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CHINA'S CHOICE: CAPTURING THE $5 TRILLION PRODUCTIVITY OPPORTUNITY

JUNE 2016

HIGHLIGHTS

Risks rising
Investment-led model running out of steam

Focus on productivity
Five opportunities for sustainable GDP and income growth

Transforming institutions
Managing the economic shift requires sweeping changes

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CHINA'S CHOICE: CAPTURING THE $5 TRILLION PRODUCTIVITY OPPORTUNITY

JUNE 2016

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PREFACE

Where is China's economy heading? After many years of apparently inexorable rapid growth and economic development, it is rare for such a question to be greeted with so many possible answers. Uncertainty about China's economic trajectory abounds. Slowing growth, rising debt, and a deterioration in corporate performance all suggest that the investment-led model that has served the economy so well thus far is no longer fit for purpose, and that a new approach is now needed.

In this report, we put the case for China to transition to an economic growth model centered on productivity that can help this economy rediscover its dynamism and finally complete its journey toward being one of the world's advanced economies. By focusing vigorously on productivity, China would not only reap considerable benefits in terms of additional growth and rising incomes, but would also be able to tackle its current debt challenge. Specifically, we look at five opportunities that could deliver an additional $5.6 trillion (36 trillion renminbi) of GDP growth and $5.1 trillion (33 trillion renminbi) additional household income in 2030

This research was led by Jonathan Woetzel, an MGI senior partner based in Shanghai; Jeongmin Seong, an MGI senior fellow in Shanghai; Yougang Chen, a partner based in Hong Kong; Nicolas Leung, a McKinsey senior partner based in Beijing, and Kevin Sneader, a McKinsey senior partner based in Hong Kong. Jon Kowalski, a McKinsey consultant based in Pittsburgh, led the project team, which comprised Asina de Branche, Charlie Chen, Debadrita Dhara, Rochelle Hua, Xiujun Lillian Li, Yi Mei, Cuiwei Sun, Rebecca Tian, Cindy Tong, Eason Wang, Wendy Wong, Fengfeng Xu, Jessie Xue, Ren Zhang, and Hong Zhu. Thanks go to MGI senior editors Janet Bush and Geoffrey Lewis who provided editorial support; senior graphic designers Marisa Carder, Therese Khoury, and Patrick White, and designer Margo Shimasaki; Richard Johnson, senior editor, data visualization; Tim Beacom for his research expertise; Matt Cooke and Glenn Leibowitz for their help on external communications; Julie Philpot, MGI's editorial production manager; and Chelsea Grewe and Deadra Henderson in MGI practice management. We are also grateful to colleagues in the Greater China Office including Xiaoyun Li, Lin Lin, Karen Schuster, and Ruwen Shen.

We deeply appreciate the thoughtful input of our academic adviser Martin N. Baily, Bernard L. Schwartz Chair in Economy Policy Development and senior fellow and director of the Business and Public Policy Initiative at the Brookings Institution. We would like to thank Gordon Orr, a former McKinsey director in China, for his guidance throughout this project. A number of other experts provided us with valuable input, including Andrew Sheng, distinguished fellow of the Asia Global Institute; Jonathan Anderson from the Emerging Advisors Group; Fred Hu, founding partner of Primavera Capital

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This report contributes to MGI's mission to help business and policy leaders understand the forces transforming the global economy, identify strategic locations, and prepare for the next wave of growth. As with all MGI research, this work is independent and has not been commissioned or sponsored in any way by any business, government, or other institution. We welcome your comments on the research at MGI@mckinsey.com.

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IN BRIEF

CHINA'S CHOICE

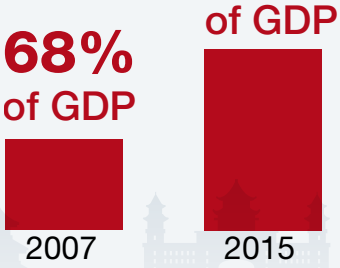
China has made substantial progress in its journey toward being a full-fledged advanced economy, but has recently experienced growing pains. The rate of GDP growth has slowed, debt has risen, and corporate performance has deteriorated. By shifting from the current investment-led growth model toward a growth model centered on productivity, China can weather current stresses and achieve sustained growth and rising incomes.

- China's investment-led model has served it well in the past. Reflecting its record-breaking urbanization and industrialization, China's GDP has expanded 25-fold, and more than 600 million people have left poverty since 1980. China is well into its transition to advanced-economy status. Its consumers have driven one-quarter of global consumption growth since 2010. The private sector is vibrant, earning three times the returns on assets of state-owned enterprises. State-owned enterprises employed 60 percent of urban Chinese workers in the 1990s, but that has dropped to 15 percent in 2015.
- But the events of recent years show that the investment-led growth model is running out of steam. Capital productivity and corporate returns are falling. If China persists with this approach, this could increase the risk of a hard landing. Our stress-test analysis found that the ratio of non-performing loans could reach 15 percent in 2019 from today's official figure of 1.7 percent. Every year that China continues on the current path could increase the cost of dealing with bad debts by 2 trillion renminbi to 3 trillion renminbi ($310 billion to $460 billion). Even then, we would not anticipate a systemic banking crisis, but a substantial (and unnecessary) slowdown in growth would be likely.
- China can face such challenges, but has a choice. By shifting decisively to a productivity-led growth model, it would ensure that capital flows to businesses that can invest in productivity, growth, and the creation of sustainable jobs. This shift could generate $5.6 trillion (36 trillion renminbi) of additional GDP by 2030, and household income could gain $5.1 trillion (33 trillion renminbi) compared with an investment-led path.
- China is ripe for a productivity revolution. Labor productivity is 15 to 30 percent of the average in OECD countries. A long tail of poorly performing companies pulls down the average although top-performing Chinese companies often have returns comparable with those of top US companies in their industries. More than 80 percent of economic profit comes from financial services—a distorted economy.
- We identify five major opportunities to raise productivity in the period to 2030: (1) unleashing more than $6 trillion (39 trillion renminbi) in consumption by serving middle-class consumers better; (2) enabling new business processes through digitization; (3) moving up the value chain through innovation, especially in R&D-intensive sectors, where profits are only about one-third those of global leaders; (4) improving business operations through lean techniques and higher energy efficiency, for instance, which could deliver a 15 to 30 percent productivity boost; and (5) strengthening competitiveness by deepening global connections, potentially raising productivity by 10 to 15 percent.
- Capturing these opportunities requires sweeping change to institutions. China needs to open up more sectors to competition, enable restructuring, and further develop its capital markets. It needs to raise the skills of the labor force to fill its talent gap and sustain labor mobility. The government will need to manage conflicts among many stakeholders and shift governance and incentives that rewarded a single-minded focus on rising GDP, even as it modernizes its own processes.

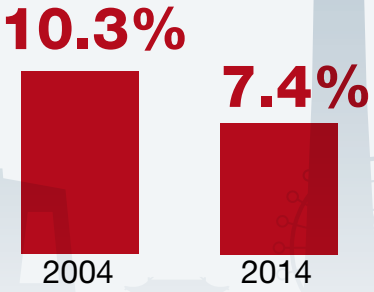
China's $5 trillion opportunity

The current investment-led model is not sustainable

Debt of non-financial corporations has doubled



Corporate returns[1] have dropped



Cost of delay

2–3 trillion RMB

additional cost to repair bad debt for every year investment-led model continues

By 2030 a new productivity-driven model can create more...

...growth

$5.6T

more GDP vs. investment-led model

...income

$5.1T

more household income vs. investment-led model

...wealth

$11,200

per capita income (from 25% of South Korea's level in 2015 to 55% in 2030)

Five opportunities can generate productivity and GDP growth

Better **serve** the middle class as it triples

Digitize to enable new business processes

Move up the value chain and raise returns 2–3 times

Improve operating efficiency to raise productivity 15–30%

Go global and potentially raise productivity 10–15%

Transforming institutions would enable the transition

- Open up to more competition
- Develop capital markets
- Enable corporate restructuring
- Invest in talent
- Boost aggregate demand
- Improve public-sector effectiveness

1 Returns on invested capital for a sample of publicly traded companies based on three-year trailing averages ending in 2004 and 2014.

SOURCE: McKinsey Global Institute analysis

EXECUTIVE SUMMARY

After three decades of sizzling growth, China is now in the ranks of upper-middle-income nations, as defined by the World Bank, and on its way toward being one of the world's advanced economies. The investment-led growth model that underpinned this extraordinary progress has served China well. But the strains associated with that approach are now evident. In 2015, GDP growth dipped to 25-year lows, corporate debt continued soaring, China's foreign reserves fell by $500 billion, and the stock market dropped by nearly 50 percent. There has been speculation that China could be on track for a financial crisis.

China faces an important choice: continue with the old model and raise the risk of a hard landing for the economy, or shift gears. Our analysis finds that a new approach centered on productivity could generate $5.6 trillion (36 trillion renminbi) of additional GDP by 2030 compared with the investment-led path. Household income could rise by $5.1 trillion (33 trillion renminbi).[1]

A new productivity-led model would enable China to create more sustainable jobs, reinforcing the rise of the consuming middle class, and accelerating progress toward being a full-fledged advanced economy. Such a shift will require China to steer investment away from overbuilt industries to businesses that have the potential to raise productivity and create new jobs. Weak competitors would need to be allowed to fail rather than dragging down profitability in major sectors. Consumers would have more access to services and opportunities to participate in the economy.

There are obstacles to be surmounted if China chooses to transition to this new approach, including a potential shortage of skills, an aging population, slowing urbanization, and growing income inequality. But the nation is in a strong position to overcome them. Over the past 30 years, it has advanced at extraordinary speed through unprecedented industrialization and urbanization. It has a thriving middle class, vibrant private enterprises, and an expanding services sector. China's leadership has already demonstrated its ability to make radical changes when necessary. Its reform of poorly performing state enterprises in the 1990s—an effort that led to a decade of 10 percent annual growth—is just one example.

Making this transition is an urgent imperative. The longer China continues to accumulate debt to support near-term GDP growth goals, the greater the risks of a hard landing. We estimate that the non-performing loan ratio in 2015 was already about 7 percent, well above the reported 1.7 percent. While most banks today have sufficient buffers to absorb losses, this ratio could rapidly increase if no visible progress is made to curb lending to poorly performing companies, and if the performance of Chinese companies overall continues to deteriorate. In such a case, we estimate that the non-performing loan ratio could rise to 15 percent, which would trigger a substantial impairment of banks' capital and require replenishing equity by as much as 8.2 trillion renminbi ($1.3 trillion) in 2019. In other words, every year of delay could raise the potential cost by more than 2 trillion renminbi ($310 billion). Our analysis suggests that such an escalation would not lead to a systemic banking crisis, but a liquidity crunch among corporate borrowers and waning confidence of investors and consumers during the recovery phase would still have a significant negative impact on growth.

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[1] Currency conversions are for reference only. We used the average exchange rate in the first half of 2016 ($1 = 6.5 renminbi).

THE INVESTMENT-LED MODEL HAS POWERED CHINA'S ECONOMY BUT IS NOW RUNNING OUT OF STEAM

Over the past three decades, investment has powered the Chinese economy. It created infrastructure to meet the demand from rapid urbanization, and it helped companies build a manufacturing sector that produces goods for customers in China and the world while creating jobs. China has been industrializing and urbanizing on an unprecedented scale. Since 1980, GDP has risen 25-fold and more than 600 million people have moved out of poverty. The World Bank already classes China as an upper-middle-income country, alongside nations such as Brazil, Mexico, and South Africa.[2] There are now 116 million middle-class and affluent households (with annual disposable income of at least $21,000 per year) compared with just two million such households in 2000.

China has moved beyond being the world's greatest source of low-cost manufacturing capacity. In 2015, the services sector grew by 8.3 percent, 2.3 percentage points faster than manufacturing, and services now account for 50 percent of GDP, compared with 41 percent for secondary industry including manufacturing sectors. Retail sales are growing by about 10 percent per year, and online sales are growing by 30 to 40 percent. Private consumption grew by more than $1 trillion from 2010 to 2015, accounting for one-quarter of global consumption growth. The private sector is playing an increasingly important role in China's economy. State-owned enterprises (SOEs) employed 60 percent of urban Chinese workers in the 1990s, but that has dropped to 15 percent in 2015. The performance of private-sector firms is far superior to that of SOEs, with a 12 percent return on assets vs. 4 percent in 2015.

Top **20%** households account for more than 50% of total household income vs. 33% in 1995

Whatever challenges it faces, China does so from a position of strength. But the evidence suggests that it now needs to move decisively beyond the investment-led model. Urbanization led to growth in the number of Chinese living in cities of 2 to 3 percent a year; now that rate is expected to slow to 1 percent, gradually removing one of the major drivers of economic growth. Labor costs are rising, compromising China's competitiveness in low-wage, labor-intensive industries such as footwear. As an illustration, China's share of global exports of footwear has fallen from 52 percent to 46 percent since 2010, with Cambodia, Indonesia, and Vietnam gaining share. Income inequality is rising. The share of income going to the top fifth of the population rose from 33 percent in 1995 to 43 percent in 2012, according to the government; other sources say it might be more than 50 percent in recent years. The years of heavy investment to build up the economy's manufacturing capacity have left some sectors with overcapacity, and China faces a skills shortage.

Risks are rising. In the near term, there is a risk that the economy could experience a hard landing that would impose significant stress on the banking sector. In the longer term, the investment-led approach is likely to lead to slower GDP growth than a productivity-led model would deliver, hindering China's progress toward being a fully advanced economy and compromising the ability of citizens to raise their incomes and standards of living. The longer China continues to rely on investment-led growth, and the more time that passes before it addresses the problems associated with the current model, the greater the risks to China's future.

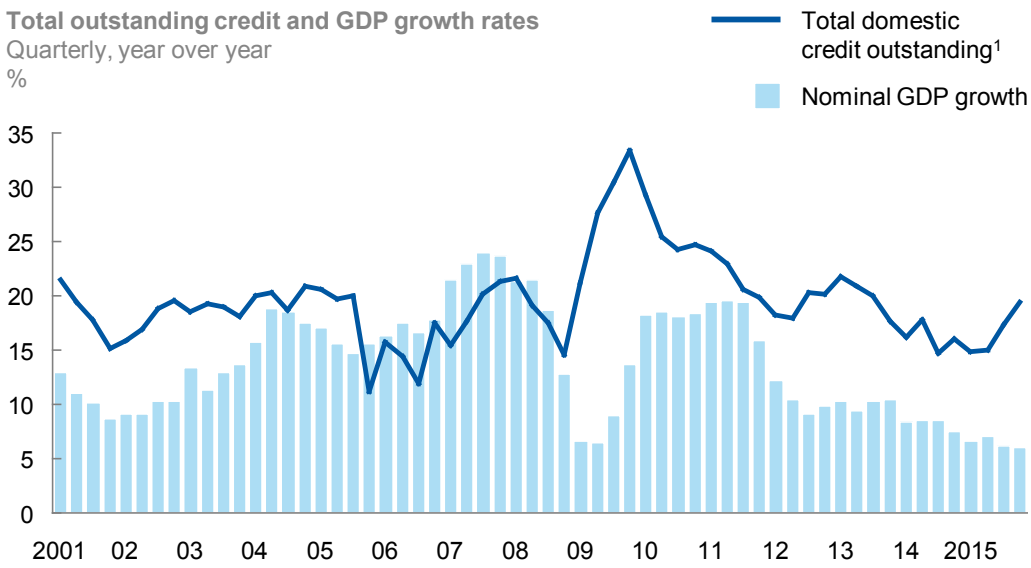
[2] China's gross national income per capita is $7,400 (Atlas method) according to the *World Bank Atlas* method, which is used to compare economic data across different countries. This is 80 percent above the World Bank's threshold for upper-middle income.

Over the past year, growth has declined, debt has risen, capital productivity has waned, and profits have weakened

A number of indicators covering the past year strongly suggest that the investment-led model is becoming unsustainable. The rate of annual nominal GDP growth fell to just under 7 percent in 2015 from 19 percent in 2011. Total debt held by non-financial corporations doubled from 68 percent of GDP in 2007 to 136 percent in 2015. Total credit outstanding has been growing at 15 to 20 percent per year (Exhibit E1). The debt of local government financing vehicles—the quasi-public entities that governments use to finance infrastructure and other projects—is also rising.

Exhibit E1

Under the investment-led model, China's credit growth far exceeds GDP



1 Includes total social financing, non-loan bank claims on non-banking financial institutions and on corporations and households, and banks' net claims on government (a portion of the claims data is available only starting in 2005). This measurement includes all outstanding credit in the real economy but excludes interbank credit.

SOURCE: McKinsey Global Institute Debt & Deleveraging database; CEIC; Emerging Advisors Group; McKinsey Global Institute analysis

60%
more capital needed to produce one unit of GDP compared with 1990-2010

As credit growth has expanded, fixed capital productivity has declined. It now takes 60 percent more fixed capital investment to produce one unit of GDP than was needed between 1990 and 2010. Weak global demand, overcapacity, and the continuing presence of unproductive companies are also dragging down returns across the Chinese economy. Average returns on invested capital for a sample of more than 3,000 Chinese companies fell from 10.3 percent to 2004 to 7.4 percent in 2014 (based on three-year trailing averages). In the steel and cement sectors, more than half of publicly listed companies are estimated to generate returns below their cost of capital. Across sectors, a long tail of poorly performing companies is dragging down average returns. Returns on invested capital in R&D-intensive manufacturing such as autos, semiconductors, and pharmaceuticals are 8.5 percent in China compared with 16.5 percent in the United States. Chinese service companies have average returns of 8.9 percent, compared with 12.0 percent for US service companies.

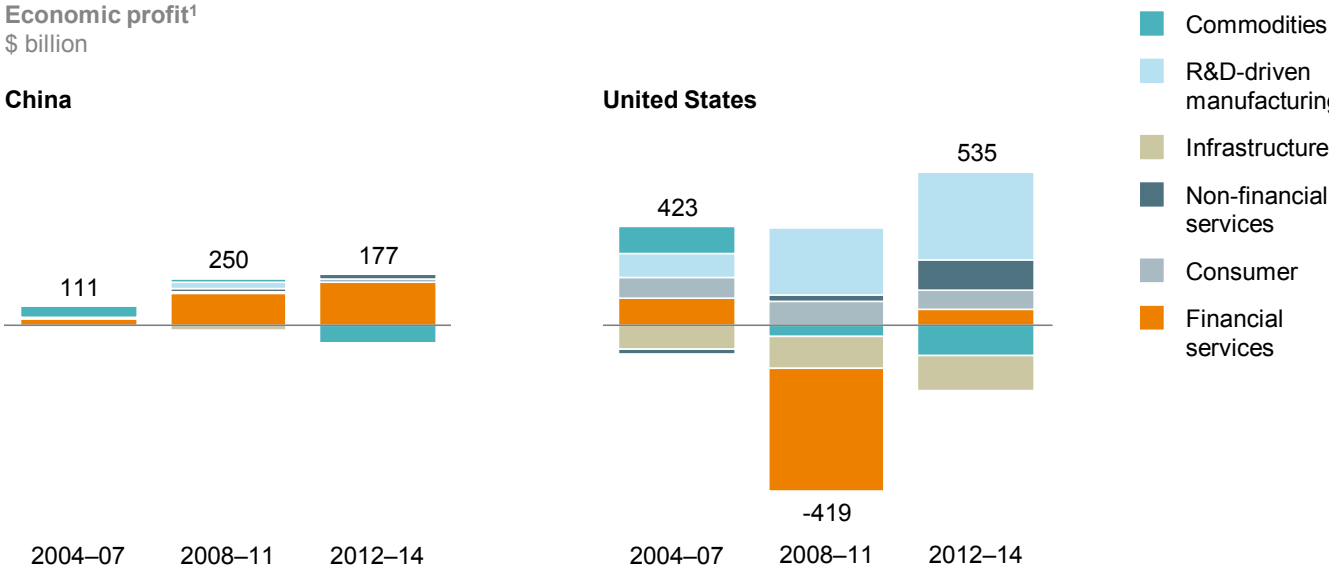
Unproductive firms remain in business because they can continue to borrow both from the formal banking system and from shadow-banking institutions, and because local authorities are reluctant to let companies fail due to job losses and the impact on local GDP. Not only does the continuing presence of poor performers drag down the averages, but their behavior in the market also can undercut profits of healthy firms.

Investment-led growth has produced a highly distorted economy

The current economic model has distorted the structure of the economy. Banks have been playing a dominant role in funding investment and supplying capital to companies, and they account for more than 80 percent of total financial assets in China. Aided by past interest-rate regulation, banks have enjoyed a comfortable net interest margin of around 3 percent (profit earned through the difference between deposit and lending rate) over the past decade; those margins have been squeezed as China has moved toward interest-rate liberalization over the past few years. Still, more than 80 percent of the economic profit generated in China—a measure that takes into account the cost of capital—comes from the financial sector.[3] SOEs get more than 50 percent of total bank lending, which has been a lifeline for the long tail of unproductive and poorly performing companies. Such companies are particularly prevalent in traditional manufacturing sectors such as metals, mining, and chemicals where economic profit is negative across industry. In the United States, the distribution of economic profit is more diversified across different industries, and changes along with the economic cycle (Exhibit E2).

Exhibit E2

In China, economic profit has been highly concentrated in the financial sector



1 We define economic profit as NOPLAT (net operating profit less adjusted taxes) minus the capital charge.

SOURCE: McKinsey Corporate Performance Analytics; McKinsey Global Institute analysis

Is there sufficient evidence to suggest that China faces a hard landing?

To understand the potential for problems in China's banking sector and the economy at large, we conducted a series of stress tests using different hypothetical scenarios. We analyzed the risks to bank assets by assessing the quality of bank lending portfolios and banks' exposure to the shadow-banking sector. We also looked at risks on the liabilities and equities side: the loss of deposits and the inability to meet capital requirements because of the effect of falling profits.

[3] We define economic profit as net operating profit less adjusted taxes (NOPLAT) minus the capital charge. The capital charge is defined as invested capital multiplied by the weighted average cost of capital. For financial companies, the economic profit is defined as net income minus the capital charge (equity multiplied by the cost of equity). We note that companies in negative-profit sectors still have positive operating margins, but once the cost of capital is fully taken into account, economic profits are negative, destroying value. Our economic profit analyses include more than 3,500 China-based (revenue equivalent to 55 percent of China's 2015 GDP) and 7,000 United States-based (revenue equivalent to 86 percent of US 2015 GDP) publicly listed companies.

On the asset side, the largest risk to banks would be widespread default by corporate borrowers in formal and shadow banking. Using the McKinsey Corporate Performance Analytics Tool, we analyzed 2,300 public companies and found that overall total debt loads have more than doubled since 2010, even as revenue and margins have contracted for many companies. As a result, debt-to-EBITDA (earnings before interest, taxes, depreciation, and amortization) multiples—a metric of solvency risk—have risen. About 30 percent of companies in our sample had EBITDA multiples of seven or higher in 2015, up from 20 percent of companies in 2010. A multiple of seven is generally regarded as a sign of heightened risk. Based on a bottom-up assessment of companies on their solvency measures, we estimate that about 7 percent of bank loans could be classified as non-performing in 2015, compared with the official estimate of 1.7 percent, and this could lead to loan losses of 2.3 trillion renminbi ($350 billion) on banks' current loan portfolios. Quantifying the risk to the banking system from shadow banking—lending that takes place outside the formal banking system—is more difficult.[4] Shadow-banking assets have grown to about 45 trillion renminbi ($6.6 trillion) and now represent about 20 percent of total lending. We estimate that, through intermediation and other links, banks are connected to about 60 percent of shadow-banking assets, which could lead to additional losses of 1.6 trillion renminbi ($250 billion). This would bring the total exposure to bad debt of the Chinese banking system to 3.9 trillion renminbi ($600 billion). This level of loss would wipe out current loan loss reserves of 2.3 trillion renminbi ($350 billion) and erode 1.6 trillion renminbi ($250 billion) of commercial bank equity, about 14 percent of the total. Large Chinese banks could absorb such losses today, but smaller banks might face capital losses.

Banks could also face challenges related to liabilities and capital. Today, Chinese banks have access to low-cost capital in the form of deposits on which they pay low interest. However, the deposit base could erode as wealthy Chinese move money abroad in search of higher returns, and less wealthy households potentially tap into their savings to see them through more challenging economic times. In addition, there are links between banks and shadow banks on both deposits and liabilities that could prove to be another trigger of funding stresses. Although these links are not substantial enough to be a threat to the banking system today, if the trend continues banks could be further exposed to low-quality sources of funding. When shadow banking products default at scale, this could lead to the sudden withdrawal of deposits or the redemption of claims by non-banking institutions that could pose a liquidity challenge to the banking system. Bank equity could also decline, potentially leaving banks without sufficient capital to meet safety requirements under Basel III accords.

China has the capacity to fund a bank rescue, but the cost of delay will be high

To quantify the potential cost to the banking sector, we estimated recapitalization requirements in three years' time in a hypothetical case in which banks continue to lend to risky borrowers and corporate performance keeps deteriorating. In this scenario, the ratio of Chinese banks' non-performing loans doubles to 15 percent, and total potential loan losses (including exposure to shadow banking) rises from 3.9 trillion renminbi ($600 billion) in 2015 to 11.5 trillion renminbi ($1.8 trillion) in 2019. This implies that the cost of recapitalizing banks would be 8.2 trillion renminbi ($1.3 trillion) in 2019, equivalent to 12 percent of current GDP. In other words, every year that China continues on the investment-led path could increase the cost of dealing with bad debts by 2 trillion renminbi to 3 trillion renminbi ($310 billion to $460 billion).

[4] Shadow banking is loosely regulated, and the connection to banks is indirect. Banks do not fund shadow-bank loans but act as intermediaries, tapping their client networks (including corporate customers) to fund shadow-banking investment vehicles known as wealth-management products or trust accounts. Customers put their money into these products on the promise of high returns (5 to 10 percent compared with 2 to 3 percent on bank deposits), but those returns are possible only because borrowers are high-risk—companies that do not qualify for bank lending or have reached their limits for bank credit. Borrowers are also concentrated in high-risk sectors, such as steel, mining, textiles, and energy.

We believe that China has enough capacity to facilitate and support such a rescue. Government debt is about 50 percent of GDP, compared with 80 to 90 percent in Germany and the United States, and 240 percent in Japan. Raising this figure to 65 percent would generate more than 10 trillion renminbi ($1.5 trillion), enough to cover the 8.2 trillion renminbi ($1.3 trillion) recapitalization in our extreme scenario. The government also manages 123 trillion renminbi ($19 trillion) of assets as of April 2016, according to China's Ministry of Finance. Securing additional financing on the basis of these assets could help generate additional funds. The government also controls land resources that have generated about 3.5 trillion renminbi ($540 billion) in revenue every year since 2010. China also has accumulated $3.2 trillion (21 trillion renminbi) of foreign reserves that could be used selectively if necessary.

However, the longer banks and shadow banks continue lending to underperforming companies, the higher the potential cost of defaults. The damage to the economy would be significant. It generally takes three to seven years for countries to recover from financial crises. During the recovery period, investor and consumer confidence will wane and will certainly impact the growth trajectory. It is important for China to take action to head off such a crisis.

A PRODUCTIVITY-LED MODEL CAN ADD MORE THAN $5 TRILLION TO GDP AND HOUSEHOLD INCOME IN 2030

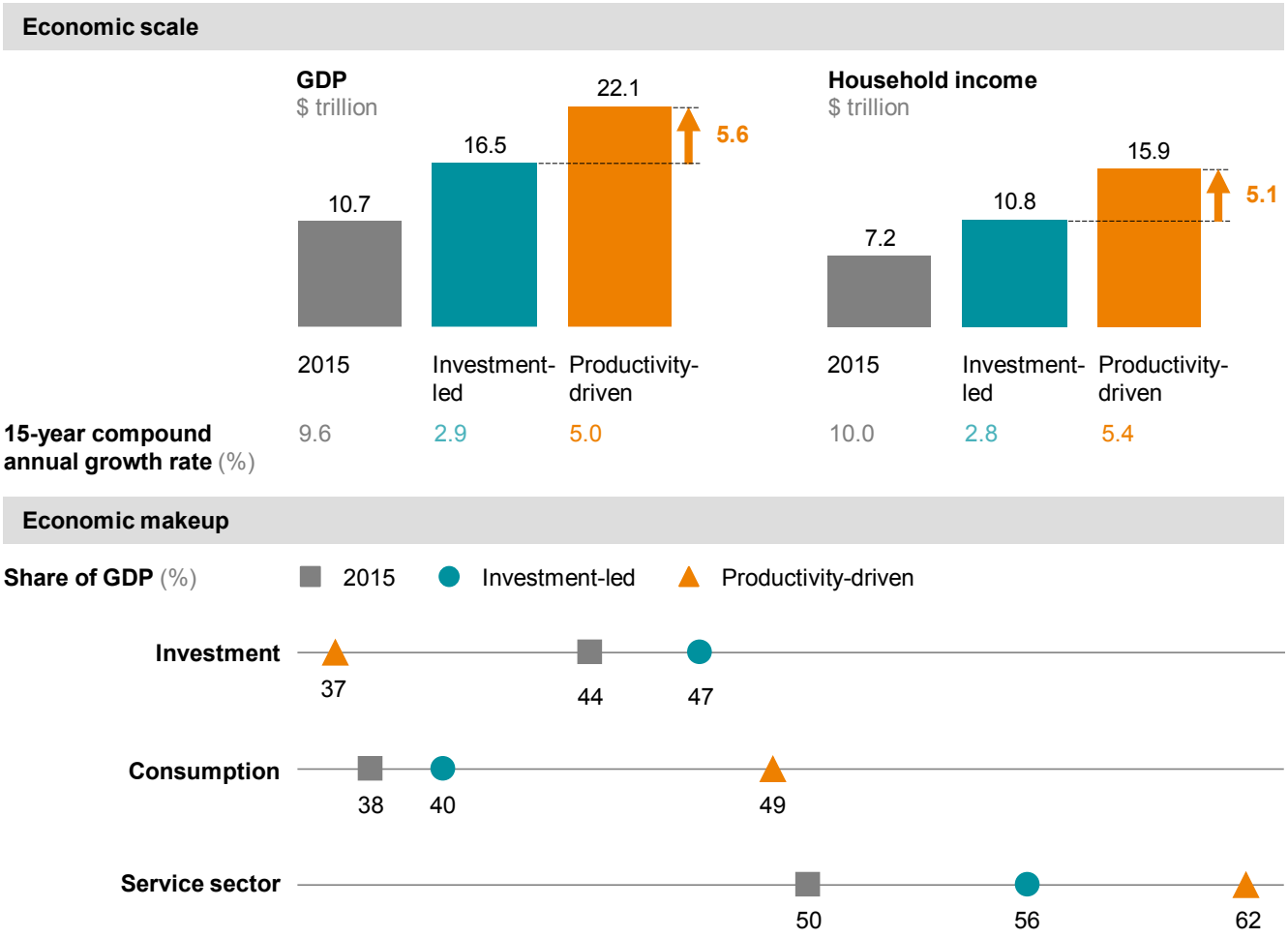
China has a choice. If it shifts decisively toward a new economic growth strategy centered on productivity, it does not need to risk a hard landing and can sustain growth as it continues to transition toward being an advanced economy. Today, productivity across Chinese industries is just 15 to 30 percent of the average for industries in OECD countries. Industries suffering from overcapacity need to be restructured, and investment must be shifted to more productive uses. The new model needs to emphasize investment in innovation and skills, and it must include a concerted effort by corporations to move up the value chain and bring productivity closer to advanced-economy standards.

We find that a successful transition to a productivity-driven growth model could raise GDP by $5.6 trillion above where it would likely be in 2030 with the current investment-led approach. Productive enterprises would create new, sustainable jobs. We estimate that aggregate household income could increase by $5.1 trillion by 2030 compared with the current approach. Rising incomes are critical if China is to continue to shift toward full advanced-economy status where consumption plays a larger role and new forms of employment are created. We estimate that rising wages can help expand China's middle-class and affluent households (with annual disposable income of at least $21,000) from about 116 million people today to an estimated 315 million in 2030.

In addition to generating higher long-term growth, the productivity-led model can substantially reduce the risk of a hard landing for the Chinese economy. It would change the economic mix. The share of consumption would be 49 percent in 2030 compared with 38 percent today and with the 40 percent that might be expected if the current investment-led model were to remain in place. The service sector would continue to expand its GDP share as the economy modernizes (Exhibit E3).

Exhibit E3

A productivity-driven approach can add $5 trillion each to GDP and household income by 2030 compared with the investment-led growth model



SOURCE: McKinsey Global Institute analysis

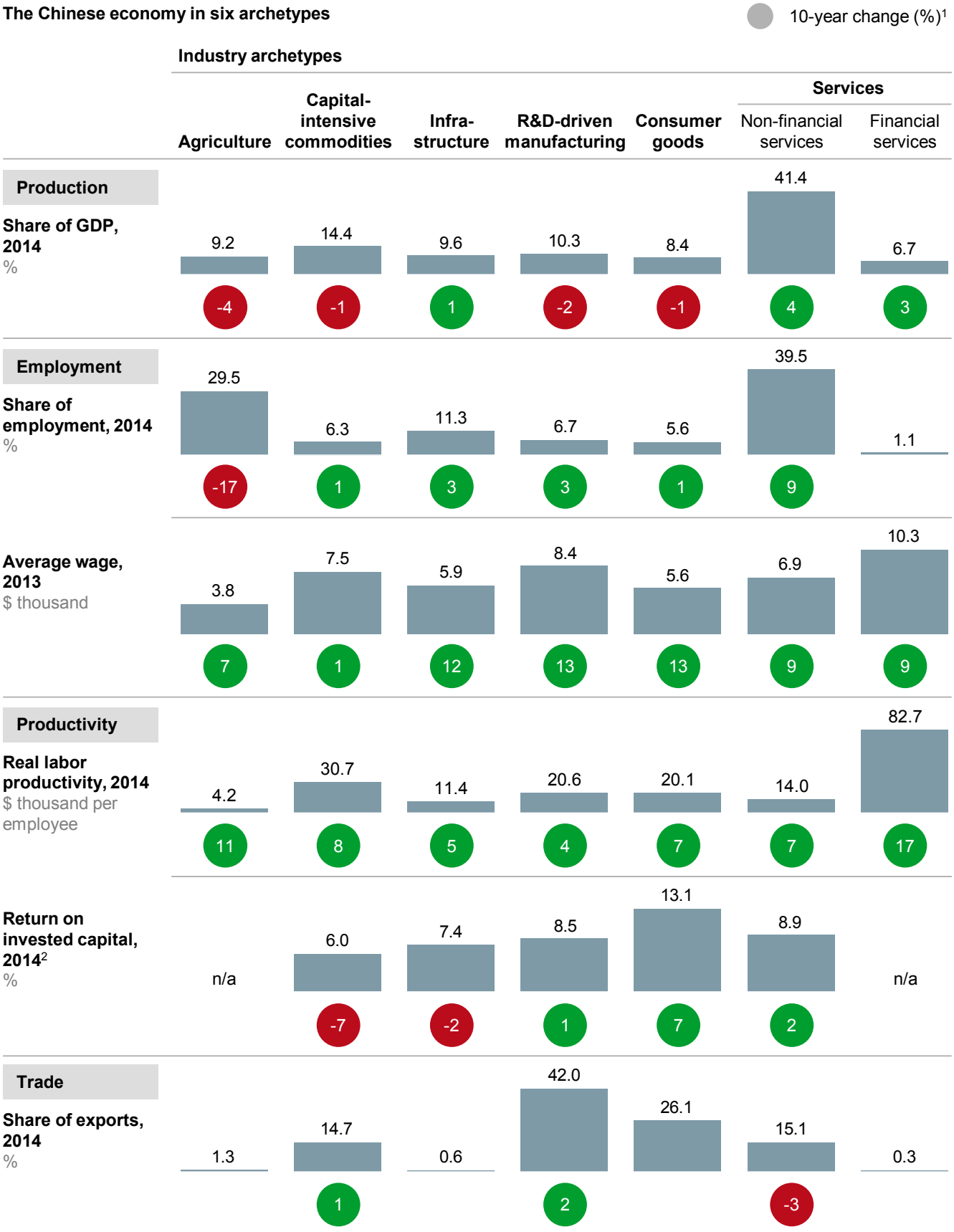
A PRODUCTIVITY-LED APPROACH WOULD CHANGE THE SECTOR AND EMPLOYMENT MIX

Adopting a productivity-led model would also hasten restructuring of China's economy. In order to better understand what can make different types of industries thrive and become more productive, we have grouped major Chinese industries into six archetypes based on common characteristics such as labor- or capital-intensity (Exhibit E4). Using this approach, policy makers, business leaders, and investors can determine where best to focus their energy and resources as China moves toward productivity-based growth.

Our analysis finds that the share of GDP and employment of the six industry archetypes will shift. Agriculture, whose share of GDP has fallen by 50 percent since 2000, could decline to 4 percent by 2030, closer to the 1 to 2 percent of GDP typical in advanced economies. Capital-intensive commodities and infrastructure, long the growth drivers of the Chinese economy, could shrink from 14 percent and 9 percent of GDP in 2015, respectively, to 8 percent and 5 percent in 2030. Meanwhile, service sectors could increase their share of GDP from 50 percent in 2015 to 62 percent in 2030, and R&D-driven manufacturing from 11 percent to 12 percent over the same period.

Exhibit E4

The Chinese economy in six archetypes



1 Changes are shown as change of share for all share or percent measurements and as compound annual growth rate for absolute measures (e.g., wages and productivity).
2 Aggregated return on invested capital of representative sectors; based on three-year trailing average.
NOTE: Numbers may not sum due to rounding.

SOURCE: IHS; National Bureau of Statistics of China; McKinsey Corporate Performance Analysis Tool; McKinsey Global Institute analysis

As the sector mix in GDP shifts, so, too, will the structure of employment. Agriculture, commodities, and infrastructure are likely to shed jobs, while employment is expected to grow in services, and consumer manufactured goods. We estimate that more than 200 million workers might need to be shifted into other sectors over 15 years as the economy undergoes its transition even while urbanization continues. Services sectors are likely to provide the most opportunities for displaced workers from traditional manufacturing sectors and the newly urbanized, potentially employing around 500 million by 2030, up from 320 million today.

FIVE MAJOR OPPORTUNITIES SHOULD BE THE CENTERPIECE OF A PRODUCTIVITY-LED APPROACH

We identify five major opportunities that would help China to execute a swift and—to the extent possible—smooth transition to a productivity-led model and to full advanced-economy status. Opportunities vary by archetype. For example, opportunities to raise productivity in capital-intensive commodity businesses such as coal and steel lie in improved capacity utilization and operations. Autos, semiconductors, and pharmaceuticals, which fall in the category of R&D-driven manufacturing, afford excellent opportunities to move up the value chain. Overall, these opportunities can help raise productivity across the six archetypes by 1 to 8 percent per year through 2030 (Exhibit E5).

Exhibit E5

We identify five major opportunities to raise productivity across industry archetypes

● Primary
○ Secondary

Industry archetypes	Labor productivity compound annual growth rate, 2015–30 %	Additional GDP[1] $ trillion	Opportunities: Better serve middle-class consumers	Digitize to enable new business processes	Innovate and move up the value chain	Drive operational transformation	Go global
Agriculture	7	+0.1	○	○	○	●	○
Capital-intensive commodities	6	-0.4		○	○	●	○
Infrastructure	4	-0.3		○	○	●	●
R&D-driven manufactured goods	8	+1.1	○	●	●	●	●
Consumer goods	5	+0.7	●	●	●	●	●
Non-financial services	4	+4.1	●	●	○	○	○
Financial services	1	+0.3	●	●	○	○	○
Total	**5.2**	**+5.6**					

1 Compared with investment-led growth path by 2030.

SOURCE: McKinsey Global Institute analysis

Opportunity 1: Better serve middle-class consumers

Consumption has grown rapidly along with GDP, rising by $1.1 trillion (7.2 trillion renminbi) from 2010 to 2015. However, its share has remained at around 36 percent of GDP since 2008 (in real terms). We believe that this share can grow to 49 percent by 2030, rising from $4.1 trillion (27 trillion renminbi) per year to $10.8 trillion (70 trillion renminbi). More Chinese consumers would have higher levels of disposable income, and consumer-facing companies would need to address rising demand for higher-quality goods and services. Achieving this growth is an enormous productivity-boosting opportunity. [5]

Consumption growth will be strongest in the largest urban clusters. We have identified 22 such clusters in China. Of these, the top three of Beijing, Shandong, and Shanghai, could generate about one-third of consumption growth, and the next seven could account for 40 percent of consumption growth. Working-age urban consumers in China will be the most important demographic, contributing 18 percent of global consumption growth by 2030.[6] In a McKinsey survey, more than half of Chinese consumers say they want to trade up.[7] Chinese travelers spent $102 billion (660 billion renminbi) in 2015 on the purchase of goods including luxury products and premium brands overseas, evidence of consumers' willingness to trade up when they do not find the products and services they want to buy in China.

50%
of Chinese consumers willing to trade up

This creates an enormous opportunity for companies that can meet the increasingly high aspirations of Chinese consumers. Companies can, for instance, achieve higher sale through "premiumization." Between 2008 and 2014, sales of premium goods grew faster than sales of goods overall—at 26 percent per year compared with 12 percent in the case of chocolate, 13 percent vs. 10 percent for personal-care products, and 12 percent compared with 5 percent for sportswear. Companies can develop upgraded product lines with improved design, more premium branding, and higher quality that appeal to China's new generation of consumers. Consumer-facing companies can also invest in microsegmentation to track down the most likely shoppers even at the level of individual neighborhoods and can invest in online advertising, social media, and advanced customer relationship management systems to help them connect with consumers.

Opportunity 2: Digitize to enable new business processes

We see significant opportunities to use digital technologies to improve the performance of manufacturing industries, expand and modernize service sectors, and improve talent management.

China has an opportunity to leapfrog into a new digital era and create significant economic value as a result.[8] Digitization is creating opportunities for enhancing revenues through the creation of new markets that can help to overcome pressure on margins. In consumer electronics, for example, sales of new categories such as smartphones and wearable devices have grown at annual rates of more than 50 percent over the past five years compared with growth in the sector overall of a more modest 14 percent. In the automotive industry, Chinese consumers are excited about connected car opportunities. Sixty percent of Chinese car consumers said that they would switch to another brand if it was

5 *Urban world: The global consumers to watch*, McKinsey Global Institute, April 2016.

6 Ibid.

7 *2016 China consumer report: The modernization of the Chinese consumer*, McKinsey & Company. Based on 10,000 in-person interviews with people aged 18 to 65 in 44 cities representing China's major regions and tiers.

8 MGI has published extensively on digitization and its impact. See, for instance, Jacques Bughin and James Manyika, "Measuring the full impact of digital capital," *McKinsey Quarterly*, July 2013; *China's digital transformation: The Internet's impact on productivity and growth*, McKinsey Global Institute, July 2014; *The Internet of Things; Mapping the value beyond the hype*, McKinsey Global Institute, June 2015; Michael Chui, James Manyika, and Mehdi Miremadi, "Four fundamentals of workplace automation," *McKinsey Quarterly*, November 2015; *Digital America: A tale of the haves and have-mores*, McKinsey Global Institute, December 2015; and *Digital globalization: The new era of global flows*, McKinsey Global Institute, March 2016.

the only brand offering a car with full access to apps, data, and media; this compares with 20 percent of Germans expressing the same view, and 33 percent of consumers surveyed in the United States.[9]

Service sectors such as retailing and logistics are highly fragmented in China today, and they need to modernize. By using digital platforms to reach new customers, retailers can leapfrog into e-commerce and reach consumers in smaller cities and rural areas without having to build physical store networks. In MGI's 2013 research on e-commerce, we estimated that as much as 40 percent of sales via e-commerce channels is new consumption.[10] In logistics, digital platforms for scheduling can help make the 700,000 companies in the sector far more efficient. China can also improve the delivery of social services—a growing need as economies become wealthier—by investing in digital technologies.[11] Investment in online learning platforms can reduce disparities in urban and rural education.[12] Telemedecine systems can enable doctors in cities to remotely treat patients in rural clinics.

Chinese companies can use digital technologies to improve their talent management. Skills shortages and high turnover of employees are major challenges for many Chinese companies. According to one survey, 28 percent of Chinese workers said that they had changed jobs in the past six months, compared with 18 percent in the United States, 11 percent in Japan, and 10 percent in Germany.[13] Digital platforms and tools can help companies match talent and available jobs faster and more cheaply. Gamification in recruiting can create a simulated working environment that helps applicants understand what is expected of them at the same time that it gives companies an opportunity to observe applicants' behavior. Optimized training approaches such as "fragmented training" (ten-minute modules delivered through digital devices) can work well, especially for young workers. Predictive human resources models can help identify high-risk individuals and groups before they are hired, improving retention rates.[14]

Opportunity 3: Innovate and move up the value chain

Companies can become more profitable and productive by raising the value added of their products and services. Chinese companies have tended to be globally competitive in sectors where they can use massive commercialization opportunities and a large manufacturing ecosystem in their domestic market; internet services and electronics manufacturing are two examples where these conditions are in place. However, Chinese business have not tended to emerge as global players in sectors where more complex innovation requiring in-depth scientific knowledge and engineering know-how is necessary in order to compete on a world stage.[15] The profitability of Chinese companies in these industries, which include autos, pharmaceuticals, and semiconductors, is only about one-third that of global leaders because Chinese companies tend to remain engaged in lower-value-added activities.

In the automotive industry, major state-owned automakers have joint ventures with major overseas car manufacturers that largely use global platforms from other markets that are then adapted for the Chinese market. This model means that Chinese firms do not have

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9 McKinsey Connectivity and Autonomous Driving Consumer Survey, 2015.

10 *China's e-tail revolution: Online shopping as a catalyst for growth*, McKinsey Global Institute, March 2013.

11 For a discussion on government productivity, see, for example, Hans Arnum at al., "Government's productivity imperative," *McKinsey on Government*, number 4, summer 2009; and *The public-sector productivity imperative*, McKinsey & Company, March 2011.

12 *A labor market that works: Connecting talent and opportunity in the digital age*, McKinsey Global Institute, June 2015.

13 Randstand Work Monitor, Randstand, December 2015.

14 *A labor market that works: Connecting talent and opportunity in the digital age*, McKinsey Global Institute, June 2015.

15 For an extensive discussion of innovation in China, see *The China effect on global innovation*, McKinsey Global Institute, October 2015.

sufficient opportunities to gain knowledge by participating in the end-to-end design of products. Moreover, Chinese auto companies invest half as much as their foreign partners on R&D as a share of sales. One opportunity that Chinese firms could seize is a global shift toward electric and part-electric vehicles. McKinsey surveys have found that Chinese consumers generally prefer foreign car brands to Chinese ones, but this preference does not extend to electric vehicles. Companies that move quickly now to upgrade value added stand a better chance of competing successfully as the market develops.[16]

China has less than **3%** share of global branded drugs market

In semiconductors, China's industry is largely focused on producing chips designed by others. The top global semiconductor players still earn the lion's share of economic profit across the value chain, and the leadership of these three companies has not changed for a long time. China could capture more value in this sector by encouraging the growth of national champions using its unique access to semiconductor customers. For their part, semiconductor companies can strengthen their in-house innovation capabilities in alignment with a long-term product-development plan and patient investment. Acquisition of know-how through mergers and acquisitions (M&A) can be a shortcut if managed well. In pharmaceuticals, Chinese companies have made a good deal of progress in boosting the number of PhDs and researchers working with them but have still not become leaders in branded pharmaceuticals, the patented medicines that command high profits. Chinese companies have less than 3 percent of the global branded drug market. Innovation in drugs—discovering a new molecule or a biologic—is a costly process that can take years of laboratory work. As regulatory authorities continue to reform the drug approval process to shorten the time to get a new drug to market, companies can move up the value chain by using China's huge research capacity to innovate.

Opportunity 4: Drive operational transformation

There is enormous scope to boost productivity within Chinese companies by overhauling the way they operate—introducing more automation, improving energy efficiency, and adopting lean processes. We estimate that a comprehensive program could improve labor productivity by 15 to 30 percent by 2030.

More automation in factories is one of the biggest opportunities. Chinese companies have pioneered a system of collaboration between people and robots that provides flexibility and reduces capital investment. Such approaches can be adopted by many other manufacturing businesses. While China is the largest purchaser of robots in the world, there are still only 36 robots per 10,000 manufacturing workers, about half the global figure, and less than one-tenth the level in South Korea, for instance. New, low-cost robots could help spread their use. On energy use, we find that well-managed energy-efficiency programs can save 10 to 30 percent of energy costs. Finally, lean processes and approaches such as Six Sigma can save costs and improve quality. These techniques are not new to China, but they have had limited success because of the ways in which they have been implemented.

