

Deloitte.

Competitiveness: Catching the next wave China

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China has the opportunity to be a global leader in a number of important areas that will be cornerstones of global growth in the next decades.

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1. Executive summary

Over the past 30 years, no economic success story has captured the world's imagination more convincingly than the stirring transformation of China and its return as a central pivot of the world's economy. Relatively impoverished, isolated, and cut off from global innovation and technology a mere generation ago, China, with its 1.3 billion population, has dramatically re-emerged to become one of the world's great manufacturing centers, a vibrant commercial marketplace, a vital source of global finance, and a central node in the global economy of the 21st century.

But China today also faces an inflection point, as the unique ingredients that propelled its rapid expansion and unprecedented development over the past 30 years cannot be expected to remain fixed in place for the next generation. Inevitably, the levers that yield competitiveness must evolve over time.

Already, the nation is losing its once-formidable comparative advantage as the world's lowest-cost manufacturer, an important element in its initial spurt of economic growth: the working-age population is starting to plateau, and is destined to decline in the foreseeable future; the productivity of additional

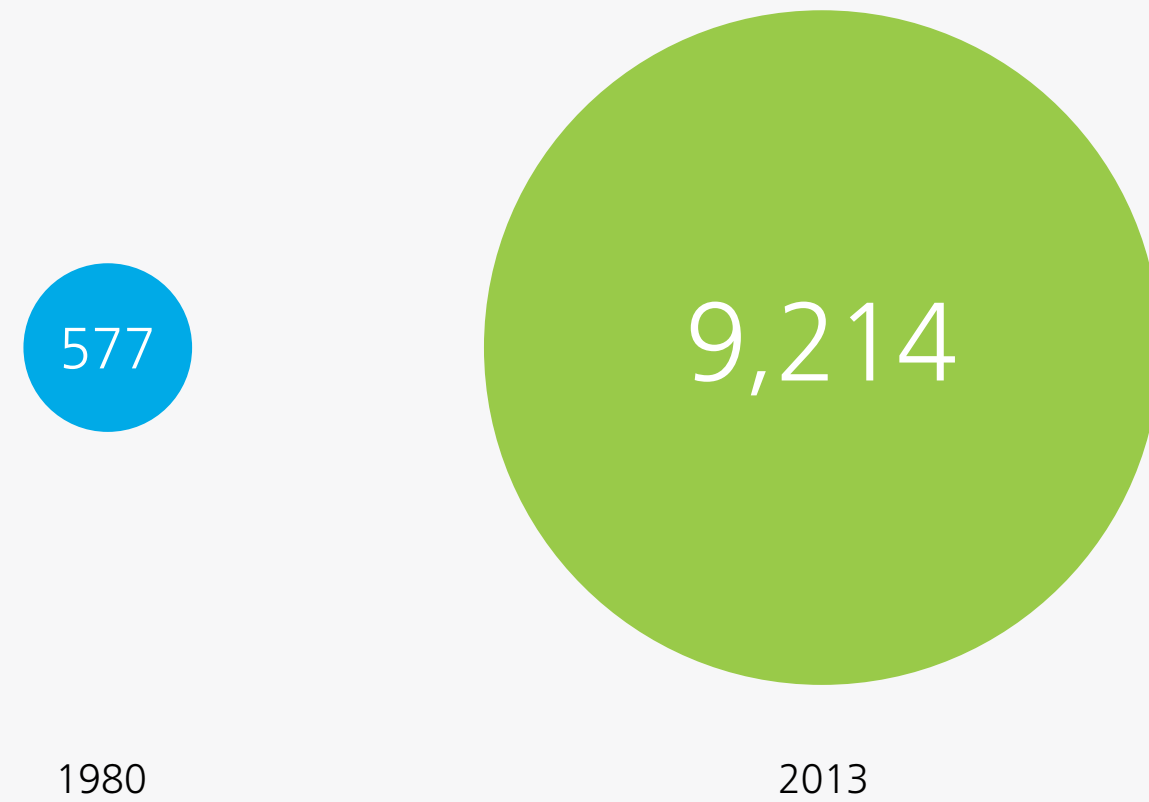
capital investments across China are continuing to decline, while the nation's debt-to-GDP ratio is beginning to climb significantly; and a real estate bubble may be emerging. Indeed, these indicators suggest that the strategies that worked so well for China in the recent past offer no guarantees for the success of the next generation. Growth must be both managed and matured.

That being said, China's notable achievements in developing a sophisticated manufacturing base, higher living standards, a more secure social safety net, and focused investments in education and health, have laid a strong foundation for the country's future dynamism. China has the opportunity to be a global leader in a number of important areas that will be cornerstones of global growth in the next decades.

This report aims to put China's history of growth into a broader perspective, and identify those key industry sectors that will help power the nation's necessary "next wave" of sustainable growth, transitioning from labor- and capital-intensive activities to those that utilize knowledge, innovation, design, IT sciences, software, and marketing. These "next wave" industries range from aerospace and high-value machinery to life sciences, health services and education, to mobile technology and "e-tailing," to energy.

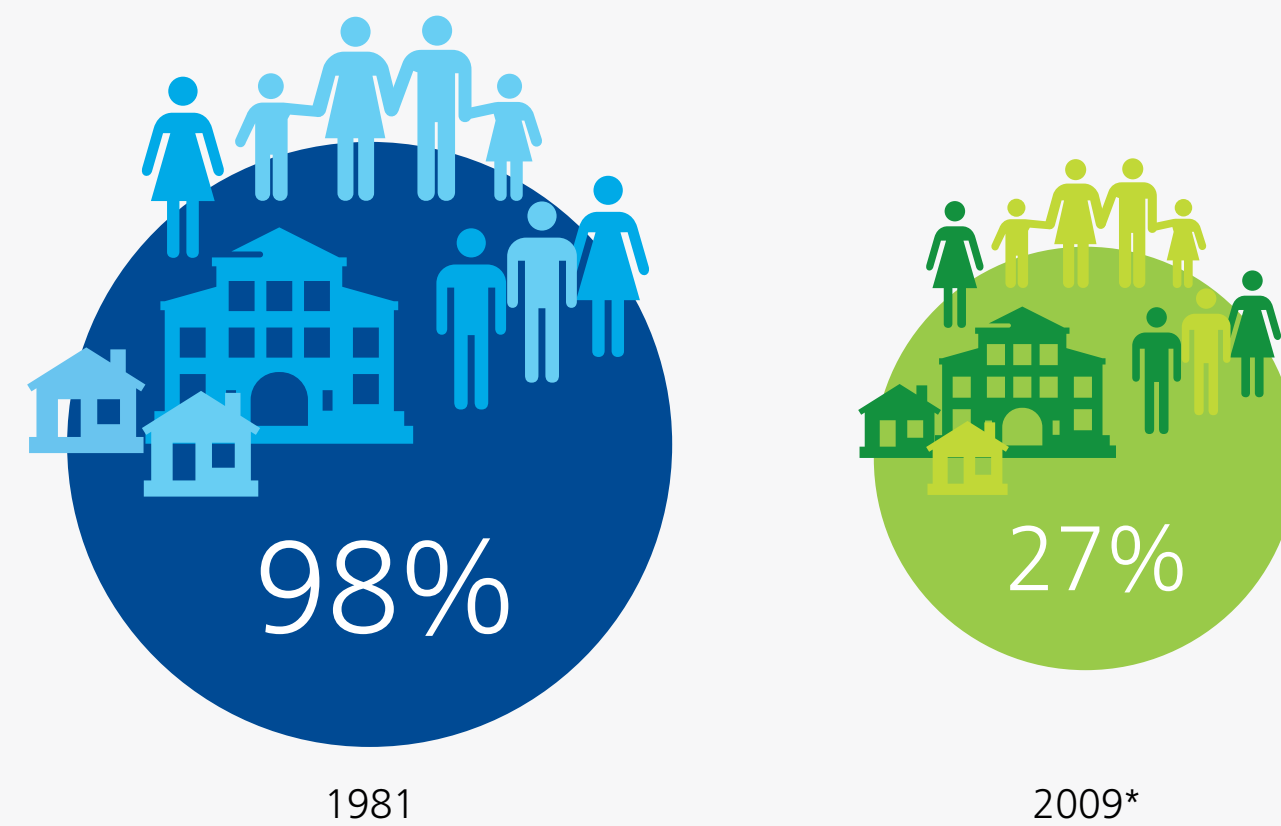
Having invested years into observing, adopting, and adapting from the practices of more mature markets in the West as it sought to develop the production facilities, skills, and systems it had kept at bay for nearly 50 years, China is today poised to strike out and become an important global partner—and leader. This will demand, however, that China accepts the responsibilities that come with leadership, and builds a society that can realize important innovations and potential breakthroughs that, in the long-run, benefit not only China, but the wider world as well.

Figure 1. China: GDP per capita
2010 US\$ at PPP



Source: Oxford Economics/Haver Analytics

Figure 2. Poverty reduction over the last 30 years
China: Population on less than \$2/day



Source: World Bank
*Most recent data available

2. Introduction

Over the past three decades, China's economic growth and profound integration into the global economy has been one of the most stirring economic stories of our—or perhaps any—generation. Over this relatively short period, the country's GDP growth averaged 10 percent nearly continuously, and, even more remarkably, some 500 million people were lifted from subsistence poverty.

To put some of China's astounding economic achievements into perspective, consider the nation's situation in 1980. As the country began to experiment with accepting private enterprise and moved to embrace full-scale economic reform, per capita GDP at purchasing power parity (PPP) at that time was less than US\$600, and 97 percent of the country's population lived on less than US\$2 per day. Bicycles were still the prime mode of transportation in its big cities, industrial development and productivity badly lagged world averages, and most inhabitants still dressed in blue worker's uniforms.

Fast forward to today. China's per capita GDP exceeds US\$9,000 (Figure 1), and the World Bank calculates that subsistence poverty represents less than 30 percent of the population (Figure 2).¹

China is now a nation transformed by bullet trains, gleaming high-rise buildings and a growing urban population with an increasing appetite for luxury goods, high technology, and cutting-edge fashion. By any measure, the nation is taking

its place as a manufacturing and commercial heavyweight and a rising economic power of the 21st century. Today, China weighs in as the world's second-largest economy, having recently overtaken a relatively stagnant Japan, and is thoroughly enmeshed in global trade, logistics, investment, and production streams—an elemental cog in what has rapidly become a deeply interconnected global supply chain.

As a result, the path of its future growth, and the sustainability of its development, is critical not only to its 1.3 billion inhabitants, and to the economic vitality of the greater East Asian region, but also to the pace, character, and dynamism of the global economy. So thoroughly have China's trade, investment, and capital flows coursed into the veins of global commerce that no part of the world is unaffected by its progress. Recent Chinese acquisitions of mineral reserves in Africa and Latin America, and European-based automobile companies like Volvo; bold investments in U.S. high technology like Lenovo's acquisition of the PC business of IBM; and Chinese-bred technology firms like Alibaba and Baidu gaining funding from Western equity investors, demonstrate how powerfully China's rise can and has influenced the global economic landscape.

¹ China 2030, The World Bank, <http://www.worldbank.org/content/dam/Worldbank/document/China-2030-complete.pdf>

Figure 3. China: GDP growth

%, CAGR

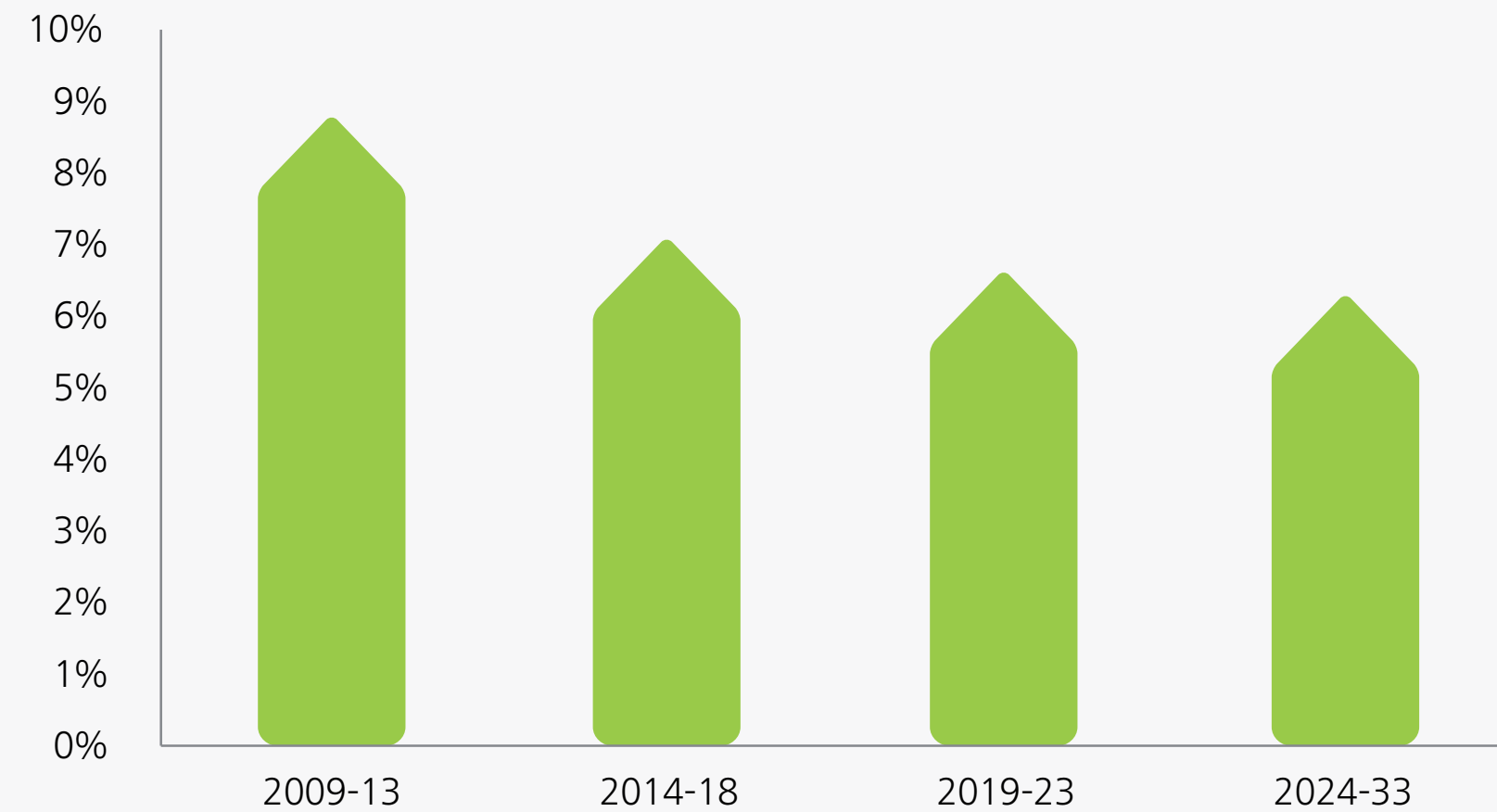
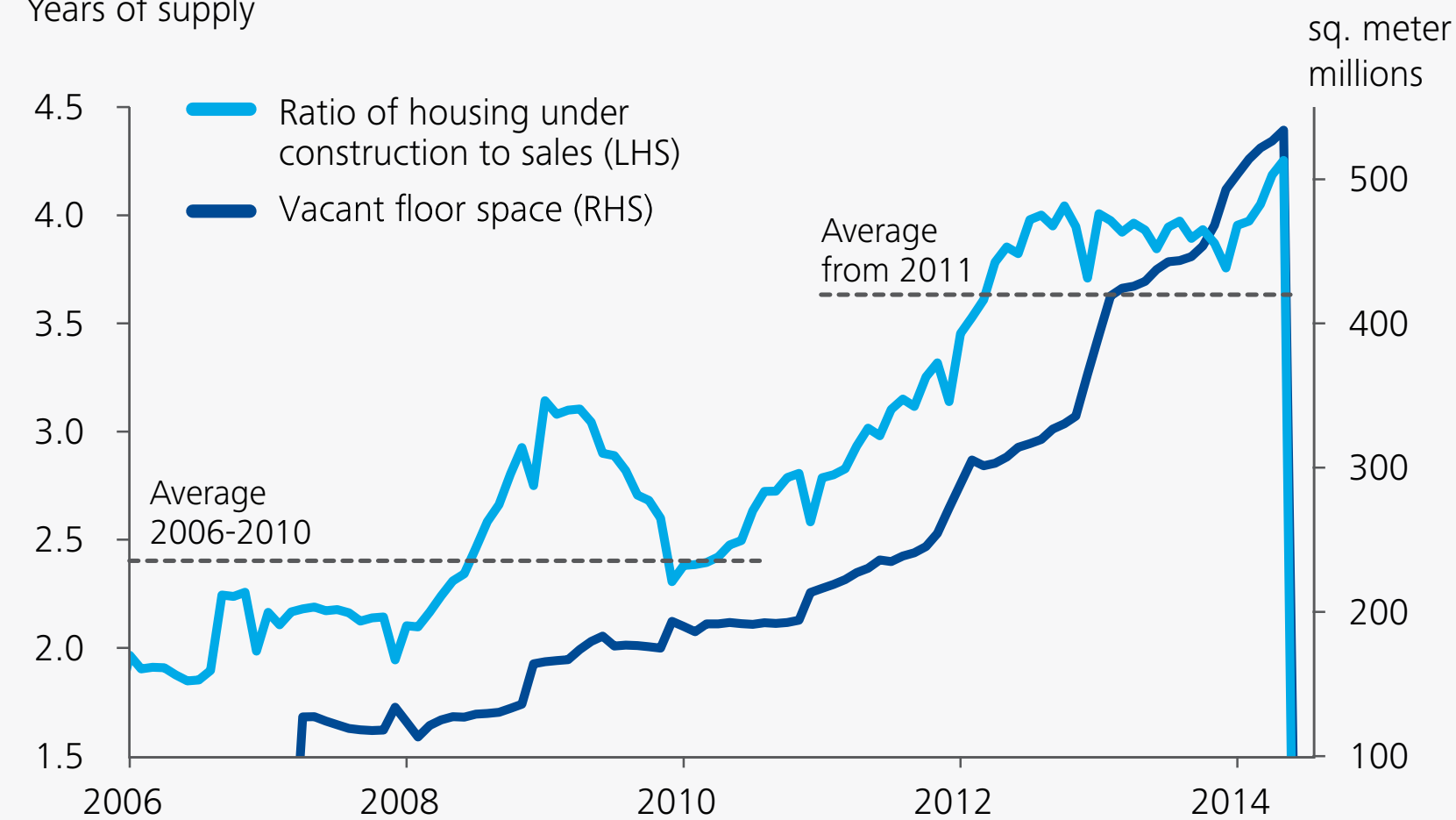


Figure 4. China: Excess supply in the real estate sector

Years of supply



Source: Oxford Economics/Haver Analytics

3. Economic analysis and outlook

However, the factors that propelled its rapid expansion and development over the past 30 years cannot be expected to remain constant over the next 30. There are unmistakable signs of a potential slowdown in China over the next three to five years, which concerns domestic policy-makers and could also have major consequences for the world economy.

Signs of a slowdown

- Oxford Economics forecasts future GDP growth of no more than 6.6 percent per year between 2015-18, far below the 10 percent pace the world became accustomed to in the years since China's entry into the World Trade Organization (WTO) in 2001.
- A run-up in real estate investment and non-traditional investment trusts may create unsustainable, and potentially damaging, investment bubbles as the spigot of easy credit is eventually closed. In recent years an enormous buildup in the housing supply, fueled by speculative investment, has triggered concern. Based on the current pace of monthly sales, it would take more than four years to sell the houses currently under construction—much higher than the average inventory level of 2.4 years in 2006–10. An oversupply of housing leaves the sector exposed to a potential house-price crash, with repercussions for the wider financial system, households, and the public sector.

- Accompanying the run-up in housing, China has permitted a massive expansion of credit since the start of the global financial crisis in 2008. Trust loans and loan products offered by the non-bank financial sector have grown by more than 70 percent over the past three years. The credit-to-GDP ratio now stands at over 200 percent according to Oxford Economics data. While that level in itself is not unsustainable, as the level of non-performing loans rise, there is a growing risk that the recent boom could quickly turn into a bust.
- A continued drive toward greater investment-led growth could compound existing problems related to overcapacity. Going back to 2005, policy-makers have been concerned with the potential for over-investment in some industrial sectors, and industrial overcapacity has only grown worse. In sectors such as steel, cement, aluminum and glass, capacity utilization has been hovering near 70 percent. Although actual data on capacity utilization remains difficult to assess, the evidence of overcapacity in these sectors can be seen in falling output prices, since excess capacity limits the extent to which firms can raise prices to boost margins. Producer-price inflation has remained negative since 2012, but prices have been falling faster in the four sectors suffering from the most severe overcapacity.

