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nighttime satellite images**

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# Global Metropolis:

Assessing Economic Activity in Urban Centers  
Based on Nighttime Satellite Images

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## **Abstract**

This research provides new data and insight metropolitan areas worldwide. It summarizes new data, derived from satellite images of the world at night, to provide systematic estimates of the economic activity generated by cities and metropolitan areas worldwide. It identifies 681 global metropolitan areas each with more than 500,000 people. Taken as a whole, these large global metropolitan regions house 24 percent of world population but produce 60 percent of global output, measured as light emissions. Asia leads the way in global economic urbanization according to our findings, followed by North America, the emerging economies, and Europe.

***Keywords:*** Metro regions, Globalization, Urbanization, Nighttime lights

***JEL:*** O18 R10

## Introduction

The year 2007 marked a turning point in world history: It was the year the world became urban. The share of the world's population living in urban areas increased from just 3 percent in 1800 to 14 percent in 1900. By 1950, it had reached 30 percent. In 2007, this number crossed the fifty percent mark. In the advanced countries, three-quarters of people live in urban areas (UNFPA, 2007). Noting this momentous shift, *The Economist* (2007) put it this way: "Whether you think the human story begins in a garden in Mesopotamia known as Eden, or more prosaically on the savannahs of present-day east Africa, it is clear that *Homo sapiens* did not start life as an urban creature. Man's habitat at the outset was dominated by the need to find food, and hunting and foraging were rural pursuits." But today, the story concludes, "Wisely or not, *Homo sapiens* has become *Homo urbanus*". According to United Nations' projections, more than two-thirds of the world's population (4.4 billion people) will be urbanites by the year 2030 (UNFPA, 2007).

Professional geographers and urbanists of all sorts have long been interested in the cities around the world and the extent of global urbanism. The past several years have seen numerous, very useful and important attempts to develop data and to better understand the economic role of cities and metropolitan areas in the global economy. Researchers like Sassen (1991, 2006, 2008), Taylor (2003, 2005), Lang and Dhavale (2005) and others have developed new and innovative ways to track and benchmark global cities and their surrounding metropolitan areas. Meijers (2005) shows that large urban regions extend far beyond single cities, but are rather made up of polycentric structures. Hall and Pain (2006) illustrate the role of networked polycentric regions in Europe and discuss the impact of such structures on various political, economic and social factors. Ni and Kresl (2008) compiled

data from a wide range of sources to produce detailed rankings of urban competitiveness for 500 cities worldwide. Mercer Consulting (2008) publishes annual reports on the cost and quality of life in a sample of global cities. MasterCard (2008) produced a Worldwide Centers of Commerce Index, drawing from the work of leading global scholars on economic activity in global cities. Henderson et al. (2009) use light emissions to estimate regional economic growth in Africa, where reliable data is hard to find.

Despite this important and successful line of research, one limiting factor in the field has been the lack of a systematic and consistent data set for cities, urban areas and metropolitan regions on a global basis. There is no one group or agency that collects the necessary data. Regional units and definitions also vary considerably across countries (see Brunn et al 2003).

There is an extensive research on urbanization, the characteristics and role of large urban and metropolitan regions, and their relationship to economic growth and development. The literature offers several explanations for urbanization in the presence of technological change. The first stream of literature focuses on the way that geographic clustering and collocation makes firms more productive, efficient and innovative. Long ago Marshall (1890) stressed the effects of co-location or agglomeration on firm efficiency. Christaller (1933) showed the importance of economies of spatial concentration and reduced transport costs. Fujita et al (1999) showed that the trade-off between scale economies and transportation costs leads to the emergence of multiple central places serving surrounding markets. A second stream focuses on the way locations improve the productivity of human capital, knowledge accumulation, and creativity (Jacobs, 1969, 1984; Lucas, 1988; Romer, 1990; Florida 2002, Berry and Glaeser, 2005). Lucas (1988) credits Jacobs (1969, 1984) for the fundamental insight that human capital externalities provide the basic underlying mechanism for economic

development and a wide range of empirical studies substantiate that claim (Glaeser et al. 2001; Florida et al., 2008).

