Cities of opportunity

Partnership for New York City

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An open letter on cities in an interdependent world...

What makes a city thrive? It's a fascinating question. Today it's also an urgent one. This is especially true in the face of a pressing financial crisis. Cities offer the strength and resilience to lead our recovery through short-term stress and rebuild toward long-term growth.

Challenges do exist: Over half the world's people live in cities, and by mid-century the share is expected to reach 70 percent. Large population centers face intense risk from climate change, pandemics and shortages of food and water, among other emerging threats. And cities confront problems such as assuring health, safety, and security, and maintaining aging infrastructures.

But these challenges are outnumbered by opportunities: Cities will continue to stand at the crossroads of an interdependent world, producing the bulk of commerce, ideas and innovation in the form of financial and intellectual capital.

We live in a highly globalized economy where financial, commercial, and social interests flow together in a confluence of markets, travel and communications, cross-border investment and trade. A vital city is a locus of activity in its region. In cities like New York, London, Paris and Tokyo—and increasingly others—that region is the world.

It's plain that the health of cities drives the wellbeing of businesses, people and nations.

A shared future

Today, as developed and emerging economies navigate a difficult economic period, cities will lead the recovery with long-term strengths that transcend short-term difficulties. It's clear that global solutions are required for global problems. Neither the direction of globalization nor the growth of cities is likely to falter.

We are in it together for better or worse, opportunity or risk. It's a rooted and healthy reality at the heart of this study: The world's interests have fused. As such, *Cities of Opportunity* closely examines 20 cities that serve as hubs of finance, commerce and innovation in their regions and whose stakeholders span the world.

Working together, PricewaterhouseCoopers and the Partnership for New York City investigated a robust range of 51 current, credible and unbiased variables to see how cities are advancing in the 21st century and what actions are helping them to thrive. We particularly sought to look deeper than the obvious front-runners and to learn from successes, not to proclaim "winners." Our goal is to provide all cities with ideas on developing their own pathways to improvement.

The pulse of urbanism

The results, in many cases, confirm that traditional leaders still maintain advantages. New York, London, Paris and Tokyo top a number of overall indicators and individual variables on the strength of their historical achievements, as well as actions now underway. For instance, New York is notable for its base of intellect and innovation, which is likely to prove critical in navigating past current difficulties and creating new growth opportunities. London leads in its openness to business, providing a powerful magnet with its size and welcoming the global economy with its diversity, brand and policies.

Cities like these understandably still hold beacons for progress. Visionary people invested tremendous work and energy over many years to build infrastructures of education, health, transportation, public works, buildings and, recently, e-readiness. Today's most powerful cities offer enduring strength and resiliency to bounce back from the current downturn.

But emerging cities are making their own investments to challenge the established order. For some, like those in China and India, today's prosperity represents a renaissance, returning to a time when they were the established order, drawing the world to their riches. Already Beijing ranks right behind London and ahead of New York, Paris and Tokyo in transportation and infrastructure. São Paulo, Dubai and Mumbai lead the world in buildings under construction. Shanghai's intellectual capital puts it among the top cities. Shanghai and Beijing lead the list of working age populations per capita, paving the way for the future.

Looking deeper

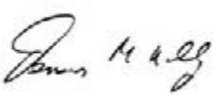
Interestingly, the study also finds a number of cities that "pound for pound" offer more opportunity than meets the eye when considered relative to their qualities and size. These cities are setting new standards and doing things right with forward-looking policies and programs to promote growth in a globalized world.

For example, Chicago and Toronto are noteworthy for strong purchasing power, diversity and quality of life, among other things. Frankfurt, the smallest city studied, sets a standard for sustainability. Houston, Chicago and Los Angeles fare particularly well on cost competitiveness.

Finally, while the study confirms some perceptions, it also offers new insights. Both emerging and mature cities have been busy in the last few years building and diversifying their infrastructures and economies. The world's great cities will continue to pave the way to a prosperous future.

In this light, all these cities of opportunity offer lessons that apply well beyond their borders.

Dennis M. Nally



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Contents

Cities of Opportunity is presented in three reinforcing sections:

A detailed listing of definitions and source documents used to develop *Cities of Opportunity* can be found at **www.pwc.com/cities.**

Overview

Paris


ENTREE

Cities of Opportunity presents a robust look at the world's hubs of finance and commerce

Study context

The collaboration between PricewaterhouseCoopers and the Partnership for New York City that developed *Cities of Opportunity* began seven years ago in the wake of 9/11. The enormous impact of 9/11 on companies and citizens caused a reassessment of what needed to be done to keep New York—and, by extension, other cities like it—vibrant engines of a globalizing economy.

What direction will cities go in years to come? What key ingredients will be required to keep them strong? Which cities are actually doing things correctly, and what can be learned?

PwC and the Partnership joined to answer these questions. Both organizations hold important stakes in the healthy growth of cities. The Partnership for New York City is a network of business leaders dedicated to enhancing the economy of the five boroughs of New York City and to maintaining the city's position as the center of world commerce, finance and innovation. PricewaterhouseCoopers is a partnership itself—but one with a strong presence and mutual self-interest in the health of the 770 cities in which it operates around the world.

This second edition of our report is significantly more ambitious than the first, extending from 11 cities and 32 variables in our 2007 study to 20 cities and 51 variables now.

Three key factors governed the cities we chose:

- **Capital market centers.** Many of the cities included are hubs of commerce, communications and culture. But all are financial capitals of their region—meaning each plays an important role not only locally but also as a vital part of a globalizing economic fabric.
- **Distributed over a broad geographic sampling.** While each city is a center of finance and commerce in its own region and in many cases the world, collectively the 20 cities form a representative international distribution.
- **Balanced between mature and emerging economies.** Twelve mature cities and eight newly growing ones are included. While debates may continue to simmer on which established city is *the* leading financial or cultural capital, the real headlines will be made as the world continues to globalize and new centers rival the prosperity and power of the traditional leaders.

Some intuitively compelling cities were left off the list because they failed to meet all three criteria. For instance, Bangalore is a center of technology, Atlanta is a headquarters city, but neither is a true financial capital.

In terms of the data indicators selected, we constructed a robust sampling of variables, each of which had to be: relevant; consistent across the sample; publicly available and collectible; current; free of skewing from local nuances; and truly reflective of a city's quality or power. (See pages 40–41 for a brief key to the variables and **www.pwc.com/cities** for a detailed listing of definitions and source documents used to develop *Cities of Opportunity.*)

These criteria eliminated cities like Milan and Zurich, which lacked some of the data needed.

Some variables, like the number of Wi-Fi zones, that once looked promising as representing the strength of a city's technological infrastructure, are now commonplace. In fact, to measure the variable acurately would have required a count of all wired coffee shops and launderettes in each city. Other promising indicators fail to reflect accurately a city's dynamism. For instance, patent filings do signal intellectual capital. But the innovations themselves may have been generated far from the city in which the paperwork was registered.

The study's result is an unbiased, quality controlled and rich look at the pulse of key cities at the heart of the interconnected financial and commercial world.

We investigated basic questions: What direction will cities go in years to come? What key ingredients will be required to keep them strong? Which cities are actually doing things correctly, and what can be learned?

Understanding the scoring: Seeking transparency and simplicity

Because *Cities of Opportunity* is based on publicly available data supported by extensive research, three main sources were used to collect the relevant data:

- Global statistical organizations such as the World Bank and the International Monetary Fund (IMF);
- National statistics organizations such as National Statistics in the UK and the US Census Bureau in the US; and
- Commercial data providers.

The data was collected during the second and third quarters of 2008. In the majority of cases, the data used in the study refers to 2007 and 2008. In some cases, national data was used as a proxy for city data. For example, the data on ease of hiring is national data. However, it is based on the largest business city in each country, which in the bulk of cases is one of the 20 cities included in this report. Care has been taken to ensure that, where used, national data closely reflects the city.

Some of the finance data used in the research relates to market conditions before the credit crisis. For example, the data on domestic market capitalization relates to the end of 2007. Unfortunately, up-to-date data was not available across some of our finance variables.

The city scoring methodology was developed to ensure transparency and simplicity for readers, as well as comparability across cities. The output makes for a robust set of results and a strong foundation for analysis and discussion.

In attempting to score cities based on relative performance, we decided at the outset of our process that for maximum transparency and simplicity we would avoid applying overly complicated weights to the 51 variables, and in so doing treat each variable with equal importance. This approach makes the study easily understandable and usable by business leaders, academics, policy makers and laypersons alike.

Taking the data for each individual variable, the 20 cities were sorted from the best performing to the worst. The cities were then assigned a score from 20 (the best performing) to 1 (the worst performing). In the case of a tie, the cities were assigned the same score.

Scoring ensures transparency and simplicity, as well as comparability across cities. A rich set of results offers a strong foundation for analysis and discussion.

In some cases a city was not included in the ranking and, therefore, was not assigned a score (ranking at zero). For example, both Dubai and Johannesburg lack any top 500 global corporate headquarters. In these cases, the remaining cities were ranked and assigned a score from 19 (reflecting the reduced number of cities in the ranking) to 1.

Once each of the 51 variables had been ranked and scored, they were placed into their 10 indicators (for example, financial clout, demographic advantages and cost). Within each individual group, the variable scores were summed to produce an overall indicator score for that topic. This produces 10 indicator league tables that display the relative performance of our 20 cities (see Indicator Discussions, pages 22–39).

