

McKinsey Global Institute



June 2012

Urban world: Cities and the rise of the consuming class



The McKinsey Global Institute

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Urban world: Cities and the rise of the consuming class

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Preface

The urbanization of the world continues apace and is one bright spot in an otherwise challenging global economic environment. The shift in economic balance toward the East and South is happening with unprecedented speed and scale. We are quite simply witnessing the biggest economic transformation the world has ever seen as the populations of cities in emerging markets expand and enjoy rising incomes—producing a game-changing new wave of consumers with considerable spending power. Meeting demand from these new consumers will necessitate an investment boom in buildings and infrastructure that will account for the lion's share of global investment in the years to 2025. It is important that cities make the investment they need in an efficient and productive way to ensure healthy returns and lock in high levels of resource productivity for decades to come.

This report is an update and expansion of *Urban world: Mapping the economic power of cities*, a report we published in March 2011. In it we focus on the economic power of cities, the huge expansion of urban consuming classes, and the implications of the consumer demand for the construction of new residential and commercial buildings, port capacity to meet rising volumes of container shipping as demand fuels trade in goods, and municipal water. In this latest research, we have expanded and updated the MGI Cityscope database of cities. This allows us to offer insights into the evolution of the urban world and its demographics, household structure, and incomes. Cityscope 2.0 includes 253 more cities, to bring the total covered to 2,657, and incorporates the latest economic and demographic data, including data available from China's 2010 and India's 2011 census. We have also added estimates of new metrics against which to view cities' contribution to activity and growth in different sectors.

The urban world reports are part of ongoing research into urbanization and the role of cities in the global economy—a core research area for MGI. Our first major report on this global phenomenon was *Preparing for China's urban billion*, whose early findings we published in 2008 and full findings in March 2009. We followed this work with *India's urban awakening: Building inclusive cities, sustaining economic growth* in April 2010. In August 2011 and April 2012, we published two more regional perspectives—*Building globally competitive cities: The key to Latin America* and *Urban America: US cities in the global economy*. We have also analyzed the consequences of today's mass urbanization for the global economy in our broader research on labor, capital, and resource markets.¹

1 *The world at work: Jobs, pay, and skills for 3.5 billion people*, June 2012; *Help wanted: The future of work in advanced economies*, March 2012; *Resource Revolution: Meeting the world's energy, materials, food, and water needs*, November 2011; *An economy that works: Job creation and America's future*, June 2011; and *Farewell to cheap capital? The implications of long-term shifts in global investment and saving*, December 2010. All MGI reports are available to download at www.mckinsey.com/mgi.

Projecting the economic and demographic evolution of cities in the period to 2025 is inherently subject to multiple sources of uncertainty. In this report, we present one scenario of how the urban world could evolve in order to provide a sense of direction to companies, investors, and policy makers, all of whom need to test the robustness of their decisions against a broader set of plausible scenarios.

McKinsey and MGI director Richard Dobbs and MGI senior fellow Jaana Remes led this project. Invaluable guidance for this work came from McKinsey and MGI directors James Manyika and Charles Roxburgh, and McKinsey director Sven Smit. Fabian Schaer managed the project team, which comprised Hyungpyo Choi, Lucia Fiorito, Christine Hong, Alessio Magnavacca, and Javier Orellana. The team also benefited from the contributions of Janet Bush, MGI senior editor; Rebeca Robboy, MGI external communications manager; Julie Philpot, MGI editorial production manager; Marisa Carder, visual graphics specialist; and Elliot Cravitz and Mary Reddy for their help on our interactive materials.

We are also grateful for the input and support of numerous MGI colleagues past and present and to McKinsey colleagues around the world. We would particularly like to thank Jonathan Ablett, Yuval Atsmon, Peter Child, Diana Farrell, Rogerio Hirose, Udo Kopka, Liz Lempres, Laxman Narasimhan, Nathalie Remy, and Olivier Sibony for their consumer market expertise; Shannon Bouton, David Cis, and Jonathan Woetzel for their insights on excellence in city management; Lee Addams, Sudeep Maitra, and Fraser Thompson for their help in our analysis of water infrastructure needs; Arjen Kersing, Sebastian Maurus, Tobias Meyer, Liumin Ni, and Markus Zils on global shipping; Ingo Becker, Benjamin Cheatham, Stefan Heck, Jan Mischke, and Abhimanyu Puri on building and construction; Tim Arscott-Mills, Taras Gorishnyy, Eric Grunberger, Susan Lund, Luis Madrigal, Heitor Martins, Peter van Nieuwenhuizen, John Piotrowski, and Emmanuel Pitsilis on financial services; and William Cheng, Parmeet Grover, Anurag Gupta, Shishir Gupta, Yangmei Hu, and Xiujun Lillian Li for their expertise on India and China.

We are grateful for the guidance we received from many experts in academia, industry, and government. Our particular thanks go to Daron Acemoglu, Elizabeth and James Killian Professor of Economics at the Massachusetts Institute of Technology; Richard Cincotta, demographer in residence at the Stimson Center; Richard Cooper, Maurits C. Boas Professor of International Economics in the Department of Economics at Harvard University; Homi Kharas, senior fellow and deputy director for the Global Economy and Development program at the Brookings Institution; and Michael Storper, professor of urban planning at the University of California, Los Angeles.

This report contributes to MGI's mission to help global leaders understand the forces transforming the global economy, identify strategic locations, and prepare for the next wave of growth. As with all MGI research, we would like to emphasize that this work is independent and has not been commissioned or sponsored in any way by any business, government, city, or other institution.

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June 2012

Growing cities ...

From 2010 to 2025, the GDP of the City 600¹ will rise by over

\$30 trillion

... or nearly **65%** of global growth

The Emerging 440² cities will contribute

\$23 trillion

... or **47%** of global growth to 2025

Over

\$10 trillion

in additional annual investments needed in cities by 2025

1 billion

new consumers in emerging market cities by 2025

1 The top 600 cities by their contribution to global GDP growth 2010–25.

2 Emerging market cities in the City 600.

... and their rising consumer demand

60% of the new urban consumers will be in the Emerging 440 cities

Annual consumption in Emerging 440 cities is set to rise by

\$10 trillion by 2025

Cities are expected to need to build floor space³ equivalent to

85% of today's building stock—an area the size of Austria

Nearly

80 billion

cubic meter increase in municipal water demand expected in the world's cities by 2025

Over

2.5 times

today's level of port infrastructure needed to meet rising container-shipping demand

3 Floor space for commercial and residential buildings, including building replacement.

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Executive summary

A wave of urbanization propelling growth across emerging economies is a welcome fillip for a world economy that continues to have pockets of acute fragility. Cities have been the world's economic dynamos for centuries, attracting skilled workers and productive businesses and benefiting from economies of scale. Urbanization and per capita GDP tend to move in close synch as countries develop. But what is different about today's wave of mass urbanization is its unprecedented speed and scale. It is not hyperbole to say that we are observing the most significant shift in the earth's economic center of gravity in history.

The move to urban living is lifting the incomes of millions of people around the world. In cities, one billion people will enter the global "consuming class" by 2025, with incomes high enough to become significant consumers of goods and services.¹ Around 600 million of them will live in only around 440 cities in emerging markets that are expected to generate close to half of global GDP growth between 2010 and 2025.²

The incomes of these new consuming classes are rising even faster than the number of individuals in the consuming classes. This means that many products and services are hitting take-off points at which their consumption rises swiftly and steeply. By 2025, urban consumers are likely to inject around \$20 trillion a year in additional spending into the world economy. Catering to the burgeoning urban consumer classes will also require a boom in the construction of buildings and infrastructure. We estimate that cities will need annual physical capital investment to more than double from nearly \$10 trillion today to more than \$20 trillion by 2025, the lion's share of which will be in the emerging world.

This huge sum of consumption and investment could inject more than \$30 trillion of annual spending into the world economy by 2025—a powerful and welcome boost to global economic growth. But there will be challenges, too. Rapidly urbanizing emerging economies and their increasingly wealthy consumers are already driving strong demand for the world's natural and capital resources. The global investment rate and resource prices have jumped and could rise further.

1 We define consuming classes or consumers as those individuals with an annual income of more than \$3,600, or \$10 per day at purchasing power parity (PPP), using constant 2005 PPP dollars.

2 We refer to these dynamic cities as the Emerging 440. This group comprises the 443 cities in emerging markets within the top 600 cities globally by GDP growth to 2025, a group we dub the City 600.

Cities can be part of the solution to such stresses, as concentrated population centers can be more productive in their resource use than areas that are more sparsely populated. But if cities fail to invest in a way that keeps abreast of the rising needs of their growing populations, they may lock in inefficient, costly practices that will become constraints to sustained growth later on. How countries and cities meet this rising urban demand therefore matters a great deal. Beyond the direct impact of the investment, their choices will have broad effects on global demand for resources, capital investment, and labor market outcomes.

How companies and governments react to this tectonic shift will fundamentally shape their future prospects. In this updated research on the urban world, the McKinsey Global Institute (MGI) focuses on the major expansion of consuming classes in cities, particularly those of emerging economies, and examines the impact of their increased demand on investment in buildings and infrastructure, including ports and municipal water supply, all using our updated Cityscope database (see Box E1, “MGI Cityscope 2.0”).

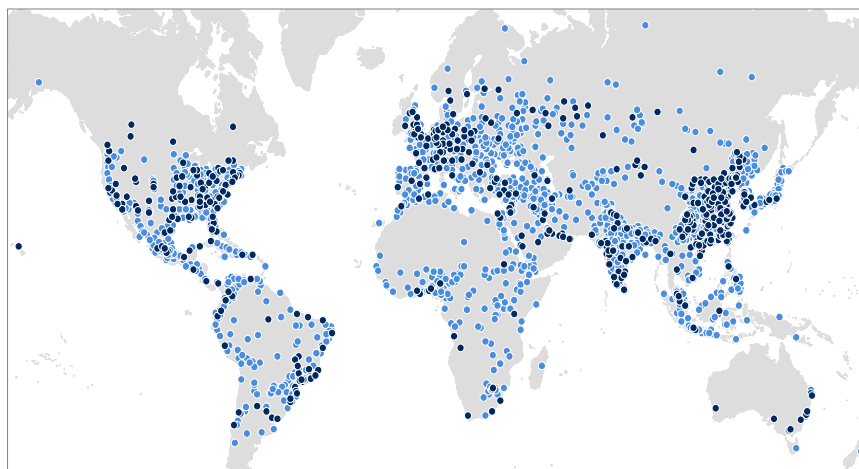
Box E1. MGI Cityscope 2.0

The MGI Cityscope is a database of more than 2,600 cities around the world that allows us to understand the evolving shape of global urban economies; extract many different city rankings and groupings by region, variable, and target market; test the growth momentum from doing business in particular geographies; and develop projections of growth in urban markets of a range of products and services (Exhibit E1). The database is, to our knowledge, the largest of its kind. It can help answer a range of questions relevant for the decisions that companies and policy makers need to make: Which cities will contribute the largest number of children to the world? Where will most new entrants to the workforce and most senior citizens be? Which cities will experience the fastest expansion among consuming classes?

Exhibit E1

The City 600: MGI's Cityscope identifies the world's fastest-growing megacities and middleweights

- The City 600¹ (600)
- Additional cities in MGI Cityscope (~2,000+)



¹ Top 600 cities ranked by absolute projected GDP growth between 2010 and 2025.

SOURCE: McKinsey Global Institute Cityscope 2.0

Box E1. MGI Cityscope 2.0 (continued)

For each city, the database includes data for 2010 and forecasts for 2025 on population by age group (children below the age of 15), working-age population (aged 15 to 64), and the older population (aged 65 and above), GDP and per capita GDP (at market and purchasing power parity, or PPP, exchange rates as well as at predicted real exchange rate, or RER), and number of households by income segment (in four income categories defined by annual household income in PPP terms: less than \$7,500, \$7,500 to \$20,000, \$20,000 to \$70,000, and more than \$70,000). MGI has developed city-specific data from existing public survey data, MGI's city-level datasets developed as part of our previous research, selected data from external providers, and MGI's country- and region-specific models of city growth to 2025.

This report draws from an updated version of the Cityscope 2.0 database, which now has a broader set of variables that shed light on the diversity of urban market growth prospects across different industries. The new Cityscope metrics include a view on markets such as deposits by city, and estimates of residential and commercial floor space, container demand, and municipal water demand.¹

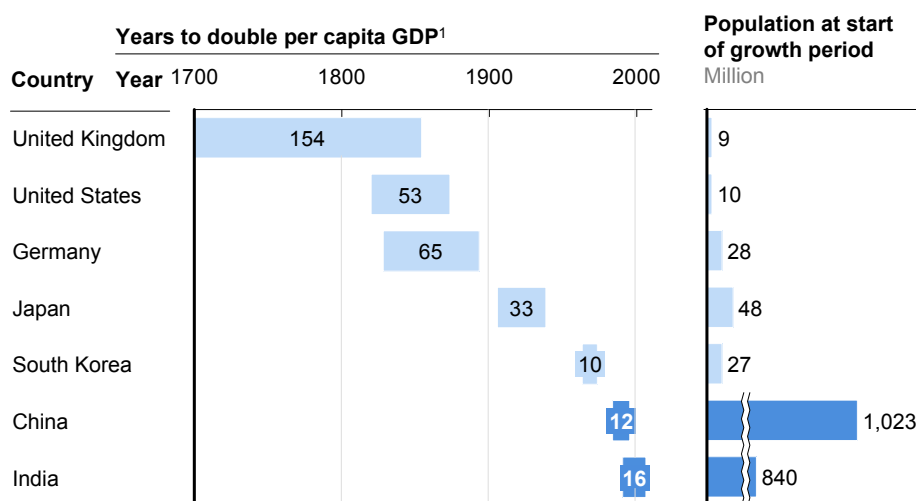
1 Projecting the economic and demographic evolution of cities over the next 15 years is inherently subject to multiple sources of uncertainty, and companies need to test the robustness of their business decisions against a broader set of plausible scenarios. See the appendix for more detail.

THE GLOBAL ECONOMIC BALANCE IS SHIFTING TO EMERGING CITIES

Until 1500, Asia was the center of gravity of the world economy, accounting for roughly two-thirds of global GDP. But in the 18th and 19th centuries, urbanization and industrialization vaulted Europe and the United States to prominence. We are now observing a decisive shift in the balance back toward Asia—at a speed and on a scale never before witnessed. China's economic transformation resulting from urbanization and industrialization is happening at 100 times the scale of the first country in the world to urbanize—the United Kingdom—and at ten times the speed (Exhibit E2).

Exhibit E2

Incomes are rising in developing economies faster, and at a greater scale, than at any previous point in history



¹ Time to increase per capita GDP in PPP terms from \$1,300 to \$2,600.

SOURCE: Angus Maddison; University of Groningen; *Resource Revolution: Meeting the world's energy, materials, food, and water needs*, McKinsey Global Institute, 2011.

The recession that has hit the United States and Western Europe particularly hard has accelerated the shift in the global economic balance. From 2007 to 2010, the GDP of large Chinese cities rose from 20 percent of that of large cities in the United States to 37 percent.³ In these three years alone, three more Chinese cities reached megacity status with populations of ten million or more—one new megacity a year. Contrast that with the developed world, whose urban landscape is far more mature. Between now and 2025, Chicago is the only city in the developed world expected to pass the ten million population mark. But the speed at which the global balance is changing is not simply a China and Asia story. In 2007, the GDP of Latin America's cities was 26 percent that of their European counterparts; by 2010, that figure had risen to 37 percent.

Urban growth is highly concentrated in just a few hundred cities and will continue to be.⁴ Our analysis suggests that just the top 600 cities by their contribution to global GDP growth to 2025—a group we call the City 600—will generate nearly 65 percent of world economic growth in this period. Today, the City 600 is home to just over 20 percent of the world's population but accounts for nearly \$34 trillion, or more than half, of global GDP. Between 2010 and 2025, we expect the City 600's combined GDP to nearly double to \$65 trillion.

But the most dramatic chapter of today's urbanization story is the role played by the so-called Emerging 440. These emerging market cities in the City 600 will

³ We define cities as broader metropolitan areas that include both a core city and surrounding metropolitan regions integrated into a connected urban region. Large cities include metropolitan areas with 150,000 or more inhabitants in developed regions and 200,000 or more inhabitants in developing regions.

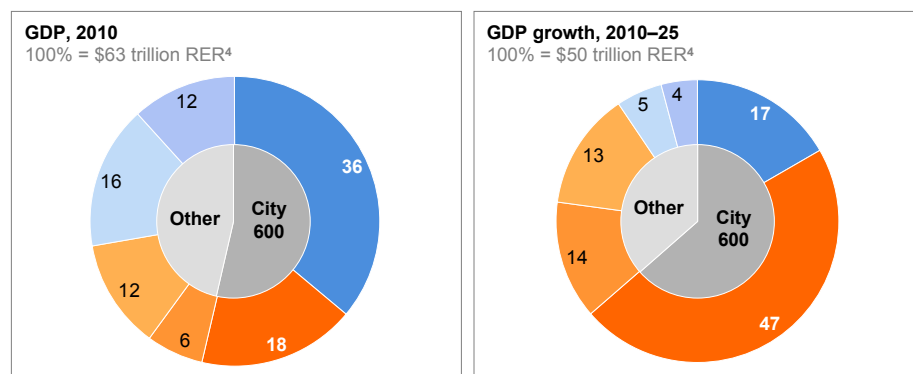
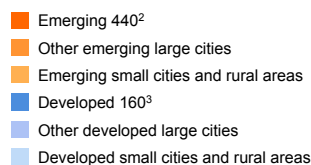
⁴ The GDP growth projections are based on MGI's Cityscope 2.0, which assumes that global GDP will expand at a compound average rate of 4.0 percent per annum to 2025. See the appendix for a more detailed discussion of our methodology. While projections for individual cities are inherently subject to wide bands of uncertainty, the broad patterns across types of cities or regions in the scenario we describe are directionally robust across a reasonable range of key assumptions.

account for close to half (47 percent) of expected global GDP growth between 2010 and 2025 (Exhibit E3). The Emerging 440 boasts 20 megacities, including Shanghai in China, São Paulo in Brazil, Istanbul in Turkey, and Lagos in Nigeria. Together these megacities will generate an estimated \$5.8 trillion of GDP growth by 2025, a compound annual growth of 7.6 percent—almost double the growth rate expected for the global economy as a whole. But more than 400 cities of the group are middleweight cities with populations of between 200,000 and ten million, spread out across 57 countries and every continent except for Oceania. We expect these middleweights to grow even faster at an 8 percent annual compound rate, contributing \$17.7 trillion in GDP growth by 2025. In the Emerging 440, China is an important part of the equation with 242 cities in this group, of which 236 are middleweights. Latin America has 57 cities in this dynamic group, 53 of them middleweights including Belo Horizonte in Brazil and Cali in Colombia. South Asia, including India, has 36 cities in this group. There are 28 Indian middleweight cities in the Emerging 440, including Bangalore, Pune, and Kochi. Africa and the Middle East together contribute 39 cities to the group, and 37 of them are middleweights, including Angola's capital Luanda, Kumasi in Ghana, Port Harcourt in Nigeria, and Doha in Qatar.

Exhibit E3

Emerging 440 cities are poised to deliver close to half of global GDP growth

Contribution to global GDP and GDP growth¹
%



1 Global GDP and GDP growth figures include 2,600+ large cities in Cityscope, as well as smaller cities and rural areas.

2 The Emerging 440 is 443 emerging market cities in City 600.

3 The 157 developed market cities in City 600.

4 Real exchange rate (RER) for 2010 is the market exchange rate. RER for 2025 was predicted from differences in the per capita GDP growth rates of countries relative to the United States.

SOURCE: McKinsey Global Institute Cityscope 2.0

EXPANDING URBAN ECONOMIES ARE CREATING WAVES OF NEW CONSUMERS

The increasing size and power of cities in emerging markets have tangible and dramatic economic benefits that translate into rising incomes. We expect to see one billion more people in cities worldwide become members of the consuming classes, with enough income to buy the very basic necessities and to have some discretionary income to spend on consumer goods and services. That's a rise of 70 percent from today. These growing consumer classes will drive rapid growth in demand for many goods and services. Across all large cities, we expect annual household consumption to rise by more than \$20 trillion to 2025—of which about

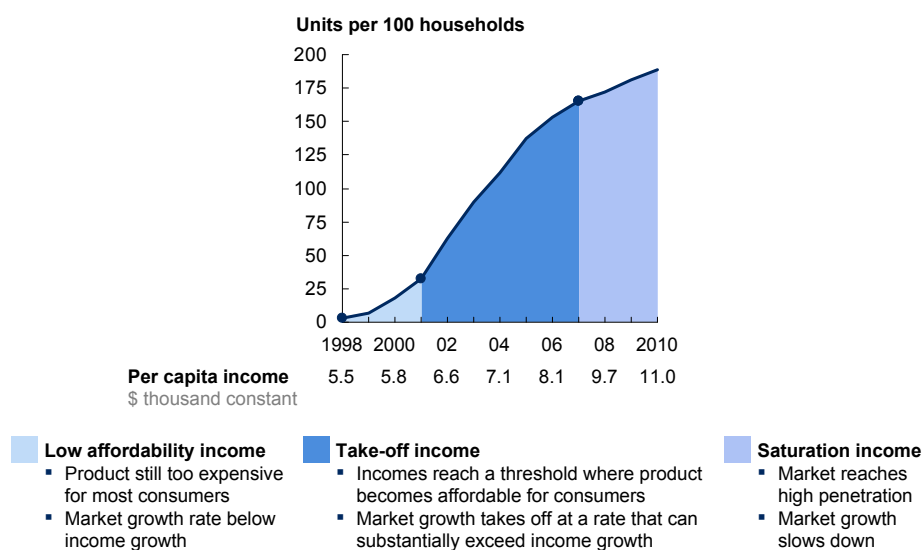
\$14 trillion will be in large cities in emerging markets. In the Emerging 440 alone, we see consumption increasing by more than \$10 trillion.

The growth in demand for many consumer goods will exceed the expansion of the consuming classes for two main reasons. First, household incomes are rising faster than the number of households and individuals in consuming classes. Second, and more important, higher shares of the populations of many large emerging economies, including China and India, are moving into income segments where the consumption of many goods and services takes off rapidly (Exhibit E4). In China, for instance, spending on dining out starts to take off at annual incomes of around \$3,000 per household and, by about \$9,000, is on a firm and steep upward trajectory. Spending on transport and communications starts increasing strongly as incomes reach around \$6,000 per annum.⁵ The recent growth in Chinese consumer markets reflects these inflection points. Between 2004 and 2011, per capita sales of electronics and video appliances rose fourfold and clothing and shoes rose fivefold in real terms, outpacing a 3.4 times increase in per capita income during that period.