Figure 5. China: Loans

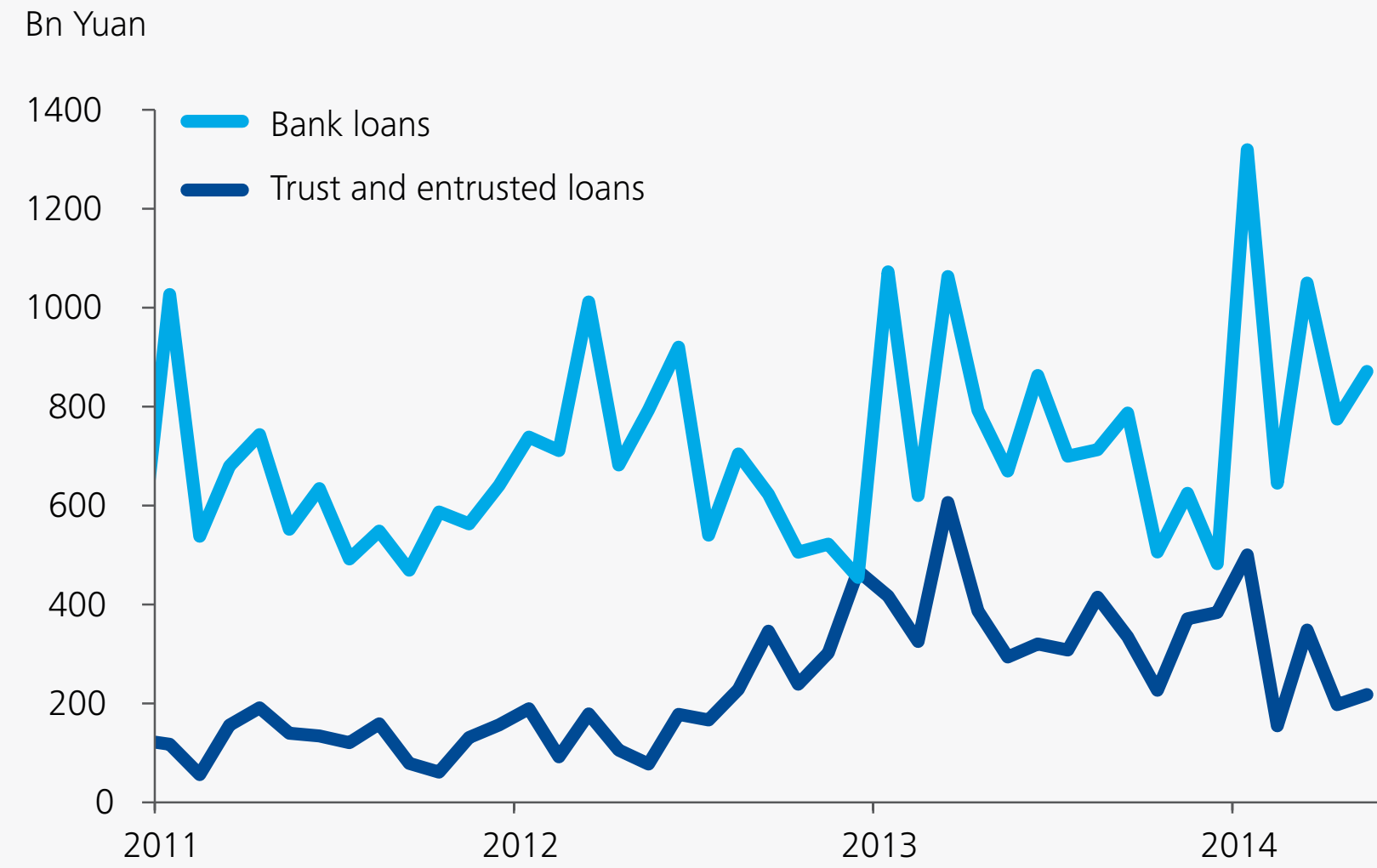
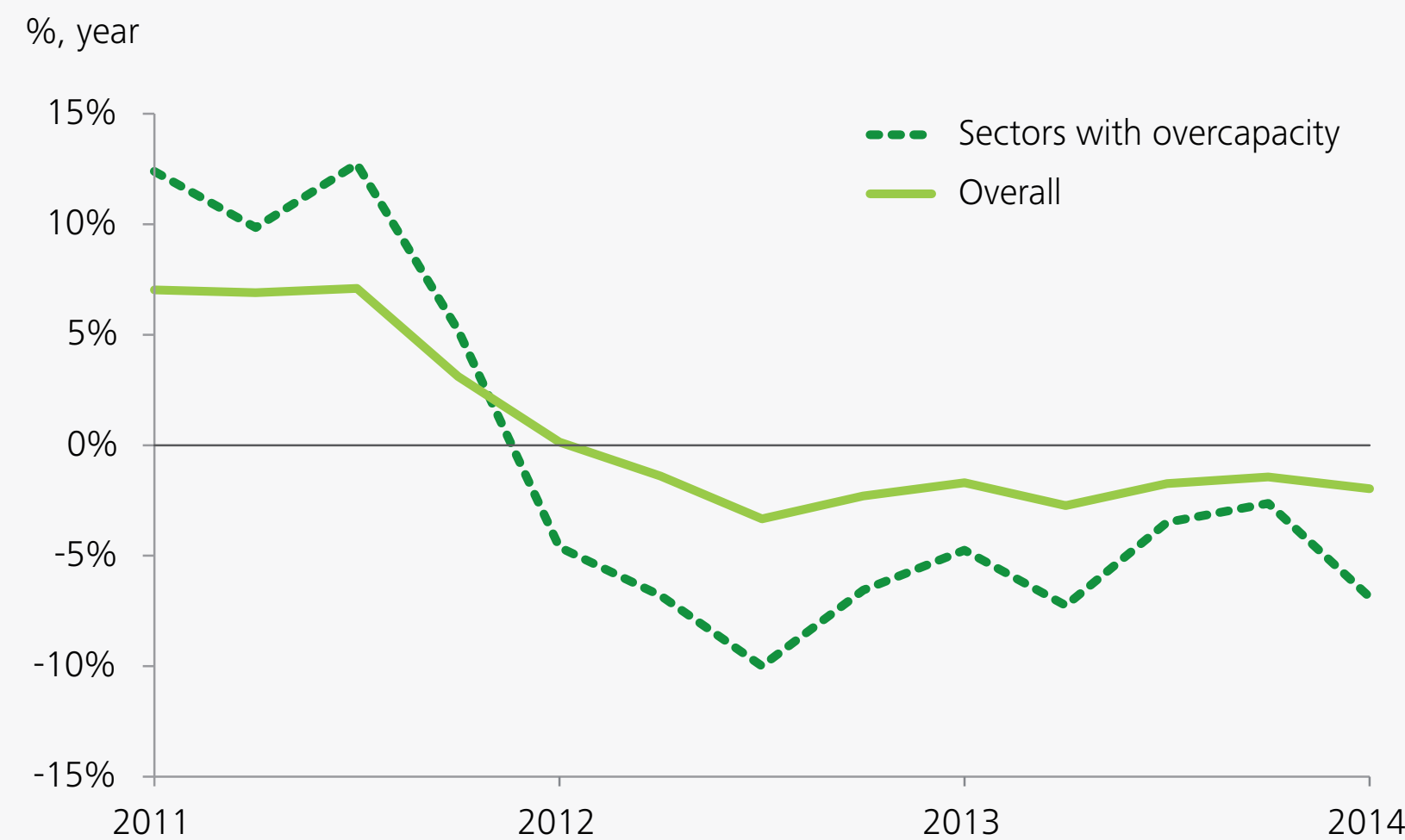


Figure 6. China: Producer price inflation



Source: Oxford Economics/Haver Analytics

- The reality of rising wages across China demonstrates that the country has already lost its once formidable comparative advantage as the world’s lowest-cost manufacturer. An expected deceleration in the pace of urban growth in the biggest cities, while middle-size cities grow more rapidly, and a decline in the working-age population expected to begin in 2016² will continue to place upward pressure on wages. As a consequence, it will be difficult for China to compete on wages against lesser-developed economies in such low-skilled manufacturing sectors as textiles and leather goods.
- China will also face additional demographic challenges. The working-age population has started to plateau and will begin to diminish within the next decade, necessitating a rebalance from low-wage manufacturing into more productive sectors. China will also be burdened with the weight of its population growing old before it grows rich, with significant implications for provision of social service and healthcare. Its old-age dependency ratio (the ratio of the population over age 65 to the working-age population) is set to rise steeply over the next two decades, creating a burden on the state’s ability to deliver healthcare and other social services to the aging, in a society where most families have been restricted to one child.

² *Global Cities 2030: Future trends and market opportunities in the world’s largest 750 cities*, Oxford Economics, May 2014.

Figure 7. China: Labor productivity relative to the U.S.

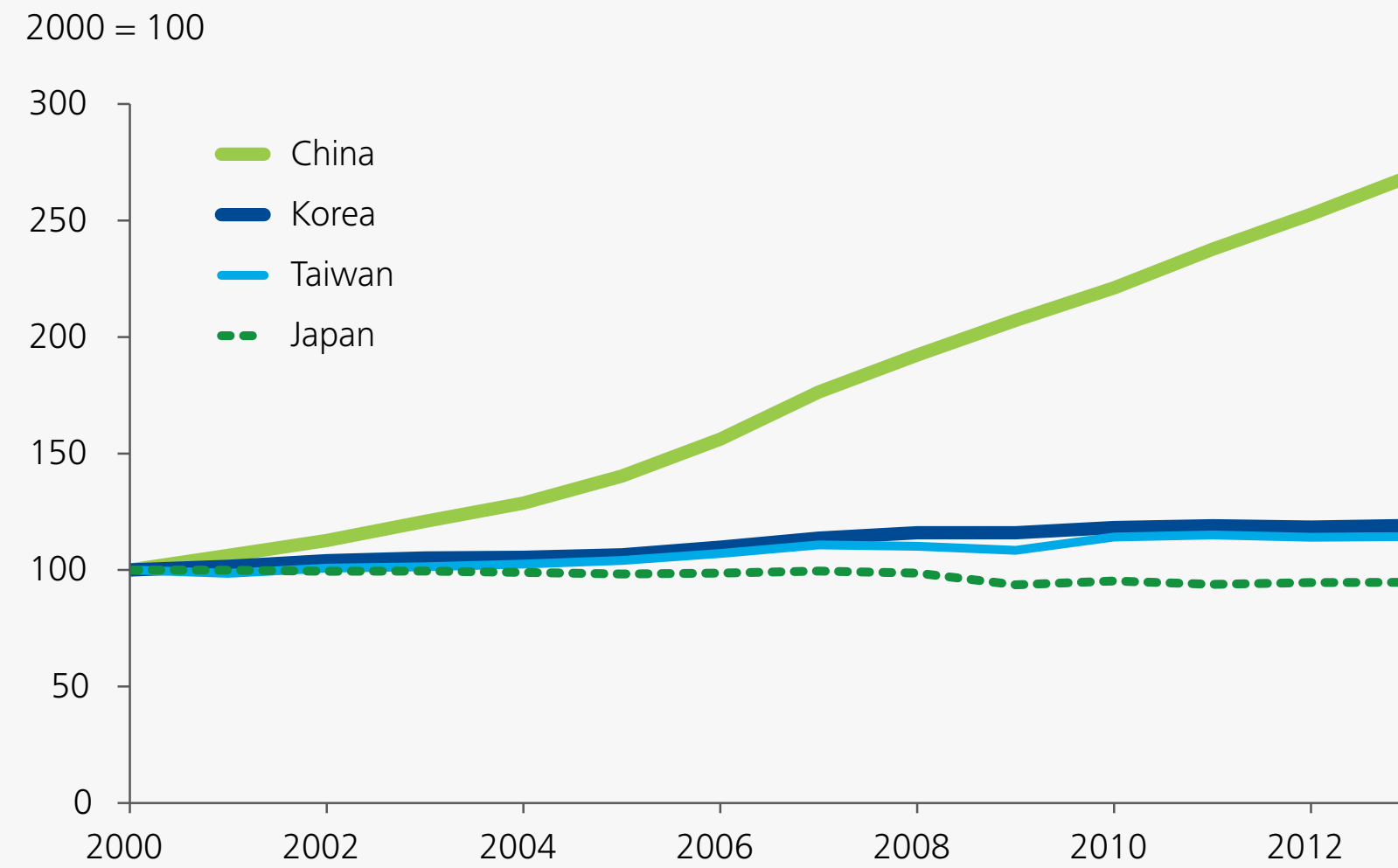
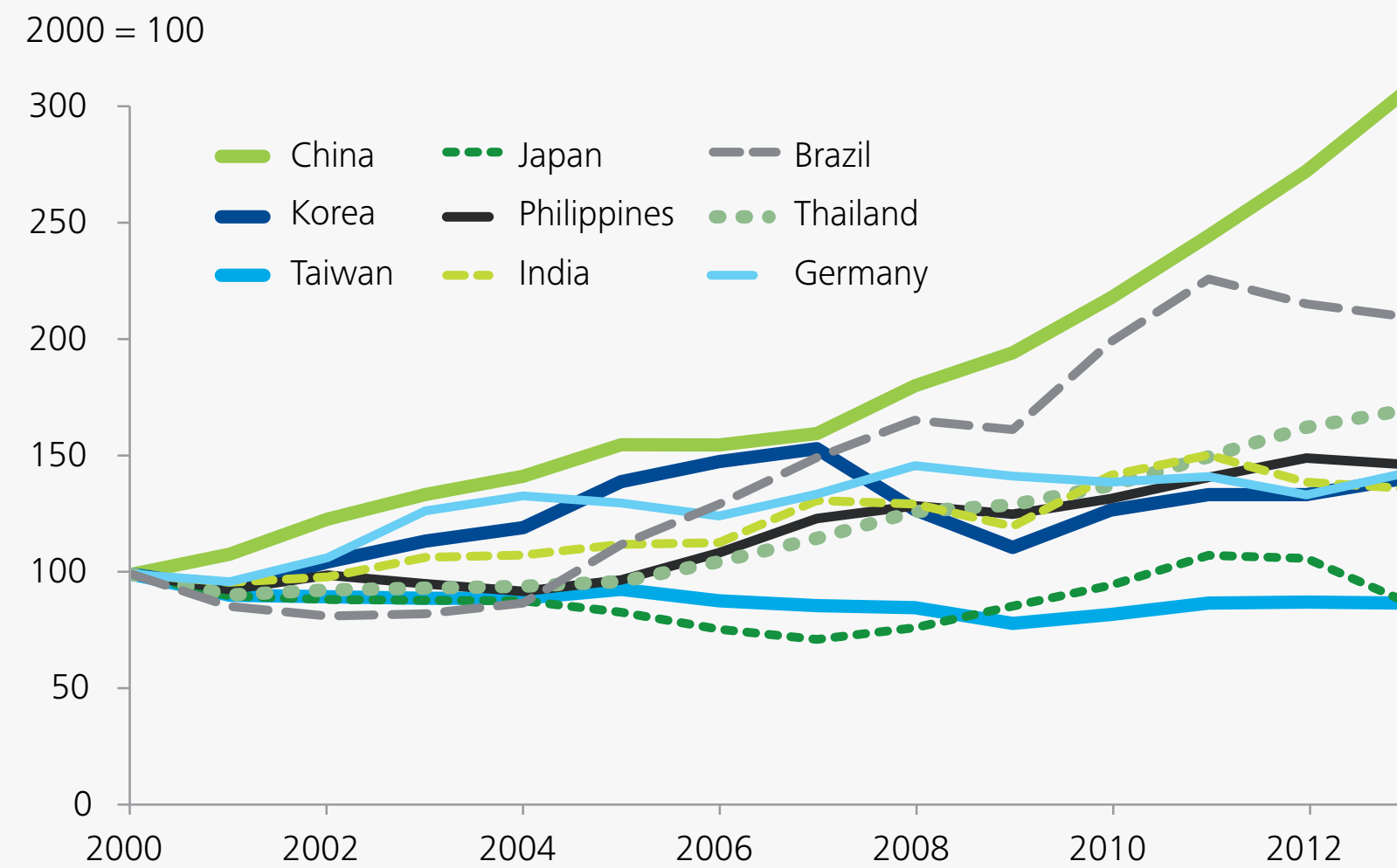


Figure 8. China: Manufacturing unit labor costs relative to the U.S.



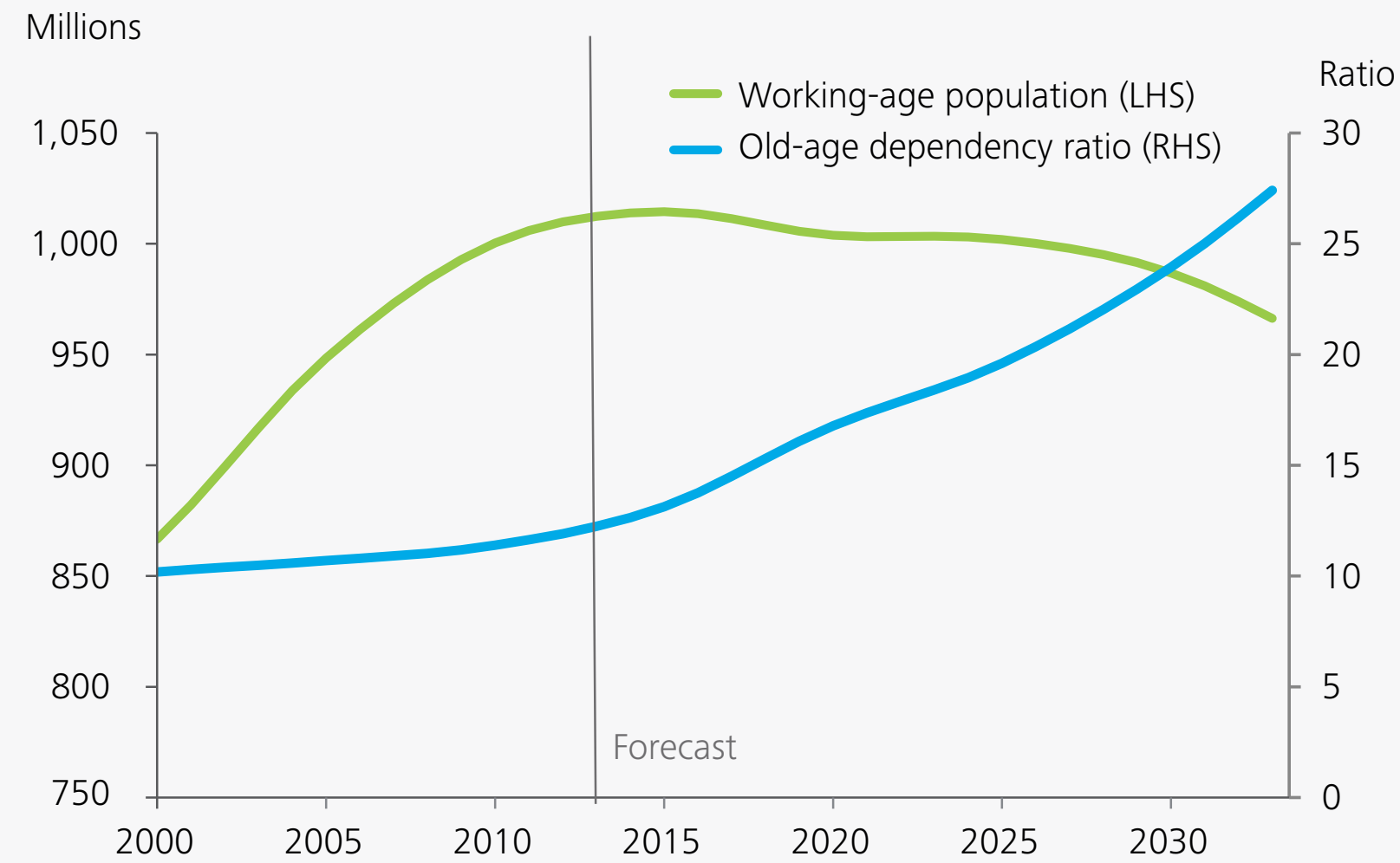
Source: Oxford Economics

Steps to boost growth

Mindful that slower economic growth may be in the cards, the Chinese government has already taken steps to further stimulate growth. It has, for example, eased reserve requirements for some banks with the aim to increase lending to agriculture, small enterprises, and consumers. It has also boosted state investment in infrastructure projects like highways and port facilities. A new economic package announced in April includes extensions to existing tax breaks on small businesses, bringing forward infrastructure investment, and lowering the reserve requirement for rural financial institutions.

