Supersized cities
China's 13 megalopolises
A report from the Economist Intelligence Unit

China will see its number of megalopolises grow from three in 2000 to 13 in 2020. We analyse their varying stages of demographic development and the implications their expansion will have for several core sectors.

The rise and decline of great cities past was largely based on their ability to draw the ambitious and the restless from other places. China's cities are on the rise. Their growth has been fuelled both by the large-scale internal migration of those seeking better lives and by government initiatives encouraging the expansion of urban areas. The government hopes that the swelling urban populace will spend more in a more highly concentrated retail environment, thereby helping to rebalance the Chinese economy towards private consumption.

Progress has been rapid. The country's urbanisation rate surpassed 50% for the first time in 2011, up from a little over one-third just ten years earlier. Even though the growth of China's total population will soon slow to a near standstill, the urban population is expected to continue expanding for at least another decade. China's cities will continue to grow.

Some cities have grown more rapidly than others. The metropolitan population of the southern city of Shenzhen, China's poster child for the liberal economic reforms of the past 30 years, has nearly doubled since 2000. However, development has also spread through more of the country, and today the fastest-growing cities are no longer all on the eastern seaboard. Moreover, a sizeable proportion of the urban population is shifting towards several key focal points across the country. The number of super-sized urban agglomerations will rise, from three in 2000 to 13 in 2020, and they will together represent nearly one-third of the total urban population by the end of the decade. We describe these urban centres as megalopolises, denoting a city or cluster of cities with a combined metropolitan population of more than 10m people.

These megalopolises will be as disparate as the regions of China itself. The inland megalopolis of greater Zhengzhou, for example, will remain a comparatively young city in ten years' time; 32% of the population will remain below the age of 30, compared with 25% in greater Guangzhou. Disposable income levels will vary drastically as well; fewer than one-half (49%) of residents in the Chongqing megalopolis will earn above roughly US$5,000 a year by 2020, compared with two-thirds (67%) in Wuhan.[1]

The megalopolises that will emerge over the next decade will all be in inland China, as growth in the hinterland outpaces the already developed eastern coast. The country's new nerve centres will be poorer and younger than the ones that have already attained dominance, and their rapid growth will strain healthcare and education infrastructure. The differing demographic and income profiles of these cities mean that investors need flexibility in their approach to the Chinese market.

This paper will pinpoint the 13 emerging megalopolises in China and highlight the demographic and income trends that are shaping their development. It will then go on to discuss some of the implications for several key sectors, including healthcare and education, using the city of Chengdu as an illustrative example.

[1] The megalopolis income forecasts discussed in this paper exclude grey, or unreported, incomes. The Economist Intelligence Unit has compiled estimates of grey incomes at the provincial level—see page 11 for further discussion.

Part 1: The rise of the Chinese megalopolis

The relationship between the Chinese government and its massive populace is an uneasy one. A controversial birth-planning policy has been in place since 1978 to make sure that the country's population does not balloon out of control. The national system of household registration (or *hukou*) acts to regulate internal migration, especially from rural to urban areas. Standing in contrast to these policies aimed at managing urban growth have been the aspirations of provincial governments, many of which want cities large enough to offer attractive consumer markets and to provide sufficient labour pools for prospective investors. Size is associated with prestige, and urbanisation has become increasingly encouraged in development plans, despite the fact that the *hukou* system remains in place (albeit with considerable fraying). The more ambitious planners want to go even further, with an eye towards moulding their cities into global metropolises like Hong Kong or, in Tianjin's case, New York City.

This more determined push behind urbanisation is a fairly recent phenomenon, as China under the ruling Chinese Communist Party has had an ambivalent relationship with its cities. Government policy for a long time had a pro-rural emphasis, reflecting priorities of agricultural development and the achievement of grain self-sufficiency, and urbanisation was not explicitly addressed in the national five-year plan until 1991. By then the mechanisation of agriculture had reduced manpower needs in the countryside and created a labour surplus to be absorbed through urbanisation and industrialisation. In the 1990s, policy therefore took on more of an urban orientation, with official guidelines stating that the goal was to "strictly control the growth of the big cities, reasonably develop the medium-sized cities and encourage the growth of the small cities/towns". This still tentative posture indicated the government's fears that a flood of migrant labourers pouring into the manufacturing centres on the eastern seaboard would result in the proliferation of urban slums—a common sight in other parts of the developing world.

In 2001 the government continued to promote urbanisation at the small city/town level, and ramped up efforts by encouraging town-based industrialisation. To further this, policies were put in place to allow farmers moving to towns within their counties to convert their *hukou* from agricultural to non-agricultural status, then allowing them to sell their land-use rights to other farmers, facilitating the conversion of agricultural land to town land for industrial use. The endeavour failed to achieve the development of small towns, however, as investment continued to pour instead into larger

urban centres, and migrants followed opportunities for manufacturing and construction jobs. In an admission that it could not control the market forces that were driving the growth of China's largest conurbations, central government policy shifted in 2006 to promoting the "balanced development" of cities, with a heavier weight on fostering wider metropolitan regions.

By then, however, local-level initiatives promoting the development of larger-scale urban conurbations were already in place. Provincial development plans included the promotion of city "economic circles" and clusters, with the aim of using a relatively prosperous city to pull upwards poorer neighbouring cities. The city cluster of Changsha, Zhuzhou and Xiangtan ("Chang-Zhu-Tan") in central China's Hunan province serves as a prime example. In 2005 the provincial government promulgated a regional plan to build a so-called city cluster. It came to include plans to build stronger transport and communication links, such as changing the area telephone codes to a common number.

Along with city clusters, the integration of neighbouring cities was also promoted at the local level. For example, in recent years efforts have been made to tie more closely together Xi'an and Xianyang, in Shaanxi province, through the construction of two new urban districts. The neighbouring Pearl River Delta cities of Guangzhou and Foshan have also been slated for closer ties; the first phase of the new metro running between the two cities opened in late 2010. The Beijing-Tianjin high-speed railway started operations in 2008, to encourage stronger business and leisure travel between the two cities. Inter-city co-operation has been encouraged as a more efficient mode of urban development, as officials worry that local-level competition between nearby cities encourages waste and overbuild in infrastructure and capacity. Even so, the development of cross-provincial megacities remains challenging, owing to locality-centric thinking among many local officials.

At the same time as shifts in official policy, growth in areas outside the eastern seaboard has also helped to accelerate urbanisation. Aware of the need to diversify sources of economic growth and address gaps in regional development, over the past decade China's leadership has launched a massive drive to kick-start growth in western and north-eastern provinces. This effort has begun to bear fruit in recent years: in 2007 growth in the west surpassed that of the east for the first time in decades. Western provinces far outperformed the rest of the country in 2011 as aggregate GDP growth reached 14.1%, compared with the average on the eastern seaboard of 10.5%. Central provinces, notably those through which the Yangtze River runs, have benefited from large infrastructure investments and preferential central government policies aimed at attracting businesses. Urban centres in the interior now offer economic opportunities to rival those found in China's established megacities, and their populations have boomed as the labour force increasingly opts for local alternatives to migrating east.