Summary of indicator rankings

The maps below show city rankings in each of the study's 10 overall indicators. Detailed results on variables and analyses are presented on pages 22 to 39. In addition, a brief key to understanding the 51 variables is available on pages 40–41. Detailed listings of definitions and source documents used to develop *Cities of Opportunity* are offered at **www.pwc.com/cities.**

High
Medium
Low

The 20 cities are sorted from the best to the worst performing, with each receiving a score from 20 for best to 1 for worst. In ties, cities are assigned the same score.

Intellectual capital

Technology IQ and innovation

Transportation and infrastructure assets

Demographic advantages

Cost

Financial clout

Lifestyle assets

Health, safety and security

Ease of doing business

Sustainability

The 20 cities are sorted from the best to the worst performing, with each receiving a score from 20 for best to 1 for worst. In ties, cities are assigned the same score.

High
Medium
Low

Dynamic measures

London


Way out
Way out
Alarm

The power of the world's capitals of finance and commerce radiates from their names: New York's grandeur; London's innovative edge; the buoyancy and light of Paris; Tokyo's driving vitality. Each maintains a history of energy and achievement.

But when gauging the direction of these and other cities, the story is less plain. The subtext of where cities are headed, particularly, requires deeper digging. Which cities are rising above others? Which are moving actively to prosper in the interdependent 21st-century world? Which are encouraging the healthiest futures?

To answer these questions, we investigated the study's 51 variables along six axes of advancing urbanism:

- **Quality versus power**—separating those areas where size and strength mainly matter from those where less may actually generate more
- **Cost competitiveness**—dividing cities among the best values, fairly priced and most expensive
- **Openness for business**—gauging the welcome not only for finance and commerce but talent as well
- **Intellect and innovation**—investing in the fundamental building blocks of global economies
- **Sustainability management**—testing the holistic thinking of big cities living on a small planet
- **Physical momentum**—taking the pulse of construction and foreign investment

While no individual city of opportunity surfaces as the winner, many cities do show where and how they are moving to take advantage of the opportunities offered by an interconnected world. (See Indicator Discussions, pages 22–39 for a more detailed discussion of each.)

Balancing quality and power: Chicago and Toronto share more than Great Lakes glimmer

Dividing the 51 variables into indicators of either a city's raw power or its per capita characteristics, a few cities show greater potential than the collective comparison reveals.

Not surprisingly, the historically dominant cities of New York, London and Paris dominate when power indicators alone are investigated. But "pound for pound," Chicago and Toronto display strong business readiness for the 21st century on per capita indicators alone, with gauges of power removed.

Power variables show absolute size, which ties to historical strength—for instance, a city's share of top 500 universities. (See Chart 1 on page 15.) Quality variables normalize cities by population, showing the intensity of a given characteristic. Quality variables are typically per capita ratios that neutralize size as a comparative factor, such as the percent of a city's population with higher education. Many of them, like the higher education ratio, may also portray an element of a city's quality in the everyday sense of the word. (See Chart 2 on page 16.)

Chicago, America's traditional "second city," stands tall in many areas—its role in finance and business; mass transit and congestion management; diversity; purchasing power; and in many of the gauges of quality of life. For a city once known for its "broad shoulders" and industrial grit, greenness flourishes through a well-kept legacy of parks and architecture. And the Chicago Climate Exchange has introduced the first active carbon emissions trading platform in the US.

Toronto ranks as a city with high quality of life and health, advanced education and great diversity. It has benefited from a national immigration policy aimed at attracting highly skilled workers. These strengths should help Toronto continue to prosper in a globalizing world.

This section presents a different look at the 51 individual variables that comprise our ten indicators (see pages 22–39). Our goal is to plumb the data for stories within it that are not readily apparent.

New York and London, the world's two most powerful cities, also rate highly on quality variables. This shows both are taking active steps to stay at the forefront of a changing world economy and neither is resting on past achievements.

In other interesting results, Sydney's natural strengths and forward-looking policies pull it up from the lowest third in power to the highest grouping when size is removed as a factor. Houston fares better than some more intuitively global cities like Los Angeles, Paris and Tokyo.

Two smaller cities, Frankfurt and Johannesburg, that lie at the bottom of power rankings, rise markedly in quality standings when results are normalized by population.

Chart 1.
Power: Cities where historical size matters
Absolute measure

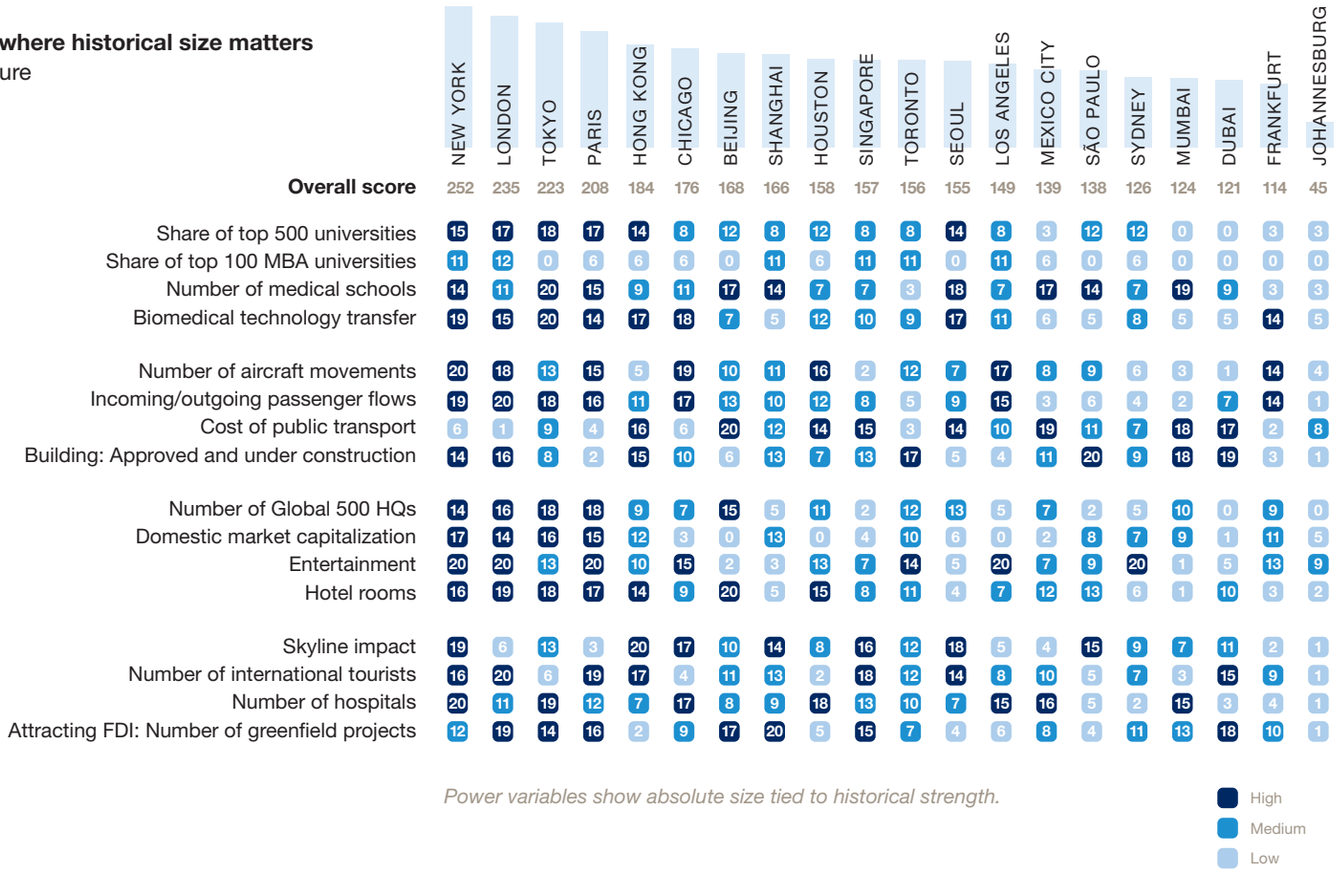
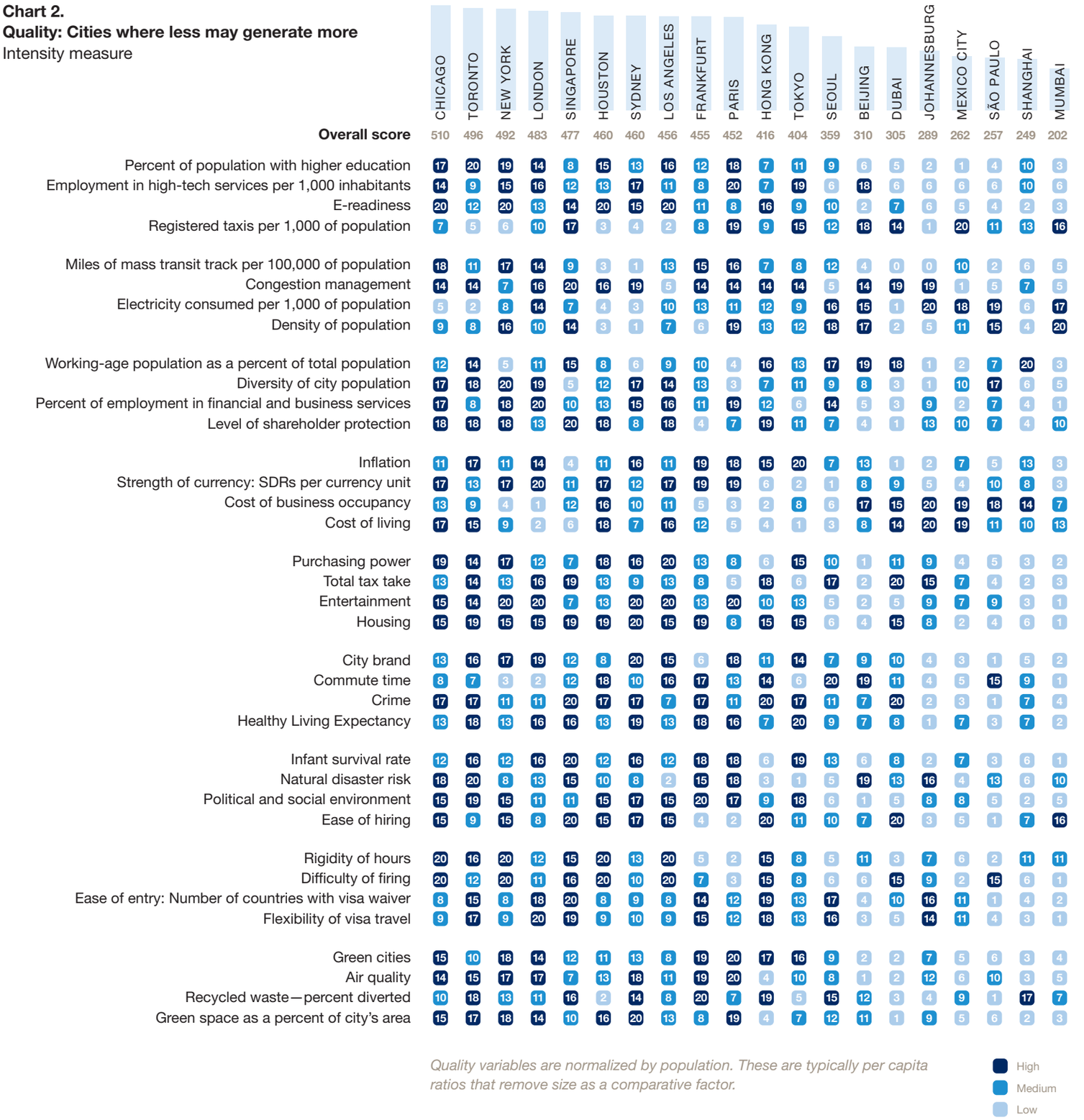