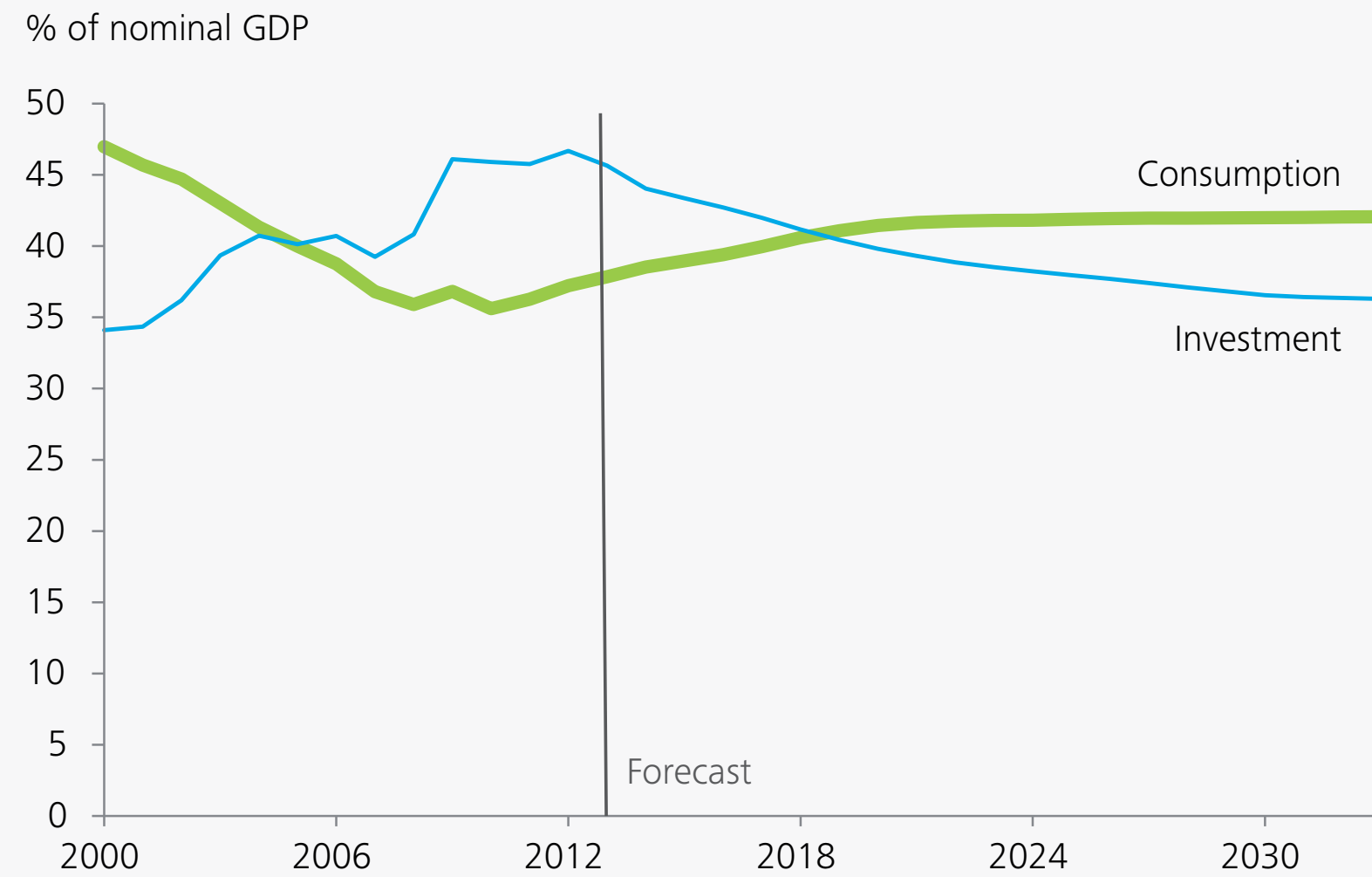
In addition, the government has already recognized the need to shift from investment-led to more consumption-led growth, and to develop more services and incentives for consumption by the nation's expanding middle class. The pacing and execution of this transition will be complex, however, and recent trends suggest that the acceleration in consumption is insufficient to offset the slowdown in investment.

Figure 9. China: Working-age population and old-age dependency ratio



Source: Oxford Economics/United Nations

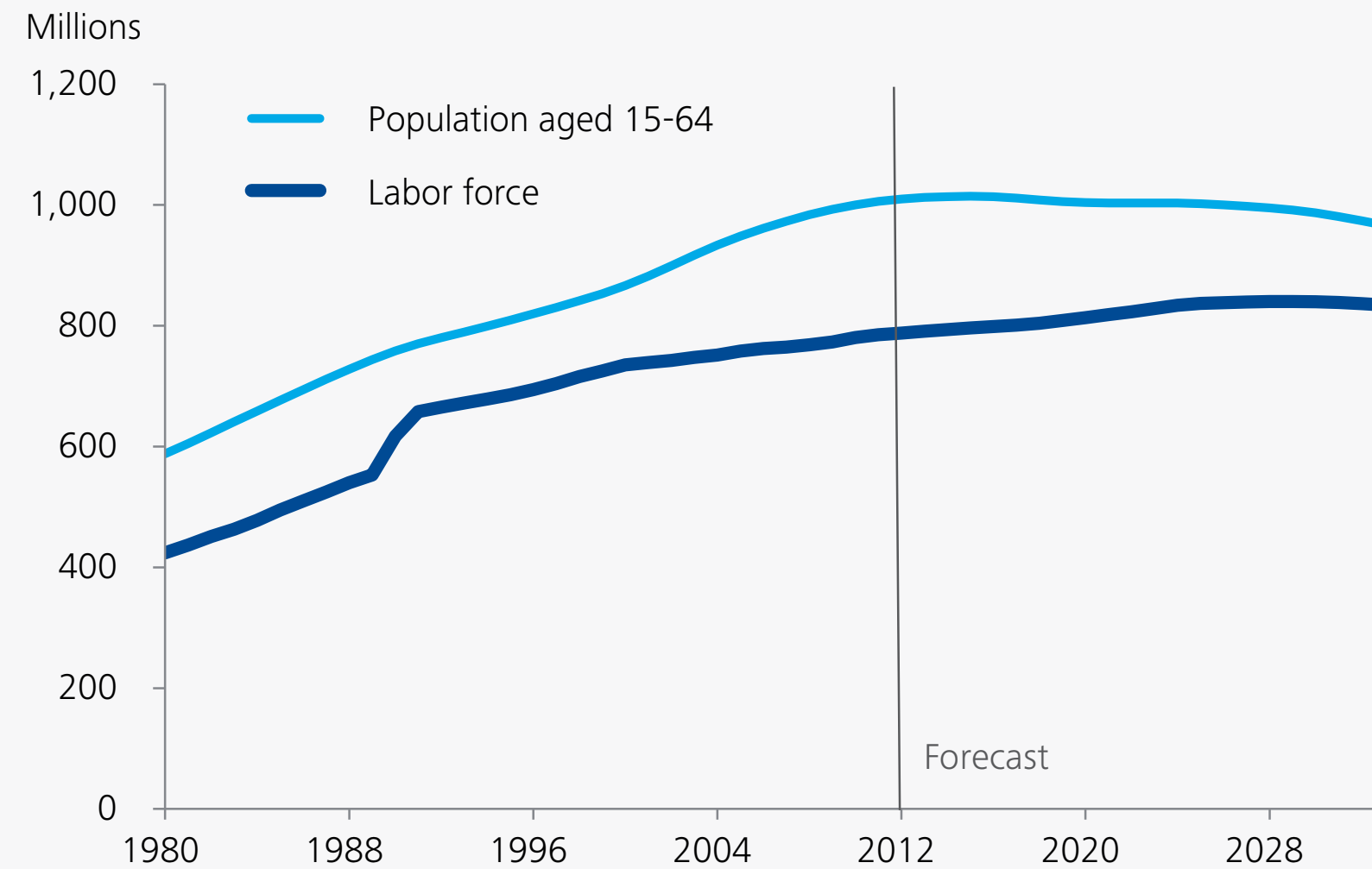
Figure 10. China: Investment and consumption share of GDP



Source: Oxford Economics/Haver Analytics

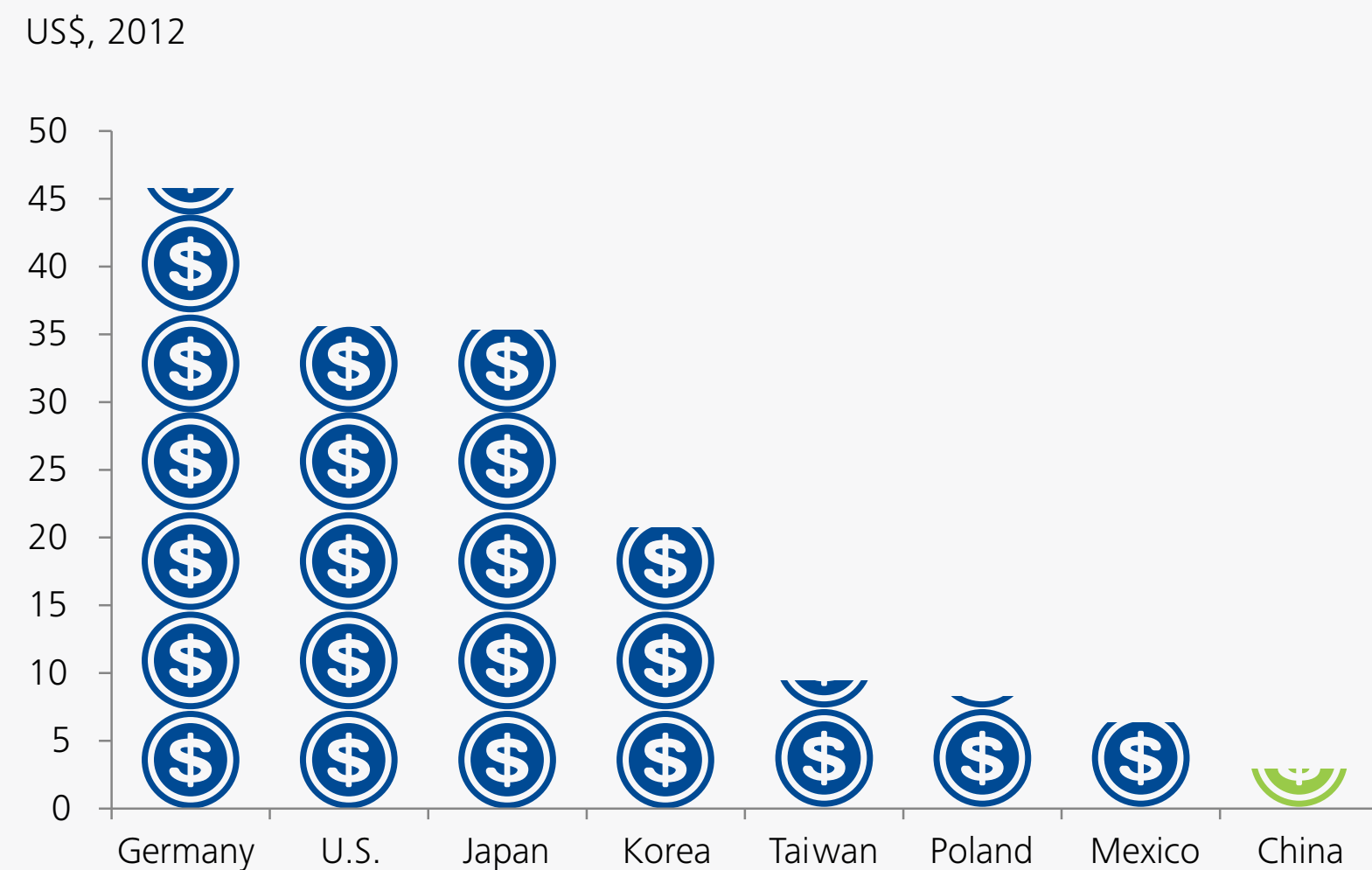
Over the longer term, China must begin to embrace new economic priorities and new strategies to ensure its longer-term prosperity. Moreover, the nation's credit-to-GDP level is now estimated to exceed 200 percent, a ratio that cannot rise much further, even if China retains enormous stocks of foreign reserves. A need to move away from large-scale investment and savings toward programs that induce greater domestic consumption will challenge the nation's leaders to boost opportunities and productivity in the services sector. And as China seeks to develop the key industries of the 21st century that will drive its next wave of growth and prosperity, the nation must develop the capabilities to become globally competitive in innovation.

Figure 11. China: Working-age population and the labor supply



Source: Oxford Economics/United Nations

Figure 12. China: Average hourly wages in manufacturing



Source: Oxford Economics/BLS

4. A look back: growth and transformation

China's revival over the past three decades has been unique in world history. Never before have so many been wrested from poverty in such a short time. Yet, in order to appreciate the enormous opportunities and some of the thorny dilemmas China now faces at this critical inflection point, it is important to reflect on how China was able to engineer its initial phases of reform and economic development.

In the late 1970s, some 30 years after the Communist Revolution, the People's Republic of China represented a populous but relatively minor economy, with little trade or contact with the outside world. State-owned enterprises dominated the economic landscape, workers depended on an "iron rice bowl" of state-organized work and living arrangements, and millions worked the land as collective farmers.

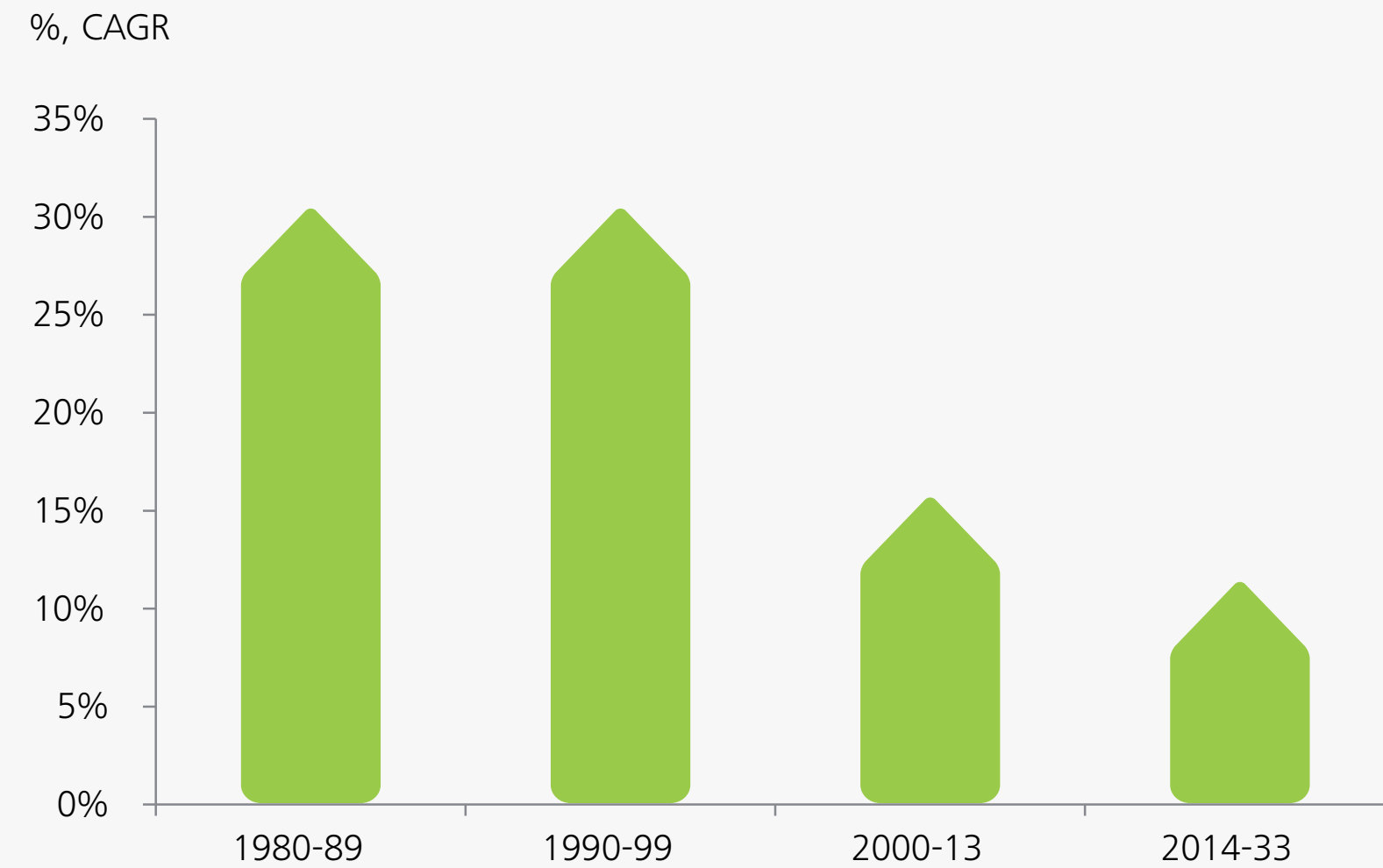
But a period of remarkable reform and "opening up," led by Paramount Leader Deng Xiaoping, in which foreign capital was given strong incentives to invest, build factories, and align China as a newly emerging hub for widely distributed global manufacturers, proved transformative. Working off a common set of plans, software, and third-party governance, China used this momentum to achieve a rapid, and unprecedented, economic blast-off.

China's emergence into the first rank of economic powers was given further impetus by its accession to the WTO in 2001, little more than 20 years after beginning to embrace private enterprise and foreign investment, which helped it integrate itself even more closely into global economic patterns.

China's growth was characterized by three distinct phases:

- In its first phase of rapid growth, between the mid-1980s and mid-1990s, the country's competitiveness was most closely linked with the ability of foreign entities, working with handpicked Chinese joint-venture partners, to build sophisticated, Western-style factories. These workshops combined advanced production technologies and cheap Chinese labor to rapidly boost exports of finished products and to begin more generalized production of higher-quality consumer goods for the Chinese domestic market. The surge in exports these factories created allowed China to begin to accumulate significant reserves of foreign currency, even as the renminbi remained tightly controlled. According to UN data, China's labor pool expanded by more than 2.7 percent per year during the 1980s and 1990s, and today the nation's labor force totals some 800 million workers³. Even though wages in China have started to rise rapidly, they remain less than one-quarter of those in the United States.

Figure 13. China: Inward FDI



Source: Oxford Economics/Haver Analytics

- The second phase of growth, from approximately the mid-1990s to the early 2000s, saw China move up the value chain to develop far more capital-intensive industries. Steel-making and glass production, as well as more sophisticated electronics, were fueled by the availability of relatively cheap capital as a result of China’s ability to accumulate a large surplus of foreign exchange dollars and easy credit from the government. This period also saw the first boom of large office and residential construction in China’s major cities and the privatization of key businesses.

