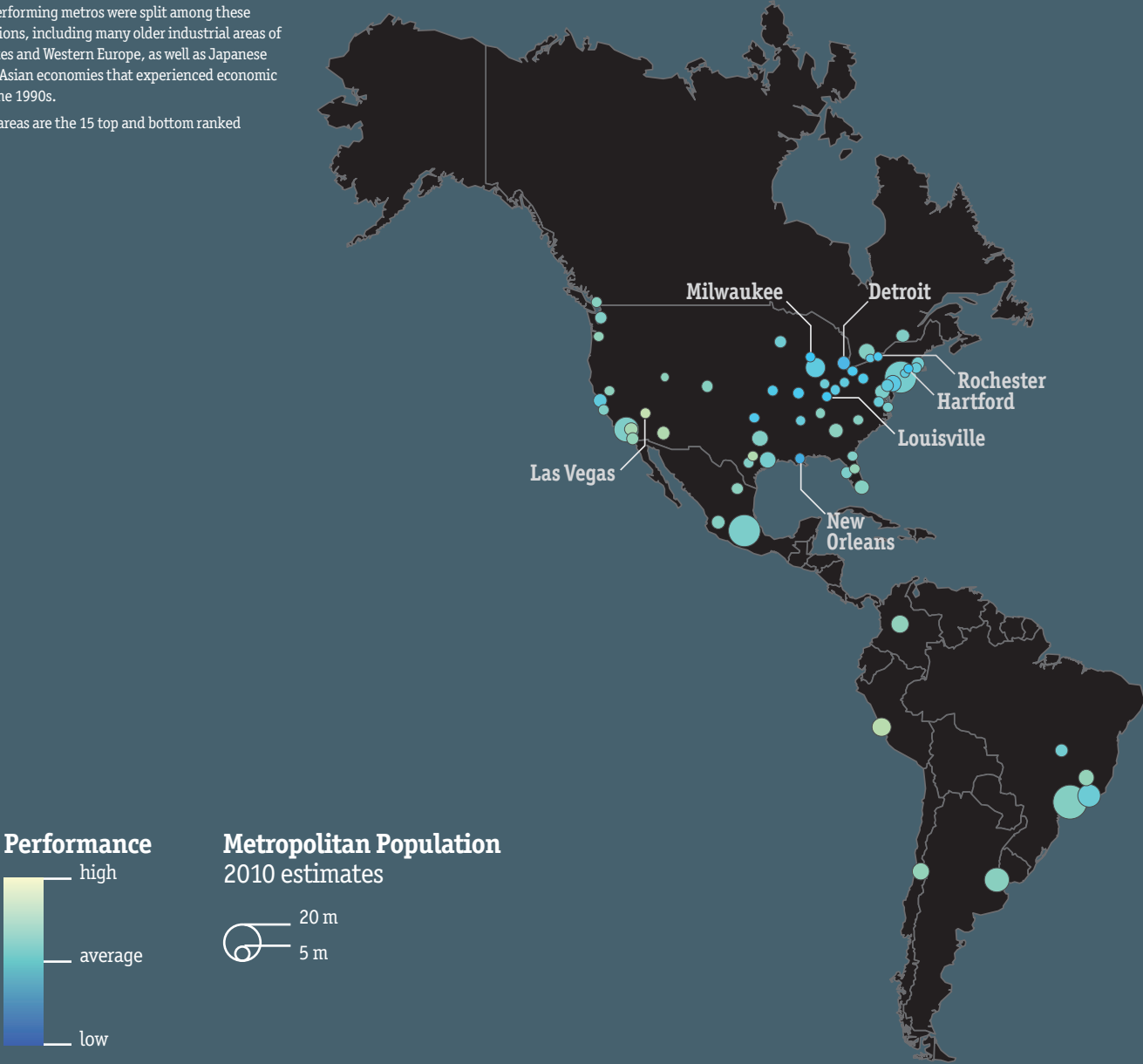
Milwaukee Detroit

Rochester
Hartford

Louisville

Las Vegas

New
Orleans

Performance

high

average

low

Metropolitan Population
2010 estimates

20 m

5 m

Dublin
Riga
Moscow
Berlin
Vilnius
Zurich
Porto
Sofia
Turin
Naples
Beijing
Tianjin
Shanghai
Osaka
Tokyo
Nagoya
Dubai
Guangzhou
Abu Dhabi
Shenzhen
Hyderabad
Bangalore
Bangkok

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.

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. Shenzhen's growth over this period has been nothing short of astonishing, expanding from a rural fishing village of 20,000 in 1980 to a global metropolis of 10 million by 2010.[35]

Recession and Recovery

Shenzhen largely 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.[36]

Shenzhen, Pearl River Delta, and China more generally, are upgrading and expanding their industries to achieve a competitive edge in the international marketplace. Shenzhen is now home to global telecommunications giants Huawei and ZTE, and labor standards in the region are improving.[37] The Chinese government is building bullet trains to connect the Pearl River Delta metropolises of Hong Kong, Shenzhen, and Guangzhou, with anticipated travel times between each of 15 minutes.[38] These developments could strengthen Shenzhen's position in meeting the needs of a growing internal market, while allowing the region to remain a leader in international exports.

	Population 2010 (million)	GVA per Capita 2007 ($)	Pre-Recession (1993–2007)		Recession (2008–2009)		Recovery (2009–2010)	
			GVA per Capita Change	Employment Change	GVA per Capita Change	Employment Change	GVA per Capita Change	Employment 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%

35 Janet Carmosky, "In China's Future, Where's Hong Kong Fit In?" Interview with Alex Fong, CEO of Hong Kong Chamber of Commerce. The China Business Network, June 4, 2010.
36 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 [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.
37 "The spirit of enterprise fades: The cradle of China's start-up firms is showing its age." The Economist, January 21, 2010.
38 Carmosky, "In China's Future, Where's Hong Kong Fit In?"

METRO PERFORMANCE PROFILE
AUSTIN

The Austin-Round Rock, TX metropolitan area is the capital region for the state of Texas, located in the southwestern United States. The metropolitan region is comprised of the core city, Austin, which together with its nearby suburbs has 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.

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 income 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.[39]

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.[40] 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 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.[41] 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.[42] As a sign of the area's continued strength, Facebook made its first major U.S. expansion outside California in Austin in 2010.[43]

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.

	Population 2010 (million)	GVA per Capita 2007 ($)	Pre-Recession (1993–2007)		Recession (2008–2009)		Recovery (2009–2010)	
			GVA per Capita Change	Employment Change	GVA per Capita Change	Employment Change	GVA per Capita Change	Employment Change
Austin	1,763	43,860	3.4%	3.1%	-3.1%	0.1%	2.7%	3.2%
U.S.	309,756	37,928	1.3%	2.1%	-3.3%	-4.0%	2.4%	-0.7%

39 Joe Cortright, "The Young and the Restless in a Knowledge Economy" (CEOs for Cities, 2005).
40 Brookings analysis of U.S. Patent and Trademark Office data.
41 Alyssa Katz, "The Lone Star Secret: How Texas Avoided the Worst of the Real Estate Meltdown." The Big Money, March 30, 2010.