Against this backdrop of urbanisation and inland economic growth, a number of megacities or megacity clusters have emerged. We have defined a megacity as a city with a metropolitan population of 10m, with a megacity cluster defined as a city grouping with a combined metropolitan population of 10m. For simplicity, these new urban centres will be called megalopolises. In 2000 only three groupings fitted the bill: greater Beijing, greater Shanghai and the Shandong peninsula city cluster.

As the pace of urbanisation picked up, so did the number of megacity clusters. By 2010, three more had emerged: Guangzhou-Foshan-Zhaoqing ("greater Guangzhou") and Shenzhen in Guangdong, and greater Shenyang in the north-eastern province of Liaoning. The Economist Intelligence Unit forecasts

[1]A *hukou* is a residency permit that is tied to a specific locality (town, village, or city). At birth, individuals are registered as an agricultural (rural) or a non-agricultural (urban) citizen in the parents' locality. Public services like healthcare and education are tied to one's *hukou* registration. There are limited ways, including marriage, to change one's *hukou* registration, but generally speaking the process is difficult and inaccessible to most.

that there will be 13 megalopolises in China by 2020, distributed more evenly throughout the country. All of the new megacity regions that will emerge in this decade will be in central and western provinces.

Our demographic model

The Economist Intelligence Unit's demographic forecasting framework estimates the metropolitan population for every prefecture-level city. Special attention was given to ensuring that internationally used definitions for city populations were used, which is why EIU data differ from those provided by Chinese statistical agencies. The metropolitan population measures the true urban population of the major city in the prefecture by including only the contiguously built city area.

Snapshot of megalopolises

	Sub-cities	Population* (m)	GDP** (Rmb bn)
Chang-Zhu-Tan	Changsha, Zhuzhou, Xiangtan	8.3	320
Chengdu	Chengdu	8.4	313
Chongqing	Chongqing	9.2	489
Greater Beijing	Beijing, Tianjin	23.3	1,900
Greater Shanghai	Shanghai, Suzhou	18.2	1,787
Greater Xi'an	Xi'an, Xianyang	7.9	264
Greater Zhengzhou	Zhengzhou, Kaifeng	7.6	162
Greater Guangzhou	Guangzhou, Foshan, Zhaoqing	10.8	1,356
Hefei economic circle	Hefei, Lu'an, Huainan, Chaohu	7.2	222
Shandong peninsula	Qingdao, Yantai, Weihai, Rizhao, Weifang, Jinan, Binzhou, Dongying, Zibo	17.9	1,227
Greater Shenyang	Shenyang, Anshan, Fushun, Yingkou, Benxi, Liaoyang, Tieling	11.0	668
Shenzhen	Shenzhen	11.1	820
Wuhan	Wuhan	8.3	389

Source: Economist Intelligence Unit, National Bureau of Statistics.
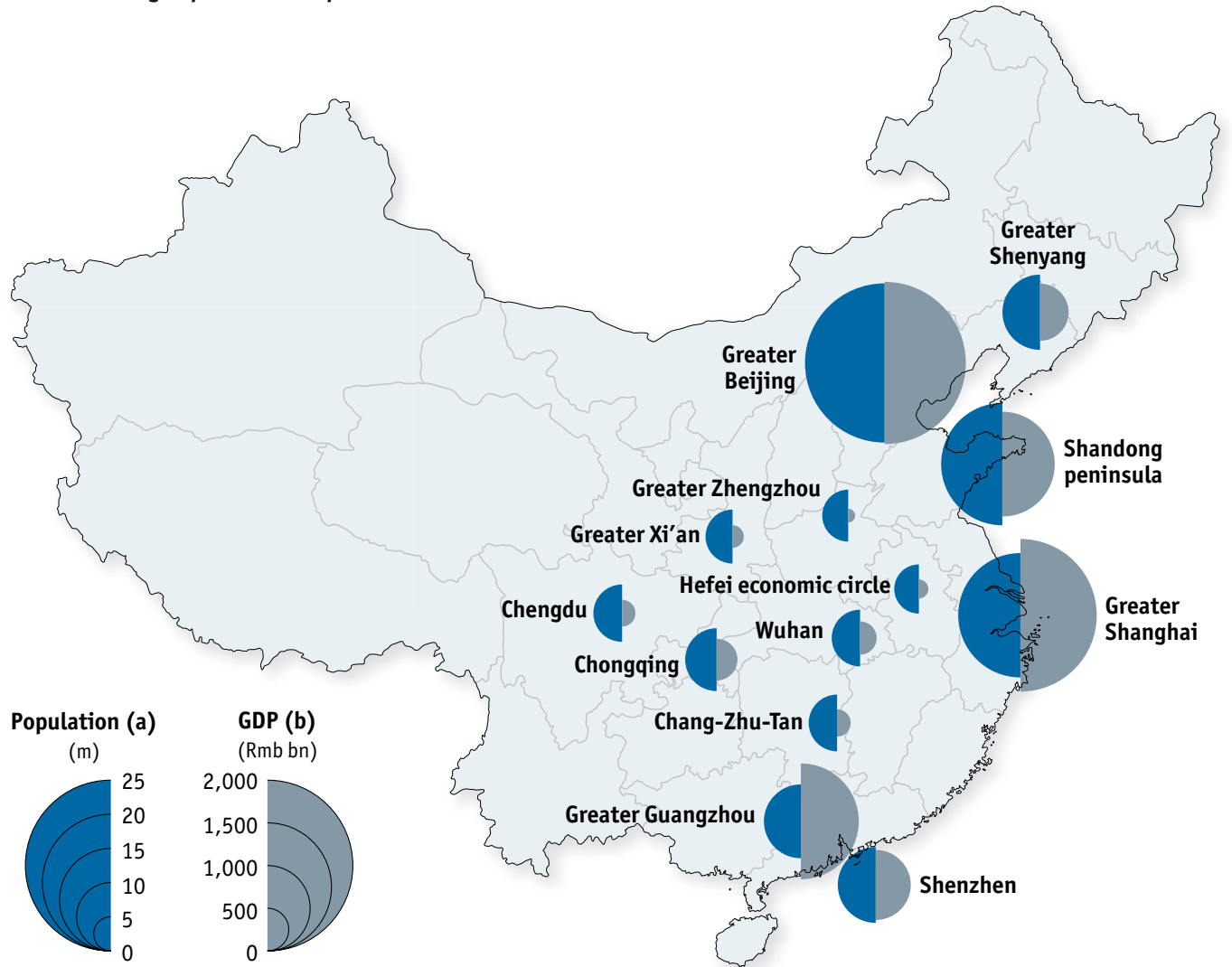*2010 estimates, metropolitan area
*2009 figures, metropolitan area

Map 1

China's 13 megalopolises: A snapshot

Greater
Shenyang

Greater
Beijing

Shandong
peninsula

Greater Zhengzhou

Greater Xi'an

Hefei economic circle

Chengdu

Wuhan

Greater
Shanghai

Chongqing

Chang-Zhu-Tan

Greater Guangzhou

Shenzhen

Population (a)
(m)
25
20
15
10
5
0

GDP (b)
(Rmb bn)
2,000
1,500
1,000
500
0

(a) 2010 estimates, metropolitan area.
(b) 2009 figures, metropolitan area.
Source: Economist Intelligence Unit, National Bureau of Statistics.