Chart 2.
Quality: Cities where less may generate more
Intensity measure



Quality variables are normalized by population. These are typically per capita ratios that remove size as a comparative factor.

Cost competitiveness: A “fair pricing” index shows Houston, Chicago and LA deliver urban value

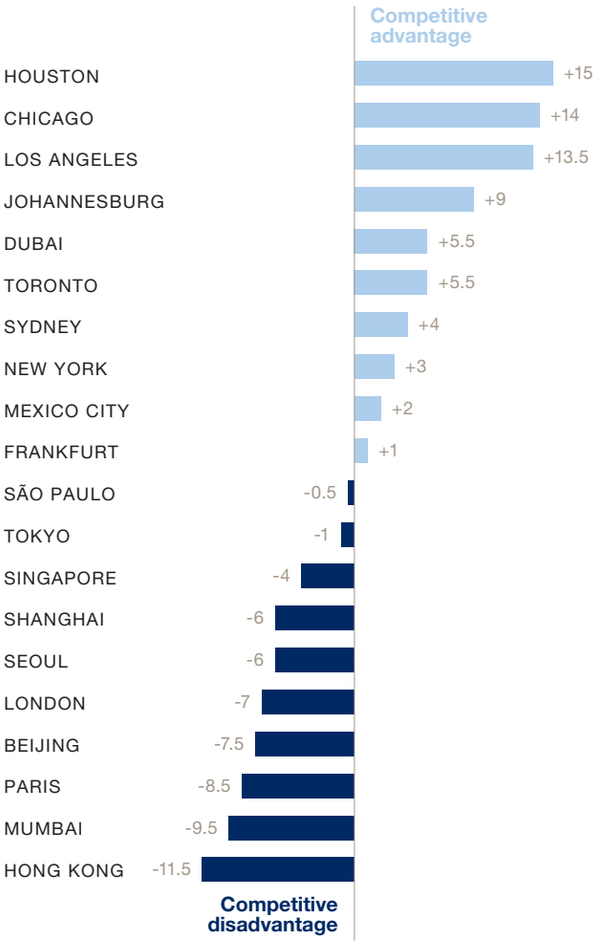
Relative cost values of each city also differentiate their attraction to finance and commerce. To compare each city, we determined average cost by creating a factor of costs of living and business occupancy. This is weighted in inverse proportion to purchasing power, and a competitive difference comes forward showing the best and worst values. (See Chart 3, right.)

The ranking is a broad indicator that reveals most by comparing results at the poles rather than analyzing nuances between adjacent numbers. Its purpose is to gauge general cost levels relative to what might be expected according to basic economic theory: that is, a city in a rich country with high purchasing power would be expected to be more costly on a relative scale. Divergences from what might be expected determine competitiveness.

Dubai proves among the better deals, tempering its glittering high-rise image with the fact that the city’s infrastructure and economy are still emerging even as it pursues ambitious plans and attracts capital. Many of the basics are still being built in this desert oasis.

Houston, Chicago and Los Angeles offer notably good values as major American cities. Toronto also scores well. For Chicago and Toronto this underscores the strength each showed in the quality comparison.

Chart 3.
A “fair pricing” index:
Cost versus purchasing power



Average cost is determined as a factor of costs of living and business occupancy. This is compared in inverse ranking to a purchasing power scale in which high numbers signal the greatest purchasing power. A difference emerges in which the highest positive numbers indicate competitive advantage, and the cities scoring on the other end of the spectrum show a competitive disadvantage.

Openness for business: London bridges old and new economies

Our 10 variables that reflect how open a city is for business—how powerful it is now as a magnet for finance and commerce and how welcoming it is to an interconnected, realigning world—offer the most insight on direction when separated into indicators of either quality or power.

A window on the future is opened in the way the 20 cities welcome the world. Visa waivers and travel, diversity, the political environment and, ultimately, their international brand overseas show the active ways they are rolling out the red carpet to talented newcomers. (See Chart 5 below.)

Notably, London tops both rankings, showing it is engineering for future growth on the strength of its rich legacy as well as forward-looking actions. Toronto moves up meaningfully relative to its power position, buoyed by immigration policies that encourage focused economic development.

On the power variables, London, Paris, New York and Tokyo lead. Their historical dominance surfaces in the ease and volume of travel, the number of international headquarters and the attraction of foreign tourists and investments that create new employment. (See Chart 4 below.)

As an interesting note, Beijing and Shanghai are closing ranks in the power comparison on Tokyo, the long-standing Japanese capital of finance. Frankfurt performs well for a small city.

Chart 4.
Power: Showing the strength to attract business
Absolute measure

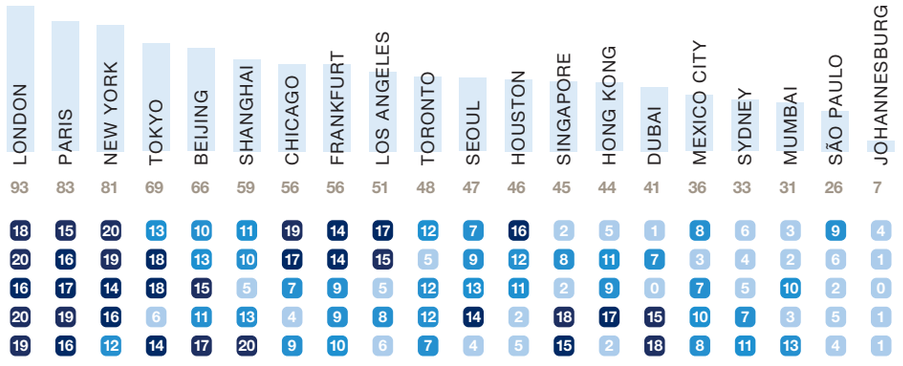
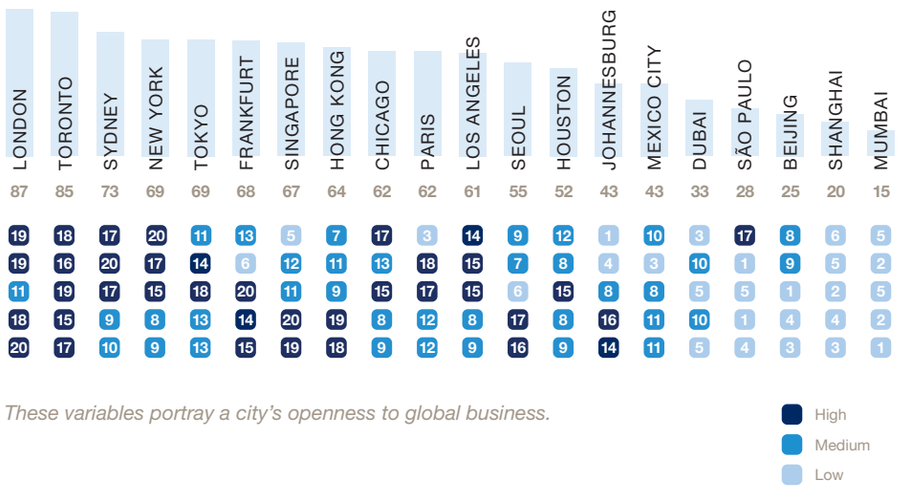


Chart 5.
Quality: Rolling out the welcome mat for a global economy
Intensity measure



These variables portray a city's openness to global business.