42 According to U.S. Bureau of Labor Statistics Current Employment Statistics data.
43 Kirk Ladendorf, "Facebook Friends Austin to Support Its Rapid Growth." Austin American Statesman, April 10, 2010.

4. 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 virtually 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.[44]

Regional Patterns

This section measures metro economic performance during the Great Recession based on minimum year-over-year employment and GVA per capita growth from 2007 to 2010.[45] 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.[46] 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 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 (Figure 4-5). 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 22 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.

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 (figure 4-6). 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 4-1). 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 in rank on average.

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44 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.

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

46 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. Metro Areas Outside the United States and Europe Outranked Others on Economic Performance During the Great Recession
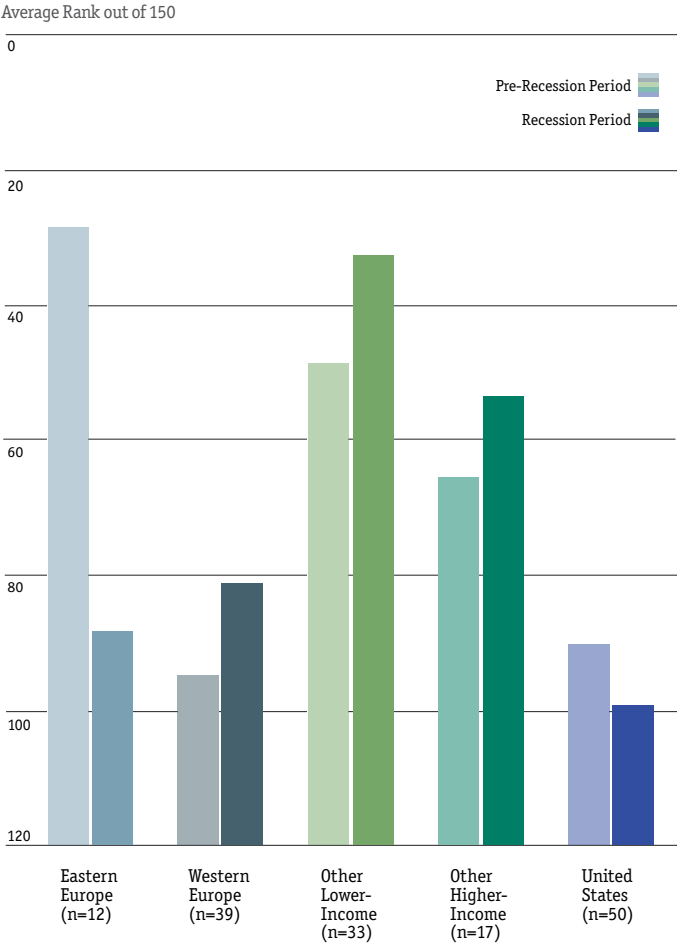
Average Rank out of 150

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

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 weaker performance during the recession was associated with stronger performance beforehand.[47]

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.[48] 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.[49]

National Performance

How metros compared 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 4-2). 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

47 There was no statistically significant relationship between pre-recession and recession performance (combined employment and income growth) for U.S. metro areas.
48 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.

49 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.

the typical rate of income loss in other lower-income metros 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-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.
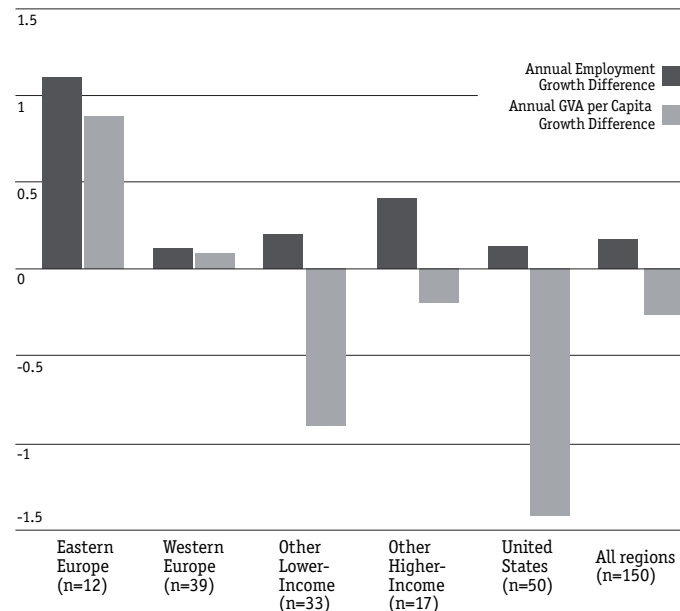
The contribution of national context to metropolitan performance appeared to be at least as important during the recession as beforehand. Once again, a little under half of metropolitan employment change could be explained by national employment change, controlling for each metro's contribution to national 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.[50]

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 34 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 4-3). From an average performance ranking of 77 before the recession, metro areas in nations experiencing house-price shocks dropped to an average rank of 93 during the recession. By contrast, those in nations that avoided severe house price declines saw their average rank rise from 94 to 66 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.[51]

Figure 4-2. Metros in Most Regions Led Their Nations on Employment Growth, but Lagged Their Nations on Income Growth, During the Recession
Median Difference between Metro and National Annual Employment and GVA per Capita Growth Rate by Region, Recession Period

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

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 4-4):

- 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

50 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.

51 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 4-3. Metros in Countries Experiencing House-Price Shocks Performed Stronger than Others Pre-Recession, but Weaker During the Recession

Average Rank out of 150

Legend:
Pre-Recession
Recession

X-axis categories: House-Price Shock | No House-Price Shock

Y-axis: 40, 60, 80, 100
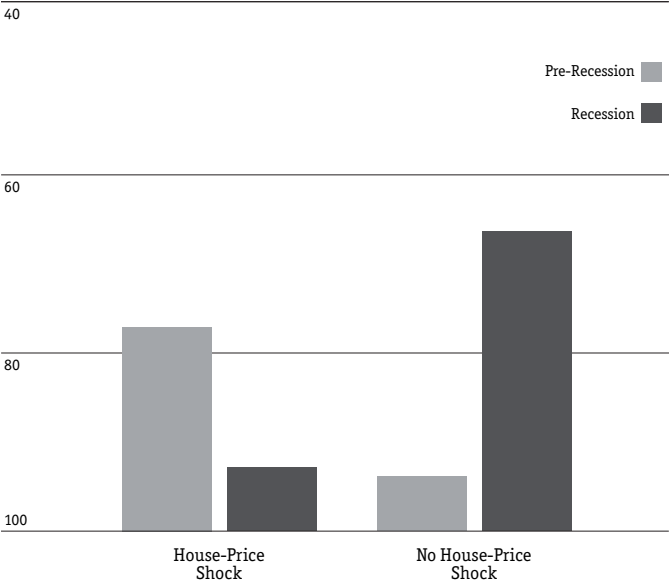
For 34 of 53 countries where house-price data were available, see text for details

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

- 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 services-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 4-4. 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=144)*			+	–	
Eastern Europe (n=12)		– –		+ +	+ +
Western Europe (n=39)	–		– –		+
Other Lower-Income (n=31)*					
Other Higher-Income (n=12)*			+ +	– –	
United States (n=50)					+

Notes: Symbols indicate direction of statistically significant correlation between metro performance score and share of GVA in industry ; Two symbols indicate strong correlation (r²>= 0.5); * Japanese and South Korean metros, and Belo Horizonte, Brazil excluded from this analysis due to data quality issues. Source: Analysis of Oxford Economics, Moody's Economy.com, and Cambridge Econometrics data.

