

# III – Which are the largest city economies in the world and how might this change by 2020?<sup>1</sup>

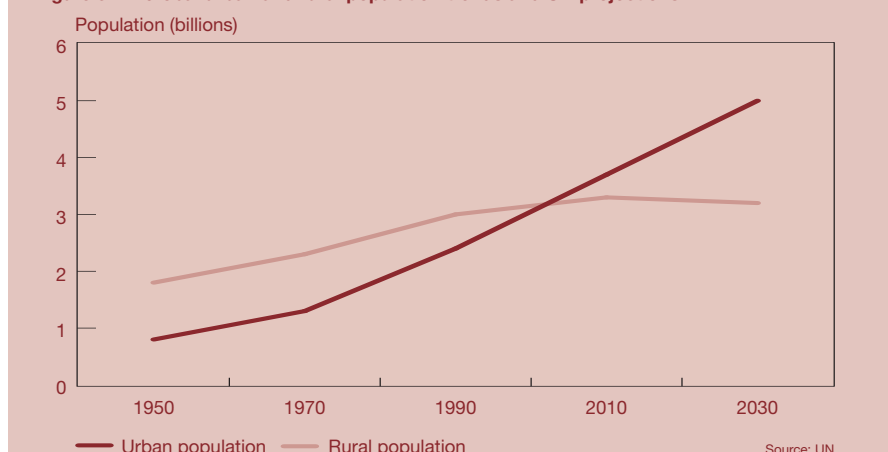
Rankings of global cities by population are common, but while population statistics are important, they are only part of the story: leading cities such as London, New York, Paris and Tokyo are major economies in their own right of a size greater than medium-sized national economies such as Sweden and Switzerland. Cities are also centres of innovation, creativity and culture, as well as focal points for government, finance, business services and corporate headquarters in their countries (and sometimes also their regions in the case of financial centres like London in Europe or Tokyo in Asia, or political centres like Brussels in the EU).

Despite this, data are much less readily available on the overall size of city economies in terms of their total output, particularly outside the OECD countries<sup>2</sup>. This article aims to fill this gap by presenting some new estimates by PricewaterhouseCoopers LLP (PwC) of the size of the largest 100 city economies in the world in 2005 as measured by their estimated Gross Domestic Product (GDP). This analysis shows a significantly different picture from rankings by population, with the advanced economy cities ranking much higher by GDP than by population due to their higher average income levels. We also, however, provide some illustrative projections of how these GDP rankings might change by 2020, which allows us to consider how far fast-growing cities in emerging market economies like China, India and Brazil will challenge the dominance of current leading global cities like New York, Tokyo, Paris and London.

The discussion below is organised as follows:

- Section III.1 provides a long-term historic perspective on population trends for the largest global cities;
- Section III.2 summarises the data and methodology used in the analysis to estimate the size of city economies as measured by GDP;

**Figure 3.1 – Global urban and rural population trends and UN projections**



- Section III.3 presents and discusses our estimates of the largest city economies in 2005;
- Section III.4 presents and discusses our illustrative projections for how these rankings might change between 2005 and 2020, with a particular focus on the rise of emerging economy cities;
- Section III.5 highlights the uncertainties surrounding our projections and discusses some of the key factors underlying the relative growth rates of city economies; and
- Section III.6 summarises and draws conclusions from the analysis.

A full listing of our ranking of the largest city economies by GDP in 2005 and 2020 is provided in the Annex.

## III.1 – Long-term historic trends in city populations

Urbanisation has been one of the major global themes of the past century and all the indications are that major cities will provide an increasing focus for global economic activity over the course of this century. In 1900, there were only 16 cities in the world with more than 1 million inhabitants, mostly in the advanced economies; now there are over 400 such cities according to United Nations (UN) estimates, around three-quarters of which

are in low and middle-income countries. In 1950, the rural population of the world was around twice the urban population, but by 2010 the UN estimates that the urban population will be greater and by 2030 it projects a total global urban population of around 5 billion compared to just over 3 billion in rural areas (see Figure 3.1).

Rankings of cities by population are available over long periods of time. Indeed Tertius Chandler, in his book *Four Thousand Years of Urban Growth: An Historical Census* (1997, St David's University Press), goes as far back as estimating that Memphis in Egypt was the largest city in the world in 3100BC with a population of 'well over 30,000'. Later holders of this 'title' include Babylon (from 1770BC and later again around 600BC when its population was over 200,000), Alexandria (around 300BC), Changan in China (c.200-25BC), Rome (c.25BC-340AD with a population of around 500,000 in 100AD), Constantinople (c.340-570AD with a population of around 400,000), Cordoba in Spain (c.935AD), Fez in Morocco (c.1170AD) and Cairo (c.1315AD)<sup>3</sup>. For much of the period from the 14th to the 18th centuries, Chandler estimates that the largest city in the world was in China (Hangzhou, Nanking or Beijing, with the latter having a population of over a million by 1800). London took over as the largest city in 1825 with a population then of around 1.35 million, rising rapidly to over 6 million by 1900. London's position was then usurped by New York in around

<sup>1</sup> The article was written primarily by John Hawksworth, with significant additional input from Thomas Hoehn. The article also draws on earlier research by Meirion Gyles and forms part of PricewaterhouseCoopers' wider research and consultancy programme on city economies.

<sup>2</sup> Some data are available for selected OECD and non-OECD cities on relative wages and costs of living, but no systematic global data source is readily available for GDP per capita at a city level as far as we are aware.

<sup>3</sup> Note that these cities in Spain and the Middle East are estimated to have had populations of around 200-300,000 at their peak, much lower than Rome at its peak, so there is not a monotonic upward trend in city size over the course of history.

1925, which in turn was overtaken by Tokyo from around 1965 onwards.

A number of interesting academic studies have been carried out using long-term trends in city populations. De Long and Shliefer (1993)<sup>4</sup>, for example, identify political regimes and taxation systems as key drivers of European city population growth in the period from 1000 to 1800, concluding that cities with non-absolutist regimes and relatively low taxation levels tended to grow faster on average. Drewett, Hoehn and Sacks (1991)<sup>5</sup> show how European city population growth in 1750-1970 was related to national economic growth.

The long-term historic estimates produced by Chandler and others, although fascinating in tracking the shifting patterns of human civilisation over the millennia, are inevitably only approximations as you go further back in time. More systematic rankings of urban agglomeration populations have been produced by the UN for the period since 1950. Table 3.1 shows the **top 30 urban agglomerations by population** in 1950, 1970, 1990 and 2005 to illustrate how these rankings have evolved over time. Notable points are that:

- Tokyo and New York remained the two largest urban agglomerations between 1950 and 1990 (although swapping places after around 1965), but Mexico City (which was only 17th in 1950) has overtaken New York in terms of population during the past ten years;
- London was still the third largest city in 1950, but has slid down the rankings progressively since then to only 25th in 2005 (with its population remaining broadly unchanged over this period); Manchester and Birmingham were in the top 30 cities in 1950 but would not rank in the top 100 by population now<sup>6</sup>;
- other leading European cities seeing sharp declines in their population rankings between 1950 and 2005 include Paris (5th to 21st), Moscow (6th to 20th) and Berlin (from 13th to well outside the top 30);