Our research helps fill this gap by developing a new data set on metropolitan regions across the entire world. It builds upon earlier research by Florida et al. (2008) who used satellite images to identify mega-regions globally. We use the same light-based estimates, but for a different regional unit; metropolitan regions worldwide. By using light-based data from satellite images of the earth at night, our method enables us to generate metropolitan level boundaries that are consistent across countries and thus overcomes the problem of different regional definitions. Our research uses these data to provide more systematic estimates of the economic activity generated by metropolitan areas across the globe.

We begin with a short summary of our methodology for using the satellite images to develop economic estimates. We then summarize our key findings on the role of metropolitan areas in the global economy overall, before turning to a more detailed look at their role in the world's major economic areas – North American, Europe, Asia, the newly industrializing countries and the developing world. The last section summarizes the overall, very significant contribution of metropolitan areas to the global economy.

## **Data and Methods**

We use a novel but straightforward and simple method to develop systematic data for metropolitan areas globally. We calculate economic activity for these locations based on satellite images of the entire globe. We define a metropolitan area as a core city and its surrounding hinterland. These are completely contiguously lighted areas as seen from space at night. The strength of our method is its consistency and simplicity. National government

statistical bodies typically use commuting ranges to identify metropolitan areas. Other studies suggest that metropolitan areas composed of its central city and its surrounding suburbs and hinterland share common social, cultural and political characteristics and benefit from close interconnections and network connectivity that inform and shape metropolitan regions. These are all important aspects of metropolitan areas, but data for them are not available on a global basis. The use of light emission data enable us to fill in an important gap in research to date and provide a simple, straightforward and consistent method to identify metropolitan areas across the world.

We utilize light emission data for the year 2000 (Doll, Muller, & Elvidge, 2000). The base data are from the Earth Observation Program of NOAA's National Geophysical Data Center. These data provide a measure of light intensity for each 30 arc second cell between 65° and 65° latitude. These cells cover approximately 1km<sup>2</sup> at the equator and become somewhat smaller at higher and lower latitudes. While the data capture low light levels that are consistent with low-density suburban and electrified semi-rural areas, the measured emission level saturates far from the most economically intense center of a major city due to the design of the sensors and the processing algorithms used by NGDC. The fall-off in brightness gradient as this threshold is quite steep and occurs in the inner suburbs of large U.S. urban areas (see Weier, 2000). While this presents a challenge in producing estimates, it is not insurmountable. This data limitation is in some ways liberating because we suspect that the relationship between light emissions and economic activity breaks down as higher levels of urbanization expand vertically rather than horizontally. We would thus be forced to estimate central cities differently from their surroundings in any case. To deal with the problem of saturation of urban cores, we break the process of estimating economic activity from light emissions into two stages. We estimate activity levels for low light areas, including

urban peripheries, as a direct function of light level. We separately estimate urban cores as a function of both area and shape.

We then set a light threshold that captures the essence of the U.S. metropolitan areas. After we determine the threshold that gives the best approximation of the established U.S. metro areas, we apply this same threshold to the nighttime lights dataset for the rest of the world. We thus calibrate the model by using detailed published data for Gross Regional Product (GRP) for 363 U.S. metropolitan areas (Global Insight, 2006). This calibration also yields an objective measure of the precision of this process. We are able to reproduce the GRP estimates with a standard error of 34 percent. In evaluating this number, it should be borne in mind that the Gross Regional Product estimate also contains measurement error. We also review satellite data for the entire decade 1993 to 2003, and that shows some regional instability and difference in the brightness of the light emissions. This introduces some impreciseness in our estimates for regions, but given the calibration technique we minimize this error that is a byproduct of the light emission itself.

We deal with the problem of translating physical economic activity into standard units by renormalizing the total for each nation to agree with that nation's 2000 Gross Domestic Product (GDP) in 2000 U.S. dollars at current market exchange rates (World Bank, 2006). We thus use the light-derived estimates to establish the relative importance of pixels within nations while maintaining consistency with published estimates at the national level. In cases where we have high quality metropolitan region estimates for areas with well-defined borders, we renormalize those areas in line with the published estimates for GRP as per above. When such sub-regional adjustments are made, we again renormalize the national total to coincide with World Development Indicators national estimates (GDP).