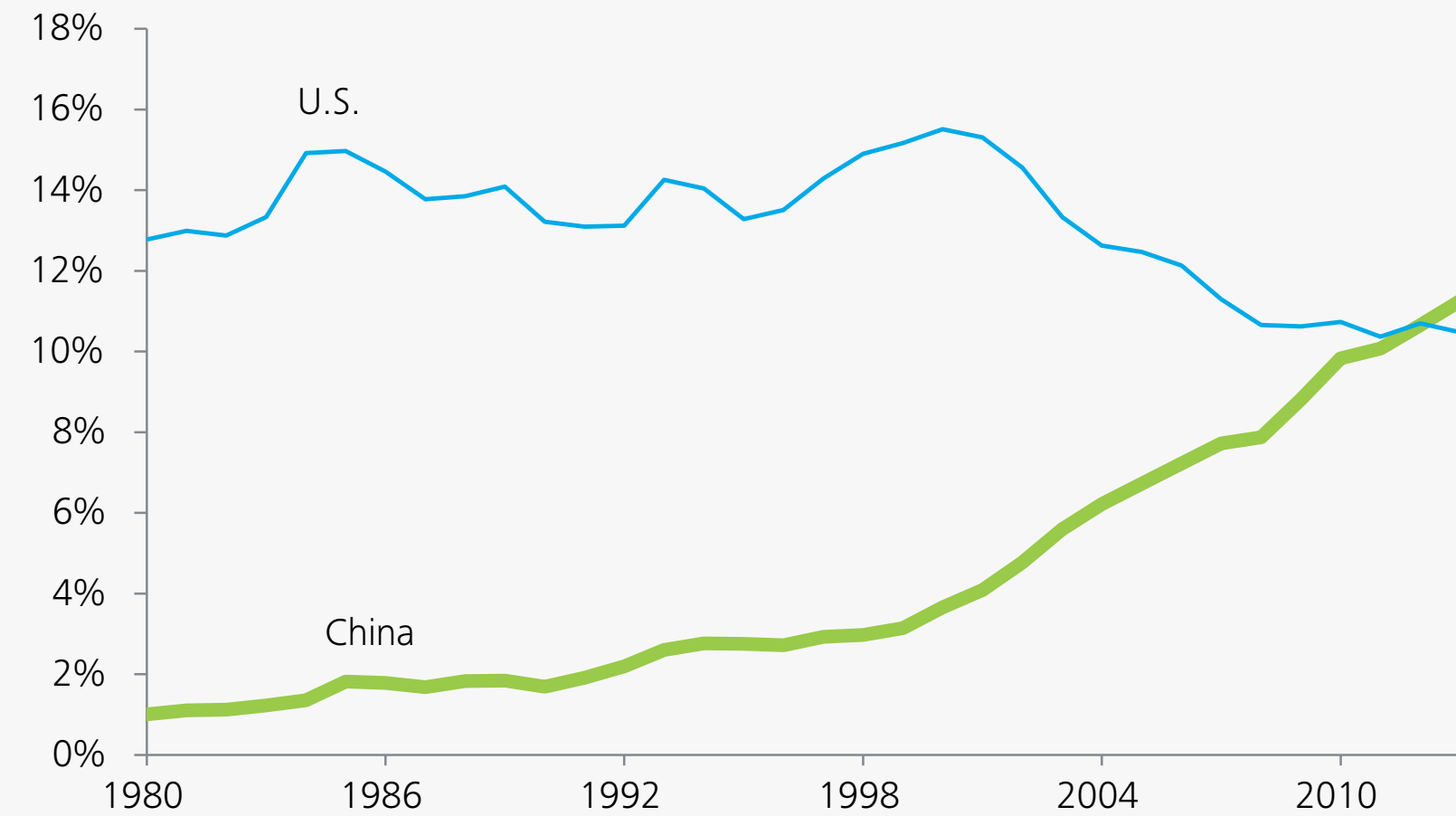
Indeed, inward FDI grew by more than 30 percent per year through the 1980s and 1990s, and even throughout the past decade, has continued to increase by a robust 15 percent per year (Figure 13). This enormous surge in investment allowed China to develop a sophisticated industrial and infrastructural base, which enabled the nation to become a key production cog in the supply chain of global manufacturing, often serving as the final assembly site for designs and products conceived elsewhere. These factors were in place prior to China’s entry into the WTO in 2001, but agreeing to abide by global trade rules only deepened its involvement in the global economy. In 2007, China overtook the United States as the largest exporter in the world, and in 2012, it accounted for the largest share of global trade (defined as its share of imports plus exports).

- Over the last decade, China has taken its place technologically as an increasingly more mature economy, manufacturing semiconductors and developing internet and mobile phone applications. This transition was aided, in part, through its ability to gain intellectual-property assets at relatively low prices. Indeed, rankings compiled by the World Economic Forum indicate that China today performs reasonably well relative to other nations in its level of R&D spending, ranking 22nd, and its capacity for innovation, where it is ranked 30th, although it continues to lag some of its more technologically advanced Asian peers, including South Korea, Taiwan, and Japan.³

³ World Economic Forum, The Global Competitiveness Index data platform, 2013-2014, <http://www.weforum.org/issues/competitiveness-0/gci2012-data-platform/>

Figure 14. China's share of global trade

% of world imports and exports



Source: Oxford Economics/Haver Analytics

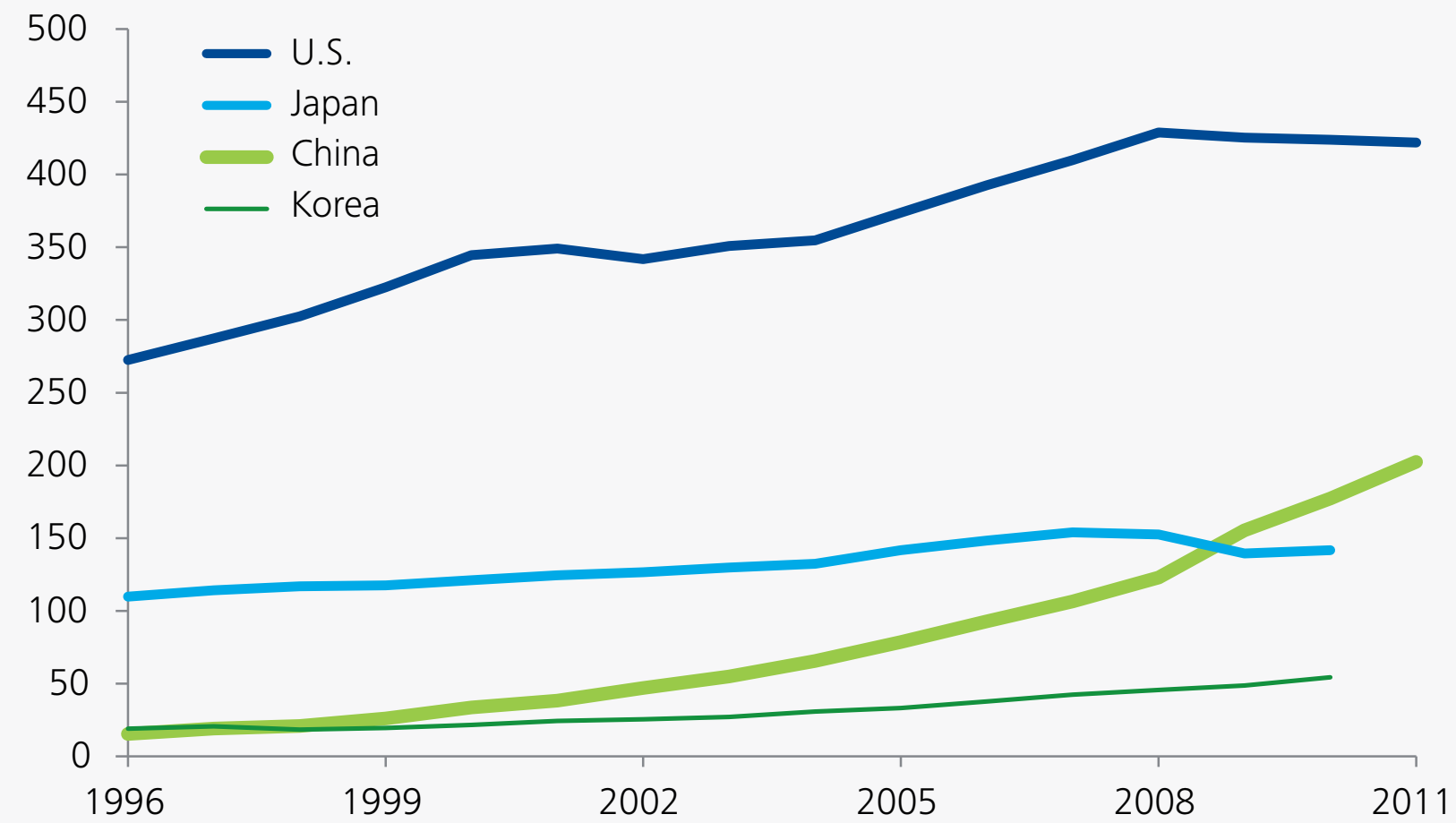
Today, only the United States possesses an economy larger than China's (some US\$16.8 trillion in 2013 GDP, compared with US\$9.2 trillion, according to Oxford Economics estimates), although on purchasing power parity (PPP) terms, the gap between the two countries is even smaller, as this calculation significantly raises China's GDP to US\$13.4 trillion.

Throughout this period of rapid transformation, China's GDP growth has been remarkably strong and stable, with the pace of growth only dropping significantly below 10 percent during the difficult reforms of state-owned enterprises in the early 1990s and then during the Asian financial crisis, when growth slowed to 6–8 percent. A surge in government-led investment helped the country weather that storm, and officials undertook a similar approach to counteract the potential slowdown triggered by the 2008–09 global financial crisis.

But size alone does not adequately represent China's potential—or its imminent challenges. With a population of 1.3 billion, China remains a relatively poor country. Its estimated GDP per capita on a PPP basis was just under US\$10,000 in 2013, lower than that of Thailand and less than one-fifth of the U.S. level, a factor that, in turn, demonstrates the enormous potential from boosting the domestic consumer market and services sector. In addition, income disparities have grown markedly as the country has been transformed by urbanization, the wholesale privatization of real estate, and a renewed emphasis on private entrepreneurship, outside the territory of the state-owned enterprises (SOEs).

Figure 15. R&D spending

2010 US\$ bn at PPP



Source: Oxford Economics/World Bank

5. Catching the next wave

Across China today, there is now a growing understanding that the nation’s longer-term challenge and next logical effort is to transition from labor- and capital-intensive activities to those that more deeply utilize knowledge, innovation, design, IT sciences, software, and marketing.

The fact that wages today are rising more rapidly than productivity dictates that China move smartly up the “value chain” in the near future, from relatively commoditized manufacturing and lower-skilled assembly to more innovative activities. Beyond the application of relatively low-skilled labor, China needs to produce more “value” in a wide assortment of fields ranging from design and logistics to financial and business services to high-tech industries and life sciences.

Undoubtedly, China possesses a number of distinct advantages that could allow it to rapidly move up the value chain and push out the nation’s technological frontier. Government policies are actively targeting key industries for aggressive investment.

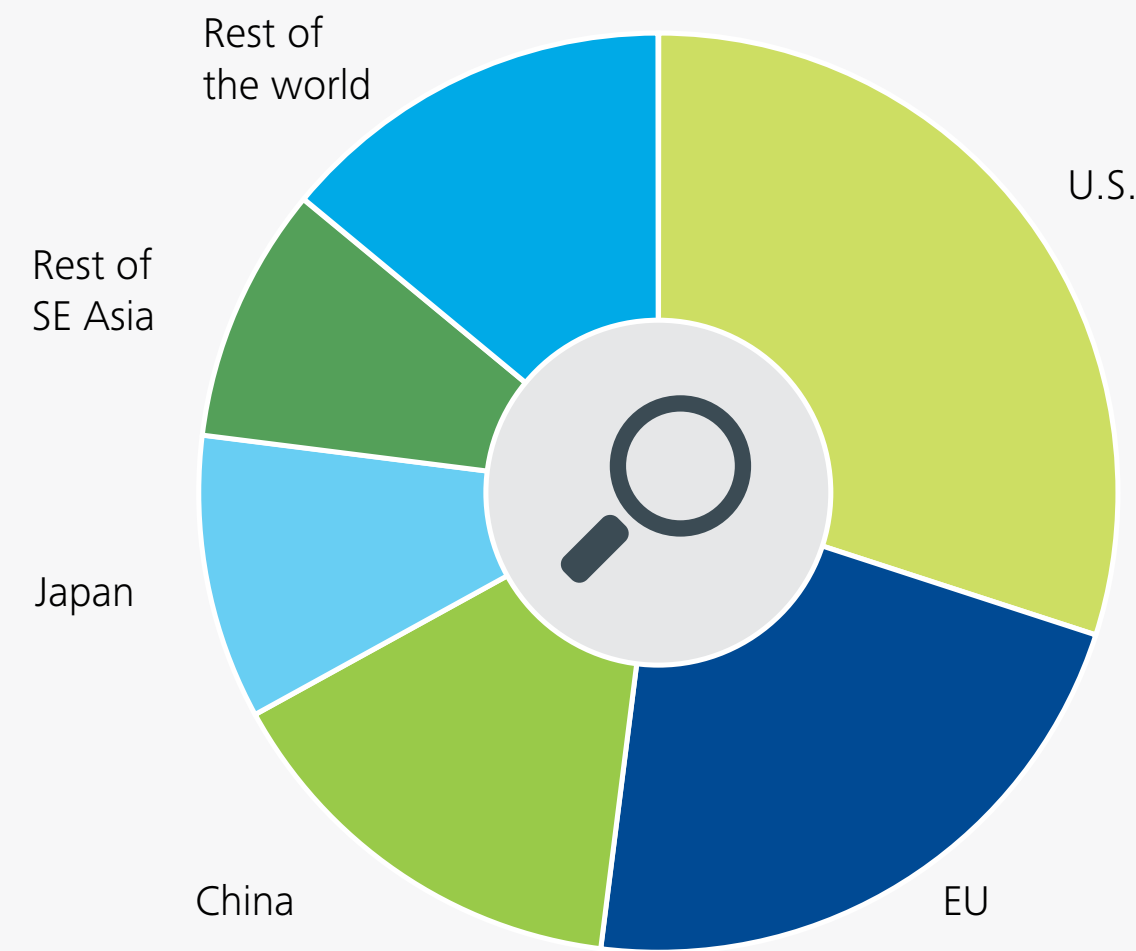
One potent example of China’s clear potential to transform its manufacturing base is through the development of “smart manufacturing,” which integrates information technology, advanced industrial tools, and human ingenuity. Deloitte China, with the support of China Machinery Industry Federation (CMIF), recently surveyed about 200 manufacturing companies and interviewed executives from leading enterprises to determine how extensively smart manufacturing would be taken up across China.

The survey found that while 77 percent of manufacturer respondents agreed that building smart manufacturing capabilities is important to their company’s future, close to half (49 percent) had not yet started to apply smart manufacturing to their business operation, and most of them had no plans to import such equipment or technologies in the next three years. That being said, 45 percent of respondents listed technology R&D as their top investment priority over the coming five years.⁴ And while smart manufacturing initiatives has already been identified as a priority for government support in China’s 12th Five-Year Plan at both the national and provincial levels, 88 percent of respondents in the Deloitte survey indicated that they expect more from the government in terms of policy support and incentives for technology innovation.⁵

⁴ 2013 China Smart Manufacturing Survey Report, Deloitte China, http://www.deloitte.com/view/en_CN/cn/ind/mfg/e74b5faf7d074410VgnVCM3000003456f70aRCRD.htm

⁵ Ibid

Figure 16. Global R&D share



Source: U.S. National Science Board

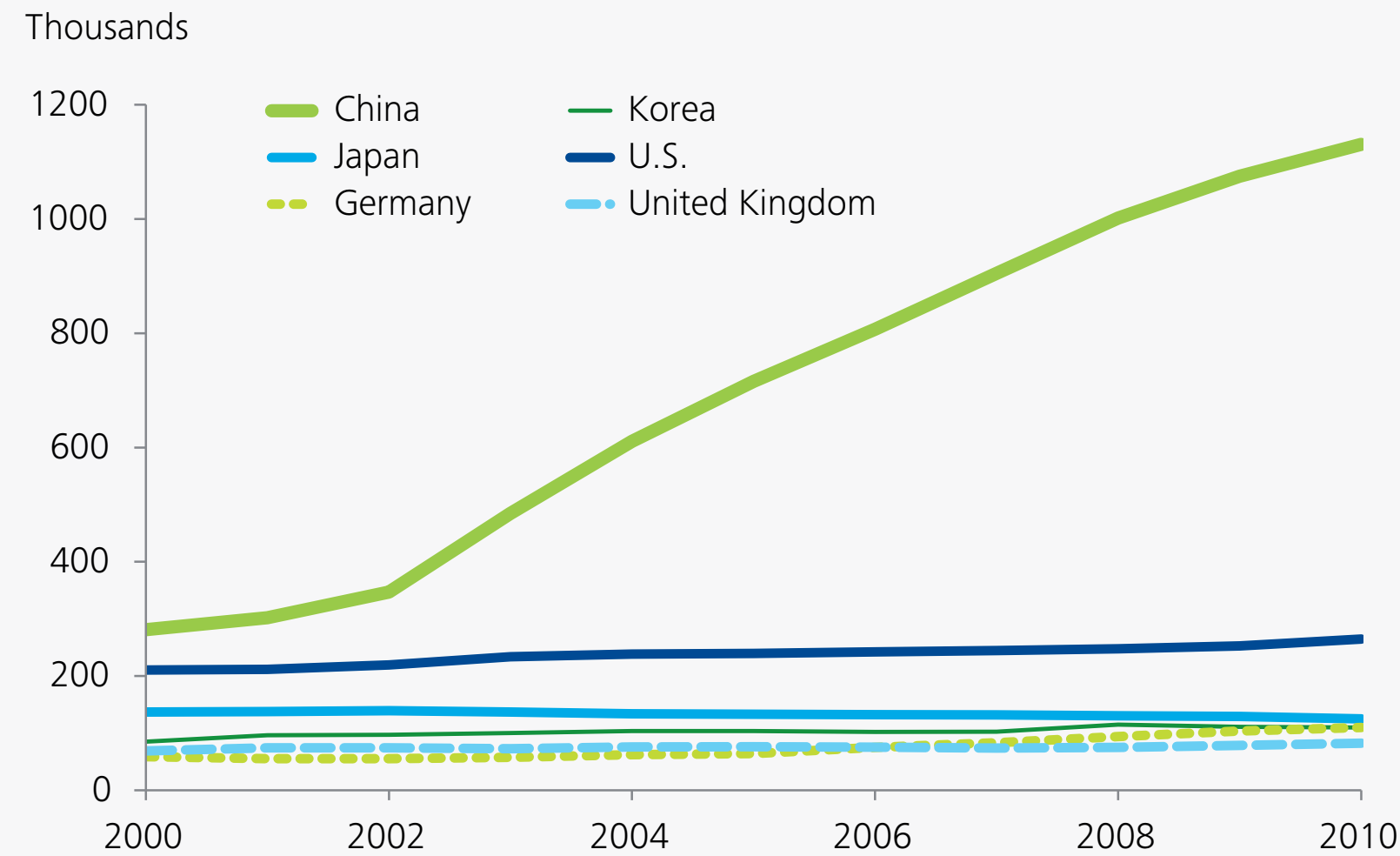
As another feature of its systematic program to boost domestic skills, the central government is also inducing highly talented China-born scientists and other experts who were trained abroad to return home. The nation is investing in universities that can develop a trained workforce of technical workers and is creating “clusters” at which high-tech and bioscience firms can converge. Moreover, because it still actively embraces the role of strong central planning as a means to lead economic development, China could conceivably develop its own distinctive model of innovation and entrepreneurship that competes against the more independent and diffuse systems that have developed in the West, which are generally powered by imaginative entrepreneurs. On the other hand, central planning could stymie innovation and market opening reforms might be required.

Some key metrics already demonstrate that China’s leadership fundamentally understands the nature of its looming challenges and is moving the country toward a more innovative future.

For example, the nation’s R&D spending has been climbing robustly in recent years. According to the U.S. National Science Board, China today accounts for the second-largest share of global R&D spending, after the United States (15 percent of the global total), having already eclipsed South Korea and Japan.⁶ Its overall spending on R&D now exceeds that of each nation of the European Union, though spending alone does not necessarily increase the quality of, or expected return on, investment.

⁶ National Science Board, 2014 Science & Engineering Indicators report, <http://www.nsf.gov/statistics/seind14/index.cfm/chapter-4/c4s2.htm>

Figure 17. Number of science and engineering graduates




Source: US National Science Board


Because of its large population and strong and rising commitment to learning, China’s education system is now producing an increasingly large cohort of workers with advanced science and engineering skills, a trend that helps counteract the projected decline in the overall workforce. China currently generates the largest supply of graduates with degrees in science and engineering (1.1 million in 2010; see Figure 17), more than four times the number of graduates in the United States, though some critics argue that Chinese institutions have yet to create a learning system that sufficiently inculcates innovation and the give-and-take essential to inspire “out of the box” breakthroughs.


A number of other factors are likely to spur innovation and a renewed focus on developing greater productivity. The rapid growth of a broad middle class has spurred an increasingly sophisticated appetite for world-class and cutting edge products, such as access to sophisticated technology, like web-enabled smart phones. This is already creating strong domestic demand for new kinds of products and services, and will help cultivate economies of scale in domestic production. Global industries such as mobile online gaming and internet chat have already gained a very strong foothold in China, and Chinese exports of this technology may become increasingly important in the medium-term.


