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CHEUNG KONG GRADUATE SCHOOL OF BUSINESS

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China's Silver Surfers

How population aging is changing the game for brands in China

- The economy of the future could run on Chinese batteries
- Beijing is trying to innovate its way out of a looming health care crisis
- Chinese millennials are turning the world of travel upside-down

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Spreading Their Wings
Chinese millennials are traveling across the world in search of adventure

Anticipating Changes

They say that if you're in a car driving down a bumpy road, the best way to avoid motion sickness is to focus on what is ahead. If you see the shocks coming, they are much less discomforting. The same logic can be applied to China. The Chinese economy is so large these days that changes here can have an impact around the world. But if you see the changes coming, it is much easier to deal with the consequences.

In this issue of *CKGSB Knowledge*, we do our best to help you prepare for bumps coming down the road. Each of our stories focuses on an important trend in the Chinese economy that is being driven by domestic forces, but which has international implications.

Arguably the most important issue that will shape the future of China over the next 50 years is that Chinese society is aging rapidly, and two of our stories deal with interesting side-effects of this process.

"China's Health Revolution" (page 21) examines how skyrocketing demand for health care is forcing China to develop cutting-edge new technologies to relieve the burden on its overworked doctors. In "Catering to China's Elderly" (page 31), we explore how population aging is set to transform China's consumer markets.

But the elderly are not the only demographic driving big changes in China; the country's millennials are also transforming the tourism industry. Find out how in "Spreading Their Wings" (page 62).

Another powerful force shaping China's economy is the country's "war on pollution," and we have a trio of stories analyzing the fallout from this battle.

"Funding China's Green Future" (page 15) explains that China's focus on fighting pollution means that its approach to green finance is dramatically different to that of the West. "Charging Ahead" (page 39), meanwhile, reports on China's attempt to dominate a crucial green industry of the future: lithium batteries. And our company profile for this issue—"On Tesla's Tail" (page 51)—introduces a company that is benefiting from the Chinese government's support for green transport, the up-and-coming electric car brand Nio.

"Tea for Ten" (page 7) takes a look at how overcapacity in the Chinese economy is driving Chinese companies from all sorts of industries to invest in Southeast Asia. Finally, "Back to the Future" (page 47) asks whether China's transition to a services-based economy is progressing as smoothly as some make out.

We are also delighted to feature four fascinating interviews with heavy hitters from the China business world in this issue. Elizabeth Economy, Director for Asia Studies at the Council on Foreign Relations, discusses how Xi Jinping has shifted China's economic trajectory (page 36). Richard Young, Managing Director of NFL China, gives a play-by-play explanation of his efforts to hook the Chinese on American football (page 44). Jiang Tao, Vice President of iFlytek, explains how his company developed voice recognition software used by 500 million people in China (page 26). And Leslie Young, Professor of Economics at CKGSB, analyzes Sino-UK business relations in the age of Brexit (page 12).

In other words, there is plenty in this issue to think about and to discuss. As usual, if you have any comments or opinions to contribute, we would love to hear from you (*lzhou@ckgsb.edu.cn* or *ckgsb.knowledge@ckgsb.edu.cn*).

Yours Sincerely,

Zhou Li
Assistant Dean, CKGSB
Editor-in-Chief, *CKGSB Knowledge*

For more insights on the Chinese economy and business, please visit the CKGSB Knowledge *site: http://knowledge.ckgsb.edu.cn/*

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Tea for Ten

Southeast Asia faces a historic choice on how to engage with a rising China

By Jens Kastner

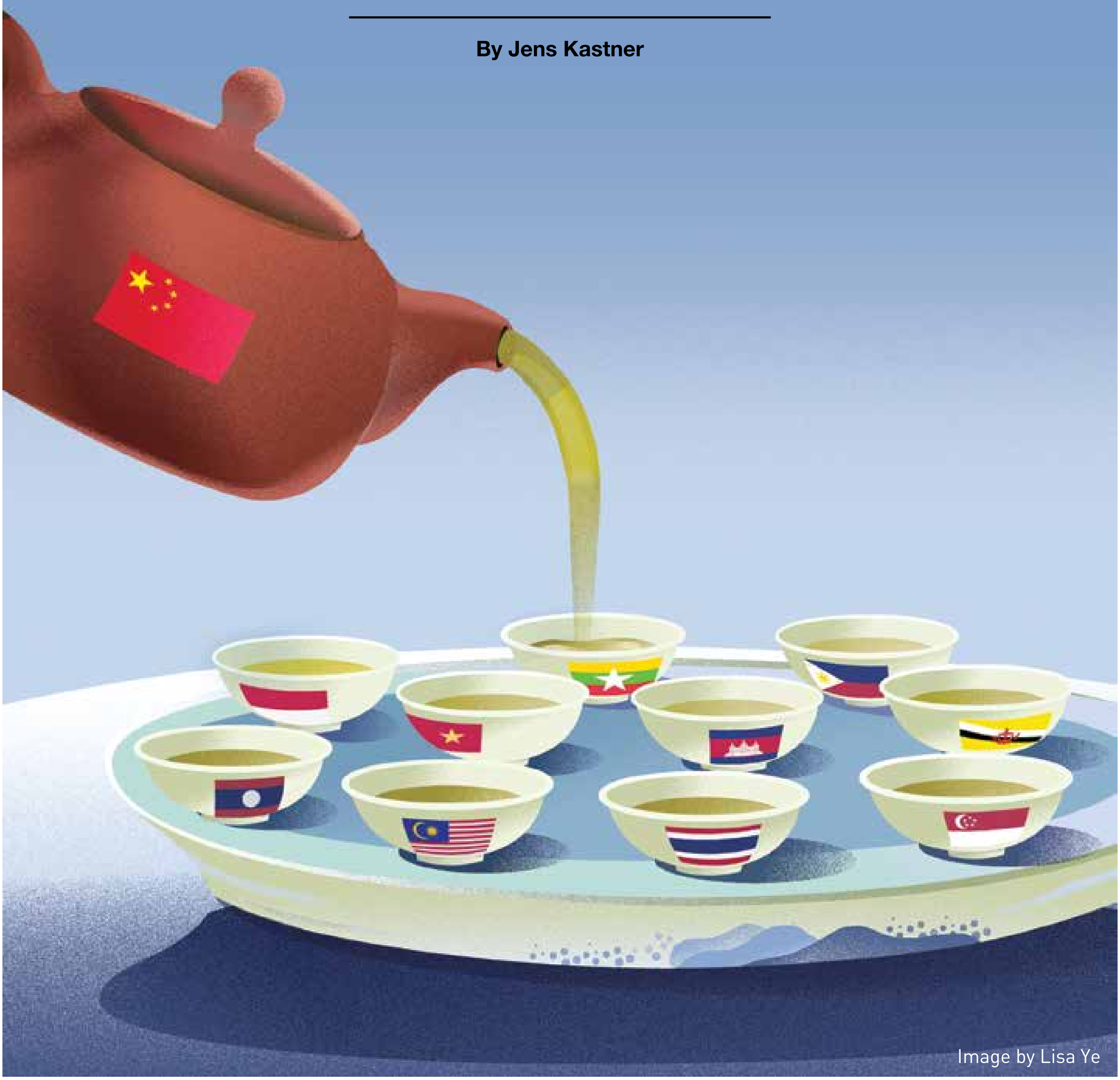


Image by Lisa Ye

Trade between China and Southeast Asia is expected to skyrocket to $1 trillion by 2020. But there is continued uncertainty among the Southeast Asian nations over how to engage with its enormous neighbor to the north

Anyone who has spent time in China over the past few years would recognize the scene instantly: dozens of delivery drivers clad in the colors of rival firms, jostling for space as they speed down congested city streets. What is different is that this is not taking place in Beijing or Shanghai, but in Indonesia's capital city, Jakarta.

The swarms of scooters bearing the logos of tech companies Lazada, Grab and JD.com are the most visible—and the loudest—sign of China's increasing presence in Southeast Asia's major cities. All three companies are owned or funded by Chinese investors.

Jakarta, like many Southeast Asian cities, is no stranger to Chinese influence. Ethnic Chinese Indonesians have been selling dumplings and Peking duck in the city's bustling central district of Kota for generations. More recently, they have become major players in the high-rise office blocks of nearby financial hub Jalan Sudirman.

But what is happening now is different, according to Dinah Rosanti, a clerk at a Jakarta hotel. "Until fairly recently, Chinese writing was not even allowed to be displayed publicly, but nowadays Chinese companies are omnipresent in Indonesia," Rosanti tells *CKGSB Knowledge*.

The speed at which China has emerged as a major player in Southeast Asia is stunning. In 2000, total trade in goods between China and the 10 members of the Association of Southeast Asian Nations (ASEAN) was only $40 billion. By 2014, this had leaped to $480 billion, and is forecast to reach $1 trillion by 2020.

Southeast Asia has become a strategic market for companies across the whole Chinese economy. Manufacturers are looking to offshore production in order to reduce labor costs, while tech companies are eyeing the region's 633 million-strong consumer market as a new source of growth.

"The Chinese home market is saturated, so companies are looking for the most promising markets nearby," says Shobhit Srivastava, a tech market analyst at Counterpoint Research.

The Chinese government, meanwhile, is keen to cement close ties with Southeast Asia through a string of major infrastructure projects. These include a railway running from Nanning in southwest China to Singapore and an expressway connecting another southwestern Chinese city, Kunming, with Bangkok.

Asian leaders are also nearing a landmark trade agreement—the Regional Comprehensive Economic Partnership (RCEP). This will create a single market encompassing the ten nations of ASEAN, as well as Australia, China, India, Japan, New Zealand and South Korea.

These trends promise to accelerate growth in Southeast Asia, but are also raising anxieties among some in a region that has often been wary of its enormous neighbor to the north. Underlying this is local unrest about the rapid influx of Chinese companies in some communities, which have a long history of viewing ethnic Chinese immigrants with suspicion. How China and the Southeast Asian countries manage these challenges could have far-reaching implications for the region's future.

China-plus-ASEAN

China is comfortably ASEAN's top external trading partner, accounting for over 15% of the region's trade as of 2015. Other partners remain important, however: the European Union, Japan and the United States make up 10%, 10.5% and 9.3%, respectively. Internal trade flows between Southeast Asian countries are even larger, accounting for 24%.

The rapid growth in China-ASEAN trade has resulted from a change in global supply chains that took place during the late 1990s, says Richard Pomfret, an economist at the University of Adelaide.

"Many multinational companies, from American computer brands to German automakers, shifted from China-based manufacturing to a new pattern where many components are made in Southeast Asia and then shipped to China for final assembly," explains Pomfret, a former adviser to the Asian Development Bank, United Nations Development Programme and the World Bank.

This new model was made possible by supportive trade policies. These include the Information Technology Agreement in 1997, under which countries including China, Indonesia, Malaysia, Thailand, Vietnam, Singapore and the Philippines agreed to remove restrictions on trade in electronic goods; China's accession to the World Trade Organization in 2001; and the China-ASEAN Free Trade Agreement—China's first ever FTA—in 2010.

The China-plus-ASEAN supply chain has proved remarkably resilient. As labor costs in China have risen (the average factory worker in China now makes $28 a day, compared to $7 a day for a worker in Vietnam) many predicted that China would increasingly be cut out of the picture with manufacturers shifting production production to Southeast Asia. But most companies have kept their China bases and only moved some aspects of production.

"China will not lose its current position as the final assembly point as wages will not only increase in China but also in ASEAN," says Pomfret. "And the growing Chinese middle class translates into more demand in China."

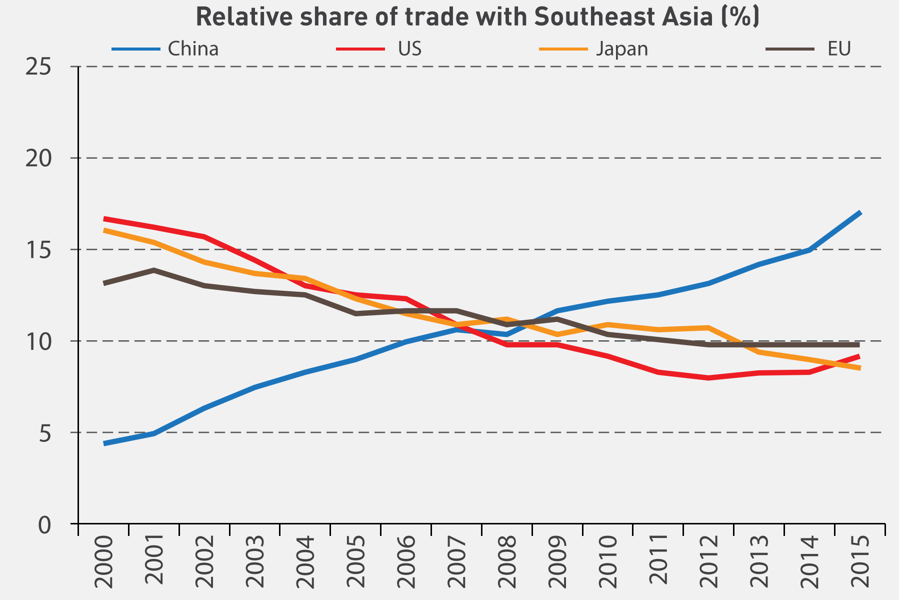
This is reflected in ASEAN's trade with China, which is growing faster than with any other partner. The bloc's total imports from China rose 9% in 2017, while exports jumped 20%.

The implementation of RCEP will boost trade flows further, with economists forecasting that ASEAN will maintain a gross domestic product (GDP) growth rate of over 5% up to 2021. The parties are scheduled to sign the agreement in November, though this could be delayed due to the uneasiness of some Indian stakeholders over China's presence in the grouping.

But China will remain key to Southeast Asia's future even without a fresh trade agreement. "Whatever happens to RCEP, it is clear that China is number one among ASEAN trading partners and China's centrality in 'Factory Asia' is the reason," says Pomfret. "The increased trade flows have also laid the groundwork for more foreign direct investment in the region."

Trading Places

China is now Southeast Asia's top trade partner



Source: Korea Institute for International Economic Policy

A Young Market

According to the data, China is a relatively minor source of foreign direct investments (FDI) for Southeast Asia. In 2016, China provided $9.2 billion of investment in the region, far behind the European Union, which invested $30.5 billion, the *ASEAN Investment Report 2017* states.

But Chinese investment is rising quickly: 44% year-on-year, by the report's calculations. China's share may also be underestimated due to the fact that much Chinese FDI is linked to commercial services provided by offshore financial companies in Singapore, where second-stage investments are common.

China's investment is also broader than that of other players. Whereas Japanese and Korean companies invest predominantly in manufacturing, and the EU and US in services, especially finance, Chinese FDI spans wholesale and retail, transportation, real estate and finance.

Chinese tech companies in particular have poured billions of dollars into Southeast Asia over the past two years in a bid to dominate what they see as a key market of the future. Nearly half of Southeast Asia's population is under 30 years old.

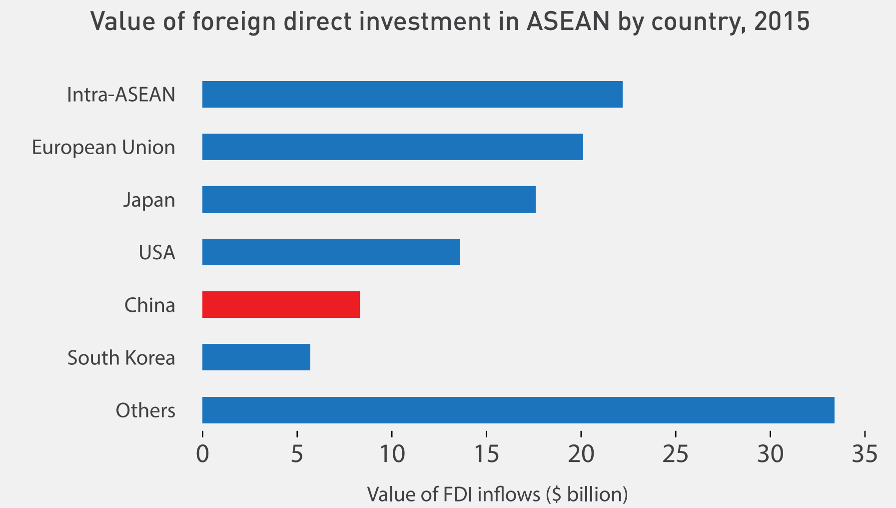
Alibaba has invested over $4 billion in e-commerce group Lazada and led a $1.1 billion funding round in e-retailer Tokopedia. Tencent and JD.com have followed closely, jointly investing in ride-hailing firm Go-Jek, while JD.com has also bought into online travel company Traveloka.

China's smartphone brands are also increasing their presence with sales soaring. The market share of Chinese brands in ASEAN rose five percentage points in 2017 to reach 37%, according to Counterpoint Research data.

"Xiaomi, Huawei and their like are increasingly well-respected as they offer value for money that is too good for the Indonesian consumer to resist," says Rosanti.

As smartphone sales stagnate in China's saturated home market, brands are investing more in Southeast Asia. Xiaomi has already announced plans to open up more stores in the region and began manufacturing phones in Indonesia last year.

Playing Catch-up
Chinese investment in ASEAN is still relatively small



Source: ASEAN Foreign Direct Investment Statistics Database

Building the Future

A similar dynamic is leading China to ramp up investment in infrastructure in Southeast Asia. This makes sense for a number of reasons. Many Southeast Asian nations have a desperate need for better infrastructure. Manila's inadequate road network, for example, costs the Philippines $67 million a day in missed economic opportunities and unnecessary expenditure, according to the Japan International Cooperation Agency.

Improving the connectivity of the region will also increase trade flows both within ASEAN and between the bloc and China. This will create more opportunities for Chinese companies operating there. And of course, it will generate work for China's huge state-owned construction groups, which urgently need new revenue streams now that China's hunger for new highways, railways and dams is decreasing. China often makes loans conditional on its partner hiring a Chinese contractor to complete the project.

For countries like the Philippines, China's bulging wallet is an exciting opportunity to push its development to the next level. China has already pledged $7 billion to President Rodrigo Duterte's "Build, Build, Build" strategy, which aims to fund $180 billion of new infrastructure projects.

But China is far from the only lender in town. Despite the hype around the Belt and Road Initiative, the Japanese have provided $230 billion in infrastructure funding since the 2000s, compared to China's $155 billion, according to BMI Research.

For many countries, Japan continues to be the preferred partner because it offers better terms. In Manila, for example, the Chinese typically offer loans at 2-3% interest rates, compared to Japan's usual rates of 0.1-1.5%.

The higher rates have raised anxieties in the Philippines that the country risks falling into a debt trap and having to hand over state assets and islands to China as collateral. These fears were stoked by Sri Lanka, which last year handed over the port in Hambantota to Chinese state firms on a 99-year lease after failing to repay debts.

The Duterte administration has denied claims that China is asking for natural resources as collateral, but local experts' reactions to the deals are far from a ringing endorsement. "The challenge is the rates: Chinese interest rates are definitely much higher than Japan's, which is not good for us," Alvin Ang, Director of the Ateneo de Manila Center for Economic Research, told the *Philippine Star* in a recent interview.

"But Japan cannot fund all our requirements; our constitutional limitation on foreign ownership is a hindrance to other foreign contractors; and most of our Filipino companies are already stretched out."

Public misgivings have also contributed to the dramatic political upheaval in Malaysia, where the United Malays National Organisation party was booted out of power in May—the first time in 60 years. The new prime minister, 92-year-old Mahathir Mohamad, has pledged to review the $34 billion of Belt and Road Initiative-related deals signed with China by Najib Razak, his predecessor, who is now under investigation for corruption.

"Mahathir will review Najib's investment deals to prevent risking Malaysian sovereignty," said Cyril Pereira, a Malaysian media consultant and former director at Hong Kong's *South China Morning Post*. "While nobody questions whether Chinese investment is good or bad per se, there are serious doubts about the economic feasibility of Razak's high-speed rail."

These political headwinds mean the crown jewel of China's Belt and Road ambitions in Southeast Asia—the rail corridor connecting southern China with Singapore via countries including Laos, Thailand and Malaysia—is under threat.

The railway is a priority for China because it will boost the Southeast Asian economy and be a game-changer for Yunnan Province, China's second-poorest region in per capita GDP terms. From being a remote outpost, Yunnan will become a strategic hub linking China with Southeast Asia.

But China has struggled to sell the idea to Southeast Asia, according to Will Doig, author of *High-Speed Empire: Chinese Expansion and the Future of Southeast Asia*. "Whereas about 20% of the Laos section has been completed, construction has yet to start in Thailand, and China has struggled to win a contract to build high-speed rail in Malaysia and Singapore," explains Doig.

Thailand is unenthusiastic because a railway linking Bangkok and Laos, albeit an old one, already exists. Thailand, Malaysia and Singapore are reluctant to hand Chinese companies too many contracts, preferring an open bid process that includes Japanese and South Korean contractors. However, Doig remains confident that China will eventually get the green light to complete the project.

"China has done pretty well considering that they have been in the international development game for only a decade or so," says Doig. "They are learning quickly, and the learning process is accelerating, which means they will most likely achieve their goals."

Pereira also stresses that opposition to specific Chinese projects in some ASEAN countries does not mean general opposition to China. "It's their own government officials, not China, that people are most suspicious about," he says.

This pragmatic attitude springs from recognition that engagement offers tremendous economic opportunities. This is seen in tourism, where better flight connections, open visa policies and rising income have sparked a boom that has brought billions of RMB into the ASEAN economy. The total number of tourists traveling between China and ASEAN surged from 23 million in 2015 to 38 million in 2017, making China the region's largest tourism source.

The Road Ahead

But China's dominance in Southeast Asia is far from inevitable. Other powers are determined to expand their presence there, while ASEAN leaders appear keen to hedge against China.

South Korean President Moon Jae-in led a trade and investment mission to Hanoi in March. Many Korean conglomerates, including LG, Lotte and Samsung, announced expansion plans in Vietnam following the trip. The Philippines and South Korea are also expected to scrap import tariffs on cars in the near future, which could lead to a spike in Korean cars on the road in Manila.

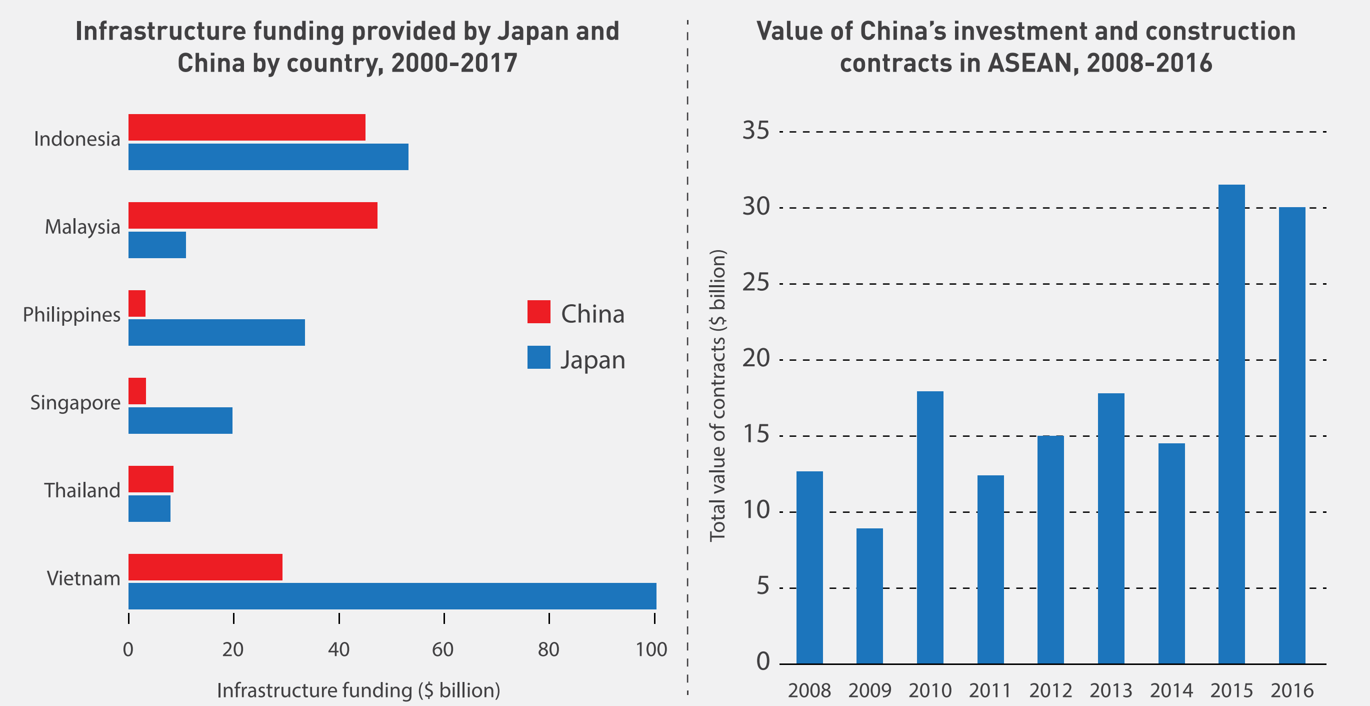
India, meanwhile, is courting ASEAN determinedly, with Prime Minister Narendra Modi taking the unprecedented step of hosting all 10 of the bloc's leaders at India's Republic Day celebrations this year. During the visit, Modi offered to use India's $1 billion ASEAN credit fund to build "digital villages" in Cambodia, Laos, Myanmar and Vietnam.