Part 2: Shaping up—how China's megalopolises are developing

Not all megacities are built alike. The new nerve centres that are emerging are poorer and younger than the ones that are currently dominant. The earliest urban clusters to emerge, centred around Beijing and Shanghai, have been long-established as the political and financial capitals of the country, and their growing prosperity fed a construction boom that drew in migrants from other provinces. In contrast, the newer groupings are being increasingly fed by intra-provincial urbanisation. In 2011, for example, the number of migrant workers leaving their homes to move to another part of Henan outnumbered the number moving to other provinces for the first time. Most of them move to the largest city in the province—Zhengzhou, in the case of Henan—where a rapidly expanding number of factories are being set up. A Taiwan-based electronics manufacturer, Foxconn, traditionally an attractive employer for migrants, is rapidly expanding its production facility in the city to make products designed by the US electronics giant, Apple. Until fairly recently, Foxconn was most famous for its sprawling manufacturing complex in the coastal export powerhouse of Shenzhen.

Growth: They grow up so fast

Falling fertility rates in China, largely owing to a combination of birth-control measures and the prohibitive costs associated with bringing up children, have brought population growth practically to a halt. Nevertheless, the populations of these megalopolises have risen sharply in recent years. The national population growth rate averaged just 0.57% a year over 2000-10, but in that period the metropolitan population of greater Zhengzhou grew by an average of 9.4% a year, more than doubling in size over the decade. The same trend was evident in Chang-Zhu-Tan, which saw its population more than double from 3.7m to 8.3m over the same period. Population growth in both megalopolises will slow in 2010-20, but will still outpace the national forecast average of 0.43% a year. The EIU forecasts that more than 11m people will reside in each by 2020. Megalopolises in the inland regions will grow the most rapidly in the coming decade because they will still be able to draw on large rural populations from their hinterlands. For example, in 2011 the rural population in Henan, at 54.4m, still represented 60% of the provincial total.

The more developed megalopolises will continue to see population growth above the national average, but will experience a less dramatic pace of expansion as construction matures and manufacturing moves inland. As these clusters reorient towards services, more highly educated

[3]Henan is one of China's main granaries. China's policy of grain self-sufficiency helps to support a larger than average rural populace

Population forecasts for megalopolises

	Total (m)			Annual growth (av, %)	
	2000	2020	Comparable in size with*	2000-10	2010-20
Chang-Zhu-Tan	3.7	11.2	Cuba	8.5	3.1
Chengdu	4.0	11.7	UAE	7.8	3.4
Chongqing	6.2	10.9	Portugal	4.1	1.7
Greater Beijing	16.6	28.7	Australia	3.4	2.1
Greater Shanghai	14.8	20.5	2x Sweden	2.1	1.2
Greater Xi'an	4.6	10.7	Portugal	5.7	3.1
Greater Zhengzhou	3.1	11.1	Cuba	9.4	3.9
Greater Guangzhou	8.8	11.9	UAE	2.1	1.0
Hefei economic circle	3.3	9.6	Hungary	8.0	3.0
Shandong peninsula	11.9	21.6	Sri Lanka	4.2	1.9
Greater Shenyang	9.9	11.6	Greece	1.1	0.5
Shenzhen	6.5	14.2	2x Hong Kong	5.5	2.5
Wuhan	6.8	9.8	Hungary	2.1	1.6

Source: Economist Intelligence Unit.

*2020 forecast population

migrants will follow, drawn to their higher wages. Shanghai will see population growth slow to an average of 1.2% a year over 2010-20, while Guangzhou will see population growth slow to 1%. Greater Shenyang, situated in the already highly urbanised north-east, will see population growth slow to a crawl as it ages and inward migration slows.
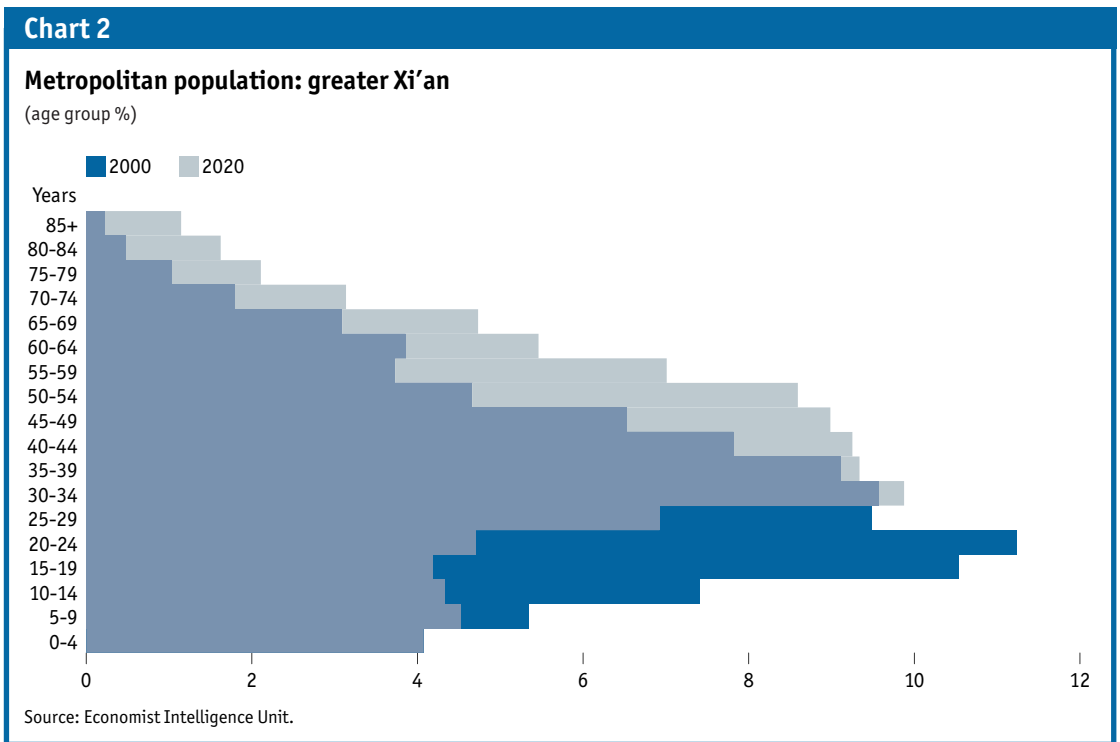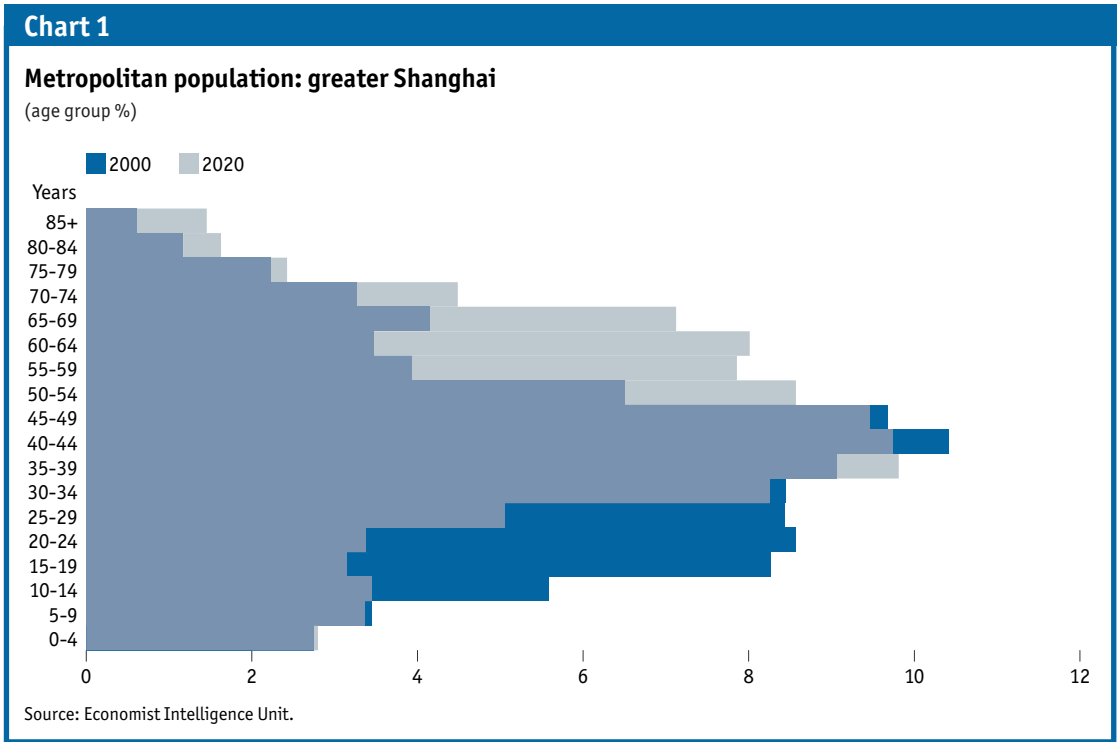
Ageing: The young and the restless