Business-friendly regional clusters, including those in the Shanghai Free Trade Zone, as well as Guangdong’s Pearl River Delta, Zhejiang, and Fujian, were designed, in part, to encourage an entrepreneurial culture that might help breed new start-up firms. The rapid pace of urbanization across China, especially in middle-sized cities, along with infrastructure investments in features like high-speed bullet trains that are connecting metropolitan areas, are already spurring new investments and productivity gains as business executives and tourists alike find it easier to meet customers, visit family, or go on holiday.


6. Future growth sectors


 Aerospace


 High-value machinery and components

 Life sciences

 Mobile technology

 Internet e-tailing and social media

 Logistics and other services

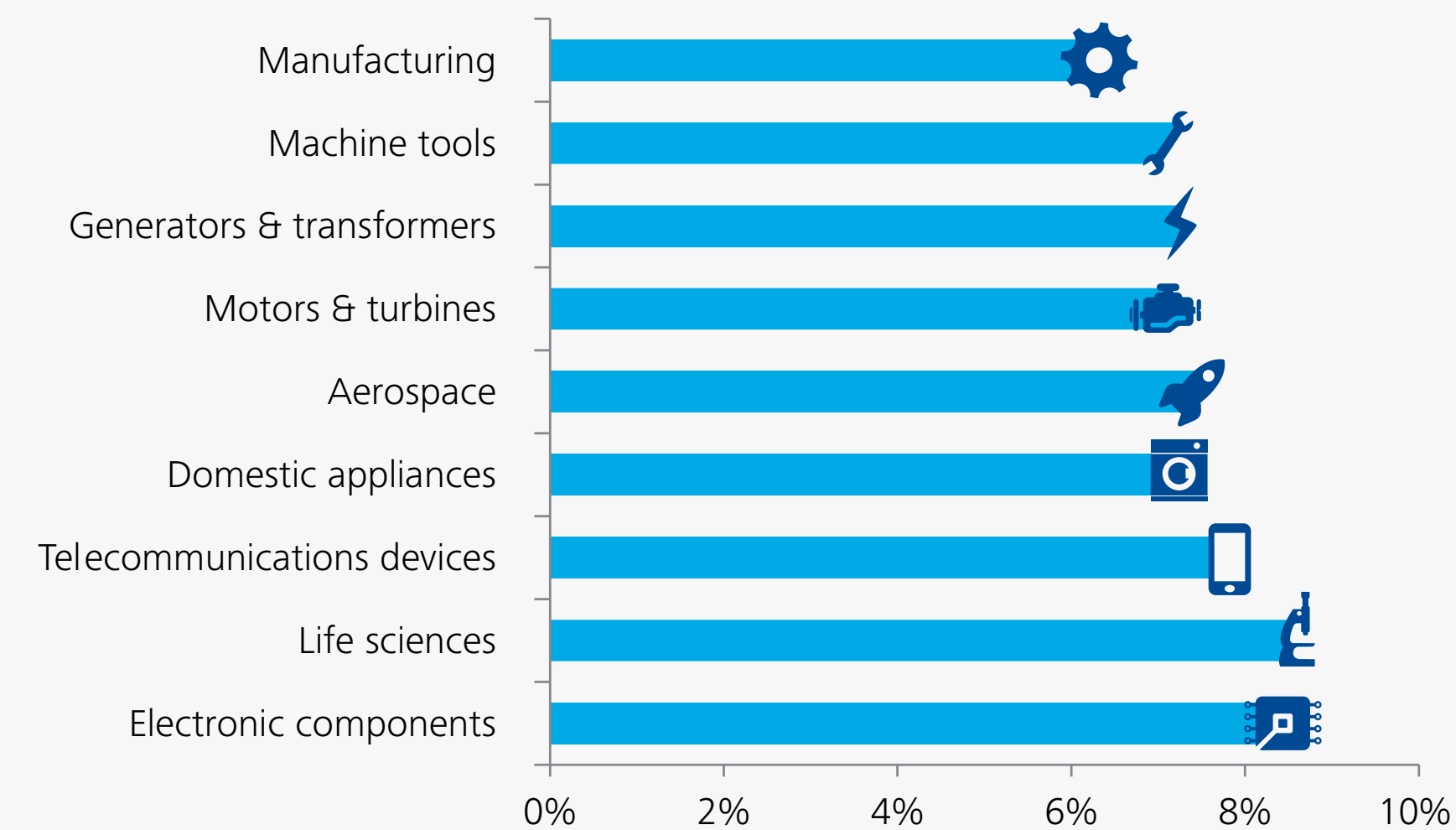
 Health services

 Education services

 Energy


Figure 18. China: Manufacturing unit labor costs relative to the U.S.

% CAGR



Source: Oxford Economics/Haver Analytics

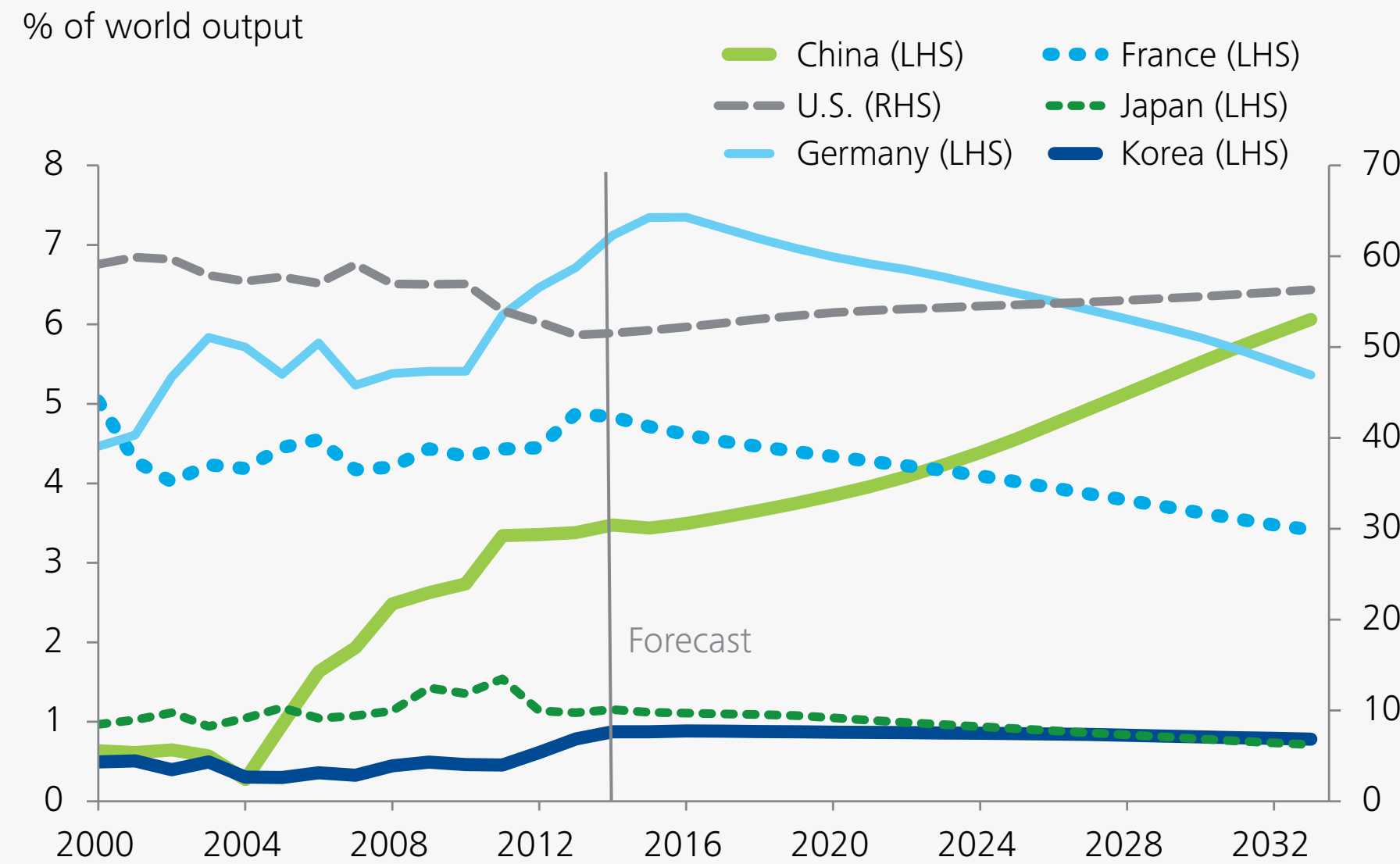
China's next growth wave will continue to focus to a very large extent on manufacturing. The nation's challenge, however, will be to move away from mass production of "commoditized" products to the development of more specialized and innovative sectors. As the chart (Figure 18) indicates, it is anticipated that there will be significant manufacturing growth in areas like aerospace, life sciences, and high-value specialized machinery, as well as in electronics componentry. The following section highlights the expected developments in some of these key growth sectors.

 Click on the tabs to navigate

6. Future growth sectors

- 🚀 Aerospace
- ⚙️ High-value machinery and components
- 🔬 Life sciences
- 📱 Mobile technology
- 📶 Internet e-tailing and social media
- 📦 Logistics and other services
- 👨‍⚕️ Health services
- 🎓 Education services
- 🔋 Energy

Figure 19. Global share in aerospace



Source: Oxford Economics


⁷ Boeing China Long-Term Market CMO 2014 – 2033, <http://www.boeing.com/boeing/commercial/cmo/china.page>

Aerospace


The nation's aerospace industry is currently relatively small, representing little more than three percent of world value-added output (Figure 19). However, aerospace remains a high-priority sector in the nation's 12th Five-Year Plan, which demonstrates that the government is intent on developing higher-value-added products. Globally, the sector is dominated by the United States, which assembles the most planes, has the most airports, and trains more pilots. Building safe and reliable airplanes that can be delivered on time involves the development of a complex and highly distributed engineering and design process, which usually demands the creation of an immense network of global supply chains. Developing a viable aircraft industry will test Chinese firms' ability to manage such tasks, but clearly appears to be a segment that has captured the imagination of the government. Already, Airbus operates a final assembly plant for its A320 passenger jet in Tianjin, and the Commercial Aircraft Corporation of China, Ltd. (COMAC) is expecting to test its first single-aisle commercial jet, the C-919, with room for 174 passengers, in the second-half of 2015.


With the rapid expansion of aviation across the country, Boeing has estimated that Chinese airlines will need nearly 6,000 new planes, valued at US\$780 billion, over the next 20 years.⁷ The Chinese government would like its own industry to fulfill some of this demand. Having developed a sophisticated automotive industry by leveraging joint ventures with foreign companies in order to acquire leading-edge technology, China could very well become a significant player in the aviation sector as well.


6. Future growth sectors


 Aerospace

 **High-value machinery and components**

 Life sciences

 Mobile technology

 Internet e-tailing and social media

 Logistics and other services

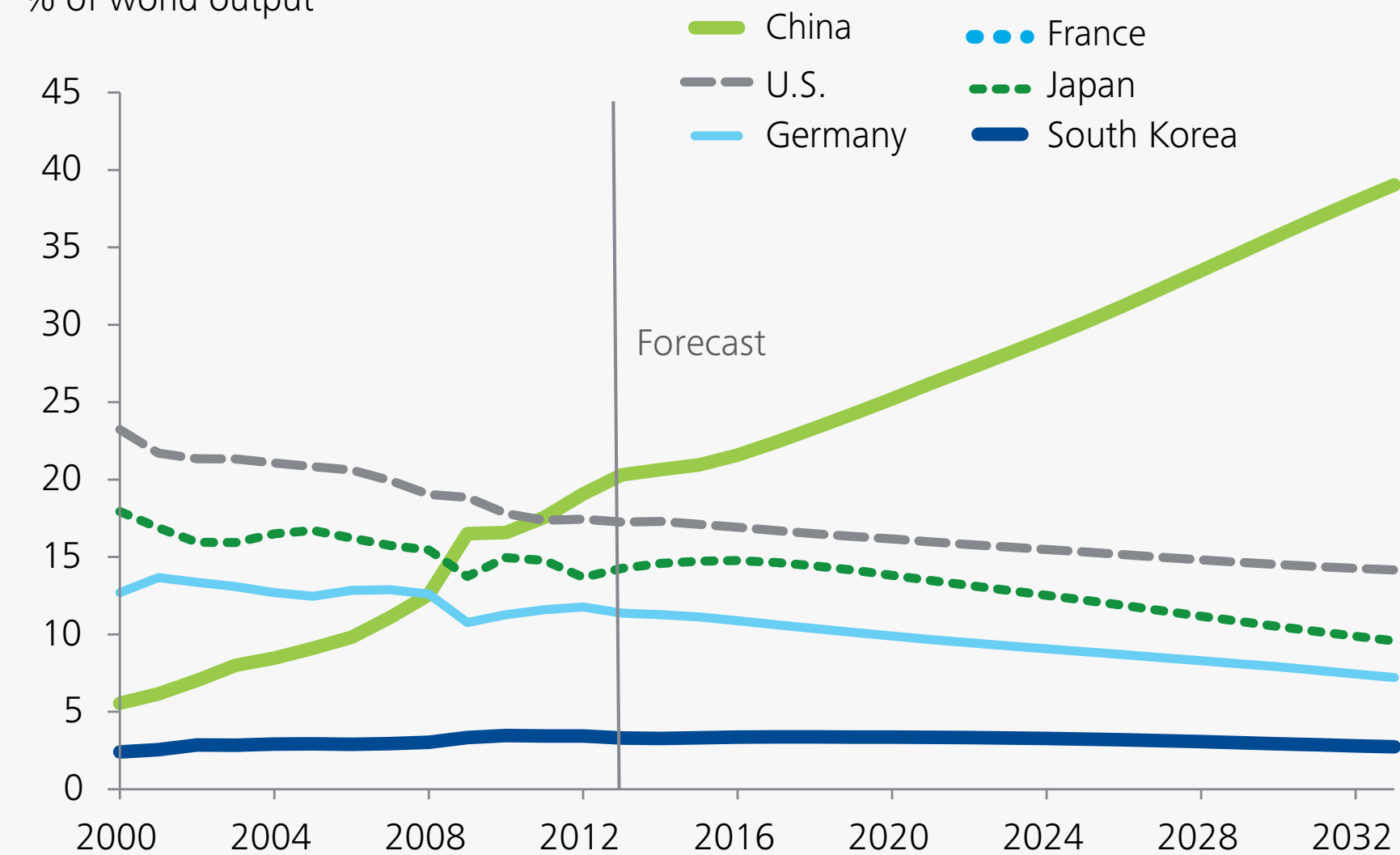
 Health services

 Education services

 Energy

Figure 20. Global share in machinery and engineering goods

% of world output



Source: Oxford Economics


High-value machinery and components

Underpinned by strong domestic investment, the production of specialized, high-value machinery and engineered products has grown rapidly across China in recent years. While a near-term slowdown in the sector can be anticipated, as the economy moves away from investment-fuelled growth, over the longer-term China is likely to become a regional hub for machinery production, displacing a large amount of the design and manufacture that currently takes place in Japan.


A similar pattern can be expected in electronics components. The size and increasing sophistication of the Chinese market may gradually induce firms from Taiwan to develop new processes and product technologies in China, as the rapid growth of the domestic market, rather than exports alone, drives the thrust for more rapid design iteration and production breakthroughs. Moreover, as China becomes more committed to the manufacture of higher-value-added electronics components, rather than merely being satisfied with final assembly of components produced elsewhere, it is likely that this accelerated accumulation of more sophisticated skills will lead to further domestic competitiveness.





6. Future growth sectors


 Aerospace

 High-value machinery and components

 Life sciences

 Mobile technology

 Internet e-tailing and social media

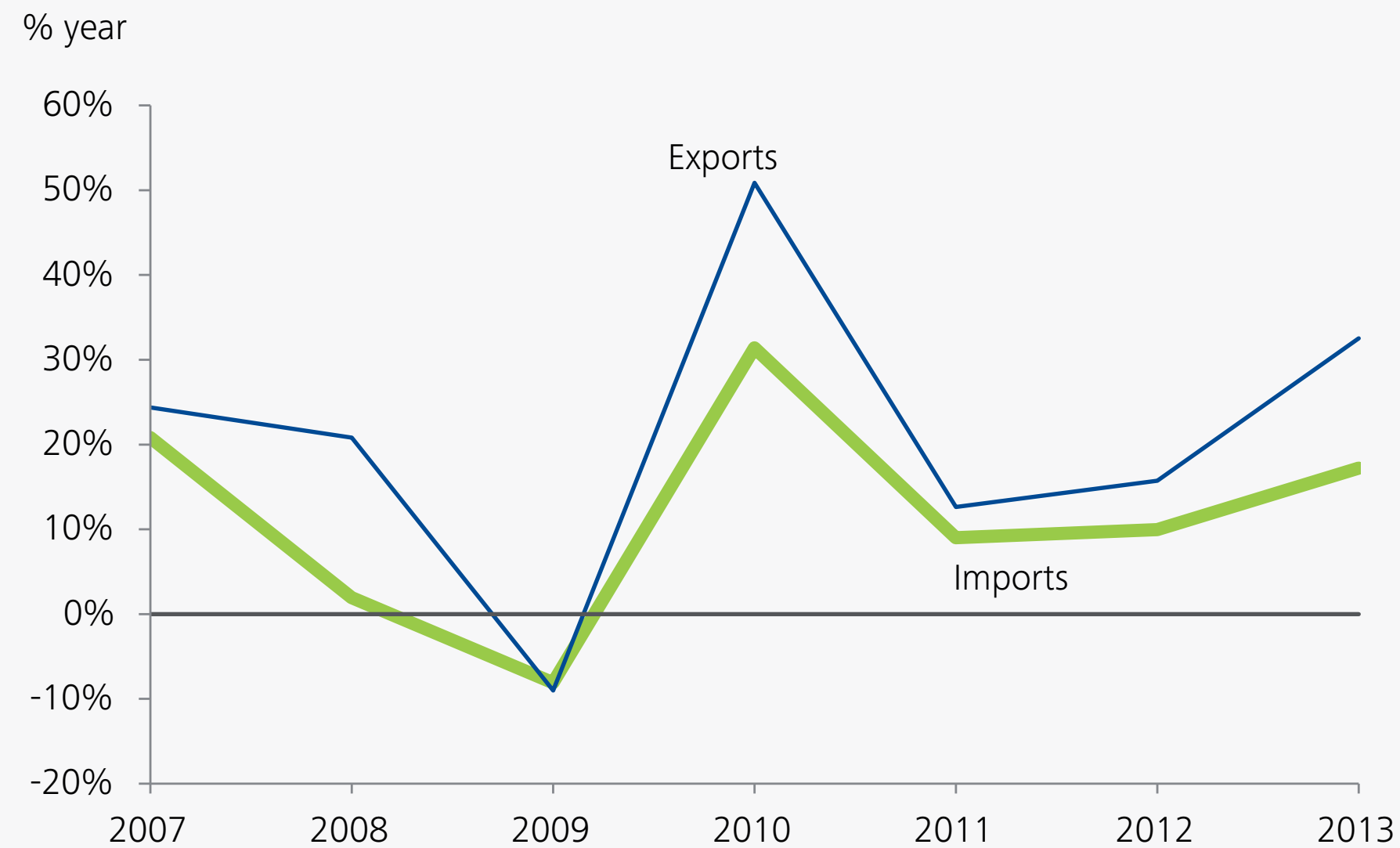
 Logistics and other services

 Health services

 Education services

 Energy

Figure 21. China's trade in electronics components



Source: Haver Analytics

China's need to develop more sustainable technologies to increase energy efficiency and reduce greenhouse gases is one example of this—and it has already led to major investments in battery cell technology and electric motors, which are likely to power the drivetrain of future electric vehicles. Since government and industrial policy can play a crucial role in inducing investment and getting innovative machinery production ramped up to efficient scale, China could play an important role in the more rapid development of affordable electric vehicles, and the panoply of components required to produce them. In July, the government mandated that electric cars make up at least 30 percent of government vehicle purchases by 2016, and exempted these autos from a 10 percent purchase tax.⁸


Moreover a review of recent trade data shows that the composition of trade in electronics components has already begun to shift. Although imports of electronics components have been rising briskly, exports of these products, particularly higher-tech electronics (parts/ components of computers, tablets, smart phones, et al), have been increasing even faster.⁹

⁸ 13 July 2014, China Central Government, http://www.gov.cn/xinwen/2014-07/13/content_2716563.htm