Exhibit E4

Consumer goods tend to follow an adoption S-curve as incomes rise

China example: Penetration of mobile telephones, 1998–2010



SOURCE: Chinese National Bureau of Statistics; McKinsey Global Institute analysis

Growth patterns will vary among products and services for three main reasons. First, as incomes rise, consumers choose where they spend the additional available income, and some products take off at lower incomes than others. Purchases of products with low unit costs such as snacks and bottled drinks accelerate at a relatively early stage of the income curve, beauty products somewhat later, and luxury products, such as fashion and fine wines, later still. Services tend to take off at higher income levels. For example, travel for leisure and retail banking services for deposits start climbing once per capita income reaches \$18,000 per annum.

⁵ McKinsey Insights China, *2010 annual Chinese consumer study*, McKinsey & Company, August 2010.

Second, products and services vary in the shape of their adoption curve and then in the rate of growth of mature, well-penetrated markets. Refrigerators have a very steep adoption curve but then experience a sharp slowdown in growth once a market reaches saturation when sales tend to focus on replacement or higher-quality items. But spending on clothing, a necessity, displays sustained growth fueled by spending by low-income households and higher-income households that tend to purchase higher-quality, more expensive items. Third, there are geographic differences in demand for cultural and demographic reasons. Many Indian households are vegetarian, for instance, and therefore meat consumption across income levels is lower than the global average. One-third of the population in Nigerian cities is aged below 16, and sales of baby food are unsurprisingly far above the global average at similar income levels.

These variations only underline the need for companies to understand their target markets in forensic detail. The top urban markets in different demographic segments (e.g., older people with middle incomes or higher; or new young entrants to the lower middle class) as well as for different products (e.g., laundry care) and demand for commercial floor space and municipal water are all different (Exhibit E5). Indeed, on these five “hot spots” for growth, the likely top cities are in three different continents: Shanghai and Mumbai in Asia; Lagos in Africa; and São Paulo and New York in the Americas. So depending on the products they sell, and the segments in which they specialize, companies need to have a detailed knowledge of which cities offer the most promising markets.

Exhibit E5

Top 20 hot spots for growth by 2025

Cityscope rankings by growth, 2010–25

Emerging regions

Developed regions

Rank	Elderly, higher-income consumers ¹	Young entry-level consumers ²	Laundry care products ³	Commercial floor space ⁴	Municipal water demand
1	Shanghai	Lagos	São Paulo	New York	Mumbai
2	Beijing	Dar es Salaam	Beijing	Beijing	Delhi
3	Tokyo	Dhaka	Rio de Janeiro	Shanghai	Shanghai
4	Tianjin	Ouagadougou	Shanghai	Los Angeles	Guangzhou
5	Mumbai	Khartoum	Mexico City	Tokyo	Beijing
6	São Paulo	Ghaziabad	Moscow	Washington, DC	Buenos Aires
7	Osaka	Sanaa	Bangkok	Dallas	Kolkata
8	Chongqing	Nairobi	Istanbul	São Paulo	Khartoum
9	Delhi	Luanda	Manila	Guangzhou	Dhaka
10	Nanjing	Baghdad	Johannesburg	Chicago	Istanbul
11	Guangzhou	Kampala	Belo Horizonte	Houston	Dallas
12	New York	Ibadan	Porto Alegre	Tianjin	Pune
13	Seoul	Lusaka	Buenos Aires	Moscow	Las Vegas
14	Hong Kong	Kinshasa	Tianjin	Atlanta	Karachi
15	Wuhan	Kano	Tehran	Miami	São Paulo
16	Kolkata	Abidjan	New York	Hong Kong	Hyderabad, India
17	Shenyang	Abuja	Foshan	Mexico City	Lagos
18	Los Angeles	Bamako	Santiago	Shenzhen	Moscow
19	Toronto	Chittagong	Shenzhen	Phoenix	Wuhan
20	Ahmedabad	Port Harcourt	London	Istanbul	Manila

1 Growth in population aged 65+ with household income >\$20,000 at PPP.

2 Growth in population aged ≤14 with household income \$7,500–\$20,000 at PPP.

3 Predicted growth in consumer spending on laundry care products based on a city-level market demand growth model.

4 Including replacement floor space.

SOURCE: McKinsey Global Institute analysis

GROWING EMERGING MARKET CITIES REQUIRE INVESTMENT TO BUILD CAPACITY

The world's new urban consumers will have an impact far beyond sales of goods and services. To cater to their needs, cities will need to invest heavily in infrastructure. We estimate that cities will need annual physical capital investment to more than double from nearly \$10 trillion today to more than \$20 trillion by 2025. Urban centers in emerging economies will make most of this investment.

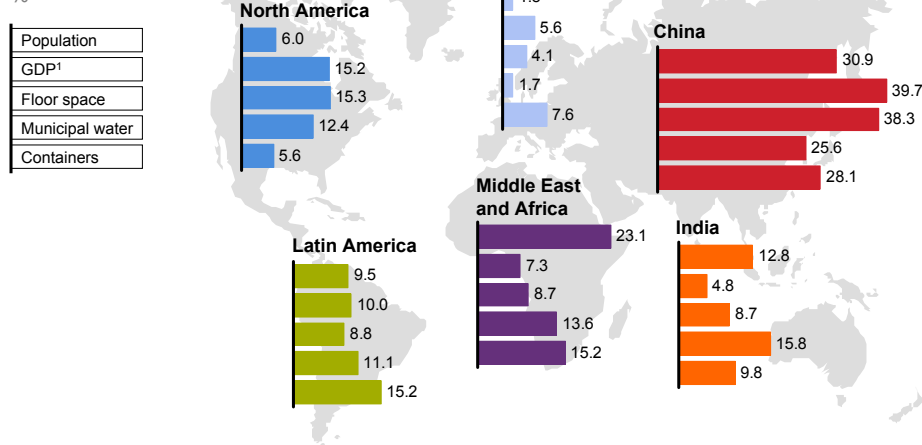
MGI has looked at three sectors in particular detail—buildings, port container capacity, and municipal water distribution (Exhibit E6).

- **Buildings.** By 2025, cities will need to construct floor space equivalent to 85 percent of all of today's urban residential and commercial building stock. In the Emerging 440 alone, we see demand for residential and commercial floor space growing by 44,000 square kilometers. The urban building boom will require cumulative investment, including for replacement buildings, of nearly \$80 trillion.
- **Container capacity of ports.** The capacity of ports to handle global container traffic needs to rise by more than 2.5 times from today's level to meet rising consumer demand for products across the globe. The investment needed to expand port capacity to 2025 exceeds \$200 billion by our reckoning, with 85 percent of it taking place in emerging markets.
- **Municipal water.** We expect urban municipal water demand to rise by almost 80 billion cubic meters, equivalent to more than 20 times the water consumption of New York today and 40 percent above today's urban global level. Serving rising demand will require cumulative investment in water supply and wastewater treatment of about \$480 billion by 2025, of which about \$200 billion will be in the Emerging 440.

Exhibit E6

All regions contribute to growth in urban demand, but China's share is highest in key categories

Contribution to urban growth,
2010–25
%



¹ GDP measured at expected real exchange rate.

NOTE: Other developed and emerging regions account for 16.0, 17.4, 16.0, 19.8, and 18.6 percent of growth in population, GDP, floor space, municipal water, and container-demand growth, respectively; floor space growth includes replacement.

SOURCE: McKinsey Global Institute Cityscope 2.0

Surging urban consumer demand, and the investment necessary to meet it, is on course to inject more than \$30 trillion of additional annual spending into the world economy by 2025. This is undoubtedly a welcome source of growth. But consumption and capacity building in the developing urban world are already straining the global supply of capital and natural resources. The urban world has already contributed to a jump in the global investment rate from 20.8 percent of GDP in 2002 to 23.7 percent in 2008, followed by a dip during the global recession of 2009.⁶ Increases in the prices of energy, land, food, and water in the first decade of the 2000s have wiped out the decline in prices observed during the entire 20th century.⁷ The new consumers we see to 2025 will only increase the stress on demand and prices, potentially for a prolonged period.

So national, regional, and local governments, as well as businesses, need to manage the consumption and investment boom. Cities have the potential to handle the stresses well. Densely populated urban centers can use resources more productively than dispersed cities and rural areas. Nevertheless, most growing cities can do better in this regard. Cities that under-invest in infrastructure and fail to keep pace with their expanding populations and their demands—or indeed invest inefficiently or in the wrong things—can find themselves hitting barriers to growth. Conversely, if cities manage their capacity building well, there is a large opportunity not only for the world's investors but also to build more productive capacity that is less costly and more efficient in environmental terms for decades to come.

Importantly, the urban planning and infrastructure investment choices made today will determine how well cities are prepared for sustained growth after the expansive urbanization wave passes. After most people have already moved to urban regions, cities will need to find new sources of productivity gains and economic growth. Urban centers that have built well-functioning and efficient environments for businesses and individuals will be in a better position to attract skilled workers and grow more productive businesses.

BUSINESSES NEED TO USE SCIENCE AND ART IN THEIR STRATEGY FOR EMERGING CITIES

To capture the significant opportunity that urbanization offers them, companies need to take a scientific approach to locating the most promising markets for their businesses. Urban markets will be highly diverse, and many of the fastest-growing segments are likely to be in middleweight cities in emerging economies that are simply not on the radar screens of many companies. As illustration, many companies might be hard-pressed to identify the geographic location of Surat, Foshan, and Porto Alegre, let alone even the broad characteristics of their economies. Yet all three have populations of more than four million. Surat is in western India and accounts for about two-fifths of India's textile production; Foshan is China's seventh-largest city by GDP; and Porto Alegre is the capital of Rio Grande do Sul, the fourth-largest state in Brazil.

⁶ *Farewell to cheap capital? The implications of long-term shifts in global investment and saving*, McKinsey Global Institute, December 2010 (www.mckinsey.com/mgi).

⁷ *Resource revolution: Meeting the world's energy, materials, food, and water needs*, McKinsey Global Institute and McKinsey & Company's Sustainability and Resource Productivity Practice, November 2011 (www.mckinsey.com/mgi).

Companies that understand the shifting urban marketplaces relevant to their businesses and build an early presence with sufficient scale are likely to benefit from being the incumbent with better market access and higher margins. Looking at cities rather than countries as a whole can be eye-opening. Take laundry care products as an example. We expect to see more sales growth of these products in São Paulo than in either France or Malaysia over the next decade.

Yet, disappointingly, most companies are still not looking at cities as they calibrate strategy. A new McKinsey survey finds that less than one in five executives is making location and resource decisions at the city, rather than the country, level—and respondents did not expect this low share to increase over the next five years. Of those surveyed, 61 percent say that their executives do not plan at the city level because cities are perceived as “an irrelevant unit of strategic planning.”⁸ There are business decisions for which city-level intelligence may matter little. Nationwide business or public-sector sales accounts with limited consumer contact, or decisions about where to locate plant in resource-intensive industries are examples. But for companies whose ultimate customers are consumers, the capacity to understand specific urban markets enables more effective decisions on pricing, channels, and marketing, and is an asset for identifying the right talent and relationships.

Even those companies that arm themselves with the detailed city-level knowledge to identify the most promising markets for their products then need to allocate resources efficiently and master the art of execution in diverse and rapidly evolving emerging markets.

THE POLICY AGENDA DIFFERS IN DEVELOPED AND EMERGING CITIES

Rapidly growing cities in the developing world face a complex and challenging managerial task in keeping pace with their expanding populations and their rising expectations. To avoid constraints on their growth, cities need to be able to plan the urban environment for sufficient housing and effective transportation, ensure that sufficient finance is available to support both operational and capital spending of electricity, telecommunications, water, and other services, and, through smart regulation, provide an environment that encourages entrepreneurialism and business investment.⁹ Cities that fail to meet the aspirations of the millions who are migrating in search of better opportunities run the risk of congestion, pollution, and insufficient public services becoming barriers to growth. Growth has already slowed down in many megacities around the globe because they have not kept pace with the needs of their expanding populations.

8 “Relocating for growth,” McKinsey Global Survey, was conducted in February 2012. The survey received responses from 2,962 executives representing the full range of regions, industries, and company sizes. To adjust for differences in response rates, we weighted the data by the contribution of each respondent’s nation to global GDP.

9 Richard Dobbs, Jaana Remes, and Jonathan Woetzel, *Strengthening the foundations of emerging cities*, McKinsey on Society, April 2012 (www.mckinseysociety.com/strengthening-the-foundations-of-emerging-cities). MGI has also discussed urban policy extensively in its reports on urbanization in China, India, Latin America, and the United States. Detailed policy discussions are beyond the scope of this particular report.

Successful management of growing cities is no simple task, and cities vary widely in how well they are able to handle the evolving demands on them—one reason that the fortunes of individual cities diverge. To deliver the benefits of economies of scale while minimizing the hazards of rapid growth, cities need to have professional planning and coordination, capable and accountable governance, and sustainable and responsible fiscal management.

Most developed regions have already reaped the majority of economic benefits from urbanization, and city leaders are more likely to be grappling with growth that is too slow rather than growth that is so rapid as to make its management difficult. In the near term, many cities are struggling to overcome deleveraging and persistent unemployment. In the longer term, slower population growth, aging, and increasing global competition are creating headwinds against growth. As we have observed in the past, some cities will outperform their peers while others will decline.¹⁰ How individual cities will fare depends on how well they are positioned to take advantage of—or mitigate the negative impact of—the relentless trends shaping their economic environment.

The first step for cities in developed regions is to understand their current strengths and weaknesses, as well as the impact of demographic and other trends on their prospects. Chicago, for example, has launched a major effort to compile a fact-based profile of the city's strengths and weaknesses as the basis for a new growth strategy.¹¹ Cities then need to translate the audit into tangible initiatives that matter to citizens and businesses. As the balance of global economic power shifts to emerging cities, those urban centers that have good connections—or build them—with the fastest-growing cities in the developing world will be in a better position to take advantage of the opportunity they offer. Cities can also find ways to limit the impact of unfavorable trends.

The way policies and strategic plans are carried out is a critical success factor for national, regional, and local economic development plans, particularly given today's weakening public finances. To sustain and improve their services, most cities will need to be able to do better with less.¹² Involving the private sector can help bring in expertise as well as intelligence about what constraints may be limiting their growth in a particular city and how to overcome them.

¹⁰ *Urban America: US cities in the global economy*, McKinsey Global Institute, April 2012 (www.mckinsey.com/mgi).

¹¹ World Business Chicago, *A plan for economic growth and jobs*, draft update, March 2012.

¹² Francois Bouvard et al., *Better for less: Improving public sector performance on a tight budget*, McKinsey Center for Government and McKinsey Global Institute, July 2011.

1. The global economic balance is shifting to emerging cities

Urbanization is not a modern phenomenon—it has dramatically boosted incomes and driven shifts in economic power for 300 years. In the 18th and 19th centuries, the shift to living in cities underpinned the industrial revolutions of Europe and the United States and those regions' rise to global economic and political power. Now urbanization is transforming the developing world. What is dramatically different is the unprecedented size and scale of today's urban shift.

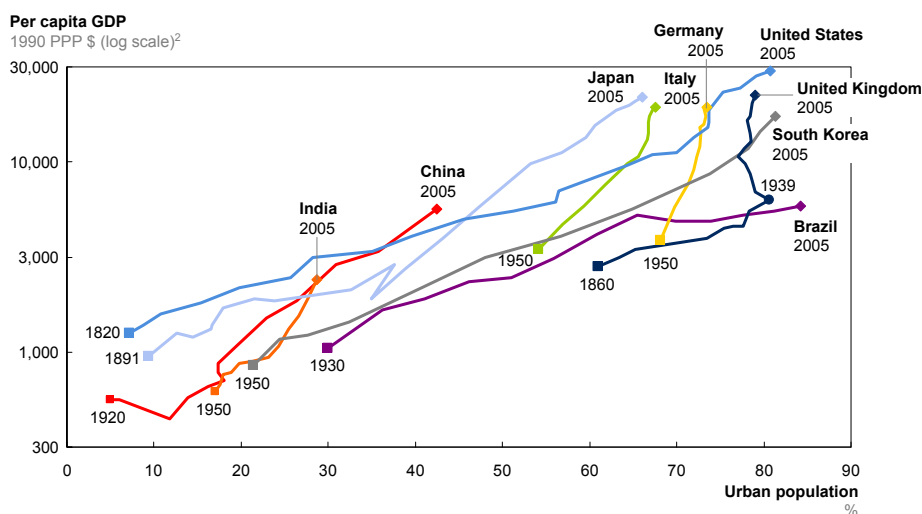
CITIES MATTER FOR ECONOMIC GROWTH

Cities dominate global economic activity, even more than their populations would suggest, because of powerful economies of scale. Urbanization and per capita GDP have tended to move in close synch (Exhibit 1).¹³

Exhibit 1

Per capita GDP has risen in tandem with increases in the urbanization rate

Per capita GDP and urbanization¹



1 Definition of urbanization varies by country; pre-1950 figures for the United Kingdom are estimated.

2 Historical per capita GDP series expressed in 1990 Geary-Khamis dollars, which reflect PPP.

SOURCE: Population Division of the United Nations; Angus Maddison via Timetrics; Global Insight; Census reports of England and Wales; Honda in Steckel & Floud, 1997; Bairoch, 1975

¹³ The decline in the share of urban population of the United Kingdom between 1939 and 1970 is an exception to the broad pattern. This was a period when Green Belt laws were introduced and expanded with the goal of restricting urban growth.

For thousands of years, cities have offered higher average standards of living than those available in surrounding rural areas. Economic historians estimate that the average income of city dwellers ranged from 1.5 to 3 times that of their rural counterparts at least until the Industrial Revolution changed the socioeconomic structure of Western Europe.¹⁴ Even today, average urban incomes are roughly three times those of their rural counterparts in both China and India. These income gaps reflect the capacity of cities to attract skilled workers and productive businesses and economies of scale that enable workers in cities to be more productive and reduce the costs of supplying basic services.¹⁵ McKinsey research in India suggests that it can be 30 to 50 percent less expensive for large cities to deliver basic services including water, housing, and education than it is in more sparsely populated rural areas. International airports, for instance, are economically viable only when they serve large urban centers. An estimated \$5 million of capital expenditure per daily flight is necessary in a city of five million people, compared with nearly \$13 million in a city whose population is less than one million. But cost is not the only issue. Ensuring the necessary quality of services such as education can be more difficult in a rural setting. In India, rural school teacher absentee rates have run at nearly 25 percent.¹⁶

Cities attract people with the skills needed to power growth. The average education level of urban dwellers is higher than the level among those living in rural areas. In India, we see higher educational attainment increasing five times as fast in urban households as in rural households. In China, more than one-quarter of Shanghai's population holds a college degree. Not only does the city produce more than 100,000 home-grown graduates a year, but it also pulls in talent from the rest of the nation and from overseas. The city's expatriate population numbers half a million.

All these factors account for the fact that the world's cities already make an overwhelming contribution to the global economy. Large cities are home to 38 percent of the world's population but generate 72 percent of global GDP.¹⁷ However, urbanization is happening at very different speeds in different regions—partly because they are in different phases of the process. The United States and Europe made the rural-to-urban transition long ago. Latin America, too, is in a relatively mature phase of its urban journey. China is right in the middle of its sweeping urbanization, while India is in the early stages of the process (see Box 1, “The maturity of urbanization varies from region to region”).

14 See, for example, Ian Morris, *Social development*, October 2010 (www.ianmorris.org/socdev.html); Angus Maddison, *Monitoring the World Economy 1820–1992*, 1995; and Walter Scheidel and Steven J. Friesen, “The size of the economy and the distribution of income in the Roman Empire,” Version 2.0, *Journal of Roman Studies*, Vol. 99, January 2009.

15 There is a large body of literature on urban economics focused on assessing the nature and size of urban economies of scale. See, for example, Edward L. Glaeser and Joshua D. Gottlieb, *The wealth of cities: Agglomeration economies and spatial equilibrium in the United States*, NBER Working Paper No. 14806, March 2009; World Bank, *World development report 2009: Reshaping economic geography*; and Indermit S. Gill and Chor-Ching Goh, “Scale economies and cities,” *World Bank Research Observer*, Vol. 25, No. 2, 2010.

16 M. Kremer et al. “Teacher absence in India: A snapshot,” *Journal of the European Economic Association*, Vol. 3, No. 2–3, April May 2005.

17 We define cities as broader metropolitan areas that include both a core city and surrounding metropolitan regions integrated into a connected urban region. Large cities include metropolitan areas with 150,000 or more inhabitants in developed regions and 200,000 or more inhabitants in developing regions.

Box 1. The maturity of urbanization varies from region to region

Regions are in different phases of their transition from largely rural to mostly urban populations. This explains both wide variations in the urban share of GDP in the regions today and anticipated differences in the future (Exhibit 2).¹

The United States urbanized in the 19th century, and today 80 percent of the population lives in large metropolitan areas, which generated almost 85 percent of US GDP in 2010. Despite the fact that Britain started to undergo its urban shift in the late 18th century, Western Europe as a whole is less urban today than the United States with less than 60 percent of its population living in large cities. Interestingly, the economic weight of urban America is largely due not to its two megacities of New York and Los Angeles but rather to its broad swath of more than 250 middleweight cities, compared with just over 180 such cities in Western Europe. It is differences in the concentration and performance of the cities of these two regions that account for about three-quarters of the per capita GDP lead that the United States holds over Western Europe today.²

Latin America was a relatively early urbanizer with enormous growth in its largest cities during the second half of the 20th century. The 289 Latin American cities in MGI's Cityscope are home to 55 percent of the region's population and produce more than 75 percent of its GDP today. But many of the region's dominant megacities are beginning to become victims of their own success in the form of traffic gridlock, urban sprawl, and pollution, making them less attractive for individuals and companies. Instead, we expect medium-sized cities to be the region's growth dynamos in the years ahead.³

China's urbanization is today in full flow. Over the past decade alone, the share of people living in large cities has increased from 36 percent to nearly 50 percent. If current trends hold, China's urban population is expected to expand from approximately 570 million in 2005 to 925 million in 2025—an increase larger than the entire current population of the United States.⁴ In 2010, China's metropolitan regions accounted for 78 percent of the nation's GDP. India is also urbanizing, but the process is at a much earlier stage; today, only 30 percent of the population lives in cities of all sizes and fewer than one in five lives in its large cities. However, we expect India's cities to generate half of the nation's GDP growth to 2025.⁵

1 Andrés Cadena, Richard Dobbs, and Jaana Remes, "The growing economic power of cities," *Journal of International Affairs*, Vol. 65, No. 2, Spring/Summer 2012.

2 *Urban America: US cities in the global economy*, McKinsey Global Institute, April 2012 (www.mckinsey.com/mgi).

3 *Building globally competitive cities: The key to Latin American growth*, McKinsey Global Institute, August 2011 (www.mckinsey.com/mgi).

4 *Preparing for China's urban billion*, McKinsey Global Institute, February 2009 (www.mckinsey.com/mgi).