The differing timeframe and pace of migration will translate into markedly different demographic profiles for these megalopolises. Shenzhen was one of the earliest draws for migrants from other provinces, attracting young people looking for employment in coastal factories. Emerging from its earlier status as a sleepy fishing village, by 2000 more than 90% of its metropolitan population was in the working-age bracket of 15-65. Migrants are usually young; that year nearly 60% of its metropolitan population was between the ages of 15 and 29, with barely more than 1% of the population over the age of 65.

In contrast, the greater Shenyang metropolitan area has been a heavy industrial base since the 1930s. It formed a central part of China's industrial rust-belt, and urbanised early on. After a period of decline in the 1990s, it has managed to rejuvenate on the back of heavy foreign investment. It is now already in a later stage of its demographic development; its profile is older than the national urban average. By 2000 only 23% of the population was in the 15-29 age range in this north-eastern megacity cluster, and 9% of the population was already over the age of 65. The national averages were 25% and 7% respectively.
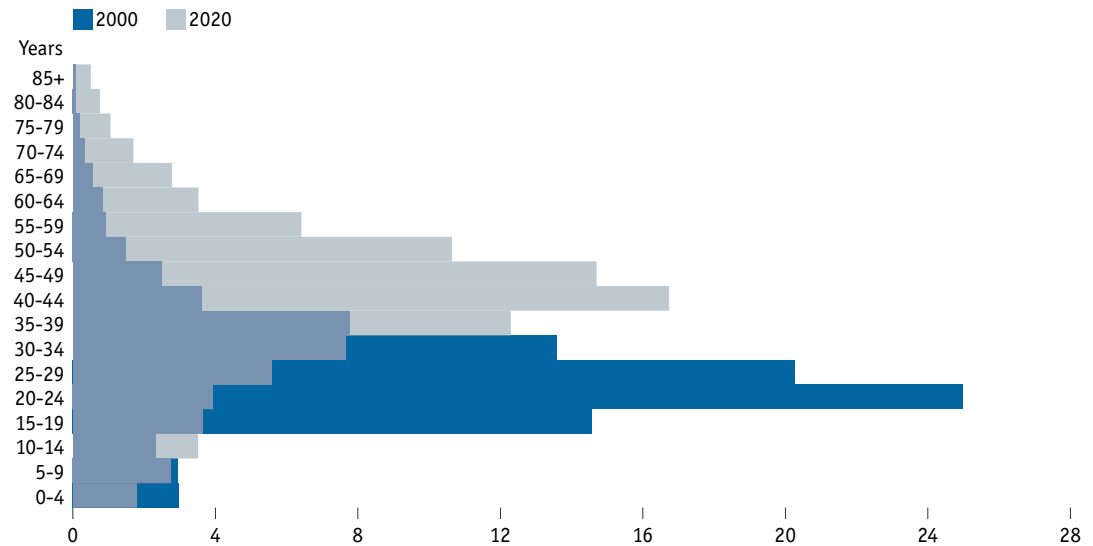
Chart 1

Metropolitan population: greater Shanghai

(age group %)

■ 2000　■ 2020

Source: Economist Intelligence Unit.

Chart 2

Metropolitan population: greater Xi'an

(age group %)

■ 2000　■ 2020

Source: Economist Intelligence Unit.

Chart 3

Metropolitan population: Shenzhen
(age group %)

■ 2000   ■ 2020

Years

85+	
80-84	
75-79	
70-74	
65-69	
60-64	
55-59	
50-54	
45-49	
40-44	
35-39	
30-34	
25-29	
20-24	
15-19	
10-14	
5-9	
0-4	

0   4   8   12   16   20   24   28
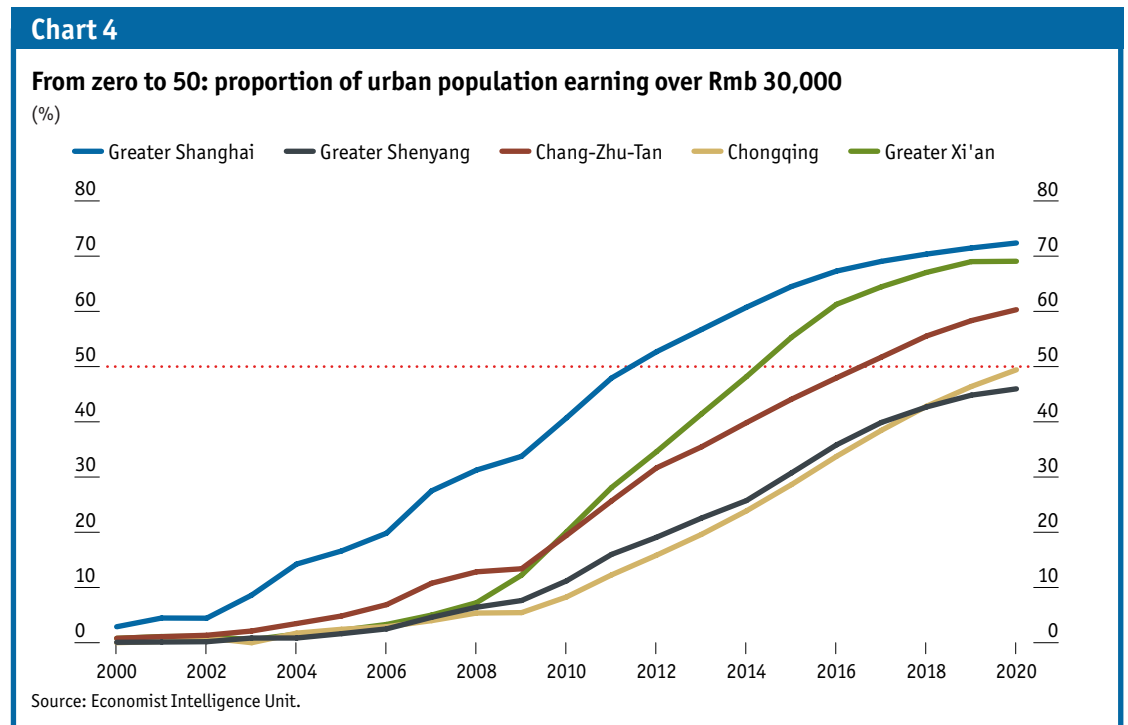
Source: Economist Intelligence Unit.