Figure 4-5. Recession Performance Ranking (Year of Minimum Growth 2007 to 2010)

RANK		ANNUAL CHANGE (%) Income	ANNUAL CHANGE (%) Employment	RANK		ANNUAL CHANGE (%) Income	ANNUAL CHANGE (%) Employment
1	Beijing	5.1	3.9	38	Santiago	-2.4	-0.3
2	Guangzhou	6.4	2.5	39	Taipei	-1.8	-0.8
3	Shanghai	6.4	2.3	40	Austin	-3.1	0.1
4	Shenzhen	4.6	2.3	41	Pittsburgh	0.3	-2.8
5	Tianjin	6.4	0.8	42	Virginia Beach	0.3	-2.8
6	Jakarta	4.2	2.1	43	Marseille	-1.8	-1.2
7	Cairo	3.0	2.1	44	Toulouse	-2.5	-0.8
8	Alexandria	2.9	2.2	45	Montreal	-2.4	-1.1
9	Bangalore	4.0	1.2	46	Oklahoma City	-2.7	-1.0
10	Kolkata	4.3	0.7	47	Athens	-1.7	-1.8
11	Lima	-0.4	4.2	48	Hong Kong	-3.3	-0.6
12	Chennai	4.0	0.7	49	Vienna	-3.7	-0.6
13	Krakow	1.9	2.1	50	Prague	-3.8	-0.5
14	Hyderabad	2.4	1.0	51	Paris	-3.1	-1.3
15	Warsaw	2.4	0.8	52	Bratislava	-4.4	-0.3
16	Abu Dhabi	-1.4	3.6	53	Lisbon	-2.0	-2.3
17	New Delhi	1.0	1.6	54	Lille	-3.4	-1.2
18	Buenos Aires	0.5	1.7	55	Auckland	-2.6	-1.9
19	Mumbai	0.8	1.5	56	Berlin	-4.4	-0.6
20	Brasilia	0.2	1.2	57	Thessaloniki	-3.0	-1.7
21	Riyadh	-1.1	2.1	58	Zurich	-3.2	-1.7
22	Melbourne	1.4	0.0	59	Kansas City	-1.8	-2.8
23	Brisbane	-0.2	0.9	60	Seattle	-2.1	-2.6
24	Manila	-0.9	1.0	61	Hamburg	-4.7	-0.5
25	Bogotá	-1.1	0.8	62	Brussels	-3.9	-1.2
26	Seoul	-0.3	0.1	63	Lyon	-3.1	-2.0
27	Belo Horizonte	-1.6	1.1	64	Cape Town	-3.9	-1.3
28	Rio de Janeiro	-0.8	0.2	65	Leipzig	-4.6	-0.9
29	Busan	0.2	-0.8	66	Mexico City	-6.0	0.1
30	Sydney	-0.6	-0.4	67	Rome	-4.5	-1.1
				68	St. Louis	-0.7	-4.2
31	São Paulo	-2.1	0.6	69	Buffalo	-2.5	-2.9
32	San Antonio	-1.7	0.2	70	Edinburgh	-5.0	-0.9
33	Singapore	-4.2	1.9	71	Rotterdam	-4.4	-1.4
34	Oslo	-1.8	-0.3	72	Tokyo	-4.7	-1.2
35	Bangkok	-2.0	-0.3	73	Bucharest	-4.4	-1.4
36	Washington	0.2	-2.1	74	Amsterdam	-4.6	-1.3
37	Kuala Lumpur	-4.0	1.1	75	Dallas	-4.5	-1.4

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

| RANK | | ANNUAL CHANGE (%) | | RANK | | ANNUAL CHANGE (%) | |
		Income	Employment			Income	Employment
76	Munich	-5.2	-1.0	114	Phoenix	-5.6	-3.3
77	Rochester	-2.5	-3.1	115	Sacramento	-4.8	-3.9
78	Philadelphia	-2.3	-3.3	116	Johannesburg	-3.7	-4.8
79	Glasgow	-4.7	-1.4	117	Birmingham	-7.1	-2.4
80	Sofia	-2.7	-3.0	118	Cincinnati	-5.5	-3.7
81	Cologne	-5.3	-0.9	119	Orlando	-3.2	-5.6
82	Toronto	-5.3	-1.0	120	Tampa	-4.5	-4.8
83	Frankfurt	-5.2	-1.1				
84	Houston	-6.3	-0.3	121	Memphis	-4.7	-4.8
85	Dusseldorf	-5.6	-0.8	122	Miami	-5.0	-4.6
86	Budapest	-4.0	-2.3	123	Salt Lake City	-6.5	-3.5
87	Porto	-2.8	-3.3	124	Monterrey	-10.1	-0.8
88	New York	-2.9	-3.3	125	Jacksonville	-5.1	-4.8
89	Baltimore	-1.2	-4.6	126	Indianapolis	-3.8	-5.9
90	Richmond	-3.4	-3.1	127	Chicago	-5.2	-5.0
91	Bridgeport	-4.8	-2.1	128	Las Vegas	-5.4	-4.9
92	Boston	-3.5	-3.2	129	Nashville	-5.3	-5.1
93	Osaka	-5.3	-1.8	130	Riverside	-4.4	-6.0
94	Naples	-5.5	-1.8	131	Cleveland	-6.5	-4.4
95	Vancouver	-6.8	-0.7	132	Denver	-6.9	-4.3
96	Manchester	-5.5	-1.7	133	San Francisco	-6.2	-4.9
97	Dubai	-8.8	0.7	134	Madrid	-5.1	-5.7
98	Guadalajara	-8.4	0.4	135	Milwaukee	-6.0	-5.2
99	Copenhagen	-4.0	-3.1	136	Atlanta	-5.9	-5.5
100	London	-5.5	-2.0	137	Los Angeles	-6.3	-5.5
101	Hartford	-5.6	-2.0	138	Helsinki	-9.9	-2.8
102	Minneapolis	-5.0	-2.6	139	Portland	-7.8	-5.1
103	Providence	-3.5	-4.1	140	Valencia	-6.2	-7.1
104	Columbus	-6.1	-2.0	141	Charlotte	-5.1	-8.0
105	Turin	-6.4	-1.8	142	San Jose	-8.5	-5.3
106	Ljubljana	-7.6	-1.0	143	Istanbul	-9.6	-5.0
107	New Orleans	-6.2	-2.2	144	Dublin	-8.1	-6.3
108	Stockholm	-6.1	-2.4	145	Barcelona	-6.9	-7.3
109	Nagoya	-6.7	-2.1	146	Detroit	-6.4	-8.1
110	Louisville	-5.7	-2.9	147	Vilnius	-13.3	-4.0
111	Milan	-7.0	-2.0	148	Riga	-15.7	-3.1
112	San Diego	-3.9	-4.4	149	Tallinn	-16.0	-10.0
113	Stuttgart	-7.6	-1.6	150	Moscow	-15.1	-17.4

Figure 4-6. Metro Performance During Recession Period and Change in Ranking From Pre-Recession Period

This map displays metro performance during the recession period, and identifies metros in each major world region undergoing particularly large changes in ranks between the pre-recession and recession periods or are of particular interest for this analysis.