⁹ April 2013, International Monetary Fund Regional Economic Outlook, Asia and Pacific; Page 9, <http://www.imf.org/external/pubs/ft/reo/2013/apd/eng/areo0413.pdf>





6. Future growth sectors


 Aerospace

 **High-value machinery and components**


 Life sciences

 Mobile technology

 Internet e-tailing and social media

 Logistics and other services

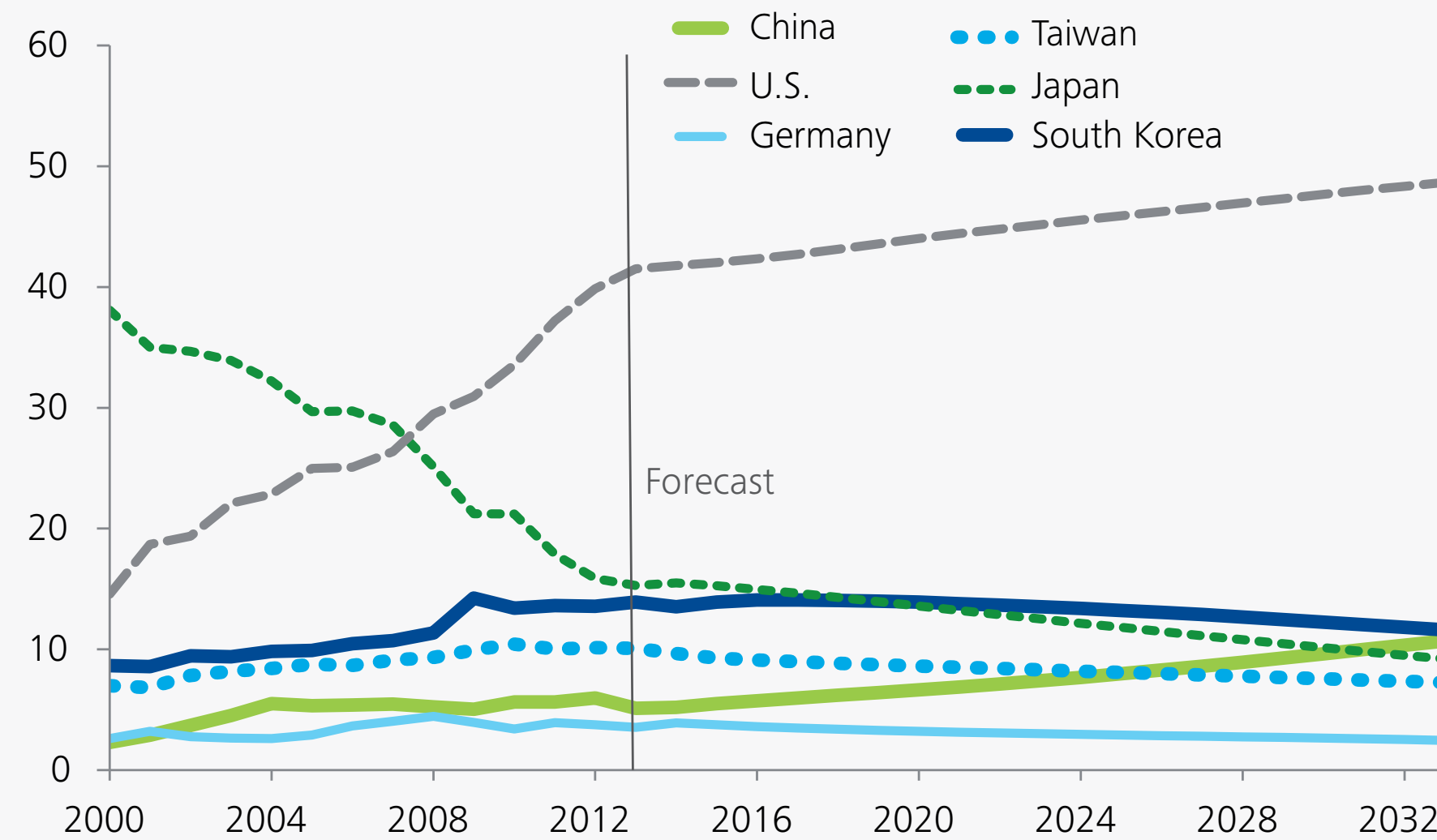
 Health services

 Education services

 Energy

Figure 22. Global share in electronics components

% of world output



Source: Oxford Economics


Indeed, over the next two decades, China’s global share of component manufacture is expected to more than double, largely at the expense of its large East Asian neighbors, particularly Japan and Taiwan, and it may overtake them during the course of the next two decades. It is likely that Chinese producers of agricultural and construction equipment, and perhaps even consumer electronics, might become important exporters in the years to come.


As the demands of China’s middle class have matured, so have its innovative providers of appliances and other consumer goods for the rapidly growing household sector. One notable innovator is the BROAD Group, a manufacturer of central air conditioning, air purification and ventilation systems that are powered by natural gas and waste heat. The company also manufactures pre-fabricated, sustainable buildings that are highly energy-efficient and able to withstand an earthquake that measures up to magnitude 9. The company’s founder, Zhang Yue, was recently ranked eighth in the world’s top 25 Eco-innovators in a list published by *Fortune* magazine.¹⁰

¹⁰ 1 May 2014, The World’s Top 25 Eco-Innovators, Fortune, <http://fortune.com/2014/05/01/the-worlds-top-25-eco-innovators>





6. Future growth sectors


 Aerospace

 High-value machinery and components

 **Life sciences**

 Mobile technology

 Internet e-tailing and social media

 Logistics and other services

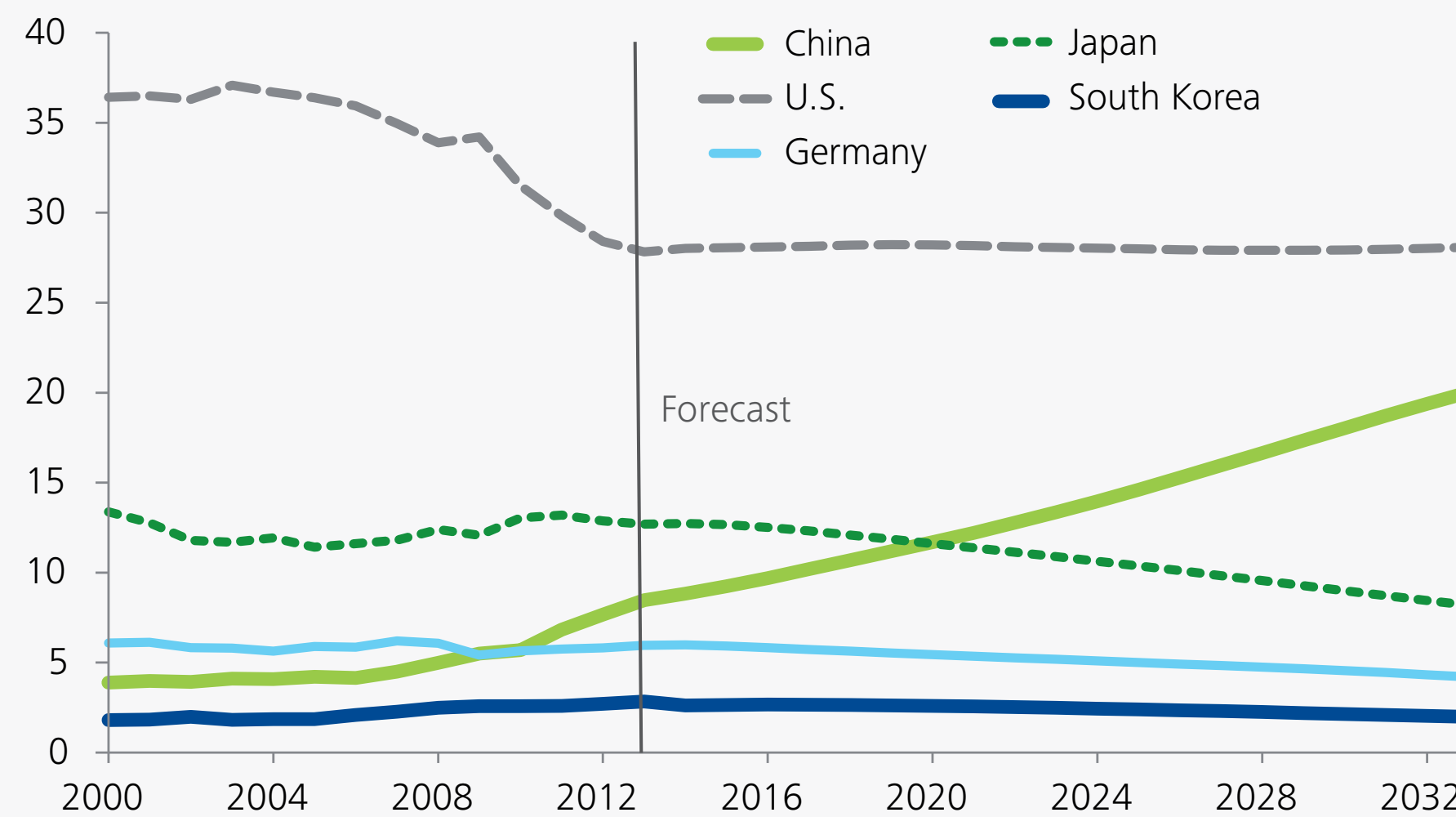
 Health services

 Education services

 Energy

Figure 23. Global share of pharmaceutical and medical-device production

% of world output



Source: Oxford Economics

Life sciences










Life sciences and drug discovery represents another area where China could position itself as an important—and potentially disruptive—player by 2025. The industry in China has gathered a critical mass of highly skilled talent, a pool of savvy and focused venture investors, and growing government support, as the domestic market for drugs and medical devices begins to rapidly expand. Indeed, some experts have noted that China may soon possess the potential to create its own pipeline for new drug development that is more vigorous than in the Western world, where the “model” of drug discovery appears to be hamstrung and the cost of new drug approvals has become almost unsustainable.¹¹ China still faces significant hurdles, including issues over drug pricing, approval of new drug discoveries, and insufficient support from domestic pharmaceutical firms to support research into new therapies. At the same time, however, a surge of investment from foreign pharmaceutical firms into R&D labs demonstrates the growing belief that breakthrough therapies may well be developed in China.

In the world of genomic testing and rapid-fire sequencing, BGI has already emerged as the destination of choice for many research institutions or universities trying to better understand plant, animal, or human DNA. The Shenzhen-based institute was called upon to decode a mysterious SARS-like virus that spread across Germany in 2011. It has also become the most world’s most prolific sequencer of human genomes, having purchased a California-based sequencing firm in 2013. As a result, the cost of sequencing a human genome, which ran to nearly US\$1 billion a decade ago, can now be completed in a day

¹¹ China: The Life Sciences Leader of 2020, Monitor Group, 2010



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or two for just thousands. BGI officials also express the ambition to become the open-source genomic “database platform” for the world’s scientists, akin to a Google for DNA.¹² In a life sciences world that is moving toward more personalized medicine, the potential for genomics to unlock new targeted drug discoveries is promising.

Moreover, Western pharmaceutical giants are increasingly looking for opportunities to partner with Chinese firms, both on the development of unique treatments, and in terms of design and manufacture of medical devices. One example, Medtronic of the United States, recently announced a “strategic alliance” with LifeTech Scientific Corp of Shenzhen to develop minimally invasive cardiovascular technologies. With government subsidies already in place to help stimulate innovation, and China’s middle-class and aged population growing rapidly, the domestic market will offer significant opportunities. This is especially true if the government can continue to strengthen its intellectual property protection to encourage patents and the China Food and Drug Administration (CFDA) can rework some of its drug approval processes, as it can often take longer for a new drug or therapy to be approved for use in China than in Europe or the United States.

¹² 1 July 2014; Around the World: Four Innovative Companies We Can Learn From, Forbes, <http://www.forbes.com/sites/theyec/2014/07/01/around-the-world-four-innovative-companies-we-can-learn-from/2/>



6. Future growth sectors



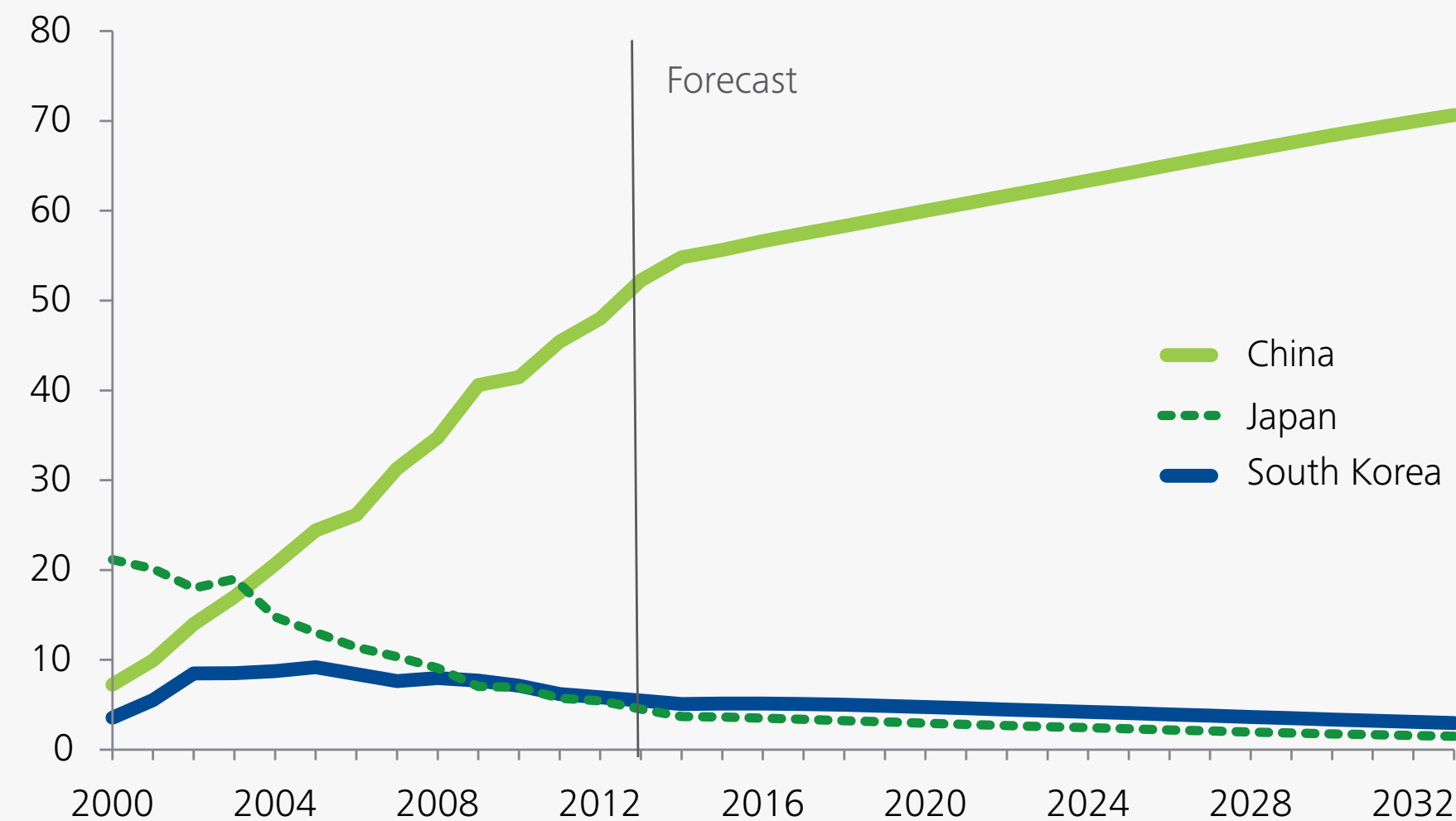
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Figure 24. Telecommunication devices

% of world output



Source: Oxford Economics

¹³ International Data Corporation (IDC)'s China Quarterly Mobile Phone Tracker (2013 Q3); 19 February 2014, <http://www.idc.com/getdoc.jsp?containerId=prCN24688114>

¹⁴ Deloitte China Global Mobile Consumer Behavior Survey Report 2013, http://www.deloitte.com/view/en_CN/cn/ind/tmt/a1bc576a77851410VgnVCM1000003256f70aRCRD.htm

Mobile technology

As China is now the world's largest consumer of mobile phones, it should not be surprising that it is beginning to emerge as a center of innovation and software advances in telecommunications. As the mobile phone has increasingly become the platform of choice for consumers around the world, Chinese innovation in mobile gaming, communication, e-commerce, and shopping software and service hold enormous potential to boost the nation's competitiveness and spur new mobile-specific industries. The adoption of mobile telephony within China has been remarkable. From seven percent of the population in 2000, the number of subscribers to mobile phones has grown to nearly 90 percent in 2013.¹³ And Chinese consumers replace their mobile phones often. According to Deloitte's 2013 China Mobile Consumer Survey, 73 percent of users replace their mobile phone within one-and-a-half years; only 12 percent of consumers possess mobile phones for more than 2 years.¹⁴

Internet penetration has also been rising rapidly, despite slower growth in the uptake in broadband subscriptions as consumers choose to rely on their mobile phones or tablets to access the internet rather than traditional PCs. China today is the world's largest market for smartphones. And while the recent annual growth rate is likely to decline over the near-term, since the price of top-tier phones is still beyond the reach of many lower-income consumers, this opportunity could well unleash a round of domestic innovation to develop less expensive alternatives. Moreover, innovative Chinese firms have already created important improvements and new capabilities in the software and services used in mobile devices, whether in social gaming, dating, blogging, or mobile messaging, like Tencent Holdings' QQ and We Chat services. Ready access to high-quality information is critical for economic development, and the mobile industry in China is likely to continue to surge.

6. Future growth sectors








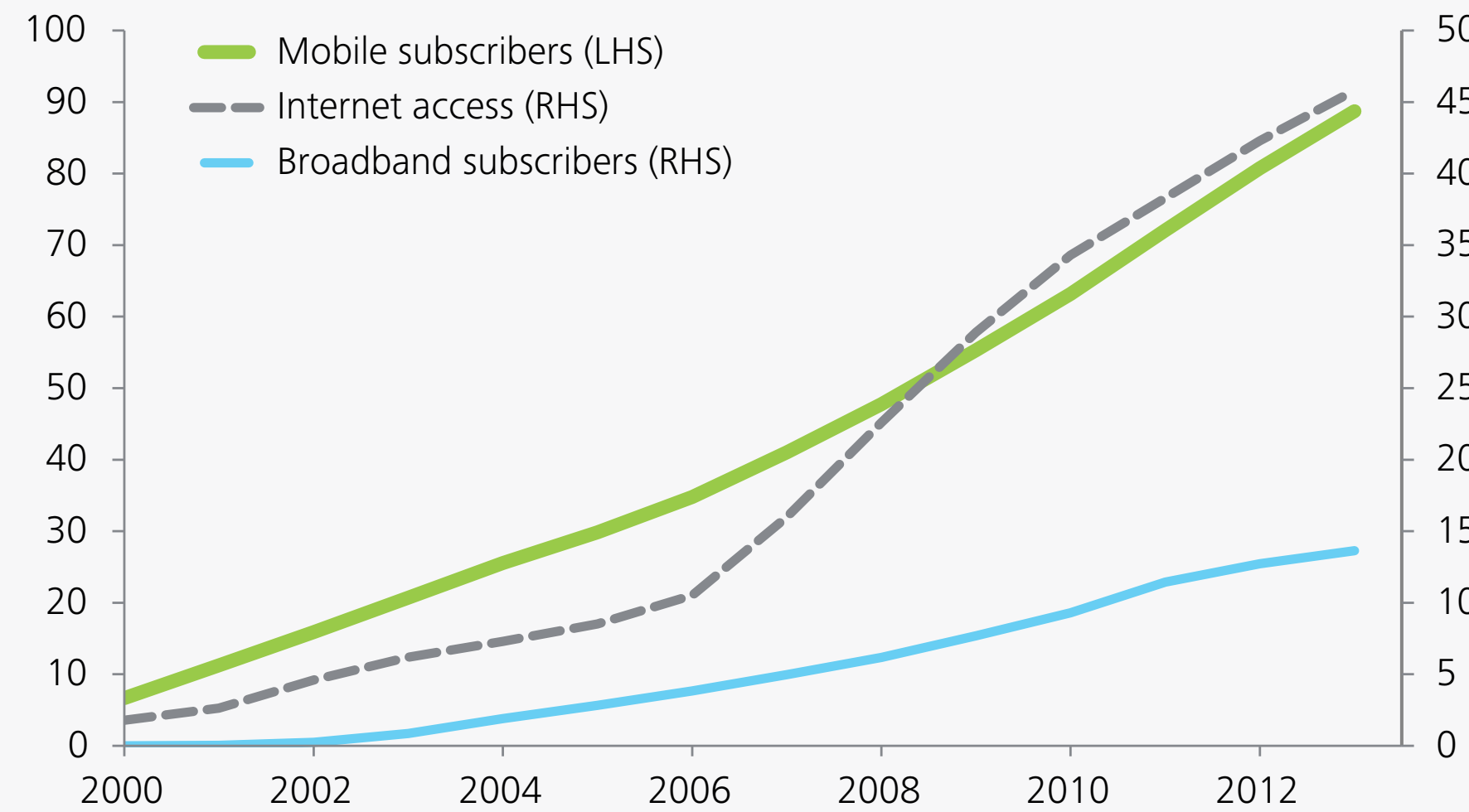
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-  Mobile technology
-  Internet e-tailing and social media
-  Logistics and other services
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-  Energy

Figure 25. Communications

per 100 people



Source: Oxford Economics/World Bank

¹⁵ iResearch, <http://www.iresearchchina.com/views/5123.html>

Internet e-tailing and social media

The spectacular rise of Alibaba demonstrates the rapid advance of Chinese firms in the e-commerce realm. Already, China’s retailers are among the world’s most wired. Based on data from China’s e-commerce research center and State Statistic Bureau, online retail sales accounted for 7.9% of the total retail sales of consumer goods in 2013.¹⁵ And unlike the U.S., where web sales are often linked to brick and mortar stores, most of China’s e-commerce takes place on innovative digital commerce sites, such as Alibaba and JD.com. Moreover, Chinese online sales aren’t just replacing traditional store-based transactions; they are also inducing consumption that would not otherwise take place. Alibaba is the world’s largest e-commerce site, measured by the value of goods sold on its platforms, and Tencent is also moving into the e-commerce market. These have pioneered new means for even small companies to have a robust online presence and to engineer trust into the commercial world in China—an attribute that was often lacking and is a requirement for online commerce to achieve explosive growth.