Yet recent statements from ASEAN's leaders indicate that the region is happy to drink tea at China's table, as long as the Southeast Asian nations can choose their order.

"New powers, including China and India, are growing in strength and influence. This has opened up new opportunities for ASEAN member states as we expand our cooperation with them," Singaporean Prime Minister Lee Hsien Loong told an ASEAN forum in April. "The global strategic balance is shifting, and so is the regional balance."

Trailing Tokyo

Japan has funded more infrastructure in ASEAN than China, but Chinese investment is growing



Source: BMI Research, American Enterprise Institute and the Heritage Foundation, ANZ

Brexit and Beijing

Leslie Young, Professor of Economics at CKGSB, argues that Brexit is a major setback for Sino-UK business, although some opportunities remain

By Liu Sha and Yan Ran

China played a surprisingly prominent role in debates surrounding the United Kingdom's 2016 referendum on membership of the European Union. For leading "Leavers" like Boris Johnson, now UK Foreign Secretary, Brexit was a chance for Britain to free itself from a stifling Brussels bureaucracy and build stronger trade relations with coming powers, like China and India.

But those expecting a blossoming in China-UK relations after Brexit might be disappointed, says Leslie Young, Professor of Economics at CKGSB. Professor Young is well-placed to understand the Sino-British economic relationship. His experience with the UK goes back to 1971, when he received a doctorate in mathematics from Oxford University at the age of 20. He is now a recognized authority in international economics with his book *Black Hole Tariffs and Endogenous Redistribution Theory* highly commended by two Nobel Prize winners.

In this interview, Professor Young explains to *CKGSB Knowledge* how Chinese business is likely to be impacted by the move of the UK to exit the EU.

Q: In recent years, the UK and Chinese governments have heralded a "golden era" in ties between the two countries, but this relationship has been tested by Brexit, political wrangling and Prime Minister Theresa May's cooler attitude toward China. Is the "golden era" over?

A: I will address this question from a wider perspective because it opens the door to a broader set of interesting issues. When you walk down the main streets of central London, the grand buildings give it the feel of an imperial capital and, of course, 150 years ago, it was the center of the world's largest empire. British people, especially the elite, growing up in London, studying at the public schools and Oxbridge with their grand ceremonies and traditions, then getting a grand job in, say, the City of

London, the Foreign Office or the Treasury, think they're world-class.

The reality is that the UK is not world-class. London is a world-class city in a second-class country. The UK has the world's fifth-largest gross domestic product, but it lacks dynamism and efficiency. It has strong sectors like higher education, information technology and precision engineering, but there are significant inefficiencies and failures, such as a chaotic railway system, a hospital system which neglects many patients and has horrendous waiting times, neglect of the bottom layers of society and weak basic education in many regions. Brexit has revealed the government and the civil service as incompetent. So, there's a discrepancy between the self-confident mind-set that's promoted by the UK's grand institutions and buildings, and the reality.

China is the opposite: it is a world-class economy and society making progress on every important front but lacks the self-confidence of a world-class country. That's shown by the desire of Chinese people to study and shop overseas. Rich Chinese families try to send their children to Eton, Oxford and Cambridge, because they want the feeling of being world-class.

This discrepancy between mind-set and reality creates potential for misunderstandings. At the political level, it might not be a problem. At the business level, it could have serious consequences when British negotiators arrive at meetings with inflated notions about themselves and a misunderstanding about how sophisticated an economy China has become. They may still think that China makes mainly T-shirts and miss real opportunities that a partnership with Chinese companies can offer.

Q. Will this mind-set change now that the UK is leaving the EU and China is growing in prominence as a world power?

A: Brexit is an issue not just for next year, but for the next 10 years. Most likely it will happen and will be a terrible mess, due to the incompetence and irresponsibility of the British elite. It's certain to be a drag on the British economy and makes the UK much less attractive as a place to invest.

If Brexit had not happened, the UK would remain the natural entry point into Europe—the world's largest economy—for Chinese investors because many Chinese speak English, but few speak French or German. They are also more familiar with British law and institutions than those of Germany or France.

But now everything is uncertain. You don't know the rules of the game because the terms on which firms located in Britain can deal with Europe have not been agreed. The uncertainty will persist for up to a decade and, over that period, will disadvantage the UK as a destination for investment. I think the "golden era" of UK-China relations was pretty much killed off by Brexit.

Q: The UK has handed China two significant victories in recent years: becoming the first major Western power to join the Asian Infrastructure Investment Bank (AIIB) and buying a Chinese-made nuclear reactor, as part of the Hinkley Point C project. What do you think of these moves?

I think the "golden era" of UK-China relations was pretty much killed off by Brexit

A: I think joining the AIIB was a political gesture to build goodwill with China but will not bring real gain. With regard to the nuclear reactor, this has been a learning experience for China. That deal was negotiated, then the incoming Prime Minister Theresa May reviewed the agreement and decided not to proceed. That was a political gesture to the British public. Then, she changed her mind again because she didn't want to antagonize China.

What this shows is that high-profile business deals between China and the UK have a political dimension. Chinese need to be aware of this and understand how the British political system works and how some British media will pander to prejudices of the British public. Even quite sophisticated British people can be quite ignorant about China.

Q: Chinese investment in the UK has increased since the referendum. One prominent deal in 2017 was the $14 billion purchase of the London-based warehouse company Logicor by China Investment Corporation, the Chinese sovereign wealth fund. Why have these deals continued to be attractive to both sides?

A: Connect this back to what I said about possible misunderstandings. The Logicor deal is a good purchase, an intelligent choice. It's in a non-sensitive industry and plays to China's strength and involves relatively little contact with the British public. China is world-class in terms of logistics. It has a lot of experience in managing shipments because, as the leading manufacturing economy, it has connections, expertise and technology. So, investing in this kind of private infrastructure is a good choice.

But if a Chinese company wanted to buy a television station or newspaper, some British people would scream and yell for fear of "Communist propaganda." There could be antagonism even if a Chinese company tried to buy a high street retailer like Marks & Spencer, although it's not a strategic or threatening purchase.

> This is an opportunity for the City of London to become the global center for RMB transactions

I don't believe that purchasing a retailer would be a smart decision for a Chinese company. Success requires understanding the peculiarities of the British people as customers and as suppliers. It requires understanding British labor and commercial law, health and safety regulations, marketing conventions and public relations. It also requires cultural or soft knowledge of British people, which Chinese sometimes lack. It plays to China's weaknesses. My suggestion to Chinese companies is not to get involved in investments that require detailed knowledge of British people, British companies or how British business is done. That could bring some costly surprises.

Q: The UK is keen to negotiate a free trade agreement with China after Brexit. How likely is that?

A: Until Brexit happens, EU rules make it illegal for the UK to negotiate a free trade agreement with any other country. Here is an example of the problems that Britain finds itself in. One of the selling points of Brexit was that Britain would be free to negotiate great trade agreements with every other country. First on the list were Australia and New Zealand because of historical ties. Last week, it was reported that the EU is negotiating FTAs with Australia and New Zealand, so before the British can even get started, the Europeans are already there.

Q: Though China and US are not yet in a full-blown trade war, tensions are heightened. How do you see Britain's position in this?

A: A big opportunity comes from the Iran situation. The US unilaterally exited the Iran nuclear deal agreed in 2015 and stated that it will impose sanctions on foreign companies that continue to do business with Iran. Some companies may not worry at first, because they're not interested in doing business in the United States, but there's a second problem: they have to use the international banking system.

The US might sanction, say, a German bank that finances a company doing business with Iran. So, that company might find itself unable to get financing from any bank that operates in the US. Because the dollar is the international currency and the US financial system has global reach, companies can be hurt even if they don't do business with the US as they still need to do business through the American-dominated global financial system.

Currently, if a Chinese company wishes to do business in Russia, it might exchange RMB to US dollars, then US dollars to the Russian ruble. This could expose it to US sanctions on international banks. But this would no longer be true if it could switch directly from the RMB to the ruble. Many companies are in this position, which opens the possibility for the RMB to emerge as a rival global currency, which is part of being a global power. I'm not saying that's going to happen overnight, but people are thinking about this. This is an opportunity for the City of London to become the global center for RMB transactions as it is used to handling another country's currency and has genuine expertise. It would be a natural match, a real partnership, but that requires the UK to detach itself emotionally from the US.

Q: Do you think Chinese investment in the UK will continue to be strong in 2018 and beyond?

A: Here we have to circle back to my opening description of the UK as an economy and as a country. It has sectors that are world-class: higher education, finance and information technology, where it is the strongest center in the world after Silicon Valley.

International companies also go to London for a very interesting reason. To travel from Cambridge to London by train takes one hour. To travel from Oxford to London takes one hour. So, essentially both can be reached in the same time that a journey across London takes. If you count the universities in London that are world-class, plus Oxford and Cambridge, there are seven in total. No other city in the world has this concentration of educational resources. The UK also attracts the intellectual elite from Australia, Canada and New Zealand due to historic connections. Some Chinese look down on the UK as a fading second-rate country, thinking it's just a place for traveling and shopping, but it has these real strengths. Opportunities exist in the UK in knowledge-intensive industries, but it is not clear how China can take advantage of them, or how we can create win-win situations.

An obvious vulnerability of the UK is that its university staff are low-paid, so it is difficult to hire world-class people. They still manage to do so. This is because the UK is attractive as a country to live in, but you have to make a financial sacrifice to join a British university. So, I sense an opportunity for Chinese money to support the UK in this area. Britain has both excellent hard and soft infrastructure for education, and, frankly, China has substantial weaknesses here. I think there should be a way for China to support UK education and research in scientific and engineering subjects and create a win-win situation. Such collaboration is becoming more difficult with the US because of rising suspicion and strategic rivalry.

Funding China's Green Future

Can green finance bring blue skies back to China?

By Douglas Bulloch

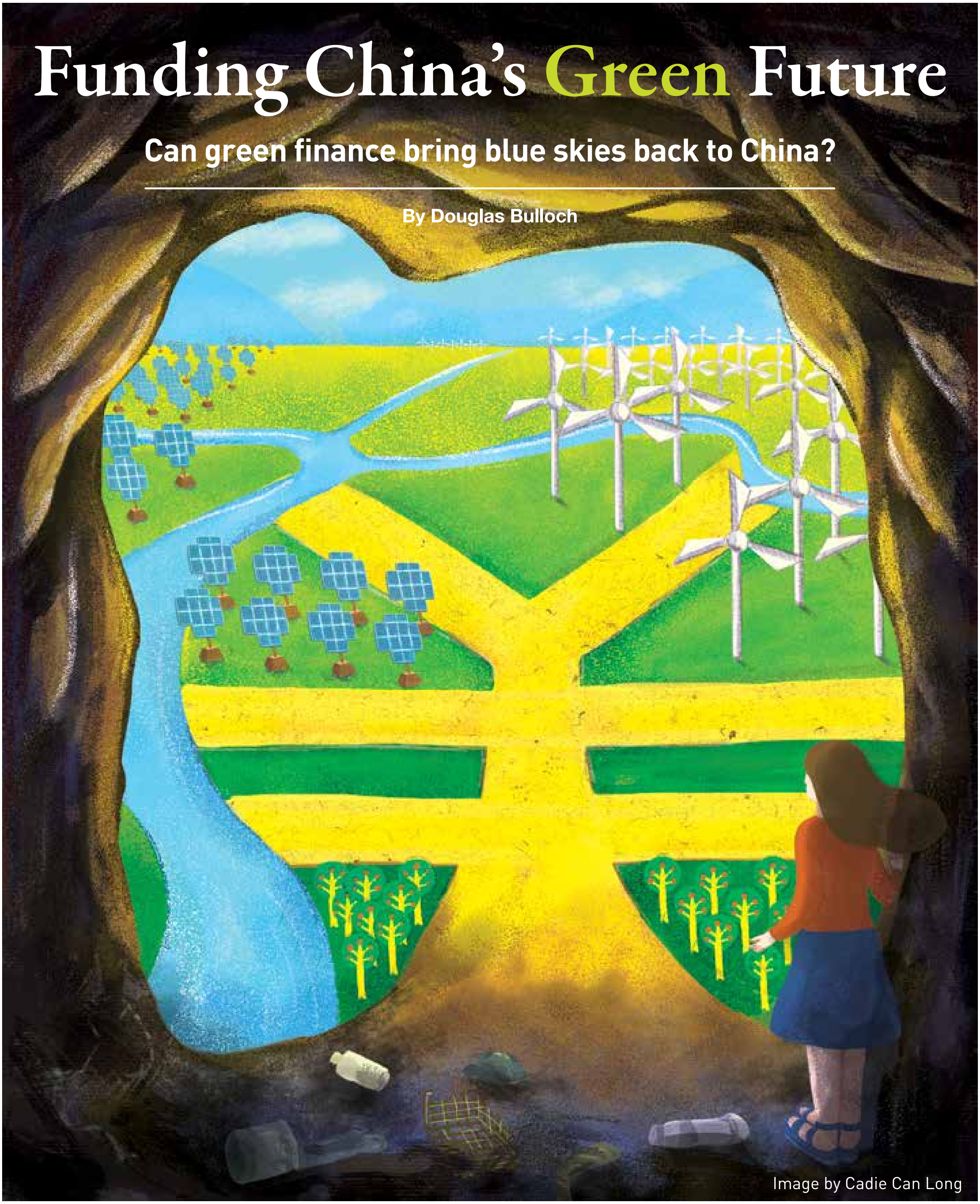


Image by Cadie Can Long

China has rapidly established itself as one of the biggest players in the global green finance movement. But how green are China's green bonds in reality?

It's not often that financial reforms are compared to wonders of the ancient world, but December 19, 2017, was no normal occasion. On that day, China launched its first national carbon trading scheme, covering a massive 3 billion tons of carbon emissions.

Overnight, Beijing became the operator of by far the world's largest carbon exchange, surpassing even the European Union's Emissions Trading Scheme. When asked to put the initiative into context, Nathaniel Keohane, Vice President of the Environmental Defense Fund, a New York-based charity that assisted the Chinese government on the project, reached back into history.

"This is an incredibly ambitious exercise," Keohane told the *South China Morning Post*. "It's like the Pyramids of Giza."

Such hyperbole is common in discussions of China's rapid rise within the world of green finance, a new approach to funding that aims at ensuring that capital is channeled into sustainable projects. As late as 2015, China barely registered as a player. But in November that year, President Xi Jinping's government made developing the field a priority in its latest five-year plan and the effect was almost instantaneous.

In 2016, China became the world's largest issuer of green bonds, raising $33 billion from 43 deals, compared to just $1.3 billion the previous year. That September, China also became the first country to make green finance a major part of a G-20 summit when it hosted the event in Hangzhou.

By November 2017, the United Nations Environment Programme (UNEP) was impressed enough by the country's rapid progress to declare: "China has firmly established itself as a global leader on green finance."

The Chinese leadership has been quick to embrace the role of green pioneers. Some are even talking about China exporting its sustainable practices through its $1 trillion infrastructure-building program, the Belt and Road Initiative (BRI). Yet China's green finance credentials remain controversial. Many analysts argue that if you scratch under the Chinese system's green veneer, it reveals a different color entirely.

Funding Gap

China has stronger motivations than most countries to push its financial system in a more sustainable direction. A desire to meet its climate change obligations is part of it: Xi famously promised President Barack Obama in 2015 that his country would launch a cap-and-trade scheme by the end of 2017 and kept his word, with 12 days to spare. But green finance for China is primarily about pollution.

Simon Zadek, Co-director of the UNEP Inquiry into the Design of a Sustainable Financial System, believes the start of China's green finance push traces back to January 8, 2013. That was the day the "Airpocalypse" hit Beijing and the city's air quality index (AQI) soared to 960, over 20 times higher than the level considered safe by the Chinese government.

"After that, everybody only wanted

> **There are a couple of key mandates for Xi Jinping: there's the Belt and Road Initiative and there's the environment**
>
> Andrew Collier
> Managing Director
> Orient Capital Research

China's Green Bond Boom

China has become a major issuer of green bonds

Source: S&P Global Market Intelligence

to talk about one thing—pollution and the environment," Zadek tells *CKGSB Knowledge*. "For the first time, in my view, 'green' became a political issue in China."

This view is echoed by Ma Jun, the former Chief Economist at the People's Bank of China (PBOC). "China has now… the most complete set of data on the PM2.5 AQI in the world," Ma told *Eco-business.com* during a recent interview. "This transparency has enabled people to pay greater attention to… anything contributing to the improvement of the environment, including green finance."

Xi Jinping has placed dealing with environmental issues at the center of his policy agenda. He has called on the government to shift the economy from high-speed to high-quality growth, and even placed environmental issues alongside gross domestic product (GDP) growth as the top issue on which officials' performance is assessed.

"There are a couple of key mandates for Xi Jinping: there's the Belt and Road Initiative and there's the environment," says Andrew Collier, Managing Director of Orient Capital Research, a Hong Kong research firm.

The problem is that cleaning up China's poisoned air, water and soil and transforming its industry-dependent economy is a vast task, one that dwarfs even the Chinese government's enormous budget. The PBOC has estimated that greening China's economy will require investment of RMB 3-4 trillion ($470-620 billion) per year, and that the government will only be able to directly fund 10-15% of that amount.

To achieve its ambitions, the government needs to attract investment from the financial sector, private companies, households and international investors. Green finance offers the opportunity to do that.

Green Shoots

China has made impressive strides toward creating the architecture for a green finance market. In August 2016, the government issued the *Guidelines on Establishing the Green Financial System*. Ma from the PBOC hails this as "the world's first attempt at an integrated policy package to promote an ambitious shift toward a green economy."

The policies have produced concrete results. China raised $37.1 billion from green bonds last year, accounting for 15% of the global total. The amount of debt owned by the main Chinese banks classified as green credit has risen from $810 billion in 2013 to $1.2 trillion as of June 2017, says Gracie Sun, an adviser from the Green Finance Center at the Paulson Institute in Shanghai.

The number of green funds registered with the Asset Management Association of China, meanwhile, nearly doubled from 144 to 265 in 2016. And a massive 7,826 public-private partnership deals for green and low-carbon projects worth $1 trillion were registered with China's national PPP project catalog, according to the UNEP's *Establishing China's Green Financial System 2017* report.

This rapid progress has been possible because of China's state-driven system. "It's basically a Xi Jinping top-down policy, and whenever that happens everyone has to pay attention," says Collier, of Orient Capital Research. "You have the China Development Bank behind a lot of this, and the minute you have significant policy banks pushing a theme then the cost of capital is lower."

In fact, Zadek from the UNEP believes that in some ways the Chinese system is uniquely suited to promoting green finance because the state has the muscle to align the financial market and the country's economic objectives.

"China's PBOC would be seen by organizations such as the OECD as beyond the pale because it is combining policy and regulatory agendas," says Zadek. "But that's what allows them to look more systemically at the nexus between financial markets, environment and national development priorities."

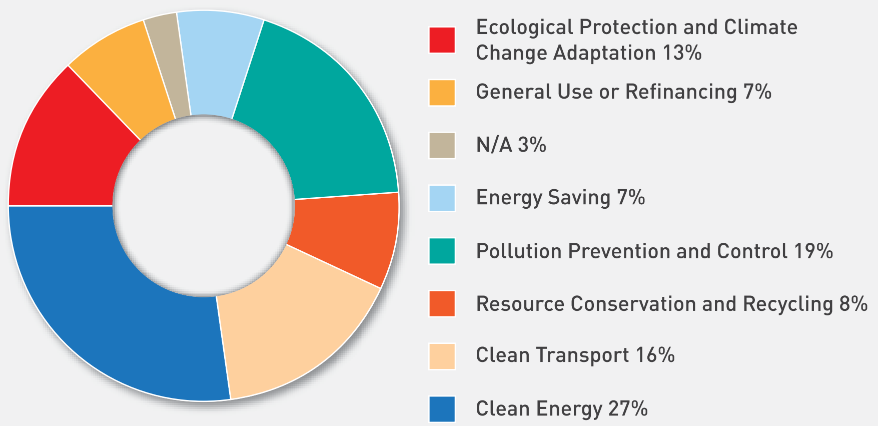
But this strength also has a downside, which is that state or state-backed investors still dominate the nascent green finance market. The China Development Bank (CDB), for example, issued 21% of the green credit in the Chinese market as of 2015, according to research organization New Climate Economy.

Many of the PPP deals, meanwhile, are not public-private partnerships at all. They are public-public tie-ins between local governments that are often heavily indebted

Different Shades of Green

China finances a wide range of projects with green bonds

Use of proceeds from green bonds issued by People's Bank of China in 2017



Source: Climate Bonds Initiative

and state-owned enterprises (SOEs), which sometimes have even greater debt levels and are being propped up by local governments and lenders.

This kind of partnership is banned, but still widespread. In April, a government crackdown led to more than 2,000 PPP deals being canceled, though how many projects were related to sustainability is not clear.

This suggests that the green finance system is not yet ready to become a long-term mechanism for lifting the burden on the state by attracting funding from a wide range of private sources. Though there are tentative signs of progress.

While only $6.6 billion of the $37.1 billion raised through green bonds last year came from overseas, new initiatives such as allowing Chinese banks to issue green bonds via the Bond Connect Scheme, which enables international investors to access China's bond market through a Hong Kong trustee, have been effective. The first such bond, worth $450 million, was issued by the Agricultural Bank of China last year and was oversubscribed 4.4 times.

Color Blind

To entice more international investment, China may need to deal with a serious PR problem. For every article praising China as a trailblazer, there is another putting its high numbers down to "greenwashing," the practice of disguising environmentally harmful projects as green investments.

Sam Geall, an associate at the UK think tank Chatham House, believes that the green credentials of some of China's projects are murky at best. "There is still a long way to go in terms of clarifying what's green about a green bond," he says. "If these bonds can be used to finance new coal-powered generation then I think that's a genuine cause for worry."

The case Geall is referring to is Tianjin SDIC Jinneng, a power company, issuing green bonds worth $150 million in 2017 to finance a 2,000-megawatt coal-fired power plant. In the West this kind of investment is seen as incompatible with green finance. Yet Chinese experts point out that upgrading outdated coal plants with cleaner alternatives is crucial to dealing with the country's air pollution problem. More than 60% of China's power generation still comes from coal, though this is declining.

According to Ma, the debate over greenwashing reflects the difference in priorities between the West, where green finance is mainly about tackling climate change, and China, where pollution is the number one issue.

"Defining green finance isn't just a matter of basic technology, it also reflects a nation's environmental protection priorities," he told *Caixin*. "Clean coal reflects this: China needs to prioritize reduction of air pollution, so it's going to put a lot of effort into reducing emissions of sulphur dioxide and nitrogen oxides… by the use of scrubbing technologies."

Another issue is lack of transparency in China's financial system, which makes it difficult to be sure that funds labeled green are actually being used for sustainable projects. Only around $1.5 billion worth of green bonds issued by China in 2017 were deemed not to meet international standards due to a lack of disclosure, according to the *China Green Bond Market 2017* report, but this figure may not capture the extent of the problem.

"The data are weak," affirms Zadek. "But we're fairly early on in the change process, and so one is cautious in drawing definitive conclusions."

Sun from the Paulson Institute insists matters are becoming more transparent. "People learn lessons from the previous stage and what to focus on next," she says. "Things are moving quite fast."

Zadek agrees that the green finance push is helping to drive an improvement in the culture of China's finance industry. "We know that there is a more studious and senior level-driven approach to assessing environmental risks on the bank balance sheets," he says. "We are seeing improved due diligence, improved metrics, improved verification and improved public reporting."

Yet China's focus on pollution over climate change makes attracting investment more challenging in another way: Chinese issuers are funding different projects to peers in the West, and these projects offer more uncertain returns.

By far the most popular green bonds on the global market are for clean energy and energy efficiency projects. These made up 33% and 29% of the market in 2017, according to the Climate Bonds Initiative. China's market is more diverse. Clean energy projects make up 27% of the market, but the next most popular are pollution control (19%), clean transport (16%) and ecological protection (13%).

Charles Donovan, Director of the

Centre for Climate Finance and Investment at London's Imperial College Business School, is doubtful about the profitability of many of the projects. "I see a lot of situations in which finance is seen as a way of covering over the fact that the policy or the regulatory structure doesn't really enable a profitable investment," he says.

Ma, on the other hand, argues that the projects will pay off in the long term, but that bonds need to have a much longer maturity. "A lot of green finance projects—subways, railways, water treatment, solid waste, new energy—have lengthy investment periods," he told *Caixin*. "It might be 10, 15 or even 20 years before investments see a return."

Stepping up the Pace

All these discussions ignore the obvious. Despite China's headline-grabbing progress on green finance, the financial products are just a means to an end. The real objectives are blue skies and lower carbon emissions. On those fronts, China still has a long way to go, says Zadek. "The direction is right, but the pace of travel is inadequate," he says.

The underlying issue is that China's high pollution and carbon emissions levels stem from the way its economy is structured, according to Collier from Orient Capital Research. "China's GDP is heavily industrial-oriented and much of that is heavily polluting," he explains.

Unless Beijing takes more radical action, green finance will be nothing more than a band-aid. Although China was the world's second-largest issuer of green bonds in 2017, green bonds still only accounted for around 2% of the total bonds issued in the country, according to Sun.