Metro performance strengthened, or held steady in the case of the highest-performing metros, in Asia and Latin America during the recession. By contrast, metros in "bubble" regions of the United States and Europe—much of Eastern Europe, Spain, Ireland, and the America Sunbelt—experienced dramatic declines. The recession was felt most severely overall in U.S. metros.

-94
Portland

-68
Denver

Sacramento
-65

Las Vegas
-114

Los Angeles
-55

La V

-91 -114
Phoenix
Los Angeles

-55

-94
Phoenix

+49
Washington
Charlotte
-76

Atlanta
-80

+49
Washington
Charlotte
-76

Atlanta
-80

+75
Brasília

+72 +75
Rio de Janeiro Brasília
São Paulo
+39

+
Ri
São Pa
+39

Performance

high

average

low

Metropolitan Population
2010 estimates

20 m

5 m

Change in Ranks: +43

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.

-138
Dublin

+72
Oslo

-137
Riga

+88
Berlin

-141
Moscow

+63
Paris

-112
Madrid

-99
Istanbul

-110
Barcelona

Lisbon
+43

Rome
+49

-95
Dubai

Riyadh
+108

+13
Delhi

Mumbai
+5

+29
Kolkata

Bangkok
+115

+3
Beijing

Shanghai
+5

+6
Seoul

Osaka
+56

+71
Tokyo

Jakarta
+117

-62
Johannesburg

Sydney
+46

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, 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.

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.[52]

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.[53] 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.[54]

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.[55] Employment in Las Vegas dropped by 4.9 percent from 2008 to 2009, compared to 4 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 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.[56] Two-thirds or more of residential mortgage holders in the state of Nevada now owe more on their mortgages than their home is worth.[57]

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.[58] 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.

	Population 2010 (million)	GVA per Capita 2007 ($)	Pre-Recession (1993–2007)		Recession (2008–2009)		Recovery (2009–2010)	
			GVA per Capita Change	Employment Change	GVA per Capita Change	Employment Change	GVA per Capita Change	Employment Change
Las Vegas	1,940	40,465	1.5%	4.9%	-5.4%	-4.9%	-1.2%	-3.0%
U.S.	309,756	37,928	1.3%	2.1%	-3.3%	-4.0%	2.4%	-0.7%

52 Richard N. Velotta, "Moves should keep McCarran seventh busiest through 2015." Las Vegas Sun, November 12, 2010.
53 1990 Census and 2007 Population Estimates Program data; Case-Shiller Home Price Index.
54 Analysis of 2007 American Community Survey data.
55 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.

56 Howard Wial and Richard Shearer, "MetroMonitor: Tracking Economic Recession and Recovery in America's 100 Largest Metro Areas" (Washington: Brookings Institution, September 2010).
57 Alan Mallach, communication with Brookings Metropolitan Policy Program, November 2010.
58 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
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.

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.[60]

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.

Much of Warsaw's economic success and strong performance during the global downturn ultimately stem from wider national dynamics. Three factors stand out.[61]

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.

	Population 2010 (million)	GVA per Capita 2007 ($)	Pre-Recession (1993–2007)		Recession (2008–2009)[59]		Recovery (2009–2010)	
			GVA per Capita Change	Employment Change	GVA per Capita Change	Employment Change	GVA per Capita Change	Employment Change
Warsaw	2,473	18,242	5.1%	1.3%	2.4%	0.8%	2.4%	0.8%
Poland	38,092	7,760	3.0%	0.3%	1.9%	-0.2%	2.2%	-0.2%

59 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.
60 Poland Territorial Review (OECD, 2008).

61 Interview with DB Research, Global Risk Analysis, 1 November 2010

5. 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.[62]

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.[63]

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 5-4). In particular, Latin American metro areas asserted themselves economically, placing seven members among the top 30, led by Lima (ranked third) and Santiago (ranked fifth).

All 30 of the top-performing metros experienced both income and employment growth in 2009–2010, reflecting in part the increased flow of capital to emerging economies as the worldwide recovery began.[64] 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 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 wealthier 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 16 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 5-1). 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.[65]

In contrast, the average American metro jumped to number 80 in the rankings, up from 102 during the recession. Most (43) U.S. metros experienced their minimum employment and income 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 about the bottom third to the top third in the rankings between the recession and recovery

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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.[66]

The real story, however, was the continued rise of lower-income metros outside the U.S. and Europe relative to others. Their average rank in the recovery year was 26, up from 33 in the recession and 49 in the pre-recession period. Outside of the South African metros of Cape Town and Johannesburg, Monterrey was the lowest-ranked metro in this group during the recovery, at a still-strong number 41. All 30 of those metro areas posted gains in both employment and income from 2009 to 2010.

In four of the five world regions (Eastern Europe excepted), there was a significant 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
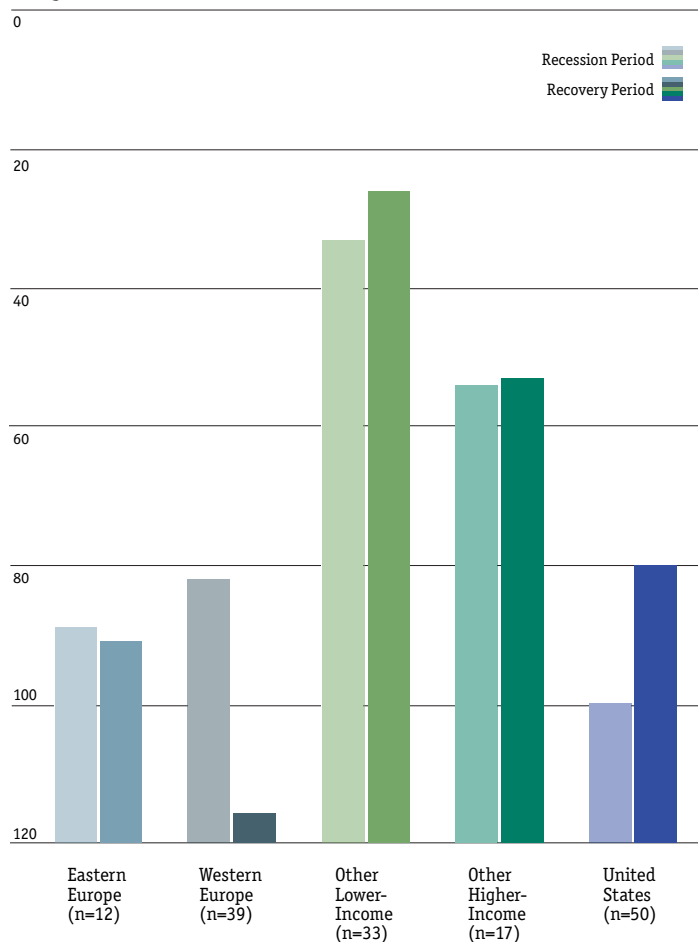
Population Size and Growth
As in the prior two periods, a metropolitan area's size had little bearing on its performance during the recovery within world regions. Bigger places did better overall, but largely because those places tended to be high-performing Asian metros, while smaller European metros 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.