High
Medium
Low

Intellect and innovation: A creative dynamo still hums in New York

Universities lay down a solid foundation that, balanced with the intensity of a population's knowledge readiness, offers a rounded view of a city's intellectual base and its potential for innovation. As the world demands increasingly complex and sophisticated products and services, cities at the top of both rankings will continue to prosper. (See Charts 6 and 7 below.)

New York does particularly well on both measures, showing not just its historical investment in education but also the large equity stake the city is taking in a future that continues to generate ideas and innovations. New York edges out other traditional powers with its strong academic base. But New York also leads in per capita quality variables of higher education, high-tech employment and e-readiness, offering one reason that New York stays at the top of the global rankings over time.

Chicago rises markedly from its power ranking in the quality standings, finishing close behind New York and again benefiting when its impressive intellectual resources are normalized relative to population. Houston moves up notably as well.

Chart 6.
Power: The brain trust that stands today
Absolute measure

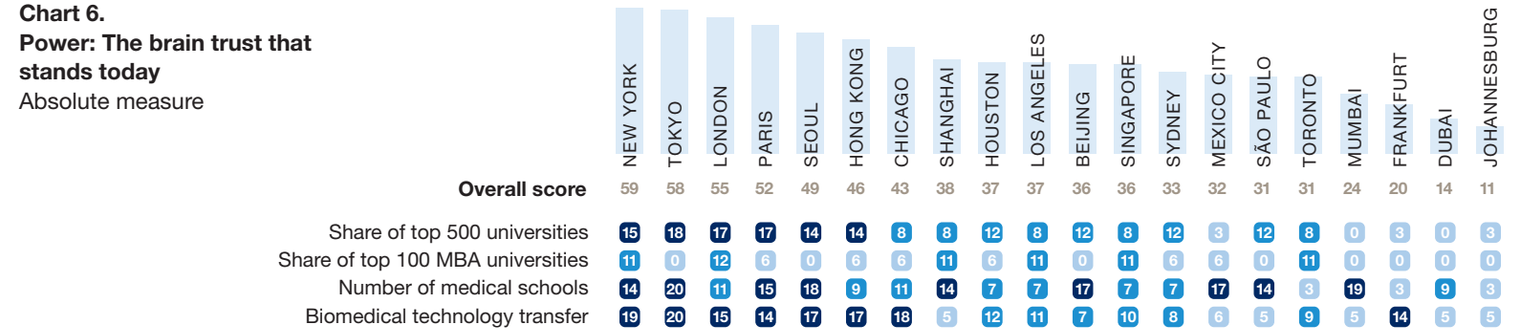
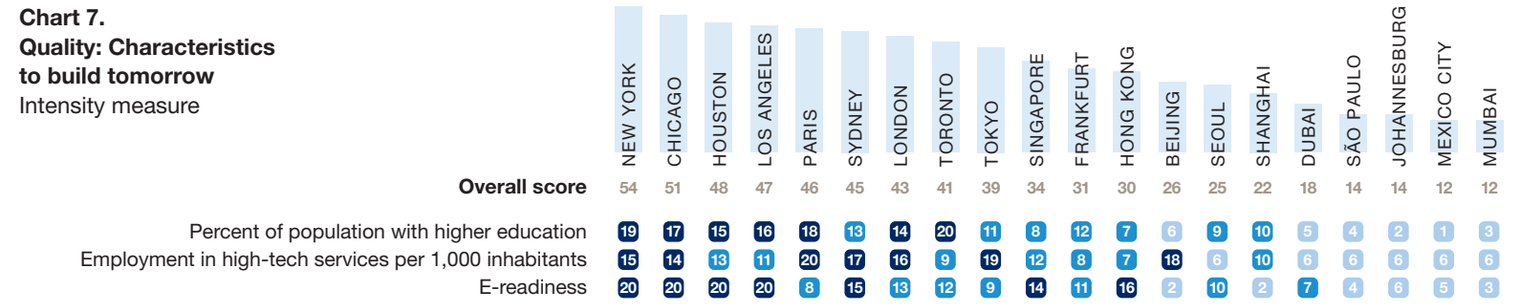


Chart 7.
Quality: Characteristics to build tomorrow
Intensity measure



As the demands for products and services grow more complex, cities where universities are entrenched in the social fabric are better situated to prosper. The 20 financial centers in our study are particularly likely to grow when they possess highly educated populations and strong high-technology sectors that generate innovation and counterbalance their financial services economies with complementary job opportunities.

High
Medium
Low

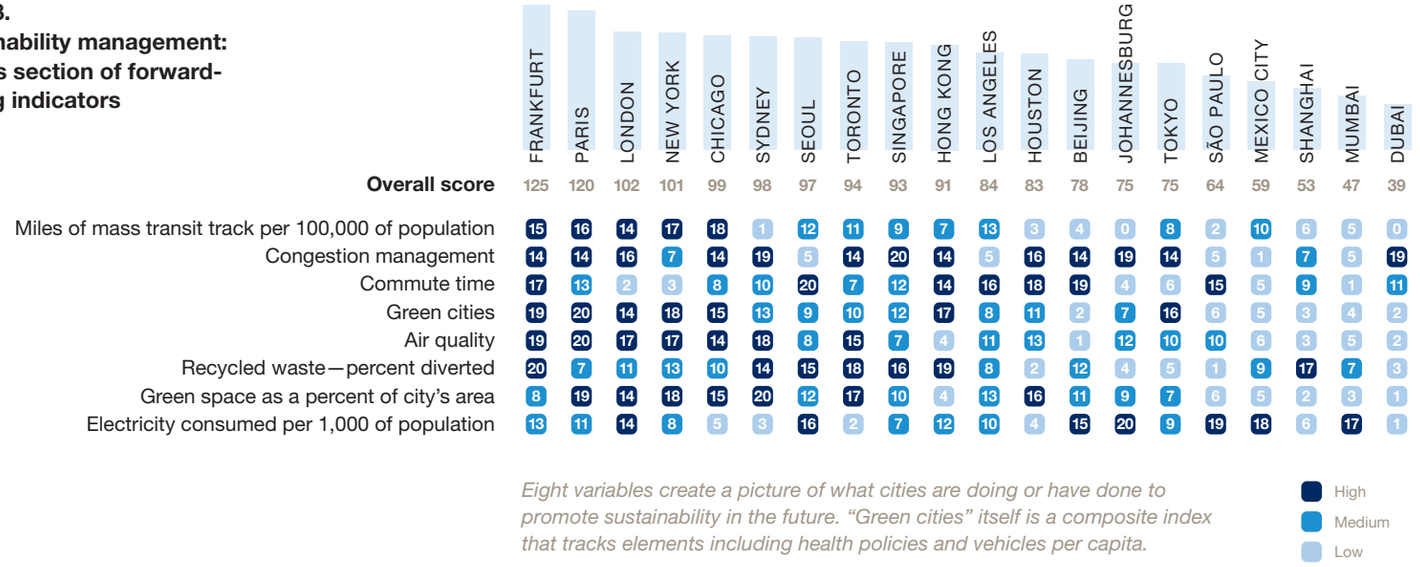
Sustainability management: Thinking ahead holistically, Frankfurt looks very green

Some cities begin with natural beauty or inviting climates. But all cities share an increasingly crowded planet and a challenge to give their citizens healthy environments in which to thrive and grow. Open space, congestion management, ease of mass transit and healthful policies collectively paint a picture of the most forward looking green cities—offering the best quality of life now and for the future.

Among the smallest cities in the study, Frankfurt fields the most dynamic green outlook in actions like recycling.

Big, traditional powers Paris, London and New York follow closely behind—perhaps surprising residents in each, who may grumble at their commute or wonder about the air quality. But industrial-age planners often had the foresight to build extensive transportation systems and provide generous green spaces. These, with continuing vision and investment, can transport and refresh harried knowledge workers as they did hard-working factory hands in the past.

Chart 8.
Sustainability management: A cross section of forward-looking indicators



Eight variables create a picture of what cities are doing or have done to promote sustainability in the future. "Green cities" itself is a composite index that tracks elements including health policies and vehicles per capita.

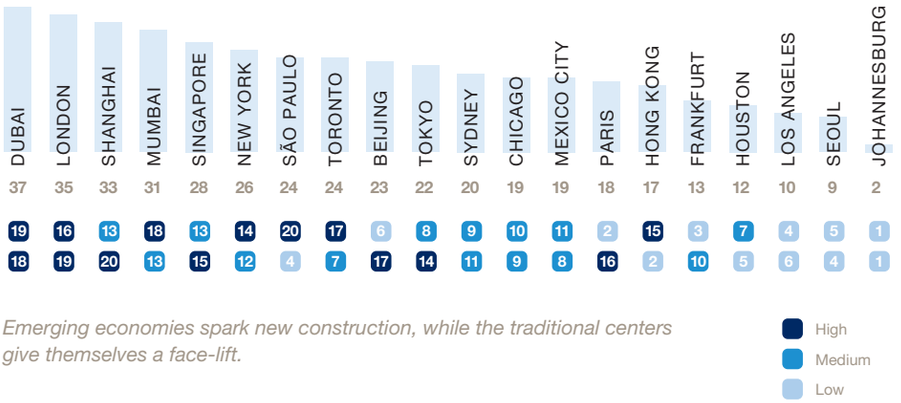
Physical growth: New and mature cities vie in brick-and-mortar momentum

Physical growth signals city vitality by measuring the pace of new construction as well as job creation funded by foreign direct investment (FDI).