The same contradiction is seen in China's Belt and Road Initiative. Though Sun argues that there is a genuine desire on the part of the Chinese government to adopt global standards on green finance and help BRI partners meet those standards, Geall from Chatham House points out that, "there are plans to build coal-fired plants in Turkey, Pakistan, Sri Lanka, Vietnam, Indonesia, Malaysia, the Balkans and so on."

The reason for this contradiction, Geall suggests, is Beijing's reluctance to move against its giant state-owned industrial firms, which employ millions and wield significant power. "My hunch is that there is a protracted bargaining process between [the Chinese government] and vested interests and strong incumbents who are seeing their markets shrink in China and are looking for an overseas outlet," says Geall.

The trade-off for regulating the domestic coal industry may be allowing the SOEs to build dozens of new plants overseas. The punchline, as Zadek points out, is that if China wants its green finance push to make a real contribution, more—not less—state meddling is required.

"If you want to deal with carbon lock-in on the Belt and Road, that takes central government policy intervention," says Zadek. "There's no other way to do it."

CHINA'S HEALTH REVOLUTION

Can China innovate its way out of a looming health care crisis?

By Dominic Morgan

Image by Lisa Ye

China's hospitals are becoming overstretched as population aging and urbanization send demand for health care soaring. But a new wave of world-leading Chinese health technology companies believe they can lift the burden on the country's frazzled doctors

Chinese medical centers tend to be crowded, chaotic places, but the radiology department of the Shanghai Ninth People's Hospital is an oasis of quiet. The only sound in the dimly-lit office is the rapid clicking of computer mice.

At one of the terminals lining the room, Dr. Wang Meili* is analyzing CT scans of a patient's lungs. It is easy to see why the young radiologist has little time for chit-chat. There are 150 sets of scans waiting for her to examine—around 30,000 images.

"Each doctor in our team reads at least 20,000 images per day," Dr. Wang tells *CKGSB Knowledge*. "The work is intense. Radiologists in a similar position in the United States have a workload about one-third to one-half of ours."

Luckily for Wang and her colleagues, they have a secret weapon to help manage their huge in-tray. On the black pair of lungs in the center of Wang's screen, several small dots have already been circled in white. To the right, a short report outlines what these suspicious nodules might be.

All this work has been completed by Care.ai, an artificial intelligence-driven diagnosis system developed by the Chinese startup Yitu Technology. The system can analyze a patient's scans, flag issues and write up a report in just a few seconds, work that takes a human physician between five and 10 minutes on average.

"Care.ai has greatly reduced the pressure on our doctors," says Dr. Wang. "It's also helping reduce misdiagnosis and missed diagnosis rates due to fatigue and stress. And it provides more information than we had previously—for example, by automatically comparing the scans with a patient's historical records."

Yitu's system sits at the crest of a technological wave sweeping through China's health sector. Health tech will be a $150 billion market in China by 2020, according to estimates by research firm Bernstein. The Chinese government is actively driving this revolution as it sees technology as the best way to help an already overstretched health care system cope with an explosion in demand.

"Compared to governments elsewhere, China has the friendliest attitude toward the AI health care market," says Cathy Fang, Vice President at Yitu Healthcare. "Several government departments have special projects to support the development of the industry."

This support is propelling Chinese companies like Yitu to the forefront of one of the world's most important emerging industries.

Health Issues

It is easy to understand why China is pushing health technology when you visit a public hospital in Shanghai or Beijing. China's health care expenditure has risen faster than gross domestic product over the past decade, but the strain on medical centers is still clear.

"In a Chinese public hospital, typically you get 5-10 minutes with a doctor, maximum," says Simon MacKinnon, co-founder of China health care consultancy and investment firm Sinophi Healthcare. "A doctor is seeing 100-150 patients a day. It's extraordinary."

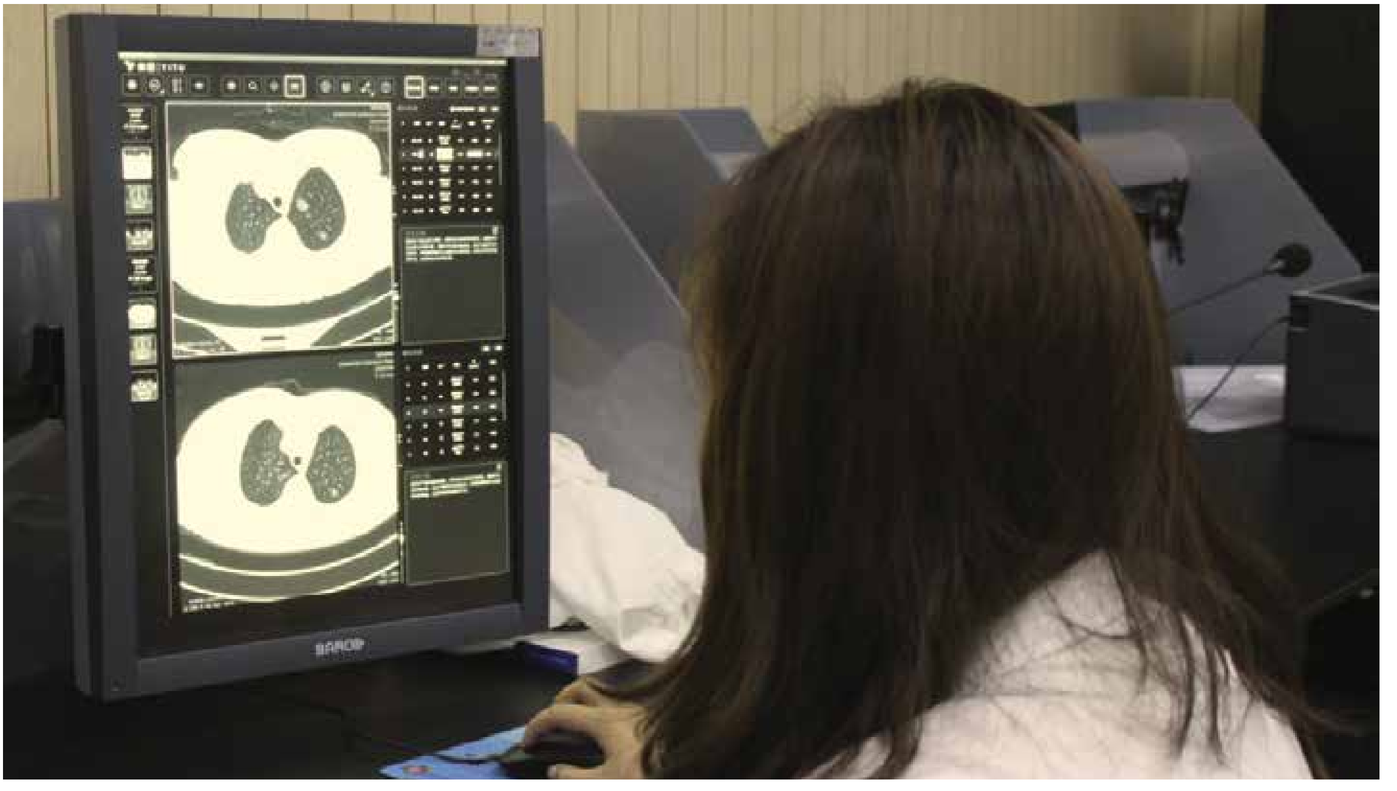
The reason is a chronic lack of qualified doctors. An often-cited figure is that China has around 1.5 doctors per 1,000 people, just over half the number in the United States. But a more telling statistic is that fewer than half of China's doctors have a university-level education, according to China's National Health and Family Planning Commission.

The best doctors are concentrated in the top hospitals in the major cities, and so patients flock to these institutions. Chinese hospitals with a "triple-A" rating, the highest level available, make up 7.7% of the country's medical centers, but handled half of total outpatient visits in 2016, according to the *South China Morning Post*.

"If patients are in Jiangsu Province and worry they have a serious illness, they'll go to the best hospital in [the provincial capital] Nanjing," says MacKinnon. "If Nanjing is still not good enough, then they'll come to Shanghai. The higher up the pyramid you go, the more pressure there is on resources."

The overcrowding of major hospitals often causes tension between patients and doctors. One-fifth of China's doctors have

** Dr. Wang's name has been changed at her request.*



A doctor analyzes CT scans using Yitu Technology's Care.ai system at the Shanghai Ninth People's Hospital

been assaulted by a patient and four-fifths have been verbally abused, according to a survey by Chinese research firm Yimi Research.

The widespread reporting of these incidents deters talented students from joining the medical profession, making the recruitment of more doctors even more difficult. In a 2016 survey of China's top high-school graduates, not a single student said they wanted to pursue medicine.

"If I have kids, I'm not sure I'd encourage them to become doctors," says Yuan Jiasheng, a teacher from Jiangsu Province. "It's kind of a dangerous profession."

But new doctors are urgently needed because of the skyrocketing demand for health care. This rise in patient numbers is being driven by a perfect storm of demographic factors.

"You've got three enormous drivers," explains MacKinnon. "People are becoming better off—as you get wealthier, you tend to spend more on health care for you and your family. Second, you've got rapid population aging. And third, you have urbanization—when you move to the suburbs, you're more likely to have access to health care."

The number of people aged 60+ in China is set to soar 90% to 240 million by 2020, according to the World Health Organization. This, along with the increasingly unhealthy lifestyles of urban Chinese, is leading to a rapid rise in the prevalence of chronic diseases such as diabetes and cancer.

The Shanghai Ninth People's Hospital is already struggling to cope with the growing number of patients. "China's aging society and increase in chronic diseases pose enormous challenges for the entire medical system," says Dr. Wang. "In the imaging field alone, the annual growth rate of data in China is over 30%, while the number of imaging physicians is only increasing 4% per year."

> **Compared to governments elsewhere, China has the friendliest attitude toward the AI health care market**
>
> Cathy Fang
> Vice President
> Yitu Healthcare

Turning to Technology

As a result, technology companies are finding massive demand among Chinese hospitals for products that help them become more efficient, according to Efstratios Tsougenis, a director at Hong Kong-based medical imaging startup Imsight. “There is no other possible solution for the hospitals,” says Tsougenis. “You cannot train doctors in two years; it takes 10 years to train an expert. So, demand for health tech will grow exponentially.”

The Chinese government is also promoting the integration of new technologies into the health care system through policies such as its Internet Plus Health Care strategy, which Premier Li Keqiang has championed. The policies focus on reducing the administrative burden by digitalizing patients’ medical records and allowing patients to book appointments and order drugs online.

Online health platforms such as WeDoctor—a startup backed by Chinese tech giant Tencent, valued at an estimated $5.5 billion—have flourished. WeDoctor now connects over 20 million patients with 220,000 doctors at 2,700 hospitals.

The online booking systems offered by WeDoctor and its competitors have reduced waiting times significantly, according to MacKinnon. “At Chinese hospitals, it used to be like the Harrods sale at 6.30 a.m. every day of the week,” he recalls, referring to the huge lines of patients waiting for an appointment.

“Now, instead of wasting a whole morning on a simple checkup, at some hospitals you can book a time using an app and be in and out in under an hour.”

Another area with potential is solutions that help patients self-diagnose and manage chronic diseases like diabetes without needing to visit a hospital. There are 109 million diabetics in China and hundreds of millions more are estimated to be at risk of developing the disease. Both Chinese and foreign companies are racing to roll out systems integrating wearable devices that help diabetics track their condition and chat bots that can help diagnose a patient’s symptoms remotely.

“In China, you’ve already got a massive takeup of technology in the pre-primary and primary care area,” says MacKinnon. “We’re seeing so much change and it is young people that are the rapid adopters.”

But the benefits for hospitals are likely to remain minor in the short term because of the low level of health education among many social groups in China, according to Douglas Corley, CEO of health tech consulting firm DHB Global.

“For diabetes, there’s a lack of understanding of the disease and that you have to keep checking your blood sugar level,” says Corley. “In the US, the compliance rates are about 60%; in China, they’re about 20%.”

Rise of AI

However, companies that are integrating artificial intelligence systems into doctors’ clinical work, like Yitu, are already bringing visible benefits to the Chinese health system.

The AI health care field has developed incredibly fast in China. There are already 131 companies working in this space, according to consulting firm Yiou Intelligence, and these startups received $2.7 billion in funding during the first half of 2017 alone.

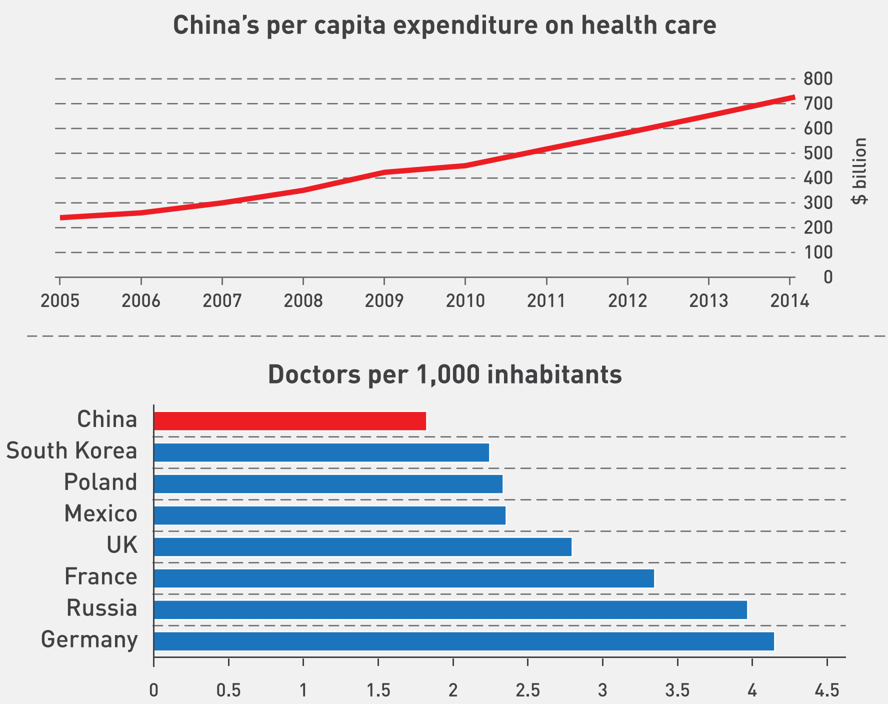
Most of China’s AI health care companies currently focus on medical imaging systems that help doctors analyze X-rays, CT scans and tissue analyses for signs of dozens of diseases, from cancers to liver disease. Doctors at Chinese hospitals train the AI systems and the accuracy of the diagnoses now rival that of the country’s top human doctors, according to Yitu. This puts Chinese companies at the cutting edge of the field.

“The diagnostic rates for these AI algorithms in China are very, very high,” agrees Corley. “It compares favorably with almost anywhere in the world.”

In some cases, the algorithms are even improving the quality of diagnoses

Investing in Health

China has a shortage of doctors despite growing health spending

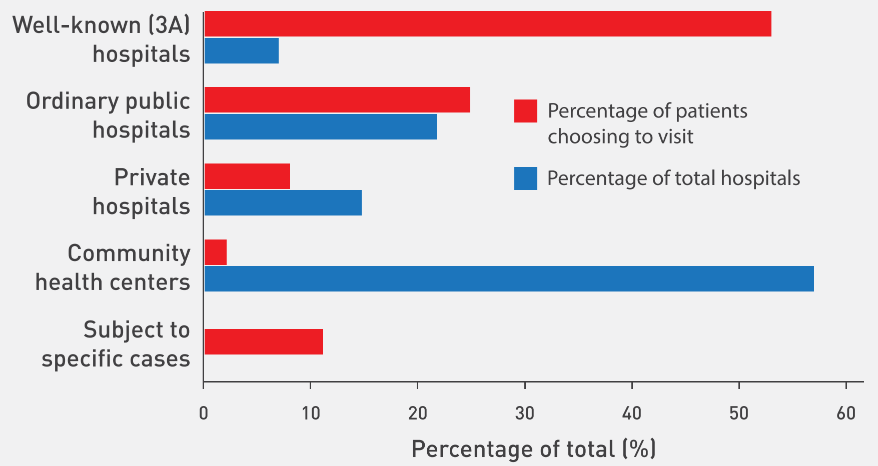


Source: World Bank, OECD

Flocking to Famous Hospitals

Chinese patients go directly to top hospitals for treatment

Percentage of patients choosing to visit different types of hospitals



Source: National Bureau of Statistics, Swedish Agency for Growth Policy Analysis, Accenture and WeDoctor 2016 Chinese Patients Survey

because they are being trained using clinical data taken from local populations.

"Previously doctors manually compared a Chinese child's bone age to a standard that was developed 40 years ago based on a white population, so it does not accurately reflect the growth or development of Chinese children," says Yitu's Fang. "We are generating the first growth and development curve for Chinese children."

The key to the Chinese startups' success is the speed at which they have partnered with hospitals and started feeding data into their systems at huge volumes. "As you're creating these neural networks you need one thing, and that's data," explains Corley. "You can't compete with China on health data."

Chinese companies can access data easily not only due to China's large population, but because Beijing is encouraging medical centers to collaborate with AI startups, according to Imsight's Tsougenis. He adds that his company already has partnerships with more than 100 Chinese hospitals.

As a result, companies like Yitu have leapfrogged many peers in the US, where much of the base technology for machine learning systems was developed. "In America, I know several companies that started in AI health care in 2013-2014, but when I spoke to them last year their products were still pretty much the same as when I first saw them," says Yitu's Fang.

"The main reason is that they struggle to annotate the training data. For them, a thousand data points is a big thing, but for us 10,000 is a starting point."

At the moment, AI imaging systems are mainly used as efficiency tools and a second pair of eyes by doctors in urban hospitals, but they could do much more. According to Corley, Beijing is keen to use AI solutions to help mitigate the gaping disparity in health care provision between urban and rural areas. AI bots could be used to evaluate X-rays from rural patients and even train rural doctors.

"AI for diagnostics is a win for everybody," he says. "It allows rural doctors to receive training and have better outcomes, it saves the hospitals money and it saves patients time and money."

Robots are not likely to replace human doctors any time soon, says Fang, but this could be a possibility down the line. "I don't think that AI is going to replace doctors, at least for the next 5-10 years," she says. "Our technology currently is suitable only to replace repetitive, tedious and specialized tasks."

Scanning for Opportunities

It is impossible to say how large the market for AI health care could become in revenue terms, but Yitu believes that its health care business will eventually be even more lucrative than surveillance, a market that has already produced four companies worth over $1 billion in China.

"I believe that health care will be the number one application field for AI in China," agrees Tsougenis.

Yitu is also exploring opportunities to export its technology. However, it could be held back by the same problem that US companies have when trying to enter the Chinese market: a product developed for Chinese patients may not be effective for diagnosing Westerners, and vice versa.

"We are launching our products in Singapore and Hong Kong to test the waters of the international market because there the genetic background of the population is similar to the Chinese mainland," says Fang. "But for the US market, we are focusing on research collaboration."

The Americans and Chinese are often thought of as competitors in the field of AI, but Fang believes that in health care the two sides' strengths complement each other perfectly.

"The strength of the US is cutting-edge research capability—they are far ahead in terms of exploring the limits of AI," says Fang. "China's strength is its rich clinical resources. Even if you want to develop AI products on very rare conditions, you can do that in China."

Yitu plans to put that theory to the test with a partnership with Harvard Medical School. Both sides have clear incentives to work together. All of the world's major economies are facing the same health issues as China.

"The whole health care system is unaffordable on a 10-15-year outlook—and that's true all over the world," says MacKinnon. "It has to change, and technology has to be the enabler."

Voice of the People

Jiang Tao, Senior Vice President of iFlytek, explains how his company came to dominate the world of speech technology and artificial intelligence in China

By CKGSB Case Center

For a company whose software speaks to more than half a billion people, iFlytek tends to keep its voice remarkably low. The firm was founded by a group of researchers in 1999 and is headquartered in the relatively sleepy eastern city of Hefei, far from China's tech hubs, Beijing and Shenzhen.

But despite keeping a low profile, iFlytek has been quietly revolutionizing the world of speech recognition in China over the past two decades. The company's software can not only understand several Chinese dialects fluently—a feat Apple's Siri, for instance, still struggles with—it can transcribe it into text, and even translate it into English instantly.

Now, the company that *MIT Technology Review* ranked as the sixth smartest company in the world in 2017—just one place below Google—is integrating artificial intelligence technology into its solutions in a bid to push the boundaries of what is possible in the world of voice-activated technology.

In this interview with CKGSB Case Center, Jiang Tao, Senior Vice President of iFlytek, who has been at the company since the very beginning, explains how the company reached this point, how it keeps hold of its world-class researchers, and why it is not afraid of competition from China's tech giants.

Q: How did iFlytek get started?

A: A special thing about the company is that we are the first listed company [in China] that was started by college students at the University of Science and Technology of China in Hefei. There were undergraduates, postgraduates and also doctoral candidates. Liu Qingfeng, who is now Chairman of iFlyTek, was in the first year of his PhD when iFlyTek started. Now, most of our C-level people hold a doctor's degree. And that initial research team is still working at the company.

Q: What was the voice recognition field like when iFlytek was founded in 1999?

A: In 1997, IBM launched ViaVoice, which was recognized as a major event by the global science and technology community. Although that product now seems basic by current standards, at the time being able to speak at a computer and see words appear on the screen was amazing.

At the end of the 1990s, there was a global boom in speech recognition technology, driven by the achievement of IBM. Many IT giants, including Intel, Microsoft, Motorola and Toshiba, had set up voice research centers in China. The market was basically monopolized by foreign firms. Top universities and institutions, like Tsinghua University and the Chinese Academy of Sciences, had related majors and their graduates went to work in those foreign companies.

We were like newborn calves that are not afraid of tigers. The situation was really hard, because after that initial breakthrough by IBM, the technology actually got stuck in a bottleneck for a long time. The accuracy of speech recognition systems stayed at 80%. Some people used voice recognition software, but many found it inefficient. The entire market did not rise. We experienced a very painful growth period, and eventually broke even in 2004.

I often divide our company's development into three stages. The first was the startup phase, from 1999 to 2004. In this period, you could describe our products as being like "iFly Inside," a play on the phrase "Intel Inside."

Q: What do you mean by "iFly Inside"?

A: When we started in 1999, we had a lot of ideas and experimented with a lot of different things. For example, we tried to create a voice-driven operating system for a PC, but this turned out to be unsuccessful. We also invested in telecom products. I led a team to develop something called a "phone internet," where people could access the internet by calling a number and then "listening" to the information. Those ideas seem naïve today, but we were so passionate.

But a turning point came when people from Huawei approached us at a tech fair. They were developing a smart telecom network, and they decided to use our technology. After Huawei became our client, many other companies like Digital China also began to use our services. So, we became a technology provider to companies producing telecom systems, PCs and other smart devices like digital dictionaries. In Huawei's case, they used our voice recognition technology in their call centers. This is what I mean by the term "iFly Inside."

But these partnerships also proved to be a problem because we didn't know how to do marketing or develop our own products. All we knew how to do was to provide technology support.

Q: So, lots of people were using your product, but none of them had heard of iFlytek?

A: Yes, we were hidden. This model had a good side because it matched our abilities at the time. The downside was that our value-

Visitors browse iFlytek's booth at the CES Asia 2018 exhibition in Shanghai

added was very small. But it did enable us to reach the break-even point six years after starting up.

Q: How did you move beyond the "iFly Inside" stage?

A: We explored two different directions, and the first was education. In 2004, a government official paid a visit to our company and gave us a suggestion. He said that college graduates need to take a Mandarin Chinese- or English-speaking test to become civil servants or teachers, and that such tests are manually scored and cost the government quite a lot of money. He asked if our speech technology could help solve this problem. Following his advice, we entered the education market by developing a speech-based evaluation system. It was a relatively narrow, but interesting application.

Q: So, your technology could analyze the candidates' pronunciation?

A: Yes, we started from the Mandarin tests and then expanded into English. Now, our product is used in most oral tests. After entering into the education industry, we found that there was more demand in this market. For example, many teachers in areas with strong local dialects have poor Mandarin Chinese pronunciation. Our speech technology allows the teachers to have an in-classroom assistant that helps correct their pronunciation. Up to now, more than 80 million teachers and students have been served by educational products from iFlytek.

The other area we explored was partnering with telecom operators. In 2005, China introduced dial tone ringtone services that allow users to replace the dial tone you hear when you make a phone call with a song. It became really popular, but one problem users faced was that when they wanted to change the ringtone, they needed to go online. But you had to do that on a PC, which is not very convenient.

> We changed our mission statement to making every machine understand and think

So, we created a system that allowed users just to make a call and say what song they wanted to use as the ringtone. Our system recognized the song title, and that was it. Later that service evolved to cater to more complex needs. For example, a football fan could call up and ask to hear the latest news from his favorite club. From here, we slowly formed our consumer business group.

Q: When did iFlytek start to focus on deep learning?

A: After we went public in 2008, the company's market value and revenue continued to increase. Then, in around 2013, our business entered a new stage, which was more about deep learning.

Pattern recognition—which is the technology we had used up to that point—is completely different from deep learning. In pattern recognition, the technology has to extract a lot of features from a piece of speech, understand these features, and then analyze them to find a "pattern." But in deep learning, you only need to look at the results, and then send them back to the deep learning platform to train the machine. The next time you encounter a similar problem, it knows how to deal with it. In a sense, speech recognition is the first suitable scenario for deep learning.

Q: How has the shift toward deep learning altered your company's business strategy?