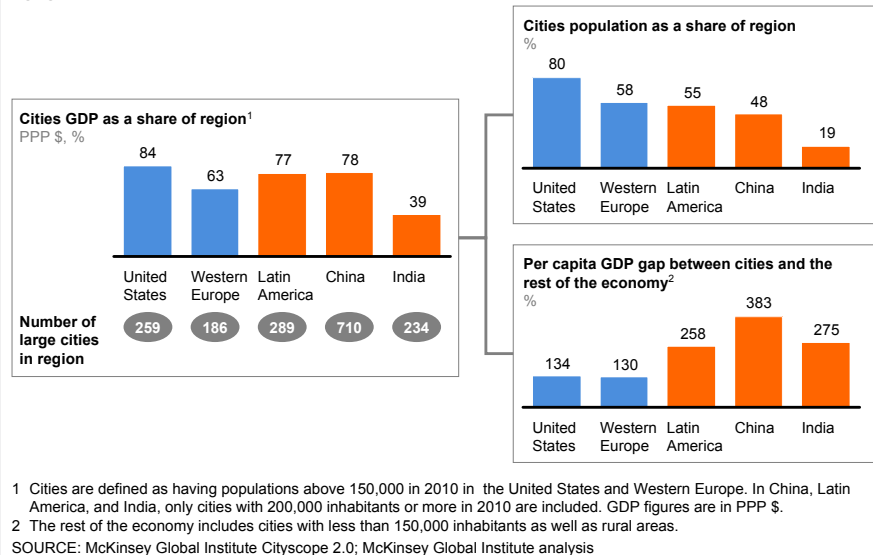
5 *India's urban awakening: Building inclusive cities, sustaining economic growth*, McKinsey Global Institute, April 2010 (www.mckinsey.com).

Box 1. The maturity of urbanization varies from region to region (continued)

Exhibit 2

The relative economic weight of large cities varies across regions

2010



TODAY'S MASS URBANIZATION IS UNPRECEDENTED IN SPEED AND SCALE—SHIFTING THE GLOBAL ECONOMIC BALANCE EAST AND SOUTH

It is not hyperbole to say that we are observing the most significant economic transformation the world has seen. China is urbanizing on 100 times the scale of Britain in the 18th century and at more than ten times the speed. As a result, the global balance—measured by the earth's economic center of gravity—is shifting back to Asia and at a speed never before witnessed.

For thousands of years, most people lived on close to subsistence incomes, and global economic power spread around the globe in a pattern that reflected the world's population. Population growth and migration were slow, and the earth's economic center of gravity was relatively stable for almost 2,000 years (Exhibit 3).¹⁸ But the industrialization and urbanization of Europe and the United States dramatically changed the global economic map, transforming these regions into the major economic powers in the world. Until the mid-20th century, there was a rapid shift in the earth's balance toward Europe and later to the United States. The rise of Japan helped change the direction, particularly in the 1980s. However, it has been in the most recent decade of 2000 to 2010 that we

18 To understand the shifting economic balance, we have calculated the globe's center of economic gravity by weighting national GDP by each nation's geographic center of gravity. We have then drawn a line from the center of the earth through this center of gravity to the surface. See the appendix for details of MGI's center of gravity analysis. Previous approaches to assessing the world's shifting economic center of gravity include Homi Kharas, *The emerging middle class in developing countries*, OECD, January 2010; and Danny Quah, "The global economy's shifting center of gravity," *Global Policy*, Vol. 2, No. 1, 2011.

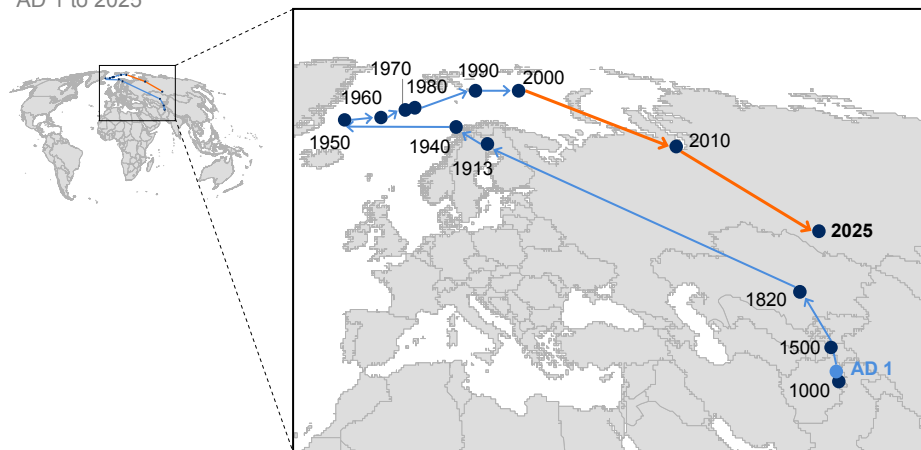
have observed the fastest rate of change in global economic balance in history. During this period, the world's economic center of gravity has shifted by about 140 kilometers per annum—about 30 percent faster than in the period after World War II when global GDP shifted from Europe to North America.

Exhibit 3

By far the most rapid shift in the world's economic center of gravity happened in 2000–10, reversing previous decades of development

Evolution of the earth's economic center of gravity¹

AD 1 to 2025



¹ Economic center of gravity is calculated by weighting locations by GDP in three dimensions and projected to the nearest point on the earth's surface. The surface projection of the center of gravity shifts north over the course of the century, reflecting the fact that in three-dimensional space America and Asia are not only "next" to each other, but also "across" from each other.

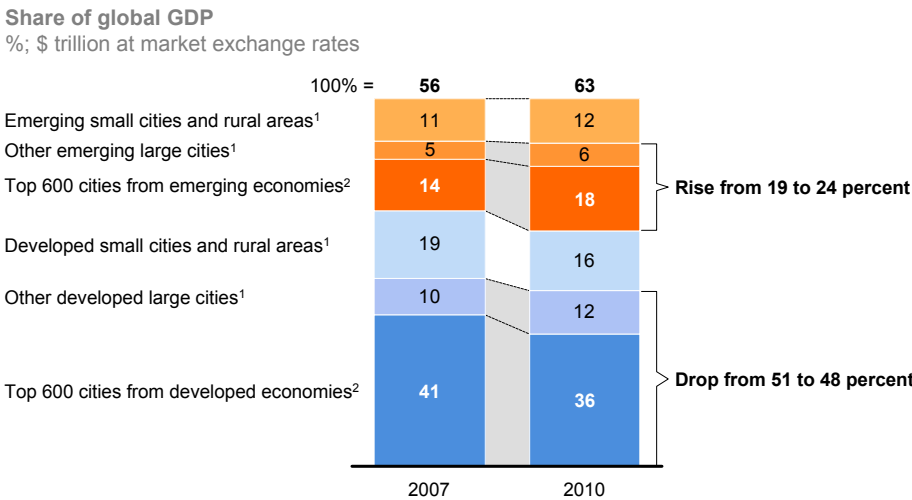
SOURCE: McKinsey Global Institute analysis using data from Angus Maddison; University of Groningen

In the past three years alone, a period in which recession constrained growth in the cities of developed economies even while urbanization proceeded at a furious pace in the emerging world, there has been a decisive shift to the East and South. Between 2007 and 2010, the GDP of large cities in emerging markets increased from 37 percent of their counterparts in developed economies to 50 percent (Exhibit 4). During the same period, in the East, the combined GDP of China's large cities increased from 20 percent of that of large cities in the United States to 37 percent.¹⁹ Three more Chinese cities vaulted into the megacity bracket with populations of ten million or more—that's one new megacity a year! Contrast this with the much slower pace of the mature urban shift in the developed world. In the period to 2025, developed regions are expected to create only one new megacity—Chicago in the United States. In the South, the GDP of Latin America's cities has risen from 26 percent of that of their European counterparts to 37 percent in these three years measured at market exchange rates.

In coming years, we expect this shifting balance of urban economic power to the East and South to continue, albeit at a slower speed.

¹⁹ This change reflects the continuing urbanization and rapid per capita GDP growth in China during the years when the United States was in recession as well as the appreciation of the renminbi against the dollar.

Exhibit 4
The contribution of large cities in developed economies to global GDP has declined from 51 percent in 2007 to 48 percent in just three years



1 Cityscope increased its large city coverage from 2,404 cities in 2007 to 2,657 in 2010, primarily as a result of new cities crossing the 200,000-inhabitant threshold.
2 The City 600 is the group of 600 cities expected to deliver 60 percent of GDP growth by 2025. The composition of this group of cities differs between 2007 and 2010 because of changes in expected city growth reflecting updated data and projections.
SOURCE: McKinsey Global Institute Cityscope 2.0

THE CITY 600 WILL GENERATE NEARLY 65 PERCENT OF GLOBAL GROWTH—WITH ALMOST HALF FROM 440 EMERGING MARKET CITIES

Urban growth is already, and will continue to be, highly concentrated in just a few hundred cities. Today, the City 600—the top 600 dynamic metropolises by contribution to global GDP growth—are home to just over 20 percent of the world’s population but account for \$34 trillion, or more than half, of global GDP. Between 2010 and 2025, we expect the City 600’s combined GDP to increase by more than \$30 trillion and thereby contribute nearly 65 percent of global GDP growth.²⁰ The world’s very largest megacities are no longer the major drivers of global growth. We estimate that today’s 27 megacities will contribute about 15 percent of global growth to 2025, proportional to their economic weight today—and that two-thirds of worldwide growth will come from middleweight cities.

20 The GDP growth projections are based on MGI’s Cityscope 2.0 projections that assume global GDP to 2025 to expand by compound average rate of 4.0 percent per annum; see a more detailed methodological discussion in the technical appendix. While individual city projections are inherently subject to wide bands of uncertainty, the broad patterns across types of cities or regions in the scenario we describe are directionally robust across reasonable range for key assumptions.

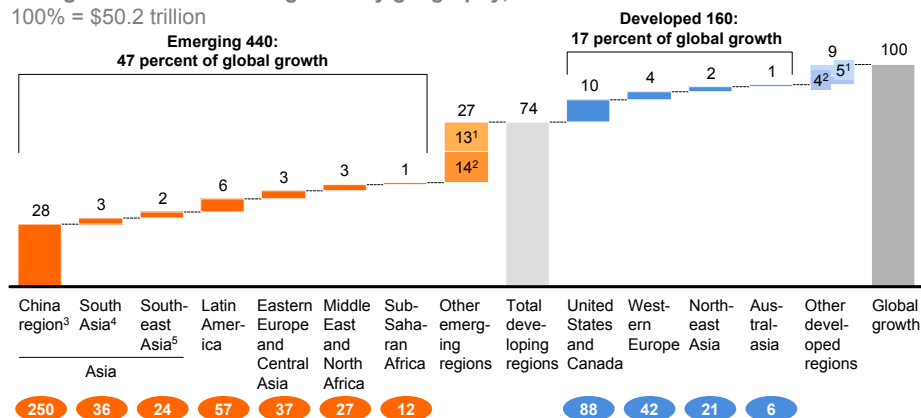
The most dramatic story of today and the next few years is the shift in economic clout from cities in the developed world to those of emerging markets. Only just over 440 cities in developing countries—the Emerging 440—will generate an estimated 47 percent of global growth between 2010 and 2025 (see Box 2, “Meet the Emerging 440”). Only 20 of the Emerging 440 are megacities, the rest being middleweights. A little over half of the Emerging 440—242 in total—are in mainland China, and these cities alone will contribute more than one-quarter of the total growth (Exhibit 5). But there are rising urban centers in all emerging regions. There are 57 Latin American cities in this dynamic group, 30 of them in Brazil and 10 in Mexico. We expect these cities to contribute 6 percent of global GDP growth, roughly the same share expected from City 600 cities in Western Europe, Japan, and South Korea combined. Africa and the Middle East together have 39 cities in the Emerging 440, and Eastern Europe and Central Asia 37.

This is not to say that the cities of developed economies will be unimportant in the world. If Tokyo, New York, and London were nations, they would rank 9th, 14th, and 17th in the world on the basis of their GDP at market exchange rates in 2010. So, even if these developed world megacities were to grow at only moderate rates, their GDPs would still rise significantly. In fact, one in five of City 600 cities is in North America or Western Europe, and we expect them to generate about 14 percent of global growth to 2025. We see the collective GDP of the large cities of the United States increasing by almost \$6 trillion to 2025, generating 10 percent of global GDP during this period.²¹

Exhibit 5

The Emerging 440 is expected to generate 47 percent of global GDP growth to 2025

GDP growth at real exchange rate by geography, 2010–25
100% = \$50.2 trillion



1 Small cities and rural areas.

2 Other large cities not included in the City 600.

3 Includes cities from China (Hong Kong and Macau) and Taiwan.

4 Includes cities from Afghanistan, Bangladesh, India, Pakistan, and Sri Lanka.

5 Includes cities from Cambodia, Indonesia, Laos, Malaysia, Myanmar, Papua New Guinea, Philippines, Singapore, Thailand, and Vietnam.

NOTE: Numbers may not sum due to rounding.

SOURCE: McKinsey Global Institute Cityscope 2.0

21 *Urban America: US cities in the global economy*, McKinsey Global Institute, April 2012 (www.mckinsey.com/mgi).

Box 2. Meet the Emerging 440

What do we know about the growth powerhouses of the Emerging 440 group? We expect the 20 megacities to generate almost \$6 trillion of GDP growth by 2025—that's a roughly 7.6 percent annual compound rate that far outpaces the 4 percent rate anticipated for the global economy as a whole. Among the 20 megacities are São Paulo in Brazil; Moscow in Russia; Mexico City in Mexico; Istanbul in Turkey; Lagos in Nigeria; and Dhaka in Bangladesh. Of the remaining 14 megacities, six are in China and three in India.¹

The Emerging 440 middleweights are a diverse group that includes cities in 57 countries and spans all continents except Oceania. Together, they are expected to increase their GDP at double the global average GDP growth rate at an 8 percent annual compound rate. We estimate that these cities will account for almost \$18 trillion in GDP growth by 2025, or 35 percent of the world's expected GDP growth during this period.

China alone has 236 middleweight cities in the Emerging 440. These include Haerbin, a city of 5.9 million people with a strong equipment manufacturing industry and the headquarters of Haerbin Electric Corporation that generates half of China's hydro and thermal power; Lanzhou, with 2.6 million inhabitants, a major inland transport hub; and Qinhuangdao, a city of 1.2 million people and China's largest coal-shipping port.

Latin America has 53 middleweights in the Emerging 440. They include Belo Horizonte, Brazil's third-largest city in terms of its population and the capital of the rich agricultural and mining state of Minas Gerais; Puebla, Mexico's fourth-largest city with more than 2.6 million inhabitants, which is a center of automotive manufacturing; and Cali in Colombia, which is the country's third-largest city and well connected to the nation's main Pacific port.

There are 28 Indian middleweight cities in the group. The best known of them is Bangalore, home to more than eight million inhabitants and the center of India's information and technology industry. But the Emerging 440 also includes less well-known cities such as Pune, a city in the state of Maharashtra with a strong automotive and pharmaceutical industry, and Kochi, a rapidly growing port city in the southern state of Kerala.

Africa and the Middle East together contribute 37 middleweights to the Emerging 440. These include Angola's capital Luanda, the third-largest Portuguese-speaking city in the world; and resource-rich cities such as Kumasi, which produces almost half of Ghana's timber; Port Harcourt, Nigeria's center of oil refining; and Doha, the capital of Qatar, which has benefited from oil wealth. Kumasi and Port Harcourt each have nearly two million inhabitants, while Doha is home to more than one million people.

¹ The 20 megacities in the Emerging 440 are, from highest to lowest population, Shanghai, Mexico City, São Paulo, Beijing, Mumbai, Delhi, Chongqing, Dhaka, Kolkata, Karachi, Buenos Aires, Manila, Rio de Janeiro, Moscow, Tianjin, Guangzhou, Cairo, Istanbul, Lagos, and Shenzhen.



The urbanization wave in emerging markets is one positive force for growth in the world economy at a time when a number of short- and long-term headwinds are bearing down on growth in mature economies. The urban shift is changing the balance of the world economy at an extraordinarily rapid speed, and governments, investors, and businesses need to ensure that they understand, and respond to, these events. In the next chapter, we discuss the game-changing by-product of urbanization—the emergence of nearly two billion new consumers in the world economy, about one billion of them in emerging market cities.

2. Expanding urban economies are creating waves of new consumers

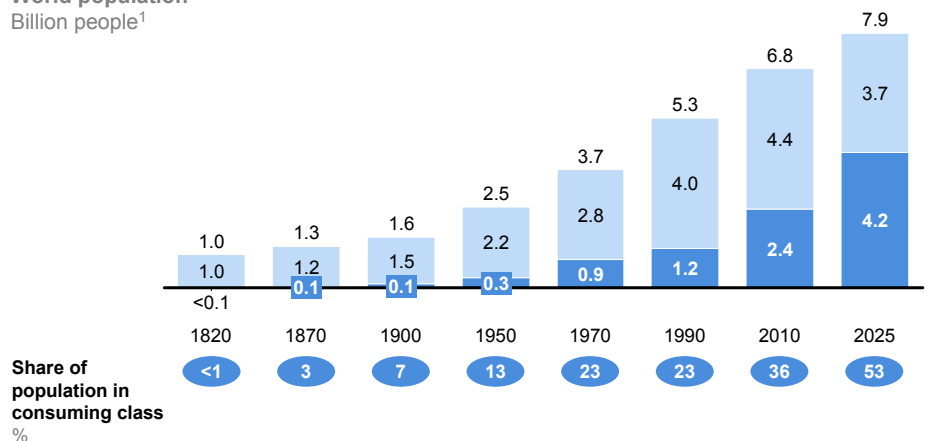
The urban world is far more than a question of geography—it is a profound economic force for growth and rising prosperity. Beyond hauling millions of people out of poverty, the shift to cities is creating waves of new consumers who promise burgeoning markets for businesses.²² It is this rise in the number of people in the consuming classes—segments of the population that have income sufficient to buy not just basic necessities but also discretionary goods and services—that fuels rapid economic growth. We include in this group individuals with annual disposable income of more than \$3,600, or \$10 per day, at PPP.²³

From 1970 to 1990, the consuming classes expanded by around 300 million people, growth of 1.7 percent per annum. After 1990, that rate of growth more than doubled to 3.5 percent per year as the number of consumers rose by 1.2 billion in the next two decades. To 2025, we expect to see another 1.8 billion more people worldwide join the consuming class—annual growth of 3.7 percent (Exhibit 6). Mass urbanization is fueling this acceleration.

Exhibit 6

From 1990 to 2025, three billion people are set to join the world's consuming class, of which more than half will live in large cities

World population
Billion people¹



1 Historical values for 1820 through 1990 estimated by Homi Kharas; 2010 and 2025 estimates by McKinsey Global Institute.
2 Defined as people with daily disposable income above \$10 at PPP. Population below consuming class defined as individuals with disposable income below \$10 at PPP.
NOTE: Numbers may not sum due to rounding.
SOURCE: Homi Kharas; Angus Maddison; McKinsey Global Institute Cityscope 2.0

22 See Martin Ravallion, Shaohua Chen, and Prem Sangraula, *New evidence on the urbanization of global poverty*, World Bank Development Research Group, March 2007. See also *Urbanization: A majority in cities*, United Nations Population Fund, www.unfpa.org/pds/urbanization.htm.

23 The lower bound is broadly consistent with Homi Kharas's definition of the lower bound of middle class, although our metric is disposable income and Kharas's is consumption. See Homi Kharas, *The emerging middle class in developing countries*, OECD, January 2010. (www.oecd.org/dataoecd/12/52/44457738.pdf). Estimates are based on 2005 PPP dollars.

EMERGING MARKET CITIES WILL BE HOME TO ONE BILLION NEW CONSUMERS

We expect to see just over one billion more people in emerging market cities worldwide become members of the consuming classes.²⁴ By 2025, the world is likely to have around 2.6 billion people living in cities with enough income to buy the very basic necessities and to have some discretionary income to spend on consumer goods and services. That's a rise of 70 percent from today (see Box 3, "The rising consuming class").

More than 600 million of the new members of the consuming class will live in Emerging 440 cities alone, truly transforming the world economy (Exhibit 7). In 2010, nearly 55 percent of the Emerging 440 population had access to discretionary consumption and were part of the consuming class. By 2025, that share is likely to rise to 80 percent. In short, four out of five inhabitants in Emerging 440 cities will have crossed the income threshold at which they become part of the broad pool of global consumers.

Box 3. The rising consuming class

We define the consuming class as individuals with disposable income of more than \$10 a day—or over \$3,600 per annum—at 2005 PPP. Our purpose is to focus on the segment of the population with enough income for discretionary spending on a range of consumer products. The threshold of \$10 a day corresponds to the income level at which the consumption of many consumer goods begins to grow rapidly. This definition is broadly consistent with work by others, including Surjit Bhalla and Homi Kharas.¹

Others have proposed different definitions for measuring the rise of emerging market standards of living, commonly characterized as the growing "middle class." There are many ways to define the boundaries of the middle class. Martin Ravallion of the World Bank defines the middle class as individuals earning between \$2 and \$13 a day at 2005 PPP, highlighting the changing share of the segment of the population just above the poverty line. The Asian Development Bank uses consumption of \$2 to \$20 per day in PPP terms as its definition of middle class.² Others, including William Easterly of New York University, define the middle class as the population between the first and fifth income quintile within a country. This approach defines the middle class relative to each nation's income distribution rather than using an absolute level of income or consumption. The right solution depends on the purpose of the analysis. Our method reflects our focus on understanding rising consumer markets in emerging economies.

1 Surjit Bhalla defined the threshold for entering the middle class as income of \$10 per day, as cited in "Burgeoning bourgeoisie," *The Economist*, February 12, 2009. The \$10 per day consumption figure was also used as the lower bound of middle class in Homi Kharas, *The emerging middle class in developing countries*, OECD, January 2010.

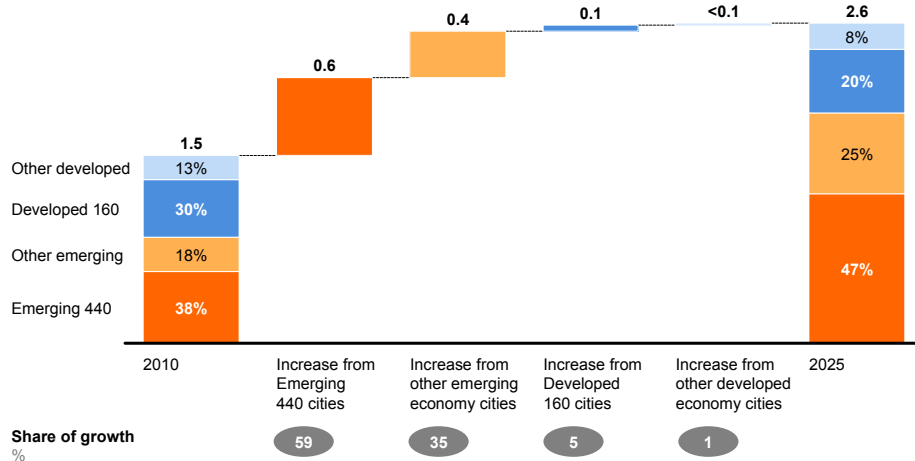
2 Asian Development Bank, *Key indicators for Asia and the Pacific 2010*, 2010.

24 Emerging market metropolitan areas contribute 95 percent of the expected increase in consuming class population across all large cities. We expect the number of consumers living in large cities in developed regions to increase by roughly 66 million, bringing the total increase in urban consumers close to 1.1 billion.