Here, cities like Dubai and Shanghai show how quickly the emerging economies are moving. Both are growing at a rate about that of London and ahead of New York. However, emerging economies are more often seeing construction of new buildings and infrastructure, while mature economies often find themselves retrofitting existing offices and factories.

London leads the overall ranking of mature economies. But that somewhat reflects the city's unrivaled dominance in UK business. Comparatively in the US, New York ranks as only one strong choice among major centers of finance and commerce including Chicago, Houston and Los Angeles, among others.

Chart 9.
Brick-and-mortar momentum



Emerging economies spark new construction, while the traditional centers give themselves a face-lift.

Indicator discussions

Shanghai

Intellectual capital

A globalizing economy depends on expanding intellectual capital. It is the foundation of a knowledge-based world. And the wealth of a city's educational opportunities and brain trust represents the key to attracting the best businesses and the brightest talent.

Renowned universities and a highly educated population act to attract those seeking high-quality educations and promising career opportunities. The percentage of a population with advanced degrees signals both a city's potential for finance, commerce and innovation as well as its energetic, thinking atmosphere.

The cities ranking highest in this indicator hold no surprises. It is interesting to note, however, that while ranking relatively poorly in all other variables, emerging economies such as Mumbai, Beijing and Mexico City have the greatest number of medical schools. Higher education institutions are profitable investments, and this may be particularly true in medicine, with timeless demand, an aging population and advances in medical science.

Shanghai performs notably. Ranking just under Tokyo and above all North American cities except New York, the Chinese center of finance and trade performs well across the board. No other emerging city approaches its consistently high ranking. However, the overall indicator rankings give a sense that emerging cities do understand the significance that establishing centers of learning and idea generation as well as building and attracting pools of skilled workers is a key to success in today's economy.

	Share of top 500 universities	Percent of population with higher education	Share of top 100 MBA universities	Number of medical schools
20 New York 59	15	19	11	14
19 Paris 56	17	18	6	15
18 London 54	17	14	**12**	11
17 Tokyo 49	**18**	11	0	**20**
16 Shanghai 43	8	10	11	14
15 Chicago 42	8	17	6	11
15 Los Angeles 42	8	16	11	7
15 Toronto 42	8	**20**	11	3
12 Seoul 41	14	9	0	18
11 Houston 40	12	15	6	7
10 Sydney 38	12	13	6	7
9 Hong Kong 36	14	7	6	9
8 Beijing 35	12	6	0	17
7 Singapore 34	8	8	11	7
6 São Paulo 30	12	4	0	14
5 Mexico City 27	3	1	6	17
4 Mumbai 22	0	3	0	19
3 Frankfurt 18	3	12	0	3
2 Dubai 14	0	5	0	9
1 Johannesburg 8	3	2	0	3

Each city's score (here 59 to 8) is the sum of its rankings across variables. The city order from 20 to 1 is based on this score. See maps on pages 10–11 for an overall indicator comparison.

High
Medium
Low

■ Highest rank in each variable

Technology IQ and innovation

Technology and innovation have helped the world expand at an exceptionally fast rate, creating unprecedented opportunities and challenges.

Today, as a globalizing world deals with an economic slowdown, the most resilient cities will be those best able to draw on their concentrations of cutting-edge technology, higher learning and market access to continue reinventing themselves through innovation. Further, cities where finance and commerce are bolstered by diversified employment in such areas as technology, will gain the balance required for long-term health and growth.

Employment in high-tech services is greatest in Asian cities as well as mature economies with large populations and high-quality educational institutions. This is no surprise. Tokyo and Beijing are known as technology and innovation hubs providing steady and skilled employment opportunities. Sydney, London and Toronto benefit from strong higher education and firmly established economies.

The ability to successfully and repeatedly transfer knowledge creation in biomedical technology to early-stage commercialization marks a city's innovative edge. Seoul, Hong Kong and Tokyo shine here due to the strong presence of technology industries supported by good universities. Mature cities like New York and Chicago benefit from their excellent universities as well, which help to concentrate pools of knowledge and innovation.

E-readiness reveals the state of a country's information and communications technology infrastructure. This variable also assesses: the ability of a city's consumers, businesses and government to usefully access technology; the transparency of business and legal systems; and the extent to which governments encourage use of digital technologies.

During an era of increasing interdependence, it is clear that economically well-balanced cities are able to weather storms more soundly and prosper faster than those dependent on a single sector. Investment in developing a technology sector and in supporting entrepreneurial innovation is instrumental in the diversification of a city's economy.

		Employment in high-tech services per 1,000 inhabitants	Biomedical technology transfer	E-readiness
20	New York 54	15	19	**20**
19	Chicago 52	14	18	**20**
18	Tokyo 48	19	**20**	9
17	Houston 45	13	12	**20**
16	London 44	16	15	13
15	Los Angeles 42	11	11	**20**
15	Paris 42	**20**	14	8
13	Hong Kong 40	7	17	16
13	Sydney 40	17	8	15
11	Singapore 36	12	10	14
10	Frankfurt 33	8	14	11
10	Seoul 33	6	17	10
8	Toronto 30	9	9	12
7	Beijing 27	18	7	2
6	Dubai 18	6	5	7
5	Johannesburg 17	6	5	6
5	Mexico City 17	6	6	5
5	Shanghai 17	10	5	2
2	São Paulo 15	6	5	4
1	Mumbai 14	6	5	3

Each city's score (here 54 to 14) is the sum of its rankings across variables. The city order from 20 to 1 is based on this score. See maps on pages 10–11 for an overall indicator comparison.

High
Medium
Low

■ Highest rank in each variable

Transportation and infrastructure assets

Transportation systems and infrastructure assets take a city's pulse at the physical heart—showing the "body's" actual strength and movement. Workers commute and visitors fly in and out. Buildings rise. Electricity flows to residents, revealing the robustness of energy infrastructures. Congestion is managed, or at least tolerated.

Larger cities inherently outperform smaller ones on variables that measure raw power—for instance, aircraft movements and incoming and outgoing passenger flows. However, other variables gauged in proportion to population—such as the number of registered taxis, miles of underground track, congestion management and the cost of public transport—show findings normalized, or placed in relative ratios among the cities. In a sense, this indicates a quality a city possesses versus the power it holds. Going forward, civic leaders and policy makers hold the most leverage to make a real difference in these qualities.

The Buildings: Approved and under construction variable takes a snapshot of a city's growth trajectory. Although many developing cities such as São Paulo, Dubai and Mumbai currently lead here, as might be expected, Toronto and London follow close behind in the top five, suggesting that both are investing actively to retain their competitive edge.

Overall, London tops the table, followed by Beijing, reflecting the latter's considerable investment and focus on transport and infrastructure in recent years. Olympic efforts likely figure in both capitals. Hosting the Olympics in 2008 is likely to have had lasting benefits to Beijing's transport and infrastructure. London has already started to prepare for the 2012 Olympics.

Meantime, mature cities like New York, Paris and Chicago follow close behind, showing not only the power of their established infrastructure, but also actions to keep abreast with newly globalizing, growing cities.

Given the current rates of growth in some emerging cities, particularly, it is likely that the ranks in the middle and bottom of the table will change in the next few years. For example, Dubai currently lacks mass transit track, but is in the process of building the world's largest automated, driverless metro system.

		Registered taxis per 1,000 of population	Miles of mass transit track per 100,000 of population
20	London 109	10	14
19	Beijing 100	18	4
18	New York 97	6	17
18	Paris 97	19	16
16	Chicago 96	7	**18**
15	Tokyo 94	15	8
14	Singapore 91	17	9
13	Mexico City 90	**20**	10
12	Hong Kong 89	9	7
11	Mumbai 84	16	5
10	Frankfurt 83	8	15
10	São Paulo 83	11	2
8	Seoul 80	12	12
7	Dubai 78	14	0
7	Shanghai 78	13	6
5	Los Angeles 76	2	13
4	Houston 75	3	3
3	Toronto 69	5	11
2	Johannesburg 54	1	0
1	Sydney 53	4	1

Aircraft movements	Incoming/outgoing passenger flows	Congestion management[1]	Cost of public transport[2]	Building: Approved and under construction	Electricity consumed per 1,000 of population
18	**20**	16	1	16	14
10	13	14	**20**	6	15
20	19	7	6	14	8
15	16	14	4	2	11
19	17	14	6	10	5
13	18	14	9	8	9
2	8	**20**	15	13	7
8	3	1	19	11	18
5	11	14	16	15	12
3	2	5	18	18	17
14	14	14	2	3	13
9	6	5	11	**20**	19
7	9	5	14	5	16
1	7	19	17	19	1
11	10	7	12	13	6
17	15	5	10	4	10
16	12	16	14	7	4
12	5	14	3	17	2
4	1	19	8	1	**20**
6	4	19	7	9	3

Each city's score (here 109 to 53) is the sum of its rankings across variables. The city order from 20 to 1 is based on this score. See maps on pages 10–11 for an overall indicator comparison.

High
Medium
Low

Highest rank in each variable

1 Congestion management is taken from the 2008 Mercer reports. This reflects not only traffic congestion but also the modernity, reliability and efficiency of public transport—measures of a city's active management of the issue.
2 Cost of public transport data refers to the cost for the longest mass transit rail trip within the city boundaries. However, bus trips were used when rail systems were absent.