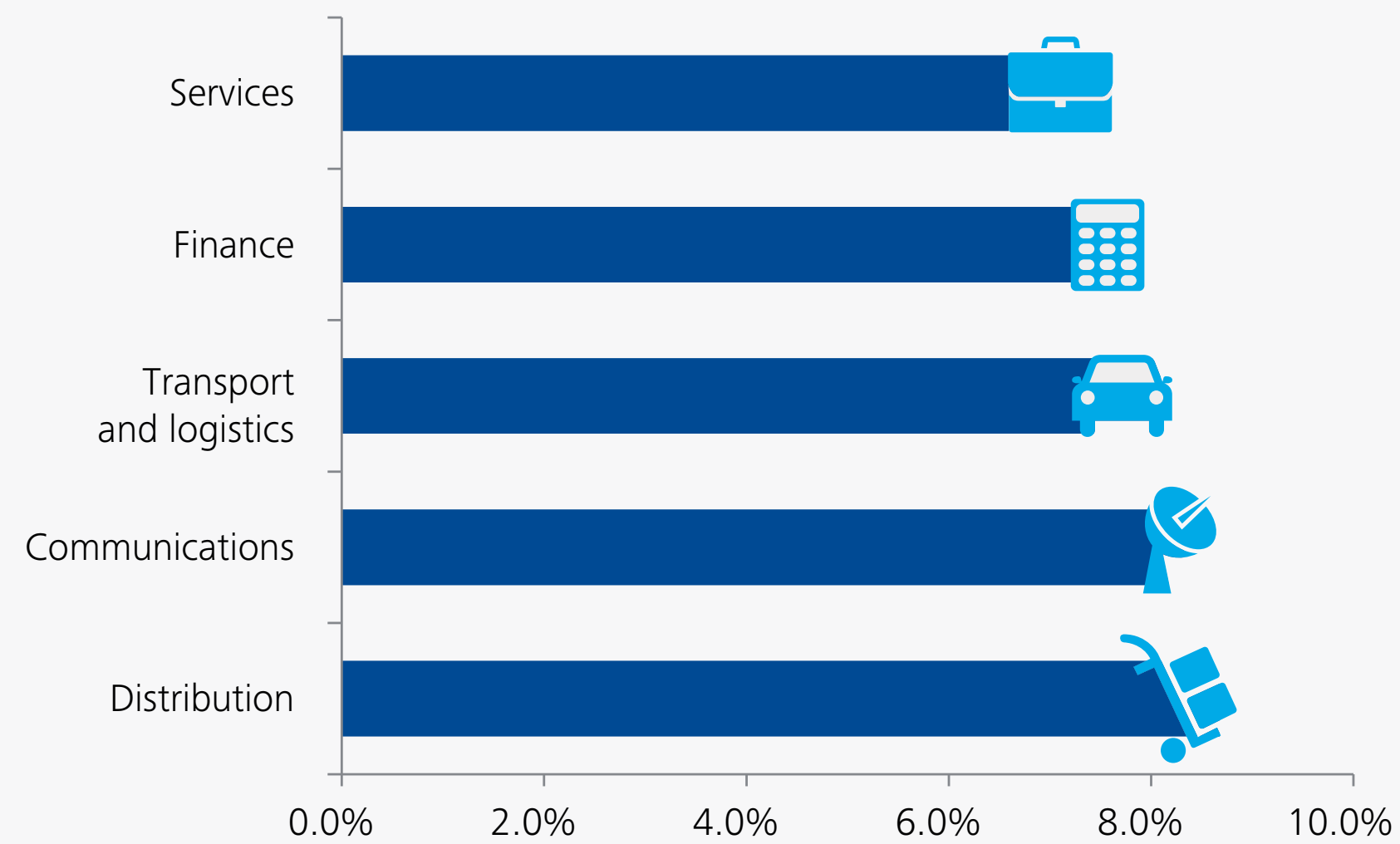
Indeed, Alibaba’s growth mirrors that of the nation itself. As China was entering the global manufacturing supply chain, Alibaba specialized in developing business-to-business relationships. As the economy has matured and the swelling ranks of middle-class Chinese are focused on fashion, travel, and commerce, Alibaba may well become a financial powerhouse, as it rapidly develops its payment and financial services. This expanding e-commerce market also presents other opportunities for the wider economy through improved logistics and distribution networks.

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-  Energy

Figure 26. China: Rapidly growing service sectors

% CAGR



Source: Oxford Economics/Haver Analytics

Logistics and other services

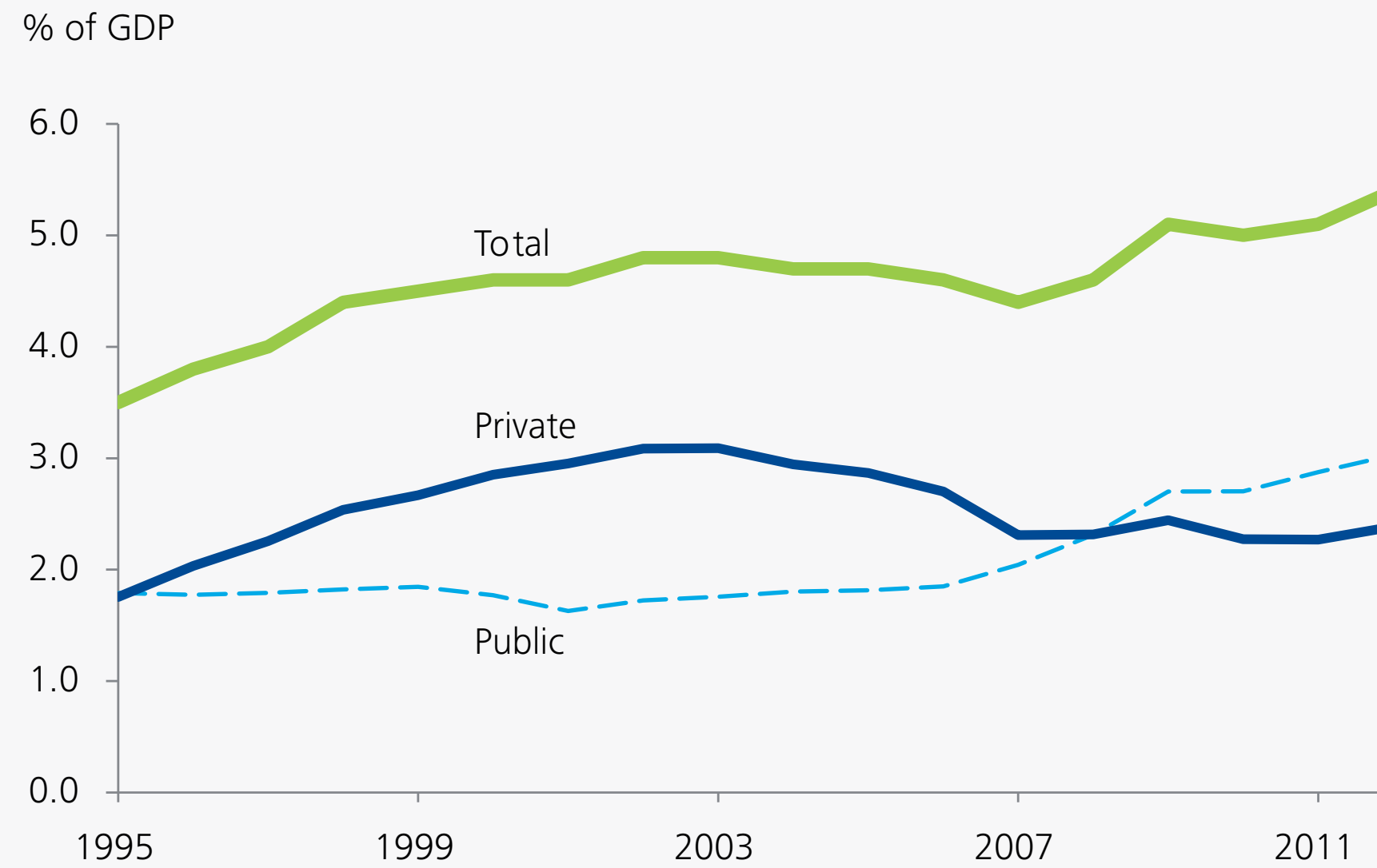
As China begins to shift away from its emphasis on production and mass manufacturing, new opportunities will emerge for companies to capture new value in the “aftermarket” for goods after they are produced. A growing middle class of increasingly sophisticated and demanding consumers will inexorably create the need for more logistics and consumer-support facilities. The first phase of digital revolution in China has been primarily driven by consumer and retail opportunities. The addition of “information” to business practices, through cloud computing and data analytics, has tremendous potential to revolutionize the domestic supply chain in a wide variety of industries ranging from automotive production to chemical manufacturing.

In addition, enormous growth is expected in a number of key services sectors, such as financial and business services, including leasing and financing; enterprise resource planning to optimize business processes; and logistics and customer-fulfillment centers. Moreover, the rapid urbanization of the country, as well as the need to build in environmental sustainability given the well-understood challenges of air pollution and constraints on water, should significantly boost investment in urban design and civil engineering. As the figures below indicate, the distribution sector is expected to be one of the nation’s fastest growing over the next two decades, with compound annual growth rates of more than eight percent, higher than the overall services sector.

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-  Education services
-  Energy

Figure 27. China: Healthcare expenditure by source



Source: Oxford Economics/World Bank

Health services

China's health services industry seems poised for significant expansion. As China's population begins to age more rapidly, a direct consequence of the nation's "One Child" policy, new opportunities in healthcare services will arise.

The government has already significantly expanded its investments in healthcare, including major construction of new urban hospitals and rural clinics, and boosting state-funded healthcare delivery, though more than a third of total costs nationwide come from individuals. Today, more than 95 percent of the population is covered by some public health insurance, which pays, on average, about half of an in-patient's costs once admitted to a hospital. Over the past decade, the country's total health expenditure has grown almost fivefold, and could reach US\$1 trillion by 2020 or equivalent to nearly 7 percent of GDP (Figure 27).

Moreover, the development of sophisticated information systems offers the potential for China to rapidly expand the Regional Health Information Network to coordinate referrals and treatment regimens between large urban hospitals and community health centers. Given significant government support, the potential for China to create a unified electronic record system for the entire population cannot be overlooked.

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Education services

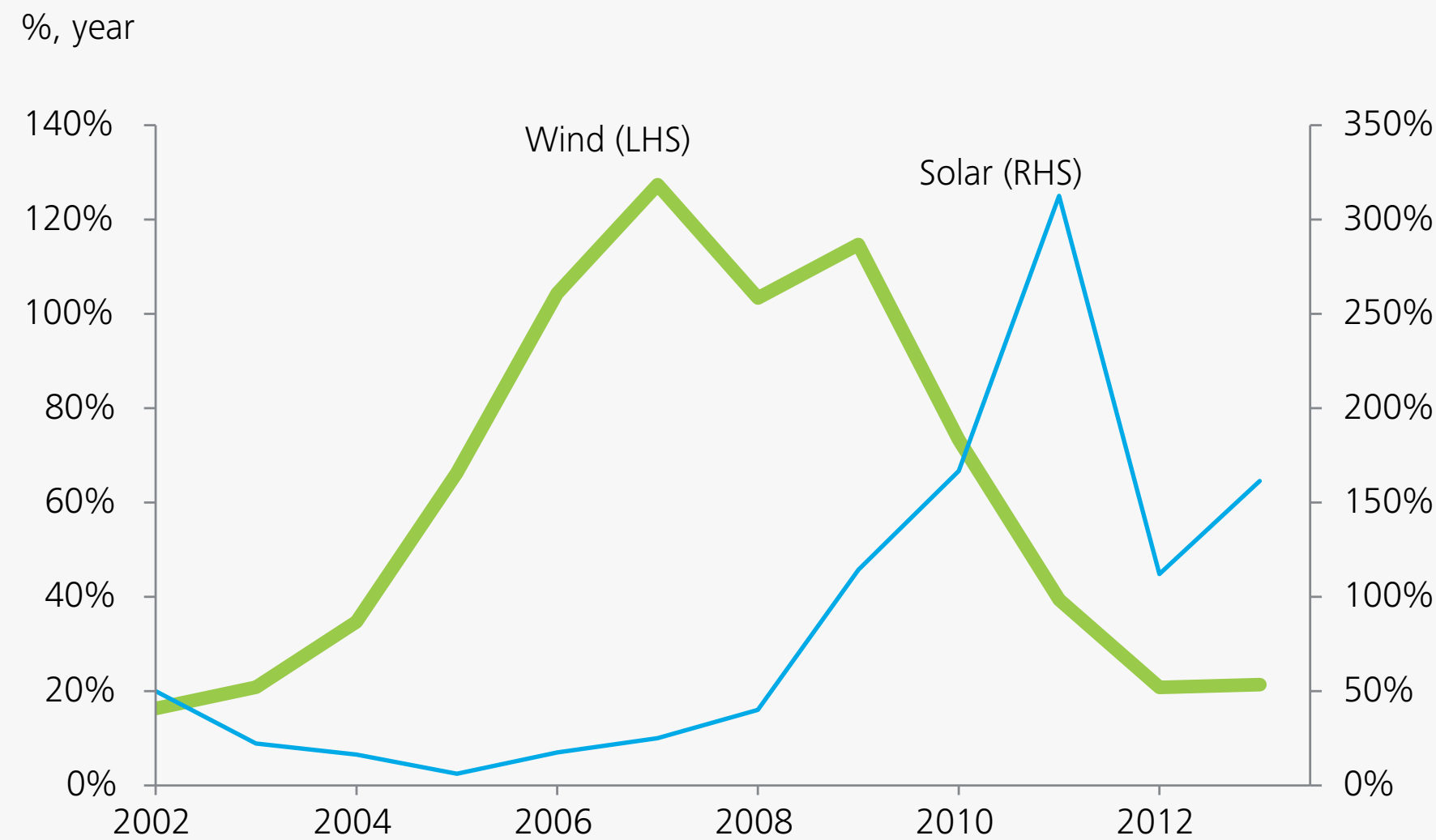
Boosting the quality of the education system has also become a top government priority in the transition toward a more services-based economy. Reforms have been implemented to increase literacy, expand access to education in rural areas, and promote education of rural migrants who have relocated to the cities. The government’s annual investment to help boost education is about US\$250 billion. Within the private sector, opportunities have been growing for pre-school education, vocational training and international schools for the children of the middle and upper classes.

China recognizes the need to expand education, increase access, and improve teaching standards and quality in an effort to “internationalize” its education process and help instill more innovation and social adaptability in students. Many Chinese companies have already opened their own universities and technical colleges to boost the capabilities of their employees and accelerate their ability to develop the human capital necessary to pursue breakthrough technologies and develop new industries.

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Figure 28. Domestic growth in solar and wind capacity



Source: BP, *Statistical Review of World Energy/GWEC*

Energy

China's enormous growth over the past three decades has also demonstrated that the nation will have to confront increased challenges regarding ambient air pollution and emission of greenhouse gases, especially CO₂. However, this challenge creates potential opportunities for China to address these hurdles by turning them into sources of innovation, economic growth, and important technological developments.

Over the past decade, China has already experienced a rapid expansion in its capacity to produce solar panels and wind turbines. Indeed, recent growth in solar production has exceeded 100 percent per year (Figure 28), generating concerns about overcapacity and complaints from foreign competitors about illegal "dumping." Globally, China possesses the largest wind-power capacity and the second-largest solar capacity after Germany. Three of the world's top 10 producers of wind turbines are Chinese. And with almost 60 percent of the global market share, China is the largest producer of photovoltaic cells. These trends in production are set to continue to serve growing demand from the large domestic market.

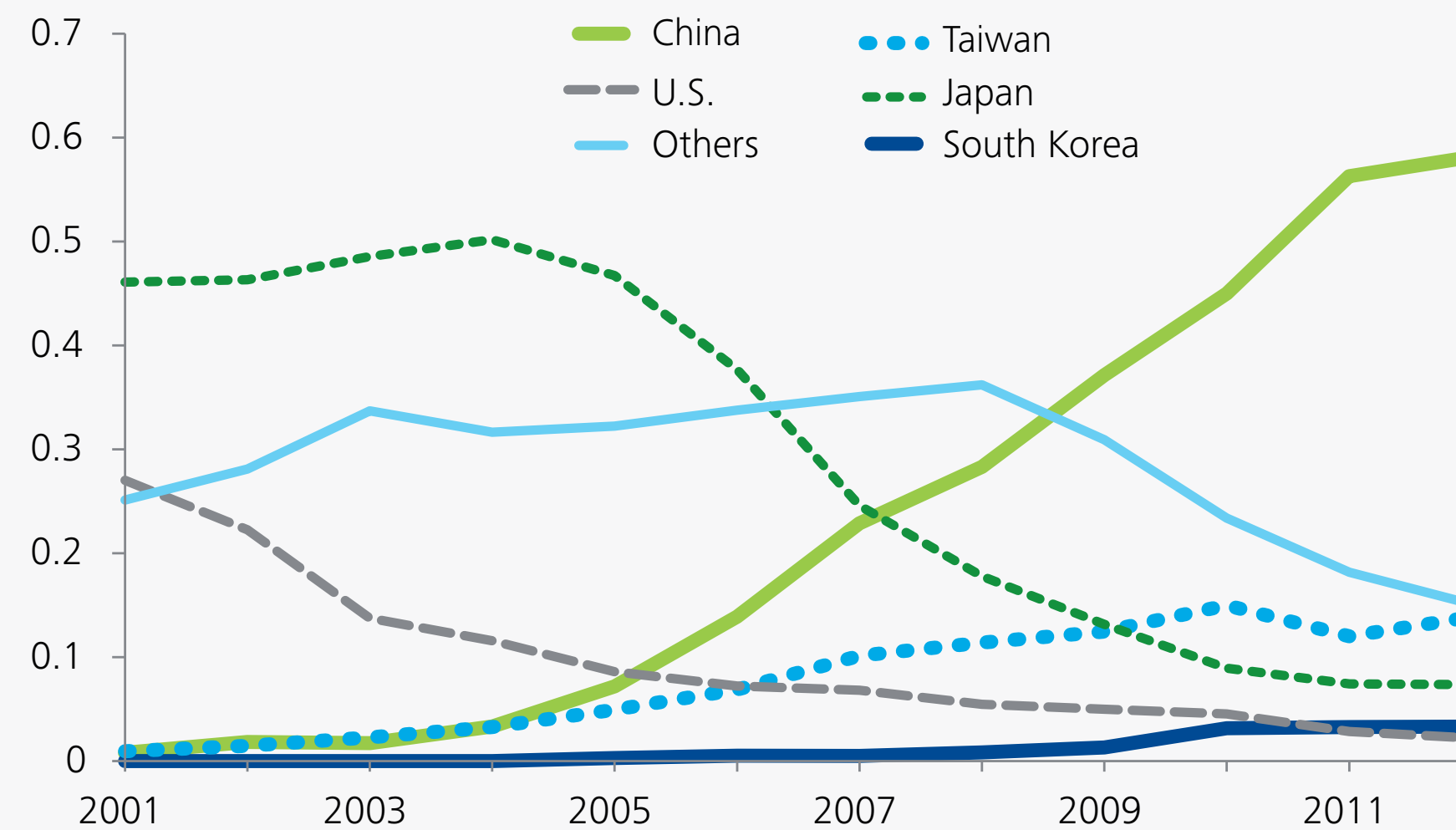


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Figure 29. Global production of PV cells

% of world total



Source: Earth Policy Institute

In 2013 alone, China added at least 11,300 megawatts of photovoltaic capacity, the largest PV addition by any country in a single year.¹⁶ In May 2014, the government announced a PV target of 70,000 megawatts by 2017.