Opportunity 5: Go global and strengthen competitiveness

China has participated in globalization mostly as a source of goods for the rest of the world. However, to continue China's progress toward being a full-fledged advanced economy, more of its companies will need to establish operations in foreign markets, competing with the world's leading players on their home turf. Despite the growing presence of Chinese firms in international markets, overall their global reach remains limited. The overseas revenue of the top five Chinese companies is less than 10 percent of total sales, compared with 30 to 70 percent in the case of non-Chinese multinationals. Going global can help companies grow and boost their productivity by gaining access to new markets for their products and services, tapping new sources of talent and strategic assets, and creating

[16] For further details, see *Finding the fast lane: Emerging trends in China's auto market*, McKinsey & Company, April 2016.

competitive pressure in domestic industries. We estimate that globalization could lift the labor productivity of Chinese companies by 10 to 15 percent by 2030.

M&A will be an important part of any global push by Chinese businesses, and it is already growing rapidly, spreading far beyond the resources sector. Energy and materials deals accounted for 62 percent of outbound M&A between 2006 and 2010, but this share fell to 46 percent between 2011 and 2015 as deal volumes increased in technology and in services such as real estate and entertainment. The geographic reach of outbound M&A has also broadened. North American deals accounted for 17 percent of transactions in 2006–2010 and rose to 25 percent in 2011–2015. However, the current performance of Chinese M&A is worse than that of its Europe and Western counterparts. The ratio of acquirers achieving higher total returns for shareholders compared with the benchmark of the local stock exchange is only 38 percent for deals done by Chinese acquirers, compared with 75 percent by Europe acquirers and 54 by US acquirers.[17] Chinese companies will need to build M&A management capabilities such as due diligence and post-merger integration while developing a system to manage global organization, marketing, and production.

TRANSFORMING INSTITUTIONS CAN ENABLE THE TRANSITION

Guiding an $11 trillion economy with 1.4 billion people in a new direction will be extremely challenging. Government can do a great deal to improve the odds of success by transforming institutions in six priority areas:

1. **Open more sectors up to competition.** SOEs still account for 43 percent of service-sector fixed-asset investment, compared with 8 percent in manufacturing. Encouraging more competition can create healthy pressure to drive more innovation and improve customer service. In telecommunications, for instance, an effort to introduce mobile virtual network operators to target underserved segments has not yet had a substantial impact because the big three players in the sector still have considerable clout in negotiations and strong influence on pricing. In health care, fixing the economics model to make hospitals less dependent on drug sales and encourage more qualified doctors to work at private hospitals could help improve the quality of service.

2. **Improve the breadth and quality of capital markets.** China would benefit from a financial system where market forces allocate capital efficiently; that means well-functioning bond and equity markets that attract a diverse set of investors, including institutional and overseas players. The municipal bond market could lower financing costs for local government while bringing market discipline to managing investment projects. To facilitate this shift, China needs to strengthen the foundations of an effective financial system, such as strong, independent credit-rating agencies, more transparent public data on the economy, and more effective communication about government monetary policy. Inviting new players (such as internet banks) to supply capital and helping banks build capabilities to undertake more lending for underserved segments such as small and medium-sized enterprises and rural consumers will be important.

3. **Enable corporate restructuring.** Shifting successfully to a productivity-led growth model will mean a sea change—letting inefficient companies fail rather than protecting and propping them up and rationalizing excess capacity. China needs to facilitate an orderly restructuring of overbuilt industrial sectors by enforcing bankruptcy law and improving the bankruptcy process. Strengthening capabilities of asset-management companies tasked with handling restructuring could help to turn around companies in default.[18] China will need to expand the securitization of non-performing loans to be

[17] For more information, see the forthcoming McKinsey & Company report, *Outbound M&A excellence: Building M&A capabilities for Chinese leaders*.

[18] China has already expanded the network of asset management companies, including 23 regional companies.

prepared for any larger-scale bad debt situation and to ensure that banks put effective risk management in place.

4. **Invest in talent and enhance labor mobility.** China has made great strides in educating its people, but more is needed. Among the measures that the government could now take are providing more funding for education, designing programs that rotate effective teachers to places they are most needed, and engaging the private sector to define job-ready skills, build those into curricula, and establish an education-to-employment pipeline. On top of this, the government could enhance labor mobility to optimize employment across different regions of the country. Expansion of unemployment insurance and training can help smooth the transition for displaced workers and help them back into jobs. Ensuring gender equality in opportunities in education and in the labor market, while supporting women as well as men as they develop their careers, can further strengthen China's talent base.

5. **Boost aggregate demand.** As inequality grows, the government can revise fiscal and tax policies to give households more spending power. For families in need, it could consider conditional cash transfers. Improving social safety net programs by raising health-care and retirement benefits, for example, can reduce the need for precautionary saving for out-of-pocket medical expenses, facilitate consumption, and reduce income inequality. Broadening affordable-housing programs to include migrant workers, with market-based subsidies on both the supply and demand side, can also help low-income families to consume more.

6. **Improve public-sector effectiveness.** Ensuring that government raises its own productivity is an important part of any transition to a productivity-led model. Such an effort can start by using household income and productivity indicators to evaluate officials and departments rather than rewarding them largely for the GDP growth their cities or regions achieve. Digitizing government operations and service delivery is an important part of the mix. Government also needs to develop better conflict-resolution capabilities to mediate between different stakeholders so that restructuring and reforms can proceed.

China's transition to a productivity-driven model—and to an advanced economy—will provide a fresh set of opportunities and challenges for businesses operating in China and for competing companies around the world. Four approaches will help corporations navigate the transition (see Box E1, "A CEO agenda for China's potential new direction").

•••

China's leaders have already signaled their intention to shift the economy away from the investment-led model that fueled such rapid growth in the past to one that relies more on domestic consumption. The risks associated with the old model are now evident, and the imperative to execute the transition decisively has become relatively urgent. A new model centered on productivity can deliver substantial benefits to the Chinese economy and enable China to complete its journey toward being one of the world's advanced economies.

Box E1. A CEO agenda for China's potential new direction

We see four ways that companies can navigate the transition.

Take a bottom-up approach to understanding the market. Instead of focusing undue attention on short-term GDP growth rates, companies that want to make the most of the opportunities of China's economy need to have a longer-term but also more detailed view. They need to identify what sectors are likely to thrive in a new productivity-led model. Markets in some cities and provinces will take off because highly productive industries are growing there; others will decline because the local economy has not performed well enough on productivity. Starbucks is one company that has opted to raise its long-term commitment to the Chinese market. The coffee chain now has 1,700 stores in more than 90 Chinese cities, and it plans to open 500 new stores per year to meet demand created by an expanding cohort of middle-class consumers.

Take bold measures to restructure businesses. When China was growing at 10 percent a year, companies in China were too busy keeping up with demand to devote sufficient attention and resources to making their operations internationally competitive. With growth slowing and the possibility of pressure on returns, companies need to take the opportunity to focus on raising productivity, judging which assets are genuinely strategic and how operations could be optimized. The sense of urgency that a more difficult business environment inspires can also be used to make a stronger push for innovation in products and business models, and to review resource allocation to support future growth.

Be prepared for heightened global competition from China. Slower domestic growth may well force Chinese companies to seek new opportunities abroad, and companies everywhere should be prepared for heightened competition. Time spent getting to know these new competitors will be valuable in shaping opportunities to collaborate. For their part, Chinese companies will need to plot their international expansion strategically, choosing which markets to prioritize initially. Global ambitions among Chinese companies present an opportunity for new partnerships that, for instance, may fund next-generation technologies in autos or telecommunications.

Enhance the speed and flexibility of decision making. The economic and political environment in China is likely to be dynamic over the coming decade; companies that cannot size up a fluid situation, decide what to do, and act with speed and agility could find themselves at a severe disadvantage. Companies need to streamline their decision making, constantly gathering information to inform their choices through frequent feedback from suppliers, customers, and partners. For foreign-based multinationals, there may not be time for proposals to travel through multiple layers of reporting to reach decision makers back at global headquarters. More local decision making and empowerment of local teams can help.

1. INVESTMENT-LED GROWTH HAS SERVED CHINA WELL, BUT IS RUNNING OUT OF STEAM

Over the past three decades, investment has been a powerful engine for China's economy, creating the infrastructure to develop the world's largest manufacturing sector and support urbanization on a scale that the world has never before seen. Millions have moved out of poverty, and China now has a burgeoning middle class with considerable purchasing power. China is well on its way to becoming one of the world's advanced economies. But the model that served the nation so well is running out of steam. New constraints on the rate of growth are emerging. Labor costs are rising, making labor-intensive sectors less competitive. China faces large skills shortages, urbanization is slowing, the population is aging, and income inequality is growing. And risks are rising as debt levels increase. Unless China can move decisively to an economy led by productivity rather than investment, growth could be constrained at best, and there is the possibility of a hard landing at worst. All the evidence suggests that for China's economy to continue to thrive requires a shift toward a new approach to growth.

CHINA IS WELL INTO ITS TRANSITION TOWARD BECOMING AN ADVANCED GLOBAL ECONOMY

25-FOLD
GDP increase and
600M+
people moved out of poverty since 1980

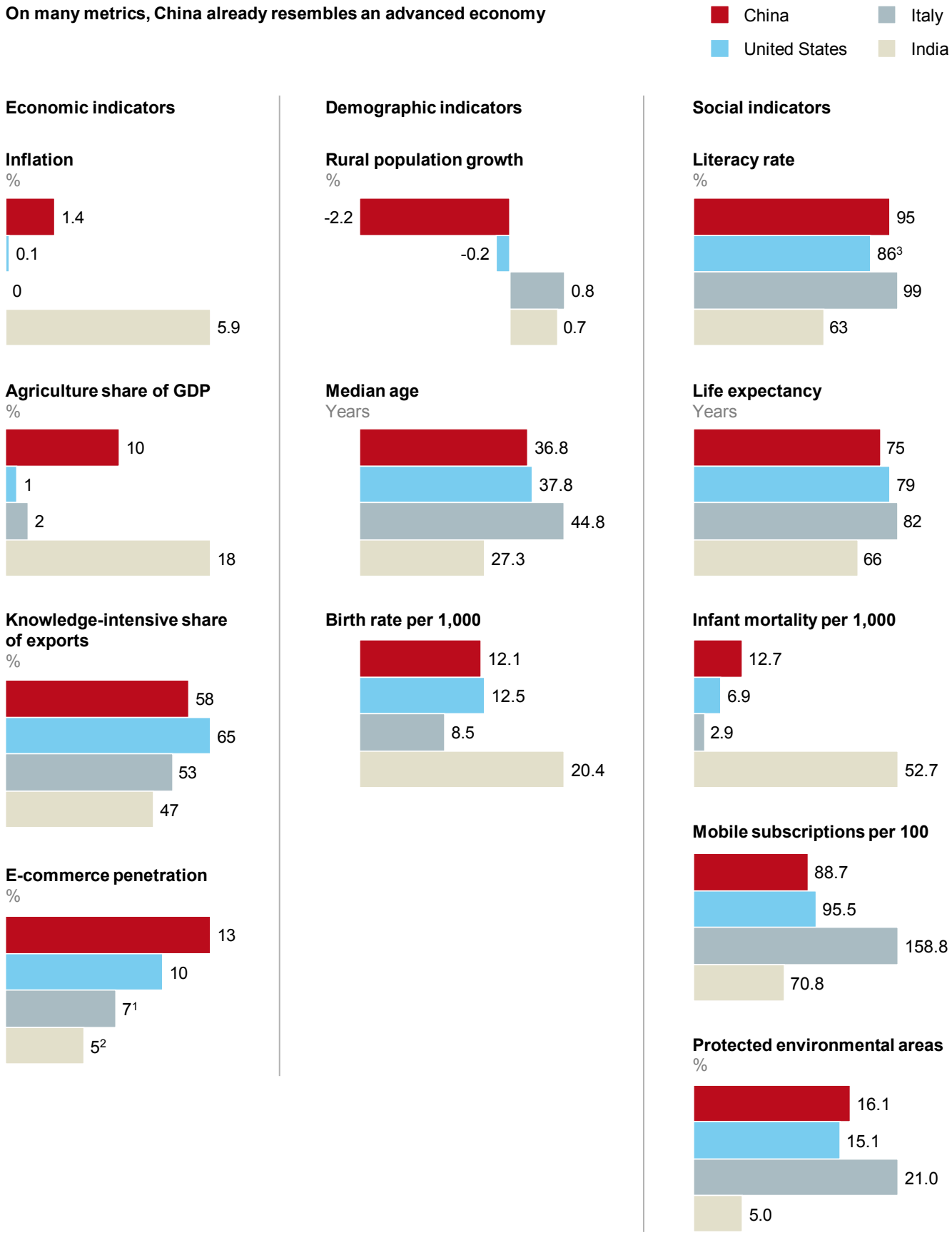
The investment that China pumped into the economy over past decades propelled it forward at a blistering pace. Investment created the infrastructure to meet the demand created by rapid urbanization, and it helped companies to build a manufacturing sector that produces goods for customers in China as well as the world, all while creating jobs. China has been industrializing and urbanizing on an unprecedented scale. Since 1980, GDP has increased 25-fold and more than 600 million people have moved out of poverty. The World Bank already classes China as an upper-middle-income country, alongside nations such as Brazil, Mexico, and South Africa.[19] China has moved far beyond being the world's greatest source of low-cost manufacturing capacity. Its share of global manufacturing value added has increased from less than 7 percent in 2000 to nearly 26 percent in 2014. The nation has an extensive manufacturing ecosystem with hundreds of thousands of manufacturers and suppliers, setting it apart from other low-wage countries. And China has been investing in talent—it graduates the most engineers and PhDs in technical fields in the world. The private sector is playing an increasingly important role in China's economy. SOEs' share of urban employment has fallen from 60 percent in the 1990s to 15 percent today. The performance of private-sector firms is far superior to that of SOEs with a 12 percent return on assets vs. 4 percent in 2014.

On many metrics, China already looks like an advanced economy (Exhibit 1). Its inflation rate is 1.4 percent, far below that of developing economies such as India at 5.9 percent inflation rate in 2015. Nearly 60 percent of China's exports are from knowledge-intensive industries, such as electrical machinery and telecommunications equipment. In China, online shopping accounts for 13 percent of retail sales, compared with 10 percent in the United States. China also ranks well on social indicators such as infant mortality and literacy.

[19] China's gross national income is 7,400 Atlas dollars according to the *World Bank Atlas* method, which is used to compare economic data across different countries. This is 80 percent above the World Bank's threshold for upper-middle income.

Exhibit 1

On many metrics, China already resembles an advanced economy



1 Europe penetration.
2 Rest of World penetration.
3 2003 (latest available data). No substantial change since 1993.
NOTE: Most indicators are 2014 data. Inflation is 2014 data.

SOURCE: World Bank; UNCTAD; FindTheData; Morgan Stanley Research; National Center for Education Statistics; McKinsey Global Institute analysis

The Chinese economy has diversified and globalized

Thirty years ago, the Chinese economy could be characterized simply as developing. Today, it has moved beyond such superficial and simplistic national views. The Chinese economy has become complex and diverse, with a wide range of industries and significant variation across regions. It has, moreover, gone global.

China has diversified its economy, reducing its reliance on manufacturing and exports, developing a large service sector, and relying more on domestic consumption to fuel growth. China's services sector grew at 8.3 percent in 2015, 2.3 percentage points faster than manufacturing, and today accounts for 50 percent of GDP, up from 44 percent in 2010. Over the same period, the share of GDP generated by manufacturing and heavy industry declined from 46 percent to 41 percent. Consumption, as a share of GDP, remains at about 36 percent (in real terms), low by the standards of advanced economies, but it is growing rapidly in absolute terms. From 2010 to 2015, consumption in China grew by more than $1 trillion (6.5 trillion renminbi), second only to the United States, accounting for about one-quarter of global consumption growth over this period. Retail sales are growing by about 10 percent per year, and online sales are growing even faster, by around 30 to 40 percent, as the internet reaches more consumers in rural areas. Movie box office sales have doubled in the past two years, and the amount of overseas travel by Chinese residents has risen by 30 percent since 2013. There are now 116 million middle-class and affluent households (with annual disposable income of at least $21,000 per year) compared with just two million such households in 2000.

To capture China's economic diversity, we have grouped major Chinese industries into six "archetypes" based on common characteristics, such as labor or capital intensity (see Box 1, "Five intensities define industry archetypes"). This grouping methodology provides a framework for understanding what can make different types of industries thrive and become more productive.

Exhibit 3 shows how each archetype contributes to China's GDP, employment, and trade, as well as how they perform on metrics such as productivity and returns on invested capital.

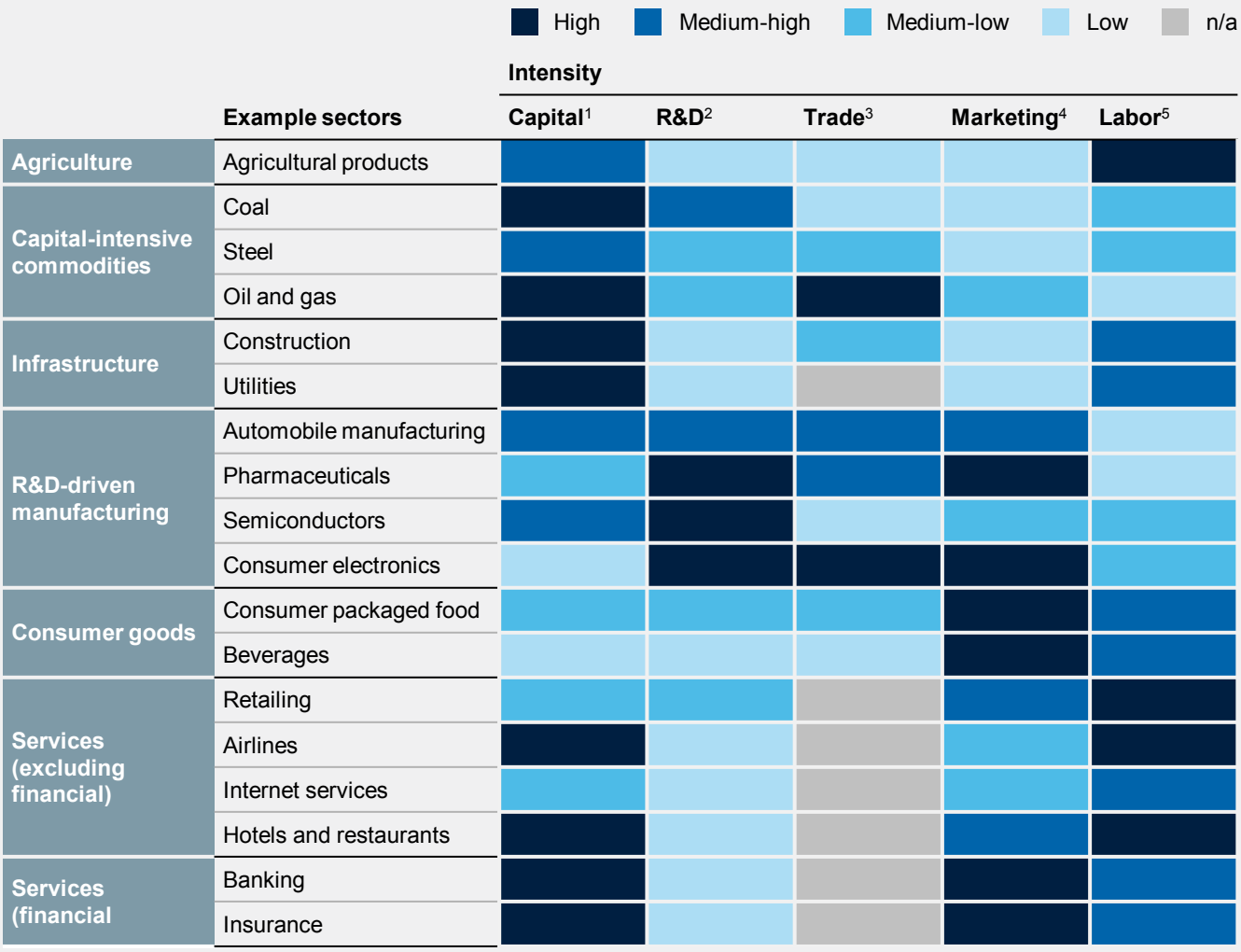
Box 1. Five "intensities" define industry archetypes

We define archetypes using five characteristics: capital intensity, R&D intensity, trade intensity, marketing intensity, and labor intensity. These help explain what inputs are most important and what might be needed to raise productivity (Exhibit 2). There is variation within archetypes. In services, for instance, airlines are highly capital- and labor-intensive, while internet services are moderately capital- and labor-intensive.

- Capital intensity. Heavy industries such as steelmaking and chemicals, as well as infrastructure sectors, tend to be capital-intensive. Some service industries, such as hotels and airlines, can also be capital-intensive.
- R&D intensity. In many industries, the ability to innovate and create new products and variations (or new services) is the key to success. These companies invest in talent and intellectual property.
- Trade intensity. Pharmaceutical and consumer electronics manufacturers operate in global markets and generate value by importing and exporting products and serving the preferences of customers in many geographies.
- Marketing intensity. To keep up with shifting tastes, consumer industries spend heavily on advertising, branding, and design.
- Labor intensity. Labor-intensive industries include agriculture, apparel, furniture making, retail, hospitality, and other low-skill manufacturing businesses. Low-cost labor is essential for these operations.

Exhibit 2

The six industry archetypes vary by "intensities"



1 Plant, property, and equipment/revenue, for financial sectors, common and ordinary equity/revenue.
2 R&D expenses/revenue.
3 Total export value/total value added, 2010–14 average.
4 Marketing expense/revenue.
5 Hours worked per $1,000 value added.

SOURCE: McKinsey Corporate Performance Analysis Tool; IHS database; U.S. Bureau of Labor Statistics; McKinsey Global Institute analysis

Exhibit 3

The Chinese economy in six archetypes

1 Changes are shown as change of share for all share or percent measurements and as compound annual growth rate for absolute measures (e.g., wages and productivity).
2 Aggregated return on invested capital of representative sectors; based on three-year trailing average.
NOTE: Numbers may not sum due to rounding.

SOURCE: IHS; National Bureau of Statistics of China; McKinsey Corporate Performance Analysis Tool; McKinsey Global Institute analysis

- **Agriculture.** Nearly 30 percent of the labor force is employed in agriculture, disproportionately high for the 9.2 percent of GDP that is produced in this archetype. This indicates a very low level of labor productivity. Labor productivity in Chinese agriculture—$4,200 per worker—is the lowest of any archetype and only 5 percent the US level. A number of factors explain this, the most important being the predominance of subscale farms in China. The average farm plot is 0.5 hectares compared with 10 hectares in the United States. In addition, mechanization is low at 60 percent compared with 70 percent in South Korea and 96 percent in the United States.

- **Capital-intensive commodities.** Capital-intensive commodities, such as steel, coal, and oil and gas, account for about 14 percent of China's GDP, a share that has not changed since 2000. These industries have high labor productivity at $30,700 per employee in 2014 compared with the average of $13,340 across Chinese industry. However, the growth of these sectors is slowing and capital productivity has dropped substantially. Returns on invested capital have fallen from 13 percent to 6 percent since 2004, reflecting inefficiency and overcapacity. In the case of steel, China accounts for 38 percent of global overcapacity.

- **Infrastructure.** The investment-led growth model has created a massive infrastructure and real estate industry, which has grown faster than the overall economy for the past ten years and accounts for about 10 percent of GDP. This archetype employs more than 11 percent of the labor force, but productivity is quite low at $11,400 per worker. As urbanization slows and investment shifts to more productive uses, growth in the infrastructure sector is likely to slow, with negative implications for employment.

- **R&D-driven manufacturing.** This archetype includes industries such as autos, computers, and medical equipment, and accounts for about 10 percent of GDP. These industries are of strategic importance, generating 42 percent of exports and accounting for 63 percent of R&D expenditure. Chinese companies are strong players in communications equipment, construction machinery, wind turbines, and generic pharmaceuticals, but shares in medical devices and branded pharmaceuticals are low relative to China's share of global GDP. The profitability of Chinese companies in these industries tends to be about one-third that of global leaders because they are active in low-value-added segments. The next opportunity for industries in this archetype is to move up the value chain. Growth in output and productivity in this archetype will be important to meeting national productivity goals.

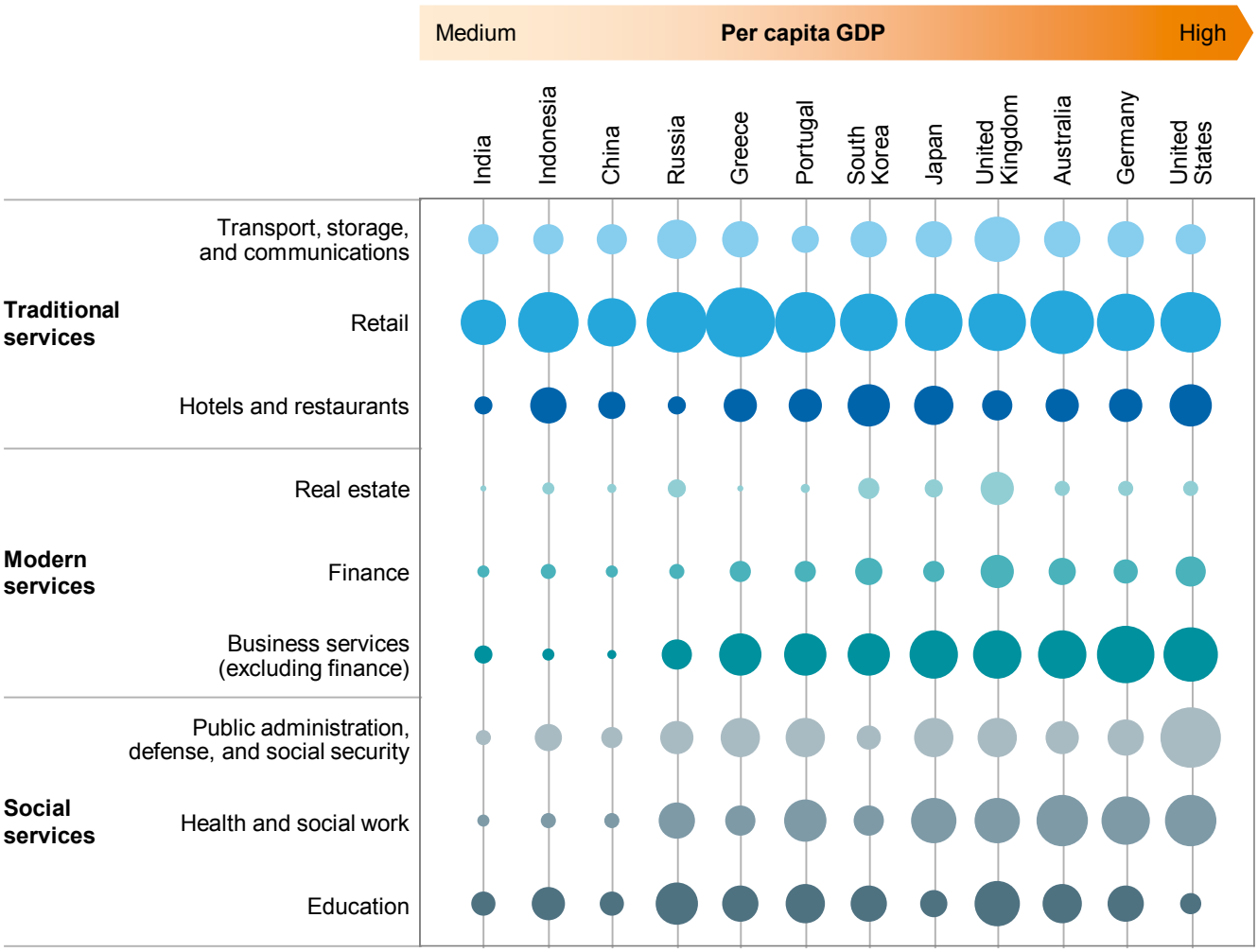
- **Consumer goods.** This archetype includes a wide range of goods, from textiles to consumer electronics, to packaged foods and beverages. Chinese players in labor-intensive goods, such as textiles, footwear, and leather goods, face rising competition from low-cost countries such as Vietnam and Thailand, and China's share of exports of such goods has fallen by 3 to 7 percent (depending on the industry) over the past five years. Given labor-cost pressures, it appears that this trend will continue. More domestic consumption will be needed to make up for falling exports and help raise productivity in consumer-facing industries. To achieve higher productivity, companies will need to keep up with the evolving tastes of a growing Chinese middle-class and affluent households.

- **Services.** China's services sector has been growing rapidly, rising from one-third of GDP in 1990 to about half in 2015. However, much of this growth has occurred in low-productivity sectors such as wholesale and retail trade where average productivity was just $9,000 per employee in 2014. Services is a broad category that includes corner grocery stores to giant internet companies, and managing the transition to a productivity-centered model will be complex. There are three major types of service industries in China, each with its own characteristics and opportunities for growth and improved productivity (Exhibit 4).

Exhibit 4

As nations grow wealthier, the makeup of the service sector shifts

Employment in sector
% of total employment



1 WIOD 2011 data based on employees engaged; China data are from 2014 (NBS and MGI estimates).

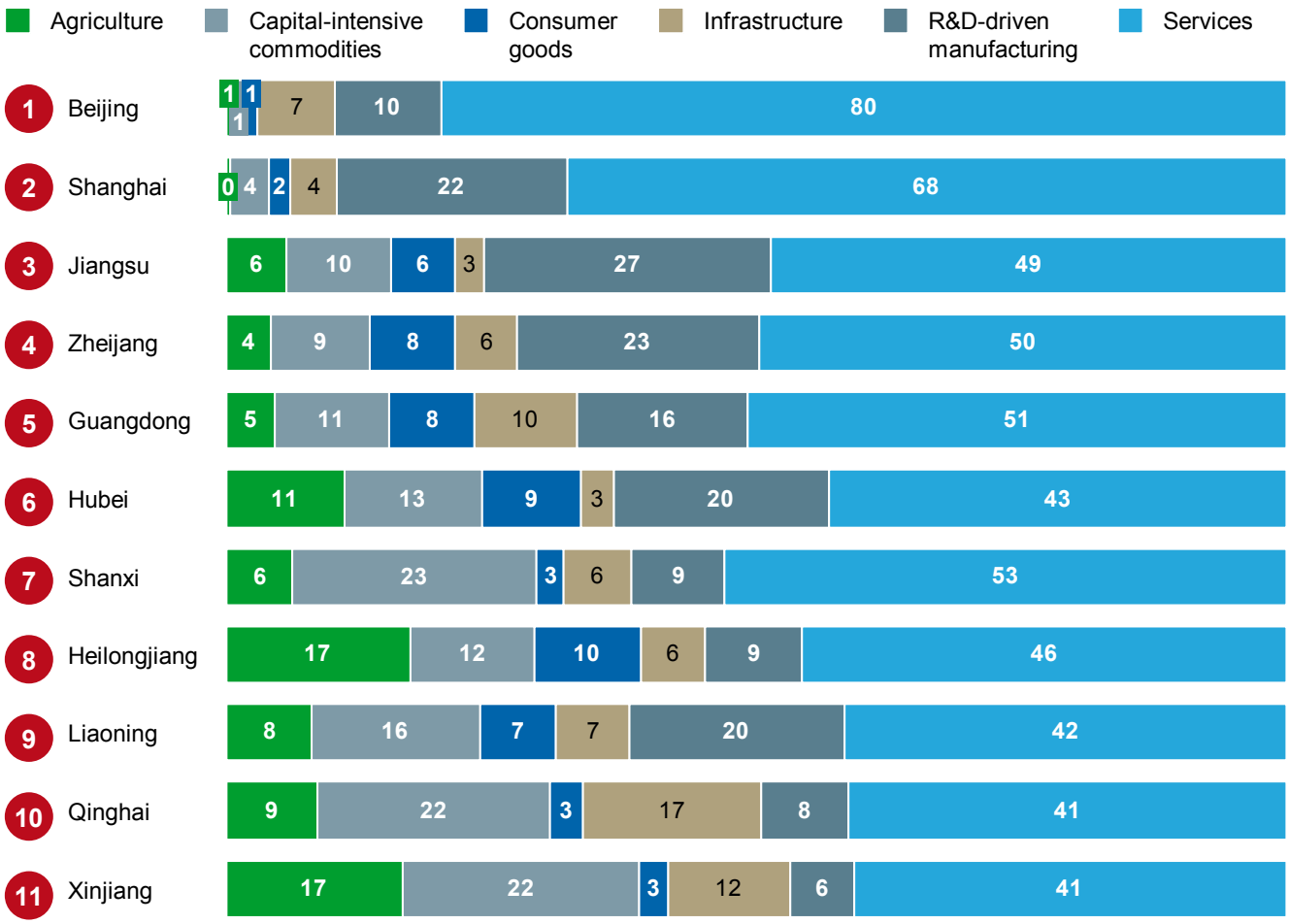
SOURCE: World Input-Output Database (WIOD); National Bureau of Statistics, China; McKinsey Global Institute analysis

Traditional services, such as retailing, are labor-intensive and large-scale employers. They require many workers with relatively low skills and tend to have low productivity. Modern services are those that grow large as economies advance, including financial and business services. These businesses tend to employ highly skilled workers. The third category is social services—public services such as education and health care, which take on a larger role as economies grow wealthier. In many advanced economies, the shift toward a more services-dominant model happened gradually. In China, the power of the service sector to create employment opportunities and raise productivity in high-value areas such as business services argues for an accelerated transition, supported by policy measures to, for instance, support the redeployment of workers, encourage investment in skills, and encourage healthy competition in sectors dominated by SOEs.

The archetypes vary among China's region, which means that shifting away from the investment-led model will present different challenges and opportunities in different provinces (Exhibit 5).

Exhibit 5

The mix of archetypes in the economy varies by region in China[1]



1 Shares of agriculture and services come from China's statistical yearbook; for other sectors, shares are estimated based on based on fixed-asset investment in secondary industries.

SOURCE: National Bureau of Statistics, China; provincial statistics yearbooks; McKinsey Global Institute analysis

Where local economies depend on industries that have overcapacity, a major challenge will be finding new sources of growth and employment. Knowing the mix of archetypes in different cities and provinces can help companies plan where and how to invest.

Services account for the vast majority of GDP in Beijing and Shanghai, while agriculture and commodities are dominant archetypes in provinces such as Heilongjiang and Xinjiang. R&D-driven manufacturing is big in Jiangsu, Zhejiang, and Guangdong, while infrastructure remains a key contributor in Xinjiang and Qinghai. To plan strategies for the productivity-led economy, policy makers and business leaders will want to know how much each archetype contributes to the local economy and assess how the challenges and opportunities for each archetype will affect their plans.

China has integrated globally

China's economic growth is a matter of great importance to the rest of the world. As recent developments in China have illustrated vividly, China's economic performance affects markets and economies around the world. It is deeply connected to other economies through the flow of goods and services, capital, and people. It is the world's largest trader of goods and second-largest purchaser of goods, buying $1.9 trillion of products in 2014. It is the number one importer of resources such as iron ore in the world. Its markets are a major source of revenue for multinationals.

We analyzed China's relationship with key trading partners based on three types of flows and assessed the exposure of each country (Exhibit 6). In 2014, China's slowdown had an impact on countries through a reduction in such flows. Some countries, such as Angola and Oman, are highly exposed to China's economy through oil and gas exports. South Korea is exposed both in trade flows and people flows.

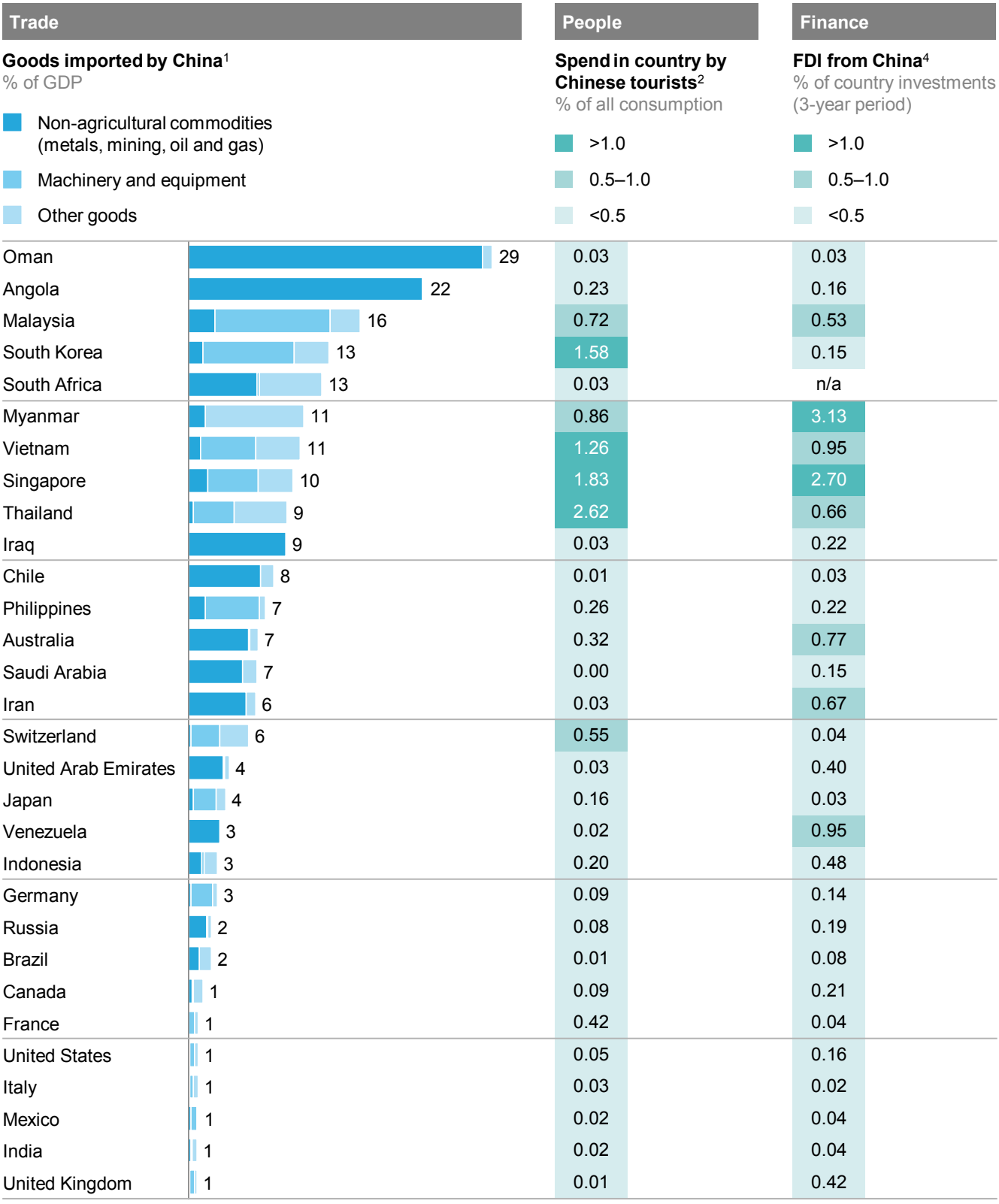
When China's economy is growing, global commodity prices are strong and other economies prosper. When China's economy slows, markets and countries suffer. It is estimated that for every 1 percentage point drop in China's real GDP growth, global economic growth could fall by 0.2 percent.[20] The impact on regional economies can be far larger. For example, a 1 percent drop in Chinese GDP growth could lead to a 0.3 percent reduction in GDP growth in Asian economies. For South Korea, one of China's largest trading partners, the hit could be up to 0.6 percent; one-quarter of South Korean exports go to China, accounting for 13 percent of South Korean GDP. In the ASEAN economies, China's 1 percentage point growth slowdown could cut growth by 0.4 percent.[21] The impact on US growth would be relatively low at about 0.1 to 0.2 percent.

[20] Compiled from estimates by the OECD, International Monetary Fund, World Bank, Goldman Sachs, Oxford Economics, and Korea Development Institute.

[21] Association of Southeast Asian Nations (ASEAN) members are Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, Philippines, Singapore, Thailand, and Vietnam.

Exhibit 6

China is connected to other nations via trade, people, and financial flows



1 As reported by NBS; some discrepancies known to exist based on country sources.
2 Includes agriculture, textiles, manufactured products, chemical products, precious gems materials.
3 Based on triangulation and estimations from international, governmental, news, and academic sources, with estimated regional averages used for Iran, Iraq, Mexico, Oman, and United Arab Emirates due to data constraints.
4 Country consumption and investment based on similar-country averages.
NOTE: Analysis based on 2014 data (or estimations if data not available), and excludes Hong Kong, Macao, and Taiwan.

SOURCE: World Bank; National Bureau of Statistics, China; UNCTAD; World Travel & Tourism Council; World Tourism Organization (UNWTO); China Ministry of Commerce; press search; McKinsey Global Institute analysis

BUT CONSTRAINTS ON GROWTH ARE NOW EVIDENT

After its extraordinary growth spurt, China's economy is now experiencing growing pains. Long-term structural constraints on growth are appearing on both the supply side and the demand side of the economy) as well as near-term risks related to rising debt). Together, they pose a considerable challenge to China's growth trajectory and economic performance.

Supply-side constraints

China has benefited over the past three decades from a strong and growing supply of labor and capital, which has propelled growth. However, it must now contend with rising labor costs, a tightening labor supply, a skills gap, and falling capital productivity.

- **Rising labor costs.** In the long run, rising labor costs can be seen as a welcome sign of China's growing productivity. Rising wage rates can be a prod to companies to manage more effectively and innovate so they can match wage gains with productivity gains. In the near term, however, some industries have had trouble keeping up with labor costs. In addition to rising wage rates, under China's 2008 labor law, employers have taken on more social-security costs, which has raised the growth rate of fully loaded labor costs to about 13 percent per year (Exhibit 7). Rising labor costs are already making China less competitive in low-wage, labor-intensive industries such as footwear, where its share of global exports has fallen from 52 percent to 46 percent since 2010, while Vietnam, Cambodia, and Indonesia have gained share. China has had similar share losses in textiles and hides.

- **Skill gaps.** Chinese industry cannot shift to more productive high-value activities without a plentiful supply of highly skilled workers. While China has addressed the quantity issue—raising the number of college graduates from one million in 2000 to 7.1 million in 2014—employers complain about the job skills of recent graduates. In surveys, employers indicate that they are not satisfied with the skills of students coming out of vocational programs either. Employers cite a lack of technical training, poor English skills, and limitations in critical thinking and innovation capabilities. In a 2013 McKinsey survey, more than one-third of employers in China said they struggled to recruit skilled workers, and 61 percent blamed inadequate skills of applicants.[22]

- **Shrinking working-age population.** China could face growing shortages of workers due to slow population growth, an aging population, and a slower rate of urbanization (see below). The flow of new workers into the labor force—the demographic dividend—is ending. From 1964 to 2014, the labor force expanded by 2.1 percent per annum, contributing 24 percent of GDP growth. But now the working-age population has peaked, and is projected to shrink by 0.5 percent per year through 2050.[23] Meanwhile, approximately 30 million Chinese are retiring each year, and the flow of new urban workers into the labor force is dropping as the pace of urbanization eases back.

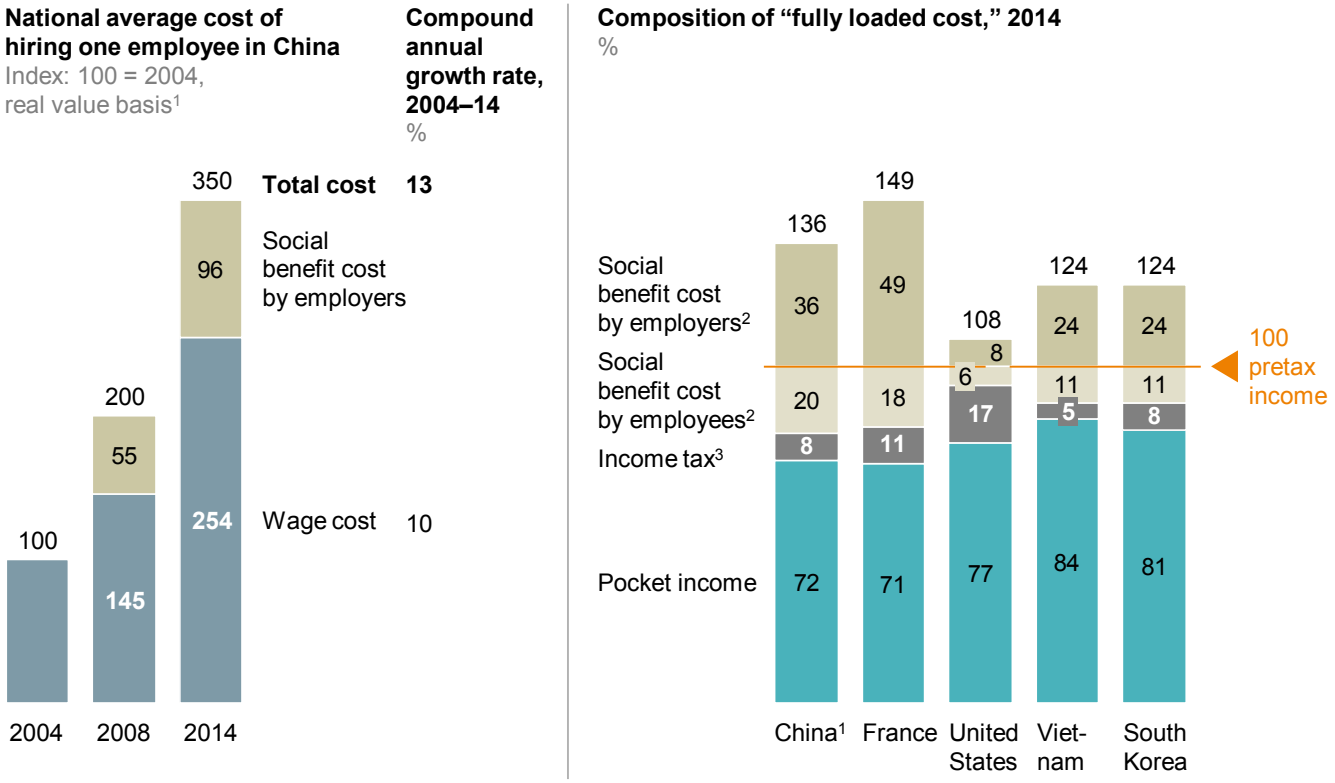
- **Declining capital productivity.** A major concern relating to the current investment-led model is falling capital productivity. The rate of return to the economy from capital investments is falling. It now takes 60 percent more fixed capital investment to create a unit of GDP than it did from 1990 to 2010. This is partly because recent infrastructure investments are in more remote regions, or have sometimes simply added to existing projects, therefore producing relatively less value, and partly because of inefficiency in project management and rising costs.[24]

60%
more fixed capital investment needed to create a unit of GDP than in 1990 to 2010

[22] *The $250 billion question: Can China close the skills gap?* McKinsey & Company, May 2013.
[23] *Global growth: Can productivity save the day in an aging world?* McKinsey Global Institute, January 2015.
[24] *Bridging global infrastructure gaps*, McKinsey Global Institute, June 2016.

Exhibit 7

China's "fully loaded employment" cost has risen by 13 percent a year since 2004



1 100 = national average wage in 2004. Social benefit payment by employers was not strictly enforced.
2 Only including the compulsory social benefits payment. Individual companies can choose to pay more to stay competitive in job markets. For South Korea and France, the amounts may vary depending on industries.
3 Income tax is estimated based on national average monthly salary in each country (actual rates can vary depending on several variables such as marital status, number of dependency, geographic location, etc.).
NOTE: Numbers may not sum due to rounding.

SOURCE: National statistical offices; review of national labor laws; McKinsey Global Institute analysis

Demand-side constraints

For many years, China has been able to count on rapid and huge-scale urbanization to raise incomes and create consumer demand, but those "easy" years of growth are ending as rural-to-urban migration slows and as, at the same time, income inequality is rising, potentially constraining the rate of growth of consumer demand.

- **Urbanization is slowing.** When Chinese workers migrate to cities, their incomes typically double or triple, raising their potential to consume. Urbanization also creates demand for housing, health care, education, and retail services, driving service-sector growth and job creation. However, the pace of urbanization is expected to slow, from 2 to 3 percent per year in the past three decades to about 1 percent per year in the next 15 years. This waning pace is likely to constrain housing and infrastructure construction, and related employment.