**Table 3.1 – Trends in top 30 urban agglomerations by population: 1950-2005**

Ranking in 1950	Pop. (m) 1950	Ranking in 1970	Pop. (m) 1970	Ranking in 1990	Pop. (m) 1990	Ranking in 2005	Pop. (m) 2005
1. New York	12.3	Tokyo	23.3	Tokyo	32.5	Tokyo	35.2
2. Tokyo	11.3	New York	16.2	New York	16.1	Mexico City	19.4
3. London	8.4	Osaka-Kobe	9.4	Mexico City	15.3	New York	18.7
4. Shanghai	6.1	Mexico City	8.8	Sao Paulo	14.8	Sao Paulo	18.3
5. Paris	5.4	Paris	8.4	Mumbai	12.3	Mumbai	18.2
6. Moscow	5.4	Los Angeles	8.4	Osaka-Kobe	11.0	Delhi	15.0
7. Buenos Aires	5.1	Buenos Aires	8.1	Kolkata	10.9	Shanghai	14.5
8. Chicago	5.0	Sao Paulo	7.6	Los Angeles	10.9	Kolkata	14.3
9. Kolkata	4.5	London	7.5	Seoul	10.5	Jakarta	13.2
10. Beijing	4.3	Moscow	7.1	Buenos Aires	10.5	Buenos Aires	12.6
11. Osaka/Kobe	4.1	Chicago	7.1	Rio de Janeiro	9.6	Dhaka	12.4
12. Los Angeles	4.0	Shanghai	7.1	Paris	9.3	Los Angeles	12.3
13. Berlin	3.3	Kolkata	6.9	Cairo	9.1	Karachi	11.6
14. Philadelphia	3.1	Rio de Janeiro	6.6	Moscow	9.1	Rio de Janeiro	11.5
15. Rio de Janeiro	3.0	Mumbai	5.8	Delhi	8.2	Osaka-Kobe	11.3
16. St Petersburg	2.9	Beijing	5.6	Shanghai	8.2	Cairo	11.1
17. Mexico City	2.9	Cairo	5.6	Manila	8.0	Lagos	10.9
18. Mumbai	2.9	Seoul	5.3	London	7.7	Beijing	10.7
19. Detroit	2.8	Tianjin	4.6	Jakarta	7.7	Manila	10.7
20. Boston	2.6	Philadelphia	4.4	Chicago	7.4	Moscow	10.7
21. Cairo	2.5	St Petersburg	4.0	Beijing	7.4	Paris	9.8
22. Manchester	2.4	Detriot	4.0	Karachi	7.1	Istanbul	9.7
23. Tianjin	2.4	Jakarta	3.9	Istanbul	6.6	Seoul	9.6
24. Sao Paulo	2.3	Manila	3.5	Dhaka	6.5	Chicago	8.8
25. Birmingham	2.2	Delhi	3.5	Tehran	6.4	London	8.5
26. Shenyang	2.1	Madrid	3.5	Bangkok	5.9	Guangzhou	8.4
27. Rome	1.9	Shenyang	3.5	Lima	5.8	Bogota	7.7
28. Milan	1.9	Barcelona	3.5	Tianjin	5.8	Tehran	7.3
29. San Francisco	1.9	Hong Kong	3.5	Hong Kong	5.7	Shenzhen	7.2
30. Barcelona	1.8	Tehran	3.3	Chennai	5.3	Lima	7.2

Source: UN World Urbanization Prospects (2005 revision)

- conversely, major risers between 1950 and 2005 include Mumbai (18th to 5th), Sao Paulo (24th to 4th) and 'new entrants' like Jakarta (9th in 2005), Dhaka (11th), Karachi (13th) and Lagos (17th), all of which were well outside the top 30 in 1950; and
- notably, however, the major Chinese cities<sup>7</sup> have not seen such rapid population rises as those in other leading emerging markets; both Shanghai (4th to 7th) and Beijing (10th to 18th), while increasing their populations significantly in absolute terms, have slid down the rankings between 1950 and 2005, particularly in recent decades due to China's one child policy.

Population, however, is only one of the factors determining the size of city

economies as measured by GDP: the other is average income per capita. We describe below how we have gone about producing such estimates for the leading cities in the world.

### III.2 Data and methodology used to derive city GDP estimates and projections

The first question to be addressed in any study of this kind is: **how should you define a city?** While national boundaries are clear and change relatively rarely, city definitions differ significantly across countries and evolve over time as the city expands and absorbs surrounding neighbourhoods. For the purposes of this study we have generally adopted UN definitions of 'urban agglomerations' (for short, these are

<sup>4</sup> De Long, J.B. and A. Shliefer, 'Princes and Merchants: European City Growth before the Industrial Revolution', Journal of Law and Economics, 36 (1993), p.671-702.

<sup>5</sup> Roy Drewett, Thomas Hoehn and Seymour Sacks 'The Crowding and Uncrowding of European Cities: Secular population trends 1750-1986'; in Innovation and Urban Population Dynamics; K.P. Strohmeier and C. W. Matthiessen (eds.), London, 1991.

<sup>6</sup> Although, as shown in the Annex, Manchester and Birmingham still rank in the top 100 cities by GDP.

<sup>7</sup> It is worth noting in passing that some recent media reports have claimed that Chongqing in China is now the most populous city in the world. However, as pointed out by Thomas Brinkhoff on his website ([www.citypopulation.de](http://www.citypopulation.de)), this is incorrect since it refers to the province of Chongqing, which is not a single urban agglomeration. In fact the urban agglomeration of Chongqing ranks only 29th on Brinkhoff's definitions and is outside the top 30 in the UN population rankings.

sometimes also referred to below as ‘urban economies’ or just as ‘cities’ where the context makes this appropriate), but it should be recognised that the UN population estimates rely on information provided by national statistical agencies and are therefore not based on fully standardised definitions across countries.

To illustrate the effect of adopting alternative definitions, we also consider in Section III.3 below the impact on our 2005 GDP estimates of using an alternative set of urban agglomeration population estimates compiled by Professor Thomas Brinkhoff (see his website at [www.citypopulation.de](http://www.citypopulation.de) for details) that also provide global coverage and have been used in a number of previous studies<sup>8</sup>. The UN urban population data (from its 2005 World Urbanization Prospects report) were selected as our primary source, however, as they have the advantage of providing both a time series of historic data by city/urban area back to 1950 and projections to 2030 for total urban population and to 2015 for individual cities/urban areas. We also used UN national population projections in deriving our national GDP per capita projections, so it was more consistent to use UN data here than the Brinkhoff estimates, which include some historic estimates back to 1970 but not forward projections. In the majority of cases where they differ, it appears that the UN adopts narrower definitions than Brinkhoff, which tends to make the UN estimates correspond more closely to what might generally be considered to be a city, as opposed to a cluster of closely-related cities or towns. But there is no ‘right’ answer here, so it is important to recognise that our GDP rankings are sensitive to the particular definitions used, as discussed further in Section III.3 below.

To establish our list of **candidate urban agglomerations** to be ranked in the global top 100 by economic size in either 2005 or 2020, we first included all urban agglomerations (using UN definitions) with a population of more than 3 million in 2005 (105 areas in total). We then added:

- other urban agglomerations projected to be in the top 100 by population in 2020 (using UN projections for 2015

**Table 3.2 – Data sources for city GDP estimates and projections**

Variable	Sources for 2005 estimates	Sources for 2020 projections
Urban area population	UN World Urbanization Prospects report (2005)	UN projections to 2015 extrapolated forward by PwC to 2020
GDP per capita for OECD urban areas	OECD Competitive Cities report (2006) estimates for 2002, extrapolated forward to 2005 using OECD data for 1995-2002, plus data on the city-national differential where available from individual national statistical offices	National projections for GDP per capita growth from PwC World in 2050 model to 2020, with adjustments to reflect historic differentials between city and national growth where OECD data available (for 44 countries in 1995-2002 period)
GDP per capita for non-OECD countries	Direct estimates from national statistical offices where available (e.g. China) or adjusted World Bank national data to reflect typical ratios of GDP per capita in major cities relative to national averages based on comparators with similar characteristics (e.g. cities of similar population in countries with similar income levels). Asian Development Bank data used for some Asian cities	National projections for GDP per capita growth from PwC World in 2050 model to 2020 for countries where available, with other countries being based on closest available comparators, with some judgemental adjustments to reflect particular national characteristics where appropriate. City GDP per capita growth assumed to be in line with national average for non-OECD countries due to lack of city-level data.

extrapolated to 2020 as described below); and

- other OECD urban agglomerations with populations over 1 million, as covered by the recent OECD report on Competitive Cities (2006).