In 2010 the differences had softened somewhat, as Shenzhen reached a more developed stage. The proportion of the population in the 15-29 age range dropped to 23% as workers matured and the influx slowed. The elderly population ticked upwards, and although the working-age population had grown larger in absolute terms, as a proportion of the total population it had fallen slightly. The ageing of the population has also started to become more apparent in several other urban clusters. In 2010 Shanghai, Shenyang and Chongqing saw their elderly population reach more than 10%.

By contrast, a robust proportion of more than 13% of the population remained aged under 15 in the Hefei economic circle, Chang-Zhu-Tan and greater Zhengzhou. Even so, these levels in the metropolitan clusters were lower than the national average, where the proportion of the population under 15 was 16% in 2010.

By 2020 trends will become more pronounced as the working-age populations of several city clusters peak in size. In Shanghai and Guangzhou, growth in this age bracket will fall below 1% a year. Shenyang will be the first to see the absolute size of its working-age population start to shrink, from 2015, as its population ages. In 2020 the proportion of elderly will reach 17.4% in Shenyang and 17.1% in Shanghai. The other metropolitan clusters will largely remain relatively balanced, with roughly 11-13% of their population in the elderly bracket. Compared with the national average, the megacity clusters will continue to maintain a relatively large proportion of working-age residents—all well above the national average of 70%.

Incomes: From zero to 50

Chart 4

From zero to 50: proportion of urban population earning over Rmb 30,000
(%)

— Greater Shanghai — Greater Shenyang — Chang-Zhu-Tan — Chongqing — Greater Xi'an

Source: Economist Intelligence Unit.

There are concerns that the population will age before the country is able to attain high-income status—the worn cliché is that China will "get old before it gets rich". However, the more immediate concern should be the wider development of the middle class, as this affects broader consumption capacity and will be a determining factor in whether and when the economy will rebalance towards consumption as the main driver of growth.

As such, the Economist Intelligence Unit combined its city-level income forecasts with its demographic model to examine the prospects of the megalopolises with regards to the development of their middle classes. These forecasts are based on government income data, which do not account for "grey income" (see box below). In this paper, middle-class income is defined as an individual earning more than Rmb30,000 a year at 2011 prices.[4]

In 2000 almost no one earned more than Rmb30,000 a year. Only Shenzhen recorded a significant number of residents earning above that level, at slightly over one-quarter of the population. The only other cluster that came close was greater Guangzhou, with just 5.3% of its metropolitan population classed as middle-income earners. Nearly all of the other clusters, including greater Beijing, recorded negligible proportions of less than 1%.

By 2010 greater Shanghai and greater Guangzhou had nearly caught up with Shenzhen. The proportion of middle-income earners in the three megalopolises had reached roughly 40%. In absolute

Shades of grey: grey income

In 2010, an academic from the China Reform Foundation, Wang Xiaolou, published an influential report on the extent of the unreported—or "grey"—income of China's households. The report was controversial, as it suggested that the discrepancy between officially reported income and the actual wealth held by Chinese households was equivalent to nearly 30% of China's GDP in 2008—a staggering amount. It also claimed that the under-reporting of income was most flagrant among China's wealthier households, suggesting that levels of wealth inequality were much wider than officially recognised. Income tends to be understated in official household surveys, as individuals are concerned that the information they disclose might be passed to the authorities (tax evasion is rife in China).

The Economist Intelligence Unit consulted with specialists to build its own estimates of the actual wealth held by Chinese households. It has developed a forecasting framework, combining its own macroeconomic data with relevant academic studies on grey income and income inequality, to generate provincial-level estimates of actual household incomes in different income bands. The megalopolis income forecasts in this paper do not include grey income, as it focuses on city-level data.

The differences between the income projections based on official data and those factoring in grey-income estimates are stark. For example, in 2010 only 6% of households in Chongqing earned above a cumulative Rmb80,000 after adjusting for inflation. When factoring in grey income, however, the EIU found that this proportion rises nearly fourfold to 27%. At the national level, 12% of households earned above a cumulative real Rmb80,000 that year. After adjusting for grey income, however, this proportion nearly triples to 32%. The under-reporting of real income levels indicates that our forecasts for the expansion of China's urban middle classes are likely to be conservative.

terms, greater Shanghai had the largest number of middle-income earners, but income distribution was more unequal—greater Shanghai had a larger proportion of people in the lower income brackets than Shenzhen. The proportions remained unimpressive, however. Not until 2011 did Shenzhen emerge as the first city cluster with the majority of its population earning more than Rmb30,000.

By 2020 the 50% milestone will be reached by most of the megacity clusters. Greater Shanghai will have the largest proportion of its population at this income level, at more than 70%. Greater Beijing and greater Xi'an will be close behind, just missing the mark at 69%. Notably, the western megalopolis of greater Xi'an will make impressive gains, surpassing the earlier-developing Guangdong and

Surpassing the 50% mark

2011	Shenzhen
2012	Greater Shanghai, Greater Guangzhou
2013	
2014	Greater Beijing
2015	Greater Xi'an
2016	Wuhan, Shandong peninsula
2017	Chang-Zhu-Tan
2018	Chengdu
2019	Hefei economic circle
2020	

[4]This is the equivalent of Rmb40,900 at forecast 2020 prices.

Shandong clusters on the eastern seaboard with its proportion of middle-class income earners. It will prove the most successful of the emerging city clusters in terms of the spread of prosperity.

However, not all of the megacity clusters will be able to achieve this milestone by 2020. Notably, greater Zhengzhou, the Shenyang metropolitan area and Chongqing will maintain the smallest proportions of middle-income earners. Shenyang will face particular problems, as it will start to see a decline in its working-age population before a majority of its residents reach the Rmb30,000 income level; there is a real possibility that it will grow old before the majority of its population reaches the middle class.