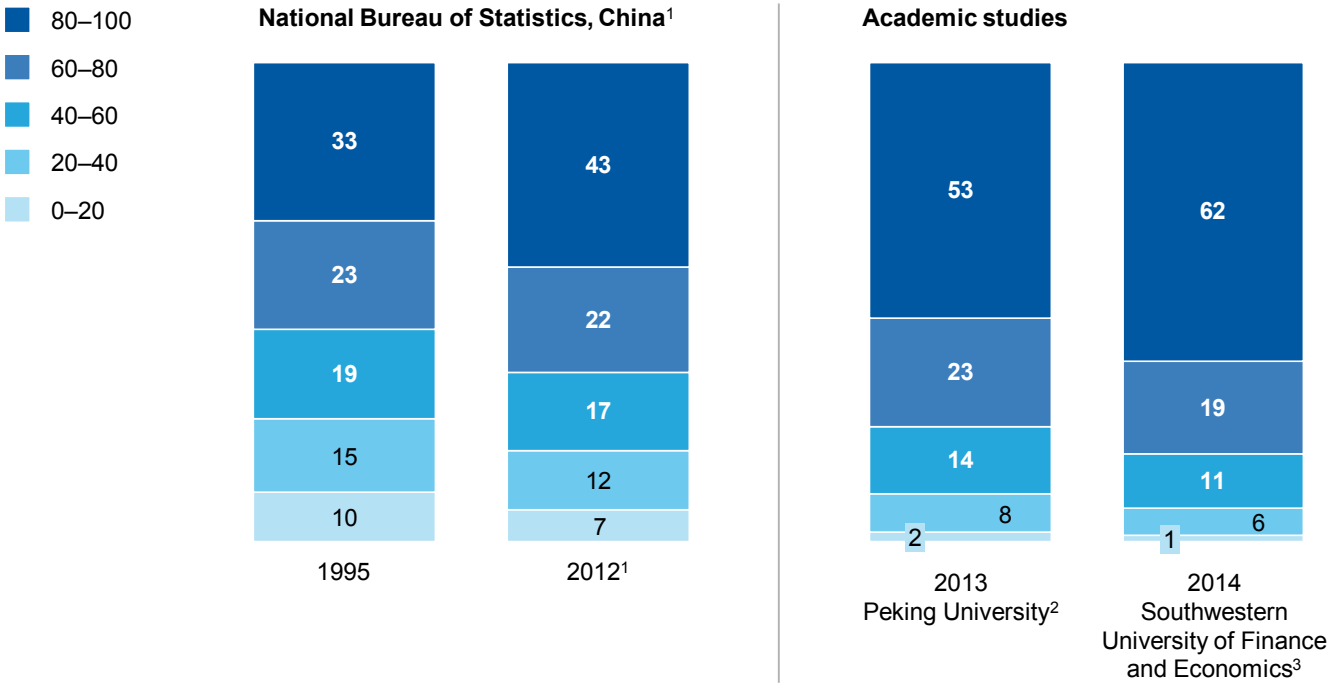
- **Inequality has widened.** China's modernization has produced uneven levels of prosperity. This complicates the transition to a more consumption-based economy. While all segments of Chinese society have experienced rising incomes, the share of income going to the top one-fifth of the population has risen from 33 percent in 1995 to 43 percent in 2012, according to the government; other sources from academic surveys say it might be more than 50 percent in recent years (Exhibit 8). This concentrates purchasing power in wealthy households that have a lower propensity to spend. Wealthy

Chinese households save 60 percent of their incomes on average. Higher incomes spread more evenly across the population would put more money in the hands of households with a greater propensity to spend and help raise overall consumption.

Exhibit 8

Income inequality is growing, limiting potential consumption

Income distribution by quintiles, government and academic sources
% of total urban income



1 NBS household income survey was not publicly available after 2012.
2 China Family Panel Study; household survey based on a sample size of 10,000 urban and rural households across 25 provinces in China.
3 China Household Finance Survey; household survey based on a sample size of 40,000 households across China 300 cities and counties.
NOTE: Numbers may not sum due to rounding.

SOURCE: National Bureau of Statistics, China; Southwestern University of Finance and Economics China Household Finance Survey; Peking University; McKinsey Global Institute analysis

THE INVESTMENT-LED MODEL HAS LED TO DISTORTION IN THE ECONOMY

Risks are rising in China's economy. The economy is highly distorted—the financial sector accounts for the vast majority of economic profit. Corporate returns are under pressure, some sectors are struggling with overcapacity, and debt—and bad debt—is rising. The combination of rising debt and deteriorating corporate performance has created a substantial risk of company defaults. In the near term, there is a possibility that the economy could experience a hard landing that would impose significant stress on the banking sector. In the longer term, the current investment-led approach is likely to lead to slower GDP growth than a productivity-led model would deliver, hindering China's progress toward becoming a fully advanced economy, and compromising the ability of citizens to raise their incomes and standards of living. The longer that China continues to rely on investment-led growth, and the more time that passes before it addresses the problems associated with the current model, the greater the risks to China's future. The evidence suggests that it now needs to move decisively beyond the investment-led model.

The investment-led model has left the Chinese economy highly distorted. More than 80 percent of economic profit (profits after accounting for the cost of capital) are today

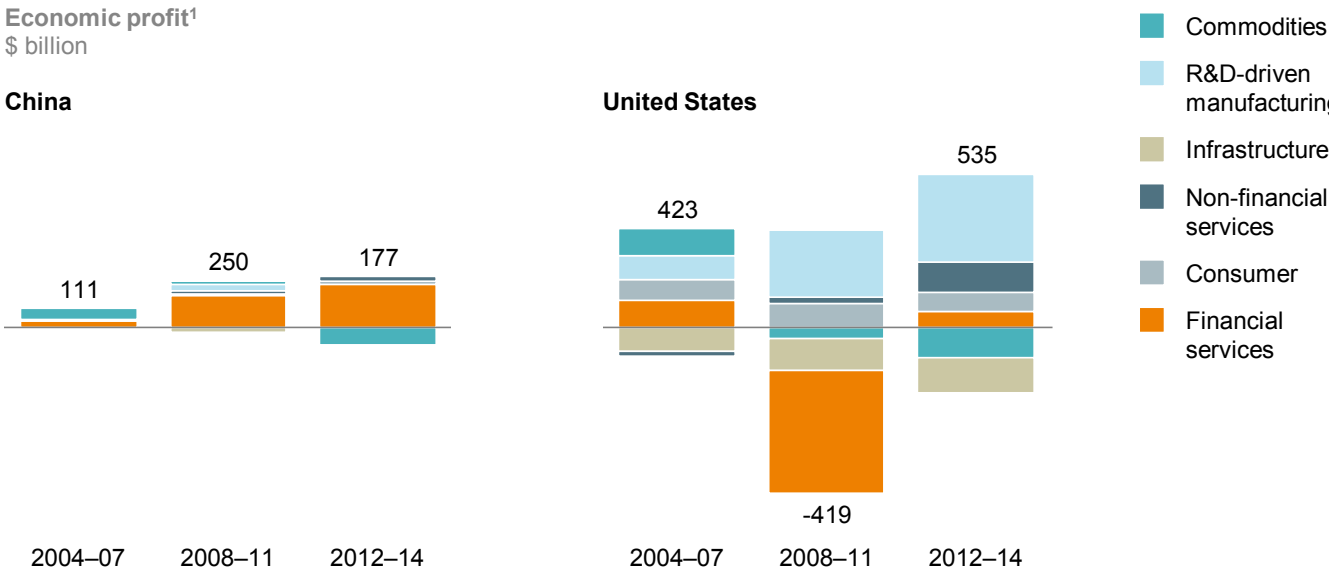
generated by the financial sector.[25] Other major sectors have negative economic profits. The large concentration of economic profits in financial services is highly unusual and could make China more vulnerable to demand shifts than economies in which more sectors generate economic profits.

Using McKinsey's Corporate Performance Analytics Tool, we have estimated aggregate economic profit for more than 10,000 companies based in China and the United States across industry sectors. We focus on economic profit that, unlike return on invested capital (ROIC) or earnings before interest, taxes, depreciation, and amortization (EBITDA), measures the creation of value from both returns and scale. This approach calculates the value created by the company for both debt and equity holders, and also takes into account the relevant opportunity cost of capital used for value creation.

This analysis provides a view of the structure of the two economies—how economic profit is distributed and how that distribution has changed over time. The data show that economic profit in China has risen from a total of $111 billion in the 2004-07 period to $176 billion from 2012 to 2014. However, economic profits in China are increasingly concentrated in financial services, which now account for more than 80 percent of economic profit (Exhibit 9). Banks today dominate funding of investment and supplying capital to companies, and account for more than 80 percent of total financial assets in China. Benefiting from interest-rate regulation in the past, banks have had comfortable net interest margins of around 3 percent (profit earned through the difference between the deposit and lending rates) over the past ten years although those margins have subsequently been squeezed as China has moved toward interest-rate liberalization in recent years. Bank profits could decline with further financial-market reforms and China will need to diversify sources of economic profit from other industries.

Exhibit 9

In China, economic profit has been highly concentrated in the financial sector



1 We define economic profit as NOPLAT (net operating profit less adjusted taxes) minus the capital charge.

SOURCE: McKinsey Corporate Performance Analytics; McKinsey Global Institute analysis

[25] We define economic profit as NOPLAT (net operating profit less adjusted taxes) minus the capital charge. The capital charge is defined as invested capital multiplied by the weighted average cost of capital. For financial companies, the economic profit is defined as net income minus the capital charge (equity multiplied by the cost of equity). Our economic profit analyses include more than 3,500 China-based (revenue equivalent to 55 percent of China 2015 GDP) and 7,000 United States-based (revenue equivalent to 85 percent of US 2015 GDP) publicly listed companies.

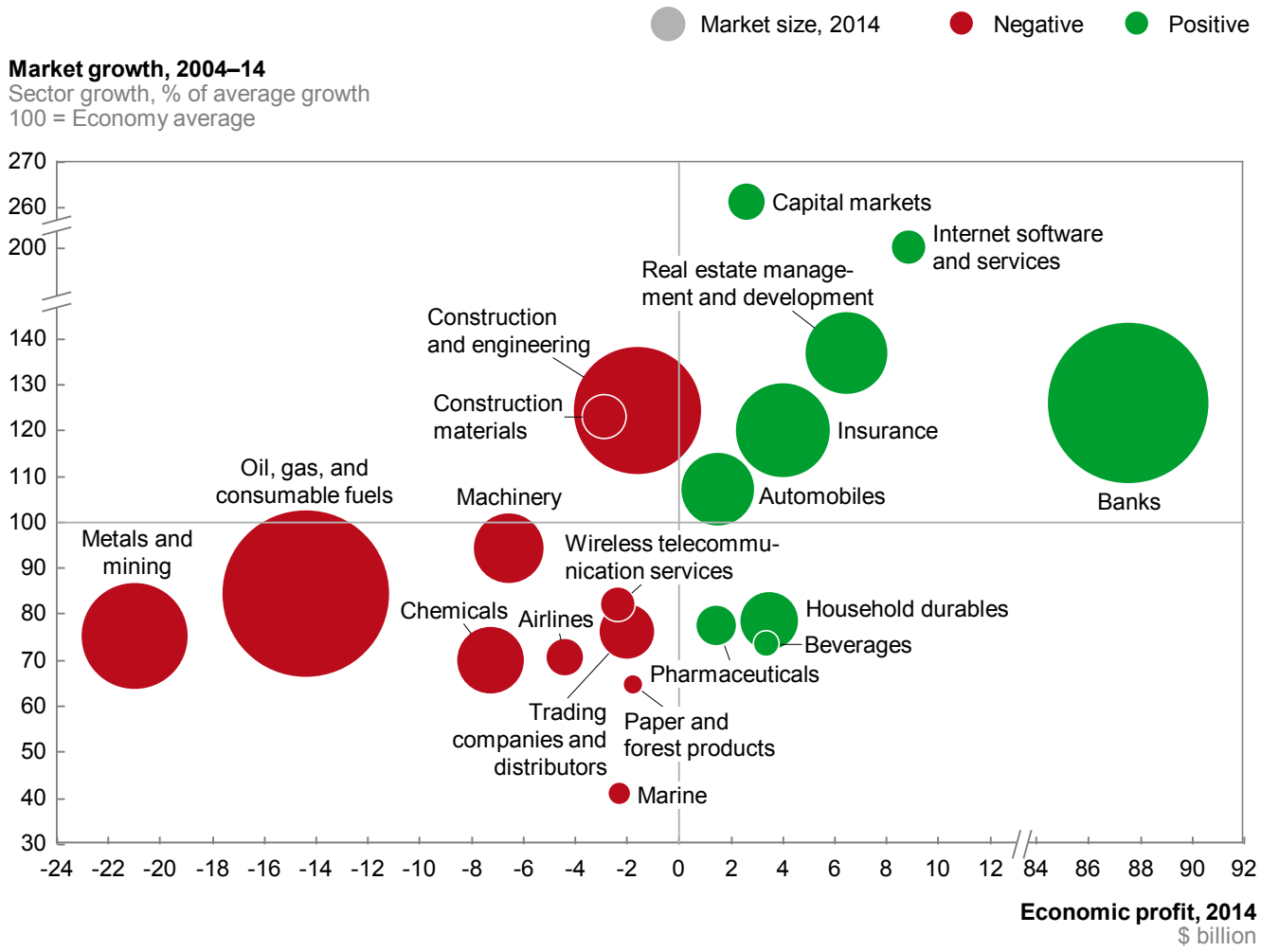
In the United States, economic profits are distributed across a number of sectors, including R&D-driven manufacturing, services, and consumer goods. The distribution of the profit pool changes along with the economic cycle, too.

CORPORATE RETURNS ARE FALLING

Examining the economic profits in China at the sector level, we see that nine of the 20 largest sectors are destroying value—posting negative economic profits (Exhibit 10). While this appears to be an alarming statistic, it should be noted that these industries still have positive operating margins, but that, after accounting for the cost of capital, economic profits are negative.

Exhibit 10

In many sectors of the Chinese economy, economic profits are negative



SOURCE: McKinsey Corporate Performance Analysis Tool; McKinsey Global Institute analysis

7.4%

ROIC for Chinese companies in 2014 compared with 10.2 percent for US companies

There are some positive signs in the data. We see, for example, that growth is slower in sectors with the largest economic losses—metals and mining and chemicals—than in the sectors that are producing economic profits. At the same time, a number of non-financial sectors that have positive economic profits (such as internet software and automobiles) are among the fastest-growing sectors in China. Over time, these sectors can help diversify China's sources of economic profit and raise the national average.

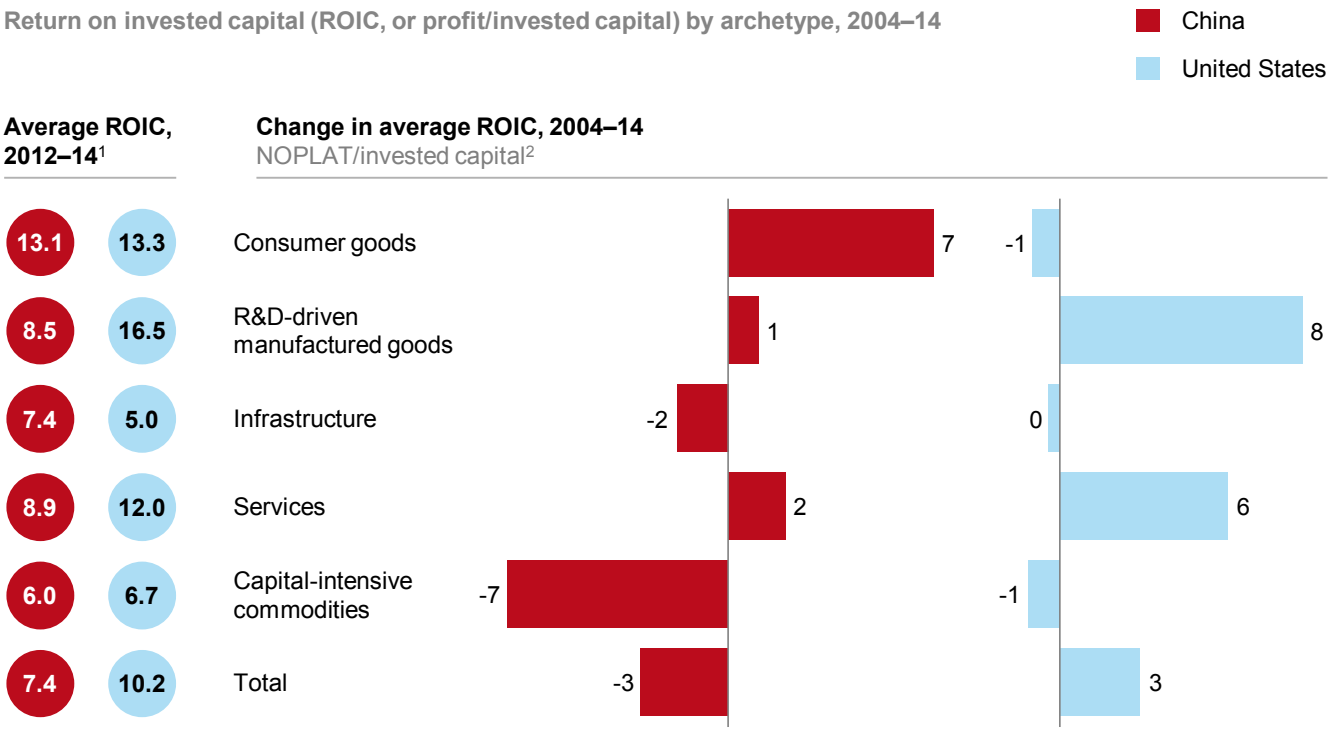
In several sectors, top-performing Chinese companies have returns that are as good, or even better, than those earned by the top US companies, according to our data on more than 10,000 companies in the two countries. However, the weakest Chinese firms perform substantially worse than the weakest firms in the United States in some sectors. On average, returns are falling across sectors in China. One reason for this is that many industries in China have a "long tail" of poor performers that drags down average returns. Returns on invested capital (ROIC) averaged 7.4 percent in 2014 (based on a three-year trailing average), compared with 10.2 percent for the US companies in our sample (Exhibit 11).

China's average return in 2014 was down sharply from 10.4 percent in 2004, reflecting declines in margins in major sectors such as steel and coal.

Exhibit 11

Average returns of Chinese companies lag US returns except in infrastructure sector

Return on invested capital (ROIC, or profit/invested capital) by archetype, 2004–14



1 Our calculation includes goodwill. If goodwill is excluded from ROIC calculations, total ROIC is 8.1 percent in China and 15.6 percent in the United States.
2 Net operating profit less adjusted taxes.

SOURCE: McKinsey Corporate Performance Analysis Tool; McKinsey Global Institute analysis

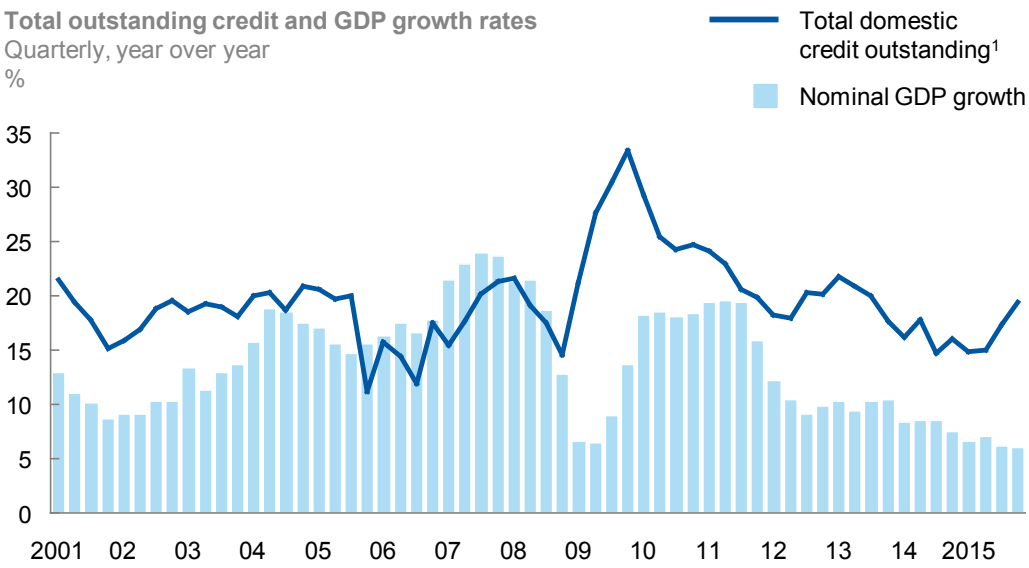
If we look at patterns of returns in six archetypes of Chinese industry, we see that the largest gaps between China and the United States are in R&D-driven manufacturing industries such as autos and pharmaceuticals, and in services. In the United States, average ROIC in R&D-driven manufacturing were 16.5 percent in 2014, compared with 8.5 percent in China. In services, Chinese companies have average returns of 8.9 percent, compared with 12.0 in the United States. China actually has comparable average ROIC in consumer goods—13.1 percent vs. 13.3 percent. China's relatively low returns in R&D-driven manufacturing and services reflect the concentration of Chinese firms in lower value-added activities; Chinese pharmaceutical companies, for example, produce generic drugs and have a small presence in branded drugs. China's higher returns in consumer goods may reflect the efficiency of China's massive manufacturing ecosystem and the scale of its domestic market.

FINANCIAL RISKS ARE RISING

Even as GDP growth has dropped to just under 7 percent in 2015 from a nominal 19 percent in 2011, total credit outstanding in China's economy has grown by 15 to 20 percent per year (Exhibit 12). The People's Bank of China has cut interest rates eight times since 2012, reducing its benchmark lending rate from 6.56 percent to 4.35 percent. It has also lowered reserve requirement from 20.5 percent to 16.5 percent since 2012. In August 2015, the State Council issued a new policy to remove the 75 percent loan-to-deposit ratio cap that had been imposed in 1995 to raise bank liquidity. In early 2016, the bank lowered minimum down payments for mortgages on primary residences from 25 percent to 20 percent.

Exhibit 12

Under the investment-led model, China's credit growth far exceeds GDP



1 Includes total social financing, non-loan bank claims on non-banking financial institutions and on corporations and households, and banks' net claims on government (a portion of the claims data is available only starting in 2005). This measurement includes all outstanding credit in the real economy but excludes interbank credit.

SOURCE: McKinsey Global Institute Debt & Deleveraging database; CEIC; Emerging Advisors Group; McKinsey Global Institute analysis

As a result, China's "real economy" debt (excluding financial-sector debt) jumped from 128 percent of GDP in 2007 to an estimated 230 percent of GDP in 2015, with corporate debt doubling from 68 percent of GDP in 2007 to 136 percent in 2015 (Exhibit 13). The continuous flow of credit has created overcapacity in industries such as steel, cement, and real estate—sectors that had been regarded as reliable sources of growth. But now companies are facing a sharp slowdown in demand and, in some cases, are relying on credit to keep going. It is estimated that roughly 10 percent of new credit created in 2015 was used to pay interest on existing debt.[26]

Real economy debt surged to **136%** in 2015, from 68% in 2007

Local governments have also built up large amounts of debt by using government-affiliated entities to fund infrastructure and other projects. Debt held by local government-affiliated platforms (off-balance sheet financing entities that use bank and non-bank loans to fund specific government projects) has doubled, rising from 15 percent of GDP in 2007 to 31 percent in 2015. In 2015, the government introduced several measures to restructure local government liabilities by allowing cities and provinces to swap high-interest bank debt with cheaper municipal bonds. The government has also tried to restrict new debt, placing a cap of 16 trillion renminbi ($2.5 billion) on local government borrowing in 2015. But local

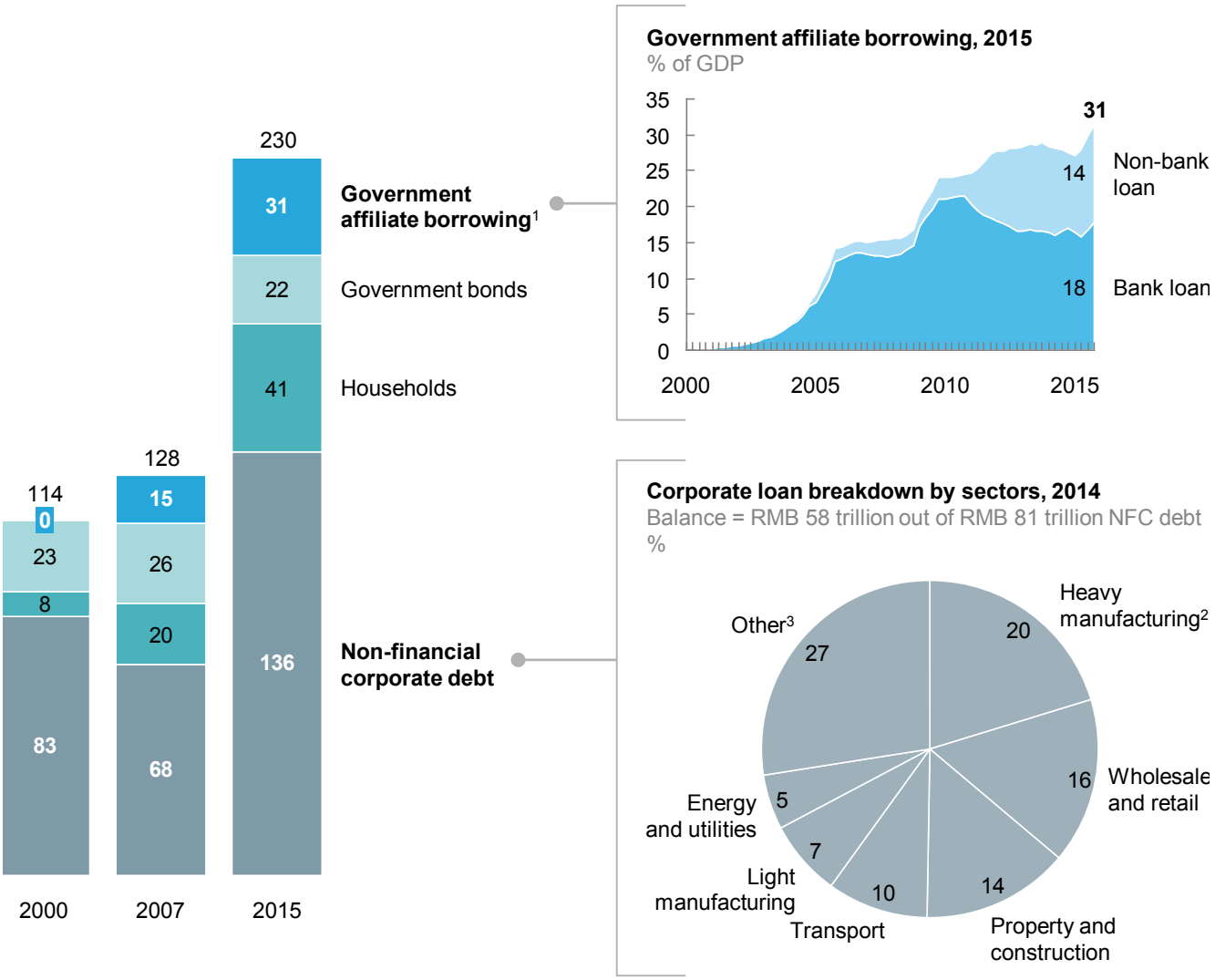
26 Tao Wang, *What are the real problems with China's debt?* UBS, April 2016.

governments are finding other ways to continue to finance projects, including using lease financing and build-and-transfer deals. It is estimated that less than half the government liabilities in these deals are captured in official statistics on social financing, the People's Bank of China measure of government liquidity.[27]

Exhibit 13

Debt of non-financial corporations (NFC) has doubled since 2007

Components of debt of real economy (balance), 2015
% of GDP



1 Including bank loan, entrusted loan, trust loan, government bonds and other financial instruments to LGFV.
2 Estimated based on bank loans on basic materials, such as mining, chemical, non-ferrous metal and equipment sectors, etc.
3 Other sectors include agribusiness, catering, education, health care, and other services sectors.
NOTE: Numbers may not sum due to rounding.

SOURCE: People's Bank of China; National Audit Office; McKinsey Global Institute analysis

[27] See Jonathan Anderson, *China's TSF data fall victim to Goodhart's law*, January 28, 2016; Moody's Investors Service, Quarterly China shadow banking monitor, April 2016.

In one area—household debt—China has not moved into a danger zone. While household debt doubled from 20 percent of GDP in 2007 to 41 percent in 2015, this level remains modest compared with the levels in South Korea (81 percent of GDP) and the United States (77 percent). Mortgages account for half of household debt in China and are for 30 to 40 percent of property value, on average.

A DEBT CRISIS IS NOT IN THE CARDS FOR THE NEXT FEW YEARS THOUGH A DOWNTURN IS POSSIBLE

Given the rapid rise in debt, slowing GDP growth, and the declining performance of corporate borrowers in major industries, could China be headed for a debt crisis? China has greater financial strength than the many developing economies that have become over-extended and wound up with bank failures, capital flight, and tumbling currencies. But China's strength is no guarantee against an unexpected event setting off a crisis. Financial crises tend to have specific triggers: the global financial crisis of 2007–08 was sparked by mounting defaults on subprime mortgages in the United States, and the Asian financial crisis was set off by the collapse of the Thai baht in 1997, which signaled to foreign investors that it was time to pull out of the entire region.

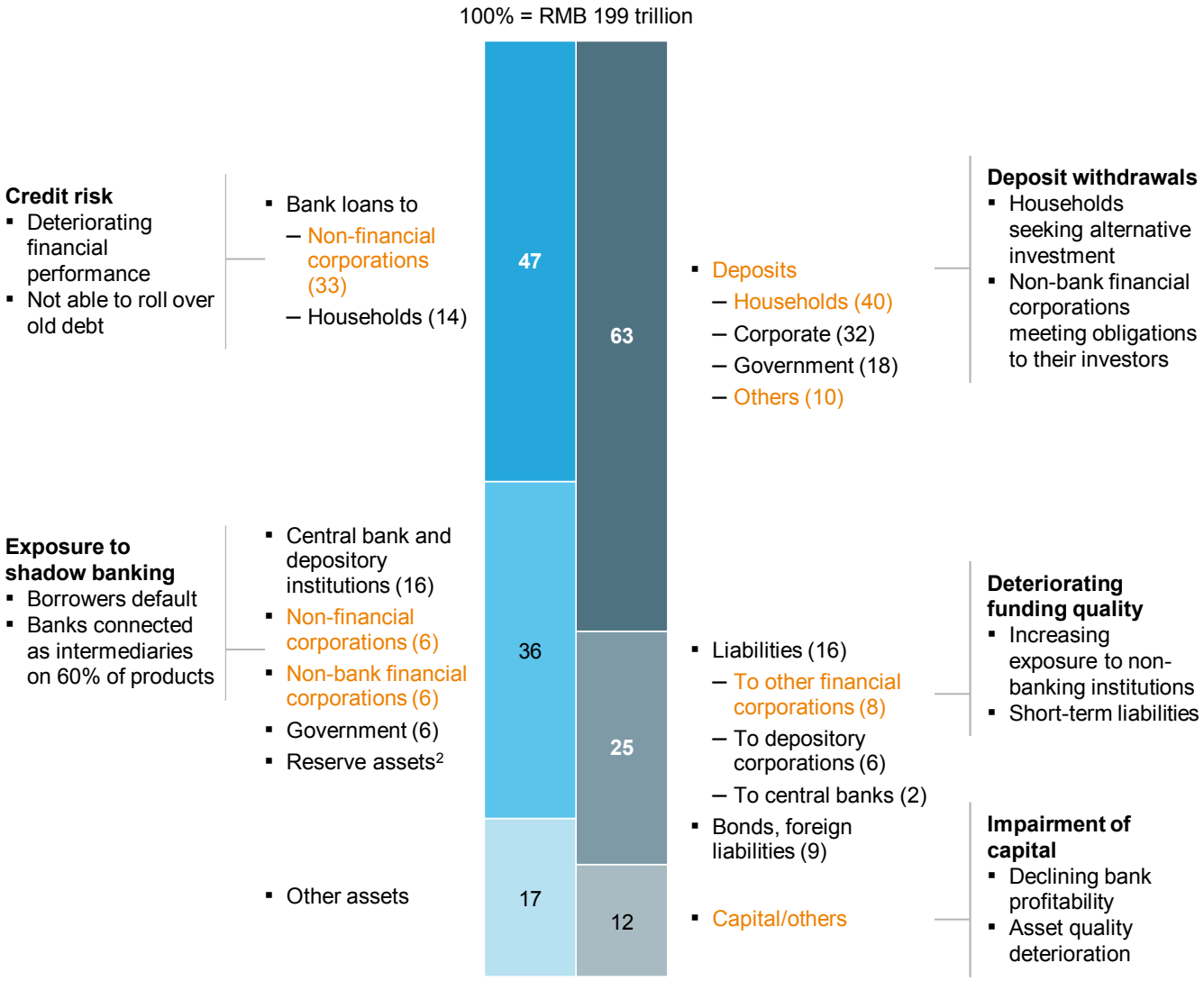
We estimate that, in 2015, bad loans and exposure to shadow-banking losses could wipe out the 2.3 trillion renminbi ($ 350 billion) that banks have in loan reserves and reduce commercial bank equity by 14 percent.

We identify four potential triggers in China's banking system. Two are related to bank assets: credit risk in corporate lending and exposure of banks to bad loans in the shadow-banking sector, for which commercial banks often act as intermediaries. Two additional funding risks are related to bank liabilities and equity: a sudden drop in deposits and rapidly increasing exposure to low-quality sources of funding, and an erosion of the bank equity needed to meet safety requirements (Exhibit 14). All four triggers are hypothetical, but they reflect actual risks. The biggest is the risk of default by corporate borrowers in both formal banking and the shadow-banking sector. We estimate that, in 2015, bad loans and exposure to shadow-banking losses could wipe out the 2.3 trillion renminbi ($ 350 billion) that banks have in loan reserves and reduce commercial bank equity by 14 percent. In the worst case—if lending continues as it has—in three years losses could be large enough to erase more than 50 percent of commercial bank equity, which could potentially cause a liquidity crunch in the banking system. We do not believe that even a write-off on this scale raises the risk of a systemic banking crisis in China (or creates a risk of global contagion in the banking system given China's closed capital account). However, with limited access to credit for corporate borrowers, and waning confidence among investors and consumers during the restructuring and recovery phase, economic growth would most likely suffer.

Exhibit 14

Potential triggers of a financial shock in China's banking system

Based on aggregated balance sheets of depository institutions, 2015[1]
%; RMB trillion



1 Depository corporation includes commercial banks, policy banks. It does not include central bank, non-bank financial corporations and bank non-depository businesses like trust, entrust, pension fund, insurance, asset management, financing and rental, securities, investment fund, financing garantory, and auto financing.
2 Includes deposit with central bank and cash in vault.
NOTE: Numbers may not sum due to rounding.

SOURCE: People's Bank of China; CEIC; McKinsey Global Institute analysis

Asset-side risks: Potential defaults in bank loans and failures in shadow banking

To understand the risk to the banking system, we analyzed the asset quality of commercial bank loans in industry sectors that rely most heavily on bank credit. Using the Corporate Performance Analytics Tool, we analyzed the financial performance of more than 2,300 publicly traded Chinese companies in seven major sectors.[28] These sectors account for 80 percent of commercial bank lending, and we used several debt and solvency ratios, including debt to assets, debt to equity, interest coverage, and debt-to-EBITDA.

In the companies we analyzed, average total debt loads have more than doubled since 2010, while revenue and margins have contracted. As a result, the mean debt-to-EBITDA multiple (a commonly used metric of solvency risk) for the group has risen. About 30 percent of companies in our sample had EBITDA multiples of seven or higher in 2015, up from 20 percent in 2010. A multiple of seven is generally regarded as a sign of heightened risk. Not surprisingly, multiples are well above the average in industries with significant overcapacity. In iron and steel, the average debt-to-EBITDA ratio rose from 7.4 to 9.0. In construction, debt-to-EBITDA multiples rose from 6.4 to 10.9. In real estate, which accounts for 11 percent of outstanding commercial bank debt, net debt-to-EBITDA multiples rose from 5.8 to 8.0.[29] While higher net debt-to-EBITDA multiples are more common in real estate, 26 percent of companies in our sample have multiples of more than 10, placing them in a high-risk category (Exhibit 15).

The second asset-side risk—exposure to the shadow-banking sector—is more difficult to assess. Shadow banking takes place largely outside the traditional banking system, usually involving loans or investments by non-bank entities. While shadow-banking activities do not appear on bank balance sheets, banks have significant links to the shadow-banking sector, arising from the role that commercial banks play in the intermediation of shadow-banking products. These links expose commercial banks to losses if shadow banks' investment products fail.

Assets in the shadow-banking sector have grown to an estimated 45 trillion renminbi ($6.6 trillion), or about 22 percent of total outstanding credit, up from 17.5 trillion renminbi ($2.7 trillion) in 2010. Shadow-bank financing has been a vital source of funding for companies and sectors that do not qualify for traditional bank financing or companies that have exceeded their bank lending. Banks raise funds for shadow-banking activities by tapping networks of bank customers, including retail and corporate clients, offering them participation in investment structures that yield higher returns than traditional savings accounts (5 to 10 percent compared with 2 to 3 percent). These vehicles, known as wealth-management products or trust loans, then fund projects or companies with loans or equity participation.

We estimate that banks are responsible for the intermediation of approximately 60 percent of shadow-bank products. About half those products are wealth-management funds, which are generally sold to small investors who are bank customers. In the case of failure, these investors would seek repayment from the banks that sold them these products. Therefore, we calculate that commercial banks could be liable for about 30 percent of losses in shadow banking.[30]

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[28] The seven sectors are mining, manufacturing, utilities, construction, wholesale and retail, transportation and warehousing, and real estate.

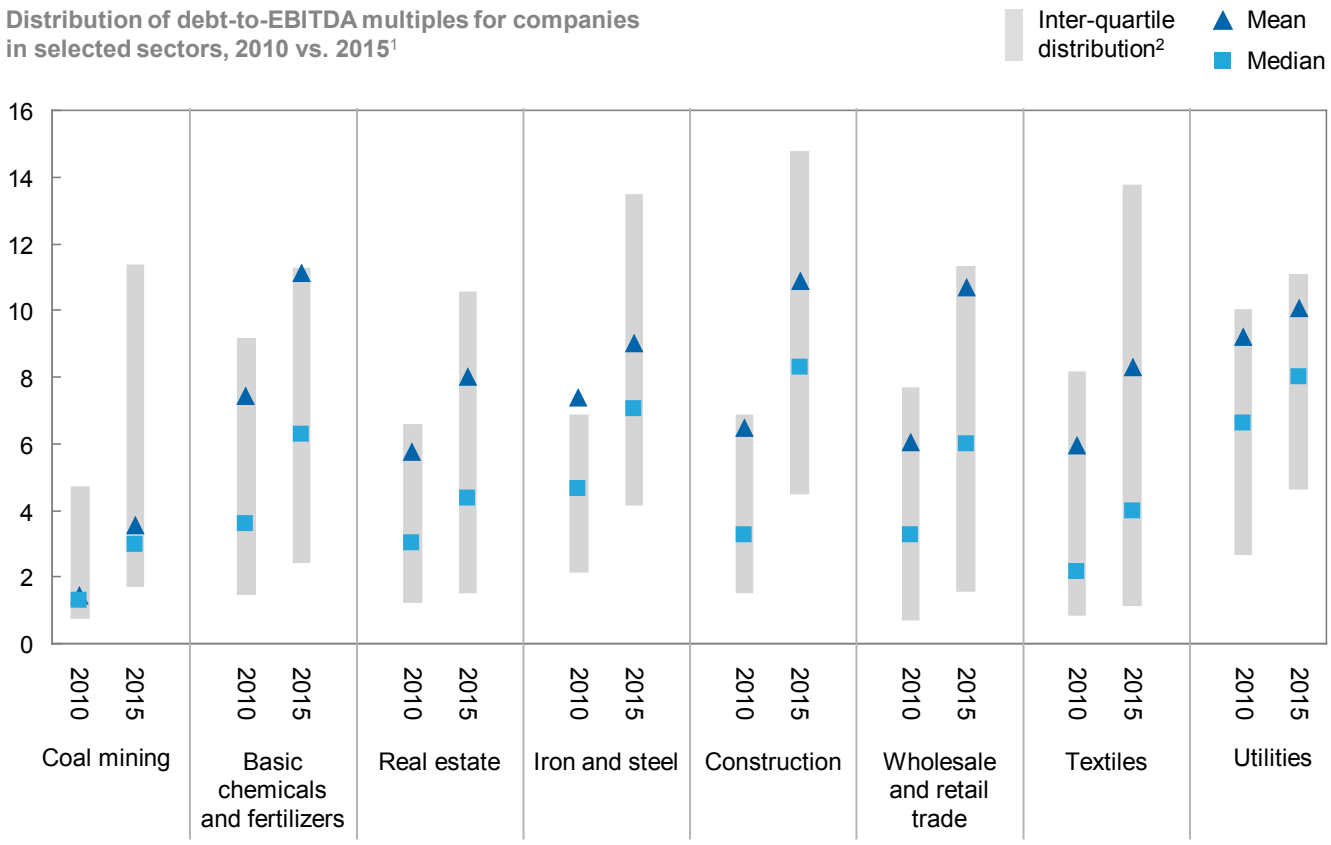
[29] In the real estate sector, net debt is used instead of total debt to account for how pre-sales are conducted in China.

[30] Based on a review of individual shadow-banking products by type (such as wealth management, trusts, peer-to-peer lending, and bankers' acceptances), we conclude that half of bank-intermediated products are wealth-management products.

Exhibit 15

Solvency risks are rising across sectors

Distribution of debt-to-EBITDA multiples for companies in selected sectors, 2010 vs. 2015[1]



1 Debt-to-EBITDA multiple = total debt/earnings before interest, tax, amortization and depreciation. EBITDA multiples in conjunction with other solvency ratios such as interest coverage and debt-to-equity are common measures to assess a company's ability to meet its debt obligations. For real estate, net-debt to EBITDA is used to account for the upfront revenue booking of pre-sales.
2 Inter-quartile distribution represents performance of the firms between the 25th percentile and 75th percentile.

SOURCE: McKinsey Corporate Performance Analysis Tool; Fitch Ratings; McKinsey Global Institute analysis

How risky is shadow banking? There are little performance data or risk disclosure in shadow banking, which makes it difficult to assess the underlying risk. However, we do know that the majority of shadow-bank funding is concentrated in high-risk sectors such as mining, metals, and real estate, which are under mounting stress from slowing growth and overcapacity. In addition to credit risk, shadow banking has higher liquidity risk than traditional lending, due to duration mismatches that create rollover risks.[31] For example, some 90 percent of wealth-management products have maturities of less than one year, while the borrowers use the lending to fund projects that are typically for 24 months or longer. In addition, new batches of wealth-management products and trust loans are sometimes issued to the same borrowers to support ongoing projects. The inability to secure the next round of financing by these borrowers could lead to defaults (Exhibit 16).

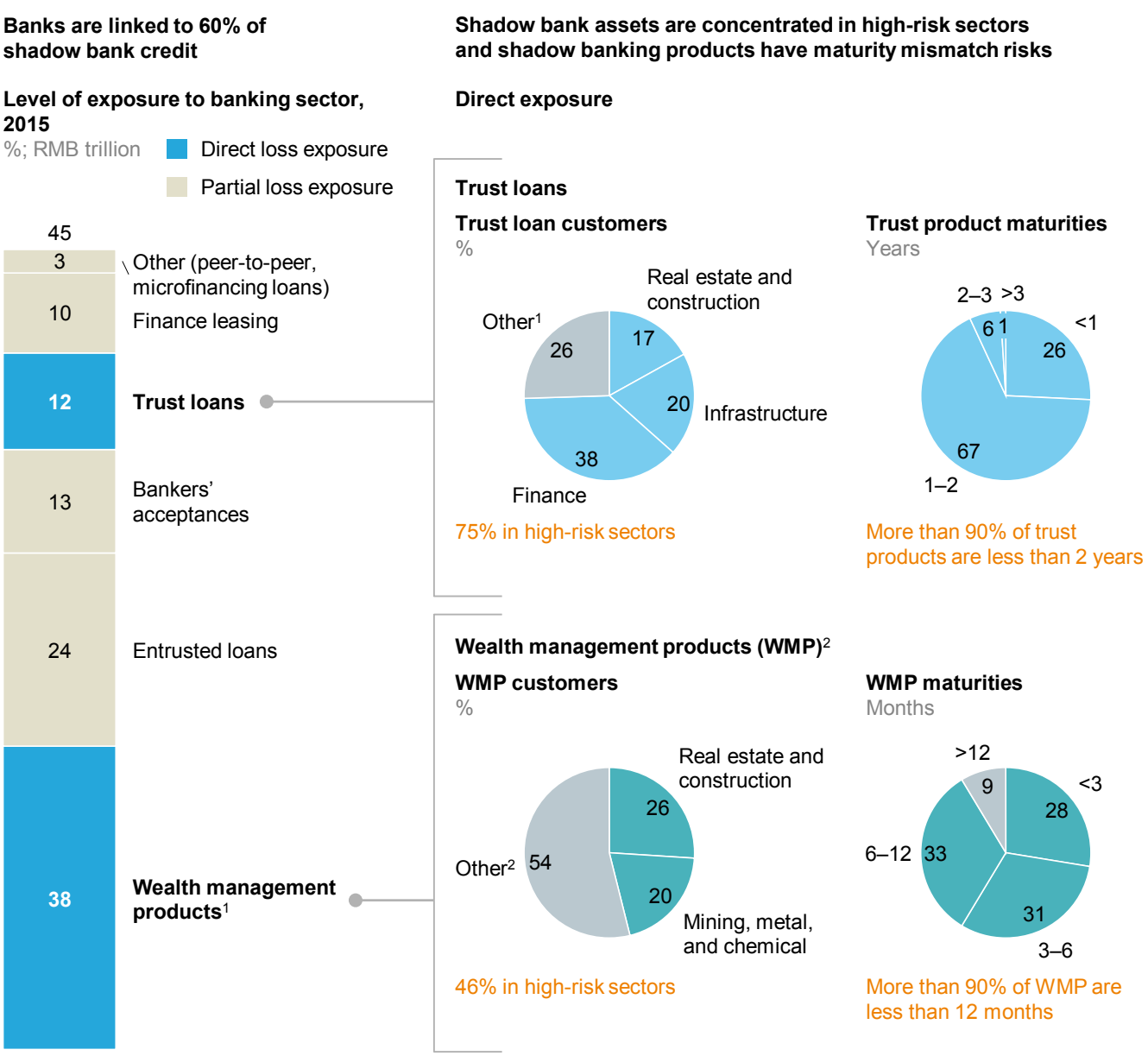
There have already been several high-profile failures of wealth-management products in the past two years because borrowers were unable to make payments. In several cases, angry investors staged public protests, demanding payment from banks. Eventually, unidentified white knights (believed to be government-associated entities or banks, or both) stepped in and paid investors back. In April 2016, an estimated $24.3 billion (160 billion renminbi) had not been paid to 1.6 million investors in wealth-management products over the previous

[31] For more detail on China's shadow banking, see Andrew Sheng and Ng Chow Soon, *Shadow banking in China: An opportunity for financial reform*, Wiley, 2016.

12 months.[32] Should more defaults occur and more investors go unpaid, this could lead to mass redemptions—a run on shadow-banking investments. In turn, that could lead to a liquidity crunch for companies that depend on shadow-bank funding, continuous rollovers, further escalating defaults, and spillover effects in the banking system—as well as more liabilities for banks that sold wealth-management products.

Exhibit 16

How banks are exposed to risks in the shadow banking sector



1 Bank non-guarantee product.
2 Including manufacturing, retail and wholesale, utility, service, health care, transportation, agriculture.
NOTE: Numbers may not sum due to rounding.

SOURCE: People's Bank of China; National Audit Office; China Trustee Association; McKinsey Global Institute analysis

[32] Chuin-Wei Yap, "China's new security challenge: Angry mom-and-pop investors," *Wall Street Journal*, April 12, 2016.