Exhibit 7**Emerging market cities will be home to 95 percent of new urban consuming classes—the Emerging 440 alone will account for 60 percent**“Consuming class”¹ population in large cities, 2010–25

ESTIMATES

%; billion people



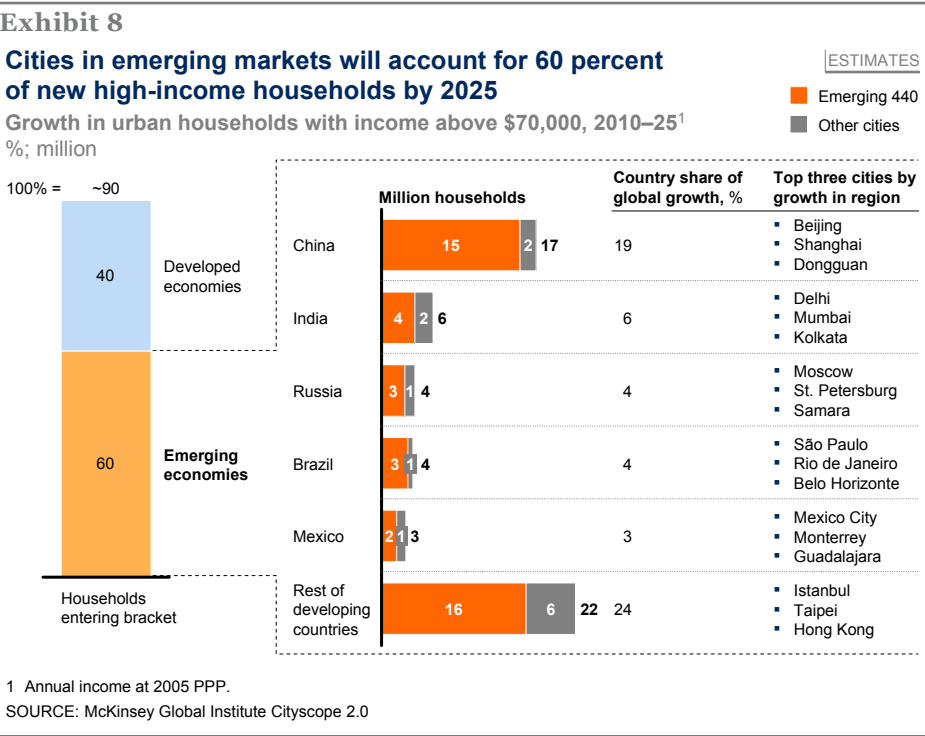
1 Defined as people with daily disposable income of \$10 or more at 2005 PPP.

NOTE: Numbers may not sum due to rounding.

SOURCE: McKinsey Global Institute Cityscope 2.0

As incomes improve, the shape of the income distribution within the consuming classes will change. In the Emerging 440, the share of households in higher middle-income segments—with an annual income above \$20,000 at PPP—will rise from 35 percent of all households to more than 55 percent. This underlines the role of cities as handmaidens to rising prosperity.

The shift in the global balance is not limited to middle-income segments. Emerging cities will be home to 60 percent of global growth in the number of urban high-income households, defined as having an annual income of more than \$70,000 at PPP. The number of such households will triple from just below 20 million households in 2010 to more than 60 million households in the Emerging 440 cities by 2025. China alone will account for 19 percent of new high-income households, India 6 percent, Russia and Brazil 4 percent each, and Mexico 3 percent (Exhibit 8). These five countries alone will be responsible for an increase of more than 33 million households—and 80 percent of the increase will be in Emerging 440 cities.



GROWING CONSUMER CLASSES WILL SPUR RAPID DEMAND GROWTH

Because so many millions more people will earn incomes in consuming segments and the incomes of consuming households are rising, demand for many goods and services will increase rapidly. In all large cities, we expect household consumption to rise by more than \$20 trillion to 2025—of which more than \$14 trillion will be in the large cities of emerging markets. In the Emerging 440 alone, we see consumption increasing by approximately \$10 trillion.²⁵

Growth in demand for many products will exceed the rate of expansion of the consuming classes for two main reasons. First, incomes are rising faster than the number of households and individuals in consuming classes (Exhibit 9). Overall disposable income is likely to grow particularly rapidly among households with annual disposable income of \$20,000 or more at PPP—a compound annual rate of around 7.6 percent a year among the households of the Emerging 440, we estimate. This means that the collective capacity to spend across all income segments is expanding at twice the rate that the rising number of people or households would indicate.

Second, and more important, higher shares of the populations of many emerging cities are moving into income segments where the consumption of many goods and services accelerates. A typical product adoption curve—or “S-curve”—begins flat (low-affordability income), then climbs rapidly (take-off income), and finally flattens out again (saturation income) as products penetrate households

25 We estimate total household consumption across cities by applying the private consumption share of GDP per country, using the GDP composition in 2010, to our GDP estimates for 2010 and 2025. Our approach implicitly assumes that the private consumption share of GDP will remain constant through 2025. Given the evidence from developed economies in the past, the share of private consumption may increase with income, leading to higher projected growth in consumption.

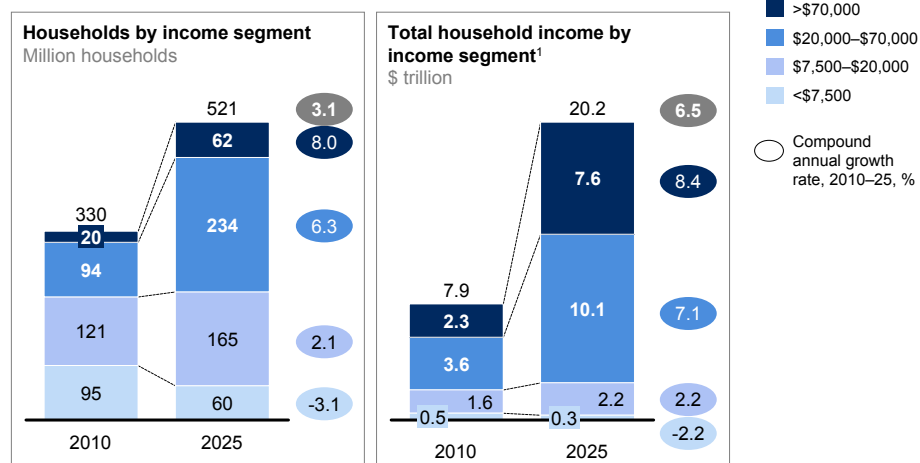
(Exhibit 10). In the steep phase, small changes in income can result in large changes in demand—it is possible to see income elasticities of 3 or 4 for specific product categories. In China and India, whose urbanization is occurring on a very large scale, we are seeing the incomes of a large number of consumers hit a “take-off” level at which the consumption of many goods and services picks up speed rapidly.²⁶

Exhibit 9

Household income pools are poised to grow at twice the rate of the number of households in the Emerging 440

Emerging 440

ESTIMATES



1 Total household income = the estimated average income in an income category times that category's households. Average incomes of categories estimated using income distribution from a segmentation of ten income brackets in 2010 and 2025.

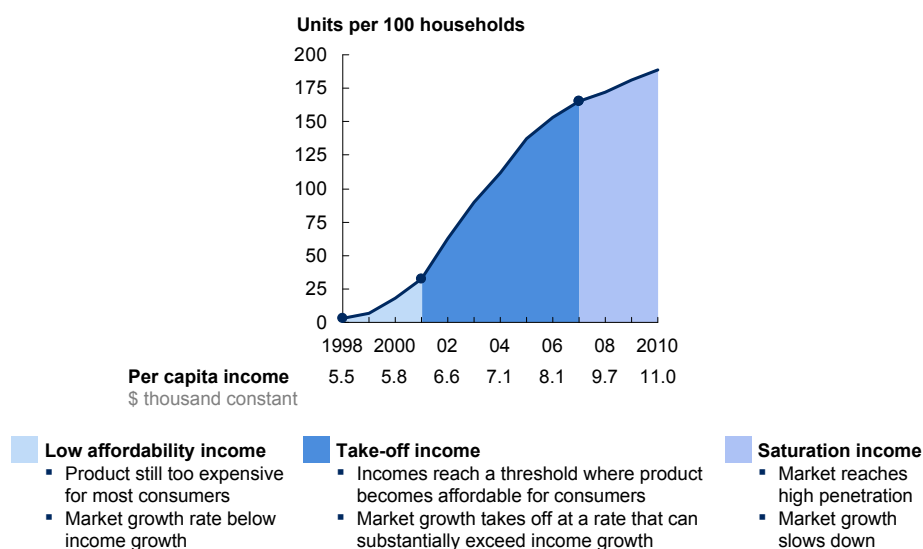
NOTE: Numbers may not sum due to rounding.

SOURCE: McKinsey Global Institute Cityscope 2.0

Exhibit 10

Consumer goods tend to follow an adoption S-curve as incomes rise

China example: Penetration of mobile telephones, 1998–2010



SOURCE: Chinese National Bureau of Statistics; McKinsey Global Institute analysis

26 For more on the patterns of consumer packaged goods across income groups and cities, see Claudia Benshimol Severin et al., *The global growth compass: Locating consumer-industry growth opportunities in emerging markets*, McKinsey & Company, November 2011.

By definition, the lower limit of the consuming class segment is the income level at which people can afford to spend money on discretionary goods and services. This is the point at which they no longer use all their disposable income on necessities such as basic food, shelter, and clothing. It is therefore at this income threshold that a broad range of consumer goods from packaged food and beverages to durable goods such as television sets and refrigerators go through their steep adoption phases. For example, in India, discretionary spending has risen from 35 percent of average household consumption in 1985 to 52 percent in 2005. MGI expects this share to reach 70 percent of average household consumption by 2025.²⁷

GROWTH PATTERNS WILL VARY ACROSS PRODUCTS AND SERVICES

Not all products have identical adoption paths or experience parallel market growth and geographic shifts in demand. These are the three main reasons behind the variation: (1) goods and services differ in the income level at which their penetration starts to take off; (2) goods and services vary in the form of the adoption curve and the rate of growth of mature, well penetrated markets; and (3) there are geographic differences in the attractiveness of products to local consumers.

1. As incomes rise, consumers choose where to spend their additional available income, and some products take off at lower incomes than others. Typical early-adoption categories include snack foods and bottled soft drinks that have low unit costs. Discretionary items such as beauty products take off at a slightly higher income, while more luxurious goods, such as fine wine and spirits, tend to start to accelerate in their adoption at much higher income levels. Consumption patterns in Beijing illustrate this pattern. For example, spending on dining out starts to take off at annual incomes of around 20,000 renminbi (about \$3,000) and is on a firm upward trajectory at around 60,000 renminbi (about \$9,000), while spending on transport and communications takes off strongly at 40,000 renminbi (about \$6,000). Wine, chocolate, and fruit juice enter a particularly steep part of the adoption curve at much higher household income of 120,000 renminbi (about \$17,600 at 2010 exchange rates). The take-off points for product demand varies across categories, as an examination of Chinese products shows.²⁸

²⁷ *The "Bird of Gold": The rise of India's consumer market*, McKinsey Global Institute, May 2007 (www.mckinsey.com/mgi).

²⁸ McKinsey Insights China, *2010 annual Chinese consumer study*, McKinsey & Company, August 2010.

Products within the same broad category can also vary widely in their adoption patterns. Home appliances are an example. Refrigerators are among the first purchases for households crossing into the consuming class. Household penetration of refrigerators starts to take off at an average annual per capita income of \$2,500 at PPP. By the time per capita income reaches \$6,000, more than four of every five households owns one of these appliances. But the penetration of washing machines takes off later. At a per capita income of \$10,000, only one-third of households on average across regions own a washing machine, and 80 percent penetration doesn't occur until per capita income reaches \$20,000 (Exhibit 11).

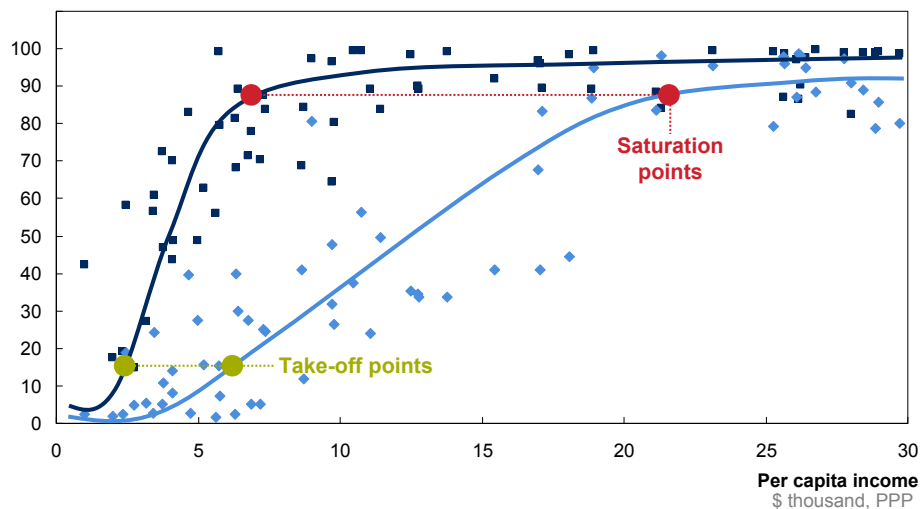
Many services tend to take off at higher income levels still. For example, leisure travel and retail banking services for deposits start climbing once per capita income reaches \$18,000 per annum (see Box 4, "The shifting global map of deposits").²⁹ Depending on where a product or service lies on the curve of consumer affordability and priorities, its growth and the geographic distribution of demand will vary from city to city.

Exhibit 11

The shape of the penetration curve varies across products, leading to very different market growth patterns

Household penetration by country, 2007

Penetration %



SOURCE: Euromonitor; McKinsey Global Institute analysis

29 Slower adoption of many consumer services is reflected in the aggregate share of service GDP that climbs slowly at later income levels. See *How to compete and grow: A sector guide to policy*, McKinsey Global Institute, March 2010 (www.mckinsey.com/mgi).

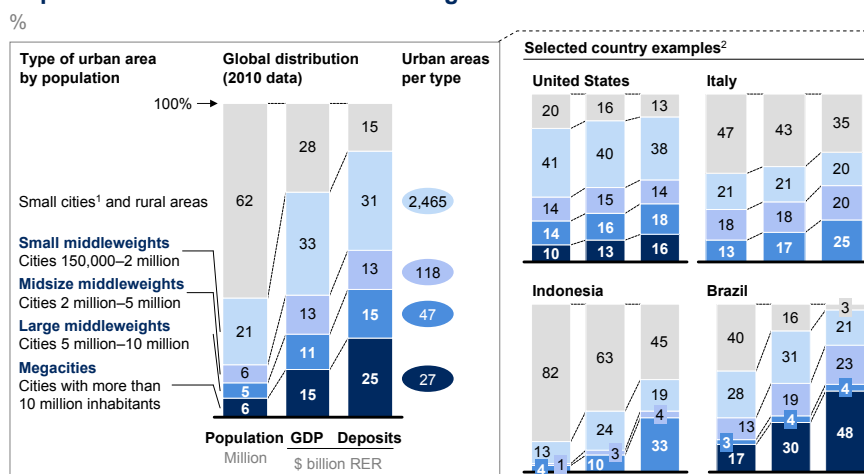
Box 4. The shifting global map of deposits

Deposits are an example of financial services that tend to take off at higher income levels than many consumer goods. Data across cities and countries suggest that the penetration of deposits starts to rise at around \$18,000 per capita income at PPP, and then continues to grow slightly faster than income without a clear saturation point.¹

However, deposits—and other products in financial services—are more concentrated than other types of products in a few leading cities in each country.² In Brazil, almost 50 percent of deposits are in São Paulo and Rio de Janeiro, more than 1.5 times the share of the combined GDP of these two cities of the overall GDP (Exhibit 12). This reflects corporate deposits pooled in central locations as well as a broader supply of financial service providers in leading cities.

Exhibit 12

Deposits are more concentrated in large cities than is GDP



1 Includes also small middleweight cities with no available data on deposits.

2 Selected among the 12 countries where deposits data by city are available for more than 90 percent of the population. Remaining countries with available data are France, India, Indonesia, Japan, Mexico, Portugal, South Korea, Spain, and Turkey.

NOTE: Numbers may not sum due to rounding.

SOURCE: National central banks; McKinsey Global Institute Cityscope 2.0

Concentration tends to decline in countries with higher per capita GDP. The top three cities in Mexico and Turkey generate between 60 and 70 percent of overall deposits, while the top three cities of the United States account for only 20 percent of the total.

We estimate that on current trends, the global pool of deposits is set to nearly double in the period to 2025. Given the concentration of deposits in major urban centers, the world's megacities are expected to account for 20 percent of growth in deposits—one-third more than their expected contribution to GDP growth. Nevertheless, middleweight cities in emerging markets will account for more than half of total global growth in deposits.

1 Available data on deposits at city level are limited in most countries, and differences in coverage and deposit definitions, as well as data reliability, vary widely across nations. However, the broad patterns described are consistent across multiple data sources and estimation methods.

2 Global capital market services are particularly concentrated. Even though there are almost 200 stock exchanges around the globe, just 24 cities represent almost 95 percent of global equity market capitalizations.

2. Products and services also vary in the shape of their adoption curve and the rate of growth of mature, well-penetrated markets. While refrigerators have a steep adoption curve and then a sharp slowdown in growth once a market reaches saturation, spending on clothing sustains its growth as incomes rise. Because clothing is a necessity in most climates, even the lowest-income segments allocate some of their income on clothing and then, as incomes rise, consumers tend to shift to higher-quality and more expensive branded apparel. There isn't a clear saturation level in high-income segments, thanks to luxury and couture offerings.
3. Geographic differences exist in the evolution of demand, sometimes due to cultural and religious differences. Many Indian households are vegetarian, and so meat consumption across income levels is lower, for instance. It is a similar story with sales of alcohol in regions that are home to a high share of Muslims. Demographics are another cause for regional differences. In Nigerian cities, one-third of the entire population is aged below 16 and sales of baby food are running at more than twice the global average at similar income levels. Climate also matters. For example, ice cream and chocolate have too short a shelf life to be viable in hot climates without reliable refrigerator capacity both at the transportation stage and in retail stores.

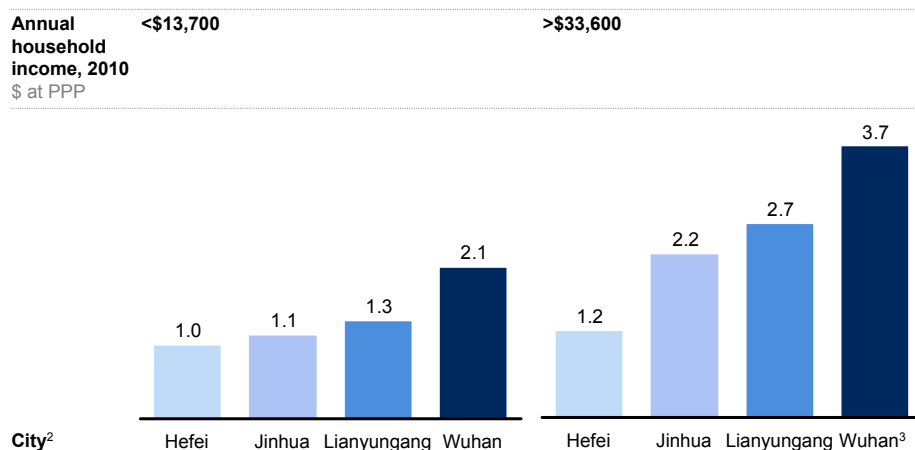
Varying consumer preferences in individual cities can mean very different spending curves even after adjusting for income differences. Take the example of yogurt consumption in China. Because of differences in regional consumer tastes, the typical household in Wuhan spends more on yogurt across income segments than do households in Hefei, Jinhua, or Lianyungang. The extra spending in Wuhan can be nearly twice the average consumption of the other three cities, depending on the income category (Exhibit 13). Such variances from city to city further underline the value of a detailed understanding of individual urban centers and their consumers in order to make the most of these markets.

Exhibit 13

Across Chinese cities, spending in products can vary markedly according to differences in regional taste

ESTIMATES

China example: Yogurt consumption per household per year
Consumption index¹



¹ Average consumption per household indexed to consumption in Hefei households earning <\$13,700.

² Middleweight cities in China, with populations between 1.1 million (Lianyungang) and 9.7 million (Wuhan) in 2010.

³ Wuhan data are for households earning >\$51,900 due to lack of survey data for households earning \$33,600–\$51,900.

SOURCE: Insight China Annual survey 2010, McKinsey Global Institute analysis



Burgeoning consumer classes and their rising incomes are injecting a much-needed dose of demand into the world economy, offering the promise of rich, new market opportunities for many consumer-facing companies. But the impact of the new consumers is much broader than this. Expanding cities will need to invest heavily in infrastructure to cater to the needs of their burgeoning populations. In the next chapter, we discuss impending urban investment needs and the strain this could place on the world's resources.

3. Growing emerging market cities will require investment, capital, and resources

Expanding cities in emerging economies will make the vast majority of global investment in coming decades as they strive to meet surging demand for buildings and infrastructure capacity. For example, the capacity of ports to handle urban container traffic needs to rise by more than 2.5 times from today's level to meet the expected increase in consumer demand for products across the globe. Cities will need to construct floor space—including building replacement—equivalent to 85 percent of all of today's residential and commercial building stock by 2025, and we expect municipal water demand in cities to rise by more than 40 percent from today's level.³⁰

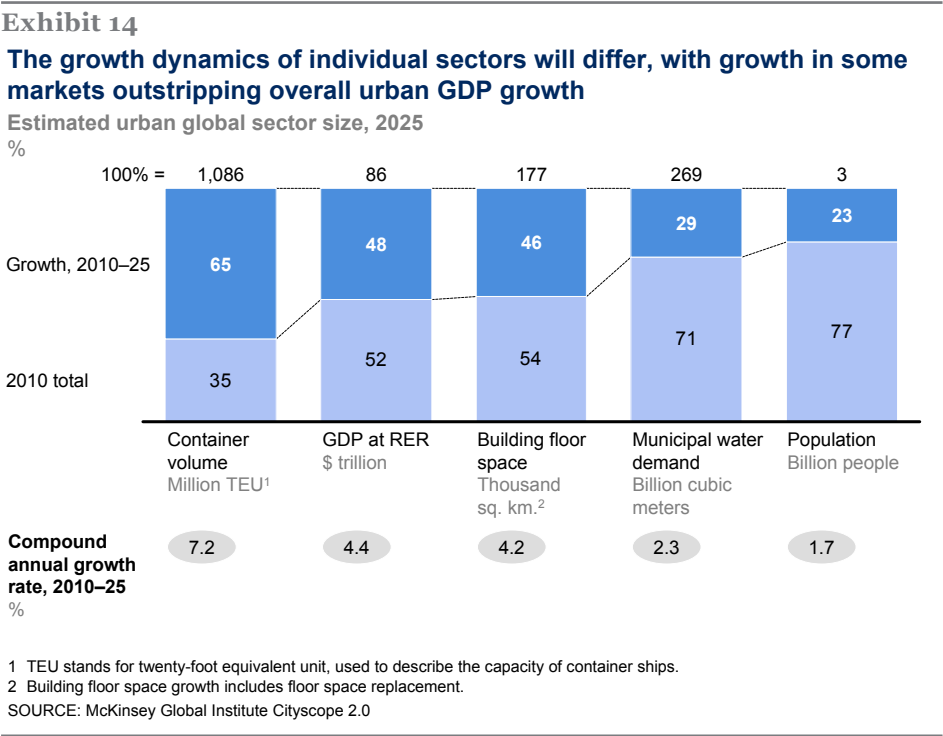
This surge in capacity building will add further strain to the world's natural and capital resources, potentially for a prolonged period. Densely populated urban centers typically use resources more productively than more dispersed cities and rural areas, but most growing cities can do better. Cities that under-invest in infrastructure and fail to keep pace with their expanding populations and their demands—or that invest inefficiently or in the wrong capacity—can hit barriers to growth. Conversely, if cities manage their capacity building well, there is a huge opportunity not only for the world's investors but also to lock in more productive, less costly, and environmentally friendlier operations for decades.