The result of this process is an estimate of economic activity for every 30 arc second grid cell (less than one square kilometer) in the world. We refer to this indicator as Light-based Regional Product or LRP. While it is expressed in the same nominal dollars as GDP and GRP and is designed to aggregate up to published estimates of GDP, it is different enough in terms both of its derivation and its conceptual design that it is best identified with its own name.

## **Key Findings**

We now turn to key findings of the research. Table 1 shows the top 20 regions worldwide in economic activity (or LRP). Appendix 1 provides a more detailed listing of the top 100 economic regions worldwide.

The world's largest metropolitan area in terms of economic activity is Greater Tokyo which produces nearly \$2 trillion dollars in economic output (see Table 2). It is followed by Greater New York, Osaka-Kyoto-Kobe, Los Angeles, Nagoya, Chicago, London, Greater Brussels, Greater Koln and Washington DC.

The economic activity produced by these regions is substantially greater than their population size. The top ten regions, which house just 2.6 percent of the world's population, account for more than 20 (21.2%) percent of global economic activity. The twenty largest regions, in economic terms, are home to 4.4 percent of the world's people and produce nearly 30 percent (28%) of global economic activity. And, the world's fifth largest

economic regions, home to 7 percent of global population, account for almost 40 percent (38.5%) of global economic activity.

**(Table 1 about here)**

We now turn to the leading economic regions by major continent – North America, Europe and Asia.

## **North America**

Table 2 lists the ten largest economic regions in North America. New York tops the list followed by Los Angeles, Chicago, Washington DC, Boston, San Jose, Dallas, Houston, Detroit and Atlanta – all U.S. regions. These regions generate 11.7 percent of global economic activity while housing 1.3 percent of world population. Toronto-Buffalo ranks 11th place in North America with 161.8 billion in LRP and Mexico City ranks 14<sup>th</sup> in North America with nearly \$140 billion in economic activity. It is interesting to note that Mexico City generates nearly a quarter (24 percent) of Mexico’s total economic activity.

**(Table 2 about here)**

## **Europe**

Table 3 lists the ten largest economic regions in Europe. London is the largest economic region, followed by Greater Brussels, Greater Koln, Paris, Leeds-Sheffield-Birmingham, Amsterdam-Rotterdam, Milan, Manchester-Liverpool, Berlin and Frankfurt. The regions

which host 1.3 percent of world population produce approximately 7.1 percent of world economic activity.

**(Table 3 about here)**

## **Asia**

Table 4 lists Asia's ten largest economic regions. Greater Tokyo is Asia's – and the world's – largest with nearly \$2 trillion in LRP. Kyoto-Osaka-Kobe, Nagoya, Seoul, Fukuoka-Kita Kyushu, Singapore, Sapporo, Bangkok and Okayama complete the top ten. The regions account for 12.8 percent of world economic activity, while housing 2.3 percent of world population.

**(Table 4 about here)**

## **The BRICS**

A Goldman Sachs (O'Neill et al., 2005) report identified the so-called BRIC nations – that is Brazil, Russia, India and China as large, rapidly growing and increasingly significant global economic actors. Table 5 shows the top 10 metro areas in the BRIC nations. The largest is Hong Kong followed by Sao Paulo, Beijing, Shanghai, Rio de Janeiro, New Delhi, Tianjin, Belo Horizonte, Calcutta and Porto Alegre.

**(Table 5 about here)**

## **Other Emerging Economies**

Table 6 lists the ten largest metros for the emerging economies - Argentina, Egypt, Malaysia, Mexico, Poland, South Africa, Thailand, and Turkey. The largest is Buenos Aires, followed by Mexico City, San Diego, Jerusalem-Tel Aviv, Bangkok, Pretoria-Johannesburg, Jakarta, Cairo, Kuala Lumpur, and El Paso.

**(Table 6 about here)**

## **Global Economic Role of Metropolitan Regions**

We now summarize the global impact of the world's largest metropolitan areas. Table 7 shows the share of global economic activity generated by metropolitan areas of various sizes.