A: We launched iFlytek Super Brain in 2014. To explain this project in one phrase: it will not only be able to listen and speak, but also understand and think. In the beginning, our mission statement was to make every machine, television, car and toy like people. And then, we changed it to making every machine understand and think, and using artificial intelligence to build a better world.

Also, the company's valuation increased a lot as we raised our ambitions in deep learning.

Q: In deep learning, people often say that the players with the most money and data have the advantage. If that's true, how can iFlytek compete against giants like Google?

A: The field of perception intelligence is only just beginning to mature. Whether it is speech recognition or image recognition fields like facial recognition, machines have now reached the level of human beings. There are no longer any complex challenges to solve, and so the rule that whoever has more data and a stronger ability to process that data will prevail certainly applies.

But the field of cognitive intelligence still has a long way to go. At the moment, we don't have a universal cognitive intelligence system that can solve problems in different scenarios. Developing that system is going to be a big challenge. So, what is status of the cognitive intelligence field today? We look at it from three different levels.

The first level is in special professional fields, like machines that can take medical exams and read CT scans. In this area, machines have already reached the level of humans.

The second level is the generalist level. For example, China's college entrance exam includes tests on Chinese, English, math and many other disciplines that require general knowledge.

The third level is common-sense reasoning. For machines, this is the most difficult. There is a global contest for common-sense reasoning called the Winograd Schema Challenge, which has questions like: *A asks B if there is a restroom nearby. B tells A there is a KFC opposite. Why?* Answering these questions requires a different kind of knowledge. It's not like reading a CT scan, where there is a single, standard answer.

When our system took the Winograd test, we got a score of 50% and assumed we were going to be eliminated. But it turned out we scored the highest of all the tech companies entering the contest. So, what does that all mean? Making machines with common sense is very difficult.

So, back to your question of whether it's true that the more you invest, the better the results you get. My answer would be: not necessarily. We believe that scaling up cognitive intelligence will require moving up the levels I just mentioned: starting with industries that require logic and standardized answers, like health care, and moving on toward more general applications.

We're not afraid of competing against the large firms because developing AI requires top talent and an ability to integrate the data.

We're not afraid of competing against the large firms because developing AI requires top talent

In terms of people, we feel that we actually have an advantage. The current research team we have is competitive and we're able to hold on to them. It is what's special about this company: our top managers used to be researchers, so we know how to train them and provide what they need and value.

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CATERING TO CHINA'S ELDERLY

Chinese society is aging rapidly, and smart brands are already adapting

By Helen Roxburgh

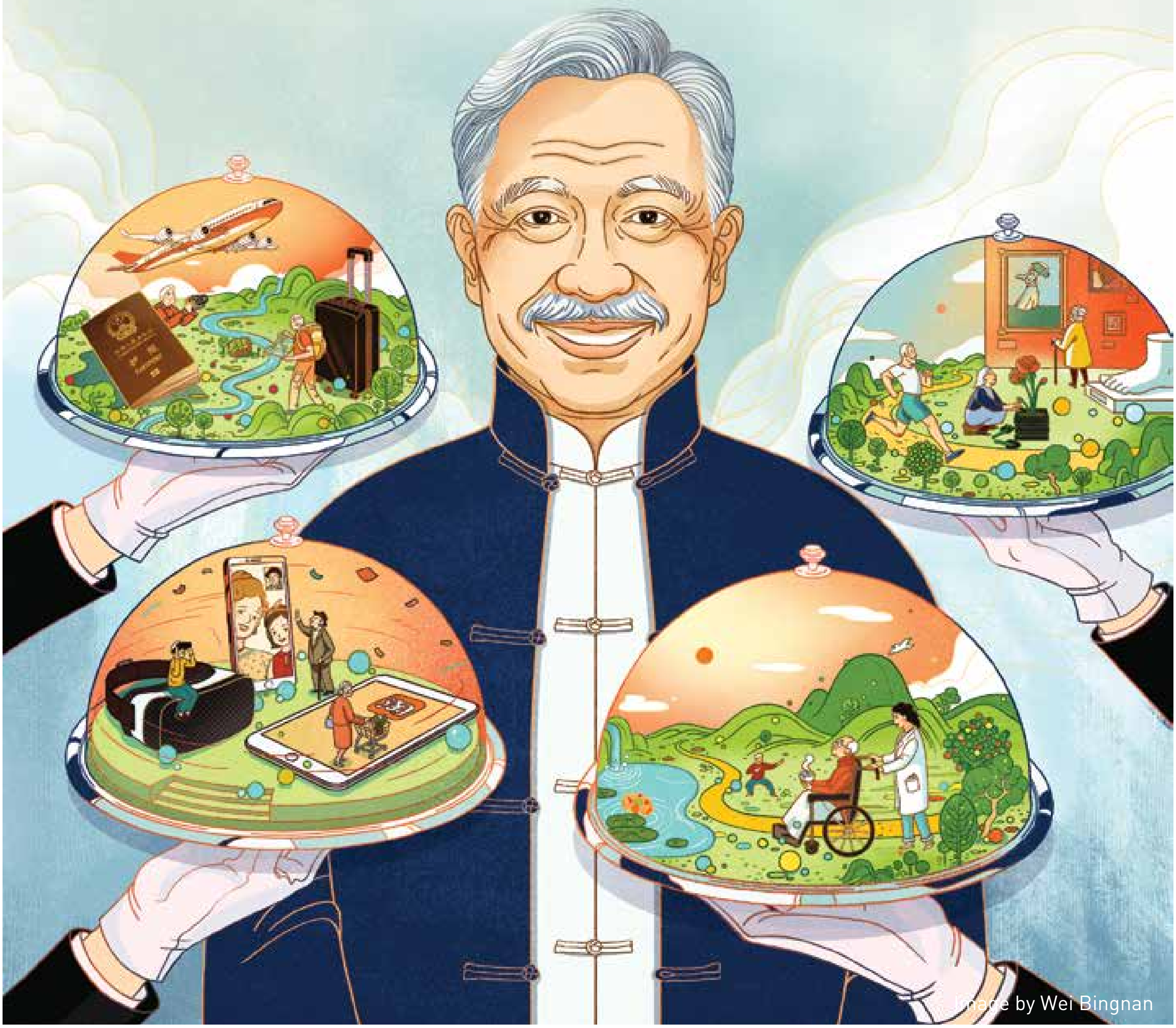


Image by Wei Bingnan

By 2045, there will be nearly 350 million people in China aged over 65. Forward-thinking companies across the Chinese economy are already preparing for a future dominated by silver consumers

Wang Jianmei never thought she would own a smartphone: the 68-year-old retiree always believed they were just for the young. But one day, she noticed a group of her elderly neighbors in her village in southern Hunan Province all messaging on their phones, and she decided to ask her son to buy one for her too.

A few days later, a big pink Huawei smartphone arrived at her doorstep and Wang could not be happier. "I like the size, the color and the way it lets me keep in touch," she enthuses. "I can send voice messages over WeChat and, now that we've had Wi-Fi installed, it's so convenient. I feel very modern."

Slowly but surely, digitally-savvy seniors like Wang are changing the game for brands in China. There are already 131 million people over the age of 65, and the United Nations projects that this number will exceed 348 million by 2045.

China's rapidly aging society is the legacy of a huge baby boom that was abruptly halted by the introduction of the one-child policy in 1979. Over the long term, this trend threatens to drag on economic growth. There were five Chinese taxpayers for every senior citizen in 2010; by 2030, there will be just two.

But for businesses that stay ahead of the demographic curve, there will be big opportunities. They are about to gain 200 million new customers.

Old Folks at Home

The most dramatic growth is likely to come in the senior care sector as demand for care homes increases exponentially. Elderly care is predicted to become a $280 billion market in China by 2020, according to research by consultancy Dezan Shira & Associates, and could even surpass real estate as the country's largest industry within 15 years.

Traditionally, Chinese children would take care of their parents in their old age, but social changes are making this Confucian ideal increasingly unrealistic for many families. Whereas children in the past usually had siblings with which to share the burden, couples from the one-child generation often have four parents and eight grandparents to take care of all by themselves.

The upshot of this is a huge shortage of care homes. State institutions currently care for just 2% of the elderly population and there are only around 42,000 private facilities in the entire country. Official estimates say an additional 3.4 million nursing homes will be needed within the next five years.

Chinese developers including Fosun, Greenland, Sino-Ocean and Vanke are already piling into this space and many are keen to partner with international care providers in order to tap their experience.

New York-based Fortress Investment Group, for example, launched a chain of Chinese care facilities called Starcastle Elderly Service in partnership with Fosun. Starcastle's flagship community opened in the suburbs of Shanghai in 2013. Residents pay up to $4,700 per month to stay at the luxury facility, where they can enjoy access to a fitness center, art room, library, teahouse, computer room and Western and Chinese medical treatment.

French nursing home operator ORPEA has also opened a premium nursing home charging between $3,100 and $7,800 per month in the eastern city of Nanjing. According to Nayoung Mathiesen, an analyst at Dezan Shira & Associates, the best opportunities in China's care industry are likely to remain at the top end of the market for the near future.

"A large number of middle-class seniors still live at home, but their children, who are often active professionals and have their own children, are the primary customer group for professional senior care services," Mathiesen tells *CKGSB Knowledge*.

"This group will demand more specialized care services. Many of them will be willing to pay for the services, whether at the home or institutional level. A bigger chunk of demand is likely to come from the private domestic market."

Businesses also need to be aware that the opportunities come with major risk, according to a recent report by investment management group PGIM entitled, *A Silver*

Elderly residents play Chinese chess at a senior care home in Jinzhou, northern China

Lining: The Investment Implications of an Ageing World.

"While there is a nascent and growing private-sector senior housing market, it may take some time for this demographic opportunity to translate into a viable investment opportunity," the report warns.

"This is due both to cultural expectations that elder care will be provided primarily by adult children and relatives, and to the legal and political risks that the government may make sweeping policy changes that could hamper a newly forming market."

Companies in other areas of the health care sector are likely to encounter less friction as the country's demand for care skyrockets. China's health care spending will hit $890 billion in 2018, Chinese professional services firm Daxue Consulting estimates. By 2030, the Chinese government predicts that this figure will reach $2.3 trillion. Health technology companies that help patients manage chronic diseases from home are likely to find the best opportunities, according to Peter Hubbell, CEO of agency BoomAgers.

"Think of all the smart technology opportunities for assisting the living of people of age," he says. "It's no longer a beeper for if grandma falls over; these are sophisticated technologies, smartphone-based apps, which can remind you to do just about anything, or give warnings when critical functions aren't done."

British companies are already helping China build a Sino-UK Health Big Data Park in Guiyang, a city in southwest China, to roll out digital health tech solutions. They are also bringing the technology to a local senior care "village," which houses 170,000 people.

Maturing Markets

The changes taking place in society are also creating new opportunities in a range of consumer markets as older Chinese loosen their purse strings, explains Hubbell.

"Because of filial piety in China, you had youths caring for adults for years and years, and those adults preserved their wealth and passed it along to the children," he says. "But now, you are seeing older people in China with a propensity to spend their money on themselves, rather than saving it for the next generation."

Older people already account for 8% of total spending on products and services in China, a market worth $680 billion, according to a government report published in September. And where previous generations of older people in China were poor, in the future senior citizens will have much more disposable cash. Standard Chartered forecasts that total consumption by the 65+ will increase to $2.8 trillion by 2030.

So far, most businesses have failed to appreciate the economic potential of older consumers, says Florian Kohlbacher, Director of the Economist Corporate Network in North Asia and a specialist in population aging in China.

"When you look at the figures, it should be a no-brainer to be in this market and be targeting senior consumers," says Kohlbacher. "But demographic change and aging populations are quite complicated. There are a lot of factors to consider as well as it being a slow process. Not many companies plan for 2050."

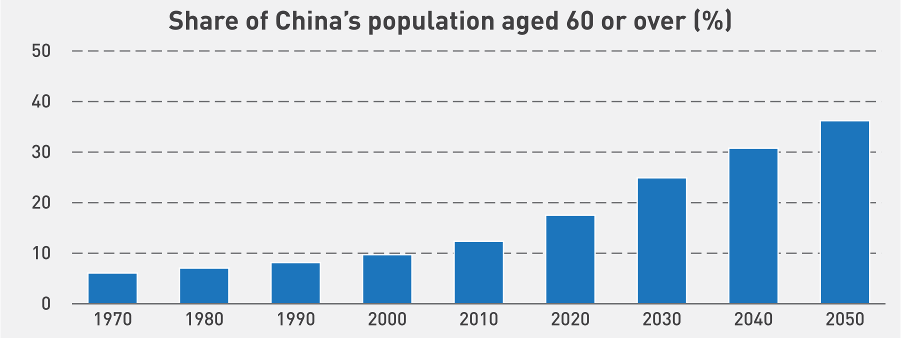
But to glimpse what China's future may look like, head to IKEA in downtown Shanghai. The Swedish furniture retailer has carved out a large social space in the middle of its cavernous shop floor, which has become a gathering place for hundreds of local seniors. Alina Ma, an analyst at market research firm Mintel, explains that retailers could learn a huge amount from how IKEA has optimized its stores for older customers.

"Friendly salespeople and guides are necessary because many seniors view shopping as a social activity," says Ma. "They also prefer stores with simple layouts, labels with a simple design and bigger fonts, close proximity to their homes, products specifically catering to older consumers and in-store dining options."

Another early mover is Reebok, which made headlines last year when it appointed 80-year-old actor Wang Deshun as its brand ambassador in China. According to the sports giant, Wang only got into sport in his 60s and is an example that people are never too old to pursue their goals.

A Maturing Market

The number of elderly Chinese consumers is growing rapidly



Source: Statista

And as more sixtysomethings like Wang Jianmei acquire fancy new smartphones, China's e-commerce giants are beginning to target older shoppers. Alibaba has released a new channel on Taobao that caters to senior users and their families, including a peer-to-peer chat function that allows family members to share products and consult each other.

There are around 30 million users of Taobao aged over 50, and 20% of these are 60+, according to Alibaba. But the next generation of retirees will be far more tech-savvy. In its 2016 Consumer Barometer report, Google found that while just 51% of over-55s in China owned a smartphone, 86% of Chinese consumers aged 45-54 used smartphones for mobile commerce.

"The new older generations will be very different from the ones before," says Kohlbacher. "They will still be consuming and they grew up using smartphones, so they'll still be using them when they are older."

> **When you look at the figures, it should be a no-brainer to be in this market and targeting senior consumers**
>
> Florian Kohlbacher
> Director, North Asia
> Economist Corporate Network

Migratory Birds

There is already a clear generational change taking place among China's elderly. Today's over-60s often have much more money than 20 years ago due to rising income levels. Many are also sitting on property that has skyrocketed in value.

These wealthier pensioners have markedly different attitudes and lifestyles to their peers. According to Mintel's research, over 40% of Chinese seniors say they want to make efforts to limit the effects of aging, whereas traditionally aging was considered a natural process. This group is also more likely to be well-educated, technologically-savvy and willing to spend money on entertaining themselves.

"This group is happy to learn new things, rather than being scared," says Ma. "Elderly care to them is more individual and involves fun, entertainment and self-development."

Many youthful retirees are embracing opportunities they missed in the past by learning a new skill. China has around 60,000 elderly education institutions with more than 7 million students, according to the China Association of Universities for the Aged, offering elderly citizens everything from Latin dance classes to literature seminars.

They are also eager to discover new places. According to Mintel, 28% of Chinese between 55 and 74 want to travel in the next year. Online travel company Ctrip is betting on silver tourism in a big way. The company estimates the current value of the senior travel market at more than RMB 100 billion ($15.6 billion), growing in value by approximately 30% each year.

The firm has formed 33 product service lines that focus on senior travelers, including special itineraries for "China aunties": modern women aged over 45 who enjoy traveling in a group but put priority on quality travel.

"We have developed specialized services to meet the needs of elderly consumers, including restaurants, hotel locations and itineraries," says Zhang Qi, Director of Travel for Beijing, Tianjin and Hebei at Ctrip. "Ctrip has also standardized our services to sell travel to older consumers, and in the future, there will be special after-sales services for the elderly to resolve any anxieties before they travel."

Ctrip has found that tours for older Chinese people must allow time for shopping and taking photos, provide hot water and Wi-Fi when traveling, and the chance to try local delicacies. Their research also suggests that more travelers over 45 are female, and so the company offers targeted deals around Mother's Day.

Cruise companies have also been successful at targeting older age groups in China. Mintel found 61% of 40-49-year-olds have been on a domestic cruise line, and 42% on an overseas cruise line.

Eighty-year-old actor Wang Deshun fronts a campaign for Reebok

Many well-off retirees—especially those from colder northern provinces—are choosing to move and spend winters somewhere warmer. The most popular destination is the subtropical island of Hainan, which has been dubbed "China's Florida" due to the massive number of elderly "migratory birds" that flock there each year. More than a million migrants arrive in Hainan every winter, according to the Hainan Provincial Committee, a high percentage of whom are seniors from the Northeast.

Local Hainanese often resent the strain this huge influx puts on public services, but others have been quick to cash in. Total spending by older people in Hainan last year reached $2.2 billion, according to the state-run Xinhua News Agency. Pharmacies have learned to stock up on medicine commonly needed by older people, while local real estate companies are building special "senior-citizen apartments."

> To today's seniors, elderly care is more individual and involves fun, entertainment and self-development
>
> Alina Ma
> Market Analyst
> Mintel

A Silver Future

As China continues to age, opportunities in China's "silver economy" for foreign companies will grow. According to Standard Chartered's *Ageing: Passing the Baton to Asia* report, the elderly consumers of tomorrow—the generation aged between 35 and 54—are "open to Western brands, strongly invest in their only child and are more educated than their predecessors."

But businesses will need to pay attention to their customers to take advantage of these opportunities, predicts Zhang from Ctrip. "The older age group is very complicated and cannot be generalized," says Zhang. "As China's population ages, there will be a richness of targeted products, services and quality."

For many brands, this kind of focus on older consumers does not come naturally, according to Kohlbacher. "Planning for an aging population always gets put off to a later date," he says. "Most executives just can't make sense of it, so they keep deferring on the opportunity."

But those who overcome this mind-set will benefit. In the US, retirees already spend more than the much-targeted millennial generation. It will only be a matter of time before the same is true in China.

China's Third Revolution

Elizabeth Economy, CV Starr Senior Fellow and Director for Asia Studies at the Council on Foreign Relations, explains how Xi Jinping's presidency is transforming China

By Dominic Morgan

The era of Deng Xiaoping is over in China. We are now living in a new historical epoch: the era of Xi Jinping. That is the message of *The Third Revolution*, the new book by renowned China scholar Dr. Elizabeth Economy.

This view is far from controversial within China; in fact, it is official party doctrine. But the fact that an academic of Dr. Economy's standing is calling time on Dengism is significant. Over her career, she has proven a remarkably clear-sighted forecaster of where China is heading, most notably in her 2004 book *The River Runs Black*, which highlighted the enormous cost of China's economic degradation years before the government was willing fully to face up to it.

In this interview, she explains why China analysts need to develop a new understanding of China's development trajectory for the Xi era.

Q: The Third Revolution argues that Xi Jinping's presidency represents a clear break from the eras of Mao Zedong and Deng Xiaoping. Why did China's leaders consider a third revolution to be necessary when Xi became president in 2013?

A: In part, there was a sense after the Hu [Jintao] and Wen [Jiabao] decade [2003-2012] that there was the need to shake things up a bit. For some, that period had become a "lost decade," despite the fact that there had been significant economic achievements. There was a sense that China had failed to capitalize on all its economic achievements.

In addition, there was an effort to rectify all the imbalances that had emerged over the 30 years of go-go economic growth under Deng Xiaoping. You had growing inequality, dramatically increasing levels of pollution, an increasingly noisy civil society and, of course, endemic corruption. This was not only corruption at the highest level that spread throughout the party, but also everyday corruption that really affected people's lives. And so, I think there was a sense of rot setting in at the core of the country even as it appeared to be rising globally.

Q: You call the Chinese leadership's new policy direction "reform without opening-up." Could you unpack what you mean by that term?

A: The Deng era became known for its collective decision making; its opening-up in terms of beginning to open the Chinese economy to market forces; the blossoming of China's civil society; and its welcoming of outside influences, including both foreign capital and foreign ideas.

Xi Jinping has largely upended that process. His approach is a return to a single leader-led state, limiting foreign influences in the country—for example, by introducing a law on the management of foreign non-governmental organizations.

You also have *Made in China 2025*, which constricts the ability of foreign actors to compete with Chinese companies on a level playing field in a number of cutting-edge technology areas. Moreover, there is a drumbeat of warnings from media and other sources about "hostile foreign forces" that are committed to containing the rise of China.

In addition, there is a much greater penetration of the party into Chinese society and the economy. Under Xi Jinping, you can see this through the social credit system, the reluctance to diminish the role of state-owned enterprises (SOEs), as well as the enhanced role of party committees, not only within SOEs but also within private enterprises and joint ventures. So, in essence, it's a 180-degree reversal of the Deng-era reforms.

Q: China's top leaders have been calling for a new wave of opening-up, particularly in industries like finance, in recent weeks. Do you expect these calls to lead to significant reforms?

A: It's difficult to tell what the impact of any single step may be in terms of opening the Chinese economy to a greater foreign role. What we've seen in the past is that even when China does permit a new step, such as allowing foreign credit rating agencies to come into the country, the government will often put in place restrictions that then make it difficult for those companies to do their jobs. For example, the agencies will have to adopt Chinese standards, which means they won't be rating the companies in the same fashion as they would outside China.

So, my concern is how are regulations implemented and what is the pace of the implementation. We have heard for many years about significant opening in the financial sector and about increased intellectual property rights protections, but we have failed to see much real change.

Q: Xi came to power promising significant economic reform, and many in the West interpreted that as meaning market reform. Was that a misjudgment?

A: If you look at the documents that came out after the Third Plenum of the 18th Party Congress [2013], which was the moment

> **In 2012, I think there was a sense of rot setting in at the core of the country even as China appeared to be rising globally**

Xi Jinping set out his economic reform agenda, you find that while there were a number of statements that referred to an enhanced role for the market—making the market a "decisive" force—there were also an equal number that highlighted the continuation of the commanding role of the state in the Chinese economy.

I think there were two things happening. First, there is a group of Chinese reformers that want to move forward on more aggressive economic reform, and they used the Third Plenum as an opportunity to advance a number of these ideas. And in the West in particular, there was a lot of excitement and enthusiasm, not only because of what people saw in the documents, but also because they know a lot of these Chinese economic reformers personally and believed that they had the upper hand in the process.

But there was a misreading in the sense that people simply ignored the other half of the document, the element that stressed the continuing role for the state in the economy. And they also underestimated the degree to which Xi Jinping wants to control the levers of political and economic development in the country.

There may also have been an evolution in the thinking of Xi Jinping, perhaps due to the stock market crash [in 2015], that caused him to rethink his commitment to economic reform. Certainly, there's been no sign from Xi Jinping himself that he is an aggressive economic reformer. He appears to believe that he needs to be able to direct the Chinese economy and doesn't want the economy to be at the mercy of the market.

Q: Some analysts argue that the anti-corruption campaign is in part aimed at unpicking entrenched vested interests to allow the central government to force through reforms that pare back the power of the state sector. What is your view on this?

A: I see no evidence that that is the case. I think the "vested interests" claim is at this point a tired argument. Xi Jinping has been in power

> China has the strategic vision to push through when countries that are driven by market forces will often fall short

for five years. He has managed transformational change on a number of fronts. The anti-corruption effort has effectively punished a number of very senior officials—economic and political—and I think it's been systematic and targeted.

So, at this point there's no reason to say that his design is to pare back the state sector. He's had all of the tools at his disposal, and if Xi wants to get something done, he gets it done. So, regarding "vested interests," I think he's pushed back and continues to push back on corruption, but that doesn't mean that there's going to be a paring back of the state sector.

Q: Xi has said that he wants China's top SOEs to become "better, stronger and bigger." What are the implications of that policy?

A: Both on the domestic front and in terms of foreign policy, there is unlikely to be a big change in the role of SOEs in the economy during Xi's tenure. He wants the SOEs at home because they're important for employment, and he can roll them forward or backward depending on the needs of the party.

In the international sphere, of course, the SOEs are essential to the Belt and Road Initiative. They offer China an enormous advantage in terms of doing business abroad, because they can be—not 100%, but to a large extent—instructed to undertake projects that are not going to be money-makers but have a broader strategic purpose. Very few other countries have that capability.

Q: There is an ongoing debate about whether China can fit into the liberal global order in its current form due to its economic system. Where do you stand on this issue?

A: I think China doesn't fit into the liberal global order because it is not a liberal state. It doesn't have a market economy; it doesn't have a democratic political system; and it's increasingly trying to use its growing power to shape international norms in ways that benefit its values and priorities. It's not surprising, because China is a big power now. It is the world's second-largest economy, the largest trading country, and has the world's largest standing army.

But this doesn't mean that China is trying to upend every element of the international system. There are areas where China can largely work within and take advantage of international norms where they largely suit China's interests. For example, that's how it's been playing it in the Arctic. It's important to understand that in different parts of global governance China behaves differently, and it's just a matter of whether the norms serve China's interests or not.

Q: You argue that Western countries will need to introduce protective policies, such as trade tariffs and investment restrictions, in response to China's rise. Why is that?