To quantify the credit risk to banks from on-balance sheet lending and shadow-banking activities, we estimated potential credit losses under different stress scenarios. We quantified credit risk using our performance-evaluation data on 2,300 companies and assumed that performance (as measured by metrics such as debt-to-EBITDA ratios) is a proxy for the credit quality of the underlying borrowers. We projected sector performance estimates using the data from our sample companies. To quantify the potential liabilities from shadow-banking activities, we assumed that credit quality of shadow-bank borrowers is one to two notches below that of similar companies that borrow in the banking system.

2015 NPL ratio might be

7%

vs. 1.7% official figure

Based on this analysis, we conclude that the non-performing loans ratio in 2015 in the banking system may be about 7 percent (far higher than the official 1.7 percent estimate by the China Banking Regulatory Commission), and the potential loan losses to banks from reported non-performing loans and corporate lending would add up to about 2.3 trillion renminbi ($350 billion) if all non-performing loans were to fail (based on a 7 percent non-performing loan ratio) and assuming recovery ratios of 20 percent to 40 percent (Exhibit 17). We also estimate that bank exposure to failures in the shadow-banking sector could amount to 1.6 trillion renminbi ($250 billion), assuming that banks would be responsible for about 30 percent of potential losses. The total gross loss to banks could be 3.9 trillion renminbi ($600 billion). Net of current loan loss reserves, this would be equivalent to about 14 percent of 2015 commercial bank equity.

This base-case stress test illustrates that commercial banks have sufficient capital buffers today to absorb potential loan losses without extreme capital impairment. It should be noted that this is an estimate of the impact on the average bank. Large, well-capitalized banks could easily absorb this implied level of capital impairment, but the impact could be much greater for smaller and medium-sized institutions, especially those with high exposure to shadow banking.

We also stress-tested commercial banks for a hypothetical worst case. This simulates what could happen if no visible progress is made to halt lending to increasingly risky borrowers (through both official lending channels and shadow banking) and corporate performance continues to deteriorate in tandem with slowing growth. In this case, we estimate that the average ratio of non-performing loans could rise to 15 percent in three years. This would have far greater impact, wiping out more than 50 percent of projected commercial bank equity. Smaller banks with little capacity to absorb losses are likely to face significantly higher capital-impairment risk.[33] Such levels of loan losses could require massive recapitalization, as seen in other nations during debt-induced crises. Even in this extreme case, however, we would not anticipate a full banking system collapse, given the capacity of the Chinese government to mount a rescue (see discussion later in this chapter). China managed an even greater recapitalization in the late 1990s. The cumulative cost was 4 trillion renminbi by 2005, which was larger than total commercial bank equity of 2.2 trillion renminbi in 2006.[34]

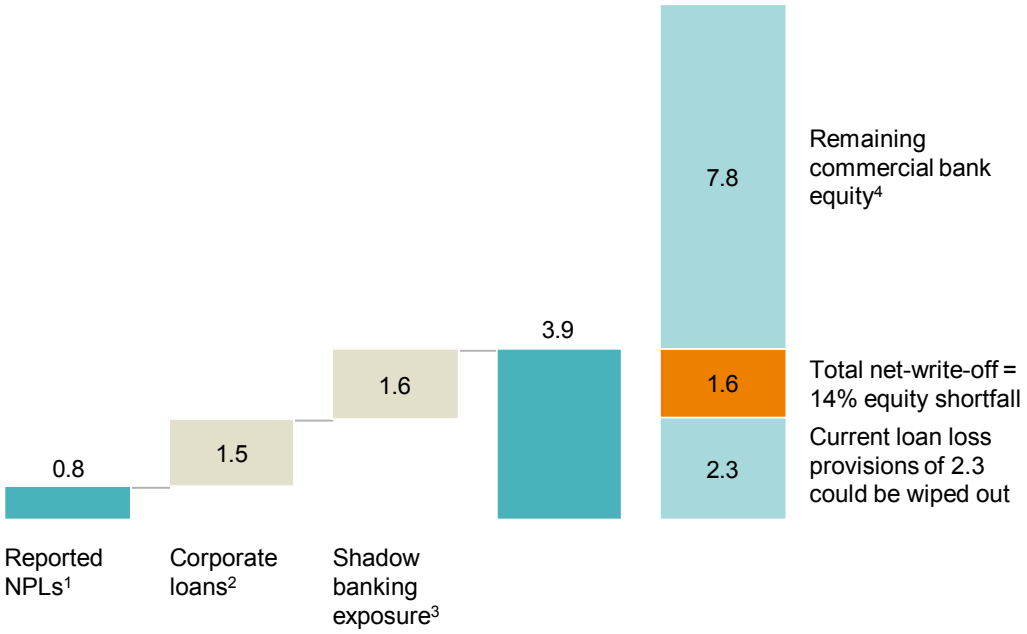
[33] Defined as the risk of impairment to Tier 1 capital adequacy ratio; we assume a minimum threshold of 8.5 to 9.5 percent of risk-weighted assets for systemically important banks.

[34] Guonan Ma, "Sharing China's bank restructuring bill," *China & World Economy*, volume 14, issue 3, May 2006.

Exhibit 17

Based on current outstanding loans and exposure to shadow banking, commercial banks could face losses of up to RMB 3.9 trillion

Asset-quality stress test
Simulated loan write-offs from on-balance sheet and shadow banking activities, 2015
RMB trillion



1 100% default probability and 40% recovery rate.
2 Loan loss estimates where derived through a solvency analysis of 2,300 listed companies.
3 Bank losses from shadow banking activities are measured by estimating the strength of inter-linkage by product type, and assuming that asset quality is one notch lower than on-balance sheet banking assets.
4 Bank equity = total commercial banks assets minus liabilities (for large commercial, joint stock, city commercial, and rural commercial banks) as defined by China Banking Regulatory Commission (CBRC).

SOURCE: CBRC; McKinsey Corporate Performance Analysis Tool; People's Bank of China; China Trustee Association, China financial leasing industry report 2015; McKinsey Global Institute analysis

Liability and equity-side banking risks: Potential loss of deposits and inability to meet capital requirements

China saves **50%** of gross national income compared with 27% in Germany and 18% in the United States

China's high gross savings rate—50 percent of gross national income compared with 27 percent in Germany and 18 percent in the United States—has helped banks build large deposit bases, reducing net debt compared with that of other countries. But some of those deposits could be vulnerable to withdrawals if the economy weakens. Bank equity, which is needed to meet regulatory requirements for a cushion against possible losses, could deteriorate if bank profits and investor confidence decline.

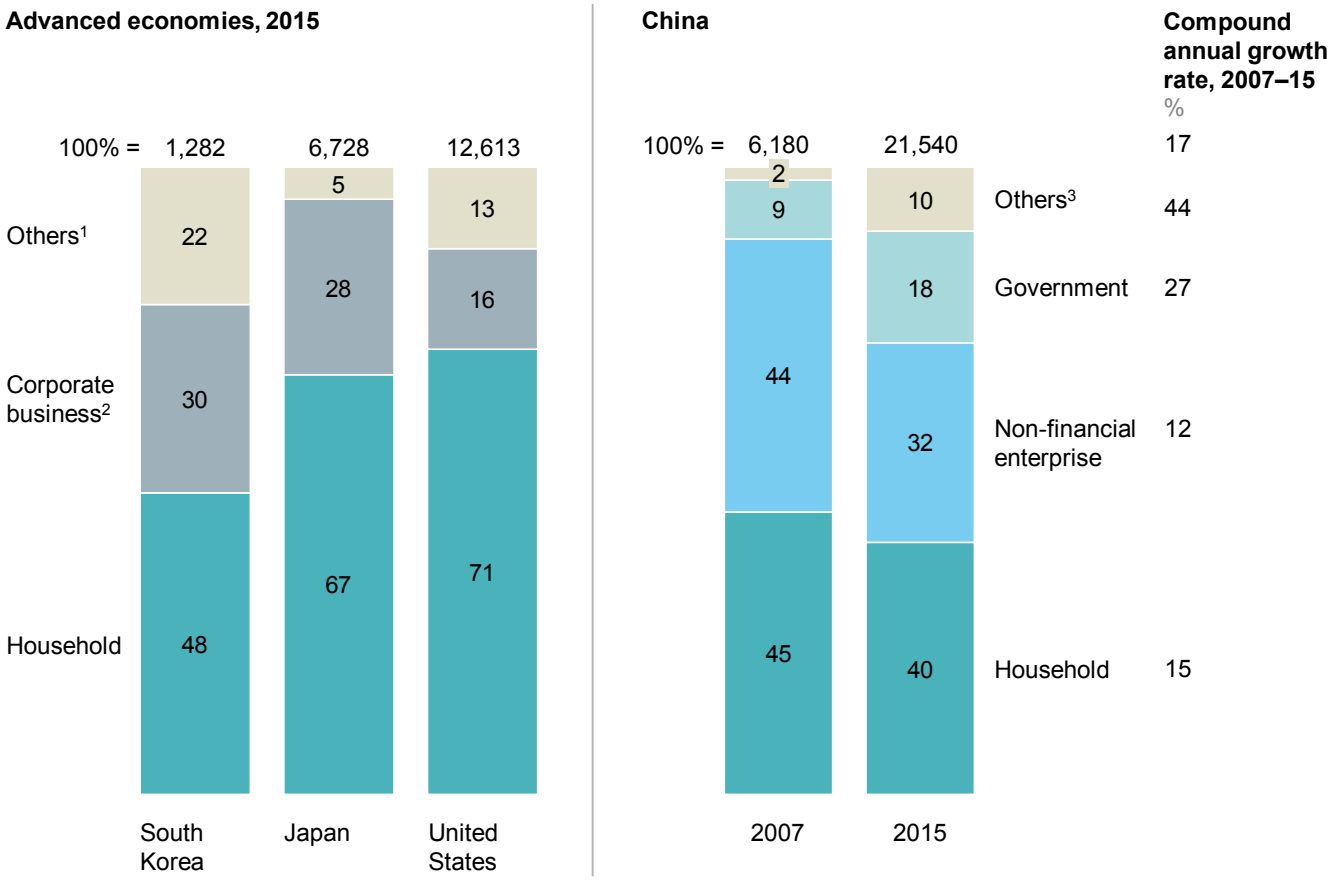
There are two risks to bank deposits: withdrawals by consumers, who may shift assets to more attractive investments or reduce savings to fund consumption, and withdrawals by "other" types of depositors including non-bank financial institutions. In China, households account for only 40 percent of total deposits, compared with about 70 percent in Japan and the United States. The share of deposits from consumers and corporations has declined as other types of deposits have grown (Exhibit 18). The fastest-growing category of deposits since 2007 has been in the "other" category, a sizable portion of which is estimated to be deposits by shadow banks (trust funds and wealth-management companies keep cash in bank accounts to fund routine operations).

The risk of mass withdrawals by households is greatest among the wealthiest 10 percent of the population, who account for about 45 percent of savings. Today, these depositors have limited investment choices, but they appear eager to diversify. For example, a recent survey of individuals with more than 10 million renminbi ($1.3 million) in assets found that wealthy Chinese could double overseas investment from 16 percent of assets to 30 percent over the next ten years.[35] We modeled what would happen if the top 5 percent of urban households decided to transfer the maximum amount year into foreign investments (an individual is allowed to convert up to $50,000 per year per of renminbi into US dollars). We estimate that this could remove about $500 billion from the Chinese banking system in a year, or about 6 percent of total household deposits. Another deposit outflow from households could occur if they had to withdraw savings to weather an economic downturn.

Exhibit 18

In China, non-financial corporations and "other" entities, including shadow banks account for a large share of deposits

Total bank deposits
$ billion



1 Others include government deposits and financial sector deposits for Japan, South Korea, and the United States.
2 Corporate business in United States includes non-financial enterprise and non-corporate business.
3 Others include non-bank financial institutions, overseas deposits, and unspecified category.

SOURCE: People's Bank of China; Bank of Korea; Bank of Japan; US Federal Reserve statistical release; McKinsey Global Institute analysis

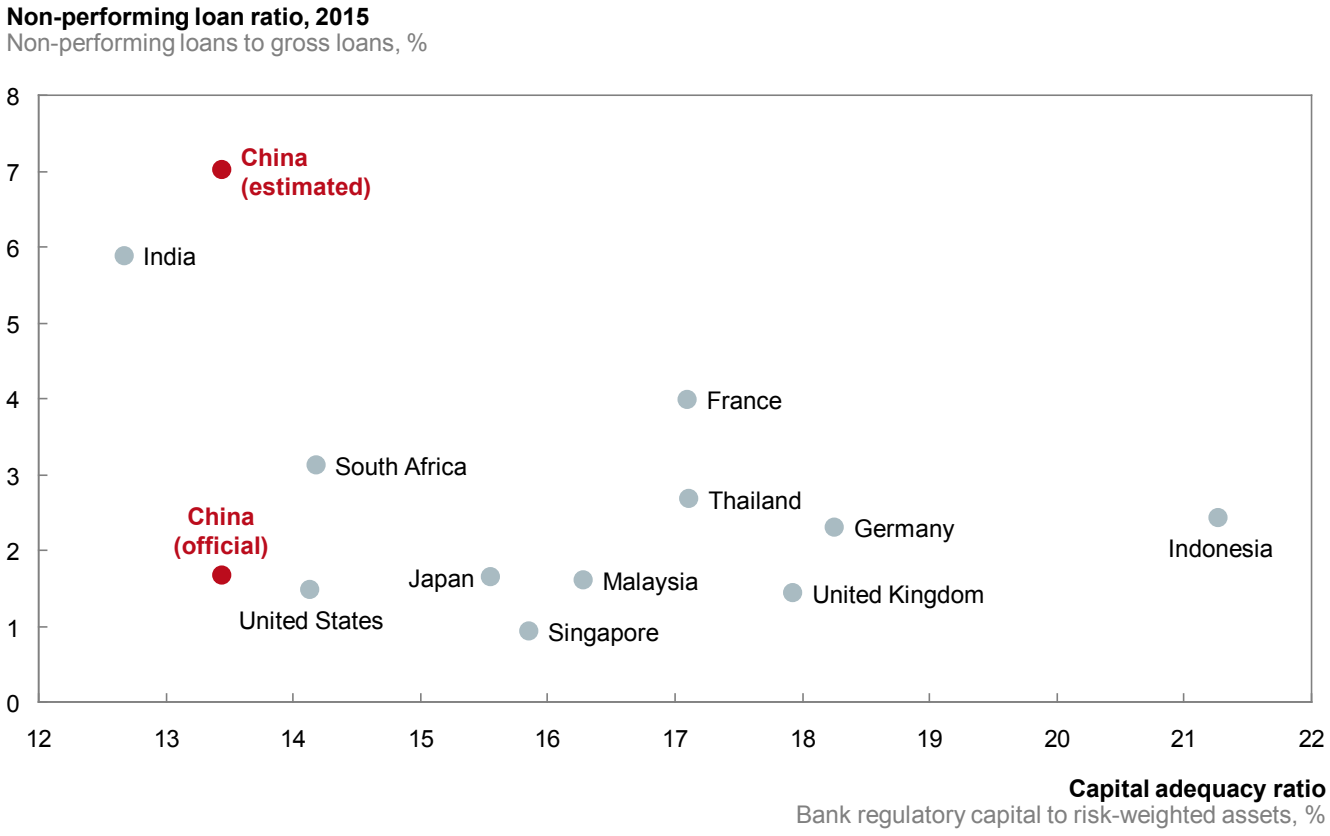
[35] Li Jing, "Wealthy Chinese to invest $463b overseas," *China Daily Europe*, April 1, 2016.

Additionally, there are deposit and other liability links between banks and shadow banks that could be another source of funding stress. Deposits from the "others" category (including non-banking institutions) continues to grow rapidly, accounting for 10 percent of total deposits in 2015, up from just 2 percent in 2007—annual growth of 44 percent. Banks' liability to "other financial institutions" (including non-banking institutions) has been also growing fast at a rate of 29 percent a year since 2010 to reach 15 trillion renminbi ($2.3 trillion) in 2015. Although these numbers are not large enough to be a serious threat to the banking system today, a continuation of this trend would leave banks with an increasingly high exposure to more questionable sources of funds, and the quality of the funding could deteriorate. There would, for instance, be more exposure to short-term liabilities. If and when defaults on shadow banking products occur, this could lead to sudden withdrawals of deposits or redemption of claims by non-banking institutions, and, in turn, be a liquidity challenge to the banking system.[36]

The equity-related risk is a decline in bank capital to below the minimum that regulators deem necessary for banks to absorb losses resulting from loan defaults. Since the global financial crisis, banks around the world have raise their minimum capital thresholds to meet capital-adequacy ratios outlined by the international Basel III accords that the China Banking Regulatory Commission is gradually implementing. China's banks currently have capital adequacy ratios of about 12 percent—above the Basel III requirement, but lower than in advanced economies (Exhibit 19).

Exhibit 19

In China, banks have lower capital adequacy ratios than in other countries



SOURCE: International Monetary Fund; McKinsey Global Institute analysis

[36] Jonathan Anderson, *How high debt can go*, Emerging Advisors Group, March 29, 2016.

The capital cushion that China's banks have today would be sufficient to absorb defaults on official estimates of the share of non-performing loans—1.7 percent in 2015. However, as noted, we estimate that the average non-performing loan ratio for commercial banks could already be around 7 percent based on our assessment of 2015 lending data.[37] Even without the type of losses that we describe in our stress tests, maintaining bank capital could become more challenging. Banks build equity through retained earnings, which acts as a first line of defense against loan losses. If profitability in the banking sector declines, those loss buffers would come under pressure. Such a decline, as a result of financial-sector liberalization, is widely expected. Chinese bank stocks currently trade at 60 to 80 percent of book value (compared with 150 to 170 percent for the top 20 US banks in 2015), implying that investors are factoring in the possibility of declining profitability.

Although these numbers are not large enough to be a serious threat to the banking system today, a continuation of this trend would leave banks with an increasingly high exposure to more questionable sources of funds, and the quality of the funding could deteriorate.

China needs to prevent an unsustainable rise in debt, but on balance could manage such a situation

While we assess four potential risks to China's banks, we do not estimate probabilities that any or all will materialize. However, we do consider a possible series of events that would involve all four triggers. Although we believe that such as case is unlikely, we think that China's government could successfully recapitalize banks and restructure the economy. However, economic growth would slow sharply given what would likely be a lengthy recovery phase and a waning of confidence among investors and consumers.

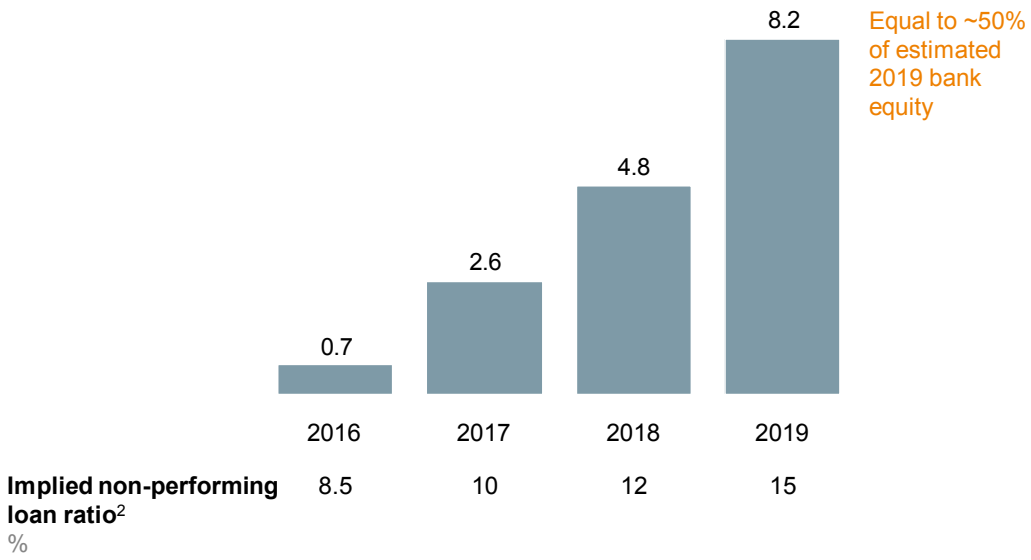
How could the risks we identify materialize? Consider a potential scenario in which economic headwinds continued to erode corporate performance, creating more distressed debt in the formal banking system and reducing the bank profits needed to maintain adequate equity cushions. In this environment, profits for the types of companies and sectors that rely on shadow banking would suffer even more, likely leading to more defaults on shadow-banking products. This could signal to investors that it is time to get out of shadow-banking products, which could cause a liquidity crunch for companies that need to roll over shadow-bank loans. With a surge of defaults on shadow-banking products, contagion would spread to the banking sector as investors looked to them to fulfill the perceived implicit guarantees that arise from intermediation of shadow-banking products. Facing economic difficulties, consumers might begin to withdraw their deposits to sustain living expenses. Sudden withdrawals of deposits or the redemption of liabilities from non-banking institutions could also follow, further undermining bank stability. As investors lost confidence, banks might find it much more costly to raise capital. In this scenario, all four potential risks would materialize, creating a challenging situation for the banks.

[37] For further detail on non-performing loans, see "Credit sleuths in China uncover bad debt dwarfing official 1.5%," Bloomberg News, October 29, 2015; Katherine Lei, Stephen Tsui, and Joy Wu, *China banks: The roadmap out of the credit cycle, part I: Quantifying NPLs and capital needs*, J. P. Morgan Chase, February 2016; Francis Cheung, Bad debt epidemic: NPLs reaching crisis level, CLSA, May 4, 2016; and Wei Hou, China banks: NPL trend in 2H 2015, Bernstein Research, April 29, 2016.

We think that the likelihood of this scenario unfolding it is low, but have nevertheless calculated the very high cost of letting the volume of non-performing loans to grow. In our stress test, we estimated that the potential cost of recapitalizing commercial banks in 2016 could be at about 500 billion renminbi ($77 billion). That figure could soar to about 8.2 trillion renminbi ($1.3 trillion) in 2019 if no visible progress was made to redirect capital from risky companies toward more productive businesses.[38] Non-performing loan ratios could grow to 15 percent, implying recapitalization costs equivalent to 12 percent of current GDP. We estimate that every year of delay would raise the ratio of non-performing loan by 2 to 3 percentage points and add 2 trillion renminbi to 3 trillion renminbi ($310 billion to $460 billion) in potential recapitalization costs (Exhibit 20).

Exhibit 20

If no visible progress is made to reduce risky lending and rebalance bank assets, the potential cost of recapitalizing banks could grow to RMB 8.2 trillion



1 Assumptions for recapitalization quantification: minimum of 8.5–9.5% of risk-weighted (RWA) to equity threshold; single year write-off.
2 Includes NPLs from both on-balance sheet lending and shadow banking activities.

SOURCE: CBRC; McKinsey Global Institute analysis

In reality, government would likely step in before all these forces created the perfect storm. Government would provide capital and liquidity to banks that were the most likely to continue to avoid recognizing bad debt on their books. The government can increase capital controls to prevent deposits flowing overseas. Even in the event of delayed measures to restore health to the banking system and therefore higher recapitalization costs, China has enough capacity to facilitate and support such a rescue. Because most large banks are state-controlled, authorities can direct larger and better capitalized banks to bail out smaller and more vulnerable institutions. Government can also raise more debt. Current government debt is about 50 percent of GDP, compared with 80 to 90 percent in Germany and the United States and 240 percent in Japan. Raising this to 65 percent would generate more than 10 trillion renminbi ($1.5 trillion renminbi), enough to cover the 8.2 trillion renminbi ($1.3 trillion) recapitalization in our extreme scenario. As of April 2016, China's government

[38] This is based on projected bank profitability and estimated losses from distressed loans in the formal banking system and exposure to the shadow banking activities.

was managing 123 trillion renminbi ($18.9 trillion) of assets as of April 2016, according to China's Ministry of Finance. Securing additional financing on the basis of these assets could help generate additional funds. The government also controls land resources that have generated about 3.5 trillion renminbi ($540 billion) in revenue every year since 2010. China also has accumulated $3.2 trillion of foreign reserves that could be used selectively if necessary.

While the government has the means to head off a banking collapse, it might not be able to avoid a potentially severe economic downturn in case of an extreme scenario arising from a lengthy recapitalization process that undermines consumer and investor confidence. It has taken other economies three to seven years to recover from debt-induced recessions. During China's reform in the late 1990s, the government spent about 4 trillion renminbi ($480 billion) to clean up bank balance sheets over seven years, equivalent to about 45 percent of 1999 GDP.[39] Today's leaders need to be prepared for the worst and be willing to act at the first sign of serious trouble. As the US subprime mortgage crisis showed, events can unfold rapidly, but policy interventions tend to evolve slowly.

Even in the event of delayed measures to restore health to the banking system and therefore higher recapitalization costs, China has enough capacity to facilitate and support such a rescue.

A productivity-led model can generate additional GDP and income of more than $5 trillion

China's economy is running into constraints and risks are rising. It is clear that the investment-led model is no longer working as well as it did, and that China needs to move into a new chapter of its growth story—one centered on boosting productivity. The imperative to make this transition is relatively urgent given the strains that have appeared in China's economy. For more than a decade, policy makers have talked about the need to restructure state-dominated industries and to reform the financial sector, but in some cases progress has been slow as preserving near-term growth and stability in employment has been the first priority. However, the cost of delaying taking action will continue to rise.

Under the investment-led approach, market forces have not been permitted to work effectively to push out weak players and channel investment to the companies with the greatest potential to grow, generate healthy returns, and create jobs. The result has been a large number of companies in many industries with very low rates of return, which brings down the average profitability of these industries. The presence of these weak firms can also affect profits of other players, since weak firms may compete in ways that further undermine profitability for all players. In other advanced economies, there may also be long tails, but the companies tend to be smaller and go out of business due to market competition and bankruptcy processes.

Moving quickly to a productivity-led model would offer substantial economic benefits to China in the form of higher GDP and higher incomes, as well as reduce current risks. A sharp focus on raising labor and capital productivity would help to address immediate threats to the economy including overcapacity and excessive debt, and could shift energy and investment to productive sectors and enterprises. The profitability of sectors could rise

[39] Guonan Ma, "Sharing China's bank restructuring bill," *China & World Economy*, volume 14, issue 3, May 2006.

if poorly performing companies were restructured, and market-based capital allocation was to diversify sources of economic profit.

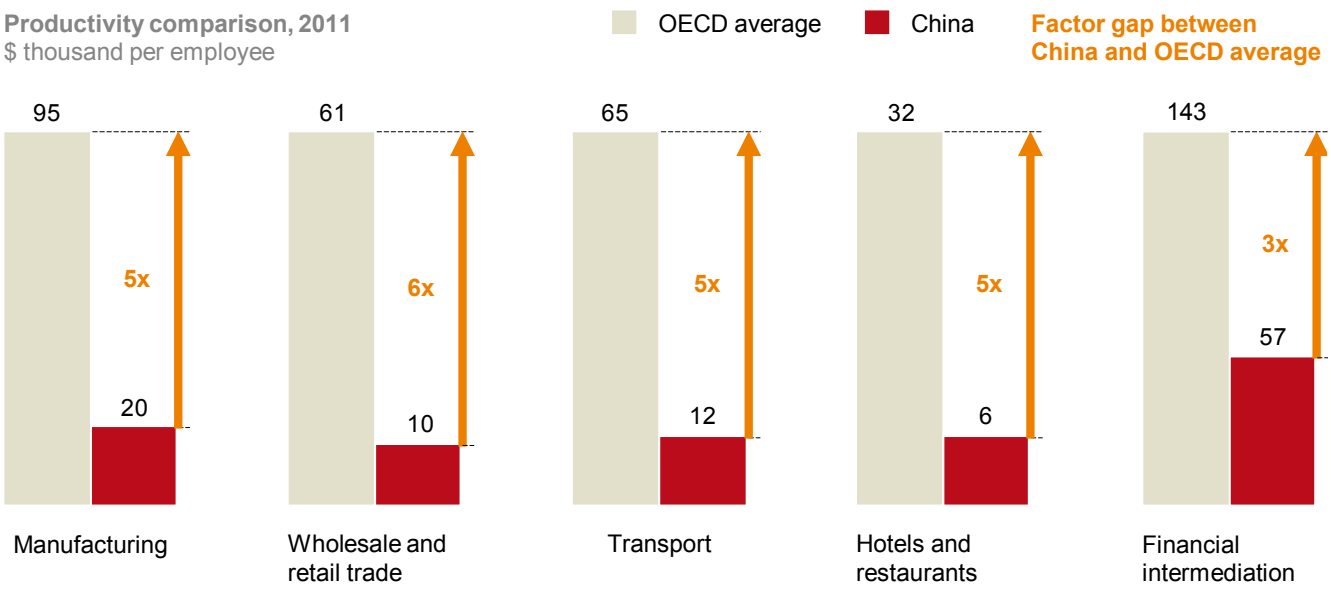
The transition necessary to achieve these benefits will not be easy. Sectors suffering from overcapacity will need to be rationalized. As unproductive businesses are allowed to fail, many millions of workers would need to be redeployed. But we also believe that China is capable of rising to the occasion. The nation faced a similar challenge when SOEs were failing in the 1990s, and the government summoned the resolve and resources to restructure poorly performing industries and implement reforms that led to a decade of 10 percent annual GDP growth.

The opportunity is to unleash firm level productivity

China is ripe for a productivity revolution. Across services and manufacturing, the labor productivity of Chinese companies is just 15 to 30 percent of the productivity of similar industries in OECD countries (Exhibit 21).

Exhibit 21

China's labor productivity is approximately 15 to 30 percent of the average in OECD countries



NOTE: Not to scale.

SOURCE: IHS Global Insights; National Bureau of Statistics, China; World Input-Output Database; McKinsey Global Institute analysis

The biggest potential to improve economy-wide productivity is through improvements in the performance of firms. The mix of industries in China depresses relative returns, but only to a small degree. Today China generates more GDP in low-return sectors such as resources than most advanced economies do, but we find that three-quarters of the difference in returns between China and the United States relates to the performance of individual firms. Without changing the sector mix, if Chinese firms could match the average return on equity of US firms, this would raise the economy-wide return on invested capital by 2.4 percentage points, or almost to the 10 percent average last seen in China in 2004.

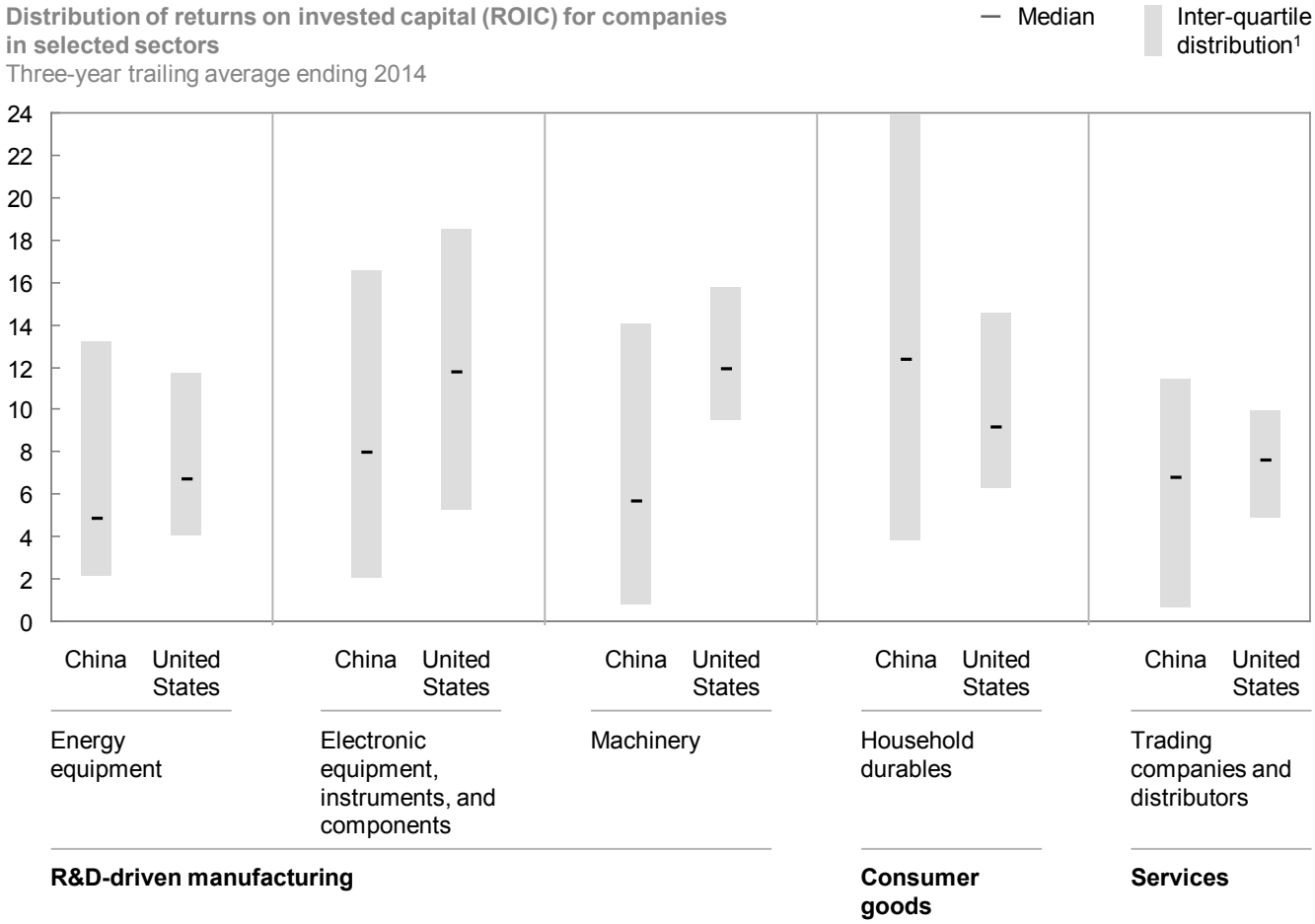
Although returns for top performers are often as good as or better than those of top US firms, the weakest Chinese firms perform substantially worse than the weakest firms in the United States in some sectors

Although returns for top performers are often as good as or better than those of top US firms, the weakest Chinese firms perform substantially worse than the weakest firms in the United States in some sectors (Exhibit 22).

Exhibit 22

Even in industries with low returns, top Chinese companies perform as well as, or better than, US firms

Distribution of returns on invested capital (ROIC) for companies in selected sectors
Three-year trailing average ending 2014



1 Inter-quartile distribution represents performance of the firms between the 25th percentile and 75th percentile of ROIC performance.

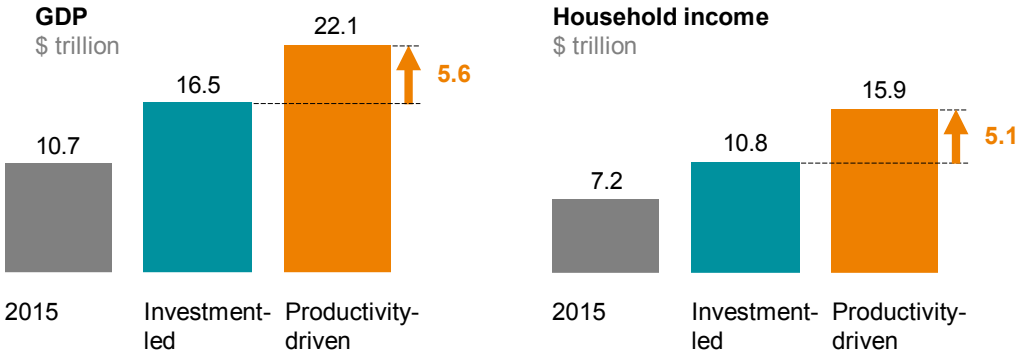
SOURCE: McKinsey Corporate Performance Analysis Tool; McKinsey Global Institute analysis

By unleashing the power of productivity and allowing top performing firms to drive the economy, in effect transitioning from investment to productivity-led growth, we estimate that China could generate GDP growth of 5 percent per year from 2015 to 2030, compared with 2.9 percent with the current investment-led model. By 2030, that would add up to $5.6 trillion more in GDP (36 trillion renminbi) than is likely under the investment-led approach. This could lift total household income from $7.2 trillion today (47 trillion renminbi) to $15.9 trillion (in current dollars) by 2030 (103 trillion renminbi), or by 5.4 percent per year—about $5.1 trillion (33 trillion renminbi) more than the current investment-led growth model is likely to deliver. We estimate that under the investment-led model, incomes would rise by just 2.8 percent per year (Exhibit 23).

Exhibit 23

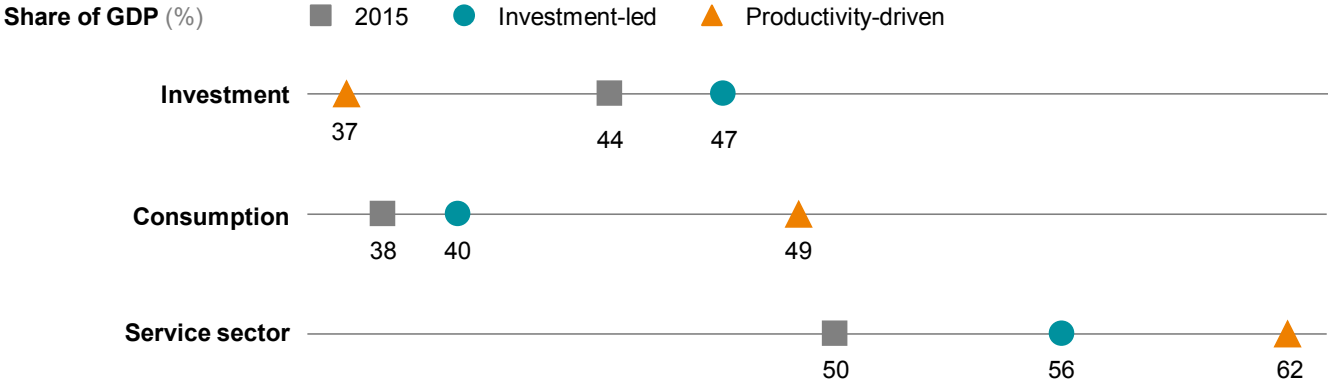
A productivity-driven approach can add $5 trillion each to GDP and household income by 2030 compared with the investment-led growth model

Economic scale



15-year compound annual growth rate (%)					
	9.6	2.9	5.0	10.0	2.8	5.4

Economic makeup



SOURCE: McKinsey Global Institute analysis

Rising productivity can lead to higher incomes, which is critical for China's continued transition toward becoming a modern consumption-based economy. We estimate that rising wages can help China's middle and affluent class (urban household annual disposable income above $21,000) from about 116 million today to 315 million in 2030. The increased spending power of these households would spur consumption and diversify sources of economic growth, helping China withstand downturns in export markets. With a productivity-led approach, economic growth would be driven by rising consumption and an expanding service sector, rather than by rising investment in infrastructure and industrial capacity. We estimate that the consumption share of GDP could rise from 38 percent in

2015 to 49 percent by 2030. The service sector could grow from 50 percent of GDP in 2015 to 62 percent in 2030.

The focus on productivity would also help guide restructuring and reforms to enhance capital productivity, reduce debt, and lower the odds of a potential financial crisis. Under the productivity-led approach, China would increasingly reallocate capital to where it can be more productive—breaking the long pattern of over-investment in capital-intensive enterprises that are regarded as reliable sources of GDP growth, but that now suffer from overcapacity and low productivity, decimating returns. By restructuring industries with overcapacity and letting the poorest performing companies fail, China can expect the share of companies that meet or exceed current industry averages to rise in many industries. As capital is allocated more productively, the long tail of weak players should become shorter.

We would expect that in a productivity-led model, average returns across industries would rise because the long tail of uncompetitive companies with low returns would shrink. Access to capital would become more difficult for the weakest companies and, if their performance did not improve, eventually they would be acquired or forced into bankruptcy. This process would have to apply to SOEs as well as to private firms. As weak players disappeared, other companies could raise their returns by adopting best practices. The combination should produce higher average ROIC within sectors and contribute to rising returns across the economy. Reducing the long tail will require better enforcement of existing bankruptcy laws as well as further bankruptcy reforms. It will also require investment by healthy firms in automation, process improvements, and in raising the skill levels of employees.

A transition to a productivity-led model will change the sector mix of China's economy

If the Chinese economy transitions from investment-led to productivity-led growth, China will continue its evolution towards being an advanced economy. China's industry mix will shift and the relative contributions to GDP, employment, and productivity of the six archetypes will change (Exhibit 24). Agriculture, whose share of GDP has fallen by 50 percent since 2000, could decline to 4 percent of the economy in 2030, which would be closer to the 1 to 2 percent of GDP in advanced economies. Capital-intensive commodities and infrastructure, long the growth drivers of the economy, could shrink from 14 percent and 9 percent of GDP, respectively, to 8 percent and 5 percent in 2030. Sectors that would grow as a share of China's GDP include services (from 50 percent in 2015 to 62 percent in 2030) and R&D-driven manufacturing (from 11 percent of GDP in 2015 to 12 percent in 2030). In services, we expect faster growth in non-financial services, with the financial services share of GDP remaining stable, and perhaps even shrinking.

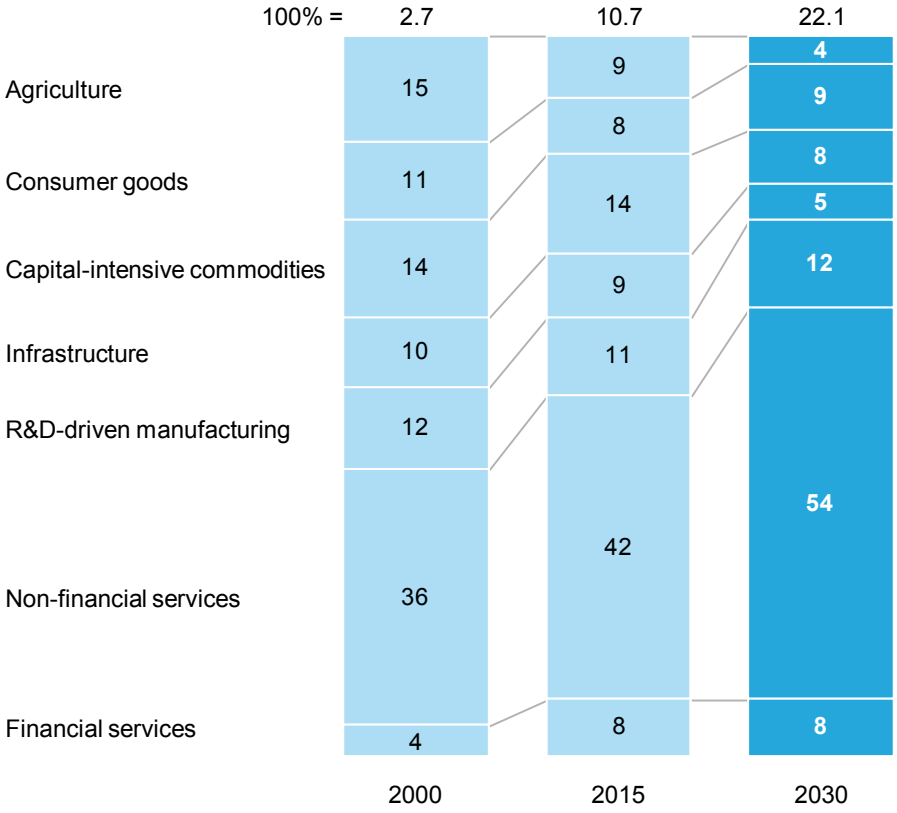
More than **200M** workers might need to be shifted into other sectors by 2030

As the structure of GDP shifts, so will the structure of employment. Agriculture, commodities, and infrastructure will shed jobs, while employment will grow in services, and consumer goods. We estimate that more than 200 million workers might need to be shifted into other sectors as the economy transitions and urbanization continues to 2030. We would expect farmers, steelworkers, and construction laborers to account for the vast majority of displaced workers. The service sector would provide the most opportunities to employ such workers; based on projected growth, service-sector employment could rise from 320 million in 2015 to 500 million by 2030.

Exhibit 24

Under the productivity-led growth model, there will be more services and less agriculture, commodities and infrastructure in China's sector mix

GDP value added composition by archetype, 2015
%; $ billion



NOTE: Numbers may not sum due to rounding.

SOURCE: McKinsey Global Institute analysis

•••

A shift to a productivity-led model would have enormous benefits in China, reshaping the economy so that it can achieve sustained growth and accelerating progress toward full-fledged advanced economy status. The question is what, specifically, that shift entails. In the next chapter, we discuss five opportunities to boost productivity that together would be more than sufficient to counteract the cost of broad economic restructuring of China's economy, and show the power of productivity to drive economic growth.


© Indeed/Getty Images

2. FIVE OPPORTUNITIES CAN DELIVER HIGHER PRODUCTIVITY

The case for finally moving decisively beyond the old investment-led growth model is clear and increasingly urgent, and the benefits of a productivity-focused growth model compelling. The question is how to proceed. We have used our archetype analysis of China's economy to analyze five opportunities that could raise productivity across sectors—and be sufficient to offset the inevitable costs of restructuring.

The potential for additional productivity growth varies by archetype (Exhibit 25). The largest potential gains in productivity—about 8 percent growth per year through 2030—could be in R&D-driven manufacturing, assuming that companies can innovate, climb up the value chain, and move into new global markets. Productivity in agriculture could rise by about 7 percent per year in the next 15 years through mechanization and land reform, which would create larger and more efficient farms. Productivity growth in capital-intensive commodities and infrastructure would be modest—perhaps 5 percent per year—because growth in these traditional sectors may be slowing. Gains in labor productivity in the non-financial service sector may be slow at about 4 percent per year as new employees are shifted into this archetype from other archetypes such as agriculture and capital-intensive commodities. Financial services are projected to grow by just around 1 percent per year—compared with 11.4 in the past 15 years—as further market reforms limit growth of the profit pool in the banking sector.

Exhibit 25

We identify five major opportunities to raise productivity across industry archetypes

● Primary
○ Secondary

Industry archetypes	Labor productivity compound annual growth rate, 2015–30 %	Additional GDP[1] $ trillion	Opportunities: Better serve middle-class consumers	Digitize to enable new business processes	Innovate and move up the value chain	Drive operational transformation	Go global
Agriculture	7	+0.1	○	○	○	●	○
Capital-intensive commodities	6	-0.4		○	○	●	○
Infrastructure	4	-0.3		○	○	●	●
R&D-driven manufactured goods	8	+1.1	○	●	●	●	●
Consumer goods	5	+0.7	●	●	●	●	●
Non-financial services	4	+4.1	●	●	○	○	○
Financial services	1	+0.3	●	●	○	○	○
Total	**5.2**	**+5.6**					

1 Compared with investment-led growth path by 2030.

SOURCE: McKinsey Global Institute analysis

We estimate that productivity-led growth could produce $5.6 trillion of additional GDP compared with under an investment-led path. Services sector would contribute most of the difference—$4.4 trillion—with an additional $1.1 trillion coming from R&D-driven manufacturing, and a further $0.7 trillion from consumer goods. However, the contribution to GDP of capital-intensive commodities and infrastructure could be lower.

OPPORTUNITY 1: BETTER SERVE MIDDLE-CLASS CONSUMERS

For many years, Chinese policy makers have recognized that the nation's future depends to no small degree on Chinese consumers. As China builds a more resilient and diverse consumption-driven advanced economy, their spending power will continue to increase. We estimate that total Chinese consumption can rise by more than $6 trillion (39 trillion renminbi) between 2015 and 2030, from $4.1 trillion (26 trillion renminbi) per year to $10.8 trillion (70 trillion renminbi), driven by continuing urbanization and rising incomes. It will take more than rising incomes, however, to unleash Chinese consumption. While consumer spending in China grew by more than $1 trillion (6.5 trillion renminbi) from 2010 to 2015, it still makes up a small share of GDP compared with consumption in advanced economies. Consumption has been held back in part by factors such as income inequality and a high household savings rate, a result of limitations in social safety net programs (unemployment insurance, health insurance, and pensions, for example). But consumers also do not spend enough because they cannot find Chinese products that fill their rising expectations. Younger consumers—the post-90 generation—have even higher expectations than the rest. Consumer-facing companies can help unlock this pent-up demand by improving their offerings and targeting consumers more effectively.

China was actually the second-fastest-growing consumer market in the world, in absolute terms, just behind the United States

China has already come a long way in boosting the consumption share of GDP

At first glance, it might seem that China has not made much progress in raising consumption. After all, since 2008, the consumption share of GDP has remained at about 36 percent in real terms. This is still low by the standards of Europe or the United States, where consumption accounts for two-thirds of demand. However, the static share of consumption actually represents additional consumption of $1.1 trillion (7.2 trillion renminbi) from the level in 2010, reflecting the fact that during this period the economy as a whole was still growing in high single digits each year. China was actually the second-fastest-growing consumer market in the world, in absolute terms, just behind the United States (Exhibit 26).