This procedure gave a total of 151 candidate urban agglomerations for further analysis. Based on a review of our results, we are confident that this should cover all urban agglomerations (on UN definitions) likely to rank in the top 100 by GDP in 2005, and probably also in 2020 (although the latter is obviously subject to more uncertainty). The Annex shows results for all the cities, although it should be noted that we cannot be sure these are the largest 151 cities given that our aim was just to identify the top 100.

We chose to use GDP at Purchasing Power Parity (PPP) exchange rates as our measure of economic size. The reason for using PPPs rather than market exchange rates is to correct for differences in price levels between economies, which are due in particular to the relatively low cost of non-traded goods and services in emerging economies. By using PPPs, we can compare the volume of goods and services produced in each urban agglomeration more accurately. Using current market

exchange rates instead would tend to understate the scale of the outputs of goods and services produced by emerging economy cities.

Our primary estimates of city output are based on combining UN population estimates for 2005 with estimates of income per capita, as summarised in Table 3.2. For the OECD countries, we began with the city-level GDP per capita estimates for 2002 in the OECD’s recent Competitive Cities report (2006) and then projected these forward to 2005 based on national GDP per capita growth over this period plus an adjustment to reflect the observed city-national GDP per capita growth differential in 1995-2002 for OECD cities for which these historic data were available (in other cases, unadjusted national growth data were used).

For non-OECD cities, data are not readily available from a single source. In some cases (e.g. China) GDP per capita estimates at city level were available from national sources, but in many cases we were only able to make approximate estimates based on plausible ratios of city to national GDP per capita (the latter sourced from the World Bank) based on comparisons with cities at similar income levels for which direct income per capita estimates were available<sup>9</sup>. As such, the 2005 urban

<sup>8</sup> The other alternative we considered was to use the OECD definition of metropolitan areas from their recent report on ‘Competitive Cities’ (2006). But, unlike the UN data and the Brinkhoff estimates, this would not have covered non-OECD countries and also did not provide historic and projected population estimates on a consistent basis.

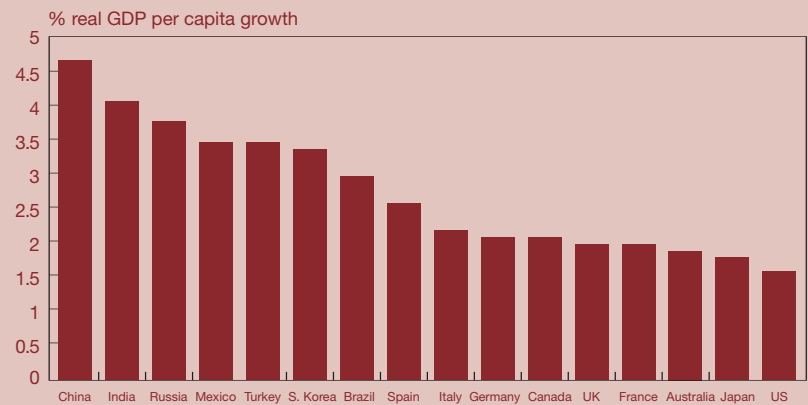
<sup>9</sup> Typically, these ratios are in the range from 1.5 to 3, with higher values tending to be observed in the lowest income countries where urban-rural income differentials are particularly large.

agglomeration GDP estimates should only be taken as broadly indicative of relative economic size for the non-OECD countries. Nonetheless, they provide a much better indication of relative economic size than just looking at population data.

As Table 3.2 also shows, our illustrative projections for city GDP in 2020 combine UN population projections<sup>10</sup> (extrapolated forward from 2015 to 2020 in a linear fashion) with our own estimates of national income per capita growth trends from our previous World in 2050 report<sup>11</sup>. As illustrated for selected countries in Figure 3.2, these latter projections show consistently higher income per capita growth in the emerging economies, with China and India coming out top. It is notable here that US GDP per capita growth is projected to be slower than that in the other major economies. This is due to the assumption in our model that other countries will tend to catch up gradually with initially higher economy-wide labour productivity levels in the US. It should be noted, however, that after taking account of its higher projected population growth (including immigration), overall US GDP growth is nonetheless projected to be higher than in any of the other G6 countries.

For the OECD urban agglomerations where historic income growth trends were available, we assumed that differences between national and urban GDP per capita growth rates in 2006-20 were half those in 1995-2002. This was based on the assumption that historic growth differentials would be gradually eroded over time, since otherwise there would be implausibly rapid or slow growth of the major cities relative to their economies as a whole. For all the other urban agglomerations, including non-OECD cities, we assume (in the absence of other data) that their income per capita growth is in line with national average projections. This is, in fact, in line with the average historic trend for the OECD cities for which data are available<sup>12</sup>. In practice, of course, income per capita growth rates will vary more than this at city level, but we have no readily available data on which to predict such variations.

Figure 3.2 – Projected real GDP per capita growth by country: 2006-20



Source: PwC World in 2050 model

Table 3.3 – Top 30 urban agglomerations by estimated GDP in 2005 using UN population estimates and definitions

GDP rank	City	Estimated GDP in 2005 (\$bn at PPPs)	Components of estimated GDP	
			Population (millions)	GDP per capita (\$k at PPPs)
1	Tokyo	1191	35.2	33.8
2	New York	1133	18.72	60.5
3	Los Angeles	639	12.3	51.9
4	Chicago	460	8.81	52.3
5	Paris	460	9.82	46.8
6	London	452	8.51	53.2
7	Osaka/Kobe	341	11.27	30.2
8	Mexico City	315	19.41	16.2
9	Philadelphia	312	5.39	57.9
10	Washington DC	299	4.24	70.6
11	Boston	290	4.36	66.5
12	Dallas/Fort Worth	268	4.66	57.4
13	Buenos Aires	245	12.55	19.5
14	Hong Kong	244	7.04	34.7
15	San Francisco/Oakland	242	3.39	71.4
16	Atlanta	236	4.3	54.8
17	Houston	235	4.32	54.3
18	Miami	231	5.43	42.6
19	Sao Paulo	225	18.33	12.3
20	Seoul	218	9.65	22.6
21	Toronto	209	5.31	39.4
22	Detroit	203	4.03	50.4
23	Madrid	188	5.61	33.5
24	Seattle	186	2.99	62.3
25	Moscow	181	10.65	17.0
26	Sydney	172	4.33	39.8
27	Phoenix	156	3.42	45.7
28	Minneapolis	155	2.56	60.7
29	San Diego	153	2.85	53.6
30	Rio de Janeiro	141	11.47	12.3

Source: UN for population estimates; PricewaterhouseCoopers GDP estimates drawing on data from UN, World Bank, OECD and national sources.

<sup>10</sup>Earlier UN city population projections were criticised, with good reason as events turned out, by Paul Bairoch ('Employment and large cities: problems and outlook', International Labour Review, vol 121, No. 5, Sept-Oct 1982).

However, the UN's projection methodology has been revised and updated since then, notably to account for the tendency of the largest cities to grow more slowly than smaller cities as diseconomies of scale set in for mega-cities.