Figure 5-1. Lower-Income Metro Areas Outside the United States and Europe Outranked Others by a Wide Margin in the First Year of Recovery

Average Rank out of 150

Recession Period
Recovery Period

Eastern Europe (n=12) · Western Europe (n=39) · Other Lower-Income (n=33) · Other Higher-Income (n=17) · United States (n=50)

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

66 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.

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 5-2). 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 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.[67] 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 three industry sectors helped to explain recent metro performance:[68]

- Several of Europe's financial and business services centers, such as Zurich, 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

- U.S. and lower-income metros with large non-market economic sectors posted better-than-average performance in the recovery period, signaling continued stability in industries such as government, education, and health

Figure 5-2. 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 per Capita Growth Rate by Region, 2009-2010
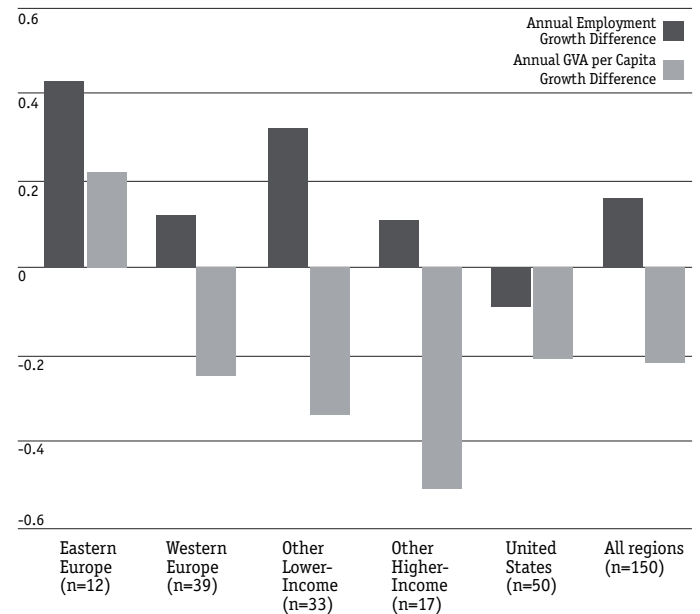
Source: Analysis of Oxford Economics, Moody's Economy.com, and Cambridge Econometrics data. Some values based on forecasted estimates, please see Data and Methods section for further details

Figure 5-3. 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=144)*			+	–	
Eastern Europe (n=12)					
Western Europe (n=39)	– –			+	
Other Lower-Income (n=31)*					+
Other Higher-Income (n=12)*	– –				
United States (n=50)		–			+

Notes: Symbols indicate direction of statistically significant correlation between metro performance score and share of GVA in industry; Two symbols indicate strong correlation ($r^2 >= 0.5$); * Japanese and South Korean metros, and Belo Horizonte, Brazil excluded from this analysis due to data quality issues. Source: Analysis of Oxford Economics, Moody's Economy.com, and Cambridge Econometrics data.

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67 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.

68 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.

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.

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

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 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.

Figure 5-4. Recovery Performance Ranking 2009-2010

RANK		ANNUAL CHANGE (%) Income	Employment	RANK		ANNUAL CHANGE (%) Income	Employment
1	Istanbul	5.5	7.3	38	Krakow	2.2	2.1
2	Shenzhen	5.9	5.9	39	Dallas	2.7	1.7
3	Lima	5.6	5.7	40	New Delhi	1.0	2.9
4	Singapore	6.6	4.6	41	Monterrey	3.8	0.8
5	Santiago	4.3	6.2	42	Baltimore	7.0	-1.8
6	Shanghai	7.5	3.1	43	Abu Dhabi	0.0	3.6
7	Guangzhou	7.4	2.5	44	Minneapolis	2.5	1.5
8	Beijing	5.4	3.9	45	Sydney	1.3	2.2
9	Manila	5.3	4.0	46	Detroit	3.2	0.6
10	Rio de Janeiro	6.2	3.2	47	Moscow	3.5	0.4
11	Hyderabad	7.2	2.4	48	Nashville	1.8	1.7
12	Mumbai	6.4	2.8	49	Cleveland	4.1	-0.1
13	Bangalore	6.3	2.6	50	Seattle	3.9	-0.1
14	Melbourne	4.8	3.8	51	San Antonio	3.5	0.2
15	Guadalajara	6.3	2.1	52	Tokyo	2.8	0.7
16	Kolkata	6.3	2.1	53	Charlotte	1.6	1.6
17	Chennai	6.0	2.1	54	St. Louis	3.3	0.2
18	Tianjin	6.4	1.8	55	Bratislava	3.3	0.2
19	Buenos Aires	4.2	3.1	56	Warsaw	2.4	0.8
20	Jakarta	5.3	2.1	57	Boston	2.2	0.9
21	Taipei	6.4	1.3	58	Nagoya	2.7	0.4
22	Belo Horizonte	4.3	2.8	59	Busan	4.2	-0.8
23	Kuala Lumpur	5.0	2.2	60	Osaka	2.6	0.0
24	Riyadh	2.2	4.3	61	Houston	2.8	-0.2
25	São Paulo	5.5	1.6	62	Cincinnati	3.6	-0.8
26	Austin	2.7	3.2	63	Toronto	0.6	1.5
27	Montreal	3.5	2.6	64	Brisbane	-0.2	2.0
28	Alexandria	4.0	2.2	65	Bucharest	2.5	-0.2
29	Cairo	4.0	2.1	66	Memphis	2.8	-0.4
30	Hong Kong	5.5	0.8	67	Salt Lake City	3.3	-1.0
				68	Phoenix	0.5	1.0
31	Bogotá	2.6	2.7	69	Richmond	3.4	-1.2
32	Brasilia	4.4	1.2	70	Bridgeport	3.0	-0.9
33	Seoul	4.2	1.0	71	Louisville	2.8	-1.0
34	Mexico City	3.8	1.3	72	San Diego	1.2	0.2
35	Bangkok	3.3	1.2	73	Providence	1.1	0.2
36	Virginia Beach	5.8	-0.7	74	Tampa	2.5	-0.9
37	Washington	5.2	-0.3	75	San Jose	0.8	0.3