Part 3: Big city promise, big city blues

Looking at these metropolises with their burgeoning populations, investors sense opportunities to make fortunes. To a certain degree, they will find them. China's new consumer class will be concentrated in its megacities. Buoyed by increases in personal income, China's first-tier cities on the east coast already offer sophisticated retail environments. They will remain indispensable markets for retailers in the period up to 2020, as their populations will have the highest levels of disposable income and will act as arbiters of taste for the rest of the country. However, the fastest growth in retail sales will come in the interior megacities, which are set to benefit from rapid wage increases and government-led efforts to boost levels of consumption. The widespread under-reporting of household income—as suggested by our estimates on grey income—suggests that consumer demand might even be higher than expected, particularly for mid-to-high-range items.

However, these megalopolises will encounter hiccups in their development if shortfalls in education and healthcare are not addressed. The rapid influx of new residents will pose severe strain on their educational and healthcare systems. Hospitals and schools are being built at a rapid pace, as the hard infrastructure needed to support additional services is put in place, and the national government has put forth plans to raise overall levels of public service coverage. However, they place heavy emphasis on raising coverage in rural areas, where populations are now shrinking. Less explicit attention is being given to the largest, more developed cities.

The challenges that China's megalopolises face are varied. An undersupply of public healthcare facilities is one. The low ratio of teachers to students is another. But the varying demographic profiles of China's most concentrated urban clusters mean that problems will vary from area to area. For example, the decline in the proportion of people aged under 20 in Shenyang means that demand for education will remain much weaker than in the Hefei economic circle, where the corresponding proportion will remain the largest of the megacity clusters. Demand will vary depending on income level as well. This section will spell out the implications of the rapid development of megalopolises on several sectors.

Retail

Urbanisation supports consumption, as it creates more concentrated retail markets than those that exist in rural areas. The density of urban populations, in addition to the superior transport and

logistics networks of cities, makes it easier for retailers to reach a larger number of consumers. Retail markets in some of China's megacities are already highly developed: once-fragmented retail markets are increasingly dominated by chain operations. Underlying this trend is the emergence of the Chinese middle class. The proportion of the population earning more than Rmb30,000—our benchmark for middle-class status—now averages above 40% in greater Beijing, greater Shanghai and Shenzhen. In the past decade the relatively young populations of these developed megacities have driven demand for discretionary items such as cars, luxury brand clothing and digital products. Over the next decade, their tastes will become more discerning and consumption will reflect the predilections of an older population. Growth in demand for services, such as healthcare, is likely to outpace that for traditional big-ticket goods.

Emerging megalopolises such as greater Zhengzhou and Hefei economic circle offer more fragmented retail markets, with larger scope for consolidation. The nature of demand in these megacities will also be quite different from that of their more established counterparts. Sales of household appliances and electrical products will continue to record strong growth, and manufacturers of these items will focus their attention on such markets. Rising incomes and busier lifestyles will ensure that demand for eating out continues to grow. On paper, at least, only a smaller section of the population will be able to afford high-end merchandise. However, the potential of these inland markets should not be underestimated. Whereas demand for luxury goods may level off in some of China's eastern megacities, it is likely to become more robust in the interior cities, as consumers look to showcase their new-found wealth through product upgrades. Strong competition has already emerged in these markets from local rivals, who have moved into inland cities much more quickly than foreign chains. This stands in stark contrast with Beijing and Shanghai, where foreign firms and local ones expanded and bought up smaller rivals at the same time.

Education

The challenges and opportunities in the education market in China's megacities are vast. The sector has long suffered from being underfunded and understaffed. These problems are particularly pronounced in the megalopolises—something of a surprise, as educational opportunities generally should improve with economic development. However, in the case of China, the population surges seen in the megalopolises far outpaced the rise in the number of schools and teachers needed to educate them. Moreover, owing to *hukou* restrictions, a significant proportion of residents in these increasingly affluent megacities are shut out of the system. Private schools for migrant children have been set up, but are often shut down for being unregistered. In 2009 China's education minister, Zhou Ji, was sacked owing to widespread public dissatisfaction with the public school network—particularly frustration with the lack of improvement in the primary and secondary school systems. The following year a long-term education plan for the period up to 2020 was issued, promising to make equal access to education a basic state policy.

Nearly all of the megalopolises provide relatively weak access to education in comparison with the smaller cities. The clusters in southern China, Shenzhen and greater Guangzhou, fare particularly poorly owing to the higher proportion of migrants in their populations. Greater Zhengzhou, Chang-

Zhu-Tan and Chengdu, which together saw some of the fastest population growth over the past ten years, also had very low ratios of schools and teachers to the total population, as the educational system failed to keep up with provincial urbanisation. Greater Xi'an was the only exception in offering comparatively high access to education at all levels; there are 7.6 primary school teachers, 7.4 secondary school instructors and 5.9 higher education instructors for every 1,000 residents, compared with 3.9, 4.1, and 3.7 respectively in Greater Beijing and 5.4, 5.5 and 4.9 in Chang-Zhu-Tan.

In theory, pressure on the school system should be easing, as the number of school-aged children has started to shrink. At the national level, total enrolment in primary schools started to fall in the mid-1990s, whereas secondary school enrolment began its decline in the early 2000s. The proportion of the university-aged population (18-22) has started to shrink as well, after it peaked in 2008. This is a more pronounced phenomenon in the megalopolises that emerged earlier, such as Shenyang and Shanghai.

In the newer megalopolises, especially those in central China, the proportion of school-aged residents will remain higher than those in the more developed eastern seaboard.[5] This should maintain pressure on their educational systems for the next decade. Moreover, school enrolment rates remain below the levels seen in developed countries, and the national government has set targets to raise them further at all three levels. Certain megalopolises have set high targets: Chengdu, for example, wants 25% of its employed population to have a university degree by 2015.

Companies aiming to target the educational market are therefore likely to find high demand in clusters with poorer provision of public services and higher average incomes. The State Council (China's cabinet) recently announced that private investment into the previously state-controlled education sector would be encouraged. Although large outlays are being set aside for the sector— the central government recently reiterated its target to spend 4% of GDP on education in 2012— this announcement is to be taken with a grain of salt. It has held, and missed, the same target for approximately 20 years.

Healthcare

Urbanisation will place the public health infrastructure of China's megacities under considerable strain. These conurbations will need to develop healthcare delivery systems capable of meeting the demands of an urban population that is not only growing in number, but also rapidly increasing in age. Many of the hospitals and clinics in China's first-tier cities are already operating at close to full capacity. China's future megacities will also need access to a range of resources required to treat ailments associated with urban living. Dietary changes and more sedentary lifestyles will lead to a rise in non-communicable diseases, such as diabetes, cardiovascular disease and cancer. Healthcare provision in China's megacities will need to be substantially improved if these challenges are to be met.

The central government has in recent years boosted healthcare spending and implemented a series of reforms aimed at improving levels of coverage. However, coverage is shallow and patients continue to pay large sums to cover medical fees. Total spending on healthcare is also low by international standards, at an estimated 4.8% of GDP in 2011 (compared with 7.3% in Japan and 5% in India). There is therefore considerable room for growth.