<sup>11</sup>J. Hawksworth, The World in 2050: How big will the large emerging economies get and how can the OECD compete?, PricewaterhouseCoopers, March 2006. Available to download from <http://www.pwc.com/extweb/pwcpublications.nsf/docid/56DD37D0C399661D852571410060FF8B>

<sup>12</sup>It should be noted here that, particularly for smaller economies, the largest cities may play a dominant role in their overall national economies, so one would not expect a large divergence between income growth in these cities and the average for their economies as a whole.

### III.3 Estimated urban economy rankings for 2005

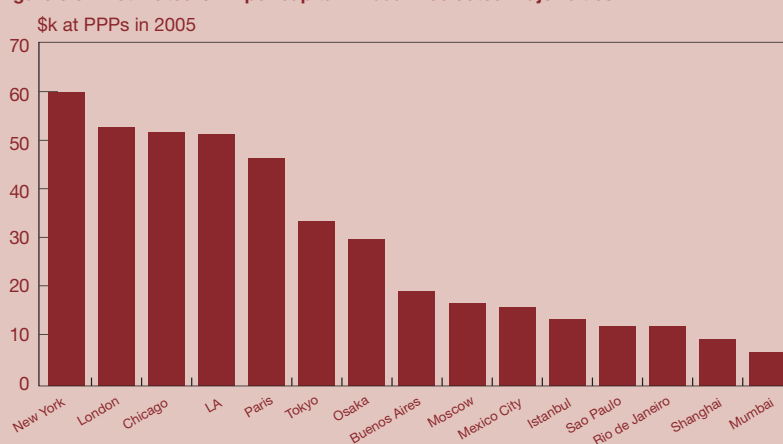
We have used the methodology described above to produce GDP estimates for our 151 candidate urban agglomerations in 2005. As noted above, it should be recognised that these estimates are reliant on the definitions adopted by the UN, and the GDP per capita estimates are subject to significant margins of error for the non-OECD cities. They should, however, at least be broadly accurate in order of magnitude terms and taking account of income per capita certainly produces a much better indication of the relative size of urban economies than just looking at population data.

Subject to these caveats, Table 3.3 shows our estimates of the size of the top 30 urban agglomerations (on UN definitions) in 2005, ranked by GDP at PPPs using the methodology described above. A full listing of GDP estimates for the 151 cities covered by our analysis is provided in the Annex. It is interesting to note that, in total, our estimates suggest that the largest 100 cities accounted for around 25% of global GDP at PPPs in 2005, with the top 30 cities alone accounting for around 16% of world GDP in that year. This emphasises the concentration of global economic activity in the world's largest cities.

The most striking point to note is that, while 22 of the top 30 urban areas by population in 2005 were from emerging/developing economies (see Table 3.1 above), only 5 of these emerging economy cities (Mexico City, Buenos Aires, Sao Paulo, Moscow and Rio de Janeiro) were in the top 30 according to our GDP estimates<sup>13</sup>. This reflects the much higher GDP per capita levels in the major developed economy cities than in the major emerging market cities, as illustrated for a selection of cases in Figure 3.3. Indeed, based on OECD estimates, 23 of the top 30 cities ranked by GDP per capita at PPPs in 2005 were from the US.

Looking at the top of the 2005 GDP rankings in Table 3.3, we can see that Tokyo is narrowly ahead of New York, with both having economies worth over \$1 trillion in 2005 (broadly similar to national economies such as Spain and Canada). Los Angeles is in clear third place with Chicago, Paris and

Figure 3.3 – Estimated GDP per capita in 2005 in selected major cities



Source: PwC estimates based on OECD, World Bank and national data sources

Table 3.4 – Comparison of estimated GDP of largest urban agglomerations with GDP of selected national economies

Country/Urban Agglomeration	Estimated GDP in 2005 (\$bn at PPPs)
UK	2230
Russia	1560
<b>Tokyo</b>	<b>1191</b>
Spain	1134
<b>New York</b>	<b>1133</b>
Canada	1061
Australia	643
<b>Los Angeles</b>	<b>639</b>
Poland	534
<b>Chicago</b>	<b>460</b>
<b>Paris</b>	<b>460</b>
<b>London</b>	<b>452</b>
Philippines	409
<b>Osaka/Kobe</b>	<b>341</b>
Belgium	337
<b>Mexico City</b>	<b>315</b>
Sweden	280
Switzerland	256

Source: World Bank for national GDP estimates (except ONS for UK); PwC for urban agglomeration GDP estimates using UN definitions (as in Table 3.3 above). These estimates are from different sources and so will not be fully consistent, but should be broadly comparable in order of magnitude terms.

London vying for the next three places (each of which has an estimated GDP higher than national economies such as Belgium, Sweden and Switzerland, as illustrated in Table 3.4). Aside from London and Paris, only two other European cities (Madrid and Moscow) make the lower reaches of the top 30.

Mexico City is the only emerging economy city in the top 10 when ranked by GDP, but Buenos Aires is not far behind in 13th place and Sao Paulo, Moscow and Rio de Janeiro are also ranked in the top 30. The full top 100 list in the Annex shows, however, that there are a number of emerging economy cities just outside the top 30, including

Shanghai (32nd), Istanbul (34th), Mumbai (37th), Manila (42nd), Beijing (44th), Cairo (45th), Jakarta (46th) and Kolkata (49th). In the next section, we consider how far these and other emerging economy cities might rise up the rankings by 2020.

Before looking forward, however, we also need to consider the effect of using the alternative urban agglomeration definitions and population estimates produced by Brinkhoff (2006), as discussed above. Table 3.5 shows an alternative top 30 GDP ranking using Brinkhoff's population estimates<sup>14</sup>, which are generally based on a broader definition of what constitutes an urban agglomeration than the UN

<sup>13</sup>This is despite using PPP rather than market exchange rates in order to avoid underestimating the scale of the outputs of the emerging economy cities.

<sup>14</sup>In the absence of any other data, we continue to use the same GDP per capita estimates for urban agglomerations that broadly match each other in the two data sets, given that we are only attempting a broad comparison between the two sets of rankings.

estimates. The first column of the table shows a comparison between the two sets of rankings from which we can note in particular that:

- 28 of the top 30 cities appear in both sets of rankings<sup>15</sup>, but some of the individual rankings vary markedly depending on the definitions used;
- in particular, Brinkhoff uses significantly wider definitions than the UN for Washington DC (including Baltimore, which is treated as a separate urban agglomeration by the UN), Seoul (including the surrounding metropolitan areas not included by the UN) and Johannesburg (including East and West Rand, which are treated as separate urban agglomerations by the UN); as a consequence, these urban agglomerations rank much higher in Table 3.5 than in Table 3.3.

As noted above, there is no correct answer here, although we prefer to focus on the UN definitions since, unlike the Brinkhoff estimates, they are linked to population projections that are consistent with those used in our other national growth modelling work. Generally speaking, the UN definitions also tend to correspond more closely to what would generally be considered as a city, as opposed to a cluster of cities. But it is certainly important to bear in mind that our precise GDP rankings are dependent to a significant extent on our use of UN definitions, even if our overall top 30 would not be much affected by using the Brinkhoff estimates instead. To some extent, this definitional issue focuses more attention on how the rankings might change in the future, and on the general balance of developed versus emerging economy cities at the top of the rankings, rather than the individual GDP estimates or rankings. These more dynamic issues are the focus of the next section of the report.