**(Table 7 about here)**

From our full global sample of approximately 14,000 estimated metropolitan regions, 681 regions house more than 500,000 people. Together, these 681 regions account for roughly a quarter (24 percent) of world population and account for nearly 60 percent (58.50%) of total world-wide economic activity. Such metros account for more than 80 percent of economic activity in Asia, roughly 60 percent of economic activity in North America, approximately 95 percent in the Emerging Economies, 40 percent in the BRICs and nearly 50 (47.93%) percent of economic activity in Europe.

The 347 metropolitan areas world-wide with more than a million people, which house 20.38 percent of world population, account for more than half (52.27 percent) of worldwide economic activity. These metros account for roughly three-quarters (75.25 percent) of

economic activity in Asia, half (54 percent) in North America, roughly 60 percent in the Emerging Economies, 40 (41.49) percent in Europe and one third (32.73 percent) in the BRICs.

The 61 metros with more than 5 million people which house roughly 10 percent of world population account for a third of all global economic activity. These metros account for two-thirds of economic activity in Asia, roughly a third (31.21 percent) in North America, a quarter (24.26 percent in Europe), approximately 36 percent in the Emerging Economies and 15 percent in the BRICs.

The 29 metros with more than 10 million people, which house roughly 8 percent of global population, account for a quarter of global economic activity. These metros account for two-thirds of economic activity in Asia, a fifth (20.69 percent) in North America, 15 percent in Europe, a quarter (24.94 percent) in the Emerging Economies and 13 percent in the BRICs.

Overall, some 60 percent of worldwide activity is generated by metro areas with more than 500,000 people. Asia leads the way in global economic urbanization, followed by North America, the Emerging Economies and Europe.

**(Table 8 about here)**

Finally, just the ten largest economic regions produce more than a fifth of total economic output. The top twenty produce nearly 30 percent (28%), and the top 100 economic regions produce almost half (46 percent) of global economic activity (Table 8).

## **Conclusion**

Global urbanization is a critical dimension of world development. Geographers and urbanists have charted the progress of global urbanization, and the past decade or so has seen significant research on the role and nature of world cities. But we lack comparable and systematic data on the world's metropolitan areas. While international statistical agencies collect data on nations, there is no repository of economic data on the world's cities and metropolitan areas. The absence of these data has made it impossible to identify and compare the world's cities and metropolitan areas. To overcome this data limitation, we use satellite images of the world at night to derive systematic and comparable estimates of economic activity across the world's cities and metropolitan areas.

Our research identifies 681 global metropolitan areas with more than 500,000 people. These global metropolitan regions house 24 percent of world population but produce 60 percent of global output. We further find that Asia leads the way in global economic urbanization, followed by North America, the Emerging Economies and Europe.

Our research which identifies global metropolitan areas is just a start. We want to encourage more research using these and other data sources to further probe the scope, nature and effects of the world's cities and metropolitan areas.

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## APPENDIX:

### Top 100 metros by LRP (billions)

Rank	Region	LRP (\$billions)
1	Tokyo-Kawasaki-Yokohama	1,997.5
2	New York-Philadelphia-Newark	1,181.9
3	Kyoto-Osaka-Kobe	617.9
4	Los Angeles	561.7
5	Nagoya	558.4
6	Chicago-Milwaukee	405.7
7	London	378.1
8	Antwerpen-Gent-Bruxelles-Lille-Liege	336.2
9	Bonn-Dortmund-Duisburg-Koln	315.2
10	Washington D.C.-Baltimore	297.3
11	Paris	280.9
12	Boston	275.2
13	Seoul-Inch`on	238.6
14	San Jose	235.1
15	Leeds-Sheffield-Birmingham	222.2
16	Dallas	212.7
17	Guangzhou-Hong Kong-Kowloon	200.5
18	Amsterdam-Rotterdam-The Hague	187.5
19	Milano	181.9
20	Houston	170.3
21	Detroit	168.3
22	Atlanta	164.5
23	Toronto-Buffalo	161.8
24	Tampa	146.3
25	Buenos Aires	143.2
26	Miami	142.7
27	Mexico City	139.4
28	Manchester-Liverpool	134.6
29	Seattle	123.1
30	Sao Paulo	114.4
31	San Diego	110.3
32	Minneapolis	107.4
33	Phoenix	106.7
34	Fukuoka-Kita Kyushu	105.8
35	Jerusalem-Tel Aviv-Yafo	104.6
36	Denver	99.7
37	Cleveland	99.1
38	Berlin	96.1
39	Frankfurt am Main	93.0
40	Singapore	91.9
41	Sydney	83.4
42	Cincinnati	82.8