Demographic advantages

The availability of labor to a city's economy complements the skills and education of a city's population (discussed in intellectual capital). Larger cities again have inherent advantages over smaller ones. Therefore, all the variables are presented on a ratio basis to standardize results.

The inclusion of the density of population (the number of people per square kilometer divided by city population) captures the relative concentration of individuals within city boundaries. This reflects the domestic demand on the city's economy, along with the current and future available labor. In addition, the working-age population as a percent of total reveals the proportion of individuals that businesses can currently draw on to contribute to the city's economy.

The study defines diversity according to the number of nationalities represented in each city, each of which accounts for at least 0.5 percent of the total foreign-born population. This reflects the openness and attractiveness a city offers to foreign labor—assuming that a truly global city today draws workers from around the world. New York and London are obvious international magnets. Relatively smaller cities—Toronto and Chicago—as well as São Paulo and Sydney—are all notable for drawing foreign workers.

Rapidly developing cities like Shanghai, Beijing, Dubai and Seoul top the list with their proportions of working-age populations.

	Density of population	Working age population as a percent of total population	Diversity of population
20 Seoul 44	18	17	9
20 Beijing 44	17	19	8
18 New York 41	16	5	**20**
17 London 40	10	11	19
17 Toronto 40	8	14	18
15 São Paulo 39	15	7	17
14 Chicago 38	9	12	17
13 Tokyo 36	12	13	11
13 Hong Kong 36	13	16	7
11 Singapore 34	14	15	5
10 Los Angeles 30	7	9	14
10 Shanghai 30	4	**20**	6
8 Frankfurt 29	6	10	13
7 Mumbai 28	**20**	3	5
6 Paris 26	19	4	3
5 Sydney 24	1	6	17
4 Dubai 23	2	18	3
4 Houston 23	3	8	12
4 Mexico City 23	11	2	10
1 Johannesburg 7	5	1	1

Each city's score (here 44 to 7) is the sum of its rankings across variables. The city order from 20 to 1 is based on this score. See maps on pages 10–11 for an overall indicator comparison.

High
Medium
Low

■ Highest rank in each variable

Cost

Although our research focuses in greatest depth on the emerging 21st-century variables that affect globalizing cities—such as intellectual capital, innovation and sustainability—cost remains an important factor when it comes to businesses investing in an area and people deciding to live and work there. This indicator has been designed to reflect not only the costs to business and to individuals but the area's purchasing power as well.

Cost of business occupancy measures accommodation costs on a per workstation basis. The measure reflects the way organizations occupy and use the space as well as the cost of space on a unit-area basis. The cost indicator also includes total tax take as a percent of profits—that is, the total amount of taxes and mandatory contributions payable by the business as a percent of profits.

Cost-of-living data is derived from Mercer's cost-of-living databases, which includes housing and cost of a basket of common household items. The purchasing-power data provides a link between prices and earnings.

As expected, developing cities tend to outperform more mature economies when it comes to cost. The reverse holds true when looking at purchasing power and tax take.

Houston, Johannesburg and Chicago top the indicator. While Johannesburg is the cheapest city, Houston and Chicago perform strongly across all the variables.

	Cost of business occupancy	Cost of living	Purchasing power	Total tax take
20 Houston 65	16	18	18	13
19 Johannesburg 64	**20**	**20**	9	15
18 Chicago 62	13	17	19	13
17 Dubai 60	15	14	11	**20**
17 Los Angeles 60	11	16	**20**	13
15 Toronto 52	9	15	14	14
14 Mexico City 49	19	19	4	7
13 Singapore 44	12	6	7	19
12 New York 43	4	9	17	13
11 Sydney 42	10	7	16	9
10 Frankfurt 38	5	12	13	8
10 Sao Paulo 38	18	11	5	4
8 Seoul 36	6	3	10	17
7 London 31	1	2	12	16
6 Hong Kong 30	2	4	6	18
6 Tokyo 30	8	1	15	6
4 Shanghai 29	14	10	3	2
3 Beijing 28	17	8	1	2
2 Mumbai 25	7	13	2	3
1 Paris 21	3	5	8	5

Each city's score (here 65 to 21) is the sum of its rankings across variables. The city order from 20 to 1 is based on this score. See maps on pages 10–11 for an overall indicator comparison.

High
Medium
Low

Highest rank in each variable

Financial clout

Financial clout analysis offers particular interest to the study, since all 20 cities represent financial hubs in their region or beyond. The indicator captures each city's success as a global business and financial center, ability to attract financial resources and stability and security of investments.

The indicator mixes variables capturing the size and quality of each city. For example, the number of Global 500 headquarters and domestic market capitalization reflect a city's power. The percent of employment in financial and business services reflects the concentration of activity in these high value-added sectors.

The level of minority shareholder protection measures the strength of safeguards against the misuse of corporate assets by directors for their personal gain. This is a key component in a successful financial center. Even though an area may have considerable growth, investments will not be maximized unless investors feel adequately protected.

Inflation and strength of currency reflect economic prosperity. The strength-of-currency measure is derived from the IMF's Special Drawing Right (SDR) per currency unit. It measures the ability of specific currencies to buy amounts of a basket of major currencies (the US dollar, the euro, the Japanese yen and pound sterling).

Not surprisingly London, New York and Paris top this indicator, and developing cities sit at the bottom of the table.

Although some of the financial data used in the research predates the credit crisis (such as that on domestic market capitalization which relates to the end of 2007), the overall relationship among cities in this indicator is likely to have remained much the same taking into account post-crisis data.

		Number of Global 500 HQs	Percent of employment in financial and business services
20	London 97	16	**20**
19	New York 95	14	18
19	Paris 95	17	19
17	Toronto 78	12	8
16	Chicago 73	7	17
16	Frankfurt 73	9	11
16	Hong Kong 73	9	12
16	Tokyo 73	**18**	6
12	Houston 70	11	13
11	Los Angeles 67	5	16
10	Sydney 63	5	15
9	Singapore 51	2	10
8	Seoul 48	13	14
7	Shanghai 47	5	4
6	Beijing 45	15	5
5	São Paulo 39	2	7
4	Mumbai 36	10	1
3	Johannesburg 34	0	9
2	Mexico City 32	7	2
1	Dubai 15	0	3

1 The market capitalization of a stock exchange is the total number of issued shares of domestic companies, including their respective prices at a given time. This figure reflects the comprehensive value of the market at that time.
2 Level of shareholder protection index is the average of "transparency of transactions," "liability for self-dealing" and "shareholders' ability to sue officers and directors for misconduct."

Domestic market capitalization[1]	Level of shareholder protection[2]	Inflation	Strength of currency (SDRs per currency unit)
14	13	14	**20**
17	18	11	17
15	7	18	19
10	18	17	13
3	18	11	17
11	19	19	6
12	4	15	19
16	11	**20**	2
0	18	11	17
0	18	11	17
7	8	16	12
4	**20**	4	11
6	7	7	1
13	4	13	8
0	4	13	8
8	7	5	10
9	10	3	3
5	13	2	5
2	10	7	4
1	1	1	9

Each city's score (here 97 to 15) is the sum of its rankings across variables. The city order from 20 to 1 is based on this score. See maps on pages 10–11 for an overall indicator comparison.

High
Medium
Low

Highest rank in each variable

Lifestyle assets

Lifestyle assets add to the quality of life and well-being potential each city offers its residents and visitors.

Numbers of international tourists and the City Brand Index were used as proxies to gauge how a city is viewed on the world stage. Paris, New York and London share perceptions of distinction. Singapore and Hong Kong show their increasing allure.

City Brand measures the overall perception of the city, impacting decisions ranging from which ones are good vacation destinations to which ones are sensible business locations. Paris, London and New York fare well again. Interestingly, Sydney ranks highest in city brand and entertainment as well as quality and availability of housing. Yet it ranks very low in international tourism, reflecting Australia's geographic distance from most of the world's population.

The power of a skyline, such as Hong Kong's, can create awe and play a part in the unconscious, instinctive decisions we make to revisit or locate to a city. Honorable mentions include New York, Seoul and Chicago.

The housing variable measures the quality, availability and affordability of housing, household appliances and furniture, as well as household maintenance and repair. Sydney, Toronto and Houston lead in this variable, while more expensive cities like Paris do not rank as highly.

Mature cities such as Sydney, London, Los Angeles and Paris generally fare best in entertainment, as might be expected. Also unsurprisingly, hotel room rankings parallel heavily visited cities—excluding Beijing, whose ranking in hotel rooms was influenced by the 2008 Olympics.

Favorable commute-time of course adds to quality of life. A mix of cities—Beijing, Seoul and Houston—lead in this ranking that considers all modes of transportation.

Overall, most of the mature city economies achieved quality lifestyle assets long ago. A number of emerging economies are currently struggling with meeting basic needs for their people in the wake of poverty and population growth. A continually globalizing world will put a rising premium on cities that offer the best lifestyles to skilled workers and relocating companies.