### III.3 Projected urban economy rankings for 2020 and growth rates since 2005

#### Rankings by economic size in 2020

**Table 3.5 – Alternative Top 30 urban agglomerations by estimated GDP in 2005 using population estimates and definitions by Thomas Brinkhoff**

GDP rank (using UN data in brackets)	City	Estimated GDP in 2005 (\$bn at PPPs)	Components of estimated GDP	
			Population (millions)	GDP per capita (\$k at PPPs)
1 (2)	New York	1325	21.9	60.5
2 (1)	Tokyo	1157	34.2	33.8
3 (3)	Los Angeles	934	18	51.9
4 (6)	London	638	12	53.2
5 (10)	Washington DC*	575	8.15	70.6
6 (15)	San Francisco/Oakland	518	7.25	71.4
7 (4)	Chicago	510	9.75	52.3
8 (7)	Osaka/Kobe	508	16.8	30.2
9 (20)	Seoul**	503	22.3	22.6
10 (5)	Paris	466	9.95	46.8
11 (11)	Boston	379	5.7	66.5
12 (8)	Mexico City	370	22.8	16.2
13 (9)	Philadelphia	347	6	57.9
14 (12)	Dallas/Fort Worth	345	6	57.4
15 (17)	Houston	293	5.4	54.3
16 (22)	Detroit	292	5.8	50.4
17 (16)	Atlanta	279	5.1	54.8
18 (13)	Buenos Aires	262	13.45	19.5
19 (14)	Hong Kong	257	7.4	34.7
20 (19)	Sao Paulo	248	20.2	12.3
21 (18)	Miami	237	5.55	42.6
22 (24)	Seattle	234	3.75	62.3
23 (25)	Moscow	234	13.75	17.0
24 (21)	Toronto	213	5.4	39.4
25 (28)	Minneapolis	207	3.4	60.7
26 (23)	Madrid	187	5.6	33.5
27 (65)	Johannesburg***	180	7.4	24.3
28 (27)	Phoenix	178	3.9	45.7
29 (32)	Shanghai	174	18.15	9.6
30 (26)	Sydney	173	4.35	39.8

\*Includes Baltimore in Brinkhoff estimates (but not in UN estimates)  
 \*\*Much broader definition in Brinkhoff estimates (compared to UN)  
 \*\*\*Includes East and West Rand in Brinkhoff estimates (but not in UN estimates)  
 Source: T. Brinkhoff (www.citypopulation.de, 2006) for population estimates; PricewaterhouseCoopers GDP estimates drawing on data from Brinkhoff (2006), World Bank, OECD and national sources.

Table 3.6 shows our projections of the top 30 urban economies in 2020 measured by GDP at PPPs (in 2005 US dollars), with the rankings in 2005 shown in brackets for comparison. The full GDP rankings for both years are given in the Annex. These are based on UN definitions and population projections, since Brinkhoff does not produce population projections using his alternative definitions. As such, the rankings in Table 3.6 should be compared with those in Table 3.3, not those in Table 3.5.

The largest six urban economies (on UN definitions) remain the same as in 2005, although London overtakes Chicago and Paris to move into 4th place. As you might expect, however, the dominant trend is for emerging economy cities to rise up the rankings: Mexico City rises from 8th to 7th

and Buenos Aires from 13th to 11th. Shanghai (32nd to 16th), Mumbai (37th to 24th), Istanbul (34th to 27th), Beijing (44th to 29th) and Manila (42nd to 30th) are notable 'new entries' in the top 30. Lower down the list (see Annex), notable 'climbers' include Jakarta (46th to 33rd), Delhi (51st to 34rd), Guangzhou (60th to 36th), Kolkata (49th to 38th), Bangkok (55th to 46th), Bogota (58th to 52nd) and Monterrey (66th to 54th).

Perhaps equally predictably, the main 'fallers' within the top 100 are the cities of 'old Europe' like Rome (33rd to 45th), Milan (40th to 48th), Vienna (50th to 65th) and Berlin (69th to 86th). Within the UK, Birmingham (71st to 79th) and Manchester (73rd to 82nd) slip down the rankings but remain in the top 100, while Leeds is

<sup>15</sup>Shanghai and Johannesburg appear in the top 30 using Brinkhoff's population estimates, replacing San Diego and Rio de Janeiro.

projected to fall from 85th to 108th. This is not because these cities are stagnating – all three are expected to see their economies grow by around 2-2.2% per annum in real terms over this period; but they cannot hope to keep pace with the fast-growing economies of the emerging world.

The theme of the rise of emerging markets also comes out from an analysis of the number of cities in the top 50/100 by country in 2005 and 2020, as set out in Table 3.7. We can see that, although there is not that much turnover in the rankings (with just 5 new entries in the top 50 and 9 in the top 100), the emerging economies are the clear gainers. India in particular has 3 of its cities projected to rise into the top 100 between 2005 and 2020, while China and Brazil each have 2 new entries in the top 100 (the other two are from Vietnam and Nigeria). European cities are again the main losers here: as well as Leeds, those projected to fall out of the top 100 include Naples, Helsinki, Zurich, Amsterdam, Copenhagen and Budapest.

Another way to illustrate this point is to note that the total estimated GDP of the 80 emerging market cities we considered (defined for the purpose of this calculation as those with GDP per capita below \$20,000 per annum at PPPs in 2005) account for around 27% of the total GDP in 2005 for all 151 cities in our full list. By 2020, however, the projected share of these same 80 cities rises to around 35% of the total (although it should be noted that some of these 80 cities will have risen out of the emerging markets category in terms of their income levels by that date).

## Rankings by economic growth in 2006-20

An even clearer way to see the shifts in global economic weight towards the emerging markets is to look at rankings by projected economic growth between 2005 and 2020. As Table 3.8 shows, there are no advanced economies represented in the top 30 fastest growing cities, as compared to 10 from China (with Changchun and Guangzhou topping the table), 9 from India and 2 each from Indonesia, Vietnam and Bangladesh.

**Table 3.6 – Top 30 urban agglomerations by estimated GDP in 2020 using UN population definitions and projections**

2020 GDP rank (2005 in brackets)	City	Estimated GDP in 2020 (\$bn at 2005 PPPs)	Population in 2020 (millions)	Average real GDP growth (% pa: 2006-2020)
1 (1)	Tokyo	1602	35.45	2.0%
2 (2)	New York	1561	20.33	2.2%
3 (3)	Los Angeles	886	13.45	2.2%
4 (6)	London	708	8.61	3.0%
5 (4)	Chicago	645	9.73	2.3%
6 (5)	Paris	611	9.85	1.9%
7 (8)	Mexico City	608	22.36	4.5%
8 (9)	Philadelphia	440	5.99	2.3%
9 (7)	Osaka/Kobe	430	11.30	1.6%
10 (10)	Washington DC	426	4.76	2.4%
11 (13)	Buenos Aires	416	13.68	3.6%
12 (11)	Boston	413	4.89	2.4%
13 (19)	Sao Paulo	411	21.45	4.1%
14 (14)	Hong Kong	407	8.10	3.5%
15 (12)	Dallas/Fort Worth	384	5.28	2.4%
16 (32)	Shanghai	360	18.81	6.5%
17 (20)	Seoul	349	9.57	3.2%
18 (16)	Atlanta	347	4.99	2.6%
19 (15)	San Francisco/Oakland	346	3.81	2.4%
20 (17)	Houston	339	4.91	2.5%
21 (18)	Miami	331	6.11	2.4%
22 (21)	Toronto	327	6.08	3.0%
23 (25)	Moscow	325	10.91	4.0%
24 (37)	Mumbai (Bombay)	300	23.81	6.0%
25 (23)	Madrid	299	6.13	3.2%
26 (22)	Detroit	287	4.49	2.3%
27 (34)	Istanbul	287	11.84	5.2%
28 (24)	Seattle	269	3.40	2.5%
29 (44)	Beijing	259	14.06	6.6%
30 (42)	Manila	257	14.12	5.9%

Source: PricewaterhouseCoopers projections

Indeed, the highest advanced economy cities in the full growth rankings are Singapore in 79th place and Hong Kong in 82nd place. Lisbon (85th), Madrid (89th) and Stockholm (90th) also score relatively well in the developed economy city growth league. London (92nd) also just makes the top 100 and, as shown in Figure 3.4, it ranks significantly higher on growth than the other advanced economy mega-cities such as Los Angeles (134th), New York (135th), Tokyo (140th) and Paris (144th). Manchester, Leeds and Birmingham are further down the list than London, however, reflecting the relatively stronger performance of London since the mid-1990s, which we assume to persist (albeit to a somewhat lesser degree) in the future as London continues to benefit from its status as one of the leading global financial and business service centres,

which seems unlikely to be eroded over the period to 2020.