A: I say that we need to try to work with China and that there are still other opportunities to engage with China. But in terms of pushing back and adopting policies regarding reciprocity, which traditionally the US has not wanted to do because we believed it's lose-lose, I think we've arrived at a point where China is simply too large economically and politically to allow illiberal practices to expand and exert greater influence globally, because it undermines those same principles by which much of the rest of world is operating. You have to push back.

The hope in pushing back is that to some extent the pushback will empower liberal reformers in China, because if you're denying China access to the advantages it wants to have inside the system, it may force a rethink within China about the way it does business. Without that kind of pushback, why would China rethink the way it does business when it's getting all the advantages of the system and paying little of the price?

Q: You state in the book that the large role the state plays in promoting innovation in China produces a number of side effects. Could you explain your thinking on this?

A: I try to distinguish between innovation and invention. China's very good at innovation, but not so good at invention. And one of the reasons that it struggles more with invention has to do with a lack of the soft infrastructure needed, such as the educational system and access to global reservoirs of knowledge. There's also the priority placed on the number of papers published or political considerations when selecting people for promotion. You end up with a lot of excess capacity and it's harder to distinguish the great ideas from the good or even the poor.

On the other hand, China has the strategic vision to push through when countries that are driven by market forces will often fall short or stop. While you end up with top quality through the ruthless competition that comes from the market, the ability of China to sustain and persevere brings its own type of rewards. In the electric vehicle market (see page 53), for example, China now boasts the largest market and the largest manufacturing capacity. The point I make at the end of the innovation chapter is that the US may have Tesla, but China is going to have everything else. And China will have its own Tesla, its own top-quality brand; it might just take it longer to get there.

Charging Ahead

Will the economy of the future be powered by Chinese batteries?

By Matthew Fulco

Image by Jose Luna

China is determined to become a world leader in lithium batteries and electric cars. And Beijing believes it has found the key to dominating these strategic industries: gaining control of global lithium supplies

Chile's Atacama Desert is one of the most inhospitable places on earth. Situated 2,300 meters above sea level and encircled by mountains, the region receives almost no rainfall and the blinding sun singes exposed human skin within minutes.

But this year, this remote desert is the center of a struggle for control of one of the world's paramount emerging industries. Forty meters below the salt flats that cover large swathes of the surface lie our planet's largest and purest reserves of the chemical element lithium.

Lithium, the lightest of all metals, has the best electrochemical potential. This makes it perfect for rechargeable batteries, a technology that powers our smartphones and is expected to become even more crucial in the future.

"Lithium-ion batteries underpin the fourth industrial revolution," says Simon Moores, Managing Director of London-based resources industry research firm Benchmark Minerals Intelligence. "They are the key to breaking the world's addiction to oil and unlocking not only electric vehicles, but renewable energy through energy storage."

Demand for lithium is rising faster than for any commodity over the past century, according to analysts at investment firm Morningstar. Total global sales in 2015 totaled 175,000 tons, but by 2025 demand could reach 775,000 tons, Morningstar forecasts.

Supply is already struggling to keep up with skyrocketing demand, and the average price of lithium has more than doubled over the past two years. Leading technology companies—including Apple, BMW, SoftBank and Tesla—are scrambling to lock up deals with suppliers of lithium and other battery raw materials to insulate themselves from a future supply crunch. Tesla has even signed a deal with Australian mining firm Kidman Resources, which will not begin producing battery-grade lithium until at least 2021.

But the most aggressive movers have been Chinese companies. Between 2016 and mid-2017, Chinese buyers accounted for three-quarters of the lithium deals signed globally, according to S&P Global Market Intelligence.

China has the second-largest lithium reserves in the world, but most of the deposits are expensive to extract due to their low quality and location in high-altitude, remote regions. Chinese companies have therefore been snapping up higher-quality lithium resources, especially in Australia and Argentina, home to the world's third- and fourth-largest reserves.

Now, Sichuan Province-based resources firm Tianqi Lithium is attempting to gain control of the Atacama's reserves, which make up around 27% of global lithium resources. Tianqi is bidding to acquire a 25.9% stake in the Atacama mine owned by Sociedad Quimica y Minera (SQM), Chile's largest lithium producer, for around $4.3 billion. The offer represents a 22% premium above market value, according to Reuters.

If the Tianqi-SQM deal goes through, the two companies would control nearly half the world's lithium supply. Many analysts see the Tianqi-SQM deal as part of a Chinese strategy to control the global supply chain for lithium batteries. The market will be worth $93 billion by 2025, according to forecasts by research firm Grand View Research.

China also sees dominating the battery industry as crucial to its ambition to become a world-leading producer of electric vehicles (EVs). *Made in China 2025*, a Chinese government plan to transform China into an advanced manufacturing powerhouse, describes electric vehicles as a key strategic industry.

Tianqi's offer has been accepted by SQM but could still be blocked by Chilean regulators due to fears the two companies would gain excessive power over the global lithium market. Santiago's antitrust authority has until August to decide whether to probe the deal further.

But China is putting maximum pressure on Chile not to proceed with that investigation. Xu Bin, China's ambassador to Chile, warned in April that a decision to block Tianqi's investment would "leave negative influences on the development of economic and commercial relations

The Salar de Atacama in Chile contains the world's largest and purest lithium reserves

between both countries."

China's anxiety to seal the deal is understandable. If current trends in the lithium market continue, the Chinese—who have nailed down access to the best and cheapest raw materials—could enjoy a significant competitive advantage in the battery and electric car industries. Yet, China's multibillion-dollar bet on lithium could turn out to be a costly mistake.

Playing the Long Game

Beijing's strategy of buying up raw materials for lithium batteries dates back to the aftermath of the global financial crisis of 2008, analysts say. The key resources it has focused on are lithium and cobalt, another metal that is used in the cathode (positive side) of a battery.

China's economic planners saw that lithium batteries were becoming ever more important due to the increasing popularity of smartphones, electric vehicles and the transition to renewable energy. They set out to make China a dominant player in that industry.

But to do that, Beijing recognized that it would first need to gain control of upstream industries. The only way to make high-quality electric vehicle batteries affordable is to manufacture them at huge scale—as Tesla is doing through its Gigafactories. Making batteries at this scale requires access to vast amounts of lithium and cobalt.

"Dominance over the global lithium-ion battery supply chain would insulate China's battery makers against a potential supply crunch and boost their influence over pricing," risk consultancy Verisk Maplecroft said in a March note.

In pursuit of that goal, China has gradually invested in and taken control of cobalt deposits in the Democratic Republic of the Congo (DRC), where 65% of the world's cobalt is mined, and built up a formidable refining capacity. China produced roughly 58% of the world's refined cobalt last year, according to metals firm Darton Commodities.

"Now, the intentions are clear," says Benchmark Minerals Intelligence's Moore. "The foresight was incredible."

Meanwhile, Chinese lithium chemical companies have been taking stakes in exploration stage lithium producers, according to Moore. Major deals have included Tianqi's 2012 takeover of Australia's Talison Lithium, then operator of the world's largest lithium ore mine, for $815 million, and Ganfeng Lithium's acquisition of a 43% stake in the Marion lithium project in Western Australia in 2015.

China has also taken control of the intermediate stages of the lithium battery supply chain. The country now produces 75% of the world's electrolyte, 75% of its anode materials, 63% of its cathode materials and 45% of its separators, according to website *Clean Technica*.

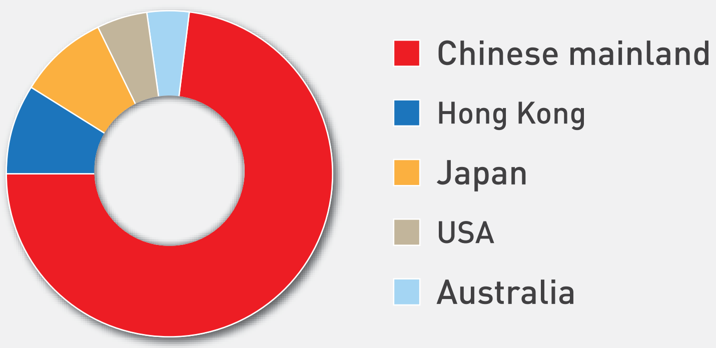
These foundations have helped China build out new battery making capacity at vast scale. Four years ago, there was only one lithium battery megafactory—a facility able to produce more than 1 Gigawatt hours of cells per year—under construction in the world: the Tesla Gigafactory in the US. Now, there are 40 worldwide, and over 50%

> **Chinese battery makers believe that controlling lithium supplies will give them a stronger competitive advantage**
>
> Global auto company executive

Buying Spree

China is aggressively buying up lithium ore resources

Lithium ore resources acquired in volume terms by country, 2016-H1 2017



Source: S&P Global Market Intelligence

of this new capacity is located in China.

"China needs the lithium: they are building EV and lithium-ion battery infrastructure on a scale that has never been seen before," Moores says. "It is very much about supply over price and the long-term thinking is putting Western companies to shame."

Panasonic was the world's top EV battery producer in 2017, followed by China's BYD and South Korea's LG Chemicals and Samsung. But Chinese upstarts like CATL, fresh from a $1 billion initial public offering, are emerging as formidable players. As the Chinese players expand production at breakneck speed, overseas rivals are struggling to keep up, according to Moores.

"Established Japanese and Korean producers will still have a competitive edge in terms of quality in the near term," he says. "But China will undoubtedly have leading companies at each level of the supply chain. For Japanese and Korean firms, it is about expanding while remaining competitive in terms of quality and cost."

But this could be a challenge for the Japanese and Koreans if they struggle to access lithium at reasonable prices.

Demand Debate

China's attempts to control the global lithium market raises geopolitical questions. If the road to lithium access one day passes through Beijing, could China use its near-monopoly as a weapon by denying foreign companies access to resources?

In the past, China has been accused of doing that with rare earths, the chemical elements used to make electronic devices. Beijing controls 85-95% of global production of rare earths, analysts estimate.

Lithium is so abundant that it would be extremely difficult for China to acquire a market share approaching 85%, according to Benchmark Minerals' Moores. "China can become the world's biggest buyers of the raw materials but there will be much competition from elsewhere as well," he says.

But if China establishes a lower level of dominance, it could still hand Chinese battery makers an advantage, according to an Asia-based global auto company executive, speaking on condition of anonymity. "Chinese battery makers believe that controlling lithium supplies will reduce EV battery costs [by allowing them to determine prices], and give them a stronger competitive advantage," says the executive.

Tianqi's SQM investment could give the company significant power to set prices due to the Atacama's massive reserves. SQM recently received approval to expand production, meaning that its output could more than treble to reach 165,000 tons by 2021, according to a forecast by Chinese finance firm Changjiang Securities. That is not far off the current total global lithium supply.

And if the lithium supply continues to tighten, the greater the strategic advantage in having access to the resources produced by SQM, currently the world's lowest-cost lithium producer thanks to the purity of the Atacama brine.

The likelihood of a future lithium supply crunch is a subject of fierce debate among analysts. As noted, supply is struggling to meet demand, helping producers like Tianqi post massive profits. Yet lithium is far from a rare commodity. Lithium reserves outstrip annual production by 400 to one, according to data compiled by Bernstein Research. This makes the metal four times more abundant than cobalt and copper, whose reserves exceed production by a factor of 100.

A recent *Wall Street Journal* op-ed argued that China would never be able to control the lithium market because other countries could simply keep opening more mines. The writer suggests that even just in Europe, new mines could open in Germany, Portugal, Sweden, the Czech Republic and the UK.

Analysts at Morgan Stanley have forecast a 45% drop in lithium prices by 2021 due to the potential for massive increases in supply. But this forecast has been sharply criticized by others for both overestimating the potential for new supply and underestimating the likely rise in demand.

"I am firmly of the view that everyone, including Morgan Stanley, is grossly underestimating how quickly the market is moving on the demand side," Ken Brinsden, CEO of Australia's Pilbara Minerals, told *Reuters* in February.

"The mistake the mining analysts make is they think it's like iron ore and other bulk commodities where you dig a big hole in the ground," Duncan Goodwin, Head of Global Resources at Barings, told the *Financial Times*. "We can raise capital to bring on new supply but it's going to be very, very difficult because of the nature of the product, which is very difficult to mine and process."

Driving Electrification

China has a lot riding on this, especially considering the scale of investment it has made into electric vehicles and charging infrastructure. Beijing has handed out billions of dollars in subsidies to electric car companies over the past decade in a bid to become a world leader in the nascent industry.

A desire to reduce air pollution and carbon emissions is partly behind this embrace of EVs, but the primary driver is technological. The transition to electric offers China a unique opportunity to become a globally competitive auto manufacturing power. Most Chinese auto brands—with the exceptions of BYD, Geely and Great Wall—still lag behind foreign competitors, despite having had access to foreign technology via joint ventures for decades.

"Chinese automakers, especially state-owned companies, have been slow to develop solid brands and technology," the auto executive says. "The powertrain [engine and driveline] of gasoline vehicles is holding them back: it's the most difficult part to develop."

In contrast, an electric induction motor is much simpler. "It produces direct rotational motion and uniform power output, is smaller and lighter, and doesn't need a complicated transmission to connect it to the drive wheels," notes Evannex, a seller of Tesla accessories, on its website.

"The Chinese believe they can quickly master the technology involved in an electric motor and leapfrog ahead in the global EV industry," says the auto executive.

Whether Chinese EV brands like BYD and Nio (see page 53) will be able to supplant traditional auto giants is uncertain, but Beijing's control of lithium could provide an advantage. The battery typically accounts for one-third of the cost of an electric vehicle, which means any savings in this area will provide a cost advantage.

If it establishes control over cobalt, lithium and nickel supplies, Beijing may achieve an ideal cost structure for the manufacture of entire electric vehicles, says Lu from TrendForce. "This will make the companies more competitive in the export of new-energy vehicles in the future," he says.

Ford Chairman William Ford agrees. Speaking in Shanghai last December, he said: "It's clearly the case that China will lead the world in EV development."

If these predictions are right, the rewards for China will be enormous. Around 1.2 million EVs were sold globally in 2017, and that figure is expected to reach 10.8 million in 2026, according to a January forecast by BIS Research.

Fork in the Road

However, there is one wild card that could disrupt Beijing's plans: the possibility of the widespread adoption of vehicles powered by hydrogen fuel cells instead of lithium-ion batteries.

Fuel-cell vehicles are superior to battery-electric vehicles (BEVs) in many ways. Whereas most BEVs only travel around 150 kilometers before needing to be recharged—a process that often takes hours—a fuel-cell vehicle can travel more than double that distance and be charged in under five minutes. As a result, fuel-cell vehicles are also eco-friendlier than BEVs.

"Fuel-cell vehicles take us out of the range anxiety problem, making them ideal for inter-city travel," says Asad Mahmoud, an assistant professor of energy materials at South Korea's Dongguk University.

At present, cost is the main bottleneck to wider adoption of fuel-cell vehicles. Toyota, one of the main proponents of fuel cells in autos, has sold just 4,000 of its Mirai vehicles since 2014. A Mirai retails for $52,500 in the US, compared to $30,000-$35,000 for a Tesla Model 3 or General Motors' Chevy Bolt, *Forbes* noted in a December report.

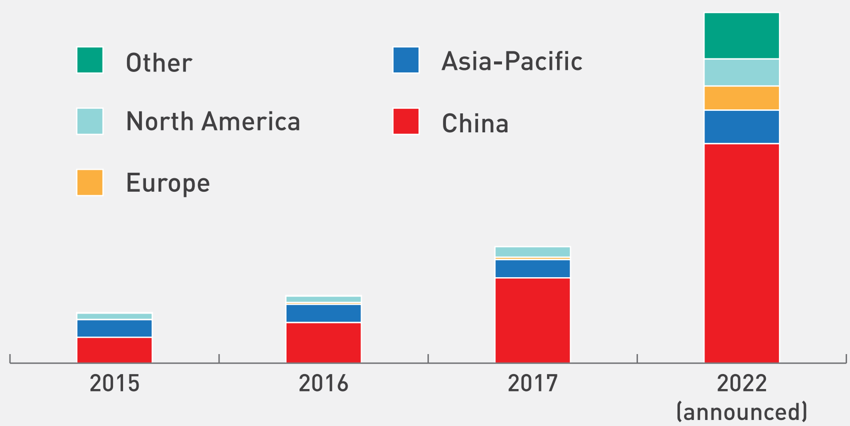
If the cost of fuel-cell vehicles could be brought to parity with BEVs, the former could be a better replacement for the internal combustion engine, Mahmoud claims. "The driving experience with a fuel-cell vehicle is more like what people are used to with petrol cars," he says.

Given the level of investment that has already gone into electric vehicles, a turn to fuel cells still looks a long shot at this stage. But if there were such a move, China would find that it had spent a decade subsidizing the auto equivalent of Betamax. "It would be a major setback," says the auto executive.

Battery Build-up

Chinese battery makers have big expansion plans

Electric vehicle and energy storage lithium-ion battery production capacity by region



Source: International Energy Agency

Touchdown in China

Richard Young, Managing Director of NFL China, is trying to hook China on America's favorite pastime

By Alex Wilson

Americans are fond of saying that football is their true religion, but until recently it was little more than a source of mystery to the rest of the world. When the NFL held its first overseas game, in London in 1983, the organizers found that there were no regulation goalposts or scoreboards in the entire UK. The players even had to arrive at Wembley in their uniforms because the stadium's changing rooms were too small to accommodate an American football team.

Trying to take the game to China, therefore, sounds at first like a hopeless endeavor. But times are changing. London now hosts four regular-season NFL games per year to sellout crowds and American football is one of the fastest-growing sports in the country. And Richard Young, Managing Director of NFL China, thinks that similar growth could soon be taking place in China. Here, he shares with *CKGSB Knowledge* how his team of NFL missionaries is working to spread the gospel of football across the Middle Kingdom.

Q: How big is the NFL in China right now?

A: Right now, we have over 30 million fans across China. Most of them are located in the major urban areas. And this has grown over 1,500% over the past four years. We have a long-term media deal with Tencent and we air our games on Tencent's online platforms. We average over 1.5 million viewers of the live games each week, with over 10 million video on-demand views each week. The Super Bowl alone had over 172 million video views and over the season we had well over 330 million views of NFL content. We believe we are now one of the most rapidly-growing sports in China's urban areas.

Q: What type of people make up your fan base in China and what attracts them to football?

A: The fan base in China is very different to in the US, where football is popular across all demographics. In China, we're growing more rapidly among young, urban, internet-savvy "cultural explorers." These are people who are essentially looking for the best quality no matter what the product. They know their sports quite well and generally are fans of many different sports. But they come to the NFL due to what we call the consistent return on your investment of your free time. Every game is compelling.

When I was a student in Beijing in 1990, I remember taking a Chinese student out for a cup of coffee one day. He was polite and drank it down, but afterward he essentially told me that not only will Chinese people not like this drink, it was almost as if we're physiologically different, and therefore Chinese people are never going to drink coffee.

Now, do I believe that coffee is going to overtake tea in terms of mass consumption in China? No, I don't. But a company like Starbucks can have a good business here because they understand they have a very good product. Similarly, is the NFL going to overtake soccer in China? I don't believe that's on the near horizon. But does it have a very good opportunity for business in China? That's what drives us: we believe we have a high-quality product and we understand the consumer and their journey.

Q: Soccer and basketball benefit from the fact that huge numbers of Chinese people play the games at a grassroots level. Is that also starting to happen with football in China?

A: Absolutely, there are now over 64 adult teams throughout China. There's quite a wide range in level of play, but there was nothing six years ago. There are also two university leagues and we've been running a flag football league for the past eight seasons that has well over 300 teams.

In fact, youth training for American football must be one of the most rapidly-growing businesses in sport right now in China. There are currently more than 30,000 kids under the age of 12 taking part in youth football training on a regular basis and our research suggests that this number will hit 120,000 before 2020.

Many Chinese parents are finding that if you can only push your kid into one sport—many of these kids are very time-pressured—American football offers the most comprehensive benefits. The key in football is that everybody has to do their job. Someone has to throw the ball that you catch; someone has to catch the ball that you throw. And then, after every play, what do you do? You huddle up and discuss what you're going to do next. Many times, through this, the children become leaders; they acquire the ability to collaborate.

Q: When did the NFL first come to China?

A: The Super Bowl had been aired on a tape-delayed basis in China as far back as the 1980s, and there was some promotion in the early 2000s via agencies primarily focused on getting games on television. Since 2010, we have broadened our efforts to include on-the-ground events such as the NFL Experience events that were festivals of NFL with games, training and fun; player visits—we've had everyone from Barry Sanders to Joe Montana, Peyton Manning and Tom Brady; and we have an NFL Truck that goes around to various cities and gives people a taste of the NFL.

We have also built a strong social media presence and continued to develop with the rapid rise of digital media.

> **Fan loyalty in China, at this time, is more set in sand than in concrete. You have that exploration of new sports**

Q: How does promoting the NFL in China differ to promoting it in other markets, such as Europe?

A: First, there is no other comparable code to American football in China. If you're in a country that has a physical sport like rugby, you'll understand elements of our game: how over time a team may wear out—not tire out but wear out—their opponents by a style of play. The lack of understanding of that in China makes the barrier to entry more difficult beyond just the complexity of the game.

The other thing that is most pronounced—and this is something that is changing, but still exists—is that sports in China have traditionally been linked to national pride and winning glory for the country. And we don't have that: we don't have country-versus-country. So, that is another challenge to overcome.

There are also some opportunities. Yes, we've been successful in the UK, but a lot of people there are more difficult to fully convert to a new sport. If you're a fan of Arsenal, it's quite possible that your grandfather was a fan of Arsenal. In China, on the other hand, if you see a 50-year-old guy wearing a LA Lakers hat it's more likely that he discovered them through his son. Fan loyalty in China, at this time, is more set in sand than in concrete. You have that exploration of new sports, which presents an opening for us.

> The next great development in sports in China is going to be the domestic leagues

Q: How is football being adapted to the Chinese context as it grows in popularity here?

A: The way people consume our games is drastically different to how they're consumed in the US. If you think about American football in the US, what pops into people's minds is beer, guacamole and chips, and people over at your house to watch the game. Well, our games are aired in China on Monday mornings, Tuesday mornings and Friday mornings. So, most people watch by themselves on their way to work and they communicate and connect digitally.

Now, I believe that there will be a professional football league in China in the near future, and that's going to change everything. Unless you have athletes that look like you and talk like you play a sport, it's very difficult to say, 'that's a sport I'm truly into.' When you get a strong domestic league, it's no longer just an American import. That's the next step in the evolution that'll happen here in China.

Q: What has been the key to growing the audience for NFL in China?

A: The key is media, getting the exposure and giving people the availability to watch it. The explosion of digital media has helped that. If you look at things from a broader perspective, 10 years ago you had one nationwide sports channel in China for 1.4 billion people. The television was telling you what to watch.

If you take another entertainment example, in the US when we had three TV channels—ABC, NBC and CBS—we all thought that *Three Is Company* was really great television. But now, you have *Game of Thrones, The Wire, Breaking Bad* and all these other great shows because competition raises your game. You have to continually improve your product.

And that's what's happening in sports. If you're a sports fan now, you can watch all different kinds of sport. That evolution will continue, there's no question, and we like a competitive environment because we believe we have a great sport product.

Q: In Europe, the Super Bowl gets huge media coverage even in countries where the NFL is not a popular sport. To what extent is that the case in China?

A: For the Super Bowl, we get 10-15 times the normal level of coverage in China. We're getting well over 10 million people watching. Of course, it also has something to do with the entertainment, such as the halftime show, but mainly they understand it is a "can't miss" global sporting event.

When we take the Super Bowl trophy around China, it's very interesting. We have to carry it around in our hand luggage, and every time it goes through the scanner the security guard at the airport will say, "that's the Super Bowl trophy." It's pretty amazing to see the recognition as that would not have happened just five years ago.

Q: The NFL has been planning to hold regular-season games in China for many years, but so far this has not happened. Is there any news on that front?

A: When we do, we want to make sure that we do it right, and that it's part of a larger long-term strategy of building the game in China. Do we believe that we could hold a game now and have a full stadium? Absolutely, but we want to do it at a time when it will help the domestic growth of the sport of American football in China. That's the key.

It's also logistically difficult. Teams only have eight home games each season. So, one team is going to have to give up one-eighth of their home season, and the fans in the US are obviously going to have their thoughts on that. Another issue is that teams are very large in football: nearly 200 players, coaches, trainers and personnel would be coming over. And each game is important in the NFL, so everything has to be exactly right.

Then there are the stadiums. You've got to have a fun, high-quality experience. You can't just have a plastic seat that hasn't been wiped down and bad concessions where it's just a bottle of water and a tin of chips on offer. That's not the NFL. So, we want to make sure that the environment there is at a level that you can experience what the NFL is really like.

Q: What are the NFL's main goals for developing the game in China over the next few years?

A: We believe very strongly in the hand-in-hand development of the media landscape alongside domestic sports. The next great development in sports in China is going to be the domestic leagues. And it's a priority of the Chinese government.

When it comes to being able to build a really solid structure for sports leagues in which all teams make money, our model has been very successful. Domestic sports are going to rise here, and we believe that the NFL can play a positive role in developing the sports business landscape in China.

BACK TO THE FUTURE

Is China pumping the brakes on its transition to a services-based economy?

By James Lord

Image by Lisa Ye

China's labor market is transforming as automation leads to factory layoffs and workers find new jobs in the growing services sector. But this transition is not taking place quite as smoothly as some make out

There is a standard narrative about China's labor market. Wages are rising rapidly as migrant workers become scarcer and manufacturers, losing their competitive advantage, are turning to automation to save costs. This is driving massive factory layoffs with displaced workers finding employment in China's fast-growing services sector.