Source: Analysis of Oxford Economics, Moody's Economy.com, and Cambridge Econometrics data. Some values based on forecasted estimates; see Data and Methods section for further details.
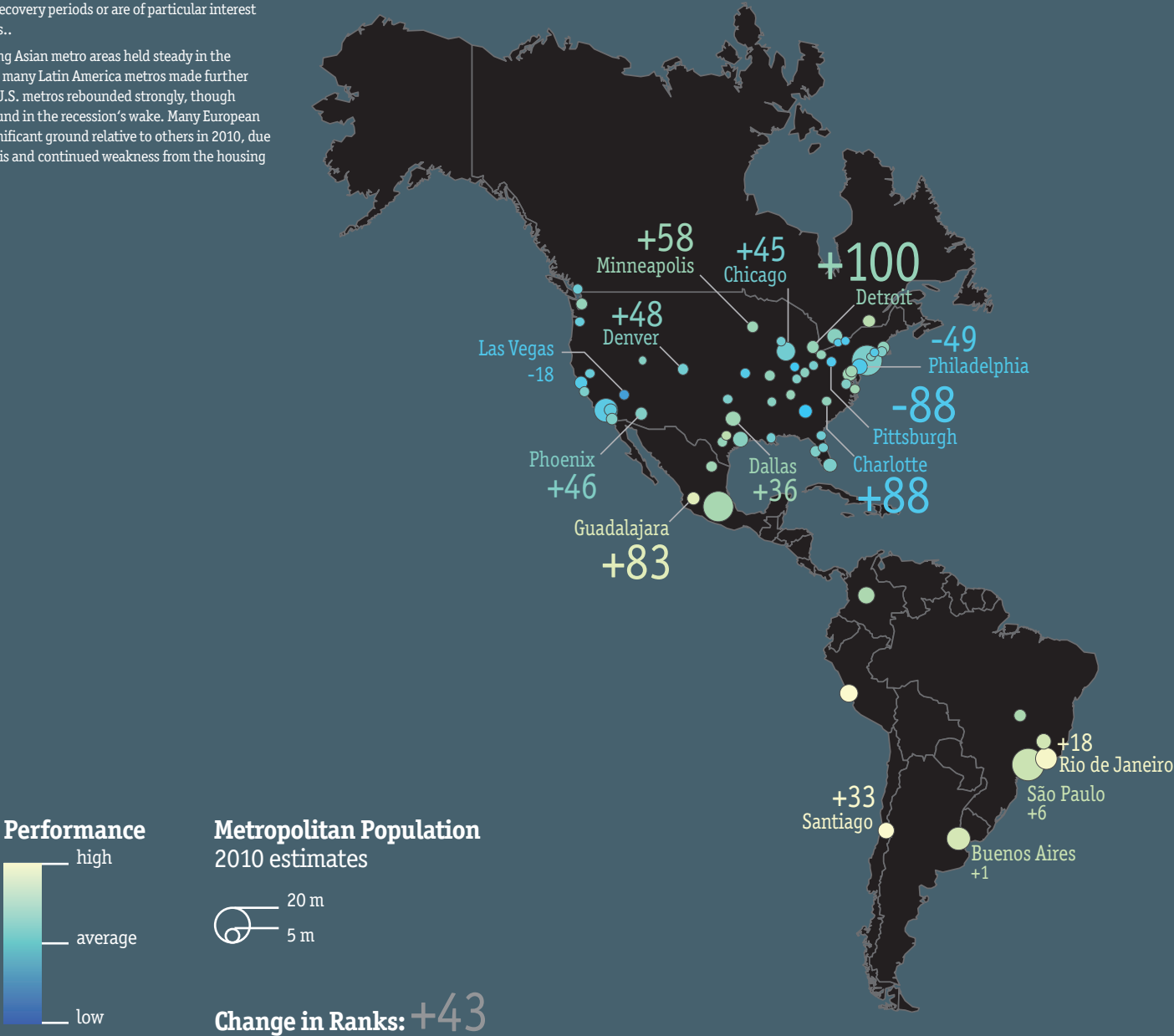
RANK		ANNUAL CHANGE (%)		RANK		ANNUAL CHANGE (%)	
		Income	Employment			Income	Employment
76	Oklahoma City	2.4	-1.0	114	Ljubljana	0.6	-1.0
77	New York	1.7	-0.5	115	Edinburgh	0.5	-0.9
78	Miami	1.6	-0.4	116	Los Angeles	0.4	-0.9
79	Prague	1.7	-0.5	117	Cape Town	0.9	-1.3
80	Toulouse	1.0	0.0	118	Vilnius	0.7	-1.2
81	Columbus	2.9	-1.5	119	Glasgow	0.8	-1.3
82	Chicago	1.7	-0.7	120	Buffalo	-0.3	-0.5
83	Milwaukee	2.0	-1.0				
84	Denver	2.2	-1.2	121	Hartford	1.6	-2.0
85	Orlando	1.7	-0.8	122	Kansas City	2.7	-2.8
86	Marseille	1.4	-0.6	123	London	0.8	-1.5
87	New Orleans	-2.5	2.4	124	Helsinki	0.2	-1.0
88	Vienna	1.0	-0.4	125	San Francisco	0.9	-1.5
89	Dusseldorf	1.6	-0.8	126	Rotterdam	0.7	-1.4
90	Jacksonville	2.2	-1.4	127	Philadelphia	1.5	-2.1
91	Auckland	1.0	-0.6	128	Rochester	0.4	-1.3
92	Vancouver	-1.1	1.0	129	Pittsburgh	0.3	-1.2
93	Lyon	1.6	-1.1	130	Stockholm	0.7	-1.6
94	Hamburg	0.8	-0.5	131	Birmingham	0.9	-1.7
95	Sacramento	2.8	-2.1	132	Amsterdam	0.3	-1.3
96	Paris	0.6	-0.4	133	Brussels	0.2	-1.2
97	Lille	1.1	-0.8	134	Manchester	0.6	-1.6
98	Oslo	0.3	-0.3	135	Naples	-0.7	-0.8
99	Leipzig	1.1	-0.9	136	Sofia	-0.5	-1.0
100	Copenhagen	1.4	-1.1	137	Indianapolis	2.2	-3.2
101	Zurich	0.6	-0.5	138	Tallinn	1.1	-2.4
102	Portland	-0.6	0.3	139	Atlanta	0.9	-2.4
103	Turin	0.4	-0.5	140	Porto	-1.2	-1.6
104	Cologne	0.9	-0.9	141	Athens	-1.7	-1.8
105	Budapest	0.4	-0.5	142	Madrid	-1.8	-1.7
106	Rome	-0.1	-0.2	143	Johannesburg	1.4	-4.2
107	Riverside	1.0	-1.0	144	Riga	-2.2	-1.5
108	Stuttgart	1.8	-1.6	145	Valencia	-1.9	-2.4
109	Munich	0.9	-1.0	146	Las Vegas	-1.2	-3.0
110	Milan	0.3	-0.5	147	Thessaloniki	-3.0	-1.7
111	Berlin	0.3	-0.6	148	Barcelona	-2.4	-2.5
112	Lisbon	-0.2	-0.2	149	Dubai	-7.8	1.1
113	Frankfurt	0.8	-1.1	150	Dublin	-4.4	-2.6

Figure 5-5. Metro Performance During Recovery Period and Change in Ranking From Recession Period

This map displays metro performance during the recovery period, and identifies metros in each major world region undergoing particularly large changes in ranks between the recession and recovery periods or are of particular interest for this analysis..