Figure 3.4 provides some further insight on key trends by comparing projected cumulative economic growth rates over the period 2006-20 for the eight largest emerging economy cities and the eight largest advanced economy cities (ranked by estimated GDP in 2005 in each case). Shanghai (158%), Mumbai (139%) and Istanbul (115%) are projected to achieve particularly impressive economic growth here relative to their fellow 'mega-cities', but the other five emerging economy cities are also projected to rack up cumulative GDP growth of around 70-90%, compared to an average of only around 40% for the eight advanced economy mega-cities (although London tops this latter list with 56% projected growth).

### III.4 Key uncertainties and factors underlying relative city growth rates

It should be recognised, however, that even though we believe that our general conclusion on the rise of the emerging market economies and cities should be robust, any such growth rankings can only be illustrative for individual cities. Given the objective of providing a comprehensive global ranking, our analysis is necessarily somewhat mechanical and relies both on the UN population projections, which are subject to widening margins of error over time as with any such long-term projections<sup>16</sup>, and on the assumption that our earlier work on national GDP per capita projections provides a good basis for city-level projections.

In practice, some cities may do significantly better than their national economies and some may lag behind. Equally, not all of the emerging economies may fulfil the potential identified in our World in 2050 report, whether due to political and/or macroeconomic instability, infrastructure constraints, energy supply problems or environmental crises. Avoiding these pitfalls, both at national and local level will be critical to the long-term economic success of these cities.

It should also be noted that economic size, although significant, is not a panacea. As noted recently by Joel Kotkin<sup>17</sup>, Singapore has established itself as a global financial centre to a greater extent than larger Asian cities like Bangkok, Manila and Jakarta. Similarly, Dubai has been more successful than Cairo. The same author notes that Mexico City, the largest emerging economy city in the world based on our analysis, is burdened by problems of crime, congestion and pollution that make smaller but better-run and faster-growing cities like Monterrey and Guadalajara more attractive to entrepreneurs and ambitious workers.

Within the developed world, it seems clear that the most successful cities will be those that have comparative advantages in intangible business, financial and consumer services that are not so easily emulated by

**Table 3.7 – Number of cities in global top 50/100 by country (GDP rankings using UN population definitions and projections)**

Countries	Number of cities in 2005 in:		Number of cities in 2020 in:	
	Global top 50	Global top 100	Global top 50	Global top 100
US	20	23	17	23
Japan	2	3	2	3
Germany	0	3	0	3
UK	1	4	1	3
France	1	2	1	2
Italy	2	4	2	3
Canada	2	3	2	3
<b>Total: G7</b>	<b>28</b>	<b>42</b>	<b>25</b>	<b>40</b>
Other advanced economies	9	21	7	15
<b>Total: advanced</b>	<b>37</b>	<b>63</b>	<b>32</b>	<b>55</b>
China	2	4	3	6
India	2	4	3	7
Brazil	2	5	2	7
Russia	1	2	1	2
Mexico	1	3	1	3
Indonesia	1	1	1	1
Turkey	1	2	1	2
<b>Total: E7</b>	<b>10</b>	<b>21</b>	<b>12</b>	<b>28</b>
Other emerging economies	3	16	6	17
<b>Total: emerging economies</b>	<b>13</b>	<b>37</b>	<b>18</b>	<b>45</b>
All countries	50	100	50	100

Source: PricewaterhouseCoopers estimates and projections (see Annex for full listings)

the rising stars of China, India or Brazil. Prominent examples include the continued pre-eminence of London, New York and Tokyo in global financial services, or of Los Angeles in the media and entertainment sector, but it also applies to smaller but possibly faster growing cities that specialise in new technologies where distance is not an issue and the most talented individuals are looking for a better quality of life than the mega-cities can offer. The comparatively rapid projected growth rates (by developed country standards) of cities such as Atlanta, Dublin, Stockholm and Seattle reflect these kind of more qualitative factors.

More formally, our projections show a negative correlation between initial economic size (GDP) and subsequent projected growth, but this is very much driven by lower initial GDP per capita in emerging economies. After correcting for differences in initial GDP per capita, regression analysis does not indicate any statistically significant relationship between initial population levels and subsequent

projected GDP growth<sup>18</sup>. These are only projections, of course, so this is a feature of our analysis that may or may not be borne out by actual experience. Without time series of historic GDP for a sufficient range of cities we are unfortunately not able to test these relationships using actual data.

It is also important to note that, while cities may compete for inward investment in some respects, they are also important trading partners for each other to the extent that they specialise in different areas of economic activity. A larger global market can still be of great potential benefit to those 'old Europe' cities that are likely to slide down the relative GDP rankings. Historic capital cities such as Rome, Vienna and Berlin, for example, should benefit from increased tourist revenues from the residents of cities in the emerging economies, while London and Frankfurt should benefit from increased financial services trade, and Paris and Milan should find new markets for their fashion industries.

<sup>16</sup>In addition to the earlier research by Bairoch (1982) cited above, this point is also explored in some detail in a more recent paper by Barry Cohen ('Urban Growth in Developing Countries: A Review of Current Trends and a Caution Regarding Existing Forecasts', World Development, vol 32, no 1, pp 23-51, 2004).

<sup>17</sup>J. Kotkin, The City: A Global History (Phoenix: London, 2005). Similar arguments on the potential disbenefits of greater city size beyond some threshold were set out by Bairoch (1982, op. cit).

<sup>18</sup>In fact, cities with larger populations have, after allowing for differences in initial GDP per capita levels, slightly higher projected growth rates in our model, but not to a statistically significant degree (t-statistic = 1.1).



### III.5 Summary and conclusions

Cities tend to be ranked in size according to their populations, but to assess the relative size of their economies we also need to take account of their average income per capita levels. Doing this in a consistent and comprehensive way at a global level is challenging, but we have pieced together data from a number of reputable sources (e.g. the OECD, the UN and the World Bank as well as national statistical agencies) to produce a ranking by GDP at Purchasing Power Parity (PPP) exchange rates of the largest 100 urban economies in the world in 2005. The precise rankings are dependent on the definitions and data sources adopted, but looking at GDP gives a much better indication of relative economic size than just looking at population.

Overall, our analysis re-emphasises the economic significance of the world's largest cities. The top 30 such cities ranked by GDP accounted, according to our estimates, for around 16% of world GDP in 2005 and this share rises to around 25% for the top 100 cities.

At present, the mega-cities of the major developed economies continue to lead the global GDP rankings, with the top six in 2005 being Tokyo, New York, Los Angeles, Chicago, Paris and London (using UN definitions). Only five emerging economy cities are currently in the top 30 (Mexico City, Buenos Aires, Sao Paulo, Moscow and Rio de Janeiro), but our illustrative projections suggest that all except Rio will move up the GDP rankings by 2020 and be joined in the top 30 by fast-growing cities such as Shanghai, Mumbai, Istanbul and Beijing. London is projected to grow somewhat faster than leading rivals such as Tokyo, New York, Chicago and Paris, moving up to 4th place by 2020 according to our illustrative projections.