ROBUST DEMAND WILL CONTINUE FOR BUILDINGS AND INFRASTRUCTURE IN THE CITIES OF THE EMERGING WORLD

As they seek to absorb and serve their expanding and ever more prosperous citizens, many cities of the emerging world have already engaged in a residential and commercial building and infrastructure boom. Although the global economic downturn has delayed some investment projects and has created a highly uncertain near-term investment climate, vigorous capacity building is set to resume. We expect cities to need to build more than 80,000 square kilometers of residential and commercial floor space by 2025 including building replacement—equivalent to the entire land area of Austria. This new building capacity is only one part of a range of physical capital investment in cities globally that is estimated to rise from nearly \$10 trillion per year today to more than \$20 trillion per year in 2025.

30 Increased demand for buildings includes both growth in floor space and replacement construction. We expect demand for floor space stock to increase by 55 percent of today's floor space, and replacement construction requirements to be 30 percent of today's floor space.

Our research looks in particular detail at demand for residential and commercial floor space, municipal water, and port capacity for container traffic.³¹ As in the case of consumer goods, different urban investment categories vary in the patterns of their demand growth (Exhibit 14). We estimate that demand for port capacity for container traffic will grow at a compound annual rate of 7.2 percent from 2010 to 2025, significantly faster than the 4.4 percent annual GDP growth in cities globally during this period. This reflects booming consumption—it is containers that deliver the majority of the products to consumers and provide the intermediate products logistics through their supply chains. In contrast, we expect demand for both water and buildings to grow more slowly than urban GDP. We expect urban municipal water demand to rise at a 2.3 percent compound annual rate between 2010 and 2025, and buildings at a 4.2 percent rate. This growth in demand largely reflects an expected annual increase in the global urban population of 1.7 percent, as well as an anticipated rise of 2.5 percent a year globally in the number of urban households in the world. Low income elasticity will give an additional boost to demand.



31 We chose to focus on these areas because of their diversity and because sufficient data were available for them at the city level. In each area, we were able to draw on some existing data on demand patterns by city that we used to identify functional forms used for global city demand estimates. Other variables we have assessed include electricity demand by city, air transport capacity, and broadband and other telecommunications capacity. We continue to seek to expand the coverage of the Cityscope.

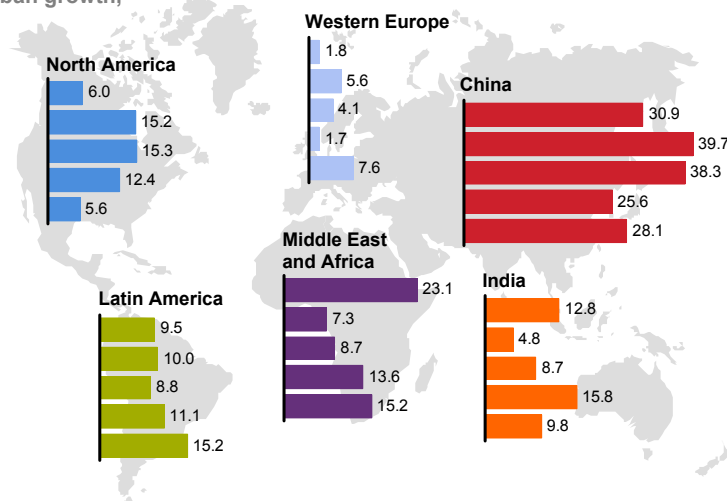
As a result of different underlying growth drivers, the geographic distribution of expected growth also varies according to the urban investment category (Exhibit 15). China's share across all three categories is high, but there are still variations. China is likely to have a 25 percent share of global municipal water demand growth and a share of nearly 40 percent of growth in global demand for urban building floor space to 2025. Africa and the Middle East will account for almost 14 percent of the global rise in municipal water demand in large cities, almost twice their share of urban GDP growth. Across all three categories, we expect Emerging 440 cities to account for roughly 60 percent of global demand growth to 2025, although the shares of individual cities will vary.

Exhibit 15

All regions contribute to growth in urban demand, but China's share is highest in key categories

Contribution to urban growth,
2010–25
%

Population
GDP ¹
Floor space
Municipal water
Containers



1 GDP measured at expected real exchange rate.

NOTE: Other developed and emerging regions account for 16.0, 17.4, 16.0, 19.8, and 18.6 percent of growth in population, GDP, floor space, municipal water, and container-demand growth, respectively; floor space growth includes replacement.

SOURCE: McKinsey Global Institute Cityscope 2.0

Floor space

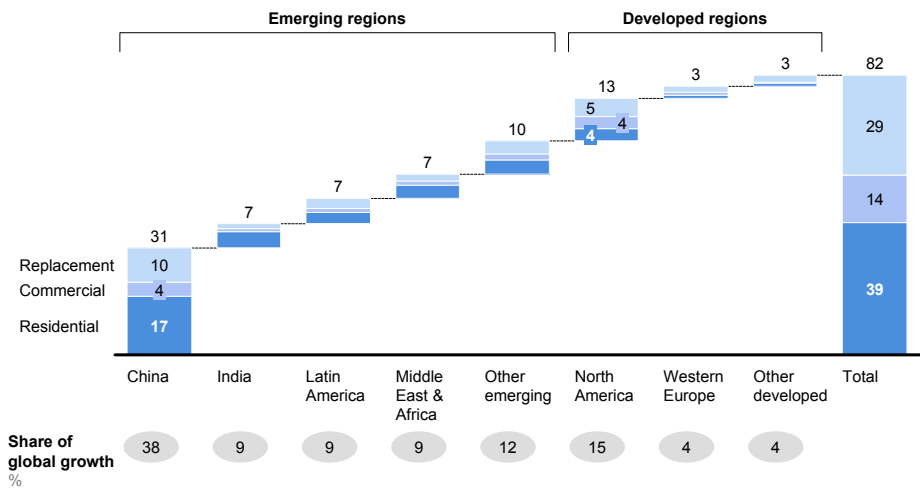
Demand for residential and commercial buildings will soar as the populations of emerging market cities increase and their incomes rise. We expect overall demand for building floor space, including replacement floor space, to increase by more than 80,000 square kilometers, an area equivalent to the national territory of Austria. We anticipate that China will be responsible for almost 40 percent of the total in the period to 2025 (Exhibit 16). Three-quarters of this rise will come from growth in demand for residential housing, and the rest from demand for commercial buildings. Replacement buildings will account for almost 40 percent of the overall expansion of floor space. We estimate that the overall investment required for these buildings will be almost \$80 trillion over 15 years.

We expect demand growth for residential floor space construction to be 90 percent of today's stock and demand growth for commercial floor space to be 75 percent of today's stock. These shares include the replacement floor space that we estimate will be necessary to compensate for the deterioration of existing buildings. The increase in demand will vary according to the region.

The rising number of households is a key factor fueling demand for dwellings, together with expanding floor space per dwelling rising along with incomes. In most emerging market cities, the number of households is expanding faster than the population because the average household size is declining.³² Per capita GDP growth is also faster in emerging cities, which explains why we expect these cities to account for more than 80 percent of growth in urban demand for residential floor space. We estimate that 55 percent of new urban residential construction to 2025 takes place in Chinese and South Asian cities alone. We expect these two regions to build new residential floor space (including replacement space) of 27,000 square kilometers and 7,000 square kilometers, respectively—together equivalent to the entire land area of the Netherlands.

Exhibit 16
Chinese cities alone are expected to contribute nearly 40 percent of global growth in residential and commercial floor space demand to 2025

Total urban floor space growth by region, 2010–25
Thousand square kilometers



NOTE: Numbers may not sum due to rounding.
SOURCE: Institute of Economic Affairs; Global Insight; McKinsey Global Institute analysis

32 A major reason for this surge in the number of urban households is a global trend toward smaller household sizes driven by demographic shifts and altered behavior. The changing shares of children and seniors have an impact on household sizes. In some regions, young adults are moving to urban areas, and there will be more, albeit smaller, families than in the past. In other regions, notably Latin America, people are not moving en masse to large cities, but demographic and cultural changes are in play. There are fewer couples of prime fertility age and thus fewer households with children; young adults who used to live with their parents may be living on their own earlier than they used to. Many seniors will tend to live in small households without their adult children, and more seniors will be in the mix. Globally, we project that the size of the average household will decline from 4.4 people per household in 2007 to 3.7 by 2025. For more detail, see the appendix.

Developed economies will continue to play a bigger role in demand for commercial floor space than emerging economies because demand for a broad range of services starts to rise at higher levels of per capita income. We estimate that roughly 65 percent of today's urban commercial floor space is in developed economies, compared with 45 percent of residential floor space. We expect cities in developed regions to continue to contribute about 40 percent of the global increase in commercial floor space demand, including the replacement of old stock, between 2010 and 2025. We see the United States and Canada adding 5,200 square kilometers of urban commercial floor space. Nevertheless, China's cities will also build an estimated 5,700 square kilometers of commercial floor space—a significant 30 percent share of the global total. Together, we expect North America and China to account for 60 percent of global growth in urban demand for commercial floor space.

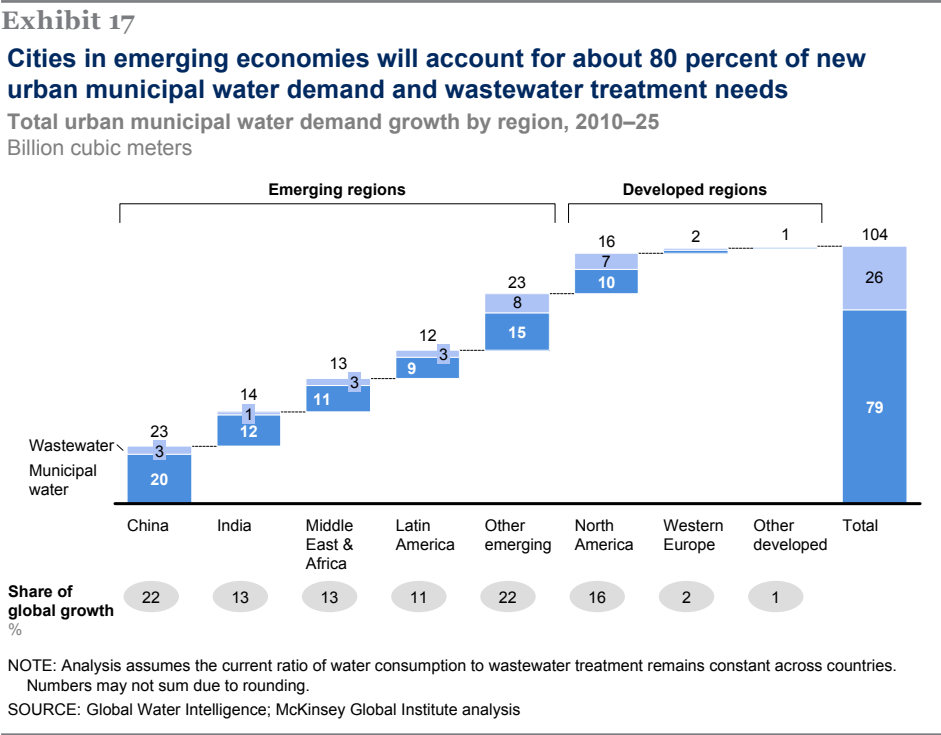
We estimate that this building boom will require cumulative investment of almost \$80 trillion over the next 15 years. In the Emerging 440 alone, we expect demand for residential floor space to rise by 35,000 square kilometers and the demand for commercial floor space to rise by 9,000 square kilometers, together requiring \$35 trillion in investment. Looking at individual nations, Chinese cities alone will require investment of \$25 trillion—32 percent of the total global need—and US cities will account for an additional \$16 trillion of investment, or 20 percent of the total.

Infrastructure

Cities will need to invest in a broad range of infrastructure including all types of transportation and communication networks. For example, there will be huge demand for road building, given predictions that the global car fleet will double to 1.7 billion by 2030. If we were to line up all these cars bumper to bumper, they would cover ten times the average distance between Earth and the moon. The bulk of these new vehicles will be in the emerging world. Large-scale investment in airport infrastructure will be necessary to meet future air traffic demand, which forecasts suggest will grow by 5 percent annually from 2010 to 2025. China alone is expected to build almost 100 new civil airports in the next ten years. Building capacity to meet rising electricity demand in cities is another major area, as is information technology, including the building and expansion of broadband networks. In our analysis, we have focused on municipal water supply and ports:

- **Municipal water distribution and services.** As urban populations and incomes grow, so does demand for water—the most basic good that people need. Providing sufficient water for drinking and sanitation is one of the key responsibilities of a city. By 2025, we expect annual demand for municipal water in the world's large cities to have increased by nearly 80 billion cubic meters, from around 190 billion cubic meters per year today to about 270 billion cubic meters per year (Exhibit 17). Building or expanding the municipal water-supply infrastructure will require cumulative investment of about \$480 billion by 2025, including investment to increase supply and to expand the distribution and treatment of wastewater. East and South Asia will account for more than 50 percent of this increase in water consumption.

The necessary investment is likely to vary among regions. Developing markets, including those in East and South Asia, are likely to focus close to 75 percent of their infrastructure investment on increasing the supply and distribution of bulk water to expanding cities. Developed regions will tend to concentrate investment spending on expanding the infrastructure needed for the treatment of wastewater and its reuse, as well as on running costs and funds to replace and upgrade the current infrastructure.



- **Ports.** Constructing and expanding transportation networks will be another major area of investment. Rising demand for goods in emerging markets and for their supply chain logistics will lead to increasing trade, and most goods will ship in containers. The share of containerized traffic is more than 90 percent for a variety of products shipped to the new wave of consumers.³³ For this reason, we assessed likely demand for container traffic to shed light on necessary port capacity.

We estimate that global port capacity for container traffic will need to expand by more than 2.5 times today’s level to meet the inflow and outflow of containers. This is the equivalent of 24 new ports the size of Shanghai’s port, the largest in the world today. We see 85 percent of growth in port infrastructure being in emerging markets (Exhibit 18).

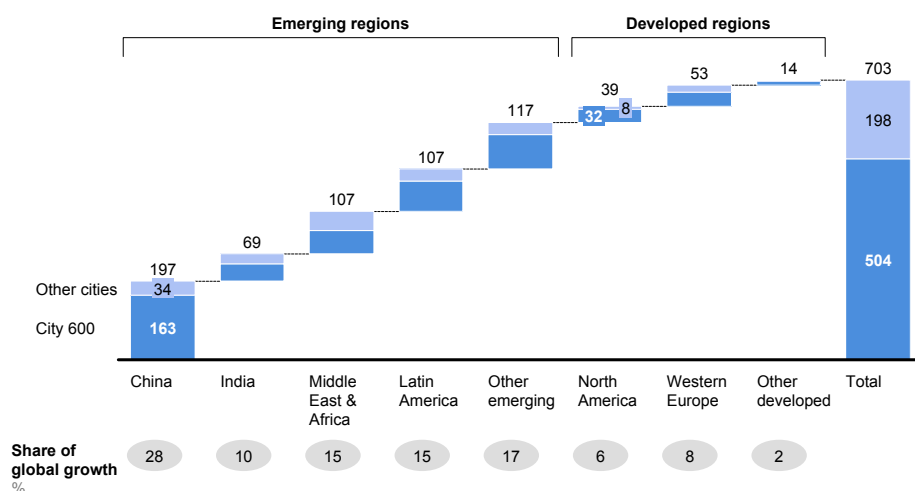
33 Containers transport more than 90 percent of goods consumed in the \$2,700 to \$19,000 medium-income bracket, from shipped bottled water and shoes to dishwashers. The same high share applies to luxury goods bought at higher incomes, including portable consumer electronics, wine, and spirits.

Establishing the port infrastructure required to meet rising container traffic is likely to require investment of at least \$200 billion in the period to 2025, with more than 35 percent of that investment needed in China alone. Further investment will be necessary to enhance the port superstructure, intermodal systems, equipment, and IT systems, and to rehabilitate and replace the existing infrastructure.

Exhibit 18

Emerging market cities will generate 85 percent of growth in container traffic demand—and the Emerging 440 60 percent of that growth

Total urban container traffic demand growth by region, 2010–25
Million TEU



NOTE: Numbers may not sum due to rounding.
SOURCE: McKinsey Global Institute analysis

If cities do not invest in buildings and infrastructure to keep pace with the needs of their growing populations, they could run into barriers to growth, as we have seen in many of the world's cities. Many of Latin America's largest cities have robust fiscal positions today—but largely because their investment on critical infrastructure did not keep pace with rapidly rising demand. As a result, insufficient housing, urban sprawl, and traffic congestion have become constraints on growth. The GDP growth rate of most of the region's top ten cities have dropped below the national rate over the past two decades. Indian cities have also under-invested. MGI research finds that they need \$1.2 trillion in capital expenditure to 2030—eight times their spending today—to keep pace with the demands of their growing populations.³⁴ The challenge of investing sufficient amounts to keep pace with the curve of increasing demand is one shared by most growing cities. But doing so is necessary if cities are to build a platform for the sustained productivity gains and growth they will need once the economic gains from their countries' rural to urban transition are exhausted.

34 See MGI reports *Building globally competitive cities: The key to Latin American growth*, August 2011, and *India's urban awakening: Building inclusive cities, sustaining economic growth*, April 2010. Both are available to download at www.mckinsey.com/mgi.

RISING CONSUMER DEMAND WILL STRAIN GLOBAL NATURAL AND CAPITAL RESOURCES

The rising consumer demand and investment that are in prospect will be a welcome injection of growth into the world economy, but they could also put mounting strain on global natural and capital resources. Natural resource prices, including energy, land, water, and metals, have already jumped dramatically, and the addition of armies of new consumers will exacerbate this trend. The huge amount of capital necessary to fund urban capacity building comes at a time when capital is likely to be scarcer, or at least more expensive. Investment therefore needs thoughtful and effective handling. Fortunately, densely populated urban centers have the potential to be more productive and less wasteful than more dispersed forms of development. Growing cities that are able to invest in economically attractive, efficient solutions can both reap capital savings and lock in lower energy and resource costs for decades.³⁵

Natural resources

Demand for the world's resources coincides with a time when finding new sources of supply and extracting them is becoming increasingly challenging and expensive despite technological improvements, and when the prices of different resources have become closely interlinked, creating shock waves from one to the other. These trends have already had a dramatic impact. During most of the 20th century, the prices of natural resources fell, supporting economic growth. But in the past ten years, all of the price declines that occurred in the previous century were wiped out (Exhibit 19).

Because of higher living standards in cities, per capita urban energy and resource consumption is likely to grow faster in cities than in nations overall. The most cost-effective way to meet this rising demand is by improving resource productivity. Fortunately, densely populated cities can be very efficient at satisfying resource demand for a given income level. In the case of energy, MGI research has shown that, by adopting existing energy-efficient technologies that pay for themselves in future energy savings, developing countries could reduce growth in their energy demand by more than half and reduce their energy consumption in 2020 by one-fifth from the projected levels. The vast majority of that benefit could accrue to urban households and businesses. Cities can scale back the expansion of the energy-supply infrastructure that would otherwise be necessary, and higher efficiency locks in lower energy costs to businesses and consumers for decades to come.³⁶ MGI research has found that there is potential to boost the energy efficiency of buildings globally that would reduce energy demand by 31 quadrillion British thermal units, 20 percent more than the global use of energy by shipping and air transportation combined. Improving the energy efficiency of residential and commercial buildings could deliver around one-fifth

35 Past MGI research on urbanization in China and India includes extensive examples of the benefits of urban scale in economic activities as well as in resource use. See also H. Weisz and J. K. Steinberger, "Reducing energy and material flows in cities," *Current Opinion in Environmental Sustainability*, Vol. 2, No. 3, 2010. The authors find that in Australia, Brazil, and India, at equal incomes, urban settlements are less resource-intensive in terms of direct household energy use than rural areas.

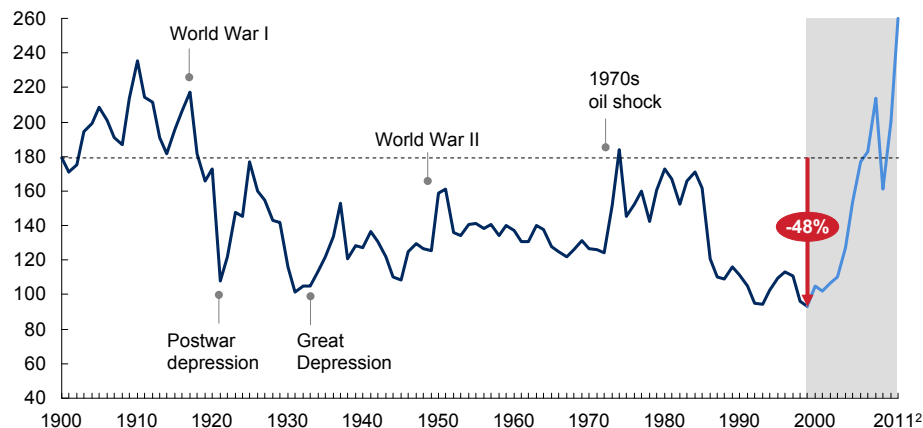
36 *Fueling sustainable development: The energy productivity solution*, McKinsey Global Institute, October 2008 (www.mckinsey.com/mgi).

of a total \$2.9 trillion opportunity to boost resource productivity by 2030. Again, cities can capture the majority of these benefits.³⁷

Exhibit 19

Economic growth driven by urbanization has reversed the commodity price declines that took place over the course of a century

McKinsey Global Institute Commodity Price Index (years 1999–2001 = 100)¹



1 See *Resource Revolution: Meeting the world's energy, materials, food, and water needs* for details on the McKinsey Global Institute Commodity Price Index.

2 2011 prices are based on the average of the first eight months.