This version of a large-scale transition of the labor force from industry to services is constantly repeated by economists, government leaders and state media combing through official data releases.

"There have been continuous announcements and plans released about cuts and shifting workers to new industries," Shehzad Qazi, Managing Director of research firm China Beige Book International, tells *CKGSB Knowledge*. "Beijing keeps releasing these headline-grabbing announcements with big numbers."

It's a simple story, and it makes sense. But is it true? Not completely and certainly not yet.

Beijing is definitely sincere in its support for automation. The government has set an ambitious target of tripling the number of industrial robots per 10,000 workers deployed in the manufacturing sector to 150 by 2020. This would bring China in line with developed economies, which Beijing hopes will allow it to maintain its status as the "world's factory."

The pressure on manufacturers from rising labor costs is also genuine. Wages increased 6.8% in 2017 alone. The average factory worker in China now makes more than their counterparts in almost every Latin American country.

Many local authorities and large employers in China are also doing their best to promote automation and reduce production costs. Dongguan, a southern manufacturing hub, launched its bluntly titled "Replace Workers with Robots" campaign four years ago. Terry Gou, CEO of manufacturing giant Foxconn, has set his company the target of deploying more robots than its 1 million human workers in the near future.

But the reality is more complex than the headlines make it appear. While it is true that some manufacturers are embracing automation, many are reluctant to invest in expensive equipment. And though the workforce is shifting from industry to services, this transition is taking place much more slowly than many believe.

Pressing Pause

There is no doubt that some rebalancing of China's labor market is happening. Employment data from the National Bureau of Statistics show a steady shift from secondary to tertiary industries in the years up to 2016, the last year for which figures are available.

China Beige Book, which collects its own independent economic data, has also noted this trend. "Hiring has been more widespread in services than in manufacturing since 2015," the company told *CKGSB Knowledge*.

But the rebalancing does not appear to be the result of the services sector absorbing workers that have been laid off by manufacturers. In fact, China Beige Book has not noticed a trend toward layoffs among manufacturers at all.

"We haven't picked up any large-scale slowdown in manufacturing hiring growth," says Qazi. "As a matter of fact, manufacturing hiring growth remains far above the levels seen two years ago."

The reason for this is partly a cyclical upturn in the global economy since the start of 2017, which has benefited Chinese exporters. But it is also due to an intentional decision by the government to stimulate the economy, especially during the run-up to the 19th Party Congress last October. "Manufacturers were being allowed to access credit at a cheaper rate," explains Qazi.

According to China Beige Book, hiring rates in manufacturing continued to accelerate throughout 2017 even as growth in the services sector fluctuated. "This raises serious questions about how much of this uptick was market-driven," the company added.

These trends suggest two things about the current labor market. First, it is manufacturing, not services, that has been driving employment in recent months. And second, the government lacks confidence in the services sector's ability to do so.

"There is definitely a reluctance to move away from the old growth model as rapidly as China probably needs to," agrees Qazi.

A Slow Revolution

In this kind of policy environment, manufacturers have little incentive to invest in expensive new machinery. And there are signs that other factors are holding back Beijing's automation drive too.

The headline figures suggest that China is making progress on automation. The country has already become the world's largest purchaser of industrial robots. By 2020, China is predicted to spend $60 billion annually on robots, accounting for half of all spending in Asia-Pacific, according to researchers International Data Corp.

Several local governments have followed Dongguan's lead by launching policies to help manufacturers automate production, including Kunshan in eastern China and Shunde in the south, according to Jenny Chan, an assistant professor at Hong Kong Polytechnic University (HKPU) whose research focuses on China's labor market. But these cities are still a minority.

What's more, some initial champions of automation appear to be losing enthusiasm. Dongguan was the first city to offer subsidies to manufacturers purchasing industrial robots. Its location in the Pearl River Delta, one of the wealthiest regions in China, meant that it felt the impact of rising wages earlier than other cities.

But after years of loudly promoting its pro-robotics incentives, the city seems to have quietly dropped the campaign. "The new mayor of Dongguan never mentions the automation policy," says Lin Jiang, Professor of Economics at Sun Yat-sen University, which is located in Guangdong—the traditional hub for export-led production.

It is not clear how successful Dongguan's pro-automation policies have been. The city's population, which is overwhelmingly made up of workers who have migrated from rural areas, has fallen from 12 million to 8 million in the past four years. But it is impossible to know how many workers left directly as a result of the campaign. Chan's research suggests that around 87,000 workers in the city were replaced by robots between 2014 and 2016, but the Dongguan government has never published its own data on this.

In reality, most workers probably left because their companies relocated to the interior, where wages are lower. For many manufacturers, particularly in industries where margins are tight, moving inland is more attractive than automating.

"For lower-end products, factories may prefer to use a lower-tech production style to save costs," explains Lin. "Despite the fact that China's labor costs are six times higher than 10 years ago, workers are often still cheaper than robots."

Even Foxconn, which has trumpeted its automation ambitions more loudly than anyone else, has taken this option. The company's workers used to be concentrated in coastal provinces like Zhejiang and Guangdong, where Dongguan is located, but in recent years it has opened enormous

Employees work on a production line at an electrical appliances factory in Jiujiang, eastern China, in March

> Some factory owners are cautious about their future in Guangdong, or even China as a whole
>
> Lin Jiang
> Professor of Economics
> Sun Yat-sen University

new facilities in interior cities, including Zhengzhou, the capital of Henan, a province in central China, and Hengyang, the second largest city of Hunan Province.

This does not mean that Foxconn has completely abandoned attempts to move to high-tech manufacturing. The company made headlines in 2016 when it announced that it had replaced 60,000 workers at its plant in Kunshan with robots. But its overall business in China is still heavily dependent on massive numbers of human workers, according to Chan.

"The changes have turned out to be much slower than what Terry Gou, the CEO, must have been hoping for," says Chan.

This was underlined in June when workers' rights group China Labor Watch published an expose on conditions at Foxconn's factory in Hengyang, one of the company's newer facilities, which produces electronic devices for Amazon. According to the report, large numbers of workers are still used on production lines, where they carry out repetitive tasks such as scrubbing speaker systems with toothbrushes.

Finding Cheaper Humans

Many manufacturers are also choosing not to invest in automation because they are able to reduce costs by using alternative labor sources. According to Chan, there is a risk that students in particular may become an enormous reserve labor force. "There is a government target that by 2020 we will have 50% of young people in vocational schools: that is 23.5 million people," says Chan.

Beijing is promoting vocational education because policymakers see it as an important tool for providing people with the skills they will need to thrive in the new economy. But in practice students are often being used as a way of propping up the old economy.

"Some leaders of companies in industries with tight margins don't see things in a long-term way," says Chan. "They just use student interns in 12-hour shifts on the assembly line."

Vocational students are particularly vulnerable to exploitation because they have to complete a mandatory six-month work placement to graduate. Foxconn was among the companies found to be using thousands of student interns on production lines by a *Financial Times* investigation in 2017. Chan believes that the use of student labor may partly explain the recent fall in the company's workforce, although she adds that Foxconn usually only uses students during peak times for production, like the run-up to the launch of the iPhone X last year.

The company has also been accused of reducing costs by hiring large numbers of staff on temporary contracts from agencies. These workers, often called dispatch workers, have fewer protections and entitlements than full-time employees. According to China Labor Watch, up to 40% of staff at Foxconn's Hengyang plant were dispatch workers, far above the permitted level of 10%.

Beijing is trying to stamp out the use of students and dispatch workers as auxiliary labor, but local governments often feel pressure to look the other way because they worry employers will move to markets with cheaper labor, such as Southeast Asia.

Phony War

Beijing is probably right that automation offers the only sustainable, long-term way for manufacturers to cut costs without offshoring production. But Lin worries that macroeconomic conditions mean that the government will continue to struggle to convince companies to make the required investment.

"It depends how confident the factory owners are looking into the future," says Lin. "Some owners are cautious about their future in Guangdong, or even China as a whole."

According to Lin, manufacturers in Guangdong are particularly concerned about the potential impact of a trade war between China and the US. If trade tensions continue to rise, the government may feel even greater pressure to pump money into the economy to support manufacturers, further reducing companies' incentives to invest long-term.

"The reality is that if the economy were to take a hit, domestic consumption is not strong enough to supplant the reliance on exports and manufacturing," says Qazi. "As a matter of fact, they may be forced to rely more on the traditional, older sectors of the economy."

Automation is sure to play an important role in China's economic future. The World Bank estimates that up to 77% of jobs in the Chinese economy could be made redundant by machines in the long term. Investing in robots will also become more attractive as labor costs continue to rise.

But replacing humans with machines does not look to be a short-term solution to the erosion of Chinese competitiveness in certain industries. The timeframe for this transition will be decades, not years.

ON TESLA'S TAIL

Chinese auto startup Nio is targeting pole position in the luxury electric car market

By Allen Young

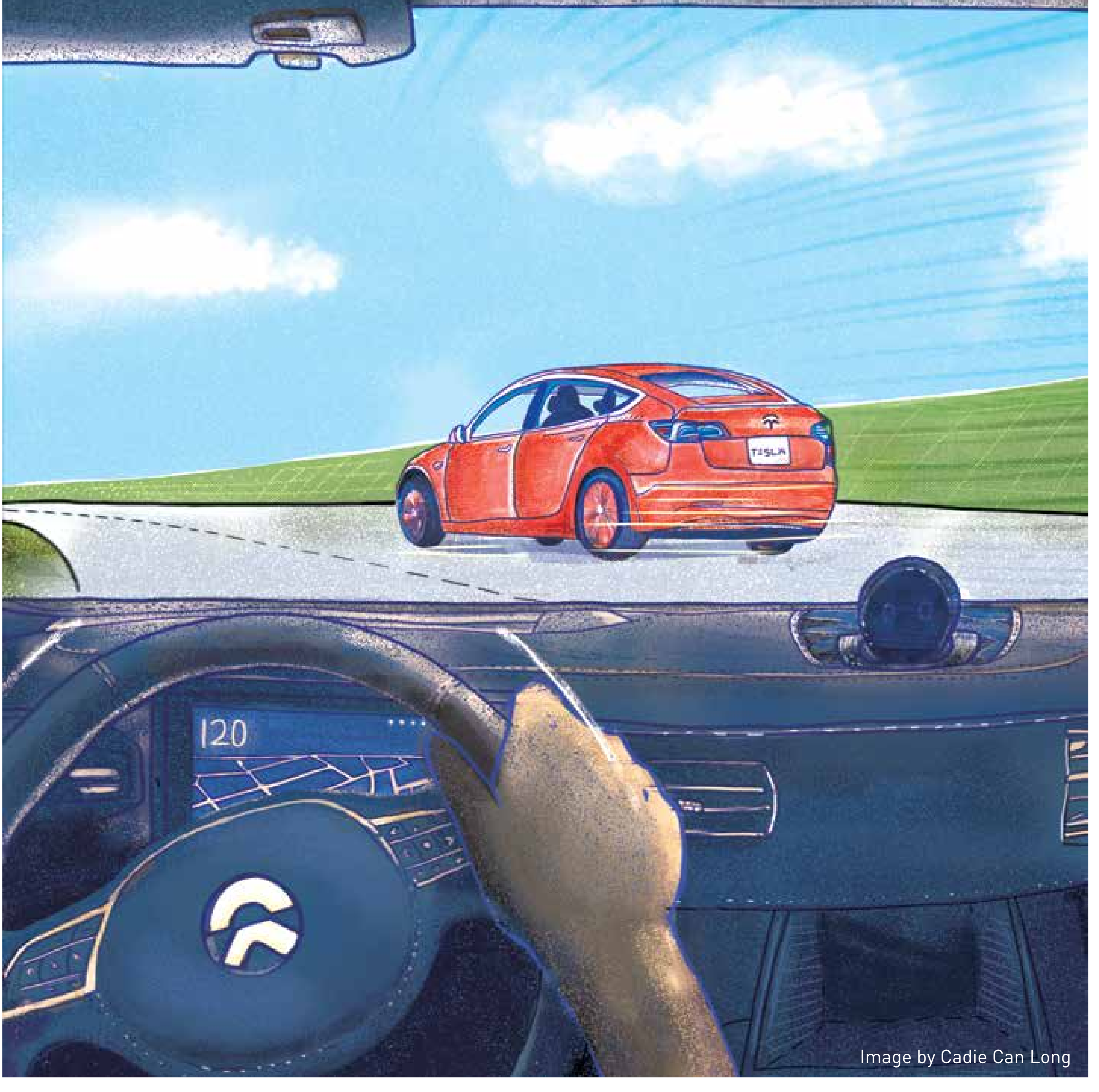


Image by Cadie Can Long

Chinese auto startup Nio has its sights set on one goal: supplanting Tesla as the world's top luxury electric car brand. Can the Shanghai-based upstarts give Elon Musk's company a run for their money?

William Li, Founder and Chairman of Chinese electric car startup Nio, is not afraid of using the "T" word: "Tesla is a company founded in the era of the internet, while Nio was born in the era of mobile internet," the young entrepreneur told the *South China Morning Post* during the launch of his company's first mass-produced road car, the ES8, last December.

That comment was no accident: Nio wants to go toe-to-toe with Tesla for dominance of the luxury electric vehicle (EV) market. The Chinese company is trying to create the same glitzy perception as its California-based rival. Like Tesla, it is targeting high-end consumers and like Tesla, its cars offer sleek, space-age designs. It also has a flair for marketing stunts: in Nio's case, setting the fastest lap ever recorded by an electric car at Germany's Nürburgring.

But Nio is offering cutting-edge technology at jaw-dropping prices. At RMB 448,000 ($70,000), the ES8 will cost only around half as much as a Tesla Model X does in China. This has led many commentators to dub Nio's new SUV the "Tesla killer."

The company also has an even more wildly ambitious vision for its future than Musk has for Tesla. Jack Cheng, one of Nio's co-founders, tells *CKGSB Knowledge* that the Chinese brand aims to transform the entire auto industry by injecting it with the startup spirit of Silicon Valley or, more to the point, of China's own startup capital, Shenzhen.

"I find that most people in our industry—the traditional, conventional carmakers—are in their comfort zone," says Cheng. "At Nio, we've set a vision that we can clean up the air. We can create a platform to provide a new lifestyle in mobility and safety."

Creating a green future and a new lifestyle sound like marketing platitudes, but Nio takes them extremely seriously. At the company's showroom in Shanghai's Taikoo Hui shopping mall, visitors marvel at the EVE concept car, a fully autonomous vehicle with a living room-like interior. Above, a banner proclaims, "Blue Sky Coming."

The EVE is not likely to be seen on the road any time soon, but anyone dismissing Li's ideas as a pipe dream should think twice. Nio is flush with cash from dozens of heavyweight backers and is one of only a small handful of companies testing self-driving cars on China's streets. It plans to begin selling cars in the United States and Europe within three years. In short, Nio looks poised to become a major player in the electric car market.

Early Lead

Nio's disruptive ambitions are the product of its founders. The three men are Li, a serial tech entrepreneur who previously created the online auto portal Bitauto; Xiang Li, the founder of rival web hub Autohome; and Cheng. Unlike his partners, Cheng is an auto industry insider with over two decades' experience in senior roles at Ford and Fiat-Chrysler. "I'm the car guy," he laughs.

Cheng provides the industry know-how and experience with production to balance out the blue-sky thinking of his younger co-founders. But he insists that he shares their vision of creating a new kind of car company.

"I'd like to leave a platform for the next generation, including the vision that William has," says Cheng. "It's a great opportunity for me to restructure myself, so I can keep up with the young guys."

The three founders set up NextEV, as Nio was originally called, in 2014, just as China's electric vehicle market was gaining momentum. The market enjoys strong support from the government, which offers generous subsidies and easier registration procedures to encourage drivers to go electric.

Last year, 777,000 electric vehicles were sold in China, up 53% year-on-year, and growth appears to be accelerating further in 2018. Around 2.7% of China's total vehicle sales are now EVs, and China drives well over half of global EV sales.

But Nio faces fierce competition in China's electric car market. There were 174 new energy vehicles showcased at the Beijing Auto Show this spring, with 124 of these made by Chinese companies.

For the moment, Cheng isn't worried

about established Chinese players like BYD and Beijing Electric. "We've looked into the other segments and we found that most of the EVs in China are on the lower end," he says. "We're not competing with them. We're competing with Audi, with BMW."

The Nio EP9 set the fastest lap ever recorded by an electric car at Germany's Nürburgring

Nio could be competing against these global brands sooner rather than later, as the government plans to impose strict quotas on all auto companies mandating that 10% of their vehicle sales must be electric by 2019. The policy has triggered a scramble among industry heavyweights, including Ford and Nissan, to tie up joint ventures to roll out electric cars. More than 200 firms have plans to launch new battery and hybrid electric vehicles in China, according to *Financial Times* reports.

If Nio is going to deal with the challenge from foreign players, it first needs to establish a clear lead over a clutch of other local EV upstarts, including Xpeng, WM, Byton and Singulato. According to Alysha Webb, a longtime EV market analyst and Managing Partner at equity research firm Cross Pacific Partners, Nio appears well-placed to do so.

"One thing they've got going for them is a head start," she says. "They've got their car out and they're selling it. And their backing is more diverse—they've got funds from some US venture capital firms."

Nio's list of backers is impressive, ranging from Chinese tech giants like Baidu, Tencent and Xiaomi, to global venture capital players Hillhouse, Sequoia and Temasek. According to Cheng, Li's connections give the company an advantage.

"Raising money for William is a way of life," he jokes. "He's good friends with Pony Ma of Tencent and Richard Liu of JD.com—with all those guys. When he ran Bitauto, he provided services to everybody."

Nio is also rumored to be launching an initial public offering (IPO) in the US as early as this year. According to *Bloomberg*, the company will seek to raise $2 billion at a valuation of $15 billion, though Cheng, unsurprisingly, refuses to comment.

Webb believes that if Nio follows through on these plans, it will be in a good position. "There are a lot of companies coming into the market, which could damage funding," she says. "I think Nio is right to be listing now because they'll face more competition later. The IPO will give them money to play with. I think they've done quite well."

Scott Laprise, founder of research firm Research from Beijing, also thinks that Nio is ahead of other Chinese players. "There are a lot of startups," he says. "But what makes Nio interesting to car people is that they set the world record at the Nürburgring. They beat everyone. You can't understand how amazing that is."

Thinking Different

Tesla and the other foreign players are still formidable opponents, especially in the premium segment Nio is targeting. And most foreign brands will also soon be more price-competitive due to the government's decision to lower tariffs on imported cars from 25% to 15%, though American imports will be hit by a 40% tax due to ongoing US-China tensions over trade. Tesla may be able to dodge these tariffs, as it confirmed a deal to set up a majority-owned Gigafactory in Shanghai in July.

But Nio believes that it will outflank its competitors by thinking outside the box. According to Izzy Zhu, Nio's Vice-head of User Development, the company's business model is closer to that of a tech company than that of Mercedes-Benz or Tesla.

"If you look at other companies in other industries—like Airbnb or Starbucks—they all think about user experience rather than the product itself," Zhu told *Business Insider* in a recent interview. "We believe the car itself is a user touchpoint, one of many touchpoints a company can have with its users."

In particular, Nio thinks that its battery subscription program will help customers avoid the frustration that often comes from owning an electric car. Allowing users to lease, rather than own, the car's battery knocks RMB 100,000 ($16,000) off the purchase price in return for a monthly fee of RMB 1,300. As an added benefit, participants can upgrade the battery when more efficient models become available.

Nio also plans to allow customers to switch batteries on the go, rather than waiting for hours for the car to recharge. The company says swap stations will be able to remove and replace the battery in just three minutes, making the process similar to refueling the tank in a conventional car.

"The battery swap will be a unique selling point to resolve the anxiety over the mileage," says Cheng. "You get the latest technology in batteries and energy, so the residual value of the platform stays high."

Rolling out this service is a challenge, but Nio is making progress. One station has been set up in Shenzhen, according to Cheng, and others are on the way.

Nio also hopes that its other main user "touchpoint"—its growing network of Nio Houses—can become a key differentiator for the company. These urban spaces are far more than customer support centers, they are social hubs where Nio owners can network, relax and play with their children.

"The lifestyle of blue sky, health, safety: all that goes into the Nio House, which is the face of the company," explains Cheng. "Nio is not just about high-tech, it's also about home. Nio House has a library, a conference room, a playground for the kids—the whole nine yards."

Such amenities may seem superfluous in the West, but in China they are an important part of car ownership. "If you look at luxury brands in China—BMW, Mercedes and so on—they organize events for their owners and have specialty items," explains Webb. "Nio's taken a page from the luxury brands' book. I think it's about making Nio the brand that Chinese millennials want to own to show how cool they are."

The company originally planned 12 centers, but quickly realized that demand was much wider than expected. According to Cheng, Nio is looking at opening 40 houses in cities across China. But before any innovative services come into play, Nio first needs to get its cars on the road.

Nio has launched just one model in China so far: the ES8, a seven-seat SUV, which was unveiled in December. Demand for the car has been robust. The company received more than 10,000 orders in the two weeks following the launch event.

Yet, six months on, the car is still hard to spot on the roads, even in Beijing and Shanghai. Laprise, who has already signed up to purchase an ES8, believes that Nio may be suffering from the same production issues that bedevil Tesla. "I have a license plate; I can buy a car tomorrow," he says. "I'm not seeing them on the streets and I'm supposedly on the list to buy one."

Cheng is adamant that his company can avoid Model 3-style delays. "Elon's problems started many years ago, because he couldn't find a supply chain near California," he says. "So, he had to outsource to remote areas. His parts are floating on the Pacific Ocean for 45 days. That's a handicap. I avoid that by putting 95% of my supply chain within a radius of 600 kilometers."

> Nio is not just about high-tech, it's also about home
>
> Jack Cheng
> Co-founder
> Nio

Mobile Future

Nio also has its sights set on the blue skies beyond China. The company already has a foot in Europe, with offices in London and Munich, and in the United States, with an office in San José. If Nio succeeds in expanding abroad, then Tesla may find that it "sells less" outside of China, too.

Looking further ahead, Nio's priority is turning its vision of vehicles as a "mobile living space" into reality. The race to develop self-driving cars is hotly contested, but Nio is holding its own. It was among the first two companies to receive a license to road-test autonomous vehicles in Shanghai in March.

Laprise thinks that the company is right to focus on concepts like the EVE. "The car currently is a way to get to a destination," he says. "In the future, the car will be the destination. The battle will be over the entertainment and other services."

According to Bill Russo, Managing Director of auto consultancy Gao Feng Advisory, this technological leap will totally transform the auto industry. "Nio and other automakers are on-ramps to the digital companies that have invested in them," he says. "Nio's engineering a networked vehicle, an internet-connected vehicle. And that means revenue streams outside the car."

Those revenue streams will not just come from in-car entertainment options, but also other services linked to Nio through investors, such as Tencent. These will include services that seem antithetical to car ownership—ride-sharing apps like Didi Chuxing, for example, in which Tencent also invests. In fact, many analysts believe that automation will cause car ownership to plummet. If robo-taxis are cheap and ubiquitous, why bother maintaining a private vehicle?

"More than four-hundred-and-fifty million people have downloaded and used the Didi app," Russo points out. "The addressable market size for mobility services is 10 times as big as the number of cars that are going to be sold."

How automation will affect driving and shopping habits is still an open question, but it is possible that individually-owned cars will play only a small role in the future of mobility. If this happens, Nio, with close ties to China's tech giants, is perhaps better placed to thrive than its US competitor.

"Tesla wants to sell electric cars to individuals. Nio wants to do that and also to put people into the digital ecosystem of Tencent," says Russo. "I'm bullish on China's path. The electrification and automation of transportation is going to be a revolution. When it happens, the rest of the world will be left scratching its head."

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CKGSB Business Sentiment Index

Optimism is on the Rise

The BSI is directed by Gan Jie, Professor of Finance at the Cheung Kong Graduate School of Business

The CKGSB Business Sentiment Index (BSI) rose above 50 for the first time in four years in our survey of China-based industrial firms for Q1 2018. This indicates that there are now more industrial firms expecting business to improve over the next six months than those predicting a contraction.