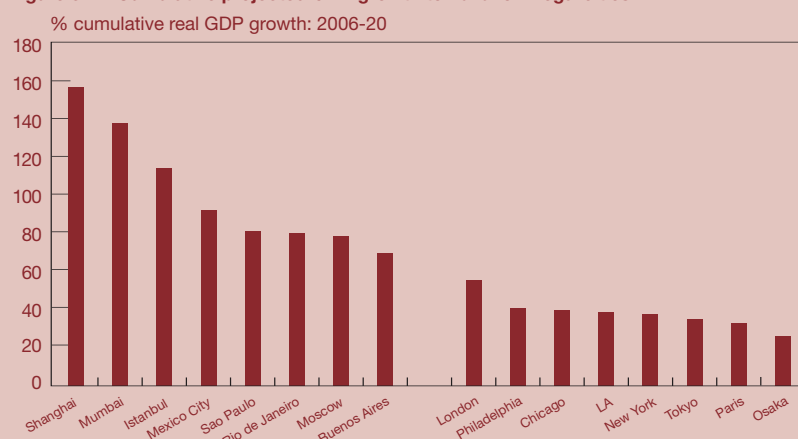
Our projections for individual cities are subject to many uncertainties, but our conclusion that the emerging economy cities as a group should increase their relative weight in the global economy seems likely to be robust. But the cities of the established developed economies should see this as more of an opportunity than a threat as it gives opportunities for

**Table 3.8 – Top 30 urban agglomerations by projected average real GDP growth in 2006-20 (using UN population definitions and projections)**

Growth rank	City	Country	Average real GDP growth in 2006-20 (% per annum)
1	Changchun	China	6.9%
2	Guangzhou	China	6.9%
3	Bandung	Indonesia	6.7%
4	Beijing	China	6.6%
5	Hanoi	Vietnam	6.6%
6	Surat	India	6.5%
7	Ho Chi Min City	Vietnam	6.5%
8	Shanghai	China	6.5%
9	Jakarta	Indonesia	6.5%
10	Kinshasha	D.R. Congo	6.4%
11	Jaipur	India	6.4%
12	Xian	China	6.4%
13	Wuhan	China	6.4%
14	Tianjin	China	6.3%
15	Nairobi	Kenya	6.3%
16	Pune	India	6.3%
17	Luchnow	India	6.3%
18	Chittagong	Bangladesh	6.3%
19	Shenyang	China	6.3%
20	Kanpur	India	6.3%
21	Chengdu	China	6.3%
22	Chongqing	China	6.3%
23	Lagos	Nigeria	6.2%
24	Ahmadabad	India	6.2%
25	Bangalore	India	6.2%
26	Delhi	India	6.2%
27	Addis Ababa	Ethiopia	6.2%
28	Hyderabad	India	6.1%
29	Kabul	Afghanistan	6.1%
30	Dhaka	Bangladesh	6.1%

Source: PricewaterhouseCoopers projections using UN population definitions

**Figure 3.4 – Cumulative projected GDP growth to 2020 for mega-cities**



Source: Top 8 emerging economy and Top 8 advanced economy cities

them to specialise further in those areas (e.g. business and financial services, entertainment and media, fashion, cultural tourism) where they have potential comparative advantages in fast-growing

global markets. Competition between cities, as between nations, should not be seen as a zero sum game.

## Annex: Full City GDP rankings for 2005 and 2020

Table 3.9 sets out in full our urban agglomeration GDP rankings and estimates/projections for 2005 and 2020 (using UN population estimates and urban agglomeration definitions). The table includes all 151 candidate cities that we have considered, although it should be noted that we are not claiming that these are the largest 151 city economies in the world, just that these should encompass the top 100 ranked by GDP in both 2005 and 2020, which was our primary focus here.

The final two columns show projected average real GDP growth rates between 2005 and 2020 and a ranking by growth from 1 to 151. Both these latter two columns refer to the cities ranked by projected GDP in 2020 rather than in 2005 (i.e. the list of cities in the fourth rather than the second column in the table).

**Table 3.9 – Full listing of urban agglomeration GDP rankings in 2005 and illustrative projection to 2020 (using UN definitions and population estimates)**

Rank	Cities ranked by estimated 2005 GDP at PPPs	Est. GDP in 2005 (\$bn at PPPs)	Cities ranked by projected 2020 GDP at PPPs	Est. GDP in 2020 (\$bn at 2005 PPPs)	Real GDP growth rate (% pa: 2006-20)	GDP growth ranking (out of 151)
1	Tokyo	1191	Tokyo	1602	2.0%	140
2	New York	1133	New York	1561	2.2%	135
3	Los Angeles	639	Los Angeles	886	2.2%	134
4	Chicago	460	London	708	3.0%	92
5	Paris	460	Chicago	645	2.3%	129
6	London	452	Paris	611	1.9%	144
7	Osaka/Kobe	341	Mexico City	608	4.5%	63
8	Mexico City	315	Philadelphia	440	2.3%	128
9	Philadelphia	312	Osaka/Kobe	430	1.6%	147
10	Washington DC	299	Washington DC	426	2.4%	124
11	Boston	290	Buenos Aires	416	3.6%	78
12	Dallas/Fort Worth	268	Boston	413	2.4%	125
13	Buenos Aires	245	Sao Paulo	411	4.1%	69
14	Hong Kong	244	Hong Kong	407	3.5%	82
15	San Francisco/Oakland	242	Dallas/Fort Worth	384	2.4%	116
16	Atlanta	236	Shanghai	360	6.5%	8
17	Houston	235	Seoul	349	3.2%	87
18	Miami	231	Atlanta	347	2.6%	105
19	Sao Paulo	225	San Francisco/Oakland	346	2.4%	123
20	Seoul	218	Houston	339	2.5%	111
21	Toronto	209	Miami	331	2.4%	122
22	Detroit	203	Toronto	327	3.0%	93
23	Madrid	188	Moscow	325	4.0%	72
24	Seattle	186	Mumbai (Bombay)	300	6.0%	35
25	Moscow	181	Madrid	299	3.2%	89
26	Sydney	172	Detroit	287	2.3%	127
27	Pheonix	156	Istanbul	287	5.2%	44
28	Minneapolis	155	Seattle	269	2.5%	113
29	San Diego	153	Beijing	259	6.6%	4
30	Rio de Janiero	141	Metro Manila	257	5.9%	36
31	Barcelona	140	Rio de Janiero	256	4.1%	70
32	Shanghai	139	Sydney	256	2.7%	100
33	Melbourne	135	Jakarta	253	6.5%	9
34	Istanbul	133	Delhi	229	6.2%	26
35	Denver	130	Pheonix	228	2.5%	107
36	Singapore	129	Guangzhou	227	6.9%	2
37	Mumbai (Bombay)	126	Minneapolis	224	2.5%	114
38	Rome	123	Kolkata (Calcutta)	224	5.9%	37
39	Montreal	120	San Diego	220	2.4%	115
40	Milan	115	Singapore	218	3.6%	79
41	Baltimore	110	Cairo	212	5.3%	43
42	Metro Manila	108	Barcelona	201	2.4%	117
43	St Louis	101	Melbourne	200	2.6%	101
44	Beijing	99	Denver	190	2.6%	106
45	Cairo	98	Rome	187	2.9%	95
46	Jakarta	98	Bangkok	180	4.8%	54
47	Tampa/St Petersburg	97	Montreal	180	2.8%	98
48	Pusan	95	Milan	174	2.8%	97
49	Kolkata (Calcutta)	94	Tehran	172	4.5%	61
50	Vienna	93	Riyadh	167	5.0%	47