SOURCE: Grilli and Yang; Stephan Pfaffenweller; World Bank; International Monetary Fund; Organisation for Economic Co-operation and Development; UN Food and Agriculture Organization; UN Comtrade; McKinsey Global Institute analysis

Capital resources

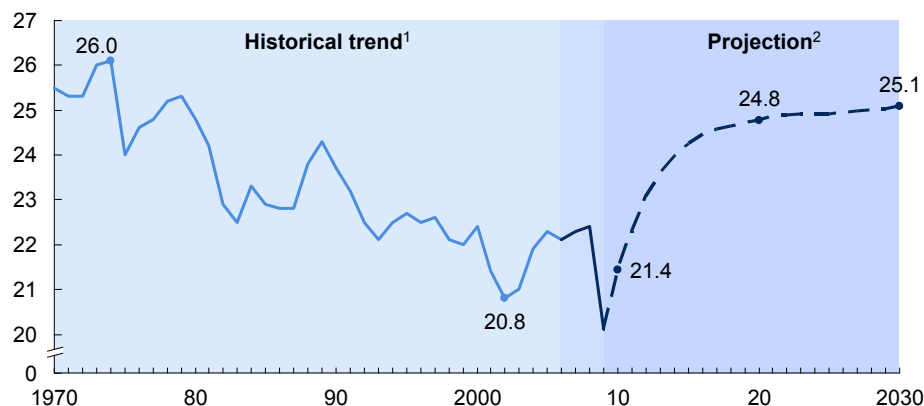
The urban world has already contributed to a jump in the global investment rate from 20.8 percent of GDP in 2002 to 23.7 percent in 2008 (followed by a dip during the global recession of 2009). Very high investment needs in emerging markets could cause the investment rate to rise to 25 percent by 2025, according to recent MGI analysis (Exhibit 20).

³⁷ MGI found that there is an opportunity to boost resource productivity that would meet nearly 30 percent of demand for resources in 2030. Higher resource productivity could address more than 80 percent of growth in demand for energy, 60 percent of anticipated growth in demand for water, and one-quarter of expected growth in demand for steel. The total value to society including the market value of resources saved is an estimated \$2.9 trillion in 2030 at current prices before accounting for environmental benefits and subsidies. The value of the opportunity would increase to \$3.7 trillion assuming a \$30 per tonne price for carbon as well as the removal of energy, agriculture, and water subsidies and the removal of energy taxes. See *Resource Revolution: Meeting the world's energy, materials, food, and water needs*, McKinsey Global Institute, November 2011 (www.mckinsey.com/mgi).

Exhibit 20**The global rate of investment is expected to rise in coming years, resulting in increased capital scarcity**

Global investment rate, 1970–2030

% of global GDP



1 Based on actual prices and exchange rates for each year between 1970 and 2006; values shown in 2005 real prices and exchange rates for period between 2007 and 2009.

2 Forecast assumes price of capital goods increases at same rate as other goods and assumes no change in inventory.

SOURCE: Economist Intelligence Unit; Global Insight; McKinsey Global Economic Growth Database; Oxford Economics; World Development Indicators of the World Bank; McKinsey Global Institute Capital Supply and Demand Model; McKinsey Global Institute analysis

Yet capital costs are likely to be rising in the period ahead, and it is therefore necessary to ensure that investment is as productive as possible because this will be a major arbiter of the returns achieved on global savings.³⁸ The capacity to meet that demand will depend on governments in emerging markets continuing to develop deep and stable financial markets that can gather national savings and channel them to the most productive investment, for example. Today, financial institutions in the formal sectors of these economies serve only a small share of the population. McKinsey estimates that 2.5 billion adults don't have a bank account. The world arguably needs a regulatory framework for infrastructure funding and rules that encourage long-term investing.

Today, the investment effectiveness of countries varies widely. But MGI analysis finds that four key levers, if pulled, could double returns on worldwide infrastructure investment:

- 1. Build the right infrastructure.** Before any investment takes place, a thorough evaluation of individual projects is required. France, for instance, uses a bottom-up assessment in its cost-benefit analysis, evaluating all projects with metrics on returns to maximize impact and usage. South Korea has put in place an independent project evaluation authority that can overrule projects proposed by ministries and has succeeded in weeding out initiatives that offer low returns.
- 2. Make the most out of existing infrastructure.** Kuala Lumpur was able to improve average traffic flow in city streets by consolidating and reducing waste in commercial distribution. Commercial trucks account for roughly one in five vehicles in large cities but create disproportionate traffic delays because they travel at a slightly slower pace than other vehicles, creating

³⁸ Farewell to cheap capital? The implications of long-term shifts in global investment and saving, McKinsey Global Institute, December 2010 (www.mckinsey.com/mgi). The analysis assumes that the current European debt crisis does not lead to a prolonged global economic downturn.

“moving bottlenecks.”³⁹ California’s electricity demand-management program, put in place nearly 40 years ago, has saved the state around 40 percent on investment and consumption.

3. **Deliver infrastructure productively.** In the United States, productivity growth in the construction industry lags behind that in other local services sectors. Yet MGI finds that a 30 percent productivity increase could be achieved over five to ten years through a range of private-sector initiatives. These might include more focus on sourcing through subcontractors, the optimization of supply chains, fully industrialized prefabricated production, and transparent planning.
4. **Work with private partners.** In Chile, Santiago’s open-access tolled ring roads are a good example of a new wave of effective public-private partnerships. User costs adjust by time of day to manage congestion. Frequent users with transponders and casual users with prepaid day passes can access the road without stopping at a toll booth. The innovation was in the design of the contract and the technology platform that have allowed the system to work seamlessly. This would not have been possible without close collaboration between the government, which oversees the system, and its private-sector partners, which operate it.

□ □ □

Soaring urban consumer demand, and the need for investment that it is driving, will inject much-needed demand into the world economy, but there are risks. Under-investment can mean that cities run into barriers to growth. And even if sufficient investment takes place to meet demand, policy makers and businesses need to ensure that they make effective choices that mitigate strains on the world’s natural and capital resources. In the next chapter, we turn to a discussion of the opportunity for business from rising urban consumption and investment.

³⁹ Because commercial trucks on average carry only 40 percent of their capacity, cities can improve efficiency by rolling out cross-docking facilities on the edges of the urban area. Individual delivery trucks gather at these facilities, and a logistics company consolidates inbound materials so that trucks travel into the city with full loads, preferably to a single delivery point or only a few that are close together. Organizing such a system requires partnership among the city, retail companies, and logistics providers.

4. The science—and art— of business strategy in emerging cities

Meeting the demands of the rising consuming classes in emerging cities is one of the few bright growth prospects for companies seeking to expand their businesses and position their business portfolios for growth. Yet, as many companies have found to their cost, tapping into this opportunity is a complex and sometimes difficult undertaking. As we have discussed, the speed and composition of growth varies across different industries and products, and therefore identifying the right micro-market opportunities is vital. At the same time, competition to seize the attention of new consumers—as well as the investment dollars of growing cities—means that companies need to be able to target resources at the most financially attractive opportunities. So executives need to reach a scientific assessment and understanding of the micro-market dynamics of their different businesses, and to have the skills and the agility to allocate resources and execute strategy to grasp the potential they identify—the art of putting market intelligence into practice on the ground.

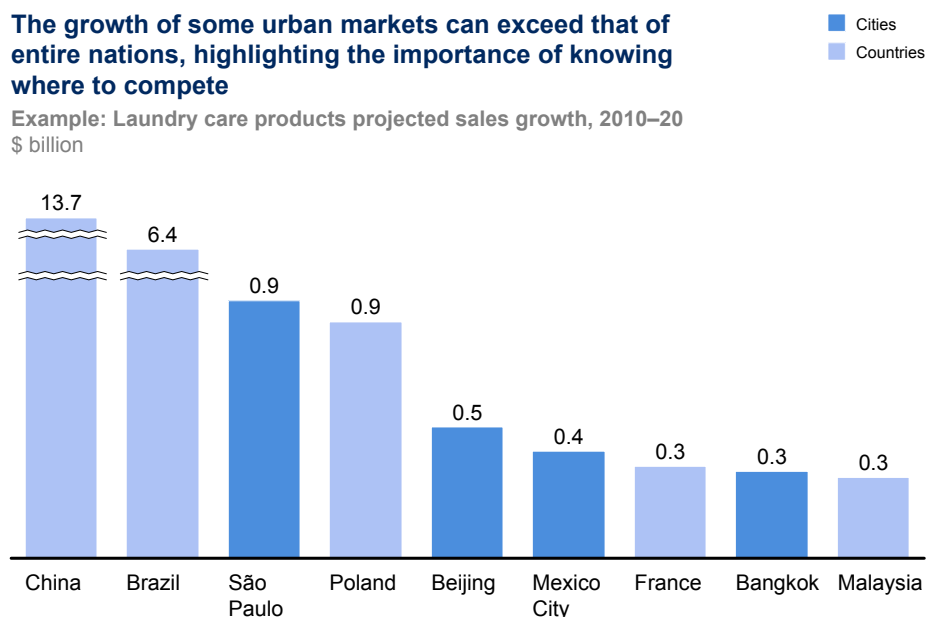
COMPANIES NEED TO TAKE A SCIENTIFIC APPROACH TO TARGETING THE RIGHT URBAN MARKETS

Companies wondering where they should go to capture the next wave of growth, or how to prioritize and sequence their entry across nations and cities, need at the start to have a good grasp of the market opportunities at the city level in order to allocate resources to the most attractive opportunities. For many products, shifting the focus from national to city markets can be eye-opening. For example, anticipated growth in the sales of laundry care products between 2010 and 2020 in São Paulo is set to exceed the growth of sales of these products in all of France and Malaysia combined (Exhibit 21).

For some businesses, it may be sufficient to identify the cities with certain demographic and income categories—a rise in the number of older consumers or young children, for example. Others will need to develop an in-depth understanding of the underlying market dynamics of a range of goods that may have very different consumption S-curves, translating this analysis into specific growth projections for relevant market segments (see Box 5, “Mapping the urban growth opportunity”).

Exhibit 21**The growth of some urban markets can exceed that of entire nations, highlighting the importance of knowing where to compete**

Example: Laundry care products projected sales growth, 2010–20
\$ billion



SOURCE: McKinsey Global Growth Compass

Box 5. Mapping the urban growth opportunity

McKinsey has developed a three-step approach to predicting the evolution of markets at the city level that might serve as a guide to the analysis that companies need to undertake to map the global urban market opportunity.

Step 1: Understand specific market growth drivers.

Using historical data, systematically analyze the relationships between demographic and macroeconomic drivers and market size and identify forecasting formulas across geographies.

Step 2: Predict the evolution of markets using forecasting formulas.

Using projected demographic and macroeconomic variables, estimate market growth by city based on demographic and macroeconomic projections and the forecasting formulas identified.

Step 3: Conduct sensitivity analyses and assess local market conditions.

Assess sensitivity of city market rankings to changes in macroeconomic scenarios, and incorporate additional factors to refine urban market priorities (e.g., evaluate the attractiveness of an urban market based on closeness to existing footprint, distribution and supply chain requirements, and local channel and competitive environment).

To illustrate the need for a granular understanding of urban markets, compare five businesses that have different underlying demand drivers and therefore widely varying rankings of cities in terms of their potential attractiveness as markets (Exhibit 22).

- **Medical devices for older people.** Manufacturers and suppliers of some medical products may want to identify “silver cities” with a large increase in the number of older consumers with incomes of more than \$20,000. The cities that are expected to experience the most growth in this segment are Shanghai and Beijing. Tokyo and Osaka are the only developed cities in the top ten, an indication that aging consumers are no longer exclusively a developed economy phenomenon.
- **Baby food.** Producers and distributors of baby food may want to focus on cities where a large number of households with young children are entering into the steep part of the baby-food adoption curve. Combining demographic and income distribution data suggests that half of the top ten cities by the increase in the number of children in households with an annual income of between \$7,500 and \$20,000 at PPP are in Africa.
- **Laundry-care products.** Detergent and related laundry-care producers may be interested in identifying the cities with the largest expected growth in overall laundry-care product sales. Using laundry-care market forecasts at the city level, the top four cities by expected sales growth are São Paulo, Beijing, Rio de Janeiro, and Shanghai.
- **Commercial building construction.** Urban planners and construction companies interested in expanding floor space should look at the leading US and Chinese cities. All but two of the top ten cities for expected commercial floor space construction are in those two nations.
- **Water-related infrastructure.** Companies providing project management or construction services for water infrastructure will want to know where they should expect to see the largest investment in municipal water infrastructure. The top two cities by expected growth in municipal water demand between 2010 and 2025 globally are both in India: Mumbai and Delhi.

Exhibit 22

Top 20 hot spots for growth by 2025

Cityscope rankings by growth, 2010–25

Emerging regions

Developed regions

Rank	Elderly, higher-income consumers ¹	Young entry-level consumers ²	Laundry care products ³	Commercial floor space ⁴	Municipal water demand
1	Shanghai	Lagos	São Paulo	New York	Mumbai
2	Beijing	Dar es Salaam	Beijing	Beijing	Delhi
3	Tokyo	Dhaka	Rio de Janeiro	Shanghai	Shanghai
4	Tianjin	Ouagadougou	Shanghai	Los Angeles	Guangzhou
5	Mumbai	Khartoum	Mexico City	Tokyo	Beijing
6	São Paulo	Ghaziabad	Moscow	Washington, DC	Buenos Aires
7	Osaka	Sanaa	Bangkok	Dallas	Kolkata
8	Chongqing	Nairobi	Istanbul	São Paulo	Khartoum
9	Delhi	Luanda	Manila	Guangzhou	Dhaka
10	Nanjing	Baghdad	Johannesburg	Chicago	Istanbul
11	Guangzhou	Kampala	Belo Horizonte	Houston	Dallas
12	New York	Ibadan	Porto Alegre	Tianjin	Pune
13	Seoul	Lusaka	Buenos Aires	Moscow	Las Vegas
14	Hong Kong	Kinshasa	Tianjin	Atlanta	Karachi
15	Wuhan	Kano	Tehran	Miami	São Paulo
16	Kolkata	Abidjan	New York	Hong Kong	Hyderabad, India
17	Shenyang	Abuja	Foshan	Mexico City	Lagos
18	Los Angeles	Bamako	Santiago	Shenzhen	Moscow
19	Toronto	Chittagong	Shenzhen	Phoenix	Wuhan
20	Ahmedabad	Port Harcourt	London	Istanbul	Manila

1 Growth in population aged 65+ with household income >\$20,000 at PPP.

2 Growth in population aged ≤14 with household income \$7,500–\$20,000 at PPP.

3 Predicted growth in consumer spending on laundry care products based on a city-level market demand growth model.

4 Including replacement floor space.

SOURCE: McKinsey Global Institute analysis

Some companies now understand that they need to look beyond well-known and high-profile cities and seek out the new breed of vigorous middleweights that will be many of the fastest-growing urban markets. But tracking what is going on in the middleweights is no trivial task. As illustration, many companies might be hard-pressed to identify the geographic location of Surat, Foshan, and Porto Alegre, let alone the bare bones of these cities' economic profiles. Yet all three have populations of more than four million. Surat is in western India and accounts for about two-fifths of India's textile production; Foshan is China's seventh-largest city by GDP; and Porto Alegre is the capital city of Rio Grande do Sul, the fourth-largest state in Brazil by GDP.

Building a sufficiently detailed profile of the cities with the most promising market opportunities, including competitive and cost considerations, is a complex and time-consuming but necessary exercise. Companies that are able to identify the most promising markets and build a presence early on are likely to benefit from better market access and higher margins.

But far from embarking on such an intelligence-gathering exercise, most companies today still do not use city-level analysis to inform their decisions where to locate and do not appear to be preparing to change this broad approach over the next five years (see Box 6, "Most executives deciding on location still look at countries, not cities"). Limited awareness and available data both act as barriers.

Box 6. Most executives deciding on location still look at countries, not cities

A new McKinsey survey of executives and the location decisions they make found only 19 percent of respondents reporting that their companies' senior executives were making those decisions at the city, rather than the country, level—and they expect that share to remain constant over the next five years.¹ Of those who responded, 36 percent say that their corporate leaders typically identify a specific region or country and then task a working group with creating a long list of possible cities there.

Nearly two-thirds of respondents say that CEOs and other senior executives are the people at their companies who typically consider individual cities as places to locate business. Yet 61 percent say their senior executives don't plan at the city level because cities are perceived as an irrelevant unit of strategic planning. This disconnect may suggest a lack of familiarity with city-level planning on the part of top leaders: 52 percent of C-level respondents say they personally don't use information about cities in their daily work. Not all businesses require city-level action. Nationwide business or public sector sales accounts and decisions about where to locate plant in resource-intensive industries are two such examples. But for companies whose ultimate customers are consumers, the capacity to understand specific urban markets allows better pricing, channel, and marketing decisions, and more effective targeting of—and higher returns on—investment.

In fact, the survey suggests that not all decisions are the same. At companies seeking new locations for improved access to knowledge or talent, 30 percent of respondents say that these decisions are taken at the city level. The share is even higher in this category of decision in the case of companies considering locating facilities in the United States or Canada, South Asia, and Greater China. This suggests that cities that can establish themselves as talent hubs (because of universities or business clusters) can also become magnets for investment, considered independently of the countries where they are located.

1 "Relocating for growth," McKinsey Global Survey. The survey was conducted in February 2012 and received responses from 2,962 executives representing the full range of regions, industries, and company sizes. To adjust for differences in response rates, we weighted the data by the contribution of each respondent's nation to global GDP.

THE NEXT STEP FOR COMPANIES IS TO PERFECT THE ART OF RESOURCE ALLOCATION AND EXECUTION ACROSS CITIES

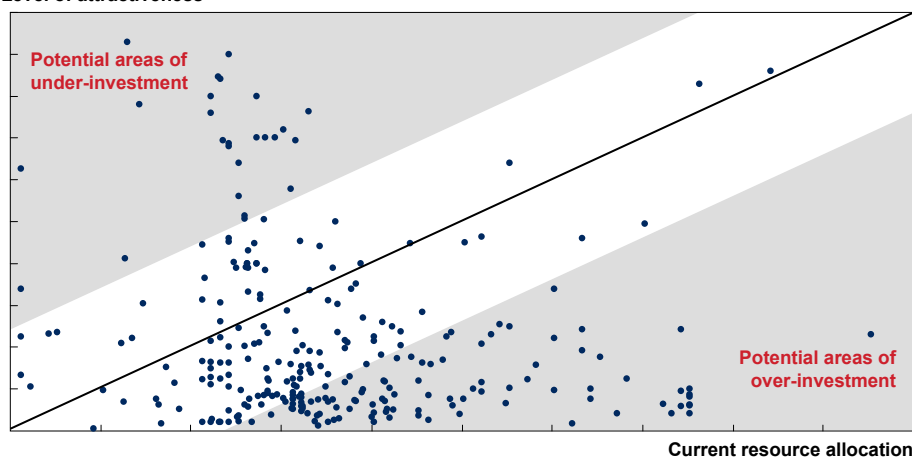
Once companies are armed with an understanding of the urban opportunity at a detailed level, their next task is to understand how their current resource allocation compares with the potential growth of markets (Exhibit 23). In many companies, resource allocation—whether capital expenditure, sales or marketing spending, or organizational and managerial capacity—tends to be sticky and reflect current revenue more closely than future opportunities. So identifying the local markets that receive disproportionate resources and those that are under-invested relative to opportunities allows top management to spot discrepancies and probe for inefficiencies in resource allocation.

Exhibit 23

Resource allocation across cities can be evaluated against a detailed understanding of the attractiveness of each urban market

Mapping of the City 600 based on attractiveness¹ and current resource allocation

Level of attractiveness



¹ Attractiveness score includes market growth projections for specific segments or products, as well as competitiveness, cost, and other relevant considerations.

SOURCE: McKinsey analysis

For some companies, the capacity to reallocate resources to the most attractive opportunities can become a skill that helps them to realize long-term success. Reallocation is not just a question of entering or exiting a business but moving investment around and reprioritizing among existing businesses. Such proactive allocation and reallocation of resources require a clear strategic direction and a sufficiently granular view of a company's business portfolio. It also requires that effective processes are in place to communicate strategy to individual business units and track investment once made.⁴⁰

Even those companies that build up detailed intelligence about their target markets and allocate resources accordingly then need to think carefully about how to execute. To capture the next wave of growth, they need to prioritize and sequence their expansion: Which cities and which product categories should come first? Should the company adopt a city cluster-based approach to reduce costs (see Box 7, "The case for a cluster-based approach in India and China")? What brands and price points are right for different micro markets?

⁴⁰ Effective reallocation processes are often hindered by organizational barriers, such as "turf wars" between business units over resources, managers who are overly wedded to the allocation decisions they made the previous year, or a broad organizational bias toward risk aversion.

What is the right channel, and is there likely to be more than one? How can the company build the capability needed to scale up operations? What talent is the company likely to need in each geography, sector, and product category? What organizational structure would best suit strategic planning for these markets, and how can the company track performance? Finally, how can the company work effectively with regulators and other stakeholders in these markets?

Box 7. The case for a cluster-based approach in India and China

A cluster-based strategy, which groups a set of cities together, can be one way that companies can streamline the highly complex urban picture that they face in many emerging economies, make their market entry most efficient, tailor their approach to locations at different points of growth S-curves, and better time moves to reflect the different stages of growth of particular locations.¹

In India, for instance, McKinsey has identified 12 urban clusters—with two or more big cities closely connected to their surrounding towns—that account for 55 percent of the nation's entire urban population (Exhibit 24). If a company were to base strategy instead on India's 14 largest cities, it would get access to only 20 percent of the country's GDP.

Defining the right clusters allows a company to improve its targeting of the segments most relevant to its business and to lower the average cost of reaching each customer. Identifying the most promising cluster means taking into account varying consumer attitudes and types of consumer segments and singling out cities that concentrate the majority of the target market. This way companies can tailor their marketing and branding to cluster-specific characteristics. Focusing marketing spending can ensure that it achieves sufficient scale and product awareness and reaches a "tipping point" that detonates growth. Success requires ensuring that the company's organization gears itself to planning, driving, and executing detailed growth strategies.

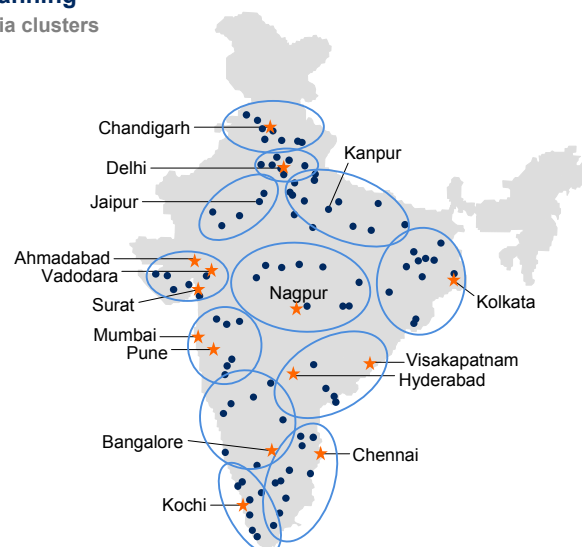
Exhibit 24

Dividing India into 12 distinct clusters can achieve granular strategic planning

Emerging India clusters

ILLUSTRATIVE

★ Core cities
● Other cities served



SOURCE: McKinsey India Urbanization Econometric Model

1 Yuval Atsmon et al., "Is your emerging-market strategy local enough?" *The McKinsey Quarterly*, April 2011.



The expanding urban landscape will have a marked impact on the evolution of global markets facing businesses. In turn, the decisions business leaders make will actively shape the rapidly evolving urban world. In a highly uncertain economic environment, those companies that respond most effectively to changing cities and make the most of the opportunities they offer will reap the most benefits. The challenge for all businesses is to home in on the most promising opportunities in their segments and products and to shift the allocation of their resources—proactively, and, if necessary, aggressively—to match this potential.