High-performing Asian metro areas held steady in the recovery, while many Latin America metros made further gains. Several U.S. metros rebounded strongly, though others lost ground in the recession's wake. Many European metros lost significant ground relative to others in 2010, due to the debt crisis and continued weakness from the housing market crash.

+58 Minneapolis
+45 Chicago
+100 Detroit
+48 Denver
Las Vegas -18
-49 Philadelphia
-88 Pittsburgh
Phoenix +46
Dallas +36
Charlotte +88
Guadalajara +83

+18 Rio de Janeiro
São Paulo +6
+33 Santiago
Buenos Aires +1

Performance
high
average
low

Metropolitan Population
2010 estimates

20 m
5 m

Change in Ranks: +43

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.

-40
Glasgow

-64
Oslo

-55
Berlin

Brussels
-71

Paris
-45

-56
Sofia

Lisbon
-59

Athens
-94

Istanbul
+142

+103
Moscow

-52
Dubai

-23
Delhi

-7
Beijing

Shanghai
-3

Osaka
+33

-20
Tokyo

-6
Kolkata

Mumbai
+7

Bangkok
+0

Jakarta
-14

Cape Town
-53

-41
Brisbane
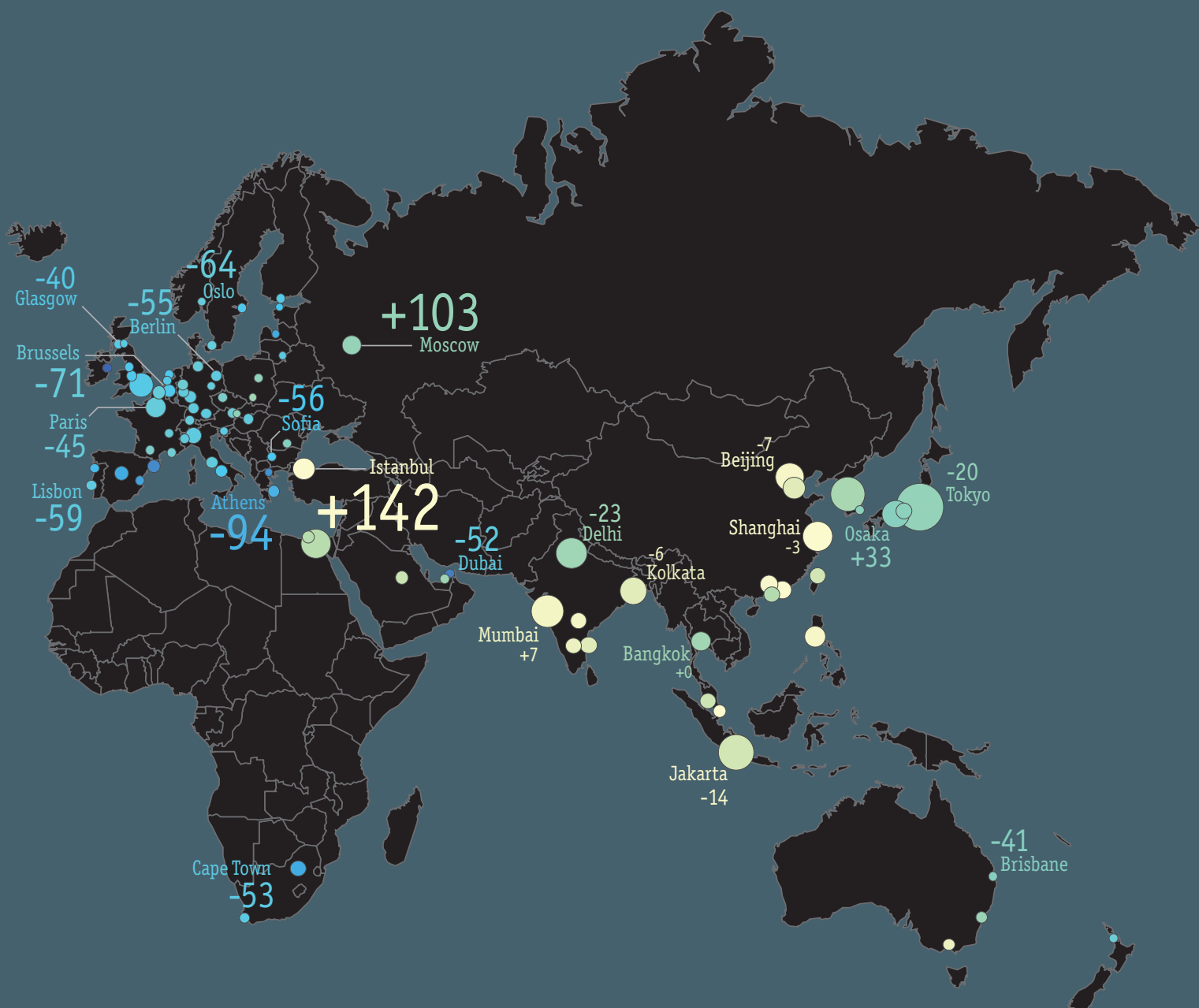
METRO PERFORMANCE PROFILE
JOHANNESBURG

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 percent share of the country's financial industries.[69] 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).

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.

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.[70] By 2009, unemployment in Gauteng province had increased to 27 percent.[71] 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.[72]

	Population 2010 (million)	GVA per Capita 2007 ($)	Pre-Recession (1993–2007)		Recession (2008–2009)		Recovery (2009–2010)	
			GVA per Capita Change	Employment Change	GVA per Capita Change	Employment Change	GVA per Capita Change	Employment 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%

69 State of South African Cities Report (Johannesburg: South African Cities Network, 2006).
70 Ibid.

71 Provincial Economic Outlook (Gauteng Government, 2010).
72 Consolidated Government Budget 2010 (National Treasury of South Africa).

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.

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. In early 2007, this "safe haven" condition had the effect of driving a reallocation of capital from markets hit by the recession to developing countries like Peru.[73] Within Peru, Lima's role as the primary engine for economic growth meant that public and private investments by far exceeded those for 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 Pãulo, 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 in 16 percent in 2010, while manufacturing's share of GDP continues a slow decline.[74]

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.

	Population 2010 (million)	GVA per Capita 2007 ($)	Pre-Recession (1993–2007)		Recession (2008–2009)		Recovery (2009–2010)	
			GVA per Capita Change	Employment Change	GVA per Capita Change	Employment Change	GVA per Capita Change	Employment 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%

73 José Antonio Ocampo, "Latin America and the Global Financial Crisis." Cambridge Journal of Economics (33)(4)(2009): 703–24.
74 Instituto Nacional de Estadística e Informática, 2010.