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43	Madrid	81.8
44	Sapporo	79.4
45	Venice	79.3
46	St. Louis	77.7
47	Glasgow	76.2
48	Bangkok	75.4
49	Melbourne	72.7
50	Barcelona	69.2
51	Napoli	68.9
52	Roma	67.1
53	Montreal	66.9
54	Pittsburgh	64.4
55	Pretoria-Johannesburg	62.9
56	Newcastle	62.7
57	Hamburg	60.1
58	Zurich	59.8
59	Portland	58.7
60	Charlotte	56.1
61	Kansas City	55.2
62	Stuttgart	55.1
63	Sacramento	53.4
64	Okayama	53.1
65	Lyon	52.1
66	Athens	50.8
67	Vienna	49.6
68	San Antonio	49.6
69	Indianapolis	48.5
70	Salt Lake City	47.9
71	Manila-Quezon City	47.1
72	Marseille	47.0
73	Beijing	46.9
74	Abu Zaby	46.4
75	Jakarta	45.9
76	Shanghai	45.8
77	Pusan	45.0
78	Las Vegas	44.8
79	Cairo-El-Giza	44.3
80	Columbus	44.2
81	Mannheim - Heidelberg	43.5
82	Rio de Janeiro	42.1
83	Munchen	40.8
84	T`ai-chung	40.8
85	Brisbane	40.6
86	Perth-Fremantle	40.5
87	Austin	40.0
88	Kuala Lumpur	39.5
89	San Juan	38.9
90	Richmond	38.9
91	Kobenhavn	38.8
92	Taipei-Chingmei	38.2

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93	Raleigh-Durham	37.0
94	Santiago	37.0
95	Greensboro-Winston-Salem	36.8
96	Norfolk	36.5
97	Nashville	36.3
98	Oslo	36.3
99	Kao-Hsiung-T`ai-nan	36.0
100	Memphis	35.1

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### Top 100 metros by population (millions)

Rank	Region	Population (millions)
1	Guangzhou-Hong Kong-Kowloon	37.19
2	Cairo-El-Giza	37.15
3	Tokyo-Kawasaki-Yokohama	36.52
4	New York-Philadelphia-Newark	29.63
5	Seoul-Inch`on	22.01
6	Sao Paulo	21.74
7	Mexico City	19.60
8	New Delhi-Delhi	17.59
9	Kyoto-Osaka-Kobe	17.48
10	Bombay	17.33
11	Jakarta	16.27
12	Manila-Quezon City	16.01
13	Los Angeles	15.86
14	Shanghai	13.97
15	Antwerpen-Gent-Bruxelles-Lille-Liege	13.76
16	Buenos Aires	13.58
17	Druzba-Moskva	13.46
18	Calcutta	13.10
19	London	12.58
20	Karachi	11.70
21	Tehran	11.19
22	Upper Nile	11.02
23	Nagoya	10.78
24	Chicago-Milwaukee	10.67
25	Paris	10.57
26	Bonn-Dortmund-Duisburg-Koln	10.44
27	Beijing	10.33
28	Rio de Janeiro	10.08
29	Bangkok	10.02
30	Taipei-Chingmei	9.54
31	Istanbul	9.44
32	Leeds-Sheffield-Birmingham	9.39
33	Dhaka	8.63
34	Pretoria-Johannesburg	8.51
35	Lima	8.00
36	Milano	7.71
37	Jerusalem-Tel Aviv-Yafo	7.63
38	Amsterdam-Rotterdam-The Hague	7.62
39	Toronto-Buffalo	7.25
40	Bogota	7.10
41	Madras	7.04
42	Lahore	7.01
43	Brazzaville	6.99
44	Washington D.C.-Baltimore	6.84
45	Boston	6.59
46	Lagos	6.54
47	Hyderabad	6.35