Although the shale gas revolution has not yet swept through China—it currently represents less than one percent of total gas production, according to the Earth Policy Institute—Chinese authorities understand their need to wean themselves from dirty coal. The U.S. Energy Information Agency currently rates China as having the world’s largest reserves of shale gas resources among the 41 countries it assessed for technically recoverable resources.¹⁷ Future investments in this new technology are also likely to drive innovation in drilling and data analysis techniques. While coal remains the fuel of choice across China because of its lower price, it is projected that oil and gas will supplant coal within the decade.

¹⁶ Earth Policy institute, “China Leads World to Solar Power Record in 2013,” June 18, 2014, <http://www.earth-policy.org/indicators/C47>

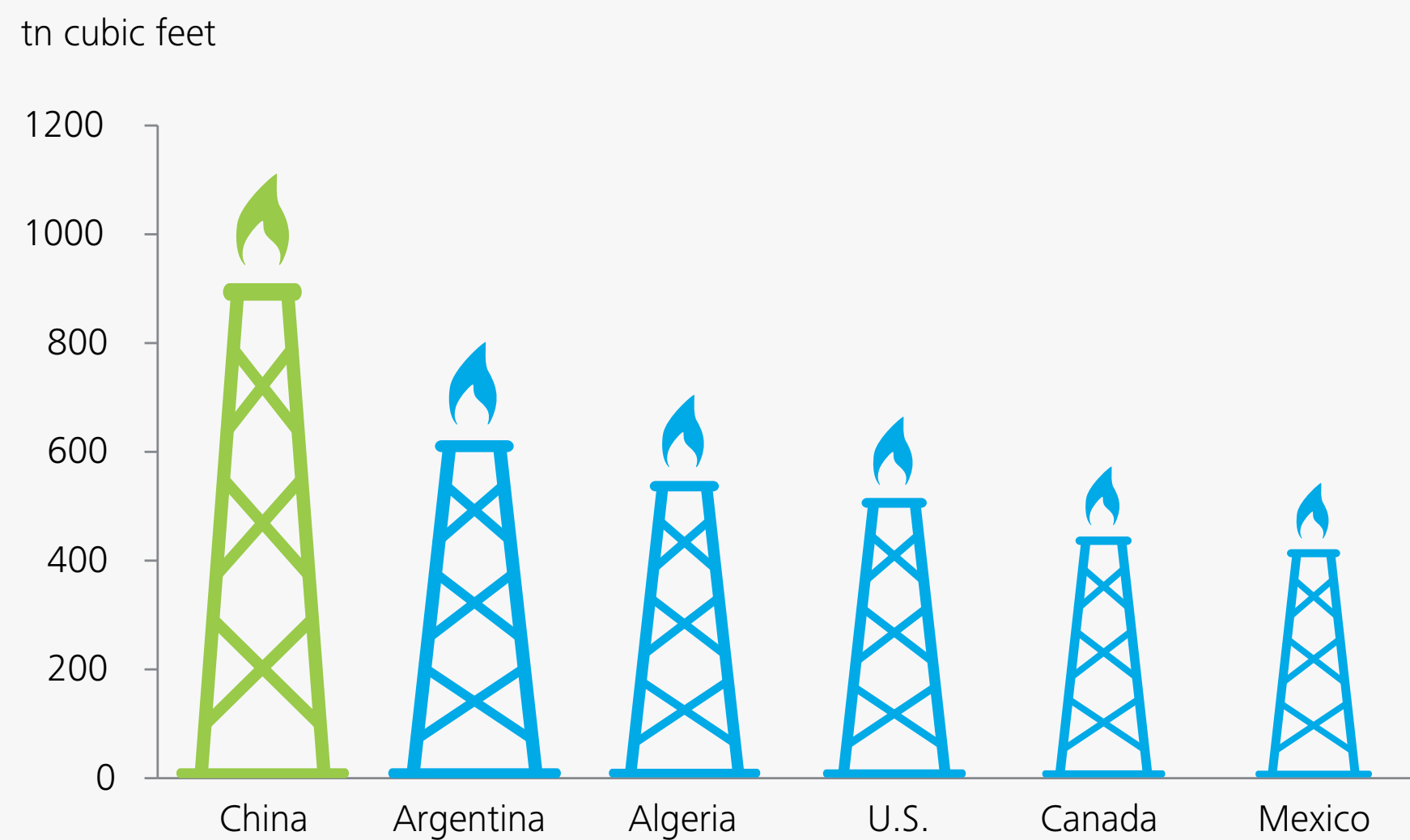
¹⁷ U.S. Energy Information Agency, <http://www.eia.gov/todayinenergy/detail.cfm?id=13491>



6. Future growth sectors

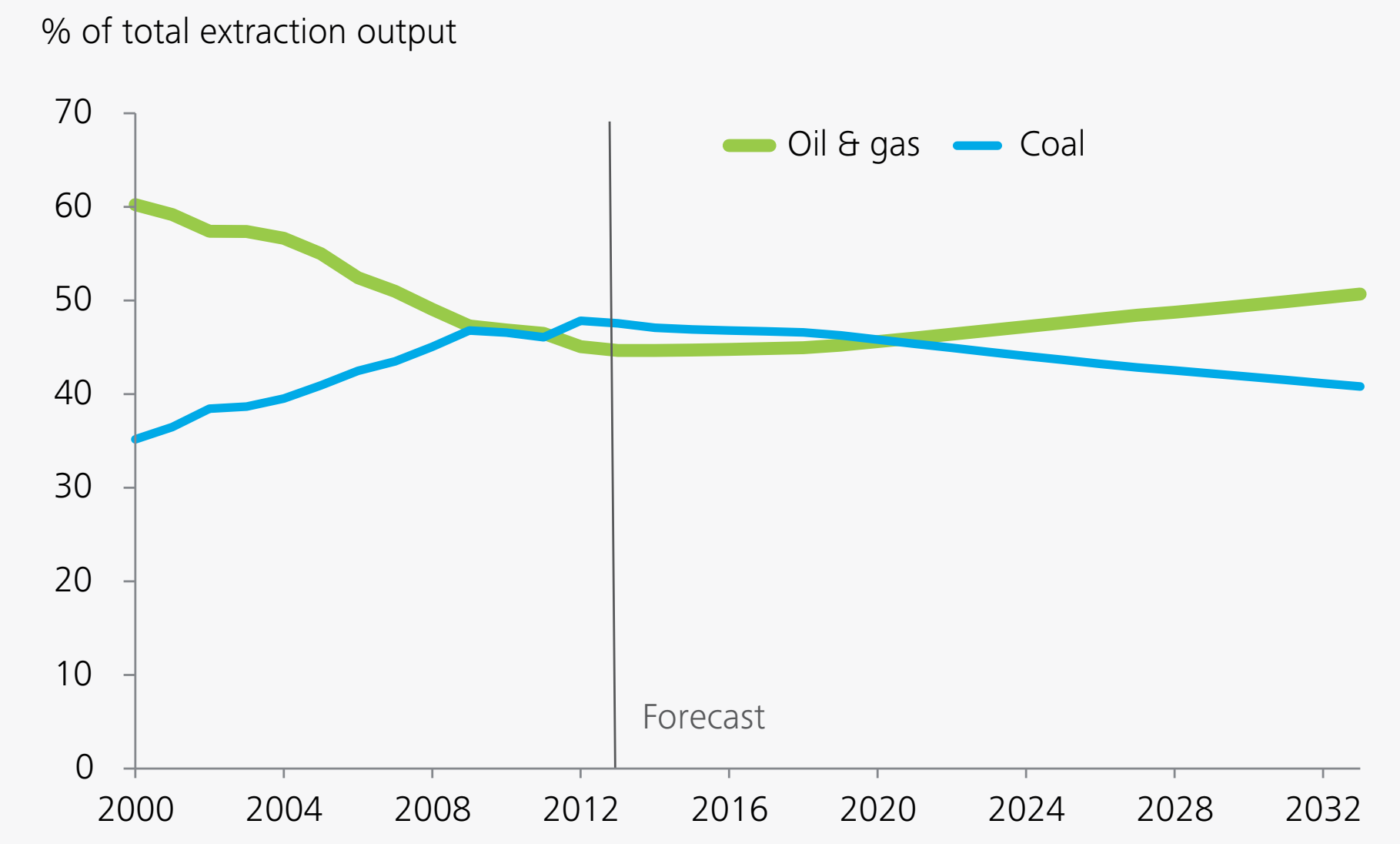
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Figure 30. China vs. the world: shale gas reserves



Source: EIA

Figure 31. China: Coal and oil & gas extraction



Source: Oxford Economics





7. China 2035: the road ahead

As the previous sections in this report have demonstrated, the forces that propelled China's rapid growth over the past 30 years cannot be expected to fuel the same degree of expansion over the next three decades. An economy once based on subsistence farming, low-wage manufacturing, and low-skilled production needs to revamp its economic policies significantly for the next generation in order to achieve higher-value, technology-enabled growth. As with other, mature economies, China will likely face critical debates over the role of the state in economic planning and the role of market-oriented reforms in triggering more structural changes.

Looking at the supply side of the economic ledger, China appears able to bear some of the challenge of gradually weaning the economy from subsidy-led growth, and using market forces to help rejuvenate productivity. Among the measures that can be considered by government leaders is the gradual scuttling of unprofitable SOEs to trim excess industrial capacity and continued privatization of SOEs, as is currently under discussion. Reform of enterprises created or supported by provincial and local governments will also have to be accelerated. Integral to the success of these projects would be the liberalization of financial services, which could facilitate the funneling of capital to economically viable projects, thereby boosting entrepreneurship and innovation.

Furthermore, reform of the educational system could create more opportunities for creative study and other programs for those not planning higher education.

China must also stimulate private demand if it hopes to develop a more sustainable long-term growth profile. One element in promoting broad-based consumption is to ratchet up public spending on elements of the social safety net that directly improve the lives of local households. The more the average Chinese residents feel that their wealth, old age, and pensions will be protected by the government, the more likely they will be to increase present-day consumption. In addition, further liberalization of the financial market that will create opportunities for individuals to access private insurance, gain consumer credit, and invest in stable instruments that can yield attractive returns, will also encourage higher levels of consumption and reduce the necessity for excessive personal savings. People who are secure in the knowledge that their savings will be protected, their pensions safe, their unemployment insurance portable, and their housing secure are more likely to increase their consumer and discretionary spending. Moreover, it is possible the state will decide to exit some areas where it has traditionally provided social services and allow innovative institutions in the private sector to take greater hold.



When it comes to the role of government institutions, reform of the nation's residency (*hukou*) system should also be considered as a means of achieving more labor mobility and a way to bring more flexibility into the national welfare system. By the same token, the state should also move aggressively to reduce the sometimes dramatic variation in access to health, education, and social services across China's vast regions.

A key element to ensure China's continued competitiveness and economic prosperity is to open further to foreign investment. Liberalizing the capital account would entail allowing freer movement of investment across borders. This would enable a greater two way flow of capital, both in terms of foreign companies' penetration of China and Chinese companies' overseas investments. There is no mistaking that China's rapid economic transformation over the past 30 years was significantly enhanced by its openness to foreign firms, and this openness continues to be a critical ingredient in China's ability to move to higher levels of innovation and production in years to come.

Finally, if innovation and technological advancement represent fundamental cornerstones of economic growth in the 21st century, China must do more to protect trademarks and intellectual property—both for its own entrepreneurs and for foreign firms hoping to expand their business operations in China. A modern, competitive economy demands no less.

One can never overlook the resource demands a nation as enormous as China imposes on its leaders, who must continue to fulfill their basic social obligations even as they undertake the necessary re-tooling and re-imagination needed to assure continued progress. But re-tooling and re-imagining will also demand systemic changes to accommodate the new demands of a global, virtual, and cloud-powered world.

How China manages this transition matters—to both individual Chinese and to the whole world. A continued collaboration with Western partners can be an important means to boost China's longer-term growth trajectory and ensure the continued prosperity of an increasingly connected global economy.

8. Final comments: China and beyond

In addition to its domestic focus, China is arguably the greatest influencer on Asia’s future growth potential. There is a clear willingness by the country’s political class to play a leadership role in this regard. As China’s Premier Li Keqiang stated at the Boao Forum for Asia 2014 Annual Conference, “[China will] share weal and woe with other Asian countries in a joint effort to open up new vistas for Asia’s development.”¹⁸

With 700 million in poverty, Asia needs development, he emphasized, laying out three paths to achieve it:

- (1) An Asia-wide shared goal of common development and a community of shared interests;
- (2) Integrated development, including infrastructural connectivity; and
- (3) Peace¹⁹

A further look at the discussions recorded during the Boao Forum gives even more insight into what this means, including a focus on the interdependence of domestic, international, security, and economic policy development, as well as on national and regional approaches to value creation, restructuring, and deploying critical resources such as labor, technology,

knowledge and capital across borders. Much change is already underway, in particular as it relates to restructuring—with policy changes in China impacting trade and investment, infrastructure, finance, currency valuation, SOEs, intellectual property protection, and anti-bribery and corruption.

Enabling China’s further integration into trade arenas must remain a priority, in particular within the region. This is despite the fact that over the last decade or so, there has been a rapid growth of trade volume between China and the rest of Asia. According to IMF research, measuring trade in value-added, the intra-regional trade of Asia increased more than 10 percent annually over the 1999–2012 period, double the trade growth in regions outside of Asia. Given the huge demand potential within its market, China has become the most important trade partner with ASEAN countries and East Asia countries as represented by Japan and South Korea. Premier Li’s remarks at the Boao Forum affirmed China as a strong proponent of regional trade integration. He made reference to the fact that not all regional and preferential trade arrangements now being negotiated include the world’s main trading partners, and put forward the view that “both RCEP (Regional Comprehensive Economic Partnership) and the TPP (Trans-Pacific Partnership) should become

important supplements to the multilateral trading system” and “go hand in hand.”²⁰

As mentioned in the previous section, open trade is vital to China’s own domestic prosperity and its impact across the region and world. Globally, countries that erect obstacles and create trade friction impede free and fair competition, both at home and abroad. Emerging practices not in concert with current international trade rules are creating complications for companies doing business across borders and can generate significant barriers to cross-border trade and investment. One example is that of regulation. Effective regulatory outcomes require strong transparency and certainty in its administration, as well as an understanding of the potential extra-territorial impacts, be it through international standard-setting or consistent oversight.

There are also tremendous unrealized benefits that could come from broader and deeper trade in services liberalization, through overall economic growth potential, cost-efficiencies, and innovation. Through a more open services economy, China can play a leading role in facilitating greater foreign direct investment and, therefore, value creation within its market and the region.

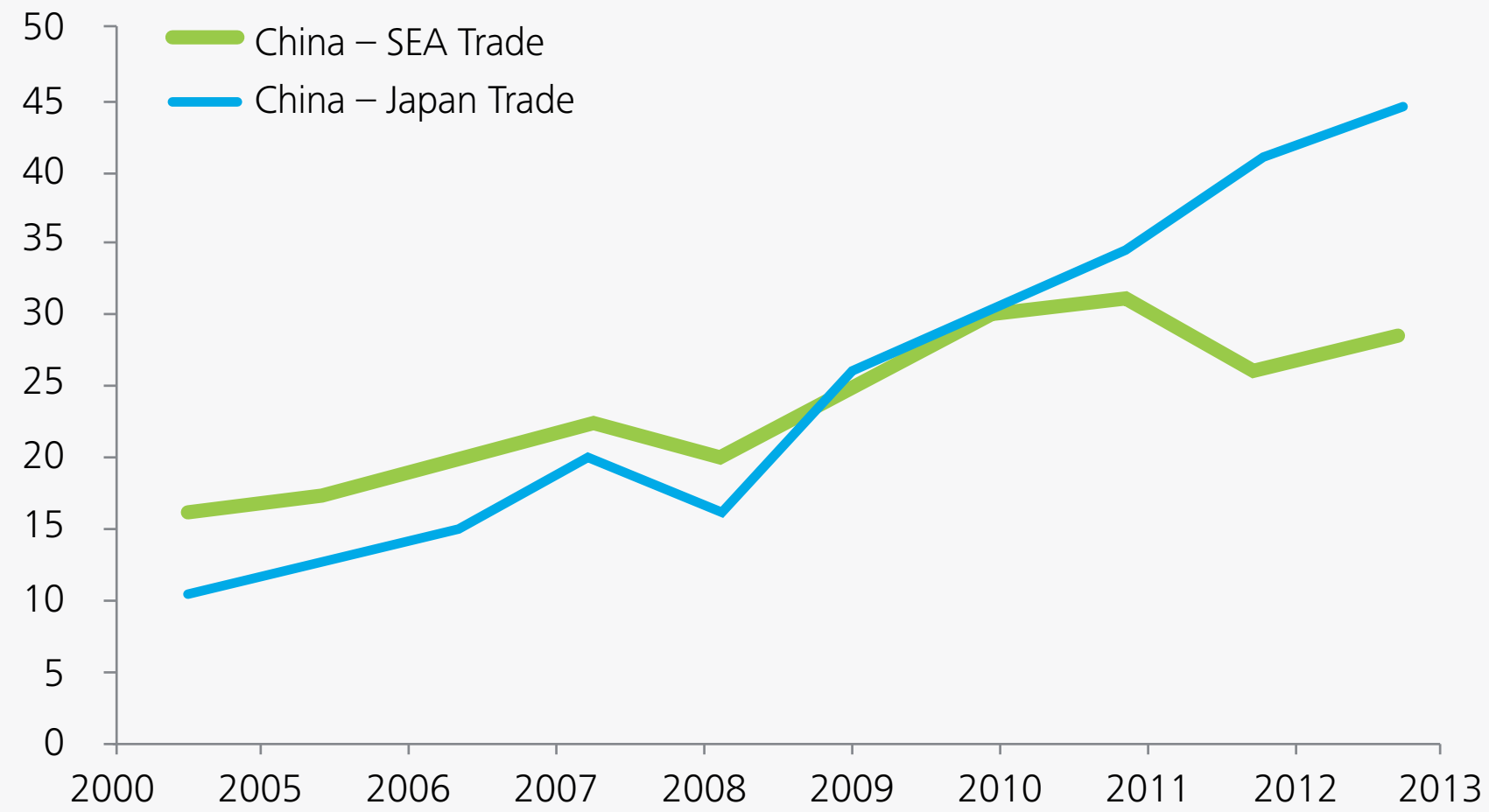
¹⁸ Boao Forum for Asia, Annual Conference Report 2014

¹⁹ Ibid

²⁰ Ibid

Figure 32. China's regional trade

US\$ billion



Source: WIND

Later this year, China will host the Asia Pacific Economic Cooperation (APEC) meetings, presenting another opportunity for the country to continue its efforts to advance regional economic integration. APEC's goals of promoting innovative development and economic reform and growth, and strengthening comprehensive connectivity and infrastructure development, align with China's efforts to spur innovation, support entrepreneurship, facilitate the movement of people, and move away from resource-driven growth. Repositioning itself to enable better access to global value chains, for example by welcoming more foreign participation and adopting good regulatory practices, will likely reap significant economic rewards. The fact that China has introduced much needed financial market reforms, focused on green growth and facilitated investment, as well as taken steps to level the competitive playing field and address inequality, is no coincidence. These and other reforms are critical to China's economic leadership both regionally and globally.

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