6. LOOKING BACK
AND LOOKING AHEAD

The economic performance of metropolitan areas across the three periods reveals important changes in the relative positions of these economies before, during, and after the Great Recession. At the same time, metros themselves are still coming to grips with 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. In this regard, the 150 metro areas split into four basic categories discussed below:[75]

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 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
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 income 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 percent—slightly below their pre-recession average—and in income 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 income.[76]

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 income. The recovery, however, has been weaker. While most began to add income 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 income 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. Tallinn, Vilnius, and Helsinki, meanwhile, began to gain back income 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 income. 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 income 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 income (4.8 percent) in its 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 income dropped by 8.1 percent in Dublin and a staggering 15.7 percent in Riga.

75 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.

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

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

Legend:
- UNITED STATES
- WESTERN EUROPE
- EASTERN EUROPE
- OTHER LOWER-INCOME
- OTHER HIGHER-INCOME

NO RECESSION / FULL RECOVERY		ROAD TO FULL RECOVERY		MIXED DECLINE / RECOVERY			STILL IN DECLINE
Alexandria	Lima	Austin	Moscow	Abu Dhabi	Hambug	Oslo	Athens
Bangalore	Manila	Boston	Nagoya	Amsterdam	Hartford	Paris	Barcelona
Bangkok	Melbourne	Bratislava	Nashville	Atlanta	Helsinki	Philadelphia	Buffalo
Beijing	Mumbai	Charlotte	Osaka	Auckland	Houston	Pittsburgh	Dublin
Belo Horizonte	New Delhi	Dallas	Phoenix	Baltimore	Indianapolis	Portland	Las Vegas
Bogotá	Rio de Janeiro	Detroit	Providence	Berlin	Jacksonville	Prague	Lisbon
Brasilia	Riyadh	Guadalajara	St. Louis	Birmingham	Johannesburg	Richmond	Madrid
Buenos Aires	San Antonio	Istanbul	San Diego	Bridgeport	Kansas City	Riverside	Naples
Cairo	Santiago	Mexico City	San Jose	Brisbane	Leipzig	Rochester	Porto
Chennai	São Paulo	Minneapolis	Singapore	Brussels	Lille	Rotterdam	Riga
Guangzhou	Seoul	Monterrey	Tokyo	Bucharest	Ljubljana	Sacramento	Rome
Hong Kong	Shanghai	Montreal	Toronto	Budapest	London	Salt Lake City	Sofia
Hyderabad	Shenzhen			Busan	Los Angeles	San Fransisco	Thessaloniki
Jakarta	Sydney			Cape Town	Louisville	Seattle	Valencia
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	Zurich	

	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 PER 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 PER 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. Some values based on forecasted estimates, please see Data and Methods section for further details

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.[77] 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.

77 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).

METROPOLITAN POLICY PROGRAM, THE BROOKINGS INSTITUTION

Created in 1996, the Brookings Metropolitan Policy Program provides decisionmakers with cutting-edge trend analysis, research and policy ideas that empower metropolitan areas to compete and prosper. The Program believes that future prosperity is dependent upon delivering a next economy that is driven by exports, powered by low carbon, fueled by innovation, rich with opportunity, and led by metropolitan areas—while simultaneously building smart, sustainable places that embrace demographic and economic change and technological advances.

To deliver on this promise, the Metropolitan Policy Program grounds its work in metropolitan areas and states to advance reforms that are tailored to the unique assets, attributes, and advantages of these disparate places. It then leverages up the most innovative policies and practices from these places to advance catalytic change at the federal level. The Program's research and policy development is informed by two networks of innovative corporate, civic, philanthropic, and political leaders—the Metropolitan Leadership Council and the Metropolitan Partners Network—who help to guide and advance systemic change both individually and collectively.

The Metropolitan Policy Program works to advance the larger goals of the Brookings Institution, a nonprofit public policy organization based in Washington, D.C. Its mission is to conduct high-quality, independent research and, based on that research, to provide innovative, practical recommendations that advance three broad goals: strengthening American democracy; fostering the economic and social welfare, security, and opportunity of all Americans; and securing a more open, safe, prosperous, and cooperative international system.

LSE CITIES, LONDON SCHOOL OF ECONOMICS AND POLITICAL SCIENCE

LSE Cities is an international research centre at the London School of Economics and Political Science that carries out research, education, outreach and advisory activities in the urban field, supported by the Deutsche Bank. The recently established centre builds on the interdisciplinary work of the Urban Age Programme, extending its partnership with Deutsche Bank's Alfred Herrhausen Society for a further five-year period. LSE Cities continues LSE's century-old commitment to improving our understanding of urban society, by studying how the built environment has profound consequences on the shape of society in an increasingly urbanized world where over 50 percent of people live in urban areas.

LSE Cities' objective is to contribute to the creation of new knowledge and generate applied research on the interactions between the physical and social dimensions of cities. This will be achieved through of series of research programs, educational initiatives, and outreach projects that initially focus on the links between the design of cities—their buildings and spaces—and social well-being, the environment, and urban governance.

The graduate education branch of LSE Cities, the Cities Programme, offers both Master and PhD-level education, including an innovative series of public lectures and events, master classes, and seminars.

DEUTSCHE BANK RESEARCH

Deutsche Bank Research is responsible for macroeconomic analysis within Deutsche Bank Group and acts as consultant for the Bank, its clients and stakeholders. It analyses relevant trends for the Bank in financial markets, the economy and society and highlights risks and opportunities. DB Research delivers high-quality, independent analysis and actively promotes public debate on economic, fiscal, labour market and social policy issues.

DB Research's focus in on the following topics:
- Macroeconomic analysis and analysis of growth trends in Germany,
- Economic policy issues in Germany and Europe,
- Global research on the financial sector and its regulation, and
- The global challenge of energy supply and climate change.

DB Research disseminates its research findings (publications, online research, speeches and presentations) via the internet (www.dbresearch.com), RSS news feed and e-mail , as well as in printed form.

ALFRED HERRHAUSEN SOCIETY

The non-profit Alfred Herrhausen Society is the international forum of the Deutsche Bank. Its work focuses on new forms of governance as a response to the challenges of the 21st century. The Alfred Herrhausen Society seeks traces of the future in the present, and conceptualizes relevant themes for analysis and debate. It works with international partners across a range of fields, including policy, academia, and business, to organize forums for discussion worldwide. It forges international networks and builds temporary institutions to help to find better solutions to global challenges. It targets future decisionmakers, but also attempts to make its work accessible to a wide public audience.

The society is dedicated to the work of Alfred Herrhausen, former spokesman of the Deutsche Bank board of directors, who advocated the idea of corporate social responsibility in an exemplary manner until his assassination by terrorists in 1989. The Alfred Herrhausen Society is an expression of the Deutsche Bank's worldwide commitment to civil society.

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GLOBAL METRO MONITOR