**Table 3.9 – Full listing of urban agglomeration GDP rankings in 2005 and illustrative projection to 2020 (using UN definitions and population estimates) continued**

Rank	Cities ranked by estimated 2005 GDP at PPPs	Est. GDP in 2005 (\$bn at PPPs)	Cities ranked by projected 2020 GDP at PPPs	Est. GDP in 2020 (\$bn at 2005 PPPs)	Real GDP growth rate (% pa: 2006-20)	GDP growth ranking (out of 151)
51	Delhi	93	Pusan	165	3.8%	77
52	Tel Aviv-Jaffa	92	Bogota	163	4.3%	66
53	Santiago	91	Santiago	160	3.8%	76
54	Cleveland	90	Monterrey	157	4.8%	55
55	Bangkok	89	Baltimore	157	2.4%	121
56	Tehran	88	Tel Aviv-Jaffa	153	3.5%	80
57	Portland	87	St Petersburg	151	3.9%	75
58	Bogota	86	St Louis	146	2.5%	112
59	St Petersburg	85	Tampa/St Petersburg	142	2.5%	109
60	Guangzhou	84	Johannesburg	131	3.4%	84
61	Pittsburgh	80	Lisbon	130	3.3%	85
62	Riyadh	80	Cleveland	129	2.4%	119
63	Lisbon	79	Belo Horizonte	129	4.6%	58
64	Vancouver	79	Portland	128	2.6%	102
65	Johannesburg	79	Vienna	127	2.1%	137
66	Monterrey	78	Karachi	127	5.8%	39
67	Stockholm	76	Dhaka	126	6.1%	30
68	Cape Town	75	Lima	123	4.2%	68
69	Berlin	75	Vancouver	121	2.9%	94
70	Athens	73	Cape Town	121	3.3%	86
71	Birmingham	72	Stockholm	121	3.2%	90
72	Fukuoka	72	Guadalajara	119	4.6%	57
73	Manchester	69	Pittsburgh	115	2.4%	120
74	Lima	67	Tianjin	112	6.3%	14
75	Belo Horizonte	65	Jiddah	111	4.8%	53
76	Guadalajara	60	Bangalore	110	6.2%	25
77	Hamburg	58	Dublin	99	4.8%	56
78	Turin	58	Ho Chi Min City	98	6.5%	7
79	Lyon	56	Birmingham	96	2.0%	143
80	Jiddah	55	Wuhan	96	6.4%	13
81	Karachi	55	Fukuoka	96	2.0%	142
82	Dhaka	52	Manchester	96	2.2%	132
83	Munich	50	Hyderabad	92	6.1%	28
84	Dublin	49	Chennai (Madras)	91	6.0%	34
85	Leeds	48	Athens	91	1.5%	148
86	Warsaw	48	Berlin	88	1.1%	150
87	Tianjin	45	Ankara	87	5.0%	48
88	Bangalore	45	Chongqing	87	6.3%	22
89	Porto Alegre	44	Lyon	85	2.8%	96
90	Helsinki	43	Turin	84	2.5%	108
91	Naples	43	Porto Alegre	82	4.3%	67
92	Budapest	43	Brasilia	82	5.1%	45
93	Zurich	42	Warsaw	80	3.5%	81
94	Ankara	42	Ahmadabad	78	6.2%	24
95	Amsterdam	42	Hamburg	78	2.0%	141
96	Auckland	41	Recife	77	4.4%	65
97	Copenhagen	41	Pune	76	6.3%	16
98	Recife	41	Lagos	76	6.2%	23
99	Rotterdam	40	Salvador	75	4.6%	60
100	Brussels	39	Munich	73	2.6%	104

**Table 3.9 – Full listing of urban agglomeration GDP rankings in 2005 and illustrative projection to 2020 (using UN definitions and population estimates) continued**

Rank	Cities ranked by estimated 2005 GDP at PPPs	Est. GDP in 2005 (\$bn at PPPs)	Cities ranked by projected 2020 GDP at PPPs	Est. GDP in 2020 (\$bn at 2005 PPPs)	Real GDP growth rate (% pa: 2006-20)	GDP growth ranking (out of 151)
101	East Rand	39	Fortaleza	73	4.6%	59
102	Brasilia	38	Algiers	73	5.0%	46
103	Salvador	38	Hanoi	73	6.6%	5
104	Wuhan	38	Bandung	69	6.7%	3
105	Chennai (Madras)	38	Naples	69	3.2%	91
106	Ho Chi Min City	38	Curitiba	68	4.9%	51
107	Hyderabad	38	Shenyang	68	6.3%	19
108	Fortaleza	37	Leeds	67	2.2%	131
109	Prague	36	Lahore	67	5.9%	38
110	Chongqing	35	Alexandria	66	5.4%	41
111	Algiers	35	East Rand	65	3.5%	83
112	Medellin	34	Medellin	65	4.4%	64
113	Taegu	34	Helsinki	65	2.7%	99
114	Curitiba	33	Izmir	62	4.9%	50
115	Ahmadabad	32	Auckland	61	2.6%	103
116	Oslo	31	Zurich	61	2.4%	118
117	Izmir	31	Amsterdam	60	2.5%	110
118	Lagos	30	Prague	58	3.2%	88
119	Pune	30	Surat	57	6.5%	6
120	Alexandria	30	Rotterdam	57	2.4%	126
121	Cologne	29	Copenhagen	56	2.1%	138
122	Lahore	28	Brussels	55	2.2%	133
123	Caracas	28	Chengdu	51	6.3%	21
124	Hanoi	28	Khartoum	51	5.6%	40
125	Shenyang	27	Caracas	50	3.9%	74
126	Puebla	27	Budapest	49	0.9%	151
127	Lille	27	Puebla	48	4.0%	73
128	Bandung	26	Xian	48	6.4%	12
129	Casablanca	24	Casablanca	47	4.5%	62
130	Khartoum	23	Taegu	45	1.9%	145
131	Surat	22	Oslo	44	2.2%	130
132	Baghdad	22	Changchun	42	6.9%	1
133	Chengdu	21	Kanpur	41	6.3%	20
134	Xian	19	Cologne	40	2.0%	139
135	Kanpur	17	Baghdad	39	4.0%	71
136	Yangon	16	Chittagong	39	6.3%	18
137	Chittagong	16	Jaipur	38	6.4%	11
138	Changchun	15	Lille	37	2.1%	136
139	Jaipur	15	Luchnow	35	6.3%	17
140	Luchnow	14	Yangon	33	4.8%	52
141	Luanda	12	Luanda	29	6.0%	33
142	Abidjan	11	Kinshasha	25	6.4%	10
143	Pyongyang	10	Faisalabad	24	6.0%	32
144	Faisalabad	10	Abidjan	22	4.9%	49
145	Kinshasha	10	Kabul	22	6.1%	29
146	Krakow	10	Nairobi	20	6.3%	15
147	Kabul	9	Addis Ababa	18	6.2%	27
148	Nairobi	8	Kano	14	5.4%	42
149	Addis Ababa	7	Dar es Salaam	13	6.0%	31
150	Kano	7	Krakow	13	1.9%	146
151	Dar es Salaam	5	Pyongyang	13	1.5%	149

Note: the final two columns on growth relate to the cities ranked by 2020 GDP  
Source: PricewaterhouseCoopers estimates and projections using UN urban agglomerations definitions and population estimates