Chinese consumers are also beginning to behave more like those in other countries. If we account for the differences in disposable incomes between China and South Korea, for example, Chinese consumers spend about the same as South Korean consumers on durable goods such as cars and appliances, semi-durable goods such as clothing and footwear, and consumer staples such as soap and toiletries. In services, Chinese consumers still lag behind South Koreans (Exhibit 27).

There are large opportunities to unleash more spending in China. Chinese consumers have demonstrated their desire for higher-quality goods and services, but Chinese companies today are often unable to meet this demand. Addressing structural issues such as reducing income inequality to increase aggregate demand, and providing a broader social safety net so that households do not have to dedicate so much of their incomes to savings can also boost more consumption.

Exhibit 26

Consumption in China grew by $1.1 trillion from 2010 to 2015, contributing one-quarter of global consumption growth

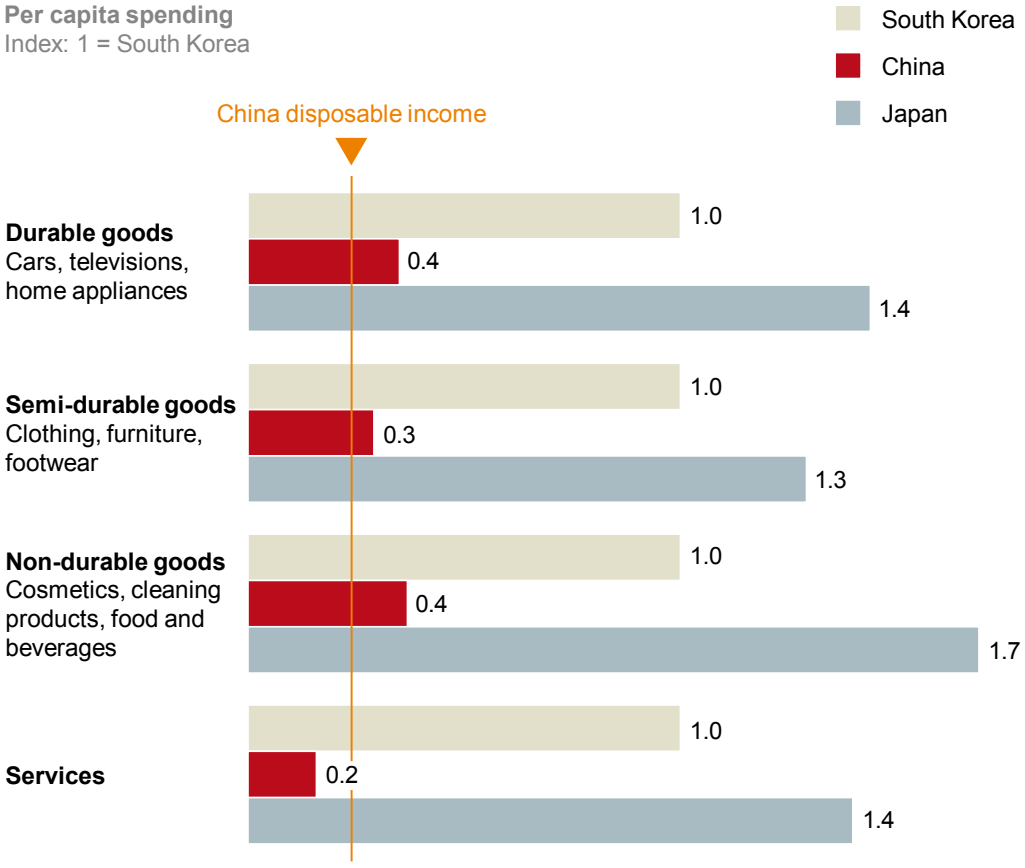
2010–15

Growth in private consumption $ billion, 2010		Consumption compound annual growth rate %	Private consumption growth share of GDP growth %	Share of world consumption growth %
United States	1,194	2	76	25
China	**1,105**	**9**	**40**	**24**
Germany	116	1	42	2
Japan	67	0	40	1
South Korea	61	2	36	1
France	40	1	35	1

SOURCE: IHS; World Bank; National Bureau of Statistics, China; McKinsey Global Institute analysis

Exhibit 27

On an income-adjusted basis, Chinese consumers are buying as much as Japanese and South Korean consumers in some categories



SOURCE: Euromonitor; McKinsey Global Institute analysis

Opportunities can be found in different geographies, demographic groups, and categories

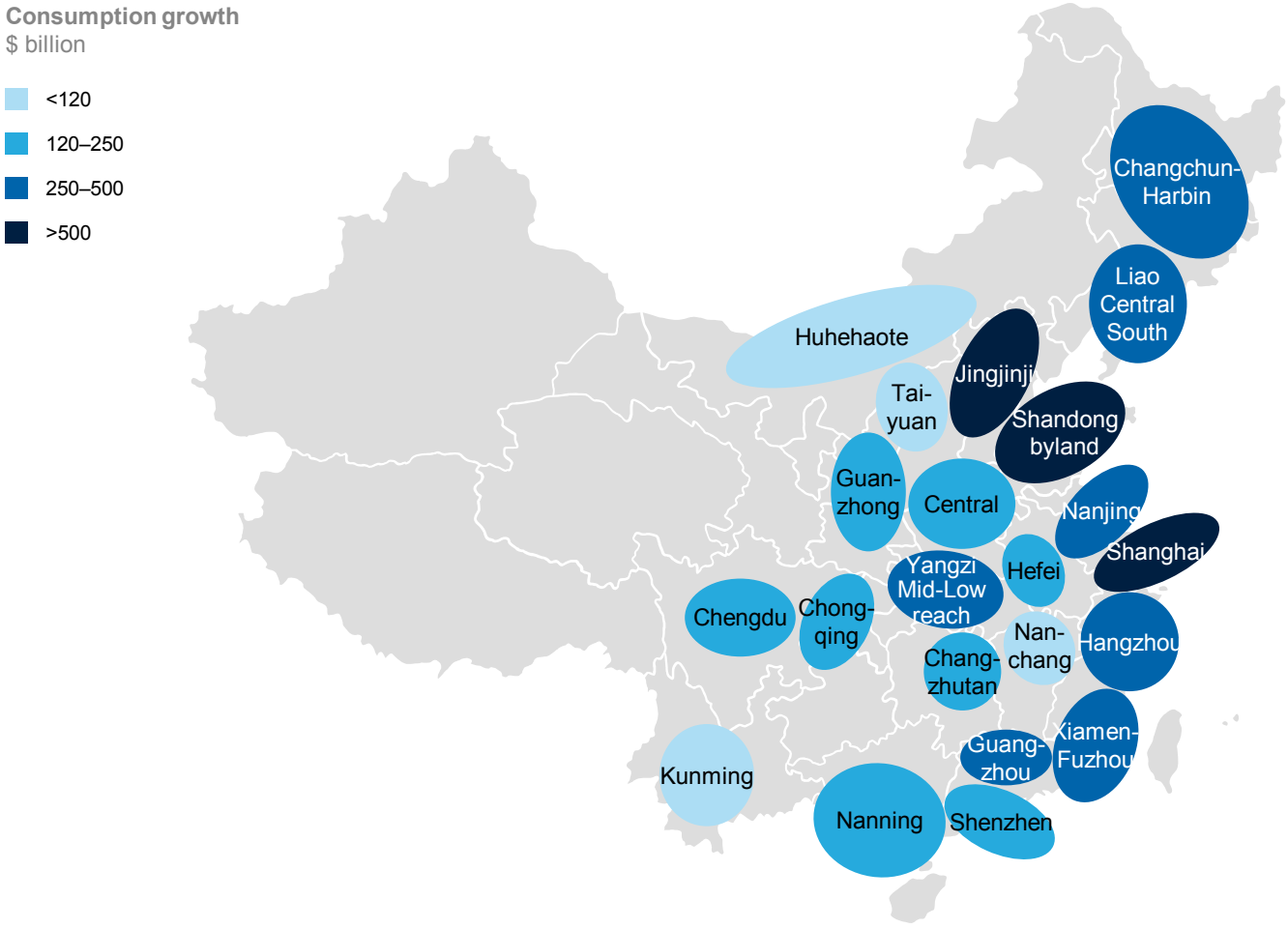
We estimate that consumption could rise by $6.7 trillion by 2030. To capture this opportunity, consumer-facing companies will need to identify the places where sales will take place, the type of people who will be doing the most buying, and the kind of products and services that are most likely to sell. From a geographic perspective, the fastest growth is likely to be in ten large city clusters, including those around Shanghai and Beijing, which will account for about 70 percent of consumption growth. The most attractive demographic group of consumers to capture is likely to be urban workers, particularly those who are young. "Indulgence" goods such as dining and tobacco, and lifestyle products like consumer electronics and travel that enable consumers to trade up will be among the top categories for sales growth.

More than 30 percent of consumption growth will occur in clusters including Beijing, Shanghai, and Shandong in 2015 to 2030

China has 22 major city clusters, of which the most important are those around Beijing (Beijing and the cities around it are also called Jingjinji) and Shanghai, which currently account for 18 percent of China's population and 23 percent of consumption growth. Between 2015 and 2030, some 22 percent of urban population growth is projected to occur in these two city clusters. MGI estimates that these two together with Shandong byland could generate nearly one-third of China's consumption growth, or about $2 trillion to 2030 (Exhibit 28).

Exhibit 28

Consumption is growing fastest in the Jingjinji, Shanghai, and "Shangdong byland" clusters



SOURCE: Insight China; MGI CityScope Database; McKinsey Global Institute analysis

There are also substantial opportunities in other city clusters. Seven of them—Hangzhou, Guangzhou, Changchun-Harbin, Liao Central South, Nanjing, Xiamen-Fuzhou, and Yangzi Mid-Lower reaches—could account for more than $2.3 trillion in consumption growth through 2030. Beyond the largest city clusters, pursuing growth may require further investment in mobile commerce, which should be possible given that the penetration of smartphones and other mobile devices is about 90 percent across all city clusters.[40]

Understanding consumer psychology and shifting consumer attitudes in different demographic groups is vital

As in other economies, in China the consumer market is made up of many segments that have different spending habits and preferences. Not surprisingly, working-age consumers (aged 30 to 59) are the largest source of consumption growth, and are expected to account for 48 percent of additional consumption through 2030. A subset of this cohort, especially the generation born after 1990, could be particularly promising for marketers. These are the consumers who have grown up during the years of China's rapid growth and rising incomes. They know no other China than the affluent urbanized nation of today and have very different attitudes than older consumers. They tend to be less concerned about building up savings and are more willing to spend; indeed, They are also interested in buying goods and services that reflect their status—or the status to which they aspire—and they are very brand-conscious. They also value healthy products and are willing to pay more for safe products.

Unlocking consumption across different geographies and age groups will require companies to take a "micro" view on opportunities. They will need to disregard the old tier-based view, and start to prioritize using a city and city cluster view, marketing to the largest city clusters, then medium-sized ones, and so on, for example. Even within cities and urban clusters, it will be more important than ever for companies to develop deep knowledge of different demographic groups within them, and their buying preferences. Taking a micro view will also help companies make their media spending more effective because China's media is highly localized. The nation has more than 3,000 television channels; in some areas, only around 5 percent the audience watches national television. Newspapers and radio are even more local.[41]

By combining age and location data, we project that about half of consumption growth in the Jingjinji, Shanghai, and Shandong byland city clusters will be driven by 30- to 59-year-olds.

By combining age and location data, we project that about half of consumption growth in the Jingjinji, Shanghai, and Shandong byland city clusters will be driven by 30- to 59-year-olds. (Exhibit 29). Marketers also will need to know the differences between demographic groups across city clusters, as well as within clusters. This will require microlevel local consumer data. Footwear and apparel maker Nike, for instance, has invested in a micromarketing strategy in China that divides cities into different zones and tailors store formats accordingly. For its own stores and for its retailers, Nike maps key commercial trade zones within cities and neighborhoods based on population, macroeconomic data, and consumer demographics. Shanghai, for example, has 90 trade zones, according to Nike's

[40] *2016 China consumer report: The modernization of the Chinese consumer*, McKinsey & Company, March 2016.

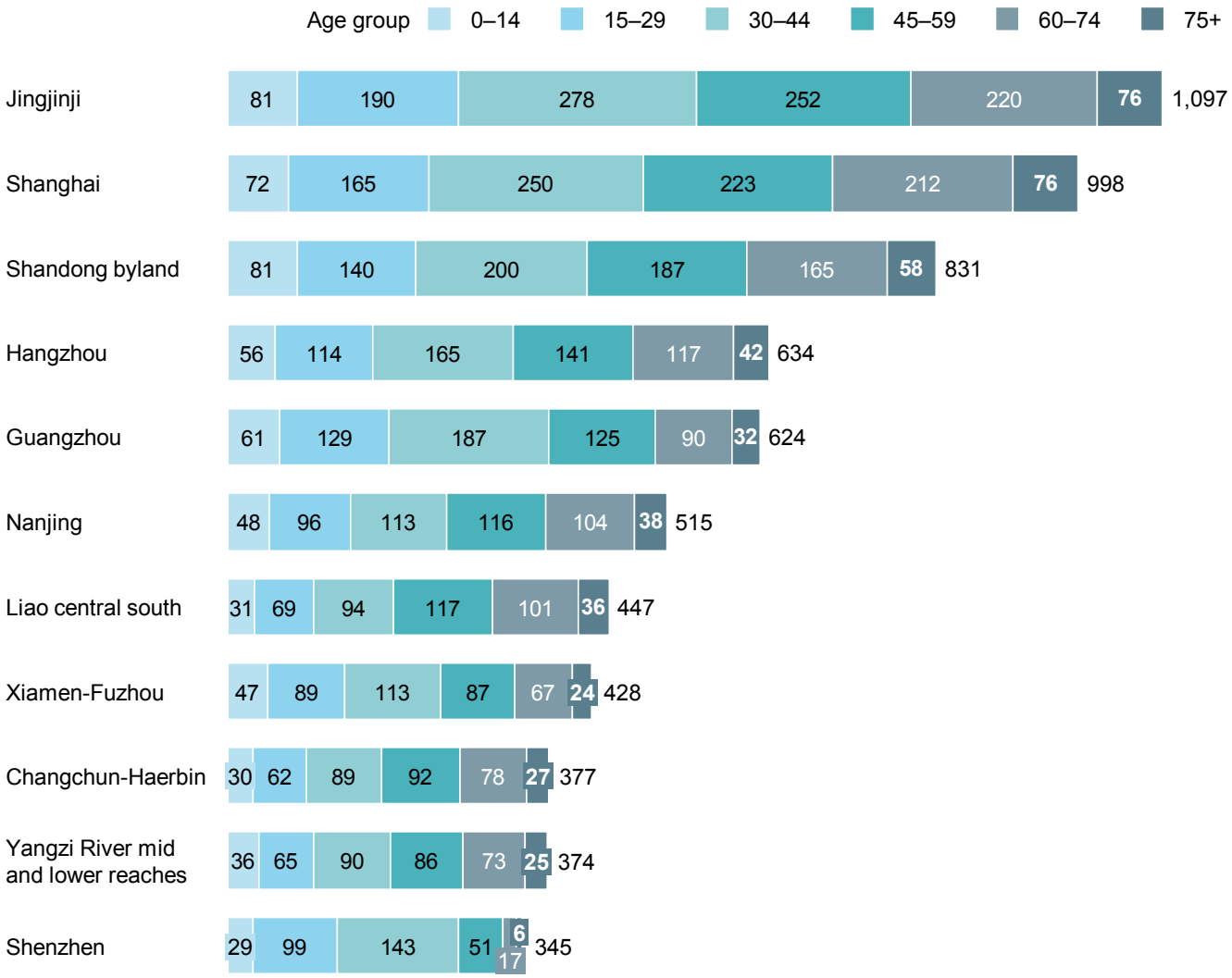
[41] Yuval Atsmon, Ari Kertesz, and Ireena Vittal, "Is your emerging-market strategy local enough?" *McKinsey Quarterly*, April 2011.

microsegmentation. Within each trade zone, Nike also identifies the sites where target consumers are most likely to shop.

Exhibit 29

Middle-aged consumers will drive consumption growth in city clusters

City cluster consumption in 2030 by age bracket
$ billion



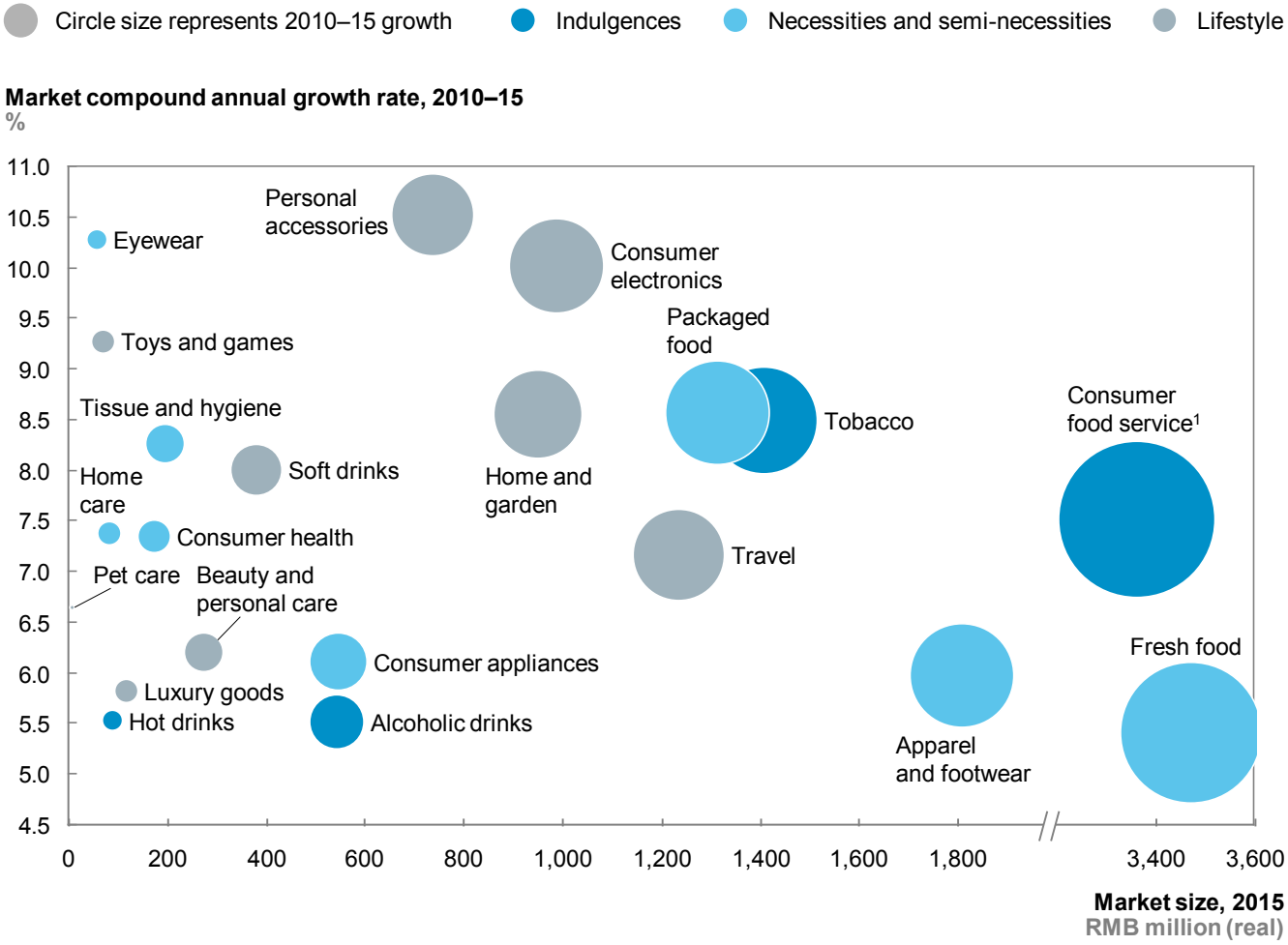
SOURCE: Insight China; MGI CityScope Database; McKinsey Global Institute analysis

Companies looking for growth categories should think lifestyle and "premiumization"

We find that the fastest-growing categories of goods and services from 2010 to 2015 were lifestyle (such as personal accessories, consumer electronics, home and garden items, and travel) and indulgence (such as tobacco and dining). Compound growth in these categories averaged 5.5 percent to 10.5 percent during this period, while sales of necessities and semi-necessities (apparel and fresh food, for example) grew by between 5.5 percent and 8.5 percent (Exhibit 30).

Exhibit 30

Some of the fastest-growing consumer goods and services are in lifestyle and "indulgence" categories



1 Includes dining out.

SOURCE: Euromonitor; IHS; McKinsey Global Institute analysis

Chinese shoppers would consume more if they were more satisfied with what is on offer in the domestic market. We know from consumer surveys and from the voracious shopping habits of Chinese travelers that Chinese consumers have a taste for higher-quality goods and services and more prestigious brands than Chinese companies now provide at home. In McKinsey's 2015 China Consumer Survey, which canvassed 10,000 consumers, more than 50 percent of respondents said that they were willing to trade up to premium offerings in fast-moving consumer products such as cosmetics, spirits, and oral care. About 60 percent of respondents said that important factors they consider when buying food and beverages include whether a product is a "famous brand" and "organic."

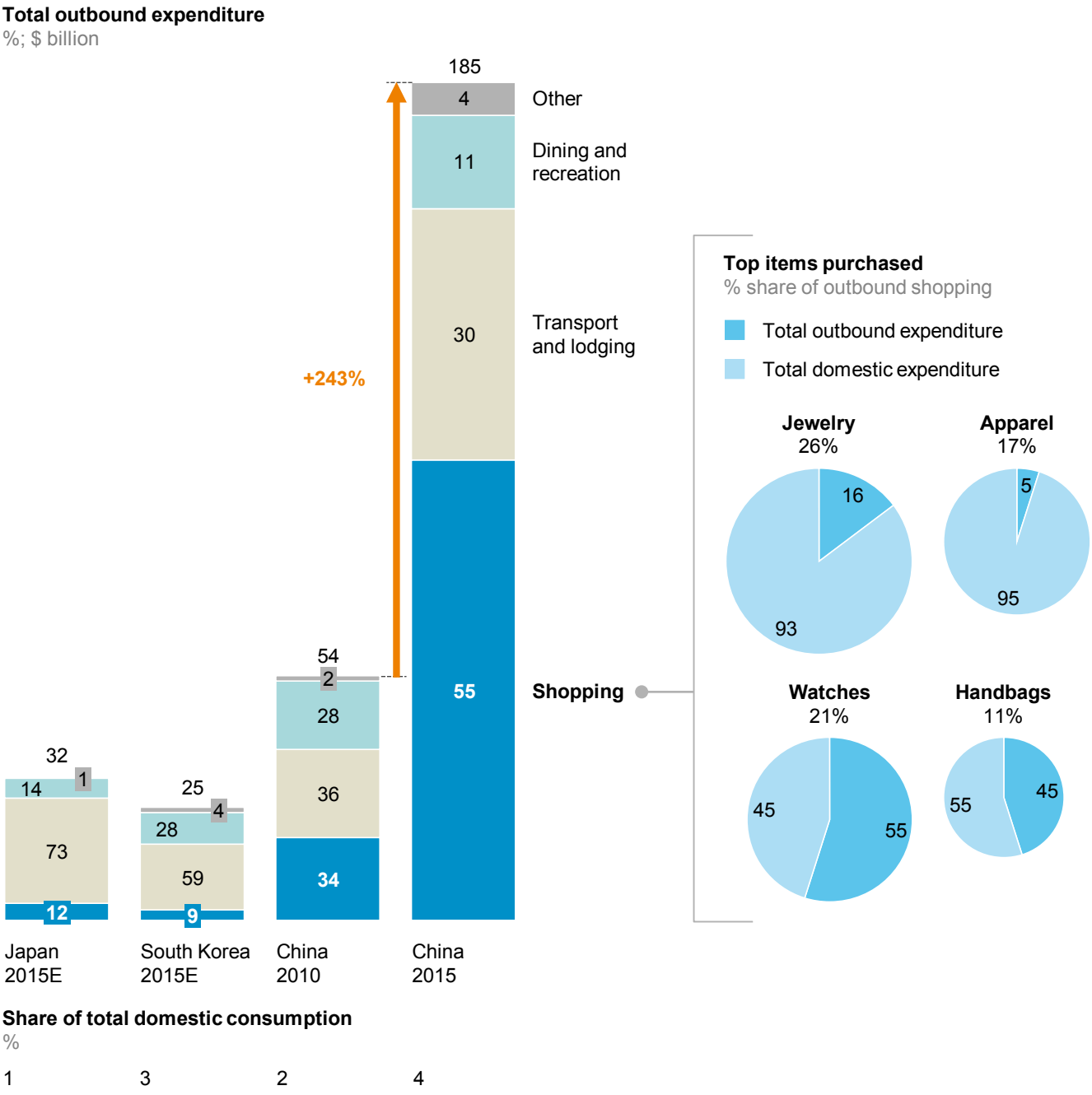
More than **50M** of Chinese consumers showed willingness to trade up

When overseas, Chinese consumers have proven their willingness to buy luxury products and premium brands they say they crave. Chinese tourists on overseas trips spent $102 billion (650 billion renminbi) on purchases in 2015; that is four times what Japanese travelers spend as a share of domestic consumption (Exhibit 31). This figure does not include what Chinese consumers spend on overseas travel services (airfare, accommodations, dining, and so on), which totaled $83 billion (540 billion renminbi) in 2015. Most of the money Chinese tourists spent on goods in their travels was in four categories: jewelry, watches, apparel, and handbags.

At home, Chinese consumers still tend to believe that Chinese brands do not measure up to prestige foreign brands, but they do trust Chinese brands in mass-market categories. For example, in 2015, Chinese brands captured a 32 percent share of mass-market facial moisturizers and 87 percent of mass-market smartphones sales.[42] However, the Chinese companies that are succeeding with mass-market brands have not yet done so in premium categories. These companies have none of the premium facial moisturizer market and only 9 percent of the premium smartphone segment.

Exhibit 31

Overseas, Chinese outspend other Asians and shop for luxury goods



Share of total domestic consumption
%

1	3	2	4

NOTE: Numbers may not sum due to rounding.

SOURCE: McKinsey China Consumer Survey 2015; Ministry of Commerce; UNWTO; Korea Trade Organization; Japanese Ministry of Land, Infrastructure, Transport and Tourism; McKinsey Global Institute analysis

[42] *2016 China consumer report: The modernization of the Chinese consumer*, McKinsey & Company, March 2016.

Companies can achieve higher sales as consumers trade up to premium products—premiumization—by enhancing product design and quality while improving perceptions of their brands. Between 2008 and 2014, sales of premium goods have been growing faster than goods overall—at 26 percent per annum compared with 12 percent in the case of chocolate, 13 percent vs. 10 percent for personal-care products, and 12 percent compared with 5 percent in sportswear. Clearly, Chinese consumers are ready to trade up in many categories. For example, 48 percent of consumers in McKinsey's latest survey indicated that they would buy the most expensive apparel items they can afford, up from 28 percent of respondents in 2011. To tap such lucrative demand, Chinese companies need to enhance their brands, and this includes cracking down on knockoffs that can degrade their own brands. At the same time, Chinese firms need to invest in improving the quality of their offerings. More than 60 percent of Chinese consumers equate better-known brands with higher levels of quality. The desire to trade up, especially by young adults, is also an opportunity for foreign brands. For example, Häagen-Dazs, a General Mills ice cream brand, has introduced its premium brand in China and, to appeal to urban consumers, opened cafes in trendy districts. Its sales in China grew 23 percent per year from 2006 to 2015.

26%
per annum growth in premium chocolate segments in 2008-14 compared with 12% industry average

As Chinese consumers purchase more goods and services, competition to attract and retain these customers will grow as well. Consumer-facing companies can use customer relationship management (CRM) systems to track customer activity, predict which customers are most likely to buy, and tailor offers for them. Additionally, CRM data can be used to predict demand and as an input into product design in industries such as consumer electronics. Across consumer categories, companies can use tightly targeted online advertising and social media. Ariel, a P&G laundry detergent brand, uses social media including the Weibo microblogging service to engage consumers and maintain customer relationships. Company bloggers post humorous items and style tips. An Ariel joke competition on Weibo garnered more than 510,000 comments, and Ariel claims to have twice as many online followers as Tide, another P&G brand.

Innovative Chinese start-ups are creating opportunities, too through innovative approaches to branding and engaging with customers. Three Squirrels, an An-hui based start-up, turned nuts—a very ordinary agricultural product—into a popular snack among young consumers by creating an animated world in which three squirrel characters with their own personalities interact with customers through their accounts on the social network WeChat. Customers are called "owners" and any purchase is referred as an "adoption". Sales have been growing at 100 percent per year since 2012, and the company is now the largest seller of nuts on Tmall and Taobao, Alibaba's e-commerce platform.

Companies should also have an explicit omnichannel strategy, including online. China has the world's largest online retail market. In 2015, sales were about $600 billion (3.8 trillion renminbi) in 2015, and they are growing at a rate of more than 30 percent per year. According to the 2015 McKinsey iConsumer survey, two-thirds of Chinese consumers switch between online and offline channels to research products before purchasing. Increasingly, shoppers are making their purchases from mobile devices, which means that companies also have to consider ways to connect with consumers on the go. Joy City Shopping Malls is using a mobile app to drive online consumers to offline stores by offering instant coupons based on the shopper's mobile phone location. The app depends on combining various types of data to offer mall retailers targeted marketing offers for cross-selling.

~700M
internet users
in China

OPPORTUNITY 2: DIGITIZE TO ENABLE NEW BUSINESS PROCESSES

China has been undergoing a digital transformation for a decade. Consumers have been embracing the internet extremely rapidly and enthusiastically, and the nation currently has nearly 700 million internet users. China's e-commerce market has already grown to about 3.8 trillion renminbi ($600 billion), representing about 40 percent of the global e-commerce market; by 2017, it is expected to be larger than those of the United States and the EU combined.[43] The penetration of mobile commerce is growing even faster. Mobile e-commerce transactions account for 55 percent of the total retail e-commerce value in China, compared with 28 percent in the United States.[44]

The next wave of China's digitization will be about companies embracing digital technologies in their operations. In MGI's 2014 research on China's digital transformation, we estimated that up to 22 percent of GDP growth by 2025 could come from applying digital technologies to, for instance, enable new business processes.[45]

We highlight three major opportunities. First, manufacturing companies can digitize their value chains to create new markets. Second, service companies can use IT and internet technology to modernize their operations and offer services in new ways. Even traditional service businesses and public-sector entities can use digital technology to leapfrog to a high level of productivity, overcoming the structural barrier of underdeveloped offline capacity as well as resource imbalances between rural and urban areas. The third opportunity is for companies to use digital technologies to improve processes such as management of talent from recruiting to training and retention. This part of the digitization story is of particular importance for services sectors where we anticipate large skills gap, such as business services. This is an underdeveloped sector that can become highly productive and create sustainable jobs.

Manufacturers can digitize their value chains and processes

Digital technologies can help manufacturers explore—and create—new markets and thereby enhance revenue. Here we look at just two sectors to illustrate the potential: consumer electronics and automotive.

Consumer electronics

The internet has unleashed a remarkable burst of new product launches in this sector, including connected devices such as smart home appliances, wearable devices, and digital content.

The "smart home" concept has existed for more than a decade, but with the rapid spread of the internet and expansion of the potential customer base, it now represents a major growth opportunity. Smart home appliances and systems enable consumers to control devices remotely, improve their management of energy and utility costs, and beef up the security of their homes. In China, sales in this category grew at 50 percent a year between 2010 and 2015, from $1.7 billion to $13.1 billion, according to Strategy Analytics. This compares with annual growth of 14 percent in the consumer electronics and home appliances sector overall over the same five-year period. Although the current adoption rate for smart home products in China is low, at only about 7 percent of households in 2015, one survey finds that 55 percent of consumers expressed an interest in making their homes smart.[46] Leading

[43] iResearch; Euromonitor; U.S. Census Bureau.

[44] Ibid.

[45] *China's digital transformation: The Internet's impact on productivity and growth*, McKinsey Global Institute, July 2014. In the United States, the best-performing firms use digital technologies to reinvent core processes, create new business models, and put the customer at the center of everything. The most digitized firms are able to change the competitive game by deploying digital assets to capture value, disrupting intermediaries, breaking apart value chains, and exploiting network effects and low marginal costs to gain hyper scale. See *Digital America: A tale of the haves and have-mores*, McKinsey Global Institute, December 2015.

[46] *China smart home market outlook research report*, Zhongguancun Online, July 2014.

consumer electronics players are already tapping into this interest. Midea, a Guangdong-based electronics company, has introduced more than 30 connected device categories, including rice cookers and air conditioners, since it announced its "M-Smart" strategy in 2014.[47] Haier, another large electronics maker, has developed the U-home solution, which connects appliances with home entertainment, security, and lighting systems.

Wearable devices is another category that is emerging rapidly. Over the past two years, it has seen explosive growth in sales, from 900 million renminbi in 2013 to 2.2 billion renminbi in 2015, according to Enfodesk. This growth is being supported by cost competitiveness resulting from China's huge manufacturing ecosystem, which allows items to be produced at scale and inexpensively. For example, Xiaomi's mi-band, a device to track physical activity, costs only around $10 compared with roughly $100 for similar products in other markets. Wearable devices (wristbands, eyeglasses, watches, rings, shoes, and helmets) have a wide variety of applications that China's manufacturers can explore. Functions can range from health and fitness to entertainment and safety, and devices can be customized for personal or business use. Checking inventory with sensors embedded in eyewear is just one application that is already gaining traction in other markets.

Digital content is another rapidly growing area. As an illustration, in 2015 Apple generated $20 billion in sales from offerings such as content and cloud services, about 9 percent of total sales. As penetration of devices such as smartphones, tablets, computers, and internet TVs increases, so does the opportunity to develop media content, including streaming TV programs and movies, streaming music and music downloads, online gaming, and online reading. Penetration and growth in all four categories are promising. Chinese consumers have already demonstrated a huge appetite for digital movies, TV shows, music, games, and other content. The online video market grew from 6.3 billion renminbi in 2011 to 40 billion renminbi in 2015, according to iResearch. The digital music market grew from 4.5 billion renminbi in 2012 to 12.7 billion renminbi in 2015, according to Analysys. Chinese manufacturers are already exploring opportunities to expand revenue and profits, and to diversify by offering more content. Haier, for example, has signed a strategic partnership with Youku Tudou, an internet video group, for content sharing on its television platform.

Automotive

There is huge scope for auto manufacturers to offer customers digital products and services in their cars. Appetite among consumers is already evident. In a 2015 McKinsey survey, 60 percent of Chinese car consumers said that they would switch to another brand if it was the only brand offering a car with full access to digital apps, data, and media; this compares with 20 percent in Germany and 33 percent in the United States.[48] Although there are privacy concerns, the survey showed that 93 percent of Chinese respondents said they are willing to share their location data with the car manufacturer, compared with 65 percent in Germany and 75 percent in the United States.

This attitude on the part of Chinese consumers gives manufacturers a range of opportunities to monetize by deepening customer relationships. So far, Chinese automakers have been mostly focusing on first-time buyers, and the companies know very little about them. However, as increasing numbers of consumers are ready to upgrade their cars, automakers could potentially mine the information gained from connected devices to retain customers and attract new ones with value-added services and targeted marketing. SAIC Motors, one of the largest state-owned automotive companies in China, has agreed to a 1 billion renminbi joint venture with Alibaba to develop connected car features using big data. The data on drivers that the companies will be able to collect will enable them to create new dynamic pricing models. One example is usage-based insurance—personalized

[47] Qiu Quanlin, "Home appliance maker Midea takes smart route to success," *China Daily*, March 10, 2016.
[48] McKinsey Connectivity and Autonomous Driving Consumer Survey, 2015.

insurance rates based on how individual drivers behave (whether they speed, how they use their brakes, and what time of day they tend to travel).

Internet of Things sensors also open up new possibilities for aftermarket sales, which could be an important source of growth as sales of new cars slow in China. Sensors can be used, for instance, to deliver maintenance alerts, provide software updates, and run remote diagnoses, saving servicing costs for dealerships as well as time for car owners. The connected car not only offers manufacturers scope to get to know their customers better and to tailor and develop products accordingly; it also improves the experience of driving for consumers by providing them with real-time traffic data and entertainment features.

Service-sector companies can modernize using digital technology

Many service sectors in China, including retail, logistics, and health care, have very low productivity compared with their counterparts in other countries. Digital technologies are an obvious way to close that gap and leapfrog to higher productivity. We look in some detail at retail and logistics, two traditional service sectors, as well as two aspects of social services: health care and education.

Retail and logistics

Retail and logistics both suffer from structural problems that hold back their productivity; both are highly suited to digitization to improve existing business operations and to expand into web-based services such as online retailing. Today, Chinese retail and logistics companies have about one-fifth the labor productivity of their counterparts in advanced economies. China's logistics industry is particularly inefficient; logistics costs are equivalent to 17 percent of GDP, compared with about 8 percent in the United States (Exhibit 32). Barriers to higher productivity in retail include the fragmentation of the sector and the prevalence of outdated store formats and supply chains. The top five retailers have less than 20 percent of market share in China, compared with 67 percent in the United States. Although there are some large chains, small family-owned businesses continue to dominate Chinese retail.

Retailers can use digital technology to enable the operations of modern-format physical stores (such as "big box" discount stores) and improve the efficiency of existing businesses through better supply-chain management. Wal-Mart famously pioneered new discount store formats and supply-chain innovations, which changed the structure of the entire retail industry in the United States—and many other countries.[49] MGI estimates that the retail sector in developing economies could double its labor productivity by 2025, with 70 percent of the impact coming come from adopting modern practices (store format, merchandising best practices, and operational efficiency).[50]

In China, new store formats and modern supply chains may have less impact on retail-sector productivity than developing new online stores. China has modern retail chains, but they have not reached many second- and third-tier cities because the cost of expansion is prohibitive, leaving consumers outside of major cities with limited selection. E-commerce allows retailers to expand to harder-to-reach consumers with much less investment—and without cannibalizing in-store sales. In MGI's 2013 research on China's e-commerce revolution, we estimated that as much as 40 percent of e-commerce transactions in China

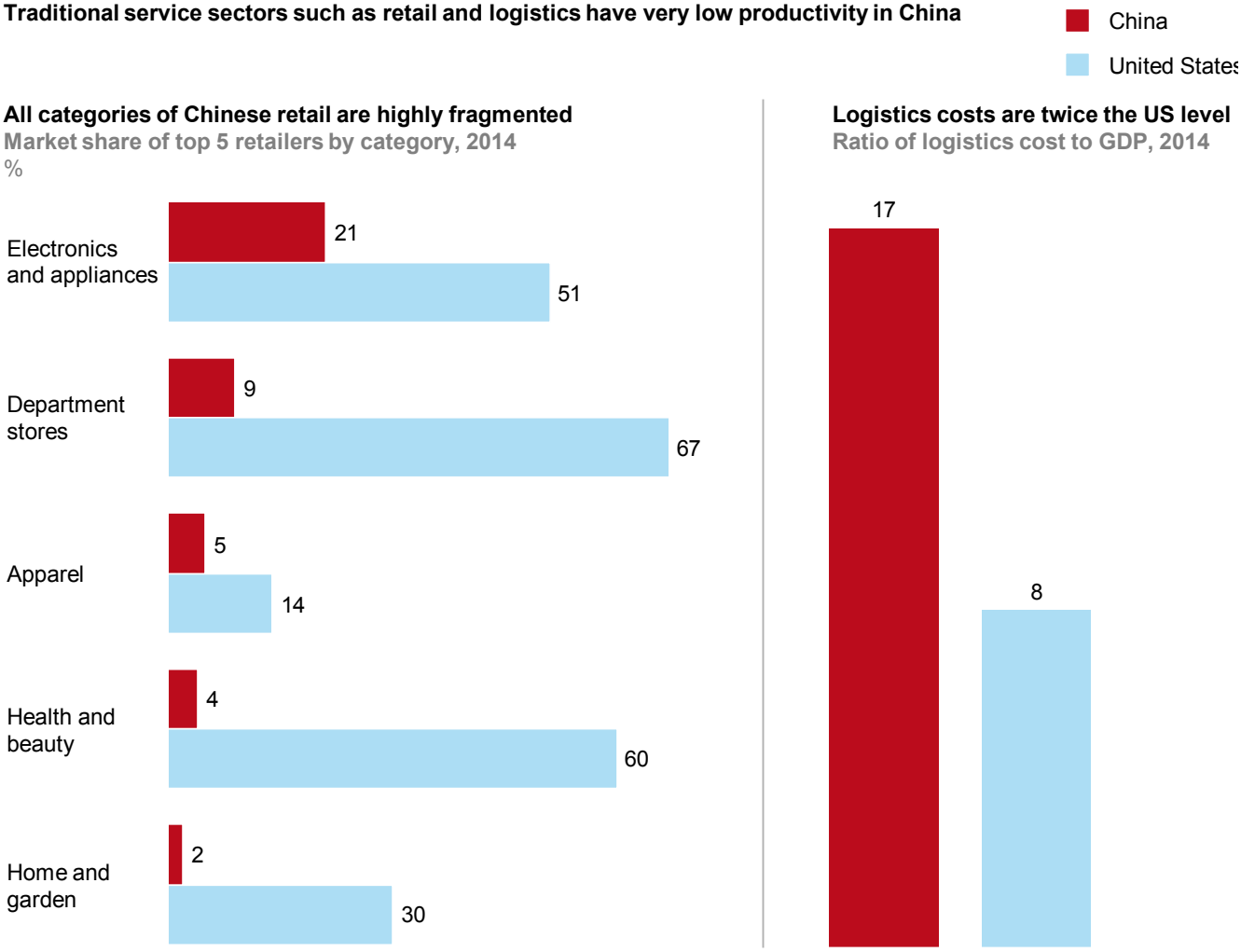
[49] As competitors raced to catch up with Wal-Mart, retail industry productivity rose by 6.7 percent a year from 1995 to 1999, compared with 3.3 percent between 1987 and 1995. This became known as the "Wal-Mart effect." Competitive pressure forced other retailers to improve store formats and to invest in technology to try to match Wal-Mart's sophisticated supply-chain management capabilities. See *US productivity growth 1995-2000: Understanding the contribution of information technology relative to other factors*, McKinsey Global Institute, October 2001.

[50] *Global growth: Can productivity save the day in an aging world?* McKinsey Global Institute, January 2015.

represents new consumption.[51] Although internet penetration in rural areas is low, more than 60 percent of rural internet users already shop online, comparable with the rate for urban mobile users.[52] While online stores do not require the large staffs that physical stores need, e-commerce creates new types of jobs. For example, more than seven million merchants run stores on Alibaba's e-commerce platform, and these stores require the services of, for instance, Web designers, fashion models, and delivery people. The number of workers in Chinese delivery businesses soared from 160,000 in 2005 to 1.4 million in 2014, largely due to the growth of e-commerce. E-commerce accounts for an estimated 60 percent of packages delivered across China.

Exhibit 32

Traditional service sectors such as retail and logistics have very low productivity in China



SOURCE: Euromonitor; Council of Supply Chain Management Professionals; China National Bureau of Statistics; McKinsey Global Institute analysis

China's logistics sector is also extremely fragmented, with an estimated seven million-plus trucking and delivery companies (including microbusinesses) operating across China.[53] The top ten firms command only about 9 percent of the market, whereas the top five in the United States have a 50 percent market share. Large US players not only have scale advantages, but they also have access to capital and have invested heavily in technology to optimize route selection, loading, and other activities. Chinese logistics firms need better organization as well as larger scale, and digital technologies can help. In 2013, Alibaba,

[51] *China's e-tail revolution: Online shopping as a catalyst for growth*, McKinsey Global Institute, March 2013.
[52] *China's iConsumer 2015: A growing appetite for change*, McKinsey China, February 2015.
[53] "Living conditions of truck drivers," China Road Transport Association, April 28, 2016.

a consortium of retailers, and the top five local express delivery services launched a new online platform. The consortium plans to build three million square meters of warehouse space and use the online platform to link small trucking and delivery firms to ten million enterprises.[54] Kaxing Tianxia, a Shanghai-based online logistics provider, has built 47 logistics points nationwide, where more than 5,000 trucking firms transfer 40,000 tons of goods per day. ANE, a startup, is a leading operator in "less-than-truckload" logistics. It uses a franchise model and now has 300 distribution centers and more than 5,000 distribution points. Other startups are using technology to manage the difficult last mile of the delivery chain. Dada Logistics, an online-to-offline startup based in Jiangsu, has enlisted 800,000 part-time delivery workers in 40 cities to complete 600,000 deliveries per day.

5.4%
spending on health care as share of GDP vs. 9 percent in OECD countries and 17 percent in the United States

Social services

As economies grow wealthier, citizens' expectations of the quality of education and health care increase. Businesses, too, have an interest in high-quality education and health care. Spending on health care remains relatively low, at 5.4 percent of GDP in 2014, compared with an average of 9 percent in OECD countries and 17 percent in the United States. Moreover, access to care is uneven across the country. In public education, too, access to good-quality teaching is uneven. In both sectors, using online platforms to deliver services remotely could be an important step toward raising quality, productivity, and equal access.

China's health-care system faces many challenges, including a lack of modern computerized systems, high out-of-pocket costs borne by patients, and an economic model that does not provide appropriate incentives for hospitals and physicians. Two particularly acute issues are matching demand with supply and improving access to care in rural areas. Class III hospitals (comprehensive-care facilities in large cities with more than 500 beds) have 100 percent-plus bed utilization rates, while smaller hospitals operate at 60 percent of capacity. Patients travel to major cities and crowd into Class III hospitals because they do not have access to good enough care where they live or do not trust the quality of care in smaller institutions. An estimated 70 percent of patients visiting Class III hospitals could have received proper care in community health centers. Remote health care via the internet can go a long way toward solving this issue. Using connected devices such as heart and blood glucose monitors, physicians in cities can remotely evaluate patients in rural clinics. Experienced doctors in large hospitals can provide remote guidance through live video feeds that share patient scans.

Making better use of data can make a major contribution, too, by avoiding redundant procedures and bad drug interactions, which are common problems in hospitals. The IT system in Chinese health care currently is fragmented; data are not centralized, which means that staff members may not access the information they need to treat a patient quickly and effectively. In 2011, the government launched the so-called 3521 project to build a three-tier (central, provincial, and municipal) health-care information network, develop electronic medical records and databases, and create a dedicated health-care network integrating all of these elements. China is also attempting to strengthen the monitoring of drug safety, providing clinical decision support (by showing physicians the most successful treatments for particular cases, based on thousands of medical histories), and establishing a system for predicting public health needs. By sharing aggregated data from these systems, the public health-care system can help the private sector develop new therapies, including personalized medicine.

[54] Bien Perez, "Alibaba forms consortium to build 100b yuan logistics network," *South China Morning Post*, May 29, 2013.

By many measures, China has made impressive progress in public education. Since 1985, nine years of schooling has been compulsory, and in 2006, the government eliminated tuition and book fees for compulsory programs. Yet huge disparities remain between rural and urban education. For example, only six out of 100 rural primary students go to senior high school, and only 2 percent attend college; in urban areas, 53 percent of primary students go to college.[55] Poverty plays a role in high dropout rates, but only 8 percent of dropouts say they left for financial reasons.[56] One study found that teachers' qualifications were linked to student dropout rates. In schools where less than 30 percent of the teachers had a university degree, students dropped out at twice the rate as at schools with more qualified staff.[57] The number of teachers in rural areas has declined from 4.7 million in 2010 to 3.3 million in 2013; 65 percent of those who left rural schools say they went to cities.[58]

Technology could play a decisive role in improving education across the country. One tool is the massive open online course (MOOC). Tsinghua University and Peking University already offer 2,000 courses that attract about one million active users per month. Yingwuluo, a Beijing-based education startup, offers online instruction via "Cloud Classrooms" in smaller cities in 20 provinces.[59] Teachers in Beijing present online lessons to students in remote classrooms. Genshuixue, another online education platform, offers 69,000 classes, from piano to college entrance exam preparation. An online study platform called 17zuoye (the name translates to "homework together") is aimed at primary-school students. Classmates use online services to discuss assignments. Finished homework is submitted via the internet and marked by the system, which offers suggestions for additional work for improvement. About 39,000 primary schools with 12 million students have signed up for the system.