[5]Proportions will still remain lower than the nattional average.

Some megacities are more prepared than others to manage the health needs of populations growing in size and age. In 2009 greater Shanghai had 961 hospitals and clinics, the most in China. However, its ratio of 2.7 doctors[6] per 1,000people compares unfavourably with 3.8 for greater Beijing and 4.1 for greater Guangzhou. As greater Shanghai's population is forecast to be among the most aged in China by 2020, it will need to increase the number of healthcare professionals employed in the city. Shenzhen scores worst among the megacities in terms of healthcare access, with less than two hospital beds and exactly two doctors per 1,000 residents. Its skewered demographic structure currently allows it to offer a relatively low level of healthcare provision, but it will need to make adjustments in the coming years as its elderly population grows.

Many of the interior megacities boast a relatively high number of hospital beds. For example, Chongqing has nearly ten hospital beds per 1,000 residents, which is 50% more than the majority of cities on China's more developed eastern seaboard. However, there are typically fewer physicians working in the emerging megalopolises. Hefei economic circle has 2.3 doctors per 1,000 residents, but Hefei proper has less than two, which means it may struggle to meet the health needs of a still-growing population. Other fast-growing clusters have comparatively low levels of medical staff; greater Zhengzhou has only 2.2 doctors per 1,000 residents. China's inland megacities face challenges in attracting doctors to work in less prosperous areas.

Local governments have each set out proposals for healthcare reform in recent years. Shanghai, for example, has set out a programme of proposed reforms up to 2020, which include the establishment of more nursing and rehabilitation centres for the elderly, as well as wider service provision through home visits and online consultations with family doctors. Megacities will adopt different plans. A 2011 World Bank report on China's health system reform calculated that public spending on health averaged Rmb235 per capita across prefectures under Tianjin's jurisdiction in 2008, compared with Rmb42 in Anhui province (with spending in its capital, Hefei, averaging just over Rmb50). Such disparities reflect the differing wherewithal of local governments. With constrained fiscal resources, many of China's emerging megacities are reluctant to embrace full-scale *hukou* liberalisation, as it would entail a significant rise in healthcare liabilities.

Healthcare companies may therefore need to adapt somewhat their investment strategies to local circumstances. Although substantial increases in public expenditure will help to drive increased demand across the megacities, demand for certain types of products—such as expensive discretionary drugs and private healthcare services—is likely to prove more niche. The large urban centres of eastern China, where levels of disposable income are highest, will provide the greatest opportunities in this regard. The private health insurance market, for instance, has expanded at annual rates of over 25% in the past decade, supported by the growing urban middle class in the eastern megalopolises and the increasing number of blue-chip companies that provide private health schemes to their employees. However, the market remains comparatively small. Foreign investors looking more broadly across the megacities are likely to find more interest in sub-sectors such as affordable medicines, medical devices and hospital information systems technology.

[6]The term "doctor" in China can be misleading, as what constitutes a doctor in China often does not translate to the same level of training as in other countries. For example, a low proportion of the doctors included in these figures have had more than five years of training.

CASE STUDY Chengdu

Chengdu, the provincial capital of Sichuan, is the furthest inland megalopolis identified in the report. It has become a significant force in China's economy on the back of government-led efforts to spur growth in western China, with real GDP expanding by 15.2% in 2011. Foreign direct investment growth has been extremely strong in recent years, attracted by cheaper land and labour costs than the eastern coast, in addition to infrastructure improvements that have eased transport bottlenecks. The information technology sector, particularly with regards to manufacturing, has been the primary beneficiary.

The city's development has turned it into a magnet for migrant workers, and Sichuan's surplus rural labour has spilled into Chengdu. The metropolitan population grew by an annual average of 7.8% in 2000-10 to reach 8.4m (its total population, including rural areas under the city's jurisdiction, was 14.7m in 2010). The Economist Intelligence Unit forecasts that Chengdu's metropolitan population will expand to 11.7m by 2020.

Continued urbanisation in Chengdu will be supported by what are the most ambitious efforts yet under way in China to reform the *hukou* system. Building on incremental reforms since 2003, the municipal government has announced that the distinction between urban and rural *hukou* holders will largely be eradicated by the end of 2012. Local migrants to the city are to hold either temporary or permanent residency rights, depending on their period of stay, which grant them access to public services and benefits from which they were previously excluded.

Unlike *hukou* reforms piloted elsewhere, Chengdu's rural *hukou* holders do not have to surrender their rural land rights in return for being granted urban residency benefits. The reforms therefore hold the real prospect of creating a more mobile labour force in the city. The proposals will test the capacity of Chengdu's social security, public health and education systems, but surging levels of public income have made the local government confident it can cope with an increase in demand.

One of the motivations for unifying the household registration system is to lower further the wealth disparity between urban and rural residents. Providing migrants working in Chengdu with social security benefits will bolster incomes and allow more capacity for discretionary spending. Average urban per capita disposable income rose by 14.9% to Rmb23,932 (US$3,783) in 2011, with rural net income increasing by 20.6% to reach Rmb9,895.

Owing to anticipated growth in wages and public spending,

the Economist Intelligence Unit forecasts that the proportion of the metropolitan population with a disposable income above Rmb30,000—our threshold for middle-class status—will hit 55.2% by 2020, an increase from 18.4% in 2010. This will underwrite healthy growth in demand for consumer goods and other services.

Our forecasts may well prove to be conservative, as income is widely known to be under-reported in the official figures on which our forecasts for per capita disposable income are based. Surging retail sales in recent years suggest that demand is stronger than might be expected from average income levels in Chengdu. A more accurate representation of Chengdu's consumer market can be garnered by adapting our analysis of hidden (or "grey") household income in section two of the report.

Although we do not have figures for Chengdu itself, our estimates for Sichuan province as a whole indicate that household income is likely to be much higher than assumed. According to official figures, only 1.3% of households in Sichuan earned above Rmb100,000 in 2010. However, after making adjustments for grey income, we estimate that closer to 12.8% of households had a disposable income of that level in 2010. We forecast that the number of households with incomes of more than Rmb100,000 (after adjusting for inflation) will surge to 62% by 2020, versus the much lower estimate of 20% drawn from official data. The vast majority of these mid-to-high-income households are likely to be located in the province's capital, Chengdu. (The EIU forecasts household size to be 2.7 persons that year.)

As earnings are most widely under-reported by high-income groups, one conclusion to draw is that income inequality in Chengdu, as well as other megacities, is likely to be much wider than otherwise recognised. The other implication is that private

Proportion of urban households in Sichuan earning more than RmbXX in 2010 (%)

	Based on official data	With grey incomes
>15k	91.35	90.52
>30k	57.68	67.38
>40k	35.88	53.14
>50k	21.16	41.24
>60k	12.51	31.92
>80k	4.47	19.65
>100k	1.28	12.81

Source: Economist Intelligence Unit

consumption is likely to be a more important driver of economic growth than might be imagined. Demand for mid-to-high-range consumer goods and other services, such as healthcare and education, is likely to be particularly robust. The success of major luxury retailers in Chengdu becomes more explainable when we factor in levels of grey income.