		Entertainment	Hotel rooms
20	New York 106	**20**	16
19	Hong Kong 101	10	14
19	London 101	**20**	19
17	Paris 98	**20**	17
16	Singapore 92	7	8
16	Sydney 92	**20**	6
14	Toronto 91	14	11
13	Los Angeles 86	**20**	7
12	Tokyo 85	13	18
11	Houston 83	13	15
10	Chicago 81	15	9
9	Dubai 77	5	10
8	Beijing 75	2	**20**
7	Seoul 74	5	4
6	Frankfurt 69	13	3
5	São Paulo 62	9	13
4	Shanghai 55	3	5
3	Mexico City 43	7	12
2	Johannesburg 29	9	2
1	Mumbai 16	1	1

Housing	City brand	Skyline impact	Number of international tourists	Commute time
15	17	19	16	3
15	11	**20**	17	14
15	19	6	**20**	2
8	18	3	19	13
19	12	16	18	12
20	**20**	9	7	10
19	16	12	12	7
15	15	5	8	16
15	14	13	6	6
19	8	8	2	18
15	13	17	4	8
15	10	11	15	11
4	9	10	11	19
6	7	18	14	**20**
19	6	2	9	17
4	1	15	5	15
6	5	14	13	9
2	3	4	10	5
8	4	1	1	4
1	2	7	3	1

Each city's score (here 106 to 16) is the sum of its rankings across variables. The city order from 20 to 1 is based on this score. See maps on pages 10–11 for an overall indicator comparison.

High
Medium
Low

Highest rank in each variable

Health, safety and security

A number of factors from government action to cultural norms contribute to a city's overall success in providing its citizens with the basic human rights of health, safety and security.

Personal safety is reflected by the number of crimes in a city, from petty to violent, committed against citizens, visitors and their property. Singapore, Dubai and Hong Kong share the lowest levels of crime. Severity of punishments, strength of law enforcement, cultural norms and social structures all play roles in the frequency of crime.

Hospital availability, infant survival rates and healthy longevity all reflect a city's ability to provide residents with good healthcare and well-being.

Singapore, Tokyo, Paris and Frankfurt possess excellent rates of infants surviving at least their first year. Rates in emerging economies lie at the bottom of the list. Tokyo tops the list for healthy living expectancy—the average number of healthy years that a person can expect to live. This data measures the effectiveness of health systems in reducing the burden of illness. Sydney, Toronto and Frankfurt also rank high in healthy longevity.

Toronto stands as the safest city for natural disaster as measured by statistics from the Center for International Earth Science Information Network's ranking of the frequency of six types of natural disaster: cyclone, drought, earthquake, flood, landslide and volcano. With more and more business activity concentrated in urban centers, an increasingly important factor for a city is its ability to manage disasters by supporting business continuity and minimizing economic effects.

The effects of a nation's and city's political and social environment cross all aspects of business and personal life. For instance, the strength of government relationships with other nations, domestic stability and good law enforcement all contribute to security. Limits on freedom and censorship stand in the way of good business conduct in an interconnected world. Frankfurt, Toronto, Tokyo, Paris and Sydney top the list in achieving personal freedoms.

Taking a step back, as the world economy continues to globalize, emerging cities can be expected to enjoy increasingly improved healthcare, safety and security as more prosperous citizens demand more advanced quality of life.

		Crime	Number of hospitals
20	Toronto 100	17	10
19	Singapore 95	**20**	13
18	Tokyo 94	17	19
17	Chicago 92	17	17
17	Frankfurt 92	17	4
17	Paris 92	11	12
14	Houston 85	17	18
13	New York 79	11	**20**
13	Sydney 79	17	2
11	London 78	11	11
10	Los Angeles 64	7	15
9	Dubai 57	**20**	3
8	Hong Kong 52	**20**	7
7	Seoul 51	11	7
6	Beijing 48	7	8
5	Mexico City 45	3	16
4	Mumbai 37	4	15
4	Shanghai 37	7	9
2	Johannesburg 30	2	1
2	São Paulo 30	1	5

Healthy Living Expectancy	Infant survival rate	Natural disaster risk	Political and social environment
18	16	**20**	19
16	**20**	15	11
20	19	1	18
13	12	18	15
18	18	15	**20**
16	18	18	17
13	12	10	15
13	12	8	15
19	16	8	17
16	16	13	11
13	12	2	15
8	8	13	5
7	6	3	9
9	13	5	6
7	6	19	1
7	7	4	8
2	1	10	5
7	6	6	2
1	2	16	8
3	3	13	5

Each city's score (here 100 to 30) is the sum of its rankings across variables. The city order from 20 to 1 is based on this score. See maps on pages 10–11 for an overall indicator comparison.

High
Medium
Low

■ Highest rank in each variable

Ease of doing business

The extent to which a city makes it easy for businesses to operate complements cost, labor, transport, financial clout, lifestyle and security in determining which cities offer the most well-rounded opportunities in a globalizing world.

This indicator measures the ease of hiring, the rigidity of hours (including scheduling of nonstandard work hours and annual paid leave), and the difficulty of firing (including notification and approval requirements for termination of a redundant worker, obligation to reassign or retrain and priority rules for redundancy and reemployment). These three variables are taken from national data. However, the national estimates are based on the most populous city in the country (in most cases the city included in our research). This national data accurately reflects the business environment in our cities (for example, the same legislation and labor laws are imposed in parts of the UK, including London). Only the US cities included in the analysis may differ marginally from this national data, as state law may result in subtle differences in labor laws.

The ease of doing business internationally is measured by the number of countries from which a resident can enter the specific city without a visa and by the flexibility of visa travel (which ranked cities according to the number of visa waivers available and the duration of visas granted).

Finally, the number of “greenfield” (new job creating) projects in a city that are funded by foreign direct investment gauges current success at attracting globalized businesses, an indicator of both ease of doing business and growth.

Singapore outperformed all cities, leading in the ease of hiring and the number of countries with visa waivers. Expectedly, it also finished strongly in the remaining indicators. Interestingly, although Shanghai attracted the most greenfield foreign direct investment, the mature economies of London, Paris and Singapore were also successful in this variable.

		Ease of hiring[1]	Rigidity of hours[2]
20	Singapore 105	**20**	15
19	Hong Kong 89	**20**	15
18	London 88	8	12
17	New York 84	15	**20**
16	Chicago 81	15	**20**
15	Los Angeles 78	15	**20**
14	Houston 77	15	**20**
13	Toronto 76	9	16
12	Dubai 71	**20**	3
11	Sydney 70	17	13
10	Tokyo 67	11	8
9	Seoul 58	10	5
8	Frankfurt 55	4	5
7	Shanghai 51	7	11
6	Johannesburg 50	3	7
5	Beijing 48	7	11
4	Paris 47	2	2
3	Mumbai 44	16	11
2	Mexico City 43	5	6
1	Sao Paulo 27	1	2

Difficulty of firing[3]	Ease of entry: Number of countries with visa waiver	Flexibility of visa travel	Attracting FDI: Number of greenfield projects
16	20	19	15
15	19	18	2
11	18	20	19
20	8	9	12
20	8	9	9
20	8	9	6
20	8	9	5
12	15	17	7
15	10	5	18
10	9	10	11
8	13	13	14
6	17	16	4
7	14	15	10
6	4	3	20
9	16	14	1
6	4	3	17
3	12	12	16
1	2	1	13
2	11	11	8
15	1	4	4

Each city's score (here 105 to 27) is the sum of its rankings across variables. The city order from 20 to 1 is based on this score. See maps on pages 10–11 for an overall indicator comparison.

High
Medium
Low

Highest rank in each variable

1 Three variables have several components and all take values between 0 and 100, with higher values indicating more rigid regulation. For example, the ease of hiring index measures whether fixed term contracts are prohibited for permanent tasks; the maximum cumulative duration of fixed term contracts and the ratio of the minimum wage for a trainee or first time employee to the average value added per worker. An economy is assigned a score of 1 if fixed term contracts are prohibited for permanent tasks and a score of 0 if they can be used for any task. A score of 1 is assigned if the maximum cumulative duration of fixed term contracts is less than 3 years; 0.5 if it is 3 years or more but less than 5 years; and 0 if fixed term contracts can last 5 years or more. Finally, a score of 1 is assigned if the ratio of the minimum wage to the average value added per worker is 0.75 or more; 0.67 for a ratio of 0.50 or more but less than 0.75; 0.33 for a ratio of 0.25 or more but less than 0.50; and 0 for a ratio of less than 0.25. Averaging the scores and scaling the result to 100 gives a final index.

2 The rigidity of hours index has 5 components: (i) whether night work is unrestricted; (ii) whether weekend work is unrestricted; (iii) whether the work week can consist of 5.5 days; (iv) whether the workweek can extend to 50 hours or more (including overtime) for 2 months a year to respond to a seasonal increase in production; and (v) whether paid annual vacation is 21 working days or fewer. For each of these questions, if the answer is no, the economy is assigned a score of 1; otherwise a score of 0 is assigned. Averaging the scores and scaling the result to 100 gives a final index.

3 The difficulty of firing index has 8 components: (i) whether redundancy is disallowed as a basis for terminating workers; (ii) whether the employer needs to notify a third party (such as a government agency) to terminate 1 redundant worker; (iii) whether the employer needs to notify a third party to terminate a group of 25 redundant workers; (iv) whether the employer needs approval from a third party to terminate 1 redundant worker; (v) whether the employer needs approval from a third party to terminate a group of 25 redundant workers; (vi) whether the law requires the employer to reassign or retrain a worker before making the worker redundant; (vii) whether priority rules apply for redundancies; and (viii) whether priority rules apply for reemployment. For the first question an answer of yes for workers of any income level gives a score of 10 and means that the rest of the questions do not apply. An answer of yes to question (iv) gives a score of 2. For every other question, if the answer is yes, a score of 1 is assigned; otherwise a score of 0 is given. Questions (i) and (iv), as the most restrictive regulations, have greater weight in the construction of the index. Averaging the scores and scaling the result to 100 gives a final index.