Digital tools can improve talent management

High staff turnover and a shortage of skills are challenges for many companies in China, in both manufacturing and services. According to one survey, 28 percent of Chinese workers said that they had changed jobs in the past six months, compared with 18 percent in the United States, 11 percent in Japan, and 10 percent in Germany.[60] Talent development is critical as China aims to shift the economy toward high-value, high-skill sectors including R&D-driven manufacturing and business services (see Box 2, "Invest in talent to develop modern services"). Companies can continue to strengthen traditional talent-management programs such as formal face-to-face interviews, corporate universities, and certification programs. But digital should be deployed on top of these traditional approaches.
MGI research on online talent programs has found that these platforms can improve transparency and efficiency by matching workers with jobs, creating digital marketplaces for freelance work, and streamlining how employers recruit and retain talent. Globally, they could increase GDP by $2.7 trillion (18 trillion renminbi) by 2025, creating 72 million new full-time jobs and improving work outcomes for 540 million people—all while helping companies to find people with the skills they need more quickly and more cheaply.[61] These figures assume that only a fraction of the global workforce is helped by such platforms. Here, we highlight just three examples of how companies in China can use digital tools to improve talent management.

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55 Dandan Zhang, Xin Li, and Jinjun Xue, "Education inequality between rural and urban areas of the People's Republic of China, migrants' children education, and some implications," *Asian Development Review*, volume 32, number 1, March 2015.

56 Sheng Menglu, "China's rural youngsters drop out of school at an alarming rate, researchers find," Caixin Online, March 24, 2016.

57 Ibid.

58 "Forum on rural education examines role of online education," *Global Times*, July 30, 2015.

59 Tier 3 cities had a nominal GDP of 22 billion renminbi to 120 billion renminbi in 2010. Tier 4 cities had less than 22 billion renminbi of GDP in 2010.

60 Randstad Workmonitor, Randstad, December 2015.

61 *A labor market that works: Connecting talent and opportunity in the digital age*, McKinsey Global Institute, June 2015.

Digitized learning modules

The digital world is poised to challenge traditional training in corporate academies and classrooms. Given dissatisfaction with the status quo, this challenge should be welcomed. A McKinsey survey of 120 senior learning and development officers found that only 57 percent of respondents said that their academies are "very aligned" or "fully aligned" with corporate priorities. Only 52 percent said that these institutions enable their companies to meet strategic objectives, and about 40 percent of chief learning officers said that their initiatives are either "ineffective" or "neither effective nor ineffective" in assessing the capabilities and gaps of employees.[62] Companies can digitize training modules and move learning content to the cloud so that it is accessible across multiple devices and teaching environments, and can be generated, shared, and continually updated by users. Sophisticated organizations are now expanding their use of cloud-based learning to run MOOCs, small private online courses, instructional videos, learning games, e-coaching, virtual classrooms, online performance support, and online simulations. Young Chinese are likely to take to such options with alacrity given their enthusiasm for digital and mobile technologies. Just one example of how the technology can be deployed in China comes from JD.com, an e-commerce retailer. The company realized that delivery staff members did not like formal training because they were under significant time pressure to meet daily targets. So the company created an internal TV channel that allowed employees to use their mobile phones to record work-related learning and share with colleagues. JD.com also created ten-minute videos from experts on various topics and shared them through the company platform.[63]

Predictive management for retention

Employee turnover is high in China, as we have noted, but digital tools can help overcome this issue by boosting staff retention. Companies can use analytics engines that identify key drivers of retention and the likelihood of attrition down to each individual. They can use this information to take steps to retain high performers and detect early signs of distress such as low productivity in employee groups, so that they can take action to improve the situation. One Chinese biochemical company with an attrition rate of more than 50 percent used analytics to identify key variables behind employee departures, including shifts, tenure, and salary. It then took action on variables among workers at high risk of leaving and reduced its attrition rate by half during a pilot period.

Gamification in recruiting

Digital tools can help reduce the time and cost of recruiting. One of the challenges facing any recruiter is ensuring that a candidate is going to be a good fit for the company. Gamification—more specifically, game-playing simulations—can be a useful tool. Eliminating unsuitable candidates is much quicker, candidates can grasp information about the company while having fun, and the results can give the recruiter a good idea of how the candidate will perform on the job. Siemens introduced Plantsville, a game in which the candidate plays the role of a plant manager. Marriott launched a mobile app that job applicants use to virtually perform hotel management tasks and get a taste of what it would be like to manage one of the chain's properties.[64]

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62 Richard Benson-Armer, Arne Gast, and Nick van Dam, "Learning at the speed of business," *McKinsey Quarterly*, May 2016.

63 *Decoding JD: How do you train 60,000 employees*, China Business Network, August 2014.

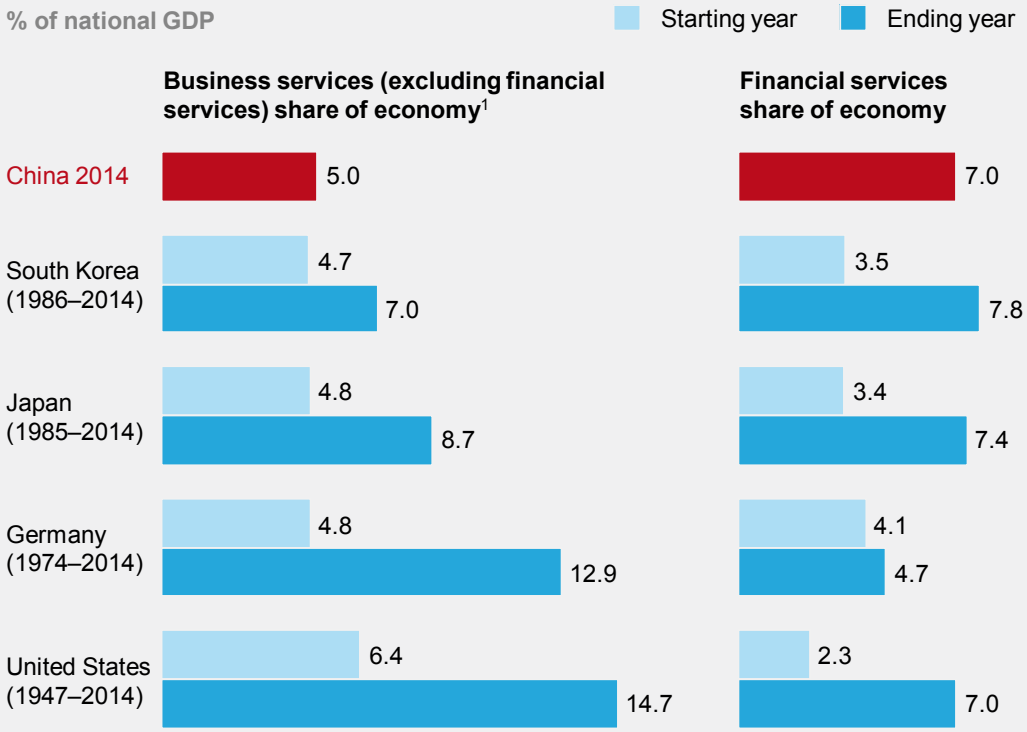
64 Prithvi Shergill, HCL Technologies, "Winning the talent game: How gamification is impacting business and HR," *Wired*, January 2014.

Box 2: Invest in talent to develop modern services

Business services in China remain underdeveloped, and one major reason is a shortage of skills. Identifying and developing talent is a priority, and digital technologies can help.[1] Business services can also help advance China's manufacturing sector, which can be a major customer for such services during the productivity-led transition. Today, services such as accounting, advertising, design, engineering, and IT services account for 5 percent of GDP in China, compared with about 15 percent in advanced economies (Exhibit 33). In the United States, business services grew from about 10 percent of GDP in the 1960s to about 22 percent in 2014.

Exhibit 33

China is far behind advanced economies in developing business services, but is about even in financial services



1 Business services based on International Standard Industrial Classification (ISIC) categories K71-74, which include: computer activities, research and development, legal, advertising, consultancy, rental services, and other business activities; US statistics based on Bureau of Economic Analysis definition.

SOURCE: Federal Statistical Office of Germany; U.S. Bureau of Economic Analysis; IHS; National Bureau of Statistics, China; McKinsey Global Institute analysis

[1] Business services are defined as International Standard Industrial Classification categories K71–74, which include computer activities, research and development, legal, advertising, consultancy, rental services, and other business activities; US statistics based on Bureau of Economic Analysis definitions.

OPPORTUNITY 3: INNOVATE AND MOVE UP THE VALUE CHAIN

Chinese companies in both manufacturing and services can raise productivity by moving into higher value-added activities. As noted in the earlier discussion of opportunities to raise consumption (Opportunity 1), Chinese consumers are eager to purchase higher-quality goods and services, which gives consumer-facing companies an opportunity to move up the value chain in their industries and, if they are successful, demand higher prices and increase profitability. Another way to move up the value chain is to innovate by introducing new products and services or adding new features and capabilities. This can also enable companies to capture more revenue and profit. Innovation will play an increasingly important role across Chinese industry as China continues to move toward being an advanced economy, and will be a driver of productivity growth.[65]

Chinese companies have tended to be able to compete globally in sectors where they can use massive commercialization opportunities and a large manufacturing ecosystem in their domestic market—these conditions are in place in internet services and electronics, for instance. However, Chinese business have not tended to emerge as global players in sectors where more complex innovation requiring in-depth scientific knowledge and engineering know-how is necessary in order to compete on a world stage.[66] This provides significant opportunities for industries such as medical equipment manufacturing (in the engineering-based group) or pharmaceuticals (in the science-based group) to improve their innovation capabilities and climb the value chain.

Chinese business have not tended to emerge as global players in sectors where more complex innovation requiring in-depth scientific knowledge and engineering know-how is necessary in order to compete on a world stage.

Four types of initiatives can help Chinese companies move up the value chain. First, they can establish global R&D footprints as Huawei and Lenovo have already done.[67] Second, they should fully leverage Chinese advantages including a huge consumer market in which they can rapidly commercialize new ideas, the research capacity that China has built over the past decade, and the fact that Chinese universities confer nearly 30,000 PhDs in science and engineering every year and graduate 2.5 million students with degrees in engineering and other STEM specialties—science, technology, and mathematics—every year. Third, they can cultivate new markets in partnership with leading global companies. Finally, they should think about where to acquire the talent they need. Beyond the many scientists and engineers China is producing, companies could tap the knowledge of Chinese nationals who have studied and worked broad, and looking beyond the most obvious talent profiles. BGI, a biotech company, looks for recruits slightly outside the norm and plucks promising young researchers from colleges before they graduate; one of these went on to become the company's CEO.

[65] For more on the role of technology in China's economy, see *The China effect on global innovation, research bulletin*, McKinsey Global Institute, July 2015.

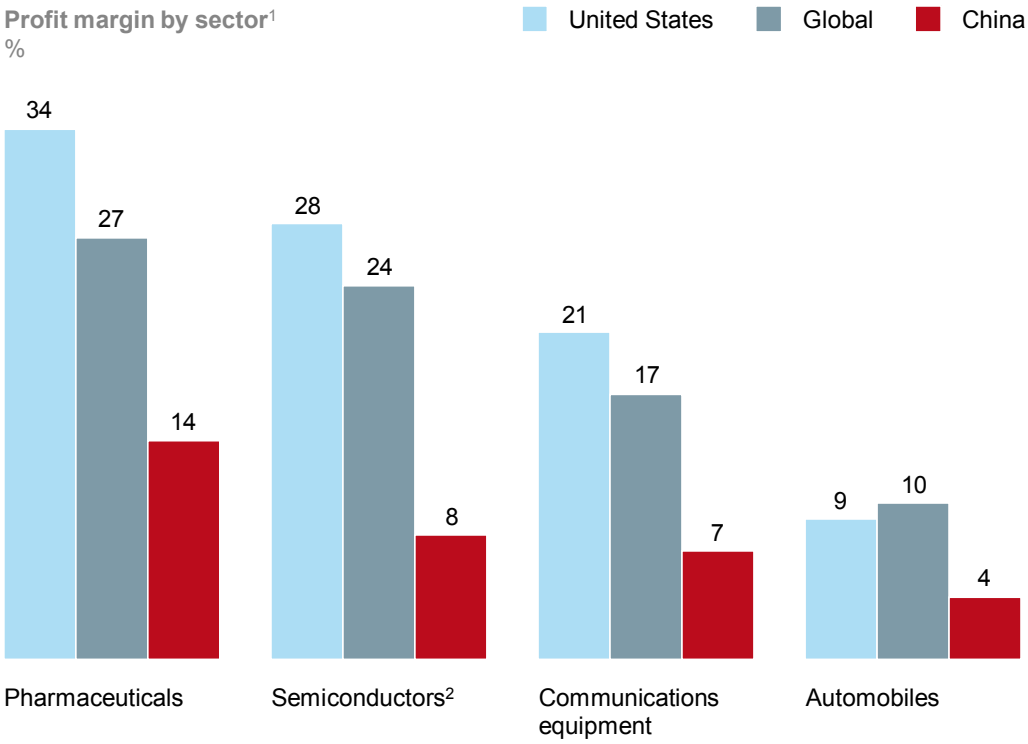
[66] Ibid.

[67] Lenovo continues to benefit from maintaining dual headquarters in Beijing and in North Carolina in United States. The North Carolina headquarters has more than 2,000 employees, including an R&D department, helping the company double its share in the US market since 2011.

We look at how Chinese companies in four sectors—autos, semiconductors, medical equipment, and pharmaceuticals—can use innovation to move up the value chain in their industries between 2015 and 2030. In all four, Chinese players have focused mostly on low value-added activities, which helps to explain the fact that their profitability remains far below US and global averages (Exhibit 34).

Exhibit 34

In R&D-driven manufacturing, Chinese companies have lower margins than global peers



1 EBITDA/Revenue, 2013.
2 Excludes foundry, back-end engineering, and solar.

SOURCE: McKinsey Corporate Performance Analysis Tool; McKinsey Global Institute analysis

Auto manufacturing

China has become the world's largest auto market, but Chinese manufacturers are not capturing most of the value. Chinese state-owned manufacturers have only 14 percent of the domestic market by volume and only 8 percent of global industry revenue. In joint ventures with major overseas car manufacturers, Chinese SOEs tend to rely on platforms from foreign partners, which means that their Chinese partners do not have an opportunity to gain knowledge by participating in end-to-end product design. In other cases, Chinese auto brands have outsourced engineering and design to external companies. Such approaches have helped local brands shorten development times but not to climb the value chain.[68] Two other factors limit the ability of Chinese automakers to innovate toward higher-value-added activities: an underdeveloped supplier ecosystem, and the fact that SOEs tend to lack incentives for long-term innovation. Chinese auto players invest half what global companies spend on R&D as a share of sales.

[68] *Chinese autos, part 1: The quest for global competitiveness—technology, competence, ambition and politics*, Sanford C. Bernstein & Co., February 2013. For more detail on innovation and the auto sector, see *The China effect on global innovation*, research bulletin, McKinsey Global Institute, July 2015.

One promising innovation opportunity for Chinese automakers is electric vehicles. McKinsey surveys have found that Chinese consumers generally prefer foreign car brands to Chinese ones, but this is not so in the case of electric vehicles, offering an opportunity to companies prepared to move quickly into this segment and put themselves in a competitive position as the market develops.[69] The Chinese government has made a strong commitment to the development of electric vehicles, investing 37 billion renminbi ($6 billion) on R&D funding for car manufacturers and research institutions, charging infrastructure, and purchase subsidies and tax breaks for buyers. Electric vehicle sales in China quadrupled in 2015, reaching 331,000 units. However, estimates suggest that nearly three-quarters of these cars were purchased by governments in what has appeared to be an effort to boost the market.[70] To broaden adoption of electric vehicles (and achieve the government's goal to have five million of them on the road by 2020) including consumer ownership, Chinese automakers will need to develop better products with attractive design, features, and prices. In addition, the government may need to adjust policy to accelerate innovation, and their adoption.[71] Currently, China charges a 25 percent tariff on imported electric vehicles, while other nations have reduced or eliminated tariffs to encourage the development of this market. Moreover, Chinese subsidies on the purchase electric vehicles apply only to locally produced models, reducing the impact of global competition that could stimulate market demand and innovation. In addition, the standards for determining which locally produced electric vehicles qualify for purchase subsidies are quite broad, which diffuses their impact. The government is considering ways to adjust subsidy rules.

Semiconductors

In semiconductors, Chinese companies have an opportunity to move up the value chain and significantly expand their share of global markets. China is by far the largest semiconductor market in the world, accounting for more than 50 percent of global sales (including re-export), but more than 90 percent of the chips China uses are imported, and Chinese companies sold just less than 2 percent of the global integrated chip and foundry supply and 12 percent of fabless chip supply.[72] However, as the manufacturer of 70 percent of the world's phones and 90 percent of the world's computers, China is well situated to move up the value chain by designing more chips and boosting their market share, leveraging its technical skills, scale, and unique access to the world's most important semiconductor customers.[73]

The government has been striving to improve the capabilities of the Chinese semiconductor industry since the 1990s by, for instance, offering incentives to companies to spend more on R&D. But its efforts have been spread thinly across many organizations and too many cities and have not yielded any commercialized innovations.[74] Moreover, these efforts failed to yield any commercialized innovations and today, even though Chinese engineers have built the world's fastest supercomputer, it uses Intel microprocessors.[75]

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69 For more detail, see *Finding the fast lane: Emerging trends in China's auto market*, McKinsey & Company, April 2016.

70 Jie Ma, "China electric car boom driven by state buying, Bernstein says," Bloomberg News, February 29, 2016.

71 For further details, see *Supercharging the development of electric vehicles in China*, McKinsey & Company, April 2015.

72 "Chips on their shoulders," *The Economist*, January 23, 2016.

73 *A new world under construction: China and semiconductors*, McKinsey & Company, November 2015.

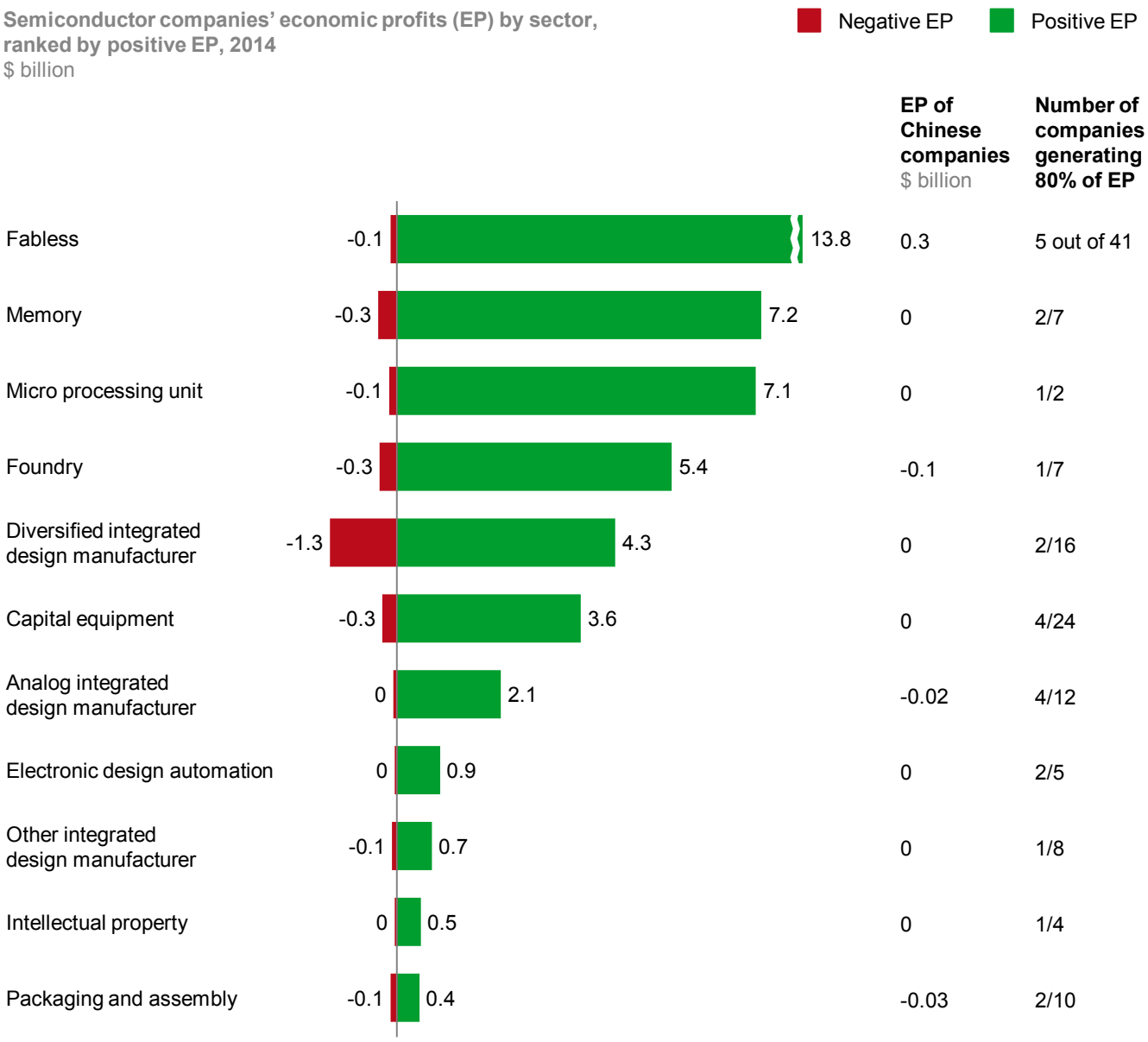
74 At one point, 130 government-financed chip fabrication plants were operating in 15 provinces, none of which grew to significant scale and none of them spawned a chip-making ecosystem, with suppliers and service companies, which is needed to support a successful semiconductor sector. See *Semiconductors in China: Brave new world or same old story?* McKinsey & Company, August 2014.

75 Zen Soo, "China's Tianhe-2 supercomputer nabs top spot in global biannual rankings," *South China Morning Post*, November 18, 2015.

Science-based innovation takes many years and the barriers to entry are especially high in the high value-added parts of the semiconductor business—fabless chip-making (companies that only design chips and do not operate fabricating plants), memory chips, and microprocessors. Incumbents have high market share, lock-in with major customers, and formidable intellectual property. Leadership in these segments rarely changes and the top players often earn 100 percent of economic profit. Intel, for example, has been the top microprocessor manufacturer since 1996 and has earned 100 percent of the segment's economic profit for the past 18 years.[76] Across the industry in China, we find that profit is highly concentrated in a small number of companies (Exhibit 35).

Exhibit 35

Semiconductor profits are highly concentrated in a few companies; most sectors have negative economic profits



NOTE: Data labels smaller than -0.1 not shown.

SOURCE: McKinsey Value Creation Database; McKinsey Global Institute analysis

[76] This does not mean other players were not profitable on an EBITDA basis, but Intel is the only company making an economic profit, defined as profit after accounting for the opportunity cost of capital. Among fabless chip makers, Qualcomm has generated more than 50 percent of economic profit for the past decade. In memory chips, Samsung has captured 40 to 80 percent of economic profit for 15 years. Even in the semiconductor foundry business, strong incumbents capture most of the value.

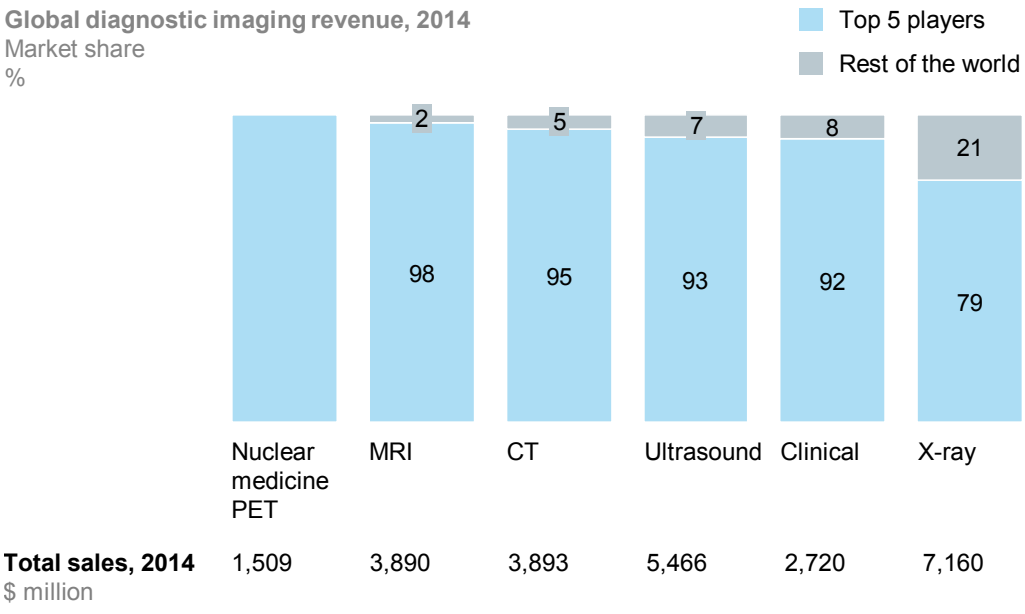
So how can Chinese semiconductor companies finally move up the value chain? Mergers and acquisitions are one option, and one that the government is seeking to encourage. Tsinghua Unigroup, a SOE, recently bought Spreadtrum and RDA Microelectronics, two of the top four Chinese fabless companies, with the aim of combining them into a single entity. Tsinghua Unigroup also attempted to buy US chip maker Micron Technology in 2015, but the deal did not come off. China's semiconductor manufacturers can also invest in their own capabilities including developing technical skills and building global client relationships. Chinese chip makers need to build technical capacity and intellectual property assets, integrating the latest science and engineering developments and applying them. To do this, they need to develop local talent while tapping into the global pool of experts. Above all, Chinese semiconductor companies need to plan long term, identifying opportunities that might exist ten years from now and aim to capture them. The companies that have sustainable and profitable positions in semiconductors today have been developing and commercializing products for decades, and spending about one-fifth of their revenue on R&D.

Medical equipment

Chinese manufacturers have captured less than 3 percent of the global market in medical equipment. In diagnostic imaging, for example, the top five multinational companies account for more than 80 percent of sales of advanced imaging product segments such as nuclear medicine/PET and MRI. In nuclear medical devices, four players dominate. In MRI devices, the top five global players have a 98 percent global market share. Chinese players are gradually gaining share in segments with lower technology barriers and less concentrated market shares, such as X-ray machines (Exhibit 36). The government is helping Chinese suppliers tap the growing domestic market through aggressive government-funded purchasing programs for hospitals. Government spending is expected to drive 12 to 14 percent annual growth in medical equipment sales through 2020, expanding the Chinese market to about $70 billion per year. Recently, public hospitals have been offered government subsidies if they favor domestically manufactured products in the bidding process. Locally made products can also get preferential, accelerated regulatory approval.

Exhibit 36

The top five multinationals dominate sales in most medical-imaging equipment categories



SOURCE: Health Research International; McKinsey Global Institute analysis

At the same time, some Chinese players in this market are now innovating, using their engineering skills to reduce the cost of product design in order to appeal to Chinese health-care organizations, many of which cannot afford global brands. Mindray, for instance, specializes in selling patient monitoring, in vitro diagnosis, and medical imaging products to mid-tier hospitals for 20 to 30 percent less than global brands. Some players are moving gradually toward the high-end medical device market where foreign players hold up to 90 percent of the market. United Imaging has aspirations in this direction, and already produces more than 20 high-end medical products.[77]

2ND-
largest pharmaceutical market in the world

Pharmaceuticals

The pharmaceutical sector is one of the profitable industries globally, but Chinese manufacturers command only less than 3 percent of global revenue in branded drugs and biotech products. China recently became the second-largest pharmaceuticals market in the world, overtaking Japan, but more than 60 percent of drugs sold in China are lower-value generic drugs compared with an average 20 percent share in advanced economies, such as in Germany, Japan, the United Kingdom, and the United States.

Several factors are holding back the growth of branded drugs in China including the fact that innovating new drugs—discovering a new molecule or a biologic—is a costly, lengthy business made more complex by a slow regulatory process and uncertainty about intellectual-property protection. Government research funding has sometimes been allocated inefficiently, private-sector players have underinvested, and companies still struggle to find sufficient talent despite the large numbers of Chinese students being trained in scientific and technical fields. Some of these difficulties are being addressed by the government. The China Food and Drug Administration has been reforming in order to speed up the regulatory process and shorten the period for drug approval. The government's Thousand Talents program is helping to bring overseas Chinese scientists home to work in the industry and at universities, and to launch companies. And 80 percent of Chinese students who study abroad are returning to China in 2014, up from 20 percent in 2004. Such efforts will help more companies to innovate in this area, as some local innovators are already doing.[78]

If these upstarts can achieve some breakthroughs in drug discover and established Chinese companies can step up their research efforts, there is an enormous opportunity for Chinese growth in the branded drug market. We estimate that with the right investments in capabilities and with a more supportive policy environment to accelerate drug approvals, the Chinese branded drug (on patent) segment could rise from about $9 billion in sales in 2014 to $25 billion by 2025.[79]

OPPORTUNITY 4: RAISE PRODUCTIVITY THROUGH OPERATIONAL TRANSFORMATION

Chinese industries are already under pressure to become more efficient because of rising factor costs, increasingly volatile consumer demand, more complex supply chains, stricter environmental regulation, and overcapacity in some sectors, eroding their profitability. Excess capacity is acute in steel, cement, and other industries that scaled up to meet the needs of China's long construction boom, and these sectors are obvious early candidates for restructuring in order to boost productivity. We identify three opportunities for

[77] For further discussion, see *The China effect on global innovation*, research bulletin, McKinsey Global Institute, July 2015.

[78] BeiGene has accelerated drug discovery by using a proprietary system to test substances on human tissue such as cancerous tumors to get an early indication of potential issues during human trials. WuXi AppTec uses an industrial approach to speeding up drug discovery by deploying massive scale. It employs 7,500 researchers and is expanding from preclinical testing through clinical trials. In genomics research, BGI also uses scale—it has more than 2,000 PhDs and more than 200 gene-sequencing machines—to power through science problems. See *The China effect on global innovation*, McKinsey Global Institute, October 2015.

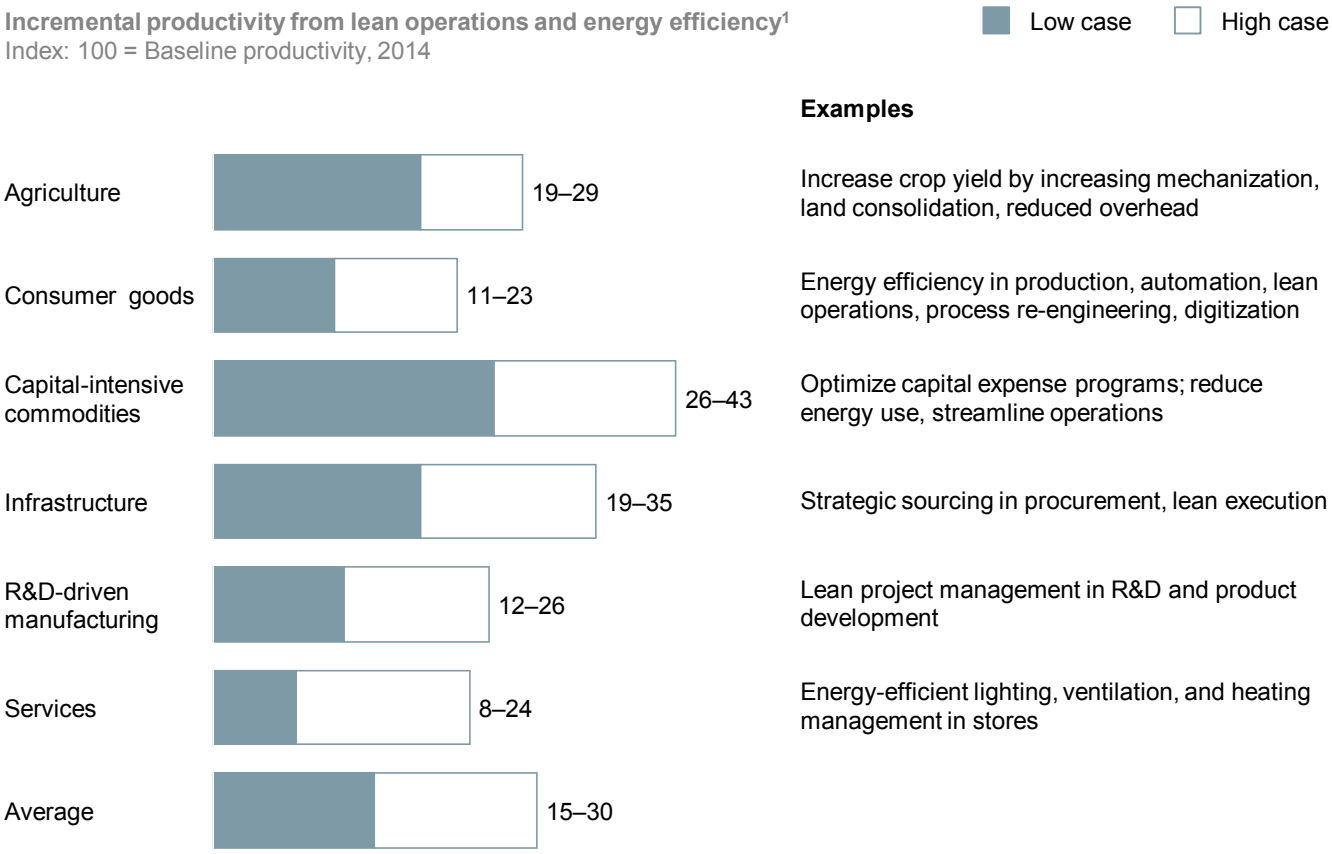
[79] Ibid.

Chinese companies: automation, energy-efficiency, and lean programs to take costs out of operations.

We estimate that comprehensive operational transformation programs, combined with energy-efficiency improvements, can raise productivity by 15 to 30 percent across Chinese industries by 2030. Capital-intensive industries and infrastructure industries have the largest potential for productivity improvement (Exhibit 37). Measures such as machine loading planning, dynamic lean scheduling, and energy-efficiency programs will be particularly helpful in these industries. In consumer manufactured goods, energy efficiency, automation, lean operations, process re-engineering, and digitization can generate productivity improvements by an estimated 11 to 23 percent. In R&D-driven manufacturing, productivity improvements of 12 to 26 percent are possible. These industries make large investments in product development and talent, and therefore lean processes in project management can be helpful. In service sectors such as leisure and hospitality, where labor is up to 20 to 25 percent of costs, lean operations can also improve productivity. In agriculture, with the help of further mechanization and loss of farm workers to urbanization, a productivity improvement of 19 to 29 percent could be possible by 2030 (see Box 3, What companies need to do to achieve operational transformation").

Exhibit 37

Energy efficiency and lean operations can help raise productivity by 15 to 30 percent



1 We use 8 representative sectors (including agriculture, consumer packaged goods, steel, infrastructure, auto, semiconductor, hospitality and leisure) to extrapolate the overall potential to lift productivity, using baseline productivity in 2014 indexed to 100.

SOURCE: CEIC; expert interviews; McKinsey Global Institute analysis

Box 3. What companies need to do to achieve operational transformation

Many companies have struggled to implement automation, energy-efficiency programs, and lean operations, and have therefore had disappointing results. To make these productivity investments pay off, we see four priorities:

Create new "operating systems." Developing a new operating system—the way in which the company manages operations—can enable managers to identify where the most important productivity improvements can be achieved. One steel company developed an operating system to identify operational and energy-efficiency opportunities using flow design and assessments of the effectiveness of equipment. It also designed a lean planning system to ensure proper machine loading and daily management of capacity and demand, as well as flow redesign mechanism to adapt to changes in demand and production capacity.

Change mindsets and behaviors. Productivity improvement initiatives are not likely to succeed unless employees change the way they work and formal change programs are critical for both managers and employees to understand what changes are needed in mindsets and behaviors, why the changes are needed, and why they are good for employees and the company. Only about one-third of change programs succeed. The ones that do have several things in common: leadership has communicated a compelling story about the need for change, top leadership models the change, there are mechanisms to enforce the change, and workers receive adequate training to carry out the change.[1]

Build management infrastructure. To make change stick, companies need to reinforce lean methods and other improvement methods. Establishing mechanisms to measure performance of machines and people—with performance indicators and targets—is the first step. In some Chinese factories, management cannot pinpoint inefficiencies exist and opportunities for improvement because they lack simple measuring systems. Meanwhile, Chinese supervisors tend to focus on basic operations management. Companies should shift more time to people leadership, performance management, and problem solving, but in order to do this they will have to rethink elements of their organization model.

Build expert teams and transformation tools. Managing automation, implementing energy-efficiency programs, and pursuing lean operations all require expert talent. These are not part-time jobs. It often takes a multiyear journey with several phases of implementation to make the kind of changes that produce lasting results. To sustain operational improvement programs, companies should build dedicated expert teams that can lead problem solving and coach production teams. It is important to develop career paths for members of these change teams, including paths to leadership. Companies should also develop proper tools including appropriate information systems. Playbooks that codify improvement programs can be used during training sessions.

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[1] Carolyn Aiken and Scott Keller, "The irrational side of change management," *McKinsey Quarterly*, April 2009.

Automation: Adopting the Chinese human-robot collaboration model

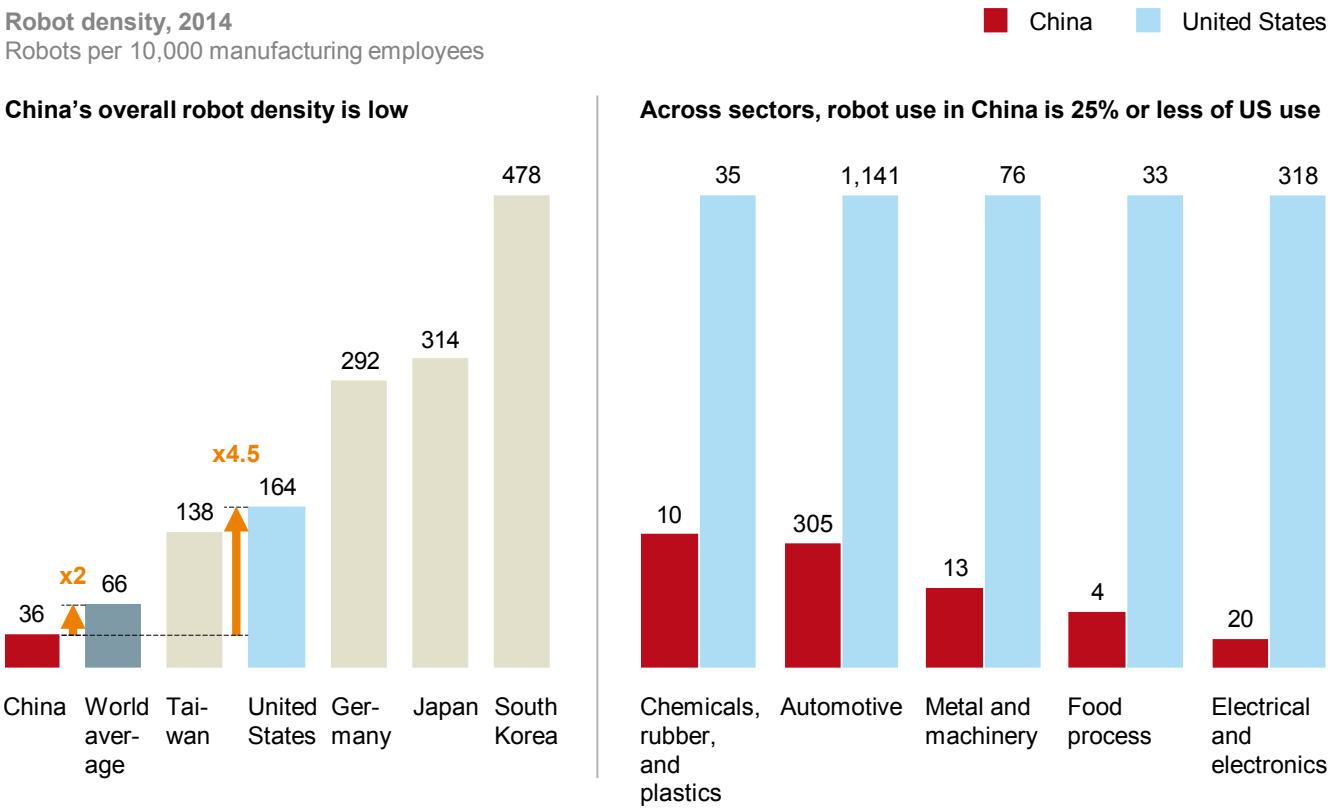
China's labor costs have been rising rapidly over the past decade, placing a burden on companies. However, businesses can respond to this pressure by making efforts to boost labor productivity—laying the groundwork for higher wages in the future. Automation is a major tool for achieving this. The scope for automation in Chinese manufacturing is significant.

Although China is the largest market for robots in the world, its companies still have low levels of automation overall. There are only 36 robots per 10,000 manufacturing workers, about half the average of all advanced economies and about one-fifth the US level (Exhibit 38). Chinese auto factories are less than 30 percent as automated as US plants, and Chinese food processing is only about 12 percent as automated as US food processing. This gap reflects the cost of Chinese manufacturing labor, which has risen but remains low by the standards of advanced economies. The average manufacturing worker makes about 10 percent of the average US manufacturing wage, for example. The high cost of automation equipment has also been a barrier, leading many Chinese companies to adopt a hybrid model that mixes automation and human labor, and thereby achieves speed and precision from the former but the flexibility of the latter. Putting in place fully robotic processes requires steep upfront investment, and while wages are still relatively low compared with other economies, there may not be sufficient impetus to make those outlays. However, eventually the labor cost/investment trade-off will shift and we would expect Chinese companies to add more fully automated production lines.

Exhibit 38

China has a significant opportunity to increase automation across manufacturing sectors

Robot density, 2014
Robots per 10,000 manufacturing employees



NOTE: Not to scale.

SOURCE: International Federation of Robotics, World Robotics 2015; McKinsey Global Institute analysis

Automation also can raise productivity in non-manufacturing sectors. In service sectors, automated checkout machines in stores or artificial intelligence systems used in finance and law for underwriting and research are examples. China also has an opportunity to raise productivity in agriculture substantially by accelerating mechanization. Agriculture is the least productive sector of the Chinese economy at $4,200 per worker per year, and the sector's productivity is also low by global standards—just one-20th of the US level. One reason is the low rate of mechanization with only about 60 percent of farms mechanized, compared with 94 percent in the United States. Another factor is the small size of Chinese farms. Mechanization would have the double benefit of raising productivity but also encouraging larger-scale farms.

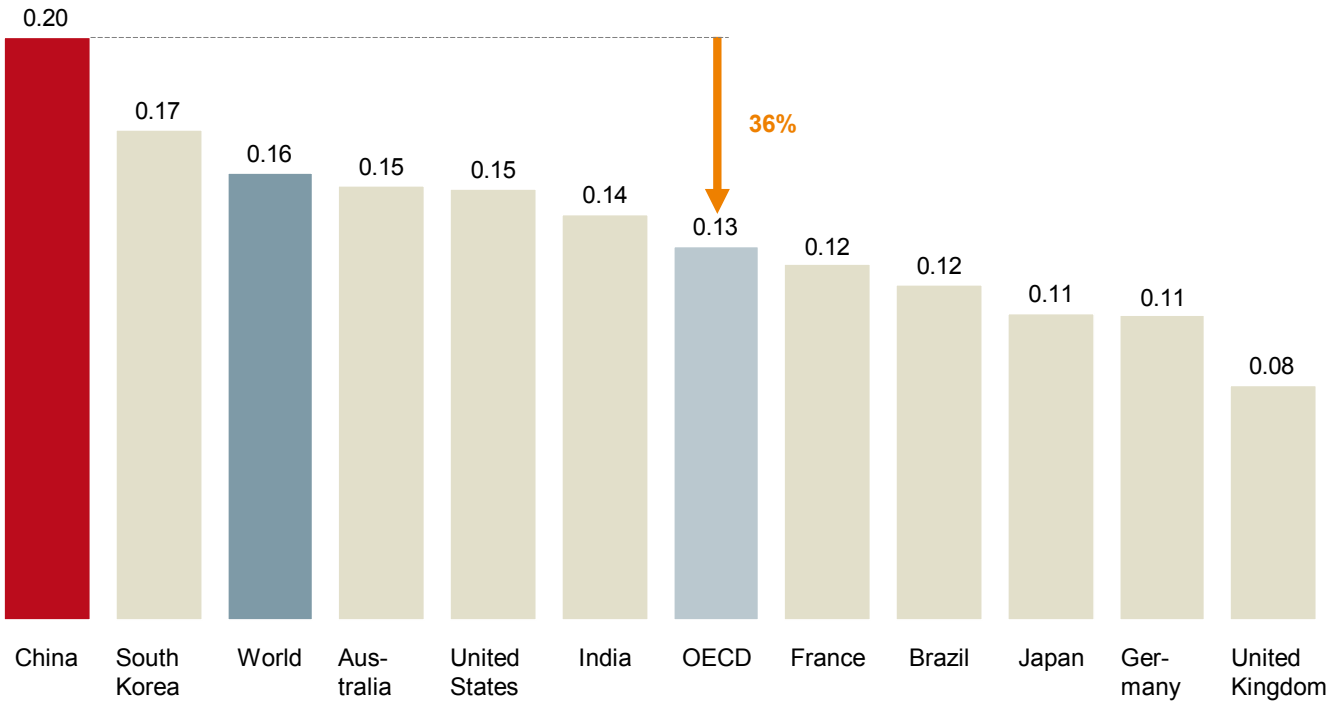
Energy efficiency: Reaching the national goal

Regulatory policy, financial incentives, and cost pressures have all made energy efficiency an important corporate priority, particularly for the largest consumers of energy including utilities, steelmakers, and chemical companies. For many of these industries, energy accounts for 20 to 50 percent of total operating cost. China's economy is still concentrated in industrial sectors, which generate about 45 percent of GDP and account for 70 percent of total energy use. As a result, China's energy intensity is estimated to be about 36 percent higher than the OECD average (Exhibit 39).

Exhibit 39

China uses 36 percent more energy per unit of GDP than the OECD average

Energy intensity of GDP at constant purchasing power parities (2014)[1]
Kilograms of oil equivalent (koe) per unit of GDP ($2005p)



1 The energy intensity is calculated by dividing the total energy consumption of a country by its GDP. It measures the total amount of energy necessary to generate one unit of GDP. Total energy consumption includes coal, gas, oil, electricity, heat and biomass. GDP is expressed at constant exchange rate and purchasing power parity to remove the impact of inflation and reflect differences in general price levels and relate energy consumption to the real level of economic activity. Using purchasing power parity rates for GDP instead of exchange rates increases the value of GDP in regions with a low cost of living, and therefore decreases their energy intensities.

SOURCE: *Global Energy Statistical Yearbook 2015*; McKinsey Global Institute analysis

The government set a goal to cut energy intensity (the cost of energy per unit of GDP) by 20 percent from 2006 to 2010 and by 16 percent from 2010 to 2015. In the 13th Five-Year Plan (2016–20), China put in place another target, this time to reduce energy intensity by an additional 17 percent. China has been meeting its stated goals at the national level, although the pace of reduction in energy intensity has slowed recently.

McKinsey's experience in various industrial sectors suggests that energy savings of 10 to 30 percent can be achieved by measuring waste, setting and enforcing performance goals, and dedicating expert resources to the effort. In chemicals, for example, companies have cut energy costs by 20 to 30 percent in batch processing and by 10 to 15 percent in continuous processing. In downstream steel processing (making wire rods, for example), 10 to 15 percent cost savings are possible. Savings are also available in non-industrial businesses. Savings of 10 to 20 percent have been achieved in retail and warehouse operations by optimizing lighting and heating/air conditioning. But many businesses do not have sufficient knowledge to manage energy-efficiency efforts effectively. Chinese companies often start with only a superficial view of how energy yields, energy output, and energy consumption affect their operations. And managers in charge of operations tend to have limited awareness of current waste or improvement opportunities; when the managers do set goals, they are often conceptual.