5. The policy agenda differs in emerging and developed regions

Emerging and developed economies face very different challenges in their city management. In a nutshell, the task for the former is to manage growth in a way that avoids diseconomies of scale and builds the basis for sustainable economic performance. For the latter, simply maintaining a healthy rate of growth can be tough, particularly in the aftermath of recession. Many developed cities are aging and no longer attracting migrants—some are even experiencing a decline in their populations. Instead, they have to seek new vigor from higher productivity, new business investors, and enhanced links with the urban dynamos of emerging regions.⁴¹

DEVELOPING WORLD CITIES NEED TO MANAGE RAPID GROWTH

Meeting the aspirations of the four million people a month coming to cities in search of higher-quality jobs and higher incomes will require cities to achieve sustained growth. That means that cities will have to engage effectively in a complex and challenging managerial task. To avoid constraints on growth, urban policy makers need to plan the urban environment to include sufficient housing and efficient transportation, ensure that sufficient finance is available to support both operational and capital spending on services including electricity, telecommunications, and water, and, through smart regulation, provide an environment that encourages entrepreneurialism and business investment. In the near term, cities that are able to invest ahead of the curve and operate effectively are likely to attract more productive companies and create more, and higher-skilled, jobs. Importantly, these factors will help the cities to create a platform for sustained growth once they have passed through their phase of rapid urbanization and reaped its benefits.⁴²

41 MGI has discussed urban policy extensively in its reports on urbanization in China, India, Latin America, and the United States, and the focus of McKinsey's Cities Special Initiative is on excellence in city management and operations. Detailed policy discussions for each region are beyond the scope of this report.

42 Richard Dobbs, Jaana Remes, and Jonathan Woetzel, *Strengthening the foundations of emerging cities*, McKinsey on Society, April 2012 (www.mckinseysociety.com/strengthening-the-foundations-of-emerging-cities).

The management of growing cities is not a simple task, and cities vary widely in how well they are able to handle the changing demands on them—one reason that the fortunes of individual cities diverge. To deliver the benefits of economies of scale while minimizing the hazards of rapid growth, cities need professional planning and coordination, capable and accountable governance, and sustainable and responsible fiscal management. We now describe some of the lessons we have learned from our in-depth research on cities in China, India, and Latin America.

- **Cities need effective planning to orchestrate investment decisions and operations.** Best-practice cities consider planning a core function and develop integrated, “cascaded” long-term plans that incorporate links between transport, housing, and economic development—across different jurisdictions within the metropolitan area, and beyond the term of current elected officials. They also combine long-term plans with realistic near-term milestones. Urban planners in New York use a 20-year planning horizon, with aspirations to 2030 combined with more targeted goals to 2013. In many rapidly growing cities in emerging markets, plans extend out just a few years—far too short to prepare the ground for sustainable long-term performance. To ensure effective execution and enforcement, planning needs sufficient political clout to make sure that urban plans are the basis of intergovernmental coordination. Cities need to engage citizens and other key stakeholders in the planning process.

Today’s rapidly expanding cities have the opportunity to cost effectively incorporate technologies and data-driven “smart city” solutions in their city designs. For instance, installing broadband in new housing developments is much less costly than retrofitting existing neighborhoods. The emerging trend of using sensors and digital devices in physical objects and machinery is enabling the birth of “smart” urban infrastructure. For example, smart grid technology and sensors in water and sewage systems can help avoid utility breakdowns, reduce leaks by up to 50 percent, and cut costs to businesses and consumers. By increasing consumer awareness of their patterns of water use, smart water meters can reduce household water consumption by 5 to 10 percent. Likewise, smart transport systems that use sensors to monitor public transportation and highway traffic can provide smart routing to reduce lost productivity caused by congestion and traffic delays. Introducing the optimization of traffic lights using real-time traffic monitoring reduces congestion by 15 percent on average. In Mumbai, traffic control that adapts to traffic conditions has led to a 12 percent decline in average travel time. When London implemented a congestion pricing scheme—using electronic license plate readers to automatically check if cars have paid to enter the restricted zone—it reduced delays in the congestion-pricing areas by about 30 percent. Bus congestion delays fell 50 percent, and average traffic speed rose by 31 percent.

- **Cities need capable and accountable governance.** Many emerging market cities don't have a single governing body that is both responsible and accountable for results.⁴³ Instead, they have a fragmented management structure that splits responsibilities among the various layers of governance (city, county, state, and federal) as well as among different authorities for specialized services such as housing or transportation. Such lack of coordination exacerbates inefficiency and wastes resources. Some regions have elected or empowered mayors with long tenures and clear accountability for urban performance. South Africa consolidated the previously independent municipalities of Johannesburg into a single metropolitan government under a mayor who is supported by a nonpolitical, professional city manager. China's major cities have powerful political appointees as mayors, and Beijing has traditionally relied on and provided incentives for entrepreneurialism among local bureaucrats.

Effective city managers have the political power to lead city planning and operations and, in turn, establish clear goals, accountability, and performance-measurement systems in their organizations. For instance, the party secretary of Wuhan, in China, sets targets on a range of measures from economic growth to administrative efficiency and evaluates the city's departments on these targets.⁴⁴ One option that some successful cities have deployed is to put in place corporatized agencies with specialized skills and the ability to make quick decisions. For example, for its Rio 2020 initiative, Rio de Janeiro established a "delivery unit"—a small, cohesive, and versatile team that has developed and coached a group of cross-functional staff dedicated to delivering on the city's central goals. A focused mandate and political support helps such an agency to break through the silos and bureaucracy that prevent government departments from working together.

- **Finally, cities need sustainable and responsible fiscal management.** Given the huge demands on their finances, including the construction of infrastructure and the need to provide quality services to their expanding populations, access to sufficient funding is important. Typical funding mechanisms include property taxes and local taxes that can be retained by the city; user charges; and public-private partnerships. Even if cities have sufficient finance, they need to be smart about how they manage spending and the investments they make. Many cities don't make decisions based on an integrated assessment of both capital and operating costs, particularly when annual cash budgets constrain investment decisions. Cities also have significant scope to improve the efficiency of construction projects (e.g., by building project-management capabilities within municipal governments and increasing pressure on the construction industry to be competitive), and by working with private partners to obtain expertise and cost-competitive contracts.

43 Many cities in developed economies face the same challenge. For example, in the broader metropolitan region around Los Angeles, about 40 agencies are involved in overseeing transport decisions and operations.

44 Since implementing this system, Wuhan has reduced its energy consumption per unit of GDP by 4.5 percent (compared with a reduction in the national average of 3 percent), cut administrative red tape in half, and boosted GDP growth to 15.5 percent from its average 13 percent growth in previous years.

City governments are not alone facing the challenge of rapid urban growth. National policies and practices fundamentally shape the productivity and growth prospects of all cities—even though cities vary in their capacity to prosper within the same jurisdiction.⁴⁵ To ensure strong national and regional growth, state and federal government agencies must work in tandem with cities on the full gamut of economic development, housing, and social policies, and they must facilitate productive intercity coordination of investment in infrastructure and communications.

Policy makers at all levels of government benefit from more transparency and better data on how individual cities are performing on their different functions. To diagnose what was slowing growth in Latin America's top cities, McKinsey developed the Urban Performance Index (UPI), a benchmarking tool designed to provide a fact-based look at a city's performance against its international counterparts on four critical criteria: economic performance, social conditions, sustainable resource use, and finances and governance.⁴⁶ While we applied the tool to leading cities in Latin America, it can be—and has since been—used to assess city performance across the globe (see Box 8, "McKinsey's Urban Performance Index").

⁴⁵ *How to compete and grow: A sector guide to policy*, McKinsey Global Institute, March 2010. Also see more than 15 in-depth country performance assessments at www.mckinsey.com/mgi.

⁴⁶ For the results of the UPI benchmarking of Latin American cities, see *Building globally competitive cities: The key to Latin American growth*, McKinsey Global Institute, August 2011 (www.mckinsey.com/mgi).

Box 8. McKinsey's Urban Performance Index

Cities can develop a scientific approach to managing their growth by developing analytic tools that diagnose their performance and identify areas where there is scope for improvement. Benchmarking relative to peers and best-in-class performers can provide city officials with invaluable information on how other cities around the world have tackled the problems they face.

The Urban Performance Index (UPI) is a quantitative benchmarking tool developed by McKinsey for assessing city performance across the full range of a city's functions: economic performance, social conditions, sustainable resource use, and finances and governance.¹ Across the four dimensions, the UPI includes 100 quantitative measures from a range of published sources. These include wealth creation, access to basic services, urban planning, resource management, and funding. The UPI then compares the scores of individual cities to the average in four global benchmark cities—Helsinki, Singapore, New York, and Toronto.²

The UPI is not designed to be a city “beauty contest” that ranks cities but a pragmatic diagnostic tool for identifying areas where each city lags behind its peers and global benchmarks, and aspects on which cities have done relatively well and could provide lessons learned or inspiring examples for others. Its comprehensive coverage and modular nature makes it flexible for different users. City mayors and citizens may be most interested in a general overview, infrastructure providers may care to highlight only those indicators most relevant to infrastructure, and organizations interested in sustainable cities may want to focus solely on the environmental component.

The UPI allows cities to benchmark their performance of cities to a high level of detail. Take the time required to register property in cities around the world—even in the same region: it takes only seven days to register a property in Lima, the shortest period in the region today, after the city aggressively moved to cut unnecessary red tape and improve approval processes. Another metric that throws up interesting differences between cities is municipal water consumption. Buenos Aires consumes six times the volume of water per capita that Bogotá does. This difference is due not to differences in access—more than 90 percent of households in each city has access to running water—but to differences in the incentives for households to manage their water demand. In Bogotá, local water utilities have used pricing and other incentives to encourage efficient water use, while flat water tolls in Buenos Aires have not helped to encourage behaviors that treat water as a scarce resource.

1 McKinsey has helped develop city performance indices in other regions as well, with the goal of developing an integrated diagnostic tool for cities across the globe. For example, the Urban China Initiative, a think tank founded by McKinsey, Columbia University, and Tsinghua University's School of Public Policy and Management in 2010, recently published an Urban Sustainability Index (USI), the first index for measuring and comparing urban sustainability across China. For detail, see Jonathan Woetzel, Geng Xiao, and Lan Xue, *The urban sustainability index: A new tool for measuring China's cities*, Urban China Initiative, November 2010.

2 We selected the global benchmark cities on the basis of their being a world leader on one or more of the key dimensions included in the UPI.

DEVELOPED WORLD CITIES NEED TO ADJUST TO NEW SOURCES OF GROWTH

Most developed regions have already reaped the majority of economic benefits from urbanization, and city leaders are more likely to be grappling with growth that is too slow rather than growth that is so rapid as to make its management difficult. In the near term, many cities are struggling to overcome deleveraging and persistent unemployment. In the longer term, slower population growth, aging, and increasing global competition are creating headwinds against growth. Some cities will outperform their peers, while others will decline, as they have done in the past.⁴⁷ How individual cities will fare depends on how well they are positioned to take advantage of—or mitigate the negative impact of—the relentless trends shaping their economic environment. While they do not control all the relevant policy levers, cities need to think about how to make the most of their advantages and how to mitigate their weaknesses.⁴⁸

The first step for cities in developed regions is to understand the facts about how well they currently perform compared with their peers, as well as the impact of demographic and other trends on their prospects. Chicago has launched a major effort to compile a fact-based profile of the city's strengths and weaknesses as the basis for a new growth strategy. Toronto's Board of Trade tracks the city's performance against 24 global metropolitan areas in an annual report. Aging is one issue facing many cities, and leaders need to know how well placed they are to cope with this trend. Demographics vary from city to city, even in the same country. In Italy, for instance, more than 30 percent of the population of Trieste is expected to be aged 65 or over in 2025; in Napoli, that share is less than 20 percent. The two cities will therefore face very different demand for public services and potentially constraints for their growth.

Once they have audited themselves, cities need to translate that information into practical initiatives that can make a difference for the performance of city managers, businesses, or for the welfare of citizens. A city's prospects depend not only on its current situation and its economic environment, but also on how policy makers respond to this context. In the context of the balance of global economic power shifting to emerging cities, those urban centers that have good connections—or build them—with the fastest-growing cities in the developing world will be in a better position to take advantage of the opportunity they offer. These connections can be physical, such as airport hubs and ports, or business and personal relationships. With slowing population growth and aging, the capacity to attract young and skilled workers is likely to matter more. Cities can also find ways to limit the impact of unfavorable trends. For instance, many have hailed Pittsburgh in the United States as an example of an industrial city making a successful transformation through diversification and attracting new, more educated migrants.

47 *Urban America: US cities in the global economy*, McKinsey Global Institute, April 2012 (www.mckinsey.com/mgi).

48 For employment challenges in the United States and Western Europe, see *Help wanted: The future of work in advanced economies*, McKinsey Global Institute, March 2012; and *The world at work: Jobs, pay, and skills for 3.5 billion people*, McKinsey Global Institute, June 2012. Both are available to download at www.mckinsey.com/mgi.

The way policies and strategic plans are carried out is a critical success factor for national, regional, and local economic development, particularly given today's challenging public finances. To sustain and improve their services, most cities need to be able to do better with less.⁴⁹ Involving the private sector can help bring in expertise as well as intelligence about what constraints may be limiting companies' growth in a particular city and how to overcome the constraints. As is the case in the cities of emerging markets, good intelligence on how a city fares on the cost and quality of its services compared with its peers is important.

National governments across all regions will benefit from strong and close commercial and economic links to the world's growth centers—and that includes cities. So policy makers may have to rethink the current spread of foreign service and trade missions that does not reflect the rise of emerging market cities and their mayors. Many governments are likely to have to shift the geographic allocation of foreign service officials to reflect the world's most promising economic opportunities. Wuhan in China is expected to deliver nearly ten times the GDP growth of Auckland, New Zealand, but most countries have an order of magnitude more diplomats in Auckland—if they have any at all in Wuhan. For embassies, consulates, and high commissions to support their nations' trade interests more effectively, they need to move away from networks of embassies and consulates designed around the world as it was in the late 20th century and identify which cities are likely to shape the 21st century.

□ □ □

The shifting urban economic landscape is creating new challenges for city leaders and national governments across the globe. Policy makers in rapidly expanding emerging market cities need to manage that process in order to maximize its benefits and avoid future constraints on growth. In the developed world, large cities looking to sustain growth need to forge close commercial, trade, and personal links with the emerging market dynamos—particularly middleweights—that are remaking the urban world.

49 Francois Bouvard et al., *Better for less: Improving public sector performance on a tight budget*, McKinsey Center for Government and McKinsey Global Institute, July 2011.

Appendix: Technical notes

This report describes one possible scenario of the evolution of the urban world. Any forward-looking projection is subject to large bands of uncertainty at the level of countries and individual cities in population and household evolution, migration patterns, business innovation, city evolution, per capita GDP growth, and exchange rate outlook. Companies and policy makers need to test the robustness of their decisions against a broader set of plausible scenarios.

Available economic data by city remain limited and fragmented across the globe, and no single data source is available for all Cityscope cities for any of the variables included in the database. For our base year 2010, we have drawn on a broad range of sources to collect existing city-level data, assessed the data for consistency across sources and variables prior to finalizing the metrics we use, and used these data to identify patterns for estimating variables for cities where data are not available. Despite our best efforts, we are aware that there continues to be room for improving and sharpening the available city data globally.

This appendix first describes the changes introduced in the latest Cityscope version 2.0 since the publication of *Urban world: Mapping the economic power of cities* in 2011 and then provides details of the definitions, sources, and methodologies used to generate the Cityscope 2.0 database that are the basis of the findings in this report. We address the following topics:

1. Changes from Cityscope 1.0 to 2.0
2. Cityscope cities and their economic and demographic data sources and methodology
3. MGI's center of gravity methodology
4. Sources and methodology for municipal water
5. Sources and methodology for container shipping
6. Sources and methodology for residential and commercial buildings
7. Sources and methodology for deposits
8. Exchange rates used in GDP estimates

1. CHANGES FROM CITYSCOPE 1.0 TO 2.0

In this report, we have incorporated newly available data where available, notably new census information from a number of countries. We have updated data for population and GDP of cities in China available from the 2010 Census from China's National Bureau of Statistics as well as new census data from the United States, India, Mexico, Brazil, Japan, South Korea, Russia, and other European and South American countries. Altogether, we have added 399 cities to the Cityscope—mostly cities whose population has crossed the minimum size threshold—to increase the number of cities in the database to 2,657.

With the newly available data, we now use 2010 as our base year (rather than 2007, the base year of our 2011 report). We have used city population data from the latest UN Urbanization Prospects publication released in April 2012 and the latest available macroeconomic projections. The assumption for the world's GDP growth from 2010 to 2025 is 4.0 percent compound annual growth rate, the same as the growth for 2007 to 2025 in last year's report. There have been some changes in the consensus regional growth rates, with real growth rates slightly lower for most developing countries (for China and India, GDP growth assumption is 7.4 and 7.6 percent compound annual growth, respectively) and higher for developed regions except Australasia.

The central findings highlighted in our 2011 report remain unchanged. However, as a result of the data updates, some of the specific data references have changed slightly:

- **Shift in regional economic weight from 2007 to 2010.** The share of developed economies in global GDP in 2010 is 64 percent, a decline from the 70 percent share in 2007 reflecting both very different GDP growth performance (1.2 percent annual growth in developed regions compared with 6.5 percent in developing ones) and changes in relative exchange rates over these three years.
- **Role and composition of the City 600.** Our updated scenario suggests that the City 600—the top 600 cities by contribution to global growth in 2010–2025—will contribute 64 percent to global GDP growth in this period, up from 62 percent estimated in the 2011 report for 2007–2025. Individual cities included within the City 600 have changed—fully 121 cities from last year's report have been dropped and replaced by new entrants. There are more cities in the latest list from China (25 additional cities), Southeast Asia, and Eastern Europe and Central Asia, while the number of cities from all other regions has declined slightly.

We conducted three different scenarios to assess the robustness of the findings: (1) slower real GDP growth in China and India (2 percentage points below consensus projections today); (b) slower real global growth (2 percentage points below consensus projections for China and India, 1 percentage point lower in other developed economies, and 0.5 percentage points lower in developed regions); and (c) faster real global growth (1 percentage point faster in all developed countries, including China and India, and 0.5 percentage points faster in developed regions).

The central findings on patterns of urban growth hold across all these macroeconomic scenarios, although global growth and individual country and city projections naturally vary. Across all scenarios, the contribution to global GDP

growth from emerging market middleweight cities was above 45 percent; the number of emerging market cities in the City 600 was over 400; and, within the City 600, Chinese cities were by far the largest grouping.

2. CITYSCOPE CITIES AND THEIR ECONOMIC AND DEMOGRAPHIC DATA SOURCES AND METHODOLOGY

How we define “cities” in the database

The cities in the database refer to integrated metropolitan areas rather than specific city jurisdictions, aggregating neighboring cities into a single urban center where appropriate. Examples include Rhein-Ruhr in Germany; Los Angeles, Long Beach, and Santa Ana in California; and Mumbai and Thane in India. This results in a relatively broad definition of a city, denoting where people live and work regardless of distances, and in which the city center is only a fraction of the size of the total urban parameters in terms of both population and area.⁵⁰ We have included in Cityscope all metropolitan areas that had a 2010 population of 150,000 or more in developed countries and cities with 200,000 or more in emerging regions.

Sources and methodologies for demographic and economic data

We have estimated demographic and economic variables by city for the years 2010 and 2025: total population; population from birth to the age of 14, 15 to 64, and 65+; total number of households and average household size; number of households in four income brackets; and city GDP and GDP per capita in US dollars measured with three different exchange rates (market exchange rates, real exchange rates, or RER, and purchasing power parity exchange rates, or PPP).

- **Total population for base year 2010.** The sources of our data were:
 - MGI’s India and China models. MGI has conducted extensive studies on cities within India and China, and our database draws on updated models originally built as part of these efforts for the cities in these two countries.⁵¹
 - National statistical offices. For instance, we drew on European city data at the NUTS-3 level from Eurostat, the European Union’s statistical bureau, and then aggregated into Functional Urban Areas using definitions from Eurostat’s ESPON project; data on US Metropolitan Statistical Areas came from the US Bureau of Economic Analysis; and Russian data came from RosStat, the national statistical agency.
 - The United Nations’ World Urbanization Prospects: The 2012 Revision
 - The United Nations’ Demographic Yearbook 2009–2010
 - C-GIDD (www.cgidd.com/)

⁵⁰ To the extent possible, we have used regional sources consistent with our definition of cities. In Europe, we used the Functional Urban Area definition from Eurostat’s ESPON project. We constructed US metropolitan areas using the US Bureau of Economic Analysis’ Metropolitan Statistical Area definition. For India, we drew on the definitions used in the 2011 series of the Census of India and drew on our regional expertise in China to construct integrated metropolitan areas.

⁵¹ *Preparing for China’s urban billion*, March 2009; *India’s urban awakening: Building inclusive cities, sustaining economic growth*, April 2010. Both are available at www.mckinsey.com/mgi.

— Thomas Brinkhoff, City Population (www.citypopulation.de)

For 2025 population estimates, we use projections from MGI's India and China models, local statistical offices, and growth rates from the United Nations World Urbanization Prospects database.

■ **GDP.** For 2010, our data sources were:

- MGI's India and China models for city-level GDP.
- National statistical offices. For instance, European city data were drawn at the NUTS-3 level from Eurostat, the European Union's statistical bureau, and then aggregated into Functional Urban Areas using definitions from Eurostat's ESPON project; data on US cities came from the Bureau of Economic Analysis; we used Latin American national statistical offices for larger countries in that region, including most capital cities.
- Third-party data providers (e.g., C-GIDD). We used their estimates of per capita GDP and applied them to population data from local and national sources to calculate absolute GDP.

- **Econometric model for city GDP.** In the case of cities for which GDP data were not available from any of these sources, we estimated 2010 GDP using a model based on the statistical data gathered from the sources we have cited that allowed us to predict the GDP of a city using the city population and country GDP. We structured the model to include regional variables that incorporated the differences in per capita GDP in cities in different regions (Exhibit A1).