Key Findings

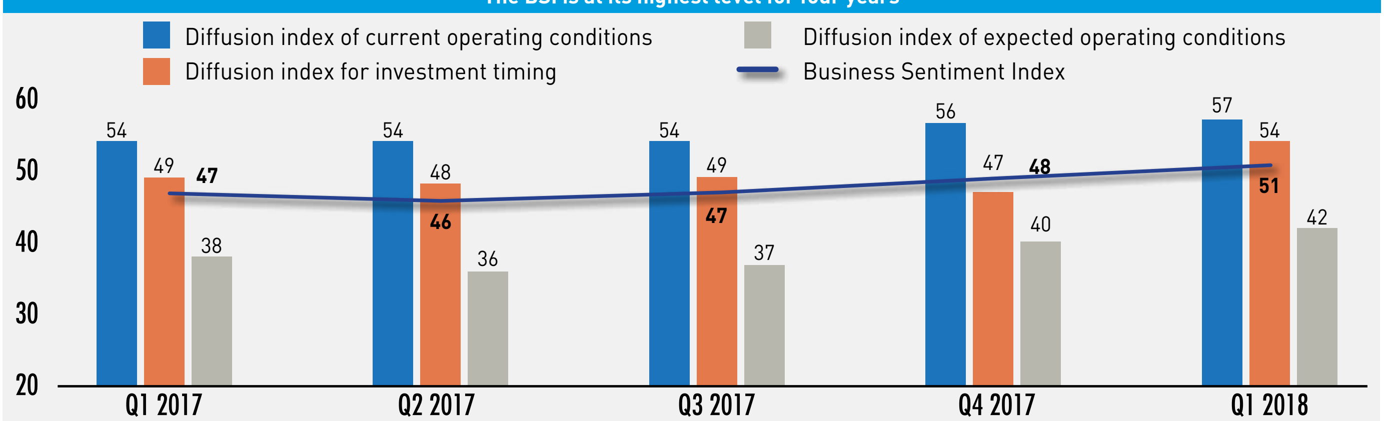
- The rise in confidence has been driven by state-owned and foreign companies, whose diffusion indices rose to 61 and 55, respectively. Sentiment among private firms, which make up the vast majority of industrial firms, remains flat at 50.
- Firms' improving sentiment is based on their optimism about the future, not their current operating conditions. Our respondents indicated that their electricity use, number of orders and production all contracted slightly during Q1, with the diffusion indices hovering between 47 and 49. These decreases cannot be attributed fully to the Lunar New Year holiday, since the firms do not normally report significant seasonal effects.
- Overcapacity and lack of demand remain by far the largest challenges affecting China's industrial economy, but the government appears to be slowly making progress on tackling these issues. In Q1, 33% of firms reported that their excess capacity was above 10%, compared to 36% the previous quarter.

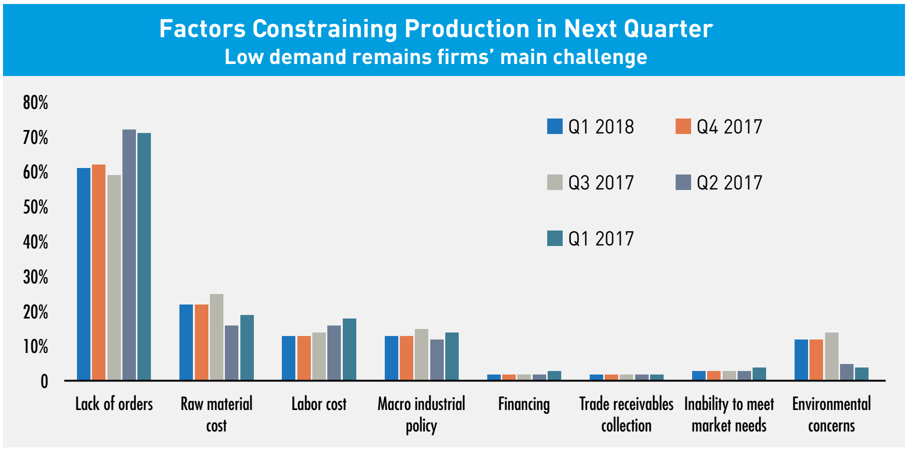
Analysis

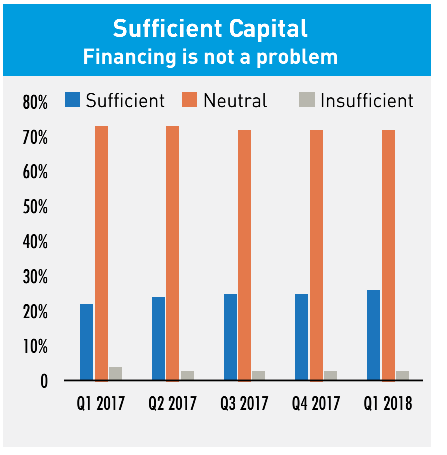
There are three main points worth picking out from our latest survey. The first is that overcapacity, though improving, remains near a historical high. In Q1, 17 out of the 38 industries included in our study had severe excess capacity, as well as 17 out of 31 provinces. Although this is a slight drop from the 19 industries and 23 industries affected by severe overcapacity in Q4 2017, the firms interviewed did not expect further improvements in the next quarter.

Because of this overcapacity, many firms have to curtail production. About 57% of companies reported having a capacity utilization rate above 90%, but 12% of

Business Sentiment Index
The BSI is at its highest level for four years







firms reported levels below 70%. For sake of comparison, the average capacity utilization rates in surveys of German and US industrial firms were 83% and 79%, respectively. The lowest levels ever recorded were after the financial crisis in 2008, when utilization rates in Germany and the US fell to 70% and 67%, respectively. Consistent with the overcapacity and lack of orders, firms were also still struggling to collect trade receivables from their customers in Q1. Just under 30% of firms reported being affected by this issue in Q1 2018, a similar level to the previous quarter.

The second point is that costs are still rising quickly for industrial firms, although the pace of growth has slowed down slightly compared to previous quarters. Just under 40% of firms reported unit cost increases in our Q1 survey, compared to 43% the previous quarter, and the diffusion index for unit costs remains far above the benchmark at 69. The increase in unit costs is mainly due to rising raw materials costs, whose diffusion index stood at 68 in our latest survey. Rising costs are also forcing firms to raise prices. The product prices index for Q1 was 54.

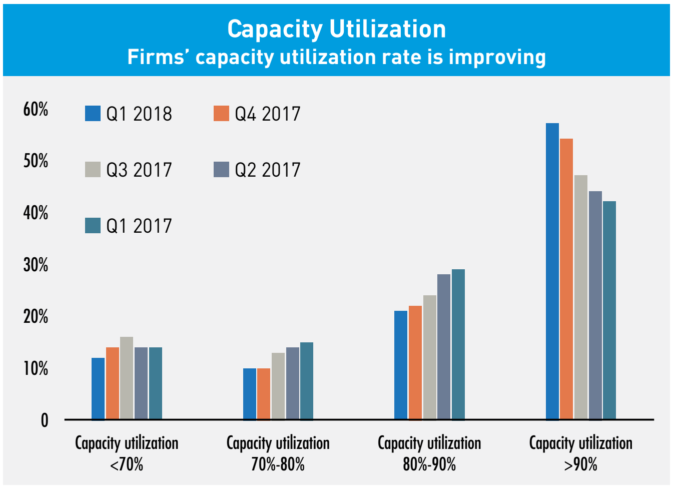
Finally, it is worth remarking that financing is not a bottleneck for China's industrial economy. Unlike SMEs, which often struggle to access financing in China, only 2% of industrial firms cited financing as a factor constraining their development.

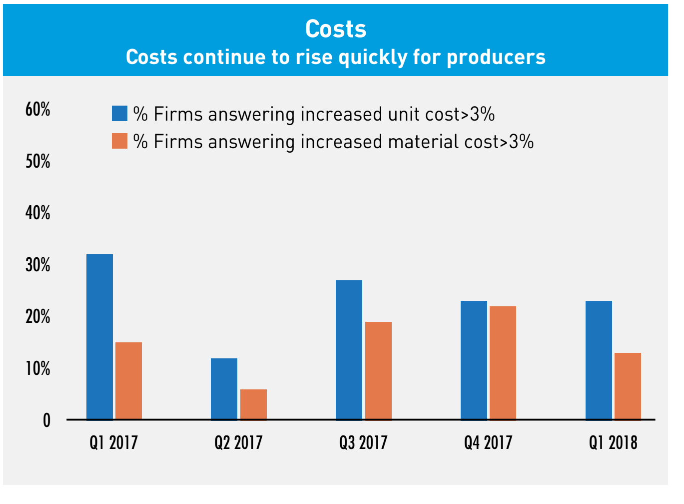
Conclusion

Overall, we remain positive about the prospects for China's industrial economy, given the Chinese government's firm commitment to economic development. Supply-side reform has made positive progress in solving the structural problems of China's industrial economy and should be continued. The industrial economy appears to be following a stable L-shaped long-term trend. The improvement over the past few months has been noticeable and appears sustainable.

What is the CKGSB BSI?

The Business Sentiment Index estimates the operating conditions in China's industrial economy. It is based on CKGSB's quarterly survey of around 2,000 industrial firms. The survey sample is weighted by industry, region and company size to fully reflect China's industrial economy.





CKGSB Business Conditions Index

Chinese Businesses Stay Positive

The BCI is directed by Li Wei, Professor of Economics at the Cheung Kong Graduate School of Business

The CKGSB Business Conditions Index (BCI) slipped slightly to 55.1 in May from 56.6 the previous month, but this score still remains comfortably higher than the baseline figure of 50. This indicates that small- and medium-sized enterprises in China are generally optimistic about their business prospects for the next six months.

Key Findings

- Firms reported feeling less confident than a month previously regarding sales and profits, but the scores remain high at 76.6 and 64.1, respectively
- Concerns remain over price inflation, as the consumer prices index and producer prices index both rose in May, to 67.9 and 58.3, respectively
- Costs for businesses are still rising fast, with the scores for labor costs and overall costs down just slightly month-on-month at 87.0 and 87.1, respectively

Analysis

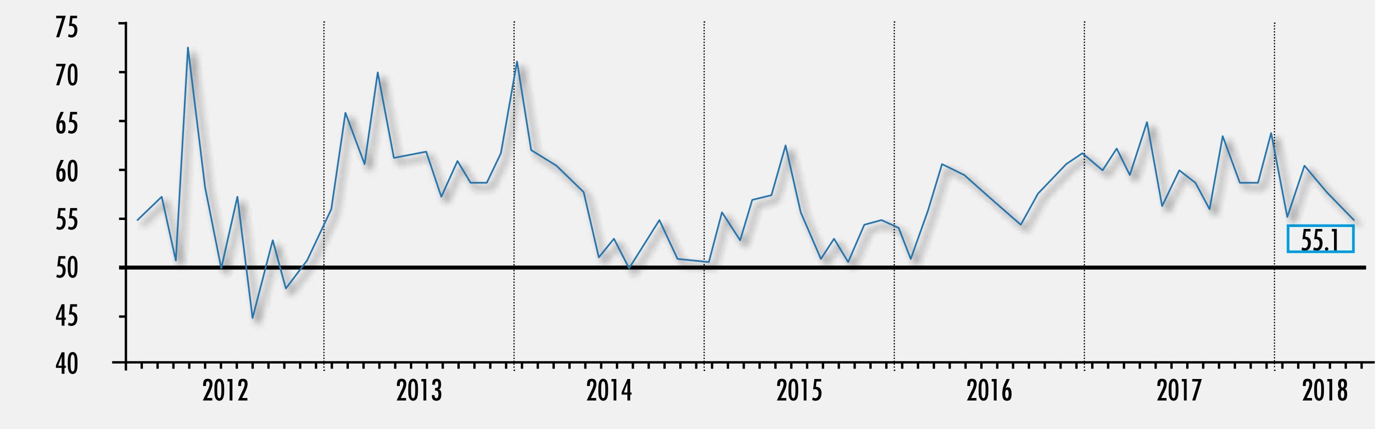
Of the four main sub-indexes we ask firms about in the BCI survey—corporate sales, profits, financing and inventory levels—two of the readings rose and two fell in May. The lower scores for profits and sales, which fell to 64.1 and 76.6 from 68.9 and 82.1 respectively, were balanced out by improved scores for financing and inventory, which rebounded from 34.6 and 41.9 to 38.0 and 47.0 respectively.

However, the score for financing in particular should concern analysts. This low reading shows that many firms are still struggling to access funds. As our BCI survey is skewed toward small- and medium-sized enterprises (SMEs) that are competitive in their industries, this suggests that even China's most efficient firms are finding it difficult to access the financing they need to fuel their growth. Combined with rapidly rising costs, this creates a very challenging set of circumstances for SMEs to deal with. It is also highly likely that lower performing firms will be experiencing even more difficulties than the companies taking part in our survey.

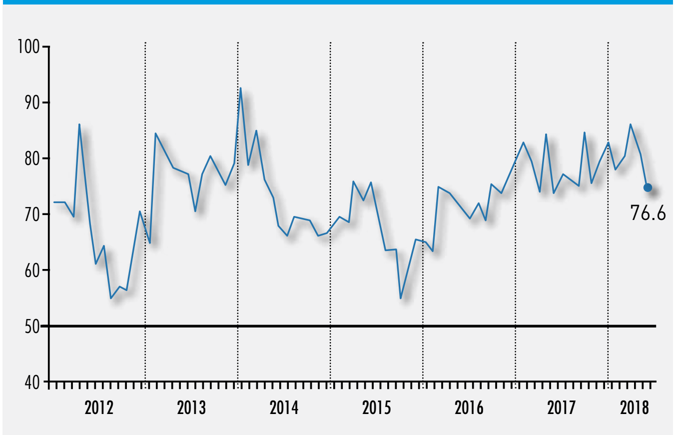
The readings for labor costs and overall costs stayed very high in May, at

CKGSB Business Conditions Index

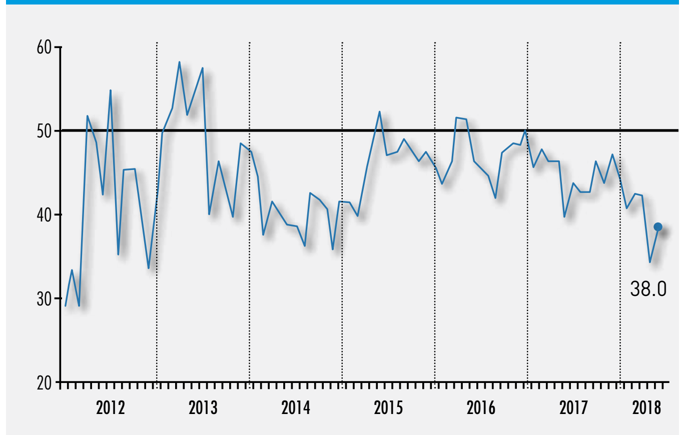
Chinese firms' confidence has fallen slightly



Corporate Sales Index
Confidence in corporate sales has dipped, but remains high



Corporate Financing Index
Chinese SMEs still struggle to access financing



87.0 and 87.1. These scores have come in far above the baseline in every survey we have conducted since 2011, no matter what the macroeconomic conditions are. Explaining this phenomenon is no easy task. We expect costs for businesses to continue rising in the short term at least. As for prices, in May the consumer prices index also rose from 66.2 to 67.9, while the producer prices index increased from 55.8 to 58.3.

Investment and recruitment are two more indexes that have stayed above 50 consistently over the years no matter the wider economic conditions. This is interesting because firms have responded with high readings for costs, investment and recruitment even as the scores for profits and inventory have fluctuated dramatically. The investment index for May was 70.3, while the recruitment index was 74.5.

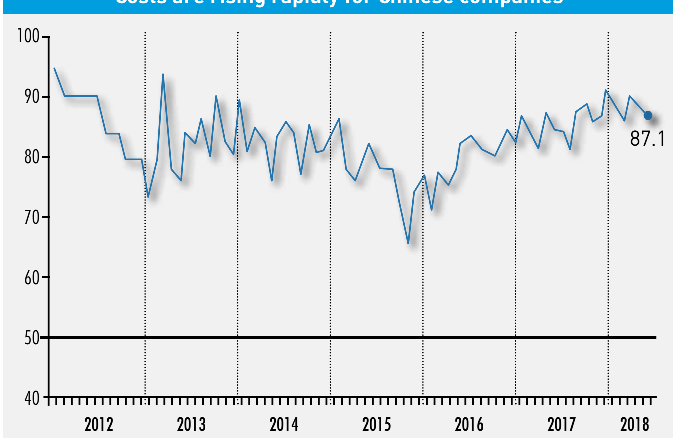
Conclusion

Overall, the May survey indicates that conditions in China's private sector remain relatively stable, though the picture does not look quite as rosy as in April. We recommend that policy makers focus their energies on fixing the structural issues in China's economy, particularly the lack of reform in the financial sector. We discuss this issue in more depth in "Fixing Chinese Finance" on page 6.

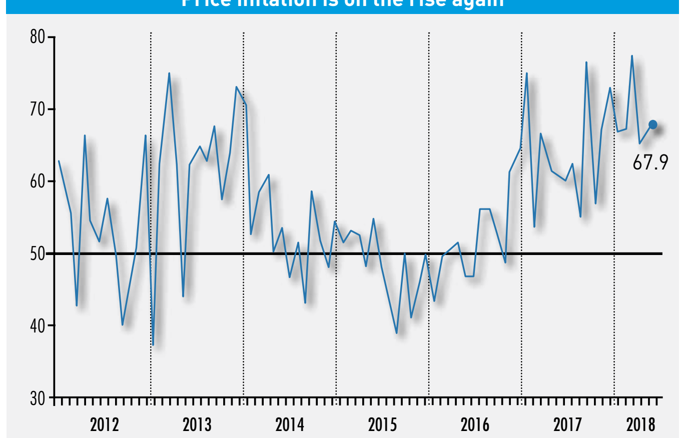
What is the CKGSB BCI?

The CKGSB BCI is a monthly survey of executives at consumer and industrial companies in China. The survey seeks to gauge how businesses expect a variety of indicators to change over the next six months: a score above 50 suggests that executives expect an index to rise, while a score below suggests that they are expecting a fall. The list of respondents consists mainly of executives run by alumni of CKGSB. These are mainly highly competitive small- and medium-sized private firms, meaning that the BCI is particularly strong at measuring sentiment among China's most efficient businesses.

Overall Costs Index
Costs are rising rapidly for Chinese companies



Consumer Prices Index
Price inflation is on the rise again



CKGSB BCI: Commentary

Why Do Chinese Companies Seek IPOs Overseas?

China needs to reform its stock exchange rules to make it easier for up-and-coming firms to go public, argues Professor Li Wei

A statue of a bull stands outside the Shenzhen stock exchange building

In May, the CKGSB Business Conditions Index (BCI) fell slightly from 56.6 to 55.1, remaining just above the confidence threshold of 50.

Some indices have not changed significantly month-on-month. The sales and profit indices fell somewhat and those for financing environment and inventory levels experienced a rebound. Costs remained at a high level and prices fell slightly. For more details, see the May BCI report in full (page 58).

In general, the BCI data does not show big changes, but some structural issues still stand out, including prospects for financing. First, let us look at the data. The corporate financing index registered 38.0, an improvement on April's 34.6, but still far below the confidence threshold of 50.

Our survey's respondents are mainly executives of CKGSB alumni companies, meaning their firms are mostly successful Chinese small and medium-sized enterprises (SMEs). They often find no place for their companies in China's financial markets, and have to deal with both financing difficulties and high costs. But what is interesting is that China is a country with a very high savings rate.

Figures from the World Bank from 2016 list 195 economies by their domestic savings-to-GDP ratios, and only six have higher saving rates than China, namely Macau (63%), Suriname (63%), Ireland (54%), Luxembourg (53%), Singapore (51%) and Qatar (51%). In current US dollar terms, the GDPs of these five economies in 2016 were respectively \$45.3 billion, \$3.3 billion, \$304.8 billion, \$58.6 billion, \$297 billion and \$152.5 million. When you consider the scale of China's economy (\$11,199.1 billion in 2016), these are all small economies.

Why does China have such a high savings rate? And why is corporate financing so hard to secure? What is particularly interesting is that most of the companies we survey are the most efficient in their sectors.

We believe the biggest funding problem facing private SMEs in China is the partial state of financial reforms, and the lack of financing channels for the most efficient players in the national economy. In this commentary, we will focus on where initial public offerings (IPO) reforms have got to today. The current laws and regulations force prospective A-share IPO companies to apply for approval, and go through what is essentially an authorization process.

While it is normal for a capital market to impose certain conditions on pre-IPO companies, the key lies in the details. For example, the Shanghai Stock Exchange stipulates that a company must have had net profits for the past three fiscal years, and have a total cumulative revenue of over RMB 30 million. A policy that requires companies to turn a profit before going public rides on the assumption that only profitable companies are good companies. Regulators might be doing this to provide investors with "good" investment targets, but their actions are often inconsistent with the logic of corporate development, and there are obvious side effects.

The idea is that companies meeting IPO standards should be mature companies with sound business models. They should have profitable and positive cash flows, despite the possibility that this limits their space to grow. It feels a bit like, "sunset is perfect, apart from being nearly nightfall." It may also encourage companies to act unscrupulously in a rush to list. It is not uncommon to see A-share listing companies doing everything to whitewash their performance to qualify for the Chinese stock market. Freshly-listed companies many look completely different from their pre-listing incarnations.

In contrast, new companies can be in a period of rapid development, either investing to seize market share, or putting all their energy into R&D to establish a competitive edge. Such companies often make less, spend more and have operational losses or negative cash flows. However, these companies have considerable room for growth and potentially high future profitability. A typical example of this is US-listed JD.com. From 2011 to 2017, JD.com was losing money every year, while its operating revenue grew rapidly. In 2011, it earned approximately $3.4 billion, and by 2017 it was earning a massive $55.5 billion. JD.com's rapid revenue growth earned it the recognition of the US capital markets, leading to a successful NASDAQ listing in 2014.

For many years, China's emerging companies, especially those in the internet sector, have relied on foreign capital. Both Alibaba and Tencent were nurtured by overseas venture capital, eventually listing abroad. These companies have become world-class giants today. On May 23, 2018, the market value of Alibaba was as much as $495.4 billion. Tencent's market value was $605.3 billion (same day exchange rate). To put this in comparison, global leader Apple was worth $919.1 billion.

Why do so many outstanding Chinese companies end up going public overseas? After all, they do most of their business in China. Chinese investors are undoubtedly more familiar with their operating models, and their valuations are generally higher than others in overseas capital markets. Why don't they list closer to home? One of the important reasons for this is that many overseas capital markets operate a registration system. As long as the information disclosed by prospective IPO companies is generally accurate, they can ultimately be qualified to list. Whether a company can finally go public depends on whether or not it can gather enough participatory investors. This means that IPO companies do not need to falsify data or whitewash their performance, as long as

> **If such a small thing cannot be changed, what about more substantial reforms, such as reform of the banking system?**

they can convince investors to accept their business model and can negotiate a decent IPO share price. We see significant numbers of loss-making Chinese companies listing overseas, even to the point of being highly sought after by investors.

In fact, we should also consider that listing is an expensive thing to do. It involves professional preparation by accountants, lawyers and securities companies, all of which costs money. If a company is already making good money, why would it pay such a lot to access funding from the market? Wouldn't it be better to use their own funds if they have them? From an operating point of view, it is precisely these "loss-making" companies that are in need of financing. From this point of view, A shares demonstrate a mismatch in resource allocation.

Finance is the beating heart of the modern economy. Its role in allocating funds to the most efficient sectors helps the economy develop better and faster. If those getting funding are not the most efficient companies, and the most efficient companies lack money, then China's capital markets are surely in need of reform.

Over the years, insightful commentators have appealed for China's capital markets to switch from an approval to a registration system. Unfortunately we are still waiting for this to happen. According to media reports, the original schedule was for the A-share market to begin a registration system on February 28, 2018. However, on February 23, the Chairman of the Securities and Futures Commission, Liu Shiyu, suggested that implementation of the relevant reform would be delayed for two years until February 2020. On February 29, the proposal was passed by the Standing Committee of the National People's Congress, which means that the registration system reform is no longer waiting just around the corner. In response, Wu Xiaoling, former deputy governor of the Central Bank and deputy chairman of the National People's Congress Financial and Economic Committee, expressed her regret and view that the implementation of the IPO registration system did not need to be delayed for another two years.

We fully agree with Ms. Wu's point of view. Everyone knows that China's financial system needs reform. However, where there are pockets of consensus, there will also be pockets of disagreement. The change from approval to registration in the IPO system is one of the issues with the highest levels of consensus. Since we want to raise economic efficiency, get more out with less input and improve the quality of economic development, why is there such hesitation over a fairly simple registration issue? If such a small thing cannot be changed, what about more substantial reforms, such as reform of the banking system? The journey of a thousand miles begins with a single step. We very much hope that China's decision-makers will accelerate reform of the IPO registration system, and at the very least not wait until 2020 to implement it. If they do, their commitment to its reform is just an empty phrase. The ultimate victims will be China's outstanding companies, Chinese investors and the Chinese economy.