Lean operations: Focusing on the quality of execution

While China has built a powerful industrial base with many globally competitive companies, there is room for improvement in how Chinese companies operate. Approaches such as lean and Six Sigma quality programs, which have been used by companies around the world, typically raise productivity by 10 to 60 percent, depending on the sector. These approaches are not new to China, but they have had limited impact because of how they have been implemented. Chinese companies have tended to focus on technical tools and have paid too little attention to the human element—helping workers embrace and adapt to new processes. Moreover, front-line managers have focused on reacting to problems as they crop up, rather than addressing their root causes. In one auto plant that was implementing lean processes, managers spent only about 5 percent of their time coaching and problem solving; 30 percent is the recommended proportion. Results improved after shift meetings were devoted to problem solving and coaching instead of dealing with crises.[80]

OPPORTUNITY 5: GO GLOBAL AND STRENGTHEN COMPETITIVENESS

Expanding internationally can help to strengthen the competitiveness and profitability of Chinese companies by exposing them to new forms of competition and to global best practices. Going up against the world's best competitors can also help companies master the three elements of operational transformation we have discussed. Another benefit of competing globally is gaining access to talent, technology, brands, and other resource that may not be available at home. Chinese companies have been going global for many years, but often in very limited ways. Recently, Chinese companies have been adopting more strategic and sophisticated approaches and more companies outside the manufacturing sector are venturing into international markets, expanding their geographic range, and doing more M&A deals. However, most Chinese companies still need to acquire new capabilities to succeed globally. More globalization on the part of Chinese companies could boost economy-wide productivity by between 10 and 15 percent.

[80] Karel Eloot, Alan Huang, and Martin Lehnich, "A new era for manufacturing in China," *McKinsey Quarterly*, June 2013.

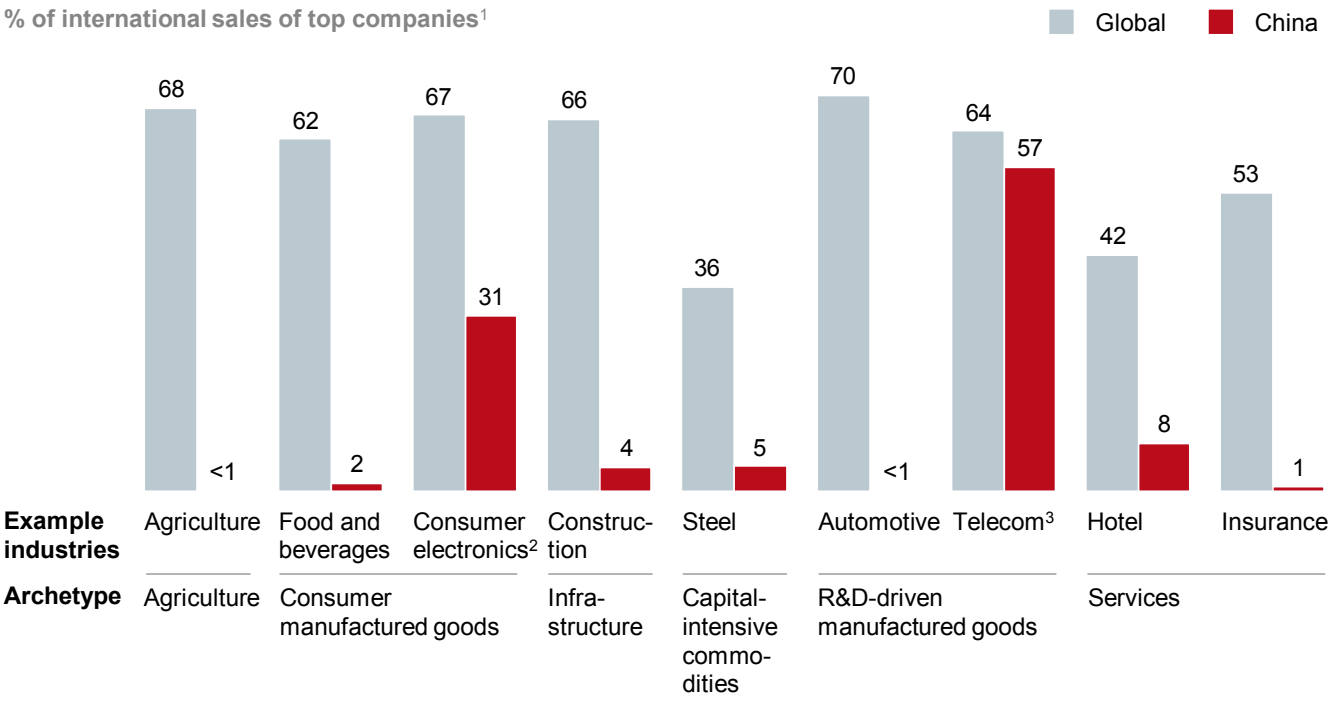
China's globalization remains extremely limited but is evolving

Exports have been an increasingly important driver of growth in the Chinese economy, accounting for 18 percent of GDP in 2000 and an even higher 28 percent in 2015. Although Chinese companies have been tapping into the opportunities of the global market, it remains the case that almost half of exports is generated by foreign invested companies in China. Chinese companies also have long understood that they would need to go beyond export and operate internationally, and not just sell to customers around the world. In 1999, the government articulated a globalization strategy—the "Go Out Policy"—that was designed to increase outbound investment, diversify product portfolios, and improve quality. However, while many Chinese companies have large shares of global sales in many product categories markets on the back of their strong positions in the domestic market, many still do not do business around the world. In 2015, China had 106 companies in the Fortune Global 500, 60 more than in 2010, and second only to the United States. However, the vast majority of Chinese companies on the ranking are in largely domestic businesses such as construction, infrastructure, energy, and finance. Some are resource monopolies and asset-heavy businesses that operate entirely in China; 80 percent are SOEs.

To measure the degree of globalization of Chinese companies, we looked at the share of revenue that they generate overseas. While foreign sales account for 30 to 70 percent of revenue for non-Chinese multinationals, they account for less than 10 percent of the revenue of China's top five multinationals. There are some exceptions to this general pattern. In consumer electronics and telecommunications, Huawei, Lenovo, Midea, and ZTE generate 35 to 60 percent of their sales outside China. Overall, however, Chinese players in all six of our industry archetypes, have very large opportunities to increase overseas sales (Exhibit 40).

Exhibit 40

Most Chinese companies have just started building global sales



1 Average percentage of international sales of top 4–5 Chinese companies and top 9–10 global companies in respective industry based on 2014 data upon availability.
2 Consumer electronics includes household appliance, consumer electronics and technology hardware, and storage and peripherals.
3 Only top 4 Chinese companies and top 7 global companies are included.

SOURCE: Fortune 500 2015; Bloomberg; company annual reports; McKinsey Global Institute analysis

The way Chinese companies go global is evolving. During the early stages of globalization, the main global activity for Chinese companies was filling factory orders for exports for overseas companies taking advantage of China's low labor costs. Now, Chinese companies are pursuing many globalization strategies—building plants and facilities abroad (greenfield investment), entering into joint ventures and alliances with non-Chinese global players, and using M&A to enter new geographies and markets. In some consumer products markets, a foreign acquisition may be the easiest way to overcome a weak brand reputation (see Box 4, "Shopping overseas for brand cachet").

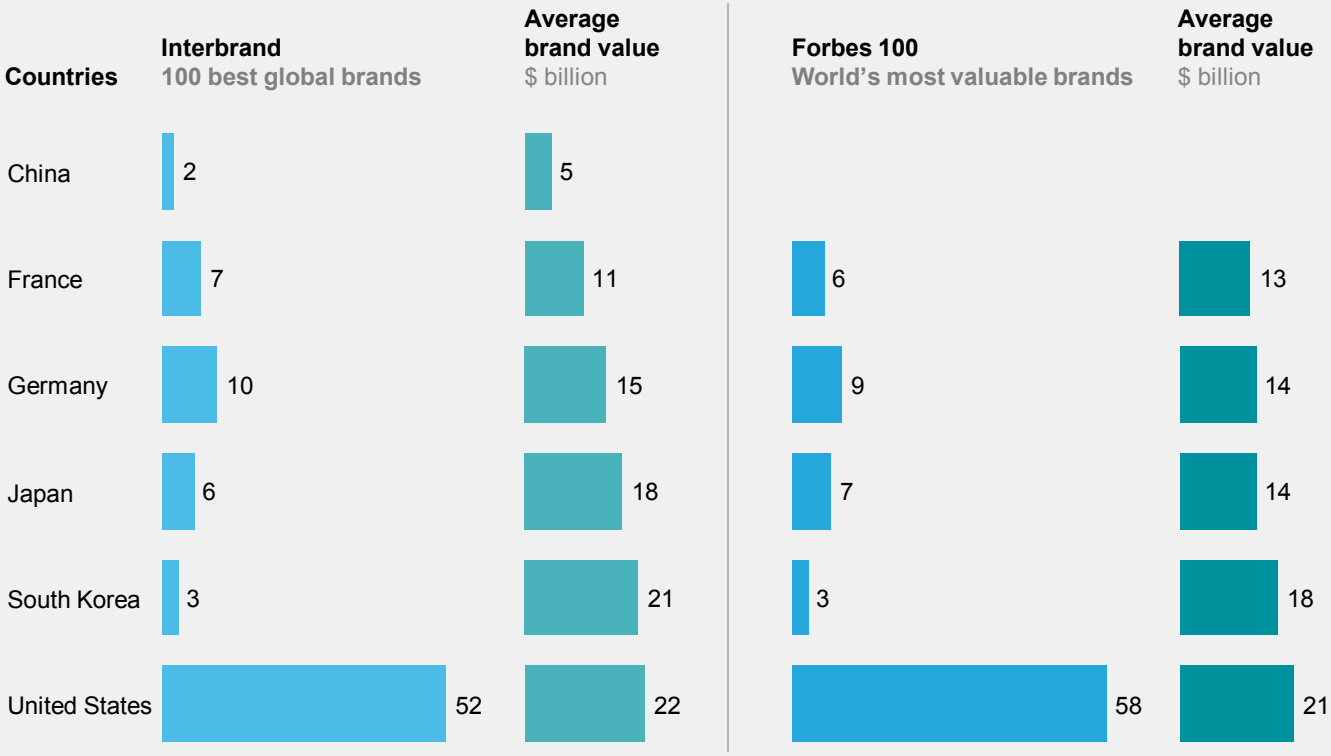
Box 4. Shopping overseas for brand cachet

Overseas M&A could be an important strategy for giving Chinese companies a better footing in consumer markets. A common obstacle for Chinese players in overseas markets is lack of recognition of their brands. Depending on who is doing the ranking, two Chinese brands (Lenovo, Huawei) at most are among the top 100 global brands (Exhibit 41). Only 6 percent of US consumers can name one Chinese brand, according to a recent survey.[1]

Exhibit 41

Few Chines brands are recognized as top brands globally

Number of brands featured



SOURCE: Interbrand; Forbes; HD trade survey; McKinsey Global Institute analysis

[1] Caitlin Dewey, "China's branding failure: Only 6% of US consumers can name one Chinese brand," *Washington Post*, April 5, 2013.

Chinese companies have ratcheted up foreign investment in the past decade. Outward investment by Chinese companies grew 25 percent a year from 2006 to 2014 to reach $123 billion in 2014. China's foreign inward direct investment has been growing at 7 percent, reaching $128 billion in 2014. Cross-border M&A by Chinese companies has also risen rapidly, more than doubling from 242 deals valued at $50 billion in 2008 to 608 deals worth $112 billion in 2015, according to Dealogic. Premier Li Keqiang has said that China is likely to invest more than $1 trillion overseas over the next five years.[81]

The nature of overseas M&A is also changing. In the past decade, Chinese companies have moved from acquisitions in resource industries such as energy and materials to deals aimed at extending capabilities in industries such as technology and services. Meanwhile, deal volume in traditional sectors has fallen. Energy and materials deals, which together accounted for 62 percent of deals between 2006 and 2010 fell to 46 percent in 2011 to 2015 (Exhibit 42). The fastest-growing category is service businesses, including real estate, transportation, dining, lodging, leisure, and entertainment. Service deals more than doubled from 7 percent of the total in the 2006–10 period to 16 percent in 2011–15.[82] Technology deals have jumped from 2 percent of the total deal values between 2006 and 2010 to 10 percent from 2011 to 2015.[83]

The nature of overseas M&A is also changing. In the past decade, Chinese companies have moved from acquisitions in resource industries such as energy and materials to deals aimed at extending capabilities in industries such as technology and services.

The geography of Chinese overseas M&A is also shifting. Deals in North America rose from 17 percent of transactions in 2006–10 to 25 percent in 2011–15, with 60 percent in the United States. Within the US market, services and telecommunication deals have increased significantly, accounting for 46 percent of the M&A deal value in the past five years. A final and important change is the growing M&A activity of private Chinese companies overseas. Although SOEs continue to benefit from access to more resources and government, private companies are increasing their role. The share of deals by state-owned companies fell from 68 percent of total value in 2008 to about 49 in 2014, according to Ministry of Commerce data.

81 "Li: China will invest US$1 trln overseas in next 5 years," *China Daily*, November 25, 2015.

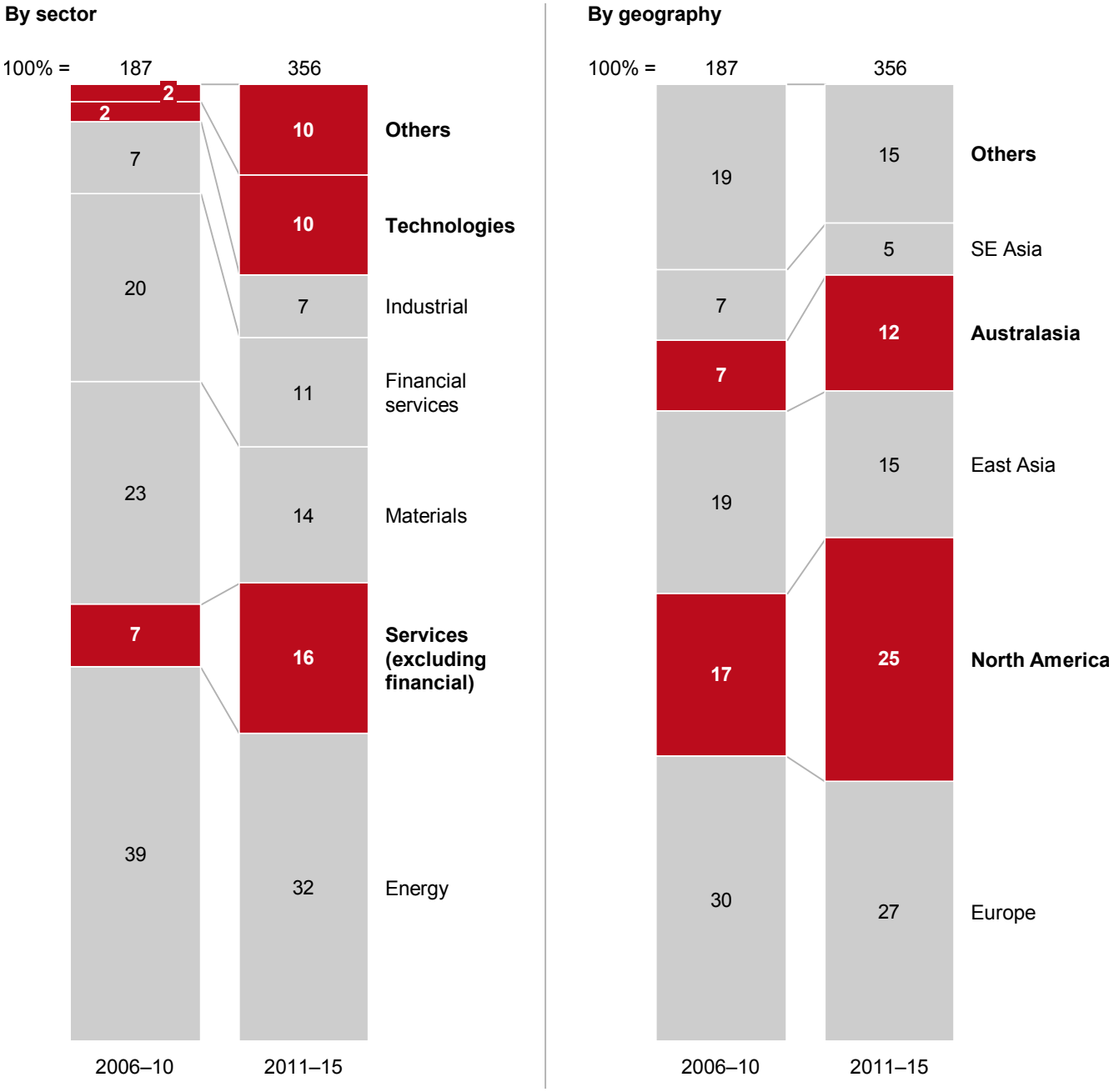
82 Examples include Wanda, China's largest real estate company, which has acquired stakes in overseas businesses including AMC Holdings, the US-based movie theater chain (for $2.6 billion in 2012); film studio Legendary Entertainment ($2.5 billion in 2016); UK yacht builder Sunseeker ($500 million in 2013); and the Atletico Madrid football club ($45 million in 2015). Fosun, a financial conglomerate, has been acquiring travel and leisure assets, such as France's Club Med in 2014 ($1 billion); it also acquired a stake in Thomas Cook, the UK-based travel agency, in 2015 ($140 million). Real estate deals account for 35 percent of total service-sector deals. One of the most notable was the 2014 purchase of New York's Waldorf Astoria hotel by Anbang Insurance for $1.95 billion.

83 Lenovo bought Motorola's mobile phone business in 2014 (for $3.1 billion) and IBM's server business in 2014 ($2 billion). In semiconductors, Jiangsu Changjiang Electronics Technology bought Singapore-based STATS ChipPAC for $1.7 billion, and Tsinghua Unigroup bought Taiwan-based Siliconware Precision Industries also for $1.7 billion in 2015. In the internet services market, Tencent acquired South Korea-based CJ Games in 2014 ($494 million), and Alibaba (and affiliated companies) has been doing global deals on internet companies across the world—India based e-commerce company One97 Communications in 2015 ($500 million) and US-based mobile messaging company Tango in 2014 ($280 million).

Exhibit 42

Chinese outbound M&A is shifting to non-resource categories and into new geographies

M&A deal value breakdown
%; $ billion

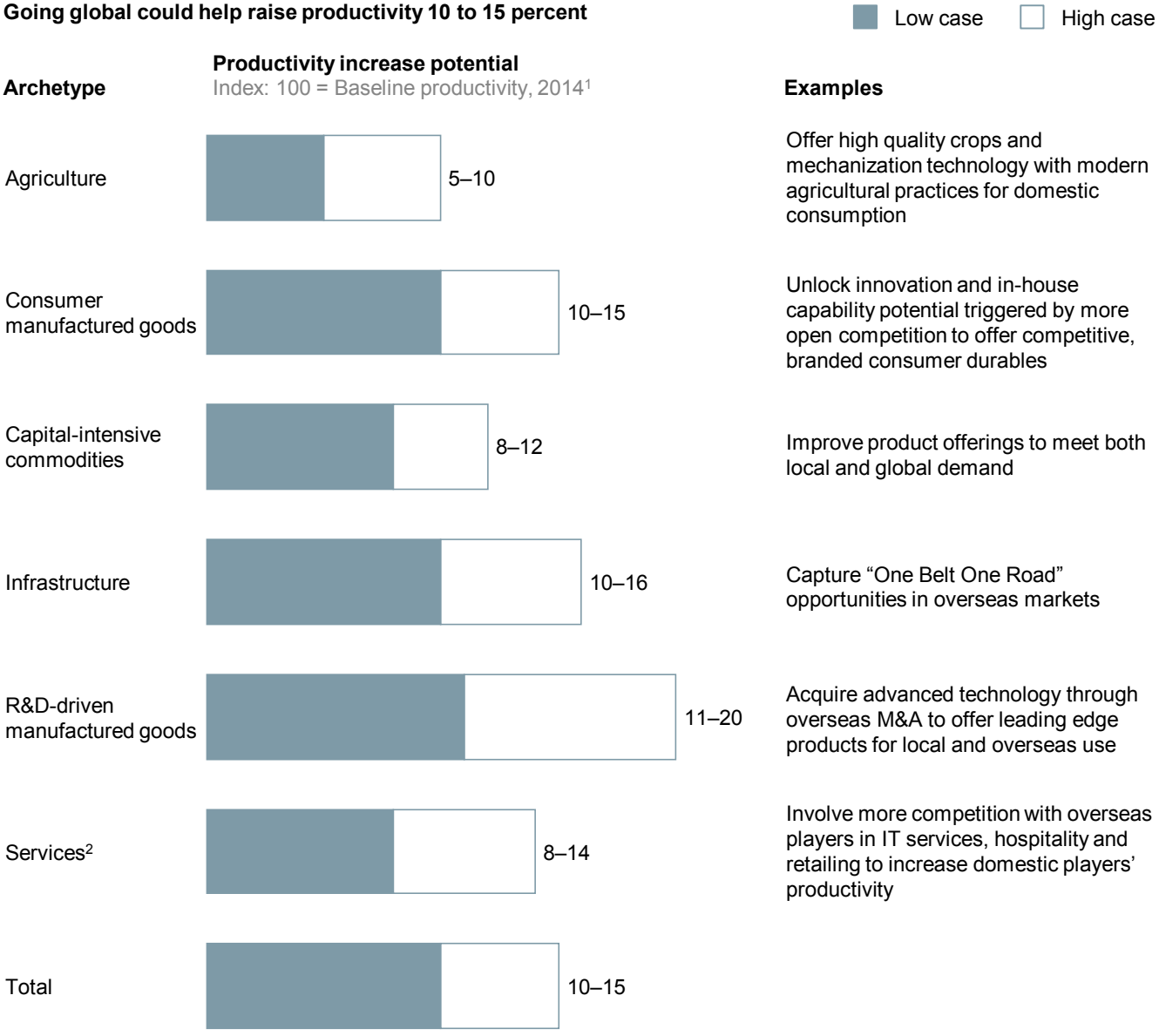


SOURCE: Dealogic; McKinsey Global Institute analysis

We estimate that globalization can increase China's productivity by 10 to 15 percent over the next 15 years (Exhibit 43). The highest productivity improvement potential from going global is in R&D-intensive manufacturing, where improvements could reach 11 to 20 percent. In infrastructure and capital-intensive industries, China's One Belt, One Road project could be an important source of overseas demand (see Box 5, "Emerging opportunities: One Belt, One Road"). In agriculture, there is marginal potential mainly through using lower-cost input to offer high-quality, high-valued crops for exports overseas.

Exhibit 43

Going global could help raise productivity 10 to 15 percent



1 We use 9 representative sectors (including agriculture, food and beverages, steel, utilities, construction, auto parts, semiconductor, health care, and tourism) to extrapolate overall productivity lift potential, using baseline productivity in 2014 indexed to 100.
2 Excluding financial services.

SOURCE: CEIC; expert interviews; McKinsey Global Institute analysis

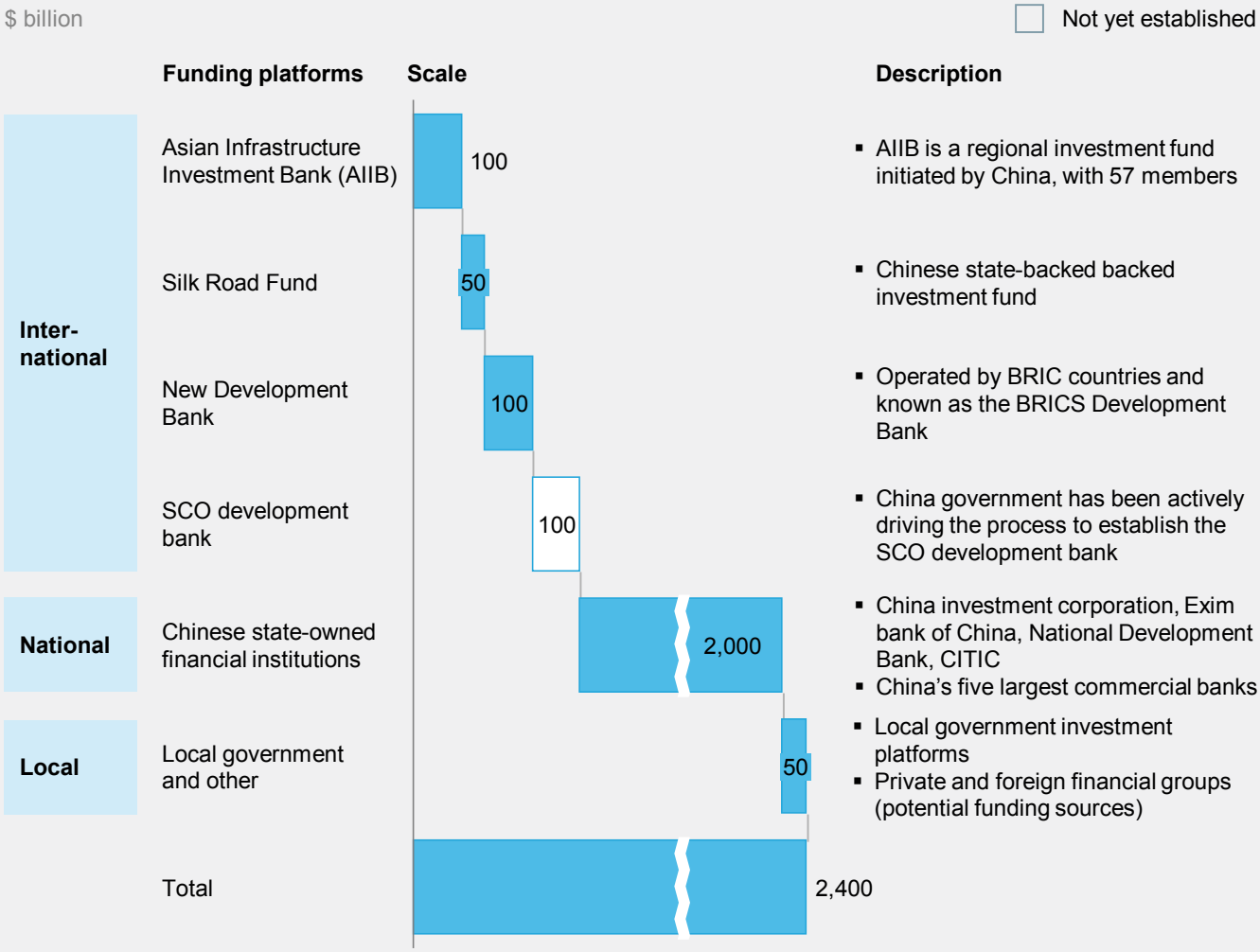
Box 5. Emerging opportunities: One Belt, One Road

There is one particularly important opportunity for Chinese companies to expand internationally over the coming decade. The government's "One Belt, One Road" initiative is a development strategy to link China much more closely with markets in Central Asia and Europe. It is named because its aim is to establish stronger trade ties along the old Silk Road between China and Eastern and Western Europe via Central and Western Asia. This area is home to 4.4 billion people, or 63 percent of the world's population, and generates 29 percent of global GDP, or GDP of $21 trillion as of today.[1] The Chinese government is expected to facilitate more than $2 trillion investment with part of the money coming from local Chinese governments and the rest from state-sponsored investment funds (Exhibit 44).

Several deals and projects have already been initiated. In April 2015, the Silk Road Fund launched Pakistan's 720-megawatt Karot hydropower project. In June 2015, Silk Road and China National Chemical Corporation teamed up to buy Italian tire manufacturer Pirelli. In September 2015, Novatek, a Russian gas producer, signed an agreement for Silk Road to purchase a stake in its Yamal liquefied natural gas project in Sabetta, northeast of the Yamal Peninsula in Russia. The massive infrastructure investment that is envisioned would help activate idle capacity in some of China's sectors. In addition to opening new markets for Chinese goods, "One Belt, One Road" can benefit service sectors such as finance and tourism.

Exhibit 44

A funding platform is being created for One Belt One Road projects



SOURCE: Press search; expert interviews; McKinsey Public Sector Practice; McKinsey Global Institute analysis

[1] Gao Hucheng, "Deepening trade collaboration, creating new successes," *People's Daily*, July 2, 2014.

Going global is a complex, high-risk undertaking for Chinese companies

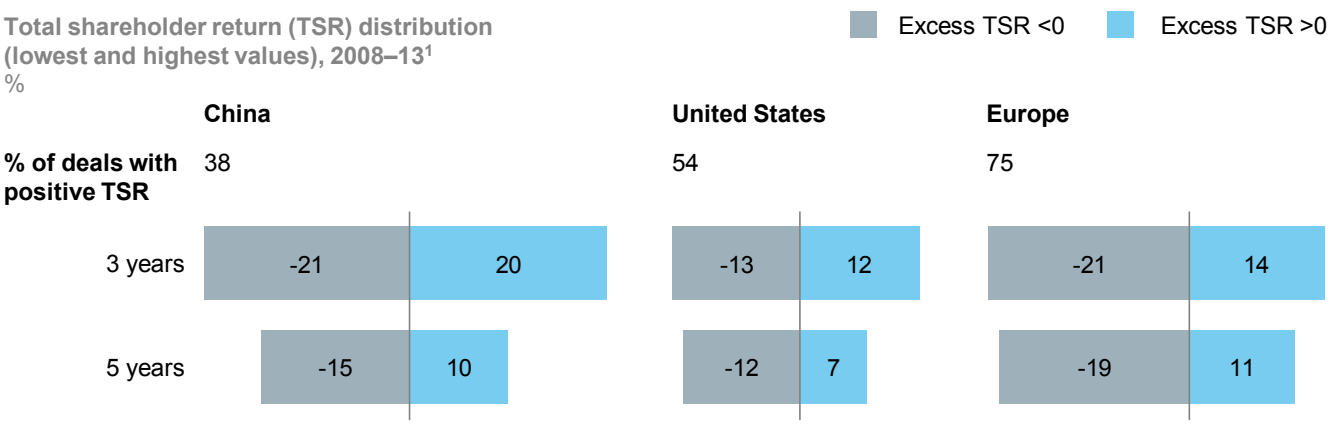
Chinese companies can improve their chances of success by defining a clear strategy for overseas initiatives, identifying the core competencies that the organization can employ globally, building an appropriate management model, and investing in creating a robust M&A process.

It is not easy to manage mergers and acquisitions successfully even when companies are in the same country and know each other's business intimately. Cross-border deals add another level of complexity by, for instance, introducing cultural differences that can hamper post-merger performance. Indeed, the performance data from Chinese outbound acquisitions indicate that Chinese companies have a lot to learn about making overseas deals pay off. Looking at total returns to shareholders three and five years after acquisitions, Chinese acquirers do worse than European and US acquirers—although overseas acquisitions by companies in all three countries (on average) reduce total returns after five years. More than three-quarters of EU deals and more than half of US deals generated additional returns, but only 38 percent of Chinese deals had positive returns (Exhibit 45).

Exhibit 45

The payoff from overseas M&A deals by Chinese companies has been low

Total shareholder return (TSR) distribution (lowest and highest values), 2008–13[1]
%



1 Includes deals where market cap was at least 5% of acquirer market cap. This includes 40 deals for China, 158 for Europe, and 185 for US. When calculating excess total returns, we used Shanghai stock exchange composite index for Chinese acquirers, MSCI world index for EU acquirers, and S&P 500 for US acquirers to calculate market average total returns and excess returns (returns exceeding market average).

SOURCE: Dealogic; McKinsey Corporate Finance Practice; McKinsey Global Institute analysis

We see three approaches that companies should consider pursuing to enable their further globalization:

- **Define a clear strategy.** In interviews, 80 percent of Chinese executives say that globalization is their top priority.[84] However, not many of them can articulate a clear objective for going global. There are usually two main motivations: expand a company's business by accessing new markets, and strengthening capabilities and resources. Samsung Electronics, a South Korean technology company, set itself an ambitious strategic global initiative in the 1990s to develop as a top player in global technology. The company identified two major objectives: to expand prudently outside its home market, and to ensure that its overseas units had the core competencies of product excellence and skills to be self-sufficient. Samsung purchased technology and formed alliances with key technology suppliers, and eventually moved into 60 overseas markets. Today, nearly 90 percent of its revenue is generated outside the home market.

84 Meagan C. Dietz, Gordon Orr, and Jane Xing, "How Chinese companies can succeed abroad," *McKinsey on Finance*, number 28, summer 2008.

- **Identify core competencies.** An examination of some of the most globally successful Asian companies reveals core competencies need to manage a global business including excellent products, an innovative business model, and effective leaders and management systems. In product excellence, winning product or service concepts can easily be easily replicable and applicable beyond the home market. An innovative business model in a domestic market can be applied to global markets to replicate that success. Toyota, the market leader in smaller, fuel-efficient cars in Japan in 1980s, established a superior management system—"the Toyota Way," a highly disciplined, lean, just-in-time production system that enabled its success. A central challenge of operating globally is to develop a balanced management system in which overseas units are able to do what is needed to succeed in local markets while supporting the company's global strategy and goals. At Lenovo, about 50 percent of top management are non-Chinese. Lenovo's headquarters functions play a strong coordinating role, implementing and enforcing standardized policies, procedures, and systems. Country offices, however, can make strategic decisions for their markets. Lenovo also initiated a global talent management program, identifying 200 high-potential candidates to be developed as global leaders.

- **Strengthen cross-border M&A execution capability.** As we have noted, the payoff from overseas deals by Chinese acquirers has varied more than the payoffs in deals by European or US acquirers. Companies can improve the odds of success by creating an M&A process that clearly defines how the company will proceed from defining strategic objective to identifying and screening targets, sourcing deals, due diligence, and comprehensive post-merger management, including organizational and cultural integration.[85] This requires a dedicated in-house M&A team, with clearly defined roles and responsibilities. The dedicated M&A team at 3M, for instance, starts with six standard questions to determine strategic fit, financial fit, organizational fit (potential for successful integration), key risk factors, motivation, and process.

•••

The opportunities we outline in this chapter are not exhaustive. Across the Chinese economy, in every industry and in every public agency, there are many more ways to introduce new technologies, rethink old processes, and raise productivity. By focusing intently on using resources productively, innovating new products and business models, and pushing for continuous operating improvements, China can achieve its aspiration to become an advanced economy.

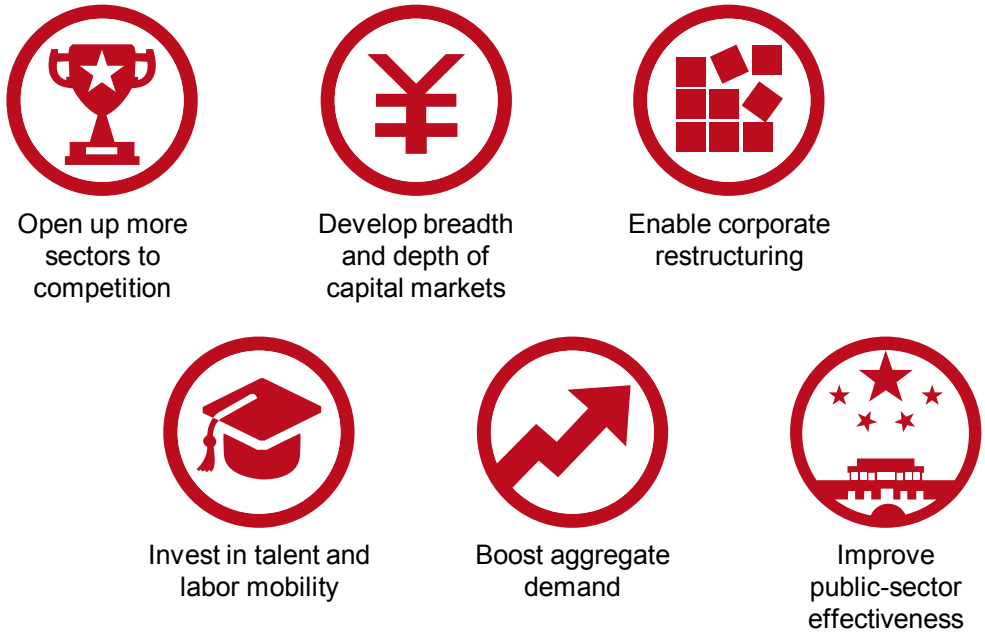
[85] For more detail, see forthcoming report: David Xu et al, *Outbound M&A excellence: Building M&A capabilities for Chinese leaders*, McKinsey & Company.

3. TRANSFORMING INSTITUTIONS TO ENABLE THE TRANSITION

Guiding an $11 trillion economy with 1.4 billion people onto a new path is an unprecedented challenge. China needs not only to consider if, and when, it will lead a transition to a new economic model, but how to do it. It seems clear that a successful implementation of such a large-scale transformation requires sweeping change to institutions. In this chapter, we discuss six major policy thrusts that would address the growing dangers posed by investment-led growth, establish a productivity-led model, and help China seize the opportunities we have discussed (Exhibit 46).

Exhibit 46

Transforming institutions to enable the transition



SOURCE: McKinsey Global Institute analysis

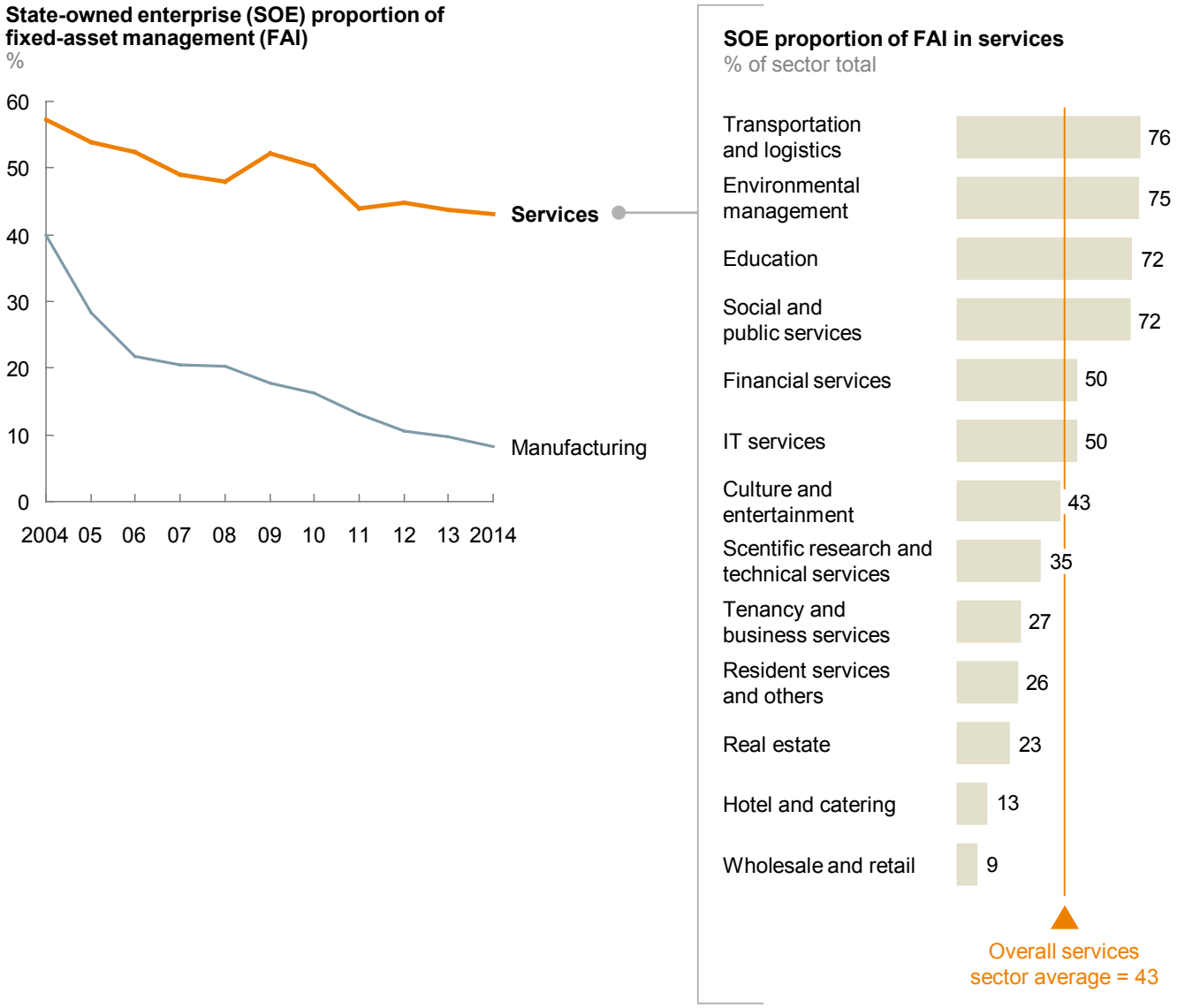
1. OPEN MORE SECTORS UP TO COMPETITION

43%
fixed asset investment in service sector made by SOEs in 2014

China has done a great deal to make its economy less dependent on SOEs. The share of fixed-asset investment in manufacturing made by SOEs dropped from 40 percent in 2004 to 8 percent in 2014. In services, the share dropped from 57 percent to 43 percent. However, further progress is needed. In health care, transportation, telecommunications, education, and financial services, SOEs still make more than half of fixed-asset investment in China (Exhibit 47). The continuing domination by SOEs often leads to limited competition, a lack of motivation to innovate, and limited choices for consumers. Continuing reforms to open up markets and remove regulatory barriers to growth can help to improve service-sector productivity and to provide consumers with improved services and better prices.

Exhibit 47

State-owned enterprises account for most fixed-asset investments in many service industries



SOURCE: National Bureau of Statistics, China; CEIC; McKinsey Global Institute analysis

Unleash true market competition

Some of the largest service sectors in China remain virtual monopolies of SOEs. To raise productivity and improve quality of services, more opportunities to encourage competition from private companies should be created. For example, in the telecoms sector that today is dominated by three state-owned carriers, the Ministry of Industry and Information Technology issued 11 mobile virtual network operator licenses to private companies in 2014, allowing them to resell mobile service and create packages and features to serve unmet customer needs. However, these virtual operators—that include the online selling giant Alibaba—have taken less than 1 percent of the market. Reports suggest that they have not generated much profit out of the new business because they lacked sufficient bargaining power to obtain a competitive "wholesale" price from the three big telecom companies, and their products are not competitive with those of the big three in the retail market.[86]

[86] C. Custer, "None of China's virtual telecom operators are making money," *Tech in Asia*, July 21, 2015.

Provide more choice to the consumer

A poorly designed economic model that limits consumer and provider choice can raise the costs of services and have a negative impact on their quality. One kind of ineffective economic model is insufficient funding in the public sector. In health care, for instance, government funding falls short of what is needed, and therefore public hospitals rely on a 15 percent markup on drug sales for 40 percent or more of their revenue. Doctors, who are paid about 6,000 renminbi ($900) per month, are motivated to overprescribe drugs. As a result, 40 percent of total health-care spending in China in 2014 went on drugs, compared with 16 percent, on average, in OECD countries.[87] Reforms are under way, including limiting revenue from drug markups to 30 percent of a hospital's overall revenue, and lowering the price of a wide range of drugs.[88] But without reforming the economic model itself, so that it works for all stakeholders in the system, the impact of such measures could be limited. Indeed, hospitals have responded to price cuts on drugs by switching to costlier alternatives or prescribing more unnecessary drugs. One option worth serious consideration would be to encourage more competition from private health-care providers as a way of improving services and productivity. Private hospitals could also take the pressure off overcrowded public hospitals. However, despite low pay, top doctors are reluctant to leave large public hospitals because of unclear career paths and the risk that they could lose a platform for their academic research. With proper incentives and policy support to encourage doctors to practice in multiple sites including private hospitals, more doctors can explore entrepreneurial opportunities to serve the unmet needs of Chinese patients.

Build trade in services

Services are becoming an increasingly important part of global trade, but still account for only 10 percent of Chinese trade (exports and imports), compared with 24 percent in the case of the United States. Digitally deliverable services—that can include everything from content to IT outsourcing—are a particularly promising opportunity. Global volumes of digital trade doubled to $2.4 trillion (16 trillion renminbi) per year from 2004 to 2014.[89] To participate in this growth area, China can review how restrictions on online communications affect the economy's ability to compete globally in digitally delivered services. Trade restrictions limit a range of opportunities in services. According to the OECD's trade restrictiveness index, China has higher-than-average trade barriers in services such as accounting, legal services, motion pictures, commercial banking, insurance, air transport, and telecommunications. Trade liberalization can help China's service sector to grow, both by opening up new markets overseas for Chinese companies and through exposure to global competition in China. The government's current effort to promote services trade in ten free trade zones is a step in the right direction and could be expanded to more cities.

2. IMPROVE THE BREADTH AND QUALITY OF CAPITAL MARKETS

Capital productivity in China has declined in part because of the way capital is allocated. SOEs have had privileged access to capital through the formal banking system and also in the capital markets. Meanwhile, many private companies, particularly small and medium-sized enterprises, have struggled to secure funding or have had to pay extremely high prices. For the productivity-led growth approach to work, it is very important for the market to decide where capital flows. China therefore needs stronger debt and equity markets, with a greater diversity of investors. It also needs an independent and reliable credit rating system and greater transparency by government about monetary and fiscal policy and how it gathers data and generates statistics. Finally, China needs find ways to fund the millions of small businesses in the economy that could grow and to create jobs.

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87 "Physician, heal thyself," *The Economist*, February 1, 2014.

88 Ibid.

89 *Digital globalization: The new era of global flows*, McKinsey Global Institute, March 2016.

Build better-functioning bond and equity markets

China has the world's third-largest bond market ($6.3 trillion or 40 trillion renminbi) and the fourth-largest stock market ($5.7 trillion or 37 trillion renminbi). However, these markets do not yet function as efficient allocators of capital. Some 60 percent of corporate financing is still done through banks. And banks are also the biggest investors in the bond market, holding about 61 percent of bonds outstanding.[90] Banks also tend to hold bonds to maturity, in effect eliminating a secondary market. It is estimated that about 86 percent of bond issues are from state-affiliated entities. Domestic bonds in China have shorter maturities than in more advanced markets. For example, the average bond maturity in China is estimated to be around 4.5 years compared with seven years in Germany and nine years in the United States. Such maturities may have limited appeal for issuers and investors who generally turn to the bond market for longer-term stable financing or investment. The combination of these factors have meant that the bond market, while large in size, remains dominated by a limited number of issuers and investors.

4.5 YRS
average bond maturity in China vs. 7 to 9 years in Germany and the United States

To attract more investors and issuers, the Chinese bond market needs simpler legal and regulatory processes, a sound bankruptcy regime, and an independent, credible debt ratings system that can be benchmarked against established credit evaluation matrix (see more discussion on this point below). For example, specifically to attract international investors and issuers who are barely visible in the Chinese bond market today, regulators can streamline securities registration procedures and clarify policy pertaining to the repatriation of proceeds. Eight government agencies are currently involved in regulating three different bond markets and the various debt instruments therein, which adds complexity to the process of bond issuance and investment. The requirement for foreign issuers to be re-rated locally adds another layer of complexity. Recognizing existing debt ratings from the accredited international rating agencies could encourage more foreign issuers to offer bonds in Chinese markets. A more diverse pool of issuers is also needed. Allowing an onshore high-yield debt market to develop would make it easier for companies that are currently using offshore markets to issue domestically. This would help to attract more investors while potentially also bring down funding costs for issuers of high-yield debt.

There are two major issues that prevent the Chinese equity markets from functioning as efficient allocators of capital. The first of these is the fact that the market is dominated by fragmented retail investors, who account for 80 percent of trades, explaining why the Chinese stock market is so highly volatile. They tend to have a very short time horizon for making trading profits compared with institutional investors who turn to capital markets as a source of buying and holding shares in companies that they believe will deliver strong returns over the longer term. The second issue relates to the process for registering securities. The China Securities Regulatory Commission controls both the timing and pricing of new issues and has, on occasion, temporarily halted all initial public offerings (IPOs). In February 2016, the agency said that 900 companies were waiting for IPO listings. Moreover, the listing requirements are stricter than on stock exchanges in some advanced economies, with thresholds on revenue and profit requirements that can discourage some fast-growing companies, especially in technology industries, from registering in China. Timely implementation of the reform agenda will be a critical step toward providing much needed capital on time for productive companies and reward innovators.

Both equity and bond markets could benefit from the stabilizing presence of institutional investors, who generally have longer time horizons and could be a source of patient capital for productive enterprises. Policy makers can encourage more active participation of institutional investors in the bond and equity markets. Chinese insurance companies, for example, still hold about 30 percent of their assets in bank deposits, compared with just 4 percent in the case of US-based insurers. One result of this is that investment returns of

[90] *China's domestic bond market: The next financing engine*, Goldman Sachs, September 21, 2015.