Exhibit A1

MGI used four sources to gather city GDP figures for 2010

GDP estimation approach
%; number of cities

Sources

Econometric estimation

GDP estimated with an econometric model based on available data from statistical offices, third-party data providers, and the McKinsey model

Third-party data providers

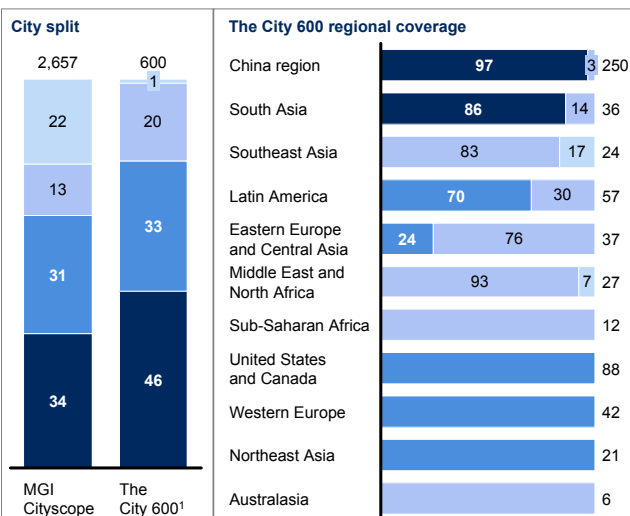
Per capita GDP estimations applied to population data from local/central sources to calculate absolute GDP

National statistic offices

Data from national as well as regional statistical sources (e.g., Eurostat for Western Europe)

MGI models

Cities and estimation of GDP based on MGI Model for India and China



¹ The City 600 is a subset of the Cityscope database with the top 600 cities ranked by absolute GDP growth for the period 2010–25.

SOURCE: McKinsey Global Institute Cityscope 2.0

We estimated city-specific GDP growth rates from 2010 to 2025 using approaches that reflect whether past GDP growth data were available for the city or not. Across all cities, our underlying country-level GDP growth assumption was the average of GDP growth projections from Global Insight, the Economist Intelligence Unit, Oxford Economics, and McKinsey's Long-Term Growth Model.⁵²

- MGI China and India urbanization models reflecting our in-depth analysis of past growth rates and current population and productivity trends, adjusted for the latest aggregate growth assumptions.
 - For other countries where historical per capita GDP growth rates were available (the United States, Western Europe, and some countries in Latin America), we projected a per capita GDP growth rate for each city by adjusting the national growth rate upward or downward proportionally based on past relative per capita GDP growth performance, yet limited the gap with the national per capita GDP growth rate to 25 percent or less. This approach implicitly assumes that cities that have outperformed (or underperformed) their peers are more likely to continue to do so, but that exceptional deviations from national patterns are not likely to be sustainable.⁵³ We derived a city's GDP in 2025 by multiplying projected per capita GDP by city population. As a result, a city's GDP growth rate can differ from national growth rates because of differences in population growth and/or differences in projected per capita GDP growth.
 - For the rest of the regions, we projected city per capita GDP growth to 2025 using national average per capita GDP and multiplying by the 2025 population. This approach assumes that each city's per capita GDP gap to the national average remains constant, yet a city's GDP growth need not be identical to national growth because of differences in population growth.
- **Population from birth to the age of 14, 15 to 64, and 65+.** For 2007, the sources of our data were:
- MGI's India and China models
 - National statistical offices
 - The United Nations' Demographic Yearbook 2009–2010

When data were unavailable, we used our demographic model. For 2025, we used MGI's India and China models and estimated growth rates using the United Nations' World Population Prospects national demographic forecasts adjusted for city-level differences in the initial age distribution and each city's population growth.

⁵² The real compound annual growth rates for GDP over the period 2010 to 2025 for selected countries and regions is 7.4 percent in China, 7.6 percent in India, 1.5 percent in Western Europe, 3.9 percent in Latin America, and 2.5 percent in the United States.

⁵³ With the exception of minor differences between relative growth of cities within a country, all of the findings in this report are unchanged if we instead assume that per capita GDP growth is the same across all cities within a country.

- **Total households and household size.** For 2010, the sources of our data were:

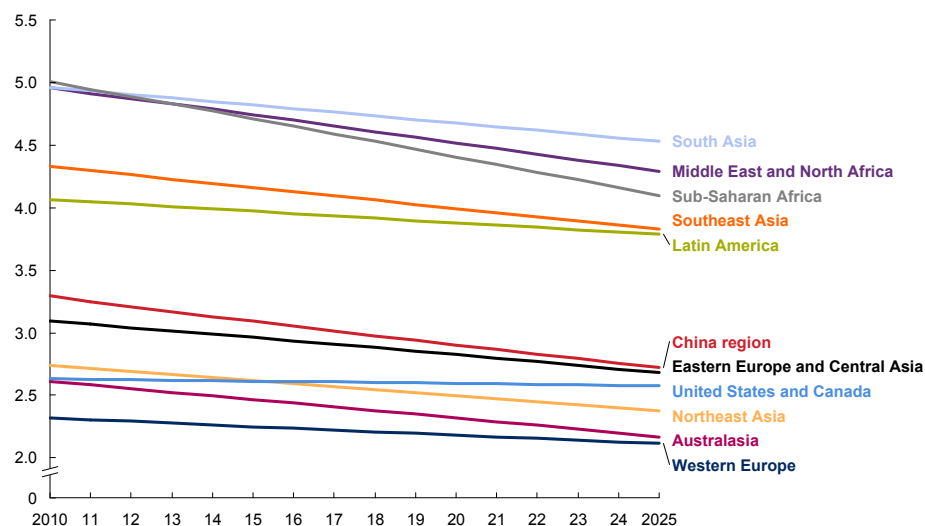
- MGI's India and China models
- National statistical offices
- C-GIDD
- Household size econometric model when data were unavailable

For 2025, we used our household size econometric model with birth rates, death rates, and regional dummies as drivers. We used the model to forecast the decline in cities' household size reflecting convergence to a regional minimum (Exhibit A2).

Exhibit A2

MGI modeled the evolution of urban household sizes globally

Average household size, 2010–25
People



SOURCE: McKinsey Global Institute Cityscope 2.0

- **Number of households by income bracket.** For 2010, the sources of our data were:

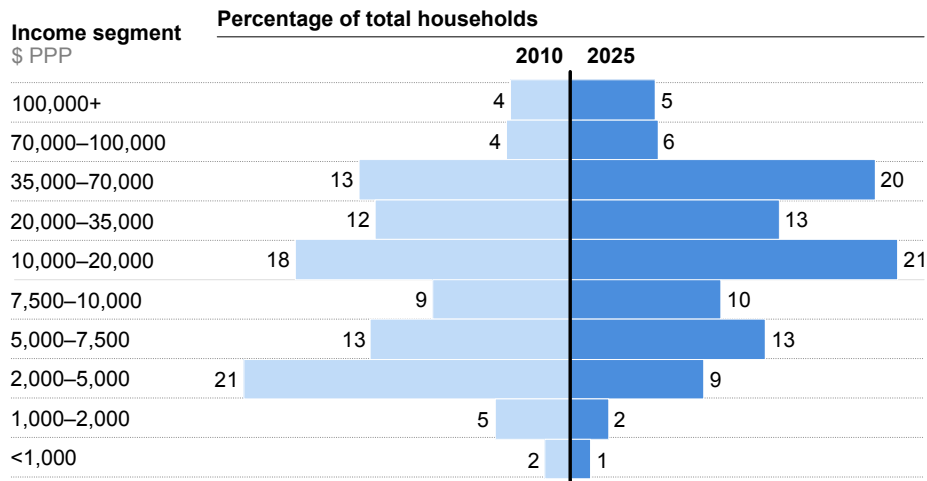
- MGI's China model
- National statistical offices
- C-GIDD
- Income distribution model when data were unavailable

For 2025, we used our income distribution model and adjusted past patterns of changes with expected growth in per capita GDP (Exhibit A3).

Exhibit A3

MGI extrapolated 2025 income distribution figures based on historical income distribution evolution and forward-looking per capita GDP growth

ILLUSTRATIVE



NOTE: Numbers may not sum due to rounding.

SOURCE: McKinsey Global Institute Cityscope 2.0

3. MGI'S CENTER OF GRAVITY METHODOLOGY

The center of gravity analysis is based on country-level historical estimates from Angus Maddison for the period AD 1 until 2007, and country-level growth rates from Cityscope 2.0 until 2025. We then allocated each country's GDP value to the approximate center of landmass of the respective country. The same center of each country was used throughout the entire time frame. To calculate the global center of gravity, landmass radian coordinates were transformed into Cartesian coordinates with a tool from the UK Ordnance Survey that uses ED50/UTM data and projection (see www.ordnancesurvey.co.uk/oswebsite/gps). We then transformed these coordinates into respective momentums and averaged these to a true economic center of gravity for each year, located within the sphere of the earth. To illustrate the shift of gravity, we lengthened the vectors from the center of the earth to the center of gravity so that they lie on the earth's surface. Although the concept of "surfacing" might create problems for interpreting data, both the resulting direction and the magnitude of the surfaced shifts were directionally consistent with the internal shifts, too. The four periods with the fastest shift, 2000–10, 1940–50, and 2010–25, maintain the same rank order, while the 1500–1820 period ranks 11th on surface but eighth on the "true" center of gravity.

4. SOURCES AND METHODOLOGY FOR MUNICIPAL WATER

We used available city-specific municipal water consumption per capita data to estimate the evolution of municipal water demand by city.⁵⁴ For 595 cities, data were available on municipal water consumption per capita from one of the following sources: national statistical offices (e.g., Brazil and India), McKinsey's China Urban Sustainability Index, the World Bank's International Benchmarking Network of Water and Sanitation Utilities (IBNET) database, the Growing Blue database, and Eurostat.⁵⁵ For cities where no per capita water consumption data were available, we used two approaches:

- In 1,260 cities for which we had partial city coverage within the same nation, we estimated their water consumption based on data for cities of a similar type within the country.
- In the case of 802 cities for which we had no water consumption data available at the city or national level, we predicted per capita water consumption based on a regression of per capita GDP and municipal water consumption, using available data for a 595-city sample. This regression accounts for roughly 45 percent of the variation in water consumption across cities. We chose this specification after testing multiple alternative models that included urban density or range of regional dummy variables; and region-specific models that led to water demand per capita GDP elasticity in the range of 0.2 to 0.7 (academic literature has estimated an elasticity of 0.25).

To project water demand in 2025, we predicted the rise in per capital consumption based on the functional form identified for missing city data, and applied the expected rate of growth to our baseline estimates of per capita water consumption according to the methodology that we have outlined. For developed regions, we do not assume increases in per capita water consumption from current levels. To assess the investments needed to supply the needed water, we relied on benchmark project costs across regions and steps in the water supply chain to estimate the range of investment needs by a city (Exhibit A4).

54 Municipal water demand does not cover the total urban water demand, as there are self-abstracting industrial uses that contribute for additional urban water demand. Given that self-abstracting industry does not rely on the municipal distribution network infrastructure, it lies outside the scope of this report. Across all water uses, agricultural use accounts for approximately 69 percent of all water withdrawals, while self-abstracting industry accounts for a further 18 percent and municipal water for 13 percent. Nevertheless, due to the nature of municipal water infrastructure, the municipal water segment accounts for more than 75 percent of the non-agriculture engineering, procurement and construction, and operations and maintenance markets, with industry accounting for the remaining 25 percent. For further discussion, see *Charting our water future: Economic frameworks to inform decision-making*, 2030 Water Resources Group, 2009.

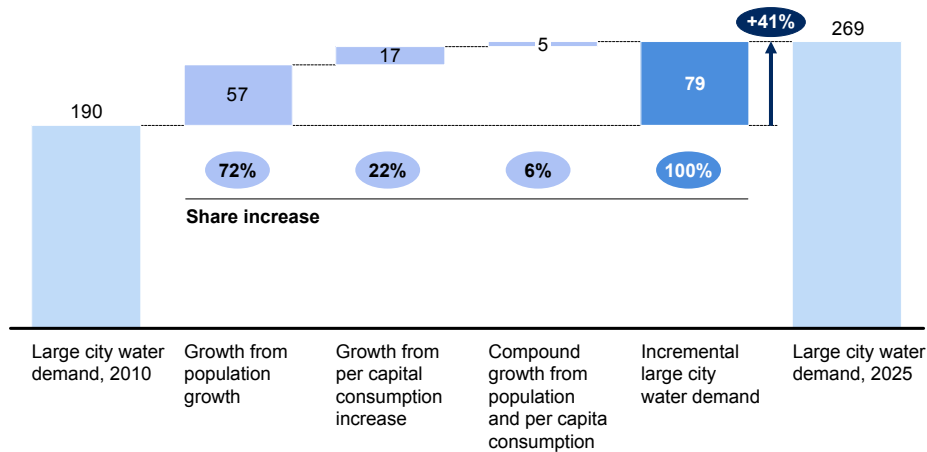
55 The World Bank's IBNET database is available at www.ib-net.org; the Growing Blue report and database can be accessed via www.growingblue.com; Eurostat data can be accessed via www.epp.eurostat.ec.europa.eu.

Exhibit A4

City growth and increased income will boost municipal water demand, set to increase more than 40 percent by 2025 from current levels

Large city municipal water consumption¹

Billion cubic meters per year



¹ Large cities refer to the 2,657 cities covered in Cityscope, which account for about 36 percent of world population.
NOTE: Assumes no gains in efficiency over forecast period, and assumes no growth in per capita water consumption in developed countries.

SOURCE: McKinsey Global Institute analysis

5. SOURCES AND METHODOLOGY FOR CONTAINER SHIPPING

For our deep dive on container shipping, we based our analyses on historical port-level container data with country-level GDP and trade variables using data from Containerization International database, Drewry Shipping Consultants, Global Insight, and MGI Cityscope 2.0.⁵⁶ We allocate regional container traffic demand to cities in the base year based on the city's contribution to regional GDP. To forecast container demand, we consider only origin-destination container traffic and link container traffic growth to that of trade volume using observed historical relationships across regions. We incorporate expected transshipment flows to calculate port infrastructure investment needs.⁵⁷ We differentiated between net exporting and net importing countries in the analysis to identify the direction that is likely to determine capacity demand and to account for empty container flows on the other direction.

We then forecast growth in national container demand to 2025 based on expected GDP growth, expected trade growth, and the observed historical relationships between GDP growth and trade. We apply the estimated growth rate of container traffic demand to the city-level baseline and aggregate demand at the port region level to estimate regional port infrastructure needs to meet expected demand.

⁵⁶ Containerization International data are available at www.ci-online.co.uk/, while Global Insight data are available at www.ihs.com/products/global-insight/index.aspx.

⁵⁷ Port container volume throughput is composed of transshipment and origin-destination volumes. Transshipment refers to "deep sea to deep sea" flows, reflecting the intermediate flow of containers. Origin-destination volumes refer to container flows that leave from or arrive at their destination port.

To estimate the regional investment required to meet expected demand growth, we first accounted for the utilization of current container capacity to ascertain how much more traffic could be absorbed without building new capacity. We also estimated how much traffic could be absorbed without building new capacity through efficiency improvements. In this way, we estimated the net capacity required to meet expected demand, and included an estimate of the additional capacity needed to ensure that capacity utilization does not exceed 80 percent and that transshipment capacity needs are met. We then applied a global benchmark cost per twenty foot-equivalent unit (TEU)—the size of a standard container—of around \$290 to the additional capacity required to meet demand by 2025. We did not make an assumption on the specific characteristics of newly built capacity (e.g., whether a greenfield or a brownfield approach is taken, or how much perching is needed to build capacity). The actual cost may therefore vary substantially on individual projects, driven by factors beyond the scope of our models.

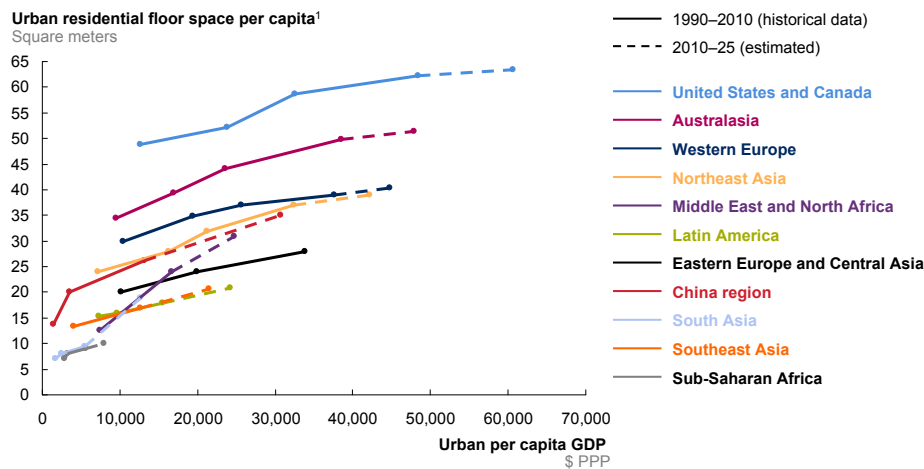
6. SOURCES AND METHODOLOGY FOR RESIDENTIAL AND COMMERCIAL BUILDINGS

Because no global benchmark data are available for residential and commercial floor space, we relied on a variety of sources, including the Institute of Economic Affairs (IEA), Global Insight, Lawrence Berkeley National Laboratory, SEMPLA-DIPRO, Embraesp, Seade, IBGE (Brazilian Institute of Geography and Statistics), UNCHS (United Nations Human Settlements Programme), and the Economist Intelligence Unit to produce a region-specific floor space consumption demand as a function of per capita GDP for residential buildings and of service industry value added per capita GDP for commercial buildings. We then broke this down further into countries for which data were available. Although only limited time series were available for regression, this approach allowed us to reflect the main differences in floor space consumption (e.g., population density, tax treatment of house ownership, household sizes) when estimating 2010 building stock. We then estimated the growth rate of per capita floor space demand to 2025, using fitted 2010 values and expected per capita GDP and per capita services GDP in 2025. In our estimates of residential and commercial floor space growth, we account for demand for new floor space as well as replacement of floor space at the end of buildings' lifecycles.

Finally, we estimated an aggregate range of investment needs across regions using data from Turner & Townsend and Riders Digest. We used average regional ranges for construction costs, but we didn't make an assumption on the type of buildings constructed or on the specific city-cost level (Exhibit A5). We do not include the cost of land as part of the cost of construction.

Exhibit A5

We expect current regional differences in residential building demand to persist and increasing per capita GDP and population to lift demand



1 2025 estimation based on historical data for 1980, 1990, 1998, and 2010.

2 Regional estimates based on available data for countries within the region and proxy countries.

SOURCE: IEA; Global Insight; Lawrence Berkeley National Laboratory; SEMPLA-DIPRO; Embraesp; Seade; IBGE; T. G. McGee and Ira M. Robinson, eds., *The Mega-urban Regions of Southeast Asia*; UNCHS; Economist Intelligence Unit; McKinsey Global Institute Cityscope 2.0; J. McDonald and D. McMillen, *Urban Economics and Real Estate: Theory and Policy*; Insma.udgs.es; INEGI

7. SOURCES AND METHODOLOGY FOR DEPOSITS

We gathered total national deposits from the MGI capital market database, McKinsey's Global Banking pools, and the International Monetary Fund. We collected city-level data on deposits for 771 cities worldwide using publications from national central banks. We limited data collection to 2007, as we deemed 2008 and 2009 to be too volatile for modelling and 2010 data were available to a much lesser extent.⁵⁸

In a similar approach to other industry metrics introduced into Cityscope, we used a regression model to cover missing data points for the base year as well as 2025 forecasts. After testing more than 20 possible specifications, we opted to implement a four-element approach, consisting of:

1. Population and GDP figures from the Cityscope database
2. A factor adjustment for the largest city in each country
3. A factor taking into account absolute per capita GDP levels (at PPP) as people start saving only after a specific income level has been reached that can be approximated by the respective per capita GDP value
4. A factor taking into account country-level values that reflects regulation and consumption preferences on a country level

⁵⁸ We have therefore identified regression parameters based on 2007 population and GDP data, too.

8. EXCHANGE RATES USED IN GDP ESTIMATES

Our database includes three GDP measures for all cities, each of which we express in US dollars (our unit currency) but derive using different exchange rates. The first of these is GDP measured at 2010 market exchange rates. The second is GDP measured at 2010 PPP exchange rates. The third is GDP measured at predicted RER in 2010 and 2025. Each is useful for different purposes. However, we have included the predicted RER figures as our base case in the growth projections in this report because these most closely approximate the expected dollar value of revenue or income earned in different currencies.

The RER for 2010 is the market exchange rate. We predict the RER for 2025 from differences in per capita GDP growth rates. The faster per capita GDP grows, the more rapidly the relative cost of non-tradable goods and services is likely to increase, leading to a higher dollar value of local sales. We account for this factor by assuming a relative RER appreciation proportional to the gap in per capita GDP growth relative to the growth of the United States, adjusted for the share of non-tradables in the economy. The RER predicted for 2025 therefore indicates the combined effect of changes in local prices and market exchange rates that affect the dollar value of GDP or income in each country.⁵⁹

59 P. A. Samuelson, "Theoretical notes on trade problems," *Review of Economics and Statistics*, Vol. 46, 1964; B. Balassa, "The purchasing power parity doctrine: A reappraisal," *Journal of Political Economy*, Vol. 72, No. 6, 1964.

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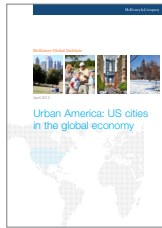
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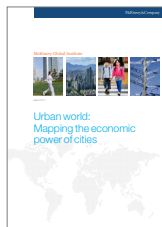
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The degree of economic vigor that the economy of the United States derives from its cities is unmatched by any other region of the globe. Large US cities generated almost 85 percent of the country's GDP in 2010. In the next 15 years, the 259 large US cities are expected to generate more than 10 percent of global GDP growth—a share bigger than that of all such cities in other developed countries combined.



Building globally competitive cities: The key to Latin American growth (August 2011)

Latin America is a bright spot in the post-recession global economy, with growth rebounding strongly in much of the region. In the years ahead, cities will be critical to regional growth. Latin America is the most urbanized region in the developing world, with 80 percent of its relatively young population living in cities today, a share expected to rise to 85 percent by 2025.



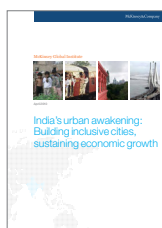
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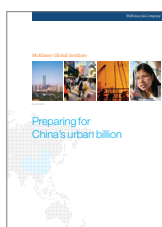
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India has a young and rapidly growing population—a potential demographic dividend. But India needs thriving cities if that dividend is to pay out. New MGI research estimates that cities could generate 70 percent of net new jobs created to 2030, produce around 70 percent of Indian GDP, and drive a near fourfold increase in per capita incomes across the nation.



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The scale and pace of China's urbanization continues at an unprecedented rate. If current trends hold, China's urban population will hit the one billion mark by 2030. In 20 years, China's cities will have added 350 million people, more than the entire population of the United States today. By 2025, China will have 221 cities with over one million inhabitants—compared with 35 cities of this size in Europe today—and 23 cities with more than five million. For companies in China and around the world, the scale of China's urbanization promises substantial new markets and investment opportunities.

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June 2012
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