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48	Baghdad	6.26
49	Manchester-Liverpool	5.96
50	Bangalore	5.84
51	Santiago	5.80
52	San Jose	5.59
53	Pusan	5.32
54	Ho Chi Minh City	5.30
55	Madrid	5.29
56	Ar Riyad	5.25
57	Dallas	5.24
58	Miami	5.23
59	Tianjin	5.13
60	T`ai-chung	5.09
61	Kao-Hsiung-T`ai-nan	5.07
62	Tampa	4.93
63	Ahmadabad	4.86
64	Kuala Lumpur	4.78
65	Napoli	4.74
66	Surabaja	4.74
67	Barcelona	4.73
68	Houston	4.66
69	Fukuoka-Kita Kyushu	4.64
70	Saint Petersburg	4.60
71	Khartoum-Omdurman	4.55
72	Wuhan	4.50
73	Detroit	4.46
74	Pune	4.46
75	Chengdu	4.39
76	Shenyang	4.31
77	Atlanta	4.23
78	Singapore	4.23
79	Belo Horizonte	4.16
80	Montreal	4.13
81	Xian	4.03
82	San Diego	3.99
83	Alexandria	3.95
84	Guadalajara	3.92
85	Bandung	3.80
86	Berlin	3.71
87	Nanjing	3.63
88	Algiers	3.59
89	Phoenix	3.58
90	Sydney	3.54
91	Casablanca	3.54
92	Monterrey	3.49
93	Roma	3.46
94	Athens	3.42
95	Caracas	3.36
96	Recife	3.34
97	Ankara	3.30

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98	Porto Alegre	3.25
99	Santo Domingo	3.16
100	Rangoon	3.15

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**TABLES:**

**Table 1**  
**World's Largest Metropolitan Regions by LRP (billions)**

	<b>Region</b>	<b>LRP (billions)</b>
<b>1</b>	Tokyo-Kawasaki-Yokohama	\$1,997.5
<b>2</b>	New York-Philadelphia-Newark	1,181.9
<b>3</b>	Kyoto-Osaka-Kobe	617.9
<b>4</b>	Los Angeles	561.7
<b>5</b>	Nagoya	558.4
<b>6</b>	Chicago-Milwaukee	405.7
<b>7</b>	London	378.1
<b>8</b>	Antwerpen-Gent-Bruxelles-Lille-Liege	336.2
<b>9</b>	Bonn-Dortmund-Duisburg-Koln	315.2
<b>10</b>	Washington D.C.-Baltimore	297.3
<b>11</b>	Paris	280.9
<b>12</b>	Boston	275.2
<b>13</b>	Seoul-Inch`on	238.9
<b>14</b>	San Jose	235.1
<b>15</b>	Leeds-Sheffield-Birmingham	222.2
<b>16</b>	Dallas	212.7
<b>17</b>	Guangzhou-Hong Kong-Kowloon	200.5
<b>18</b>	Amsterdam-Rotterdam-The Hague	187.5
<b>19</b>	Milano	181.9
<b>20</b>	Houston	170.3

**Table 2**  
**North America's Largest Economic Regions**

	<b>Region</b>	<b>LRP (billions)</b>
<b>1</b>	New York-Philadelphia-Newark	\$1,181.9
<b>2</b>	Los Angeles	561.7
<b>3</b>	Chicago-Milwaukee	405.7
<b>4</b>	Washington D.C.-Baltimore	297.3
<b>5</b>	Boston	275.2
<b>6</b>	San Jose	235.1
<b>7</b>	Dallas	212.7
<b>8</b>	Houston	170.3
<b>9</b>	Detroit	168.3
<b>10</b>	Atlanta	164.5