Chinese insurance companies fell from 12 percent in 2007 to 6 percent in 2014. More than 80 percent of China's pension fund assets are held in bank deposits, compared with less than 5 percent in Japan, the United Kingdom, and the United States.

These allocations are partly driven by longstanding government regulations, which have recently been relaxed. For example, until recently, the state pension fund was allowed to put money only into bank deposits and government bonds. In May 2016, the government announced that the pension fund can now also hold up to 30 percent of net assets in equities.[91] In 2014, the China Insurance Regulatory Commission scrapped ceilings on fixed-income holdings and raised the cap on equity investment (including both publicly traded stocks and private equity) from 20 percent of total assets to 30 percent. These measures can certainly help to create more stable and long-term holdings in bond and equity markets. However, institutional investors are unlikely to fully commit to bonds and equities until the markets have a diversity of listings and product types (bonds with different maturities and yields), and markets have been proven to be transparent, with trading and pricing determined by market forces. One indication that there is more work to be done is that, despite the fact that insurance companies can put 20 percent of assets into equities in 2014, on average they allocated only 11 percent of assets to stocks.

Build a robust credit rating system

A robust and independent credit rating system can help banks sharpen their lending skills, give investors a way to assess the risks they may be taking, and allow companies to attract capital. China has five local credit rating agencies with some state affiliation. For local credit rating agencies to improve their reputations with investors, greater efforts to expose and publicize their rating methodologies and criteria are needed to enable improved benchmarking against established international credit rating practices. There have been several instances in which bonds had high investment grade ratings on the domestic rating scale, within weeks of defaulting. While not isolated to China, such instances tend to hurt investor confidence.

China can further develop an independent and credible credit ratings system by encouraging domestic rating agencies to improve rating criteria based on internationally established credit assessment methodologies. Publishing rating criteria together with information on their methodology of credit ratings assigned can all help to build confidence among investors, and raise the credibility of the ratings. Hiring seasoned credit analysts, seeking accreditation from international regulators, and forging deeper partnerships with established rating agencies to develop methodology should all be explored.

Increase policy and data transparency

As in other countries, in China the government and the central bank have enormous influence over the real economy and the markets. When governments and central banks are clear about their intentions about shifts in policy, investors can make informed decisions about the implications for their portfolios. When policy is opaque and shifts are not explained, markets can react violently. In the summer of 2015, China touched off turmoil in domestic and international markets when it decided to depreciate its currency without effective advance communication. The move gave rise to speculation that a large devaluation was beginning, which accelerated the exodus of capital from the country. The subsequent decision to prop up the stock market caused additional uncertainties, particularly because the intervention did not quell market volatility. Timely and transparent communication by authorities can avoid the uncertainty and confusion that lead to sell-offs.

[91] Li Xiang, "Pension funds inch closer to stocks," *China Daily*, May 9, 2016.

Government can also serve investors, companies, and markets by providing reliable data and being transparent about how official statistics are calculated. The speed with which China publishes GDP data, the tendency for results to line up with projections, and the lack of revisions have raised some questions about the reliability of these data, although bottom-up research of a series of indicators on Chinese economic activity tends to confirm that GDP is still a useful indicator, reasonably reflecting the direction of economic trends.[92] Another question arises from the discrepancies between national and regional GDP figures. In 2015, reported growth data from China's provinces implied GDP growth of about 8 percent, rather than the 6.9 percent that National Bureau of Statistics announced.[93] China's national statistics agency can address questions about data quality by improving transparency. Compared with other national bureaus, the agency provides relatively little information about source data or statistical frameworks, making independent verification of its numbers impossible. Greater transparency about how data are compiled and how statistics are calculated (possibly including outside peer review) would build confidence in official data and help identify where improvements are needed.[94]

Improve SME financing

Capital is not being allocated—efficiently or inefficiently—in sufficient amounts to China's SMEs. These businesses account for 97 percent of registered industrial companies and 65 percent of employment. Yet, they received only 23 percent of bank loans in 2013.[95] A World Bank survey of 2,700 private firms in China found that only 25 percent had bank credit.[96] Non-bank lenders have been known to charge as much as 35 percent interest for a six-month loan.

By contrast, in Germany, only 7 percent of SMEs report problems obtaining financing.[97] One way Germany provides access to funding for small companies is through the government-owned KfW Group. KfW is a development bank that provides publicly funded loans through regular banks, which use standard risk assessment methods and set the same requirements that they use in other commercial loans. Germany has more than 2,000 banks, and local commercial banks have good knowledge of the market, local business conditions, and probably many of the companies that seek KfW loans.[98]

The Chinese government has been encouraging banks to lend more to small businesses and has ordered banks to meet targets for small business lending (as a share of loan portfolios) and reduce the risk weighting of small business loans. However, the scheme has loopholes. Banks have met their targets by lending to subsidiaries of SOEs or suppliers affiliated with SOEs.[99] To improve results, policy makers can support capability building by banks to develop stronger skills to better assess the risk of smaller borrowers and to tailor loans to their needs. Chinese banks tend to apply the same criteria for all borrowers, focusing on hard assets such as real estate and equipment that can serve as collateral, rather than the ability of the business to generate cash. SMEs, particularly in services, might have little collateral, but might also have little trouble meeting loan obligations. Taizhou Bank, a city commercial bank in Zhejiang province that specializes in serving SMEs and individual

92 Jonathan Anderson, *China activity picks up in Q1 but . . .* Emerging Advisors Group, April 18, 2016.

93 Wang Cong and Xie Jun, "Analysts say local GDP numbers don't add up, failing to reflect actual growth," *Global Times*, January 31, 2016.

94 Ben S. Bernanke and Peter Olson, *China's transparency challenges*, Brookings Institution, March 8, 2016.

95 Kellee S. Tsai, *Financing small and medium enterprises in China: Recent trends and prospects beyond shadow banking*, Hong Kong University of Science and Technology Institute for Emerging Market Studies, working paper number 2015-24, May 1, 2015.

96 World Bank Enterprise Surveys

97 *Survey on the access to finance of enterprises in the euro area: April to September 2015*, European Central Bank, December 2015.

98 Phil Thornton, "A gateway to better lending—learning from the German model," *Financial Director*, February 2014.

99 Pete Sweeney and Gabriel Wildau, "Analysis: Forced lending to China SMEs may risk more harm than good," Reuters, November 19, 2013.

business owners, has a non-performing loan ratio that is half the national average, reflecting the bank's strong risk-management capabilities.[100] One way that Chinese banks can learn best practices in small-business lending is by working with foreign banks that have already got proven track records and methods in other markets.

Government can also help improve access to credit for small companies by approving new types of banks. The China Banking Regulatory Commission announced a plan to issue five privately owned online banking licenses in 2014. The top three internet companies—Baidu, Alibaba, and Tencent—all applied for licenses and launched internet banking businesses that offer business loans. Policy makers can continue to provide a supportive regulatory framework that can help these new players compete effectively with established banks. New rules, such as allowing remote verification of new customers via facial recognition technology, for example, could allow online banks to take advantage of their distinctive capabilities.[101]

3. ENABLE CORPORATE RESTRUCTURING

One result of investment-led growth model is overcapacity in traditional industries and a long tail of poorly performing companies in several sectors (see Box 6, "Rationalizing excess capacity"). SOEs continue to attract investment even though their returns on assets are only about 4 percent, about one-third of the 12 percent returns recorded by private companies according to data published by China's National Bureau of Statistics. China can move toward more efficient capital allocation by enabling the restructuring of current bank debt and shift capital to fund more productive companies that can drive sustainable growth, innovation, and job creation.

China can move toward more efficient capital allocation by enabling the restructuring of current bank debt and shift capital to fund more productive companies that can drive sustainable growth, innovation, and job creation.

The first step toward market-based capital allocation is to clean up some of the bad debt on bank balance sheets and formalize shadow banking products to enable banks to finance more productive enterprises. This will involve implementing a coordinated resolution plan for distressed debt. China needs to enforce the bankruptcy process more consistently, to strengthen the role and capability of asset management companies as turn-around investors, work with banks to set-up bad debt restructuring units, expand the current debt-to-bond swap program, institute regulation to allow some debt-to-equity swaps, and expand current bad-debt securitization schemes—with prudent guidelines—to help a larger part of the banking and non-banking sector to shift credit risk to the market. These measures would be useful but banks would still need to improve their capabilities to manage default risk and prevent non-performing loans from turning into defaults. Chinese banks need to develop stronger risk-management mechanisms that enable timely responses to loans in distress, and better processes for collecting when loans default.

[100] Zhou Feng, "Pitfall of private bank fever," *China Daily*, January 24, 2014.
[101] Wu Hongyuran, "Internet-only banks in China not clicking yet," Caixin Online, October 8, 2015.

Box 6. Rationalizing excess capacity

Overcapacity is a highly destructive force. In industries with overcapacity, marginal players continue to participate, dragging down the profitability of the entire industry. Today in China, the vast majority of coal and steel is produced by companies that return less than their estimated cost of capital because so many inefficient companies live on due to continuing support from local government and banks. Reducing overcapacity, however, is only part of the solution in these sectors. Even relatively strong players are inefficient. We estimate, for example, that the costs of more than half of Chinese steel producers are more than 7 percent higher than the global average. Surviving companies in sectors that now have overcapacity will also need to improve their operating efficiency to compete on a long-term basis.

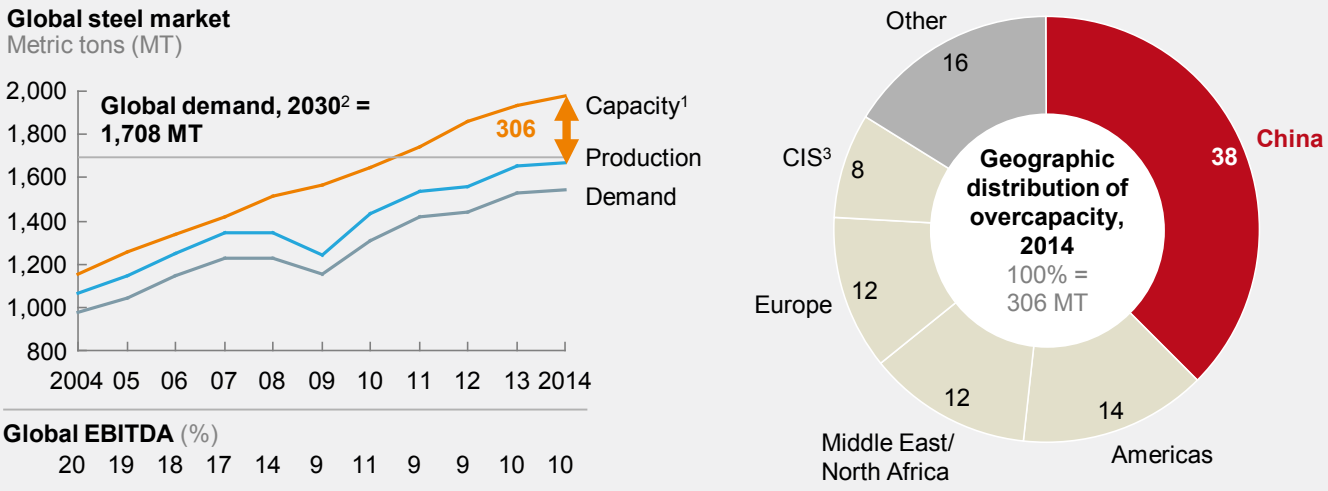
In steel, excess capacity is estimated to be more than 100 million tons; China accounts for 38 percent of global excess capacity (Exhibit 48). Profit margins in steel declined from 8.5 percent in 2004 to 1.1 percent in 2014, and ROIC has declined from 17 percent to 6 percent in the past decade. Some two-thirds of excess steel capacity was built by SOEs. This is a problem that the government has long recognized.[1] In 2011, the 12th Five-Year Plan (2011–15) set forth consolidation goals, but the industry has not met those targets. For example, instead of shutting redundant mills following mergers and acquisitions, companies have kept them going, often because regional governments wanted to prevent job losses. Indeed, rather than consolidating, the industry is becoming more fragmented. The largest producers now have just 37 percent of the market, down from 49 percent in 2010, due to the entry of smaller players.

Overcapacity is a problem that extends well beyond well-known cases such as steel. In 2015, in 15 out of 23 industries we analyzed, capacity utilization was less than 80 percent (the threshold that the Ministry of Industry and Information Technology uses to define overcapacity). These 15 industries account for about 30 percent of industrial GDP, according to government statistics.

Take the auto industry as another example of overcapacity. The Chinese auto market grew from four million units in 2004 to 25 million in 2015, partly because of a 2008 tax incentive for consumers who replaced old vehicles with more fuel-efficient models. By 2009, China was the largest automotive market in the world and both local and global players undertook massive expansions to capture sales. Today, Chinese plants have capacity to build 40 million vehicles per year, even though unit sales are 25 million. Utilization rates at plants of some local companies are as low as 50 percent. Meanwhile, demand growth has slowed from the 20 percent annual pace of the 2005–14 period to 9 percent in 2015. Operating profits of the top three local automakers fell from 5.3 percent in 2010 to 2.0 percent in 2015. Both local and joint-venture suppliers slashed prices in 2015—by as much as 35 to 60 percent off sticker prices—to move inventory.[2]

Exhibit 48

China accounts for 38 percent of global excess capacity in steel



1 90% capacity to account for yield losses.
2 McKinsey BMI Steel demand model.
3 Commonwealth of Independent States.

SOURCE: BMI region report; McKinsey Global Institute analysis

[1] Mysteel; McKinsey & Company Basic Materials Institute China Crude Steel database.

[2] "China's demand for cars has slowed," Bloomberg News, November 5, 2015.

Eliminating excess capacity can be painful and is particularly hard on workers, but it creates long-term value by improving the performance of the industry. The disappearance of marginal players selling products below their cost can help restore industry profitability and reducing capacity within companies can improve cost structures, by reducing the fixed-cost base. In the United States, when utilization was averaging 48 percent in the 1980s, the steel industry underwent a massive consolidation that reduced capacity from 154 million tons in 1982 to 110 million tons in 1993, and employment dropped from approximately 400,000 to 180,000.[102] A similar consolidation in Chinese industries would improve industry-wide performance and raise productivity.

Enforce bankruptcy processes

An effective bankruptcy system to discharge bad debt in an orderly way is an important component of an efficient capital-allocation system. Allowing uncompetitive, insolvent companies to survive by continuously rolling over debt creates inefficient markets that hold back more capable competitors. Carrying bad debt limits the capacity of banks to fund productive enterprises. China adopted its basic bankruptcy law in 1986, which applied mainly to SOEs. In 2007, China adopted a more modern bankruptcy law, and expanded coverage to other types of companies, including enterprises funded by foreign investors and joint ventures. However, bankruptcy remains an underutilized tool in China. Official bankruptcy data from the Supreme People's Court of The People's Republic of China show about 3,000 to 4,000 cases per year, less than one-sixth the number of corporate bankruptcies per year in the United States.

3,000~4,000
bankruptcy cases per year in China, one sixth of the US number

There are several reasons that bankruptcy is not used more often in China. The bankruptcy process itself can be complex, time-consuming, and uncertain. If a company has assets in multiple cities, it may require filings in each, which adds cost and time to the process.[103] Also, a large number of bankruptcy filings are rejected by the courts, and there is often a waiting time of a week or two between when a company files and when the court decides whether to accept the filing. When creditors find out the bankruptcy filing is made, they tend to rush to collect their claim even before the court decision is made.

The bankruptcy law is sometimes enforced inconsistently. One common reason is interference by local government in the bankruptcy process. Local governments often intervene to minimize the risk of social instability and maintain employment. According to one researcher, three out of four bankruptcy cases involve local government interference.[104] Also, even though large secured creditors such as banks are supposed to be paid first, Chinese courts seem to favor small unsecured creditors, forcing banks to write off claims against companies in bankruptcy.[105] Another barrier to orderly bankruptcy is a lack of knowledge. Business owners are not familiar with bankruptcy procedures and wind down operations or liquidate when they become insolvent.

To increase use of the bankruptcy system, China can start by building a dedicated bankruptcy infrastructure within the judicial system. In the United States, there is a bankruptcy court in each of the country's 94 federal jurisdictions; all bankruptcies must be filed in federal court. Each case is heard by a bankruptcy judge, who is appointed to a 14-year term by the court of appeals for that district. In China, judges who handle bankruptcy also handle other civil and criminal cases and have limited incentive to add complex and

[102] *The competitive status of the US steel industry: A study of the influences of technology in determining international industrial competitice advantage*, Steel Panel Committee on Technology and International Economic and Trade Issues, National Academies Press, 1985; *Technology and its effect on labor in the steel industry*, bulletin number 2435, US Bureau of Labor Statistics, May 1994.

[103] Enoch Yiu, "Bankruptcies in China pose challenge for foreign creditors," *South China Morning Post*, October 11, 2015.

[104] Fitch Ratings, *China onshore corporate bankruptcy proceedings*, December 2014.

[105] Ibid.

lengthy bankruptcy cases to their workloads under the current evaluation scheme.[106] It is also important to build a mechanism to share the knowledge of judges who have developed expertise in bankruptcy proceedings with other courts and judges; in some cases, judges have made decisions based on out-of-date knowledge of the law.[107] Besides helping to build expertise, a dedicated bankruptcy court system could avoid the problem of adjudicating cases in multiple jurisdictions and minimize the influence of local governments on the process. The bankruptcy court system could also help businesses learn about their rights in bankruptcy and help companies navigate the bankruptcy process. In the United Kingdom, the government provides step-by-step guidance via a website and a telephone hotline.

Broaden the use of asset management companies for turnarounds

In 1999, China designated four asset management companies to function as "bad banks" to take over bad loans that were threatening China's banking system. Although these companies have since evolved into professional financial service providers with broader business scopes, they have continued to work with banks to resolve non-performing loan issues and have developed extensive expertise in turnaround investing. They can continue to play an instrumental role in helping China's banks get ahead of potential defaults by buying non-performing loans and managing workouts and restructurings of borrower companies.

However, the four original asset management companies may not have enough capacity to deal with the volume of current non-performing loans. While banks today have a much better credit culture and governance structures than they had in 1999, the complexity and sheer size of the potential problem means that the four original asset management companies may face capacity constraints. Recognizing this, in the past two years the government has established 23 regional asset management companies around the country. The theory is that, by being local, they can help local and regional banks resolve non-performing loans; having local knowledge will help them to price transactions more accurately and speed up the workout process. For now, however, most of the regional asset management companies have limited capital and capabilities. Most are backed largely by local governments and local investors. For a more efficient deployment of these local resolution platforms, encouraging joint ventures and or strategic partnerships with more experienced companies, including professional foreign workout investors, would help close the capacity and funding gap. Besides working with external asset management companies, banks could also be encouraged to set-up internal "bad banks", which are essential restructuring units that can be spun-off into subsidiaries that can absorb toxic assets from the banks' balance-sheet. The creation of such restructuring units is also beneficial in providing special servicing for bad debt securitization programs where banks will generally need to retain the portfolio management and work-out of the securitized assets.

Expand the non-performing loan securitization program

Before the global financial crisis, China launched a small-scale effort to strengthen bank balance sheets by allowing securitizations of non-performing loans. The program was halted in 2008 only to be restarted in early 2016 in a limited way, and made available only to the large banking institutions. Under the current program, a securitization quota of 50 billion renminbi ($7.7 billion), has been set for now. This would address less than 4 percent of reported commercial bank non-performing loans of 1.27 trillion renminbi ($200 billion). To have meaningful impact, this program would need to be expanded significantly. With the right safeguards in place, the total quota would need to be increased, at the same

[106] Shuguang Li, *Improving bankruptcy law and implementing support supply side reform*, China Law Forum, April 2016.

[107] Emily Lee, "The reorganization process under China's corporate bankruptcy system," *The International Lawyer*, volume 45, number 4, winter 2011.

time as allowing a wider range of bank and non-bank entities that have accumulated sub-performing debt on their balance sheets to use the program. This would require careful oversight to avoid abuses observed in other securitization markets. For example, mechanisms are needed to prevent investors from cherry-picking the best assets from bundles of loans. Another concern is making sure that a diverse group of investors purchases these instruments. At present, banks themselves are the largest bond-market investors in China, holding 62 percent of issues. They would be likely purchasers of the non-performing loan securitizations. In effect, this would simply move bad loans from one part of banks' balance sheets to another, without significantly reducing credit risk. To achieve a meaningful transfer of credit risk to the market, a wider range of investors will need to be attracted to the market (see the section on building better-functioning bond and equity markets above. Another fundamental question remains how proceeds from the securitization will be used; if banks simply use proceeds to create new risky loans, the securitization scheme will not fulfill its objective.

4. INVEST IN TALENT AND ENHANCE LABOR MOBILITY

In the past 30 years, China has benefited from a demographic dividend, as the shift of its enormous population to urban areas provided a steady supply of workers to enable rapid industrialization and GDP growth. Today, however, China faces the prospect of a talent deficit. Based on current patterns in supply—including a shrinking labor force due to aging—there could be a growing gap between the skills that employers will need and what workers can provide. MGI has estimated that by 2030 China could have about 40 million too few medium- and high-skill workers. Addressing the skills gap will be essential for companies to raise productivity and create jobs that can lead to sustainable incomes and build a larger and stronger middle class. In the next 15 years, China needs to turn its demographic dividend into a talent dividend—creating a better-educated labor force with the skills to fill high-productivity jobs.

Expand access to quality education

7.3%
of women on average have no schooling vs. 2.8% of men

While China has achieved a great deal in public education over the past decades and now has more university students than any other country, access to high-quality education is uneven across the country. This is largely a result of funding disparities. For example, students in Shanghai were the top performers in the world in the Programme for International Student Assessment standardized tests, which are administered by the OECD, but Shanghai's spending per student is three times China's national average. Educational outcomes remain very different between regions, and a rural-urban divide persists. On average, 38 percent of rural children enrolled do not complete nine years of compulsory education whereas urban pupils have a graduation rate of close to 100 percent.[108] Gender is another divide in education that remains pronounced—on average, 7.3 percent of women have no schooling, vs. 2.8 percent of men.

For China to equip its labor force for the jobs of the future, it cannot afford such disparities. While China has substantially raised government education spending from 2.6 percent of GDP in 2000 to 4.2 percent in 2014, the GDP share of education expenditure is still behind the 5 to 6 percent in advanced economies including France, the United Kingdom, and the United States. China can continue to increase spending on education and, more importantly, ensure that funding is distributed more equitably across regions and income groups.

[108] Dandan Zhang, Xin Li, and Jinjun Xue, "Education inequality between rural and urban areas of the People's Republic of China, migrants' children education, and some implications," *Asian Development Review*, volume 32, number 1, March 2015.

In addition to putting more money into education in rural areas, to hire better teachers and build better facilities, China can invest in technology platforms for remote learning and consider rotational programs to bring qualified urban teachers into rural schools. Online platforms can be used for remote teaching and for self-teaching, but this will require investment in equipment and broadband connections. Rotating experienced teachers to rural schools for placements of six to 12 months can bring better teachers into the classroom and provide an opportunity to improve the skills of permanent teachers. The visiting teachers can help with curriculum and share effective teaching techniques.

Make graduates "job-ready"

Surveys of employers consistently show that they are not satisfied with the skill level of new hires from both universities and vocational schools. At the university level, administrators and professors can work with local employers to understand what specific skills they require of graduates. At the secondary-school level, Germany and Switzerland have led the world in the creation of a "dual-channel" vocational education, in which high school students attend school part of the time and work part of the time. The program is co-funded by employers and educational institutions. Employers benefit by creating a supply of young workers with proven skills and valuable experience. Employers say that many of these students continue their education and go on to become managers and engineers.

In China, there have been experiments in improved vocational education, such as the Guangdong Technical and Vocational Education and Training Project, which was a collaboration of Guangdong Province and the World Bank. The pilot project upgraded three vocational training schools by implementing industry-relevant curricula standards and textbooks, upgrading IT systems, providing technical training for staff, and expanding training spaces. The program helped raise the pass rate on skill certification exams from 70 percent in 2009 to 90 percent in 2014. The share of graduates finding employment within six months increased from 86 percent to more than 98 percent, and average starting salaries rose from 1,744 renminbi per month ($270) in 2009 to 2,625 renminbi ($400) in 2014. Adapting this model on a wider scale could help build a larger pool of job-ready candidates.[109]

As the economy evolves and services become a larger share of GDP and employment, the educational system will be called upon to equip workers with skills that go beyond technical expertise. Even now, employers say that some of the major problems they have with new hires is their inability to work well in teams, poor critical thinking capabilities, and lack of innovative flair. This reflects longstanding concerns that the Chinese education system focuses too much on rote learning and testing and does little to develop creative and independent thinking. To function effectively in modern businesses—and to enable those businesses to innovate and raise productivity—employees will need strong communications, collaboration, and problem-solving skills.

Engage the private sector

China has the fiscal muscle to invest in talent development and upgrade the education system, but not all investment needs to come from the state and the government does not need to bear sole responsibility for building a qualified talent pool. In addition to collaborating with the educational system on vocational training and college curricula to produce candidates with job-ready skills, companies can invest in talent training and upgrading. Companies should be incented to support on-the-job training programs that will keep employees' skills relevant and help employers continuously raise productivity. The state of New York for example, instituted an Employee Training Incentive Program, under which eligible companies receive a certificate of tax credit for investing in training to upgrade skills, retrain workers for different assignments, or improve the productivity of employees.

[109] "China: Improving technical and vocational education," World Bank, May 6, 2013.

The private sector can also contribute to improving the actual process of education in China. One survey conducted in 29 countries found that those that had a higher rate of enrolment in private schools performed better on math, science, and reading exams at the same time as having lower overall expenditure on education.[110] Private schools also had greater authority for decision making at the school level and placed greater emphasis on student achievement. To facilitate more private investment in adult education and training, China can consider deregulating the industry, and issuing more licenses to privately funded school programs. Private-sector initiatives could also include grants and scholarship (perhaps using global companies as funding partners) for overseas technical training. Such a fund would give Chinese university students and professionals access to vital on-site technical training in areas where expertise in China is limited. However, even where the private sector provides a greater share of education services, the government has an important role to play in ensuring that all children have access to a quality education, and in setting regulation for education systems.

Finally, governments have the option of collaborating with private partners to design, finance, and operate schools. Public private partnerships (PPP) can help the government to spread risk and also learn from expert private partners. One example of this approach was the Pernada University established by the government of Malaysia through a PPP. To address a talent gap in the health-care sector, it launched series of medical degree programs and research centers together with global universities and companies.

Promote labor force participation through gender parity

Beyond education, there are still opportunities to enhance participation in the workforce, in particular by women. MGI research has found that in a realistic scenario in which China's progress toward gender parity were to match the momentum of the fastest-improving country in its region, it could boost GDP in 2025 by $2.5 trillion (16 trillion renminbi). That is an 11 percent increase relative to business-as-usual, and would add more than 1 percentage point a year to GDP growth between 2014 and 2015.[111]

~28M
women in China are affected by gender gaps in financial inclusion

Although China's female share of labor force is 41 percent, exceeding the global average of 37 percent, the male-to-female ratio in leadership positions is 5:1, half the global average of 2.5:1. Gender parity is also lacking across society. For instance, women in China devote 2.5 times as many hours as men do to unpaid work, such as child care and housecleaning. Some 28 million women in China—15 percent of the global total—are affected by gender gaps in financial inclusion. Increased gender parity would generate more opportunities for women to earn more and spend more. Enforcing the law on gender discrimination, providing better opportunities in education and employment, and building a better social support system such as child care for working women will be important.

Many of the interventions required to narrow the gender gap are the natural responsibility of government, including safe transport, sanitation facilities for girls in schools, or establishing special courts to handle gender-based violence. But companies can do more within their own operations and among their suppliers, distributors, consumers, and communities. Companies should regard gender parity not as a cost but an opportunity.[112] There is now a considerable body of evidence suggesting a link between the presence of women in executive positions and corporate returns. They can develop women's skills and capabilities through vocational training, help provide financial support for girls to develop their science and math skills, and invest in digital infrastructure such as mobile apps

[110] Martin R. West and Ludger Woessmann, "'Every Catholic child in a Catholic school': Historical resistance to state schooling, contemporary private competition and student achievement across countries," *The Economic Journal*, volume 120, issue 546, August 2010.

[111] *The power of parity: How advancing women's equality can add $12 trillion to global growth*, McKinsey Global Institute, September 2015.

[112] See McKinsey's Women Matter research at http://www.mckinsey.com/search.aspx?q=women+matter

targeted at women entrepreneurs. Helping women to become business leaders in their own firms—as entrepreneurs—is the focus of US retailer Walmart's Global Women's Economic Empowerment initiative which aims to source $20 billion from women-owned businesses to provide training to other women. Helping women with the "double burden" of working and caring for families is the focus of IBM's $50 million Global Dependent Care Fund whose priority is developing child-care centers in or near offices, and ensuring employees get places in them.

Improve labor mobility

As the economy shifts toward a productivity-driven model, a change in the sector mix of the economy and restructuring of parts of the economy are inevitable. This means that hundreds of millions of workers would need to be redeployed. This will be an enormous challenge, particularly for low-skill workers. China can improve labor mobility—both the ability to move into different types of work and the ability to move to another location to get work.

Government can help workers who are displaced by restructuring of traditional industries by investing in employment services modeled on those used in advanced economies. These facilities typically assist unemployed workers with assistance in job hunting and training. The United States, for example, has built more than 2,500 American Job Centers to help workers through unemployment and transitions into new kinds of work. These centers help those who are unemployed file for unemployment benefits and help job seekers write their résumés, apply for jobs, and find suitable training programs.

An obvious option for workers whose jobs have disappeared is to move to a place where jobs are more plentiful. However, it is not always easy for workers to relocate, especially older workers with working spouses and children in school. Workers with less education also tend to be less mobile than more highly educated workers.[113] Countries have used various methods, including tax breaks and affordable housing schemes, to help workers relocate for re-employment. In China, labor mobility is further complicated by the limitations of the resident permit or Hukou system established some 60 years ago.[114] Migrant workers cannot enjoy the full benefit of urban services such as education and health care, creating social problems such as 60 million "left behind children" often raised by their grandparents.[115] Because workers cannot carry their benefits to different geographies, the system can discourage relocation. Gradual reforms have been underway to meet the government's pledge to help 100 million urban migrant workers and their families settle permanently in cities by 2020.[116] However, the scope of the reform can be further improved to include bigger cities. In addition, China could give migrants greater clarity on land ownership in their home towns in case of a change in Hukou. Migrant workers regard returning home to farm land to which they are entitled as a fall back option, and clarity on whether they can keep or transfer their land rights will help migrant workers make more informed decisions.

Finally, government can encourage, or work with, private sectors to help develop new sources of employment in places that are hard-hit by restructuring. In Salo, Finland, thousands of workers have been displaced as Nokia, the town's largest employer, lost market share. Between 2010 and 2012, the company laid off 40,000 workers globally (half its labor force) and in 2015, Nokia's new owner, Microsoft, closed the Salo factory. After

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[113] Jens Ludwig and Steven Raphael, *The mobility bank: Increasing residential mobility to boost economic mobility*, Hamilton Project discussion paper, Brookings Institution, October 2010.

[114] Hukou is the household registration system in China, which assigns people to urban and rural locations (cities or provinces) for allocation of social benefits, which are administered at the local level. A citizen without a local hukou registration may not be able to obtain education, health care, or pension benefits.

[115] "China's left-behind: Little match children," *The Economist*, October 17, 2015.

[116] Wang Yanfei, "Speed up hukou process, government says", *China Daily*, April 20, 2016.

the 2012 layoffs, Nokia worked with the government to establish Nokia Bridge, a business incubator program to help former employees launch new businesses. The program started with €150,000 ($167,000, 1 million renminbi) in seed funding and backing of angel investors. With the help of the program, 400 new companies have been created in the area.[117]

5. BOOST AGGREGATE DEMAND

Public policy measures can help unleash the demand that is needed to raise consumption to help grow and diversify the Chinese economy. Government can improve access to credit to improve household cash flow, lower the cost of consumption (by cutting tariffs, for example), and address income inequality.

Expand access to credit

Consumers could spend more if they had better access to credit and could tap the wealth that is tied up in real estate. Policies to loosen credit and allow reverse mortgages can put more money in the pockets of consumers without creating excessive risk. Expanding access to credit could also help raise household consumption by middle-class households. With prudent precautions, lenders could underwrite more home mortgages and extend unsecured credit to consumers. Although China's consumer credit has been growing rapidly, it is still underdeveloped. In the past decade, the share of car sales in China with loan financing has increased from roughly 5 percent in 2005 to 17 percent in 2013. Still, this proportion is far behind most developed countries, with the United States at 80 percent and Germany, also a credit-averse nation, at 50 percent. Moreover, the Chinese consumer credit market is neither "inclusive" nor "affordable" according to research. A study of 114 financial companies found that only eight of them pass the threshold of 60 points out of a possible 100.[118] Also companies tend to favor rich consumers, leaving people in need of consumer credit underserved. Increasing the use of consumer credit within the Chinese economy will enable more consumption by diverting this income from savings.

Chinese households have **60%+** net worth in real estate

Real estate-based lending is a particular opportunity. Chinese households now have more than 60 percent of net worth in real estate, compared with 38 percent in Japan and 25 percent in the United States. Given the heavy exposure to real estate, one way to generate cash flow and encourage more consumption is through refinancing or reverse mortgages. Reverse mortgages are usually marketed to older consumers, who can get monthly payments from investors (banks or insurers), which eventually wind up owning the asset. In 2014, Beijing, Shanghai, and Guangdong launched pilot reverse-mortgage programs.

Use tax policy to engage new consumers and capture revenues

The government can offer tax breaks to stimulate demand, but these incentives must be crafted in ways that benefit consumers who otherwise might not make a purchase, not as blanket discounts that simply cuts prices for wealthy consumers. Incentive programs should also have specific goals, such as raising energy efficiency. Otherwise, such subsidies simply pull future consumption forward, generating no long-term benefits. For example, during the global financial crisis, the Chinese government cut sales taxes on autos in half and offered subsidies to rural buyers. The program also had an environmental goal because it encouraged purchases of vehicles with smaller engines and purchases to replace diesel cars and trucks. This helped revive demand and was instrumental in China's becoming the largest auto market.

[117] Mark Bosworth, "The upside to being let go by Nokia," *BBC Magazine*, January 31, 2014.

[118] *Research of the consumer credit market in China*, Tsinghua University Center for China in the World Economy, October 2015.

Today a significant amount of Chinese consumption (as much as 4 percent of total domestic consumption) occurs outside of the country by Chinese travelers. This is in part because of high import duties and consumption taxes. Import duties are 30 percent on jewelry and 25 percent on autos and can range as high as 60 percent (on some liquor products). The consumption tax can be as high as 56 percent and applies to products ranging from cosmetics to watches. Another factor is vendor pricing strategies—sellers of high-end goods know that they can command high prices because demand is so strong. These factors combined can make foreign products more than 50 percent costlier than they are overseas. China has been reforming parts of the tax system and in 2015 cut tariffs on items such as cosmetics and apparel, but could now broaden these efforts.

Address income inequality

While China's middle-class and affluent households now number 116 million, income inequality is more widespread, leaving lower-income households with limited disposable income. Disposable incomes can be raised by strengthening the social safety net—covering more costs of medical care, for example.

Strengthen the social safety net

Only **10–20%** of migrant workers covered by unemployment insurance

Improving social safety net benefits can discourage excessive precautionary saving and enable more discretionary spending. Strengthening the social safety net can also reduce the potential for social instability that may result from growing inequality. In addition, higher-quality health care and more generous pensions will foster labor-productivity gains over the long term and further improve China's growth prospects. At least during the transition to the productivity-led model, a more robust unemployment insurance system will be needed. The current system requires self-registration. And coverage is limited: 60 to 70 percent of urban residents and only 10 to 20 percent of migrant workers are covered. Also, the average benefit is only 20 percent of average wages compared with more than 50 percent in Germany and the United States. Besides increasing the number of workers covered and raising benefits, China can link the unemployment insurance system to job placement and retraining services, as other advanced nations have done.

Transfer income to people in need

Despite China's achievements in reducing poverty, income inequality in China is increasing. Raising incomes of low- and middle-income households can have a direct impact on consumption since these households have a higher marginal propensity to spend than wealthy households. Eventually, strong productivity growth may raise more Chinese households into the consuming class, but in the near term, government can increase aggregate demand by placing more money in the hands of those who are most likely to spend it. China can consider expanding "conditional cash transfer" programs, which provide money to very low-income households as part of a broader antipoverty effort. Recipients receive income payments that are conditional on certain criteria such as health care check-ups, attending work training programs, or the narrowing of any outstanding gender divide in education. The goal is reaching people who have never participated in social programs. When these programs have been used in Colombia and Honduras, consumption has risen among the poor (by 15 to 30 percent) and poverty rates have been reduced.[119]

Reform affordable-housing programs

Government spending on housing and transport remains one of the most important ways it can increase low-income consumers' access to employment and consumption opportunities. Improving the oversight and governance of these programs will be another opportunity for China to enhance its economic productivity. China has recently undertaken one of the world's largest affordable housing programs but there have been significant

[119] *The case for conditional cash transfers in the People's Republic of China*, Asian Development Bank, March 2012.

teething problems that the government has gradually overcome. There was early reluctance among local governments to devote funds to affordable housing at a time when all the incentives were in favor of GDP growth rather than the delivery of public services; funding improved when the government stepped in with finance from a special fund. However, the scheme has been very slow to get housing to those who need it most, especially migrants. As of 2012, only 1 percent of migrant responding to a survey said they lived in housing units with full equipment for tap water, a toilet, bathroom, kitchen, and piped gas.[120] Analysts argue that to accelerate provision will require policy to add market-based policy instruments to demand- and supply-side subsidies. International affordable housing policy has increasingly relied on a combination of fiscal, tax, financial, and regulatory tools to incentivize the public and private sectors to provide low-cost housing.[121]

6. IMPROVE PUBLIC-SECTOR EFFECTIVENESS

The policy measures we discuss in this chapter address a wide range of challenges—to tackle them will require government agencies and employees to implement them effectively. The shift from three decades of investment-led growth will require a comprehensive and coherent set of policies to manage the transition to productivity-led growth as well as improvements in how government at all levels carries out policies and delivers services. Better follow-through on policy initiatives and finding ways to quickly resolve conflicts among competing interests will be critically important—years of delay this point would have very serious consequences. At the same time, Chinese government can improve its operations to provide better services to citizens.

We consider three avenues for updating Chinese governance. First, we look at ways to set goals and priorities. Then we examine measures for improving efficiency, and finally, we look at ways in which China can ensure that its policies are executed effectively. While these three approaches are similar to those that a corporation might use to refine and implement strategy—and while we also discuss how to execute in a business-like fashion—we acknowledge that public-sector governance cannot be reduced to a business model. Government has many stakeholders with different aspirations and needs and, therefore, the objectives of policy cannot be reduced to a single goal such as shareholder value.

Formulate new priority goals

The many stakeholders affected by government policy means that setting and prioritizing goals is complex. Policy initiatives and reforms often fail because goals were not set properly and the interests of multiple stakeholders were not well managed.

For policies to have a good chance of success, some measurable goals and mechanisms must be in place with which to enforce them, and be carefully thought through. Under the investment-led growth model, the primary goal of local officials was sustaining GDP growth, and these officials were answerable to the central government for meeting that goal. Although there have been efforts to broaden the performance criteria for local officials, the focus still tends to be primarily on growth, contributing to China's debt and misallocation of capital to unproductive uses. For the productivity-driven growth model to succeed, local governments need a greater emphasis on new sets of goals such as raising labor productivity and household incomes. The central government can also consider increasing transparency in how goals are set and how local officials are promoted. A more radical change would be to move away from centrally set goals and adopt a decentralized approach.

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[120] Zhilin Liu, Assessing local implementation process of affordable housing policy in China: The case of cheap rental housing program, School of Public Policy and Management, Tsinghua University, mid-term report submitted to the Urban China Initiative, August 2012.

[121] Ibid. Also see *A blueprint for addressing the global affordable housing challenge*, McKinsey Global Institute, October 2014.

Government then needs to manage the interests of multiple stakeholders. Too often, efforts to reform lose steam when policy makers and government officials have attempted to reconcile diverging interests among stakeholders, even when they agree on the overarching goal. For instance, there has been widespread agreement on the need to provide health care and education to migrants, but disagreement on who will shoulder the cost. Similarly, SOE reforms such as instituting mixed ownership and dismantling monopolies are widely acknowledged to be important, but these reforms may challenge the influence of the State-owned Assets Supervision and Administration Commission founded to 2003 to manage SOEs. Foreign exchange liberalization, a reform pushed by the People's Bank of China, involves the State Administration of Foreign Exchange, which is responsible for managing foreign exchange reserves and administration systems.

Complex accountability structures, which are common in government, can be the enemy of effective execution. Responsibility for government services is often split among many agencies and departments. Aquaculture in China is overseen by five different agencies: agriculture, health, commerce, industry, and food and drugs. It is not always clear what department is responsible for which regulation, and the problem is complicated by interagency politics. The result is suboptimal execution, frustration for citizens and businesses, and low productivity in governance operations. The consequences of overlapping and uncoordinated oversight can even be dangerous as illustrated by recent incidents involving contaminated infant formula and decades-old frozen meat reaching store shelves.

For reforms to succeed, government leaders need to resolve conflicts that hold up change. A significant challenge will be reconciling the interests of local and national leaders and communities. For example, as China rationalizes excess capacity and tries to reduce the number of poorly performing companies, local governments have an incentive to keep large local companies alive to meet growth targets, maintain employment, and generate tax revenue. If a factory closes, few city or provincial governments have ready alternatives to fill these needs. For small towns that depend on one or two enterprises, government can align with business owners to support them temporarily with specific conditions such as meeting cost savings and productivity targets while keeping to a timetable for eventual closure.[122]

When South Korea undertook a massive restructuring of weakened industries after the 1998 financial crisis, it established the Tripartite Commission with representatives from labor, management, and government. The commission created a social agreement that spelled out what each group of stakeholders would agree to do to make the restructuring succeed and put the South Korean economy on stronger footing. Unions accepted mass layoffs and more labor flexibility, government agreed to expand social programs, and companies consented to stronger governance and greater transparency.

Improve government operations

Inefficient government operations could be a drag on China's progress toward becoming an advanced economy. On the World Economic Forum's 2015 competitiveness index, China ranks 51st for the efficiency of government operations, down from 47th in 2014. China ranks 24th in wastefulness of government spending, 26th in burden of government regulation, and 50th in ease of settling disputes. Technology can enable government to improve its efficiency, digitizing its operations to raise productivity and serve customers (citizens) more effectively (see Box 7, "Use technology in procurement").

[122] Genia Kostka and William Hobbs, "Local energy efficiency policy implementation in China: Bridging the gap between national priorities and local interests," *The China Quarterly*, volume 211, September 2012.

Digitizing processes that are now done manually has many benefits for government. It can free government employees to do more value-added tasks and raise overall productivity.[123] And it can often improve efficiency and speed, reduce fraud and error, and improve the citizen experience. Well-designed systems with advanced analytics systems can identify patterns in transactions that identify fraud, help agencies improve collections (of taxes due, for example), and assist with workforce planning. China currently ranks 70th out of 193 countries according to the UN's e-government survey. Data—even basic information such as marital status—are often not shared across different departments. In China, government operations at all levels would benefit greatly from the presence of digitally savvy managers who can determine what systems are needed and work with government tech departments and contractors to build and maintain them. Around the world, governments are moving citizen-facing services online, speeding up service delivery, and often improving quality of service. They are also embracing open data—freely sharing information gathered by government in digital formats. Open data can increase citizen engagement and can lead to innovation and new businesses. For example, in some cities, entrepreneurs have been able to use government transit data to create smartphone apps that tell commuters when the next bus or train is arriving.[124]

For the productivity-driven growth model to succeed, local governments need a greater emphasis on new sets of goals such as raising labor productivity and household incomes.

[123] See, for instance, Cem Dilmegani, Bengi Korkmaz, and Martin Lundqvist, *Public-sector digitization: The trillion-dollar challenge*, McKinsey.com, December 2014.

[124] See, for example, Open data: Unlocking innovation and performance with liquid information, McKinsey Global Institute, October 2013; and Michael Chui, Diana Farrell, and Kate Jackson, *How government can promote open data*, McKinsey & Company, April 2014.

Box 7. Use technology in procurement

Procurement is a particular opportunity: China could benefit from a more business-like approach to procurement (buying goods and services to enable government operations). China's public procurement in 2014 reached 1.7 trillion renminbi ($260 billion), having grown by 22 percent per year since 2005. In early 2000, China issued two laws on government procurement: the Tendering and Bidding Law and the Government Procurement Law. These laws lay out processes and requirements for businesses that sell goods and services to the government. This was an important step, but government procurement could be further improved with greater transparency and promotion of competition. Government purchasers not only pay too much and buy in inefficient ways, but they can also fail to buy the most appropriate and highest-quality products and services. Adopting best practices from the private sector can help. Private companies that excel in procurement use rigorous benchmarking and measurement processes, competitive tendering, and strong contract enforcement procedures. New approaches by government for engaging the private sector are also emerging. For example, the United States has launched the Challenge.gov website, where companies and individuals can compete for cash prizes for solving specific government problems used by the US government to solicit new solutions to specific problems for 80 different agencies.

Strengthen program management

Skillful execution of policy initiatives will be critical to a smooth transition of the Chinese economy to 2030. Much of China's economic agenda—SOE reform, financial-sector reform, and initiatives to enable innovation—has been in place for a decade. At the Third Plenum of 18th Central Committee, held in 2012, more than 300 initiatives were put forth, including a new budget law (after ten years of discussion) to reinforce financial accountability of local government. There has been slow progress on some of the announced reforms, partly because of suboptimal execution (in addition to resistance and improperly aligned incentives). China can manage execution better by strengthening program management and bolstering oversight.

New initiatives, in both the public and the private sectors, benefit from strong program management with direct commitment and involvement from top leadership. A program management office in government operations can set the agenda for cross-agency activities and coordinate actions across government. To further accelerate implementation program management, units can engage external experts. Program management organizations should monitor progress carefully and be transparent in their decision making. In addition, they should publicize lessons learned across the organization. China has a broad reform agenda, and many different parts of the government will be involved. For example, four departments are involved in resolving local government debt issues, 15 departments are involved in Hukou reform, and five departments are working on SOE reform. A stronger program management function at the top level of government can oversee the overall reform agenda, monitor progress, and remove organizational bottlenecks to accelerate implementation of reforms.

Another practice from the advanced economies that can improve the quality of execution in China's government sector is a strong audit function. In the United States, for example, the Government Accountability Office is used to track the performance of government agencies and spending programs to determine whether they are effective in achieving their goals and are worth funding. A strong audit function can also identify opportunities to raise productivity—by benchmarking performance between regions or with other countries In the United Kingdom, the National Audit Office is an independent body that provides both financial and performance reports to Parliament. Singapore's General Auditor's Office is well known for its authority, and its independence is protected by the constitution. China established the National Audit Office in 1982, and it has played an important role in showing leaders and the public how government is performing. It produced a national audit of local government debt in 2013, for example. It could benefit from clearer independence (it now reports to the State Council) and greater transparency about auditing processes, criteria, and report results. The capabilities of the National Audit Office could also be upgraded so it can make strategic recommendations.

The next chapter in China's economic development will have historic consequences for the Chinese people and the world. But will China pursue a transition to a new economic model centered on productivity?

Past experience suggests that China has the determination to make changes when they are necessary for the health of the economy. The economic reforms put in place since 1978 were bold and radical, and fundamentally changed the nature of its economy, setting off three decades of remarkable growth. But more recently, China has appeared to take some necessary measures but to postpone bolder moves. Yet, at the same time, a number of government initiatives indicate that policy makers are well aware of the problems facing the economy, and have clear ideas of how they should be tackled. The comprehensive reform agenda crafted at the Third Plenum of 18th Central Committee held in 2012 includes more than 300 initiatives.

A measure of caution is understandable. Turning off the credit taps to underperforming businesses would have a negative impact on local jobs and growth as companies failed, and local government are justifiably concerned. However, if it chooses to move, China has a sufficiently strong "cushion" to absorb the pain of the transition: a thriving private sector, an expanding middle class, and a stronger social safety net than in the past, for instance.

Ultimately, the huge economic benefits of a productivity-centered model should act as an incentive. By our reckoning, the approach that we have discussed in this report would still enable China to meet President Xi Jinping's goal of doubling per capita income in the 2010–20 decade. In the longer-term, China would be within touching distance of becoming a truly diversified—and advanced—global economy.

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