Sustainability

With half the world's people living in cities and that share projected by the UN Population Fund to hit 70 percent by mid-century, public policies focused on sustainability will make tremendous advances in creating a healthier and more vibrant environment for both urban populations and the world. *Cities of Opportunity* weighs air quality, recycling rates, recreational space and a green cities index to compare efforts toward sustainability.

To be sure, sustainability is on the planning agenda of most cities today, albeit at different stages. Cost-benefit analyses indicate that open space often offers greater benefit to citizens than do revenue-generating properties in terms of the ability to make a city more attractive to a globalizing world.

Our analysis shows emerging cities rank lowest in sustainability—not surprising as they rush to catch up with their long-industrialized peers. Yet they also possess a real opportunity: planning is easier as a city grows, and emerging economies can learn from the earlier missteps of the mature economies to further sustainable innovation.

In terms of the variables we chose, the green cities index is based on a variety of raw measurements and subjective assessments to capture a city's greenness and good citizenry. Components include garbage production per capita, gasoline and electricity prices, private vehicles per capita, public transit's share of energy consumption and smoking laws.

Air quality is a common gauge of sustainable practices. Mature cities tend to have the best levels, with a few exceptions, such as Houston and Los Angeles faring relatively poorly. In fast-growing cities like Mumbai and Dubai, the rapid pace of development is reflected by the high level of air pollutants.

Looking at recycling rates, Frankfurt's lead in diverting garbage from landfills illustrates an interesting chicken-and-egg question that urban policy makers face in promoting sustainable behaviors. That is, what drives the greenest actions—public policies, or community environmental stewardship and conscientious economic development? In the case of Frankfurt, residents pay fees based on weight for the amount of their non-recycled refuse. Nothing is charged for waste that is recycled.

Implementing sustainable practices requires both strong municipal policy actions and support by a city's residents. While cities are at different stages of developing innovative policies, all are facing the same questions of whether to make sustainability a central goal and if so, how to move most effectively—by regulating, engaging and energizing residents, or some combination of all three.

		Green cities	Air quality	Recycled waste—percent diverted	Green space as a percent of city area
20	Frankfurt 66	19	19	**20**	8
20	New York 66	18	17	13	18
20	Paris 66	**20**	**20**	7	19
17	Sydney 65	13	18	14	**20**
16	Toronto 60	10	15	18	17
15	London 56	14	17	11	14
14	Chicago 54	15	14	10	15
13	Singapore 54	12	7	16	10
12	Hong Kong 44	17	4	19	4
12	Seoul 44	9	8	15	12
10	Houston 42	11	13	2	16
9	Los Angeles 40	8	11	8	13
8	Tokyo 38	16	10	5	7
7	Johannesburg 32	7	12	4	9
6	Beijing 26	2	1	12	11
5	Mexico City 25	5	6	9	5
5	Shanghai 25	3	3	17	2
3	Sao Paulo 23	6	10	1	6
2	Mumbai 19	4	5	7	3
1	Dubai 8	2	2	3	1

Each city's score (here 66 to 8) is the sum of its rankings across variables. The city order from 20 to 1 is based on this score. See maps on pages 10–11 for an overall indicator comparison.

High
Medium
Low

■ Highest rank in each variable

Key to the variables

Air quality: Indicated by the average annual concentrations of particulate matter measured in micrograms per cubic meter in residential areas away from air pollution hot spots, such as transport corridors.

Aircraft movements: Air traffic movements include civil international passenger, cargo and non-revenue flights, but exclude military and local flights.

Attracting FDI—number of greenfield projects: The number of greenfield (new job creating projects) in the destination city funded by foreign direct investment.

Biomedical technology transfer: The value of biotechnology transfer at the university level in each city, from knowledge creation to technology transfer and early-stage commercialization. The scores are based on total composite scores for all schools in each city.

Building—approved and under construction: The number includes building projects either approved or under construction in each city.

City brand: The Anholt City Brands Index℠ is based on how a city is perceived, impacting decisions ranging from vacation destinations to business relocation. Rankings include such criteria as international status, physical assets, economic and educational opportunities, image, friendliness of citizens and basic public amenities.

Commute time: The commute time assesses the average commute time across all modes, measured in minutes.

Congestion management: The management-of-traffic-congestion score for each city is included from the 2008 Mercer Quality of Life Reports. The reports include the level of traffic congestion in addition to modernity, reliability and efficiency of public transport.

Cost of business occupancy: The cost of business occupancy is measured by the annual total occupancy cost per workstation in USD within a city's central business district.

Cost of living: The Cost of Living Indexes are based on Mercer's cost of living database and are modified to include housing and to reflect constant weighting and basket items.

Cost of public transport: Data for the cost of public transport for the longest mass transit rail trip within the city boundaries are included; bus trips were used when rail systems were absent.

Crime: Includes figures of petty and property crimes, violent crimes and street crimes.

Density of population: The density of each city is calculated by dividing the city population by the land area of the city in square kilometers.

Difficulty of firing: Represents notification and approval requirements for termination of a redundant worker or a group of redundant workers, obligation to reassign or retrain and priority rules for redundancy and reemployment.

Diversity of city population: The number of countries represented in each city for which there is more than 0.5 percent of the foreign-born population.

Domestic market capitalization: The market capitalization of a stock exchange is the total number of issued shares of domestic companies multiplied by their respective prices at a given time.

Ease of entry: Number of countries with visa waiver: The number of countries whose citizens may enter the city without a visa is quantified.

Ease of hiring: Includes data on restrictions and regulations employers must follow when taking on new staff.

Electricity: Total electricity consumption in megawatt hours is divided by the city population and multiplied by 1,000.

Employment in high-tech services: The number of people employed in high-tech services per 1,000 inhabitants.

Entertainment: Includes the quality and variety of restaurants, theatrical and musical performances, cinemas, and sport and leisure activities within each city.

E-readiness: Measures the ability of a country's consumers, businesses and government to use information and communications technology to their benefit. Also assesses citizens' ability to utilize technology skillfully and the transparency of the business and legal systems and the extent to which governments encourage the use of digital technologies.

Flexibility of visa travel: Countries were ranked taking into account both the number of visa waivers available and the time the visa would be granted for. Any additional restrictions were counted as negatives.

Green cities: The Green Cities Index from Reader's Digest is based on 11 variables to capture a city's local "greenness," and "good citizenry." Variables include raw data as well as qualitative analysis such as garbage production per capita, gasoline price, price of electricity, recycling laws, private vehicles per capita, public transit's share of energy consumption and smoking laws.

Green space as a percentage of city's area: A city's land areas designated as recreational and green spaces out of the total land area.

Healthy Living Expectancy: The Healthy Living Expectancy is the average number of years that a person can expect to live in full health by taking into account years lived in less than full health due to disease and/or injury.

Hotel rooms: A count of all hotel rooms within each city.

Housing: The term *housing* includes measures of availability, diversity, cost and quality of housing; household appliances and furniture; and household maintenance and repair.

Incoming/outgoing passenger flows: The total number of incoming and outgoing passengers includes originating, terminating, transfer and transit passengers in each of the airports located within each city. Transfer and transit passengers are counted twice.

Infant survival rate: The probability of a child living until at least age one.

Inflation: Inflation reflects the rise in price of goods and services, or the Consumer Price Index (CPI).

Level of shareholder protection: A measurement of minority shareholder protections against misuse of corporate assets by directors for their personal gain. The Strength of Investor Protection Index is the average of "transparency of transactions," "liability for self-dealing" and "shareholders' ability to sue officers and directors for misconduct."

Miles of mass transit track per 100,000 of population: The miles of metro, tram and light rail track within the city is divided by the city population and then multiplied by 100,000.

Natural disaster risk: The risk of natural disasters occurring in a region, including hurricane, drought, earthquake, flood, landslide and volcano hazards.

Number of Global 500 HQs: The number includes the Global 500 headquarters located in each city.

Number of hospitals: The number includes a count of all hospitals within each city.

Number of international tourists: Includes international tourist arrivals for each city in 2006.

Number of medical schools: The number includes medical schools located in each city.

Percent of employment in financial and business services: Ratio of employees in this sector to the total city workforce.

Percent of population with higher education: The percent of the population with a higher education is derived from the number of people with a university-level education or higher, then divided by the total population.

Political and social environment: Governments' relationship with other countries, internal stability, law enforcement, and the sociocultural environment—limitations on personal freedom and media censorship.

Purchasing power: A measure that establishes a link between prices and earnings.

Recycled waste—percent diverted: The percent of waste recycled in each city (diverted from landfills).

Registered taxis per 1,000 of population: The number of registered taxis in each city is divided by the city population and then multiplied by 1,000.

Rigidity of hours: Reflects the flexibility in scheduling of nonstandard work hours and annual paid leave for a business.

Skyline impact: A ranking of cities by the visual impact of completed high-rise buildings on their skylines.

Strength of currency (SDRs per currency unit): The IMF variable is designed to measure the strength of currencies. It is essentially the amount of a basket of major currencies that can be bought by a given currency unit (measured in dollars). To access the official definition please refer to: http://www.imf.org/external/np/fin/data/rms_sdrv.aspx.

Top 100 MBA universities: Each city's share of the world's top 100 MBA universities.

Top 500 universities: Each city's share of the world's top 500 universities.

Total tax take: The total tax take includes the total amount of taxes and mandatory contributions payable by the business as a percent of the profit.

Working-age population: A city's working-age population includes all residents aged 15 years to 64 years within the city, divided by the total city population expressed as a percentage.

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For a detailed listing of definitions and source documents for *Cities of Opportunity*, please visit our web site:

www.pwc.com/cities