**Table 3**  
**Europe's Largest Economic Regions**

	<b>Region</b>	<b>LRP (billions)</b>
<b>1</b>	London	\$378.1
<b>2</b>	Antwerpen-Gent-Bruxelles-Lille-Liege	336.2
<b>3</b>	Bonn-Dortmund-Duisburg-Koln	315.2
<b>4</b>	Paris	280.9
<b>5</b>	Leeds-Sheffield-Birmingham	222.2
<b>6</b>	Amsterdam-Rotterdam-The Hague	187.5
<b>7</b>	Milano	181.9
<b>8</b>	Manchester-Liverpool	134.3
<b>9</b>	Berlin	96.0
<b>10</b>	Frankfurt am Main	93.0

**Table 4**  
**Asia's Ten Largest Economic Regions**

	<b>Region</b>	<b>LRP (billions)</b>
<b>1</b>	Tokyo-Kawasaki-Yokohama	\$1,997.5
<b>2</b>	Kyoto-Osaka-Kobe	617.9
<b>3</b>	Nagoya	558.4
<b>4</b>	Seoul	238.9
<b>5</b>	Guangzhou-Hong Kong-Kowloon	200.5
<b>6</b>	Fukuoka-Kita Kyushu	105.8
<b>7</b>	Singapore	91.9
<b>8</b>	Sapporo	79.4
<b>9</b>	Bangkok	75.4
<b>10</b>	Okayama	53.1

**Table 5**  
**BRICS - Ten Largest Economic Regions**

	Region	LRP (billions)
<b>1</b>	Guangzhou-Hong Kong-Kowloon	\$200.5
<b>2</b>	Sao Paulo	114.3
<b>3</b>	Beijing	46.9
<b>4</b>	Shanghai	45.8
<b>5</b>	Rio de Janeiro	42.1
<b>6</b>	New Delhi-Delhi	31.6
<b>7</b>	Tianjin	17.3
<b>8</b>	Belo Horizonte	16.5
<b>9</b>	Calcutta	14.9
<b>10</b>	Porto Alegre	14.5

**Table 6**  
**Ten Largest Economic Regions in the Emerging Economies**

	Region	LRP (billions)
<b>1</b>	Buenos Aires	\$143.2
<b>2</b>	Mexico City	139.4
<b>3</b>	San Diego	110.3
<b>4</b>	Jerusalem-Tel Aviv-Yafo	104.6
<b>5</b>	Bangkok	75.4
<b>6</b>	Pretoria-Johannesburg	62.9
<b>7</b>	Jakarta	45.9
<b>8</b>	Cairo-El-Giza	44.3
<b>9</b>	Kuala Lumpur	39.5
<b>10</b>	El Paso	27.5

**Table 7**  
**Economic Activity by Major Region**

<b>Region</b>	<b>Population cutoff (millions)</b>			
	<b>10.0</b>	<b>5.0</b>	<b>1.0</b>	<b>0.5</b>
<b>North America</b>	\$2,288.7 (20.69%)	\$3,451.5 (31.21%)	\$5,972.0 (54.00%)	\$6,704.9 (60.62%)
<b>Europe</b>	\$1,310.4 (15.01%)	\$2,118.1 (24.26%)	\$3,609.3 (41.49%)	\$4,183.8 (47.93%)
<b>BRICs</b>	\$322.3 (13.43%)	\$369.1 (15.38%)	\$785.4 (32.73%)	\$954.9 (39.80%)
<b>Asia*</b>	\$3,613.1 (65.44%)	\$3,658.0 (66.26%)	\$4,154.5 (75.25%)	\$4,421.0 (80.07%)
<b>Emerging Economies **</b>	\$417.0 24.94%	\$609.8 (36.47%)	\$1,023.2 (61.20%)	\$1,602.9 (95.87%)
<b>All Nations</b>	\$7,962.8 (25.49%)	\$10,615.1 (34.13%)	\$16,259.1 (52.27%)	\$18,205.1 (58.5%)

\* Hong Kong, Japan, Macao, South Korea, Singapore

\*\* Argentina, Egypt, Malaysia, Mexico, Poland, South Africa, Thailand, Turkey

**Table 8**  
**Share of Global Economic Activity Produced by the Largest Economic Regions**

<b>Top Metro Regions</b>	<b>Total LRP (billions)</b>	<b>Economic Share</b>
10	\$6,649.75	21.18%
20	\$8,854.81	28.02%
100	\$14,458.68	46.05%