Retail

Chengdu is a already a target for retailers in western China, as wealthier residents of Sichuan, Shaanxi and Gansu travel to the city's busy shopping centres to make purchases. Luxury brands such as Burberry, Louis Vuitton and Prada have store branches in the city. The local government has set a goal of bringing 20 top international brands to the city every year in the period up to 2015. The city's retail sales grew by 18.4% to reach Rmb286.1bn (US$45.1bn) in 2011. This compares with Rmb690bn in Beijing and Rmb349bn in neighbouring Chongqing (which has a substantially larger population).

Opportunities for retailers in the city in the period up to 2020 are likely to be substantial. Levels of personal disposable income are forecast to rise rapidly, and an influx of migrants from the city's surrounding regions will drive demand for a range of consumer items. Improvements in Chengdu's transport infrastructure, such as the planned expansion of its metro system, will help to improve access to shopping districts. Retail sales will remain dominated by items such as cars, clothing, home appliances and electrical products, but there will also be substantial growth in high-end items as the number of top-income earners expands. The city's entertainment offerings will also expand. The city has a long tea-house tradition, which is reflected in the numerous new modernised entertainment zones with tea-house streets. A Hong Kong-based developer, Lan Kwai Fong, opened a 43,000-sq metre entertainment district in the city in 2010, its first venture in mainland China.

Healthcare

Chengdu's existing public health facilities are relatively strong. The city's rate of 2.8 doctors per 1,000 people is higher than similar megacities (for example, it is 2.4 in Chang-Zhu-Tan) and one of the world's largest hospitals, the West China Hospital, is located in the city. Nevertheless, urbanisation and ageing will pose a number of public health challenges in the coming decade. The proportion of Chengdu's population over the age of 65 years is forecast to reach

13.4% by 2020, up from 9.2% in 2010. The plans of the municipal authorities up to 2015 include increasing basic medical insurance coverage, establishing more primary healthcare facilities and creating a system of electronic medical records for all residents.

Owing to an anticipated increase in demand, international healthcare companies are rapidly expanding their presence in Chengdu. In 2011 a subsidiary of the US-based General Electric, GE Healthcare, began to build an innovation centre to develop medical devices for the local market. The healthcare businesses of Philips (Netherlands) and Siemens (Germany) are developing similar research and development operations in Chengdu. A number of privately owned hospitals have established presences in the city to serve not only expatriate workers, but also a growing number of local residents. Opportunities in e-health and hospital information systems are also likely to multiply as the city looks to overhaul its public health management and record systems.

Education

Hukou reform raises the possibility that an influx of migrant families will overburden Chengdu's education system. However, as overall fertility rates are likely to remain low, this should prove manageable. The more pressing challenge for Chengdu is to develop a workforce capable of sustaining the upgrade of the local economy. As with other megacities in China, problems in recruiting and retaining talent are a top concern for foreign-invested companies in Chengdu. A lack of sufficiently trained workers may constrain the city's ambitions to cultivate sectors that have been earmarked for growth, such as information technology software and financial services.

Chengdu has a large number of educational institutions, including some of China's leading universities, but it is relatively understaffed. For example, the number of primary school teachers per 1,000 residents is lower than in greater Shanghai and greater Shenyang, even though the proportion of the very young in its population is higher. The need to reform the education system is likely to offer opportunities to educational providers in the period up to 2020. The city has ambitious plans to improve vocational training, which has not always been aligned with employer needs. China's second-largest vocational training college is based in the city, and already offers courses by international providers. Foreign investors are also being encouraged to establish in-house training centres. International schools are being asked to expand in the city and to develop links with local educational institutions.

Conclusion

Each of China's 13 megalopolises represents a potential market the size of a small country. While impressive, the considerable variation in demographic composition, overall income levels and degrees of retail development present a significant challenge for investors as well. Such variations will need to be factored into any China business strategy. Over the next decade, most of the megalopolises will see a majority of their population attain middle-class status. However, this will take place over different timeframes: greater Xi'an will see this happen by 2015, whereas greater Zhengzhou will not attain this level by 2020. Like the rest of the country, the megalopolises will see their populations start to age. The pace at which this will happen will vary—a significant factor for sellers of baby formula and medical devices. For example, by 2020 roughly 17% of greater Shanghai's population will be more than 65 years old, compared with 12% in greater Guangzhou. The geographic spread will be wide. All of the new megalopolises that will emerge in the years to 2020 will be in inland China, where most of the new transport and logistics infrastructure was only put in place in the past ten years or so. Those seeking to cater to the consumer classes of the megalopolises will need to take such distinctions—and the need for regional substrategies—into consideration.

At the same time, these megalopolises will present common opportunities. The bulk of China's new consuming class will be concentrated in these areas. Continued population growth in the megalopolises will require continued large investments into education and healthcare, and the Chinese government has signalled that it will open such sectors further to private support. Huge outlays will also be poured into the city service sectors, such as waste management, water supply and public transport, that are needed to support super-sized cities.

The emergence of these 13 megalopolises will mark an important stage in the transformation of China's society from largely agrarian to urban. By 2020 58% of the population will live in urban areas, with 32% of those living in one of the metropolises identified in this paper. The growth in the urban population will present sizeable public governance challenges: the depth of local government finances will be tested by the welfare demands of urbanites; innovative solutions to ensure sustainable energy and water supplies will have to be found; and measures to minimise the environmental costs of urbanisation will need to be implemented. How the authorities in China respond to these challenges will be pivotal in shaping the long-term future of the domestic economy.

In this paper we have offered a rosy picture of what might result from the successful management of such issues. A more concentrated urban environment will deliver several productivity gains. It will allow land to be used more efficiently. Cities offer the "soft" infrastructure needed to create an educated and skilled workforce that is capable of delivering higher value-added output. Urbanisation helps to distribute welfare services more efficiently. Wages also typically increase more rapidly in urban areas, and surging income levels will support greater levels of private consumption. If our forecasts are correct, the long-heralded rebalancing of the Chinese economy is a matter of when, not if. This is essential, as China's current model of economic development, which has been fuelled by a combination of low-cost manufacturing and high investment, is not sustainable in the context of rising input costs and growing fiscal imbalances over the longer term.

There are several risks to this optimistic scenario, and progress in several key policy areas needs to be realised. Further *hukou* reform is a priority, as the system currently acts to discourage urbanisation (which has been achieved despite it) and diminishes the spending power of non-resident migrants. Various local initiatives have been trialled, but a national consensus on how to amend the system has yet to emerge. A related problem is the financial capacity of local governments. Tax reforms over the past decade have seen a growing proportion of fiscal revenue going to the central government, even as the spending responsibilities of local governments have increased. This has made local administrations increasingly dependent on land sales, which are highly volatile, as a source of revenue. If municipal authorities are to improve their provision of public services, or to regularise the status of residents with non-local *hukou*, a more balanced fiscal relationship needs to be struck between the central and local arms of China's government. The possibility of social unrest in the period up to 2020 also cannot be ruled out as China's urban population makes increasingly rights-based demands of political and business leaders. The rise of China's megalopolises presents unprecedented opportunities, but the realisation of their full potential depends on the gargantuan task of successful management.

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