Li Wei is Professor of Economics, Director of the Case Center and Director of the China Economy and Sustainable Development Center at CKGSB

Spreading Their Wings

China's big-spending millennials are turning the world of travel upside-down

By Lu-Hai Liang

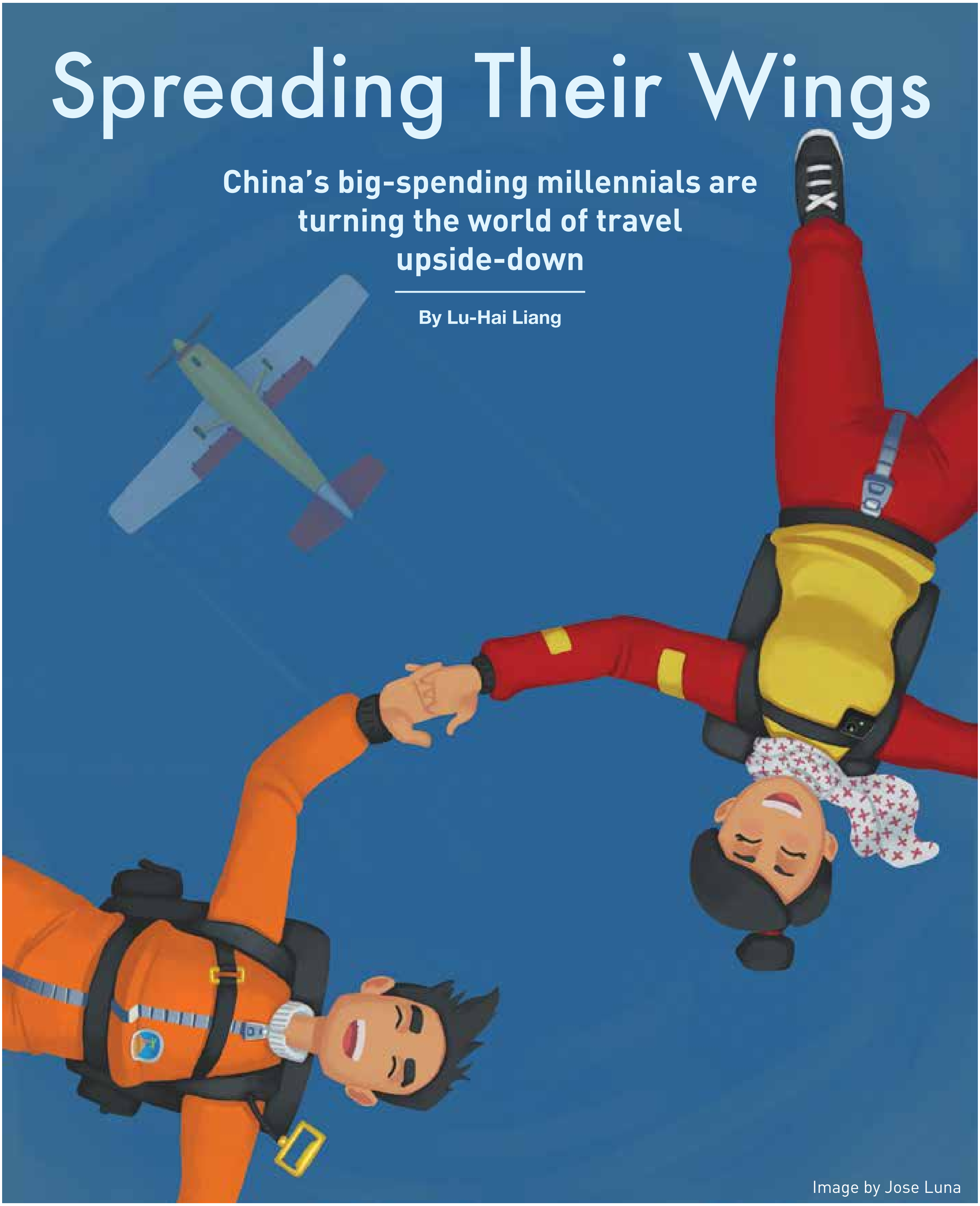


Image by Jose Luna

Yin He cannot stand tour groups. The 29-year-old Beijinger has traveled to 20 different countries in the past few years, but she insists on doing so under her own steam.

"I don't want to get up early every morning and follow a bunch of people around places in a rush," she says. "I prefer to decide things in the moment and enjoy the freedom I don't have when working. Plus, my English is good enough to communicate and solve problems by myself when I'm traveling."

Chinese millennials like Yin promise to reshape the global tourism industry. Unlike their parents' generation, who preferred to travel abroad on Chinese-organized tour groups, today's young Chinese are independent, individualistic and willing to try more adventurous vacations.

This shift is opening up huge new opportunities for travel and tourism operators worldwide. They can now advertise directly to China's 400 million children of the 1980s and 1990s, who often book their next trip online and on impulse.

For operators able to target this group, the rewards can be spectacular. Chinese millennials already make more overseas trips than all American tourists combined. They also spend more: tourists from China splurged $261 billion on international travel in 2016, the United Nations World Tourism Organization estimates, far higher than the $122 billion spent by tourists from the United States. But businesses looking to appeal to Chinese millennials need to understand what sets them apart.

Expanding Horizons

It is difficult to overstate the generation gap between Chinese millennials and their elders. Today's young Chinese feel so different to their parents, who mainly grew up under Mao Zedong, that 74% say they have more in common with millennials in other countries than with older people in China, according to research firm JWT Intelligence's *Meet the BRIC Millennials* report.

Like many young people in the West, China's millennials see travel as essential to their lifestyle. Young Chinese typically spend 35% of their income on overseas trips, according to Hotels.com's *2017 China International Travel Monitor* report, even more than their Asian counterparts. Despite accounting for under one-third of China's population, millennials make up two-thirds of Chinese outbound tourists.

"This young generation sees their lifestyle as the way to express their personal brand, and travel is a hugely important part of that identity," commented Ellen Hou, CEO of consultancy Carat China, in a recent report.

Many millennials can invest heavily in their brand because of their relative lack of financial commitments. Geng Mengwen, a 28-year-old marketing professional from Tianjin in northern China, traveled to six countries last year.

"I have a stable job and I don't have many outgoings—I'm not married, don't have children, don't pay installments on a car or house and I don't need to support my parents either," she says. "So, every three months or so, I have enough money for my next trip."

Chinese millennials are also becoming more adventurous as they seek out new experiences to impress their friends with a well-timed selfie. The Eiffel Tower does not cut it anymore; these days, young Chinese head much further afield. While classic vacation spots like Japan and Thailand remain popular, the countries that saw the fastest growth in Chinese visitor numbers in 2017 included Morocco, Tunisia, Turkey and United Arab Emirates.

Lareina Yang, 32, a director at a media company in Beijing, chose to visit Morocco because Chinese nationals can travel there without a visa and she wanted to try something different. "It has amazing scenery and religious differences," she says. "I like different cultures. I'd been to Spain before, and Morocco is near, and it's part of Africa."

Some travelers are even going to the ends of the Earth. Polar tourism has become fashionable with the number of Chinese traveling to see the Northern Lights soaring 400% between 2016 and 2017, according to online travel giant Ctrip.

Seeking the Unique

The way that millennials travel also differs dramatically to older generations. Before, when overseas travel was still a rarity for the Chinese, tourists would focus on cramming in as many stops at world-famous sights as possible. Today, travelers can afford to take their time.

"In the past, it was a case of ticking boxes, sharing the selfie and buying the paraphernalia," says Mark Tanner, Managing Director of marketing agency China Skinny. "Although this mentality still exists, more and more millennials are immersing themselves into a destination."

Young Chinese are focusing on seeking out new experiences. They spend more on sightseeing, dining and other leisure activities during their vacations, and less on shopping. Alex Wang, Co-founder of the Chinese travel company Zanadu, which organizes premium vacations for high-income clients, has noticed a shift in mind-

> **This young generation sees their lifestyle as the way to express their personal brand**
>
> Ellen Hou
> CEO
> Carat China

sets in recent years.

"Before the focus was on material goods; now, it's more on experiences," says Wang. "When we launched Zanadu, Chinese travelers might have bought RMB 100,000 ($15,600) worth of luxury goods but stayed in three-star hotels."

This shift is partly due to the fact that it is easier and cheaper than before to buy luxury brands like Gucci and Louis Vuitton in China. But it is also because Chinese millennials' spending habits are driven by an urge to "upgrade their lifestyle," according to Chinese research group Fung Business Intelligence. This means that they will prioritize premium and unique products and services that enhance their sense of personal well-being and superiority: a helicopter ride or a rare Scotch whisky, rather than a Rolex watch.

"Clients today are looking for uniqueness," explains Wang. "They don't just want to stay in big-brand hotel chains."

Millennials' search for quality, uniqueness and new experiences has also led to a rise in independent travel. Group travel is still significant, especially for people from smaller cities that often have spent less time overseas. But Ctrip now finds that as many as half of the bookings made through its site are for independent tours.

Geng, from Tianjin, always books her trips independently using online platforms and social media for inspiration. "I would describe myself as an adventurous person," she says.

There is also a trend toward alternative vacations. The number of people taking part in adventure travel and road trips is expected to rise 52% and 75% respectively over the next three years, according to *Chinese Luxury Traveler 2016*, a report by the influential research group Hurun Report.

Lauren Hallanan, a marketing consultant who specializes on China, agrees that Chinese millennials are increasingly searching out new, alternative vacations. "There's a growing number of millennials choosing to go on road trips, visit national parks and use Airbnb," she says. "Iceland is a trendy destination, and the numbers traveling to Africa and Russia have also increased."

Chinese millennials are looking for new experiences from their vacations

Standing out from the Crowd

With a whole world out there to discover, it can be tough for individual travel destinations to capture the attention of Chinese millennials and many places have a long way to go in terms of optimizing their offerings for Chinese guests. But those willing to make this a priority have reaped the benefit.

Morocco and Tunisia's decision to allow visa-free travel for Chinese tourists in 2016 and 2017 produced instant and spectacular results. The numbers visiting leaped 240% and 378% respectively last year, according to travel intelligence firm ForwardKeys. South Africa also saw a 53% rise in tourism from China after it allowed accredited tour companies to process visa applications in advance for group travelers.

Carat China's findings suggest that such policies will become more important as an increasing number of Chinese millennials book vacations independently and impulsively.

"We saw an increasing level of spontaneity in travel plans with 33% of users making their plans in the month before travel as they look to capitalize on late deals and the rising number of visa-free destinations," said Hou, Carat's CEO.

But even destinations without China-friendly visa policies can be hugely successful in attracting Chinese tourists if they engage millennials online. "Online channels account for the majority of touch points Chinese millennials have on their customer journey when making travel decisions," says Tanner from China Skinny.

According to Tanner, one of the most effective ways to do this is by using social media stars and bloggers—often referred to as key opinion leaders (KOLs) in China. "Advocacy-based marketing is one of the

Before, the focus of Chinese tourists was on material goods; now, it's more on experiences

Alex Wang
Co-founder
Zanadu

most powerful, cost-effective, but highly underutilized strategies," he says.

KOLs are effective in China because it is a "high-context culture," according to Elijah Whaley, Chief Marketing Officer of influencer agency Parklu. This means that people identify strongly with groups, peers and people they recognize.

One of the most dramatic demonstrations of the power of influencer marketing happened by chance in 2012, when Chinese actress Yao Chen married in Queenstown, New Zealand. The country was mentioned over 2.4 million times on Chinese social media and received a huge spike in Chinese tourists in the weeks following the wedding.

Airbnb also used influencers to great effect during its marketing push in China last year. The company racked up 2 million mentions on the WeChat social media app on the first day of the campaign.

However, this kind of strategy can be costly. "Travel is particularly tough for influencers and brands simply because of the costs—flights, hotels, activities and then paying the influencer on top of that," Whaley explains.

Brands with a smaller budget can also attract millennials by producing high-quality content. Zanadu's Wang says that content marketing has played a huge role in helping his company to double revenues every year since 2012.

"We have a high emphasis on producing quality content—it is a cornerstone of our whole business," he says. "We produce a lot of content and we benefit tremendously from that."

A key platform to focus on is Mafengwo, a travel app popular among China's millennials. Mafengwo is often described as China's answer to TripAdvisor, but it is more of a combination of TripAdvisor, Instagram and Booking.com because it blends user-generated content with booking and social media features.

"If someone mentions some specific hotel in their travel review, you will be able to book that exact hotel on Mafengwo," says Geng.

PR firm China Travel Outbound, on the other hand, has found that more old-school methods can still be effective. The agency says that a sales mission can help increase business by making a destination known to tour operators and online platforms.

A three-day sales mission to Beijing helped Royal Museums Greenwich in London increase Chinese visitor numbers by 74%, thanks to the meetings it held with local travel agents, tour operators, travel journalists and student specialists.

Getting "China Ready"

Ultimately, the best strategy may be to make sure that a destination is as comfortable as possible for Chinese guests, because China's millennials are coming whether you're advertising to them or not. By 2025, Chinese tourists will make 220 million overseas trips a year and spend $450 billion, according to a Goldman Sachs forecast.

Even making small changes like allowing travelers to use WeChat Pay and Alipay can make a big difference. "One of my favorite examples is Finnair, which started accepting Alipay for onboard sales on China flights, including duty free," says Tanner. "They saw sales increase 200% in a few months."

Ensuring Wi-Fi is widely available is also essential, so that Chinese visitors are able to share their experiences in real time on social media. Monitoring and responding to comments on Chinese review sites is another valuable activity, as it provides insight into what Chinese visitors like and don't like about services and products.

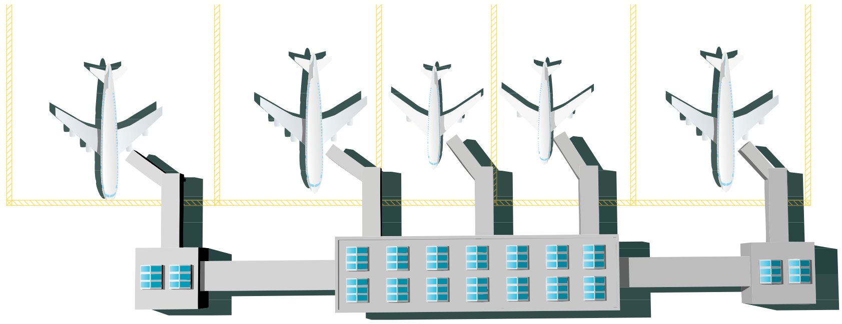
Millennials like Geng are unlikely to shake off the travel bug any time soon. "I think traveling is a good way to release stress," she says. "Going somewhere new can reset my brain and I can forget about work for a while, so when I come back I feel like I'm recharged."

CHINA data

The stats you need to know

A paucity of pilots

China will need to hire **110,000** pilots by 2035 to staff its booming aviation industry. The problem is that there is already a global shortage of pilots. Salaries for foreign pilots have nearly **tripled** in China over the past decade.



Source: Financial Times

A coffee war is brewing

Beijing coffee startup Luckin Coffee aims to roast rivals Starbucks and Costa by opening **500** cafes in China by June. The average Chinese consumes just **four** cups of coffee a year, compared to 400 for Americans, but this is rising fast.

Source: Caixin

Music to Chinese lawyers' ears

The number of lawsuits related to online music streaming in China leaped from 20 in 2014 to **535** in 2016 as providers try to enforce exclusive deals with artists. Over **30 million** people now pay to stream music in China.

Source: Financial Times

Wind power soars

China's wind power generation has risen **40%** year-on-year in 2018 even as regulators clamp down on useless wind farms. Just over **8.5%** of China's wind power was wasted last year, down from 16.5% in 2016.

Source: Caixin

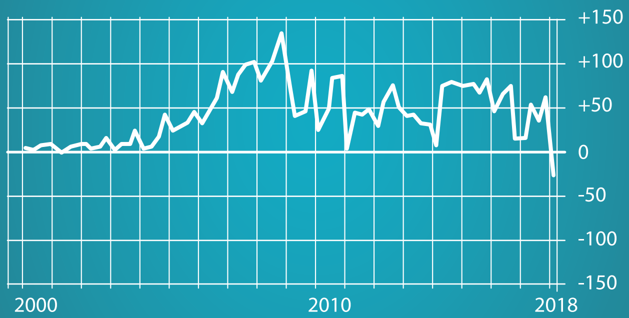
Where's Warren?

More than **5,000** Chinese visitors traveled to Omaha, Nebraska for this year's shareholder meeting of Berkshire Hathaway. Warren Buffett is a huge star in China, where his face appears on bottles of Cherry Coke.

Source: Reuters

The other trade deficit

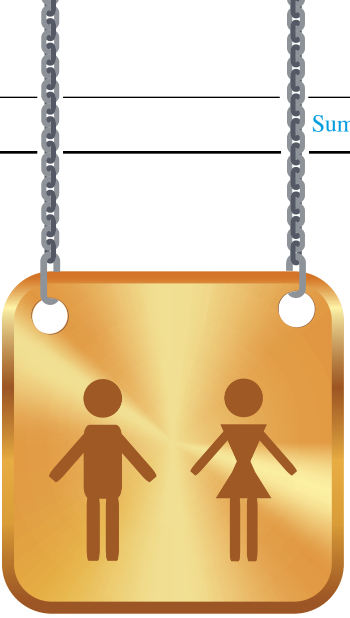
China posted its first overall quarterly current account deficit in **17** years in the first quarter of 2018 as growth in imports continues to outpace exports.



Source: South China Morning Post

Luxury loos

China plans to build or upgrade **64,000** public toilets by 2020 as part of its “toilet revolution.” But some cities have been reprimanded for building “five-star toilets,” with Chongqing spending **RMB 1 million** ($160,000) on one facility.



Source: The Guardian

Bonding with global investors

The value of Chinese domestic bonds held by overseas institutions has increased by **68%** in the past year. Nearly 6% of Chinese government bonds are now held by foreign investors.

Source: Caixin

Domestic cars in the driving seat

Even if China lowers car import tariffs from 25% to 10%, a boom in foreign car sales is unlikely. Most imports would still cost over **20%** more than their made-in-China equivalents, and only **14%** of Chinese consumers would be willing to pay that premium.

Source: Financial Times

No disabled access

Only **6.5%** of China’s 85 million disabled citizens are employed, far below the average in developed economies. This is despite Chinese law requiring companies to reserve **1.5%** of positions for disabled people.

Source: Financial Times

382.95−205.37	▼	61.082	+0.040	+0.535%	72.370M
535.01−308.18	▼	172.293	−0.009	−0.082%	12.920A
755.67−740.20	▼	20.308	+0.278	+05.37%	80.370M
205.20−370.16	▼	29.374	−0.820	−82.95%	17.293A
111.48−300.77	▼	10.888	+0.616	+2.370%	90.616A
108.33−740.74	▼	50.061	+0.374	+2.061%	11.009M
293.08−728.57	▼	37.820	−0.572	−8.537%	20.308A
100.95−108.70	▼	18.447	−0.537	−0.048%	82.061M
293.57−537.00	▼	38.101	+0.370	+0.003%	70.082B
135.18−108.61	▼	100.616	+0.101	+7.820%	18.600M
278.00−121.20	▼	48.061	+0.111	+6.108%	10.205M

Tanking tech stocks

The share prices of the 21 Chinese tech companies that went public in 2017 have since fallen **20%** below the IPO price on average. The worst performers have been fintech firms Qudian and PPDAI.

Source: Bloomberg

Special Delivery

Logistics is an industry with massive potential in China

China's logistics industry is on the fast track to a bright future. The country's delivery firms are already posting impressive growth figures, and rapidly rising consumer spending is set to send demand soaring further.

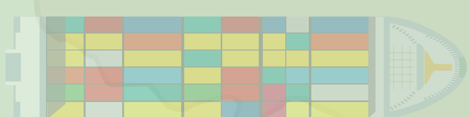
China's Logistics Industry at a Glance

50 million	$1.4 trillion	17%	6.5%
Total employment	Total industry revenue	Percentage of global market	Growth rate

How China Shifts its Goods

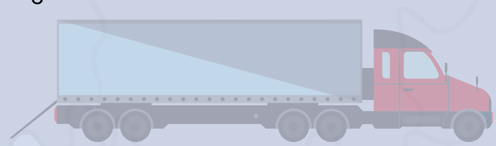
Shipping

- China exports **36 million** containers each year
- That is **28%** of global sea freight exports
- **Seven** of the world's 10 busiest ports are in China



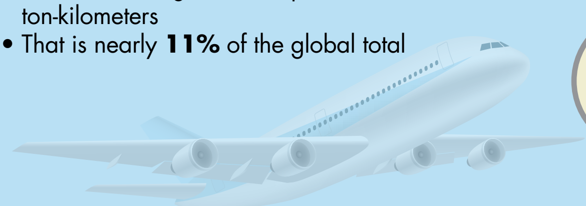
Highways

- China's road freight traffic is over **6 trillion** ton-kilometers
- China accounts for **40%** of the OECD countries' road freight



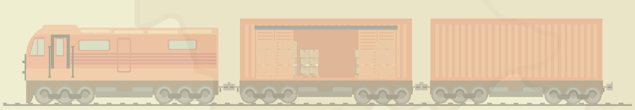
Air

- China's air freight now surpasses **21 billion** ton-kilometers
- That is nearly **11%** of the global total



Rail

- China's rail freight traffic is nearly **2.4 trillion** ton-kilometers
- That is **23.5%** of global rail freight



Source: AAR, Boeing, China Daily, OECD, Statista, World Shipping

Delivering the Future

The rapid changes taking place in China's economy are also transforming its logistics industry. Demand is shifting from the coasts to the interior, global firms are growing their presence and Chinese firms are also expanding worldwide.

Heading Inland

- Total consumer spending in China will **double** by 2030
- **Two-thirds** of this growth will be driven by third- and fourth-tier cities
- These cities are mainly located in China's less-developed interior
- Freight along the Yangtze River will more than **double** over the next decade

Ramping Up Imports

- China's imports are rising **twice** as fast as exports
- Parcel deliveries from outside the Chinese mainland rose **34%** last year
- This is creating opportunities for global delivery firms with Chinese partners
- FedEx, Nippon Express and other global firms are investing in China

Parcel Force

- Delivery companies are struggling to keep up with demand from e-commerce
- More than **40 billion** packages were delivered within China last year
- That is **50%** of the global total
- Package deliveries are set to rise another **20%** this year

Getting Smart

- Logistics companies are investing in automation due to rising costs
- Labor costs in the Chinese logistics industry are rising **10%** annually
- The smart logistics market will grow from $32 billion to **$160 billion** by 2025
- Smart logistics includes robotics, drones and tracking technology

Delivered by China

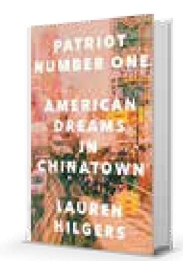
- China is investing huge amounts in global logistics infrastructure
- China's investment in overseas logistics companies and infrastructure more than doubled to **$32.2 billion** last year
- Nearly **70%** of this investment is in "Belt and Road" countries
- China now controls **10%** of European port capacity

Source: Financial Times, JLL, Nikkei, Reuters, World Bank

Looking Under China's Hood

Dinny McMahon recommends books to help readers see what's really going on in China's economy

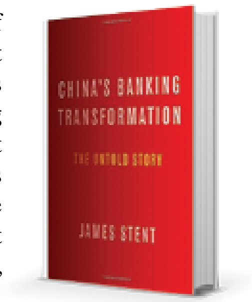
Dinny McMahon is a fellow at MacroPolo, a China-focused think tank run by the Paulson Institute in Chicago, and the author of China's Great Wall of Debt. *He completed the book while a fellow at the Woodrow Wilson International Center for Scholars in Washington, DC. McMahon spent ten years covering China as a financial journalist. He wrote for Dow Jones Newswires in Shanghai for four years, and covered China's financial system for the* Wall Street Journal *in Beijing for six years.*



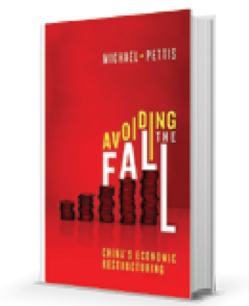
Patriot Number One—American Dreams in Chinatown
by Lauren Hilgers

Stealing the State—Control and Collapse in Soviet Institutions
by Steven L. Solnick

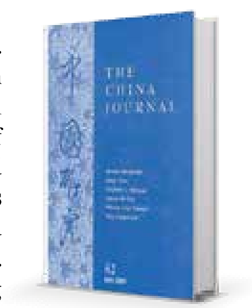
James Stent has more first-hand experience of China's banking system than almost anyone out there: he spent more than a decade on the boards of two Chinese banks. In **China's Banking Transformation—The Untold Story**, Stent mines that experience to explain how China's banking system works—in very accessible prose. Not all readers will be as upbeat as Stent about the prospects of China's financial system, but his insights shouldn't be dismissed lightly.



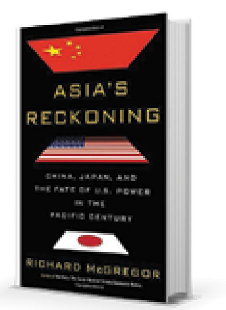
Perhaps the most unique and original voice writing about the Chinese economy is Michael Pettis, and **Avoiding the Fall—China's Economic Restructuring** is a good entry point if you're coming to his work for the first time. Pettis thinks deeply about the imbalances in the Chinese economy. I find that his writing invariably forces me to think differently about how China works.



This is a somewhat unusual recommendation—it's not a book, but an academic paper. Throughout the early 2000s Graeme Smith returned annually to a small city in Anhui where he observed up close the intersection of government authority, corruption and vested interests. The result is '**Political Machinations in a Rural County**,' which was published in **The China Journal (Vol. 62, July 2009)**. Don't let the title fool you. This is an engaging story full of colorful characters.



Few people write about China as well as Richard McGregor whose first book, The Party, is on many people's list of must-read China books. His most recent offering, **Asia's Reckoning: China, Japan, and the Fate of US Power in the Pacific Century**, is equally good. It's an incredibly engaging romp through history that helps make sense of the decades of grievances that shape great power politics in East Asia.



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CHINA START

28TH OCT – 2ND NOV 2018 | CHINA (XI'AN, SHANGHAI, SHENZHEN)

A 1-week immersion program for global elite start-ups, scale-ups as well as investors to **Learn, Network** and **Pitch.** It has brought together around 100 participants from 23 countries all over the world spanning 25 sectors. The overall program satisfactory rate is **4.94/5.00.**

HIGHLIGHTS

1 Week-long program

2 China accelerators visits

3 Cities: Beijing, Xi'an Shanghai and Shenzhen

4 Investment pitching opportunities to investors and potential partners

5 Company visits including JD.com, Fosun, Tencent, and 3NOD etc

APPLY
China-Start.org

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3nod三诺 JD.COM 京东 FOSUN复星 Alibaba Group Tencent腾讯