

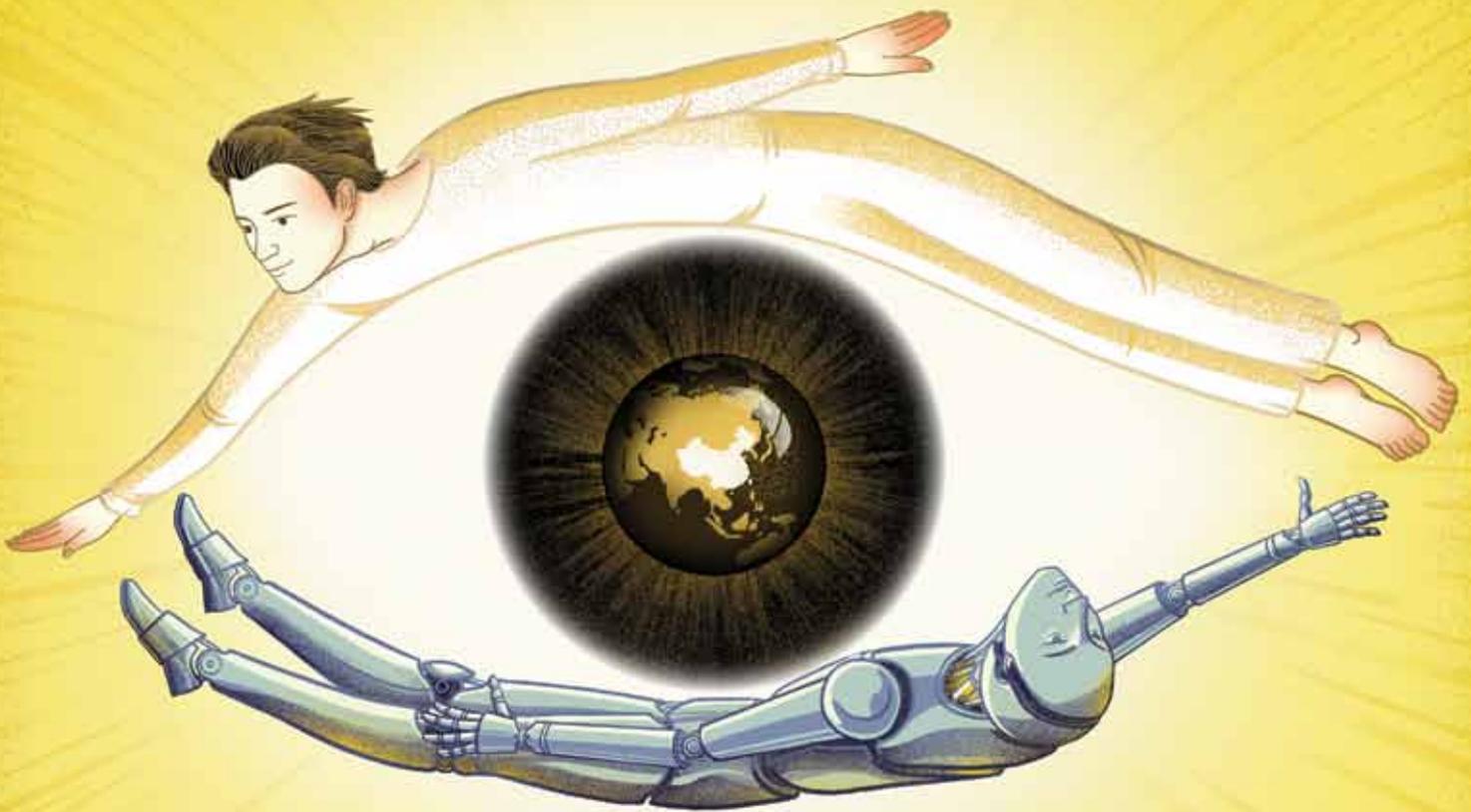
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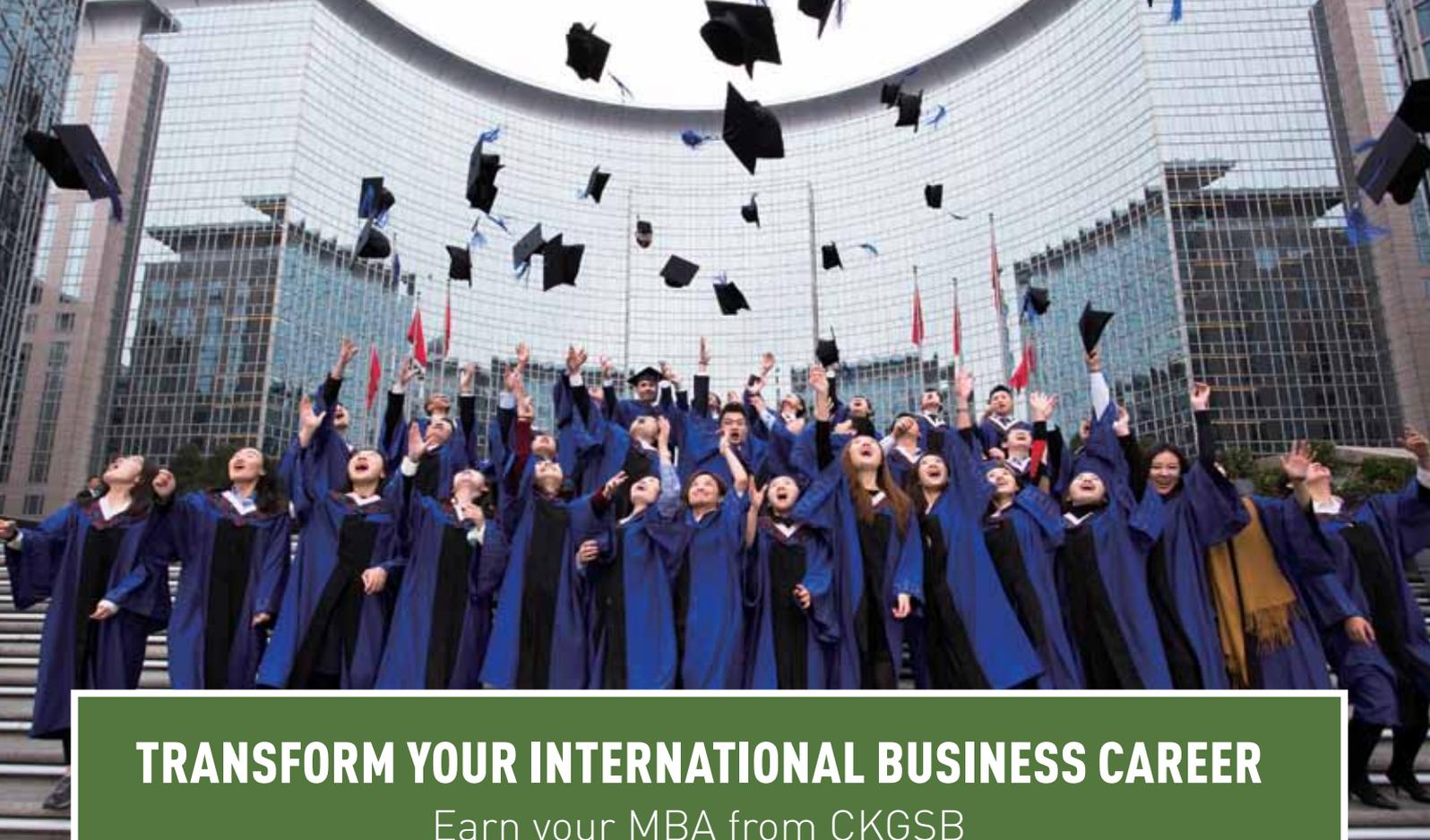
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China and the Fourth Industrial Revolution

**4IR is bringing promise and disruption
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-
- How China is driving real-world use of AI
 - Understanding China's everlasting property 'bubble'
 - The 'world's factory' has begun to send its manufacturing offshore



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Comment

The Fourth Industrial Revolution 6
A new era is upon us, and this time it will be different, not least because of China's active involvement

Globalization



India: The New Battlefield 8
The next big market is right next door to China, and the entire world is looking for a piece of it

Offshoring Goes Full Circle 14
The new offshoring is sending factories from China to the US and beyond

Innovation

The WeChat Economy 20
Tencent's messaging app is much more than that, and seeks to be nothing less than indispensable

Intelligent Future 25
In China, artificial intelligence is already having a big impact



Daniel Kahneman, Nobel laureate and grandfather of behavioral economics, tells us how his field came to be and explains its impact 30

Xu Huabin, Vice President of DJI, shares the mindset that made the company the world's leading drone maker, and offers a glimpse as to what is next 33

Economy & Finance



Float of the RMB
The 'redback' wants to be free... eventually 36

Housing: The Iron Bubble 41
China's housing market is complex, disparate and, for now, unstoppable

Business Barometer 46

Latest figures on production and investment confidence

Kent Kedl, Senior Partner with global consulting firm Control Risks, talks about new risks facing foreign companies in the fast-changing regulatory environment of Xi Jinping's administration 50

Company



Online Underdog
NetEase has not only survived but thrived in China's competitive digital world 53

Christian Haessler, Head of Innovation for APAC at materials science company Covestro explains how the company is working in China to create the next generation of game-changing materials 58

Downtime

Elite Education 63
Opinions on how to educate children in China are changing

China Data 66
From oil mergers and avocado sales, to infrastructure and tax cuts, the numbers you need to know



Expats in China 68
Foreigners are coming to live in China in droves, chasing opportunities that can be found nowhere else

Bookshelf 70
Must-read books on China recommended by Chris Ruffle, author and CEO of Open Door Capital Group

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Editor-in-Chief
Zhou Li

Senior editor
Greg Langley

Managing Editor
Tom Nunlist

Coordination
Deng Yuanyuan, Liu Sha

Design
Jason Wong

Cover
Wei Bingnan

Produced By
SinoMedia

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Suite 3203, 32/F, Champion Tower,
3 Garden Road,
Central, Hong Kong

For letters to the Editor or reprint requests,
please contact:
ckgsb.knowledge@ckgsb.edu.cn



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Entering a New Age

Two and a half centuries ago, a revolution broke out in Western Europe that changed the world more than any other event in modern human history—the Industrial Revolution, which burned coal to make steam and transformed farmers into urban workers. This revolution led to the collapse of some countries and the birth of others; it created wars but also raised standards of living far beyond what was ever thought possible.

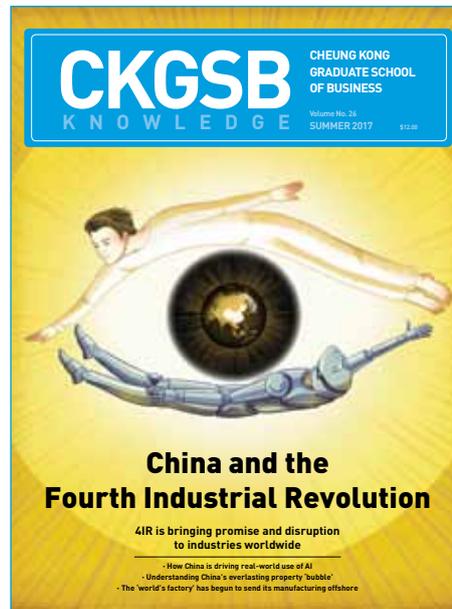
Today a new revolution, the Fourth Industrial Revolution of AI, connectivity and distributed manufacturing—and this time a resurgent China is near the head of the pack. In this issue, we look at the implications of this for the world in the Comment section (page 6).

Our lead story, “India: The New Battlefield” (page 8), focuses on another emerging power touted as the next big market opportunity. With a decelerating economy at home, China cannot afford to miss out, and is already making massive investments in its near neighbor. Also related to changing global economic opportunities is “Offshoring Goes Full Circle” (page 14), which looks at how Chinese manufacturers are moving to the United States, which is reversing a decades-long trend.

In this issue, you will also find several articles relating to technology. “China and the Intelligent Future” (page 25) examines how China is developing game-changing artificial intelligence applications that are already coming to market. “The WeChat Economy” (page 20) looks at how the uber-popular app from Tencent has come to be omnipresent in the lives of hundreds of millions of people. In addition, we tell the story of one of Tencent’s rivals, NetEase, in “Online Underdog” (see page 53). Little known in the West, NetEase helped develop the internet in China and is a dynamic survivor seeking to reach higher still.

You will also find in this edition two stories dealing with the fundamental workings of China’s economy. “Housing: The Iron Bubble” (page 41) investigates the risks and opportunities presented by the nation’s booming property market, particularly comparing the differences to the US market leading up to the 2008 sub-prime crisis. There is also a deep dive into China’s currency in “Float of the RMB” (page 36). Yes, the currency is controlled, but the story is far from the simple narrative presented by many in the West.

In Downtime, we learn about the changing world of educa-



tion in China, in “Elite Education” (page 63). The interviews in this issue, as usual, feature some of the best and brightest. We have a conversation with Daniel Kahneman, grandfather of behavioral economics (page 30). On page 50, Kent Kiedl, Senior Partner at Control Risks in China, talks about finding opportunity in a world increasingly filled with uncertainty. And we also chat with two manufacturers. Christian Haessler, Head of Innovation, APAC, from materials science giant Covestro gives insight into one of the behind-the-scenes companies that makes our modern world possible (page 58), while on page 33, we talk with Xu Huabin, Vice President of DJI, a company largely responsible for defining what we consider drones.

As always, there is more than enough in this issue to think about and to discuss. If you have any comments or opinions to contribute, we would love to hear from you.

Yours Sincerely,

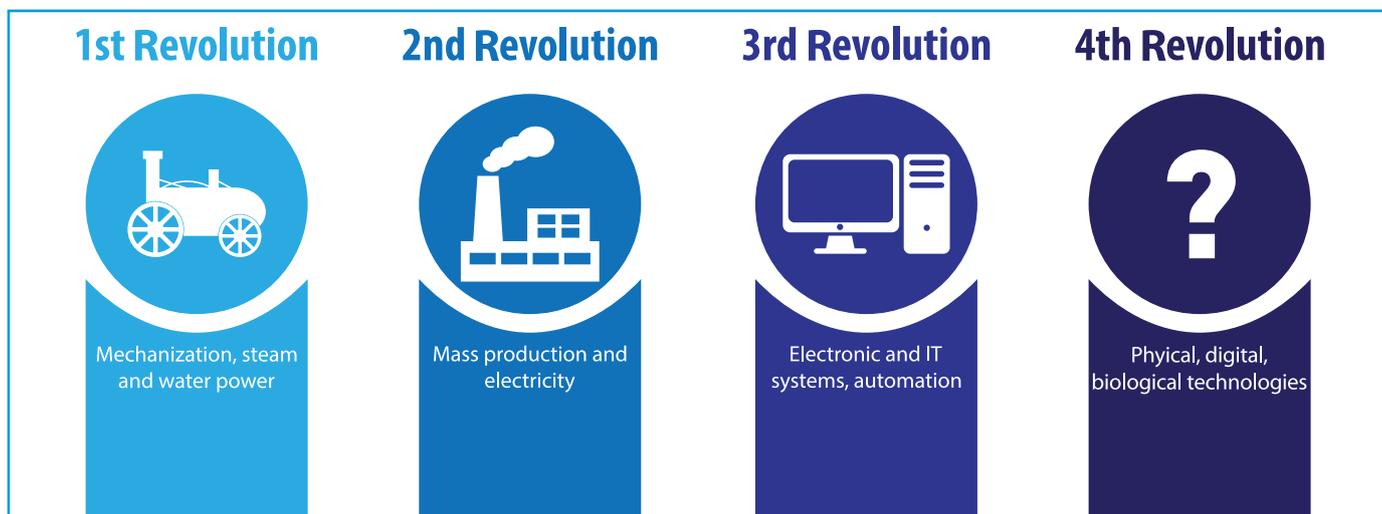
Zhou Li
Assistant Dean, CKGSB

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

China and the Fourth Industrial Revolution (4IR)

This time around, China will not miss the boat

By Zhou Li



The fourth industrial revolution (4IR) is “a fusion of technologies” that blurs the lines “between the physical, digital, and biological spheres,” according to Klaus Schwab, founder of the Davos Forum. This fusion of so many fields will ultimately see 4IR change the world far more fundamentally than the first three industrial revolutions.

Any analysis of the many technological breakthroughs that now define this new 4IR business world, such as the internet of things (IOT), robotics, artificial intelligence and biotech, is incomplete at best if it misses the China factor. The country now accounts for nearly 20% of the world economy in terms of purchasing power parity (PPP), although this is still 10 percentage points below its share of total world output two centuries or so ago when the first industrial revolution began.

China has become a major driver of “re-globalization,” a term we coined in the

Winter 2016 Issue of our magazine. China is also preparing to participate actively in 4IR and is armed with a number of advantages that give it a decided edge over other major economies.

SINKING ‘DRAGON BOATS’

China was one of the biggest casualties of the first and second industrial revolutions, triggered respectively by the steam engine and electricity. Under the Manchus, like the Mongolian hunters before them who invaded and occupied the heart of China, the Qing Dynasty lost one war after another to the “industrialized” powers from the West and Japan. That last dynasty collapsed in the early 20th century, but the country’s misfortunes continued with wars, famines and political chaos lasting until the end of the “Cultural Revolution” in the late 1970s.

Even the second industrial revolution did not arrive in China until the early

1980s, when the nation finally decided to integrate into the global economy after more than a century of isolation. China’s entrance to the modern industrialized world, which coincided with the third industrial revolution (sparked by computers), has possibly been the most significant event in human history since the first industrial revolution.

STIRRING 3IR WATERS

Since the early 1980s, China has managed to achieve in one generation what took five or more in the West. The country is now the second largest economy in the world and, given the recent retreat of major Western economies from globalization, its influence around the world is only likely to grow.

Here, at the dawn of 4IR era, China is much better positioned than in the past to seize the opportunities offered by an industrial transformation. Indeed, it may be bet-

China's entrance to the modern industrialized world has possibly been the most significant event in human history since the first industrial revolution



ter placed than any other major economy to capitalize on the transformation ahead.

SAILING OFF FOR 4IR

The most fundamental difference between China now and in the first three industrial revolutions is the indomitable entrepreneurial spirit that has emerged over four decades of full-tilt development. Unlike in the imperial system of the Qing Dynasty when the first two industrializations hit China, and under the Soviet-type economy, in which private ownership was banned until the time of the third industrial revolution, China's leaders today encourage people to start companies and become their own bosses.

• Magic entrepreneurship

Entrepreneurship is now at a higher level in China than in almost any other country. In 2016, over 15,000 new enterprises were registered per day. This dynamism created by millions of people seeking ways to get ahead using new technologies and business models is creating a lot of entrepreneurial "magic."

• Integration vs Invention

Previous industrial revolutions bestowed great advantages upon countries that were early adopters. However, our age features a more level playing field in terms of speed of access to advanced modes of production. While China may still be less adept than the West in some areas of basic research, its newly unleashed entrepreneurial approach could

prove a crucial advantage in the 4IR era, which will place a premium on fast-paced innovation and novel uses of existing technologies.

Alibaba is a good example. It became a global giant by cobbling together mostly off-the-shelf tools into a platform that has transformed the Chinese economy. The result is a new, far more information-efficient marketplace that gives sellers from even the most remote regions of China the ability to reach customers.

• From copycat to innovator

While many in the West still focus on protecting their intellectual property, Chinese companies are filing growing numbers of patents for self-developed technologies. In 2016, China ranked third after the US and Japan in international patent applications. Huawei, once bothered by IP infringement claims, is now one of the top two patent owners in the telecom industry and earlier this year won an IP lawsuit against Samsung.

• The power of size

As we discussed in the last issue (#25), China is transforming from being the world's largest factory to its biggest market. The country is the most populous on Earth and many studies show that, based on its fast expanding middle class, China will soon be the largest market for consumer products and services while remaining the largest source of manufacturing.

This is generating incredible amounts

of data and means, for example, that China is already leading in facial identification, a crucial application for artificial intelligence (AI). In 2015, more than one-third of the worldwide spend on high-end bags, shoes and similar goods came from Chinese consumers. As the growth of China's middle class continues, the country will become the main source of data that front-runners in 4IR need so desperately.

Robotics is another key area for 4IR. According to the International Federation of Robotics, thanks to its manufacturing base developed in the last four decades, China has been the world's number-one buyer of industrial robots since 2013.

• Visible Hand

The continued shift from state-owned enterprises to entrepreneurialism as the engine of change in the Chinese economy is crucial to 4IR, but the government also has a critical role to play in building the future. In its embrace of 4IR, China recognizes the mutual gains that can accrue to both the government and the economy. The nation is investing heavily in the development of 4IR across key industries. At the same time, the distributed nature of 4IR requires greater transparency, which has interesting and positive implications for China at all levels.

In January this year, Chinese leader Xi Jinping delivered a keynote speech at the World Economic Forum in Davos that drove home the importance of 4IR to China. "Unlike the previous industrial revolutions, the fourth industrial revolution is unfolding at an exponential rather than linear pace," Xi said. "We need to relentlessly pursue innovation. Only with the courage to innovate and reform can we remove bottlenecks blocking global growth and development."

With this industrial revolution, China has not missed the boat. Indeed, it will be among the countries steering the world along this next wave. With the inclusive and sustainable development lessons learned in the past, there is hope that this journey will be much better for everyone in the world. 

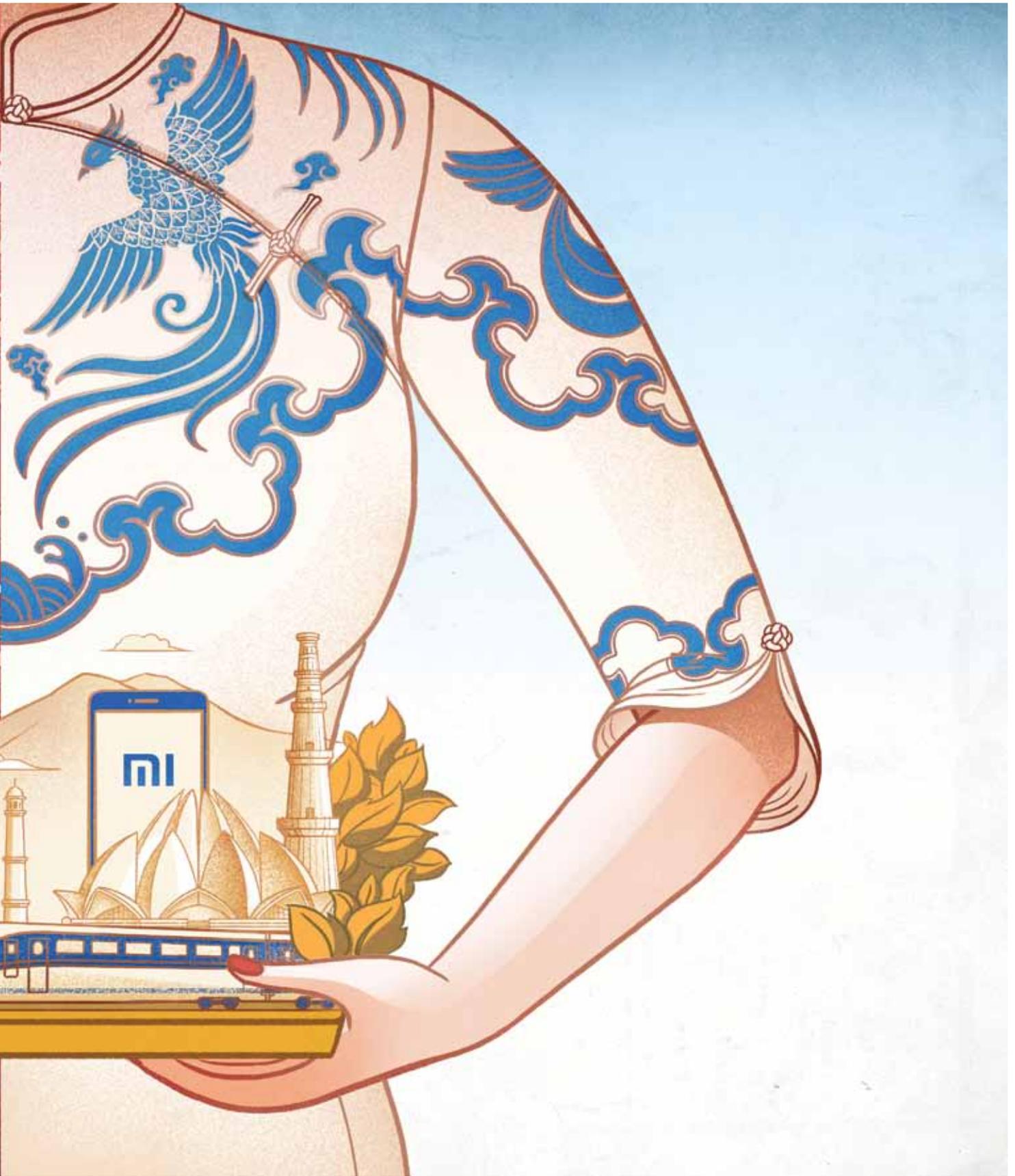
India: The New Battlefield

China and the rest of world are fighting for the next big market

By Jens Kastner

Image by Wei Bingnan





For many years China has taken the spotlight as the biggest and most important emerging market in Asia. But now its next-door neighbor, India, is starting to steal that attention as opportunities for foreign companies grow

Anju, a clerk aged in her late 50s, works in a trading company in Delhi, India. She swears she will never use any mobile phone other than an Apple and she definitely refuses to buy Chinese goods, even toys for her grandsons. “All Chinese products break so quickly,” she says dismissively.

Anju’s son Rishi, a product photographer in his late 20s, uses an iPhone, but is now considering a Chinese Xiaomi phone. He describes his mother’s views as outdated, held by “India’s older people only.” Statistics bear him out—Indians are readily embracing Chinese-branded Androids. Over half of all mobile phone sales in the first quarter of 2017 were Chinese products.

Meanwhile, the TV set playing behind the pair in the living room of their nicely decorated middle-class home features India’s beloved national cricket team wearing new jerseys. The logo featured on the breast is Oppo, China’s top mobile phone maker. In March, Oppo paid 10.8 billion rupees (\$166 million) for a five-year sponsorship that displaced Indian broadcasting company, *Star India*.

The spend is a continuation of a strong push by the company into India’s mobile market—Oppo grew 1,578% in 2016. By the end of Q1 this year, the company had 9.3% of the market and was the fifth largest smartphone seller in India behind three other Chinese brands: Xiaomi, which took 14.2% marketshare, Vivo, with 10.5% and Lenovo, with 9.5%. Samsung, a Korean brand, still lead, however, with 28.1%.

The competition in India’s smartphone market reflects the increasing interest India is arousing in multinationals, as well as many Chinese firms with international ambitions. With a population of 1.2 billion and an increasingly vibrant consumer market, companies from around the world are excited about the country’s potential.

Last year, a record 109.1 million smartphones were sold in India, up from 102.7 million in 2015. With the Indian market still dominated by older flip-style phones, there is plenty of room for growth. Meanwhile, passenger vehicle sales crossed the 3 million threshold for the first time last year, with sales growth of 9.2%. Consumer

appliance sales also grew an estimated 7.5% in 2016. This was double Asia-Pacific growth as a whole and triple the world, according to Euromonitor International.

The boom has even stolen the economic spotlight from China. For the last two years, India’s growth has outpaced its northern neighbor. In 2015, it was 7.9% compared to 6.9%, and 7% against 6.7% in 2016. When Apple Chief Executive Tim Cook recently visited to push the opening of branded retail stores in India, the state-run *Global Times* newspaper, based in Beijing, warned that “China’s thunder” had been stolen.

Growth in India has become especially important for many multinationals, including Apple, as their market share in China has fallen in recent years. This applies not only to consumer electronics and automotive firms, but also to European and American luxury brands. Companies such as Louis Vuitton, Michael Kors and Coach are increasingly present with flagship stores located in iconic malls of major cities designed to lure new customers.

“India has a young population with jobs,” says Shobhit Srivastava, an analyst with IT analysis firm Counterpoint Research, based in the city of Gurugram, southwest of New Delhi. “When you have that, you have international companies seeing potential customers.”

In India, tens of millions of young people are entering the labor market each year. In comparison, China’s birthrate has been low for decades and shows little uptick despite relaxation of the one-child policy last year. This has resulted in a shrinking workforce and a rapidly aging population. According to United Nations estimates in 2015, by 2030 the median age in China will be 43, but in India it will still be just 31.

Chinese companies hoping to capitalize on the boom and expecting an easy conquest of the Indian market are, however, in for a shock. A complex market, stiff competition and a heady mix of political issues means success will not come easy.

The Next Big Opportunity

“Although India has always had huge potential, the sense of urgency among inter-

national companies has grown recently,” Srivastava explains. “Barriers are [being] removed for the entry of international companies and the Indian government is becoming more cooperative.”

He is referring to the bold policies launched by Indian Prime Minister Narendra Modi who swept into power in 2014 on a platform to open and accelerate the Indian economy. Modi’s flagship policy, the “Make in India” program, aims to increase the share of manufacturing in the economy from about 18% when he took office to 25% by 2022.

Modi’s strategic outreach has already attracted a long list of foreign investment ventures. These include South Korea elec-

tronics-maker Samsung and Japanese peer Sony, as well as German automotive component and services supplier Bosch. Many other foreign players have announced major expansions to existing plants. Also on the list are Taiwanese electronics contract manufacturers Foxconn, Inventec Corporation and Winstron. SAIC Motor, China’s largest auto manufacturer, has proposed a takeover of the General Motors’ facility in the western state of Gujarat.

“Chinese companies are looking for their next big opportunity and India is an obvious choice,” says Firat Unlu, Lead India Analyst of the Economist Intelligence Unit (EIU), a London-based think tank. Currently more than 300 Chinese compa-

nies, including IT device-makers Huawei, Lenovo, Vivo, Xiaomi and ZTE, as well as electrical equipment-maker TBEA, have established outposts across India. Heavy machinery-makers Sany, Liu Gong and home appliances-maker Haier Group also plan to expand their footprints.

Thomas Hundt, a Delhi-based representative of the German Trade and Invest (GTAI) agency, part of the German Federal Ministry for Economic Affairs and Energy, keeps a well-trained eye on trends. He notes that the Chinese have become fierce competitors to the Germans in the India market, especially in terms of industrial machinery.

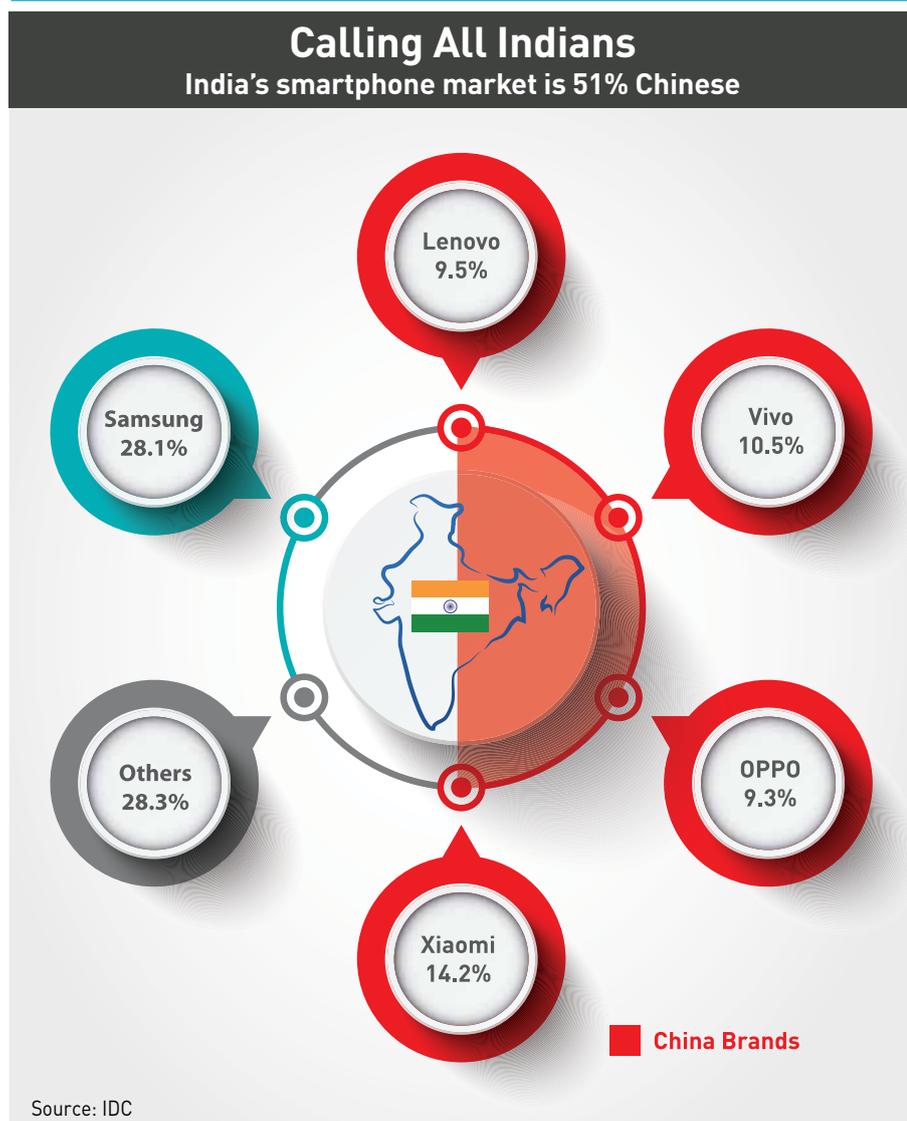
“In 2006 India’s industrial machinery imports from Germany and China stood at 21% and 13% of total machinery imports respectively,” he says. “The positions had switched by 2016, with each holding 15% and 26% respectively.”

The growing competition is not, however, limited to merchandized goods.

India’s booming e-commerce business has attracted companies from Japan, Singapore, South Korea and the United States, as well as China. Among recent deals is an investment by Chinese ride-hailing service Didi Chuxing in Ola Cabs, an Indian online transportation startup. This will again see Didi pit itself against US rival Uber. After years of tough competition in the Chinese market, Uber yielded to Didi in 2016. Ironically, when selling out, then-Uber CEO Travis Kalanick indicated that the deal would allow the company to focus on India.

Similarly, when Alibaba beat eBay in China, the e-commerce sales portal reacted by establishing an investment partnership with the Flipkart Group, which has become India’s leading e-commerce marketplace. After acquiring local rivals Myntra and Jabong, Flipkart and eBay are in a strong position to rebuff forays by Alibaba and Amazon, the United States online commerce behemoth.

“For Chinese brands to win in India, they not only face Amazon or Facebook, but also fierce local competition,” says Doreen Wang, Global Head of market researcher BrandZ at Millward Brown. “Why



should I use Alibaba? I have Flipkart!”

She stresses that India has “really smart technology and talented people,” among them an army of CEOs that have received education in the West and understand investing in R&D and marketing. “Plus, they are not shy about technology. This all makes the Indians strong competitors,” Wang says.

Steep Learning Curve

“It took the Chinese a few years to realize that they must localize operations by teaming up with local consultancies,” says Irfan Alam, Member Secretary of the Delhi-based India China Economic and Cultural Council (ICEC), a non-governmental organization that has hosted many Chinese delegations to India. “They have also begun to understand that they need a good marketing plan.”

Alam explains that this was more difficult for the Chinese to learn than other foreign players. “In the past every Indian trader went to China to buy Chinese-made no-label products, so that there was no need for the Chinese manufacturers to market themselves.”

According to Alam, the lingering negative perceptions Indian consumers have of Chinese products stem from this time. Indian traders would often bring back “cheap, low-quality goods from China, despite Chinese factories actually creating goods in all price and quality categories.”

Oppo’s embrace of cricket is evidence that Chinese companies are catching on. Counterpoint’s Srivastava says that Chi-

nese companies are now doing a lot right to dispel the negatives associated with Chinese-made goods—which is perhaps why Anju and Rishi have such different opinions.

“There is not a single corner in the country where there is not a logo of Chinese mobile phone brands, and they... hire famous Bollywood actors for promotional campaigns,” Srivastava notes. “This enables them to play on quality, so negative perceptions among consumers are eroding.”

Not everyone has taken on the lessons. Some older brands, such as the Haier Group, a white goods manufacturer, have been in India for decades without making efforts in marketing and localization. Srivastava says Haier failed to impress Indian consumers at the right time, “so now people see Haier as a brand that lags far behind the quality of LG, Samsung and the like.”

Alam believes there is more upside potential for Chinese companies in India. For example, while India imports much of its construction and home improvement materials, not a single Chinese brand in that sector has a significant presence in India. Chinese clothing and food brands, as well as motorcycles and cars, are not visible, either.

Political Headwinds

Increasing sentiment on the Indian side that the domestic industries need protection may hamper further engagement by Chinese companies in India, reflects Unlu of the EIU. “Given the significant differ-

ences in scale and connectivity with global markets, India clearly has an incentive to support its own companies.”

In this respect, China’s smartphone makers may be victims of their own success. When they snatched 51% of the total market in the first quarter of 2017, Indian competitors began demanding “anti-dumping” duties. “It looks as if India is being overwhelmed,” comments Srivastava. “So the government is coming under pressure from local companies to prevent foreigners from grabbing more market share.”

Such sentiments do not reflect the intricacies of modern supply chains. Thanks to Modi’s policies, 86% of mobile phones sold in India are manufactured there, compared to 15% in 2014. Foxconn Chennai has production lines dedicated to Oppo’s smartphone requirements in the country, as well as Huawei’s plant, also in Chennai. Xiaomi, in partnership with Foxconn, opened its second smartphone manufacturing factory in Andhra Pradesh in March, and Apple has confirmed it has started assembling iPhone SE units in Bengaluru.

Srivastava explained that Modi encouraged local production by raising tariffs of completely assembled mobile phones while keeping tariffs on components lower. He added that the Modi government is now focusing on attracting localized component production as well. Recently, however, India’s Ministry of Home Affairs blocked big-ticket investment plans by Shanghai Fosun Pharmaceutical and the Bank of China. This is seen as a response to growing anti-China pressure on Indian policymakers.

Political tensions are in the mix as well. Sino-Indian diplomatic relations have often been difficult due to a longstanding border dispute, while India still broods on what it believes was China’s decision not to support its recent bid to join the Nuclear Suppliers Group. The latest incident in the ongoing diplomatic slights was India’s boycott of the Belt and Road Summit held in Beijing this May. India claims China’s mega infrastructure plans ignore core concerns about sovereignty and territorial integrity.

“Every now and then, I am forwarded

The Chinese need to understand that if they are slower than others, they will miss out on the development of India



Irfan Alam
Member Secretary

India China Economic and Cultural Council

WhatsApp messages demanding the boycott of Chinese goods over diplomatic spats,” Anju, the office clerk from Delhi, says. Among the companies on the receiving end of such anti-Chinese sentiment is the Indian mobile wallet service company Paytm, of which Alibaba is the major shareholder.

In late 2016, opposition leader Lalu Prasad attacked Modi for “advertising” Paytm because it emerged as a major beneficiary of Modi’s currency reform campaign. The reform withdraws India’s two highest denomination bank notes, 500 and 1000 rupees, which equates to over 80% of the value of cash in circulation—the measures triggered India’s biggest-ever cash crunch.

Seemingly in reaction, Paytm confirmed in April that it was in talks with Japanese investor SoftBank. Getting SoftBank on board will help reduce the influence of Alibaba and thereby reduce potential political concerns about Chinese control in what is considered a strategically important sector.

Still Attractive

India is expected to overtake the United Kingdom in terms of GDP by 2020, making it the world’s fifth-largest economy behind the US, China, Japan and Germany. For Chinese companies seeking a foothold in this rapidly growing market, the signs remain upbeat. And attracting foreign manufacturers remains vital for Modi’s “Make in India” campaign as it relies on importing foreign technology and investment to create India’s own ecosystem for manufacturers and tech companies. India has also liberalized business visas in non-sensitive areas and removed China from the list of countries requiring prior referral, indicating that the political risks for Chinese companies are declining, not growing.

“I think the political risk for Chinese companies is not high,” says Xin Yuan, a Beijing-based China research analyst with EIU. “I don’t think India will resort to protectionism because the sectors most Chinese FDI (foreign direct investment) goes into are relatively open in India, and



Indian Prime Minister Narendra Modi arrives at the G20 in Hangzhou, September, 2016

because FDI is the major monetary source for economic development in India.”

Xin says “Make in India” should not harm Chinese companies. “China is losing its competitive edge as a low-cost manufacturing base, so many Chinese companies are seeking manufacturing opportunities in India, either on their own or through joint ventures with local counterparts,” she says.

Yet, while the reforms of the Modi government have made significant changes, entering India and doing business there remains notoriously difficult. Complex bureaucratic procedures, huge business startup costs and India’s great internal diversity can all be significant barriers. Not only do customs, culture and stages of economic development differ starkly between Indian states, but so do the bureaucracy, tax and tariff regimes. This means brick-and-mortar business presences are often necessary throughout the country.

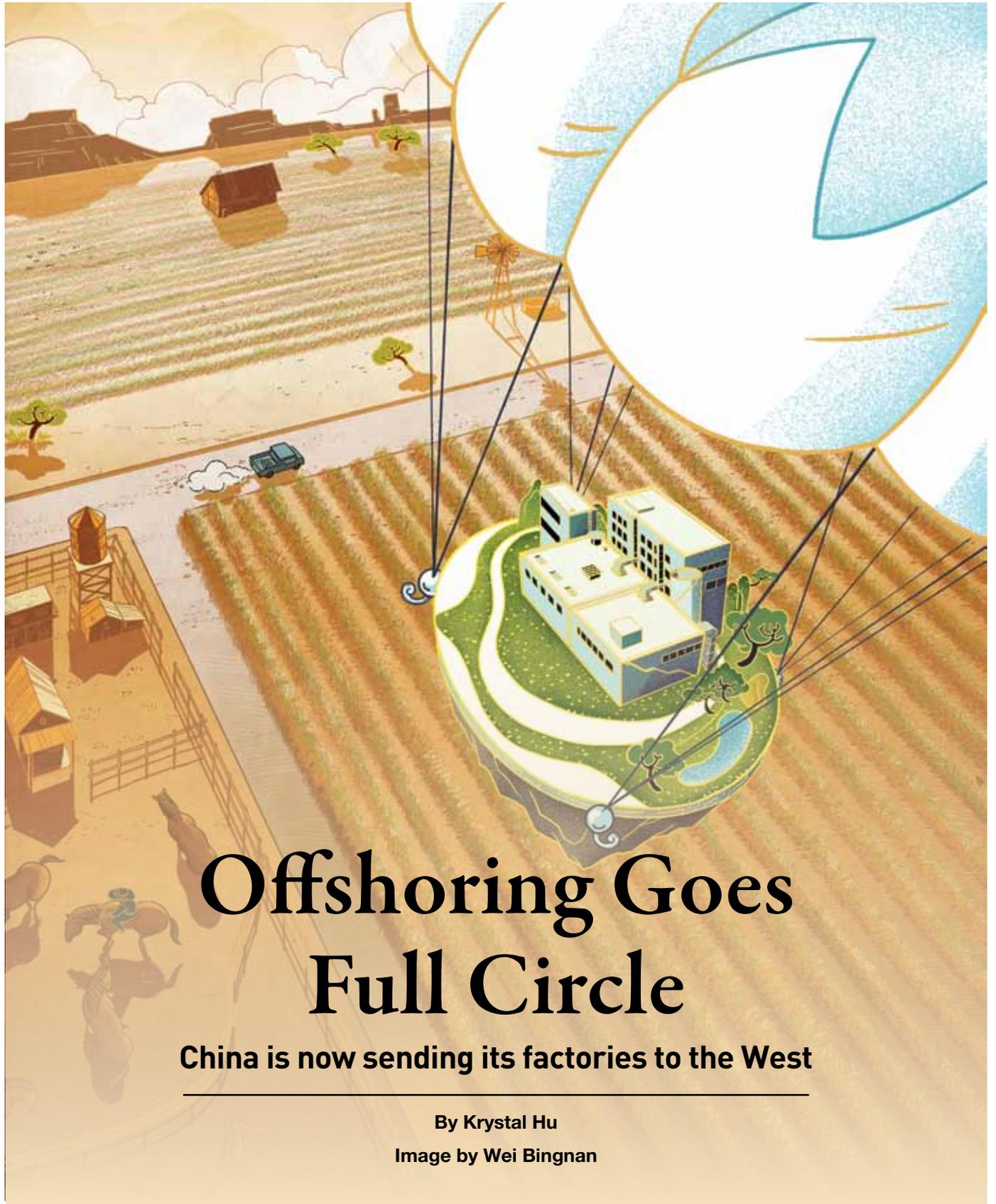
These difficulties were highlighted in a recent study by Dr. Wamser + Batra GmbH, a consultancy that supports German companies in India. The report found

that German small- and medium-sized enterprises with boots-on-the-ground subsidiaries perform significantly better than firms with other forms of engagement.

There is a risk of “no direct access to the customer, opacity in the business behavior of local business partners, insufficiently trained sales and service staff,” the report stated. Furthermore, no physical presence meant companies risked having no control over local activities, no influence on marketing strategies and, in turn, no influence on the fate of their own brands in India.

These hurdles are reflected in the World Bank’s Ease Of Doing Business Index in 2016. India ranks 130 out of 190 countries. China comes in at 78. “Things that are easy to do in China may be difficult in India,” says Alam of the ICEC, noting the slow progress of FDI from China in comparison to countries like Japan and Germany.

Nevertheless, he concludes, India is growing fast and there are many opportunities. “The Chinese need to understand that if they are slower than others, they will miss out on the development of India.” ■



Offshoring Goes Full Circle

China is now sending its factories to the West

By Krystal Hu

Image by Wei Bingnan

For decades, China was the top destination for foreign companies moving their operations abroad. But now it is Chinese companies that are shipping out of their home market in search of new business horizons

Lebanon, a small town with a biblical name located in the middle of Tennessee, recently celebrated the arrival of opportunity with a ribbon-cutting ceremony. The occasion was the opening in April of American Wonder Porcelain, a 46,000-square-meter ceramic tile plant. The \$150 million facility is expected to eventually provide more than 200 jobs for the community.

The investor, Wonderful Group, is a ceramics manufacturer based in the southern Chinese industrial hub of Guangdong Province. It is one of many Chinese firms now moving manufacturing to the United States to offset rising labor costs in China, and to expand new markets overseas.

“We’ve seen this trend since about 2009, but there’s been an uptick especially in the past two years,” says Cassie Gao, a Research Analyst focusing on China’s international trade and investment flows at the Rhodium Group. “In terms of dollar value, the top industries we see are automotive and other transportation equipment, chemicals, metals and basic materials.”

According to the Rhodium Group’s *China Investment Monitor*, Chinese companies are spending huge sums in the United States on new projects and expansions of existing subsidiaries. Between 2000 and 2016, Chinese firms spent \$8.6 billion in the US on 778 greenfield investments (that is, when a parent company builds a new foreign operation from the ground up). Last year alone, companies spent \$1.4 billion on 34 greenfield projects in various manufacturing sectors.

Fuyao Glass, China’s biggest maker of automotive glass, has invested over \$1 billion across the Midwest and opened a factory in Moraine, Ohio. Keer America opened a highly automated cotton-thread production facility in South Carolina in 2015, investing \$218 million. In the same year, Shandong Tranlin Paper broke ground on a \$2 billion plant in Virginia, which is expected to employ about 2,000 people by 2020.

Winwin International, a shoemaker based in Dongguan, Guangdong, is now working on relocating to the United States, which accounts for 60% of its business,

and the Yuhuang Chemical Company from Shandong Province is building a \$1.86 billion methanol factory in Louisiana.

“Chinese companies are going to the US because they believe they can lower the cost of production,” John Ling, President of the Council of American States in China (CASIC), told CNBC in an interview in May. CASIC facilitates dialogue and business between US state and local governments and China. “In certain parts of the US, the land will be much, much cheaper than in China.”

Lower prices for other resources like electricity, natural gas and logistics also make production in the US appealing to Chinese manufacturers, said Yao Yang, the Director of the China Center for Economic Research (CCER) at Peking University. Yang also believes efforts by the US government to promote foreign investment play a role in the move. “To attract Chinese companies, local governments in the US may offer very preferential policies in land and tax,” Yang says.

The overall trend represents an important step in China’s and, indeed, the world’s economic development. And the US is not the only place China is shipping production to—South-East Asia, known for cheap labor, just like China two decades ago, is also a destination. More importantly, signs point to this being the beginning of a trend that will continue to build.

Reverse Route

Since the beginning of the reform period, but particularly since it joined the WTO in 2001, China has become a manufacturing powerhouse. Cheap labor and input costs attracted textile and equipment factories. Shoe and clothing makers were the first to leave the US, and furniture and electronics manufacturers soon followed.

China soon became known as the “world’s factory,” in many cases producing cheap goods with imported parts for little added value. By 2013, 23.3% of all global manufacturing output came from China, according to the *Economist*. Between 2001 and 2011, the US lost an estimated 2.1 million manufacturing jobs to China, according to a 2012 report from the Economic

Policy Institute entitled *The China Toll*.

But the landscape in 2017 looks very different. Wages in China have risen substantially, and land and electricity prices are also up. This challenges China's decades-long global armlock on the mass production of goods at low cost.

While wages in China have been growing 10% to 15% every year since 2001, wage increases in the US have been much slower. Data from the US Department of Labor indicates a 2.0-2.5% annual increase. Boston Consulting Group's *Made in America, Again* project found that the estimated average manufacturing cost in the US in 2015 was only about 5% more than manufacturing in China. BCG projects that by 2018 it may be 2-3% cheaper to manufacture products in the US than in China.

Also not factored in were the substantially lower cost of land and electricity. These can be far cheaper in parts of the United States compared to Chinese manufacturing centers such as Guangdong. Industrial land costs about \$21 per square foot in Shenzhen, for instance, but only \$1.30 to \$4.65 in Tennessee and North Carolina.

This is the logic behind the move of Keer, the Chinese thread producer. Though labor costs in that industry in the United States are double the China rate, for Keer, US-based production is still significantly

cheaper. "In the US, land, electricity and cotton are all much cheaper," Zhu Shanqing, President of Keer, told CNBC in May. "My production cost per ton of textiles is 25% lower."

Another driver behind the shift across the Pacific is the general ease of doing business in the US. The financial system in China remains dominated by state-controlled banks and often regulated by opaque informal guidance from the government. Applying for loans from Chinese banks can be a lengthy process for business owners with strict collateral requirements, so many small- and medium-sized businesses in China rely on shadow financing. "We have to wait for a long time to borrow money from banks, which also requires a good relationship with bank managers," says Sun Guojin, a clothing factory owner in the inland province of Hubei.

By comparison, investing in the US is a breeze. Add to that the fact that the US is a huge market, and making goods close to the point of purchase makes sense for any business. "Chinese companies are building factories in the US so that they can be close to the market and save shipping costs," says Yao at CCER. "This also gives them flexibility to adapt to changing market demand."

The average annual disposable income in the United States is slightly more than

\$14,000, about triple that of China. And average daily spending by Americans is \$97 compared to \$7 in China where, according to the Goldman Sachs report *The Rise of China's New Consumer Class*, currently half of all spending is on food and clothing.

"Chinese consumers spend today's money, while Americans spend the money from tomorrow," explains Jill Qu, a Senior Manager at Deloitte and the Research Lead on China's manufacturing industry.

Brand Proposition

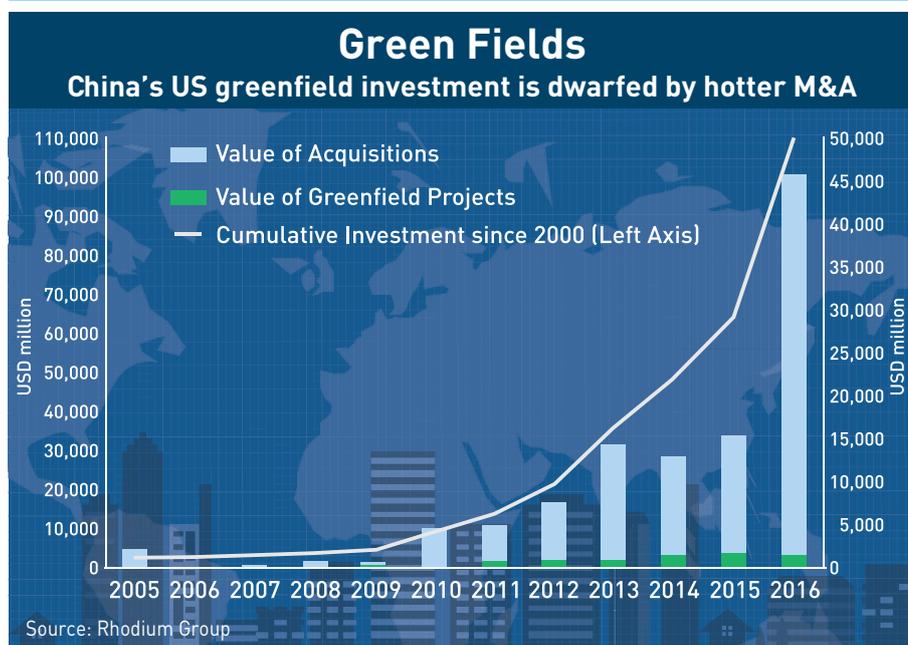
Addressing the US market effectively means that Chinese companies have to do more than just move manufacturing there. To move up the chain and offset the negative stereotypes attached to "Made in China," the Chinese government has been encouraging industries to upgrade and build brands. This is easier said than done.

"It can be really hard to persuade my clients to put faith in 'Made in China,'" says Peter Ragonetti, a New York-based industrial designer who works with American clients and factories in southern China. He notes that the level of experience and quality control that some Chinese factories have reached is quite high, yet negative perceptions persist. "They don't believe Chinese factories can produce high-quality products," he says.

Some Chinese companies have managed to build strong reputations overseas through good products and effective marketing. Lenovo acquired IBM's personal computer division in 2005, and has grown into a successful brand with over 20% of the global PC market. Another telecom giant, Huawei, is rolling out plans to conquer the US market. It has cast actor Justin Long, who played a Mac in an Apple marketing campaign in 2007, in a commercial for its Mate 9 handset, which will be released this year.

Another way to beat the China stereotype is to sidestep the definition. A product made by a Chinese company in the United States, after all, is "Made in the USA." "This label helps as consumers may consider it [higher value]," says Qu.

While American companies usually tout their American origins when selling



into the Chinese market, Chinese companies moving overseas tend to be less explicit about their “Chinese blood.” Wonderful Porcelain does not mention its Chinese parent company on its website, emphasizing that it is “an American company with international roots.”

Political Winds

There is yet one last, important reason for Chinese companies to move manufacturing to the United States: politics. During the presidential campaign last year, Donald Trump accused China of stealing jobs and “raping” the US economy, all while calling for a rejuvenation of US manufacturing.

“Bringing jobs back” was one of the President’s central planks. Trump also threatened to levy a 45% tariff on all Chinese goods entering the United States. The effect, ironically, may have been to spur Chinese manufacturing investment in the US.

“We may... see more Chinese manufacturing investment in the US if trade frictions result in additional tariffs being imposed,” says Gao of the Rhodium Group. She also pointed out that Trump’s plans to rebuild America’s infrastructure could be attractive to Chinese firms. “Infrastructure investment is one area with potential opportunities for Chinese investors if President Trump’s promise materializes.”

But regardless of how much media airtime is taken up by national-level politics, it is the attitudes and actions of state and local governments that are important in driving the trend. Chinese factories are welcomed across the United States for creating job opportunities and boosting local economies, and local governments are trying hard to win investors from China by providing incentives like tax preferences and even grants.

“Here in America, our local and state governments have been working together to diversify investments from foreign countries, and we appreciate investments from Chinese investors,” says Mayor Randall Hutto of Wilson County, Tennessee, where Wonderful Group’s new facility is located.

Mayor Hutto believes preferential tax policies are one of the big attractions for

Chinese investors, noting that there is no income tax in Tennessee. Further, corporations can enjoy up to seven years’ tax exemption if they provide enough local jobs. In contrast, China has a corporate tax of 25%, higher than the world average of 22.5%.

To express appreciation for the Wonderful investment, Tennessee Governor Bill Haslam visited the company in Dongguan last May. There, he signed a Memorandum of Understanding with the company’s CEO, Huang Jianping, strengthening the cooperation between Tennessee and Wonderful.

Many other US states have set up offices in China to attract investment, such as neighboring Virginia’s Economic Development Partnership office in Shanghai, which opened in 2011. The office helped Shan-

environmental permits, according to Tranlin.

“The company is finalizing its work on major project investment requirements and environmental studies,” Lisa Randall, Communication Director at Tranlin, said in an e-mail. This May, the company announced the project is again running months behind schedule because of new technology that the company wants to incorporate into the process. Tranlin expects the facility to be fully operational by 2020.

Moved to This Address

The United States is not the only place Chinese factories are moving to. In Europe, the pace of Chinese greenfield investment is increasing quickly. According to the European Commission, in 2015, China made up

To attract Chinese companies, local governments in the US may offer very preferential policies in land and tax

Yao Yang

Director, China Center for Economic Research, Peking University

dong Tranlin Paper launch its \$2 billion paper mill project in Chesterfield County, Virginia, by giving the company a \$20 million grant. The ground for the mill was broken in October 2015, and the project is the largest investment by a Chinese-owned company in US history. Tranlin is expected to eventually employ 2,000 people at the 850-acre site.

Not all is smooth sailing, however. Tranlin’s paper mill project has been delayed for almost two years, and the company has yet to receive the grant payout offered from the state. Operating in an environmentally-sensitive industry means the project has drawn attention from the beginning, and delays have been partly caused by complications in applying for more than 20

just 2.9% of total greenfield investment in the European Union, but that share quintupled to 15.4% last year, when €9.7 billion (\$10.1 billion) was invested.

The US remains the top greenfield investor into the EU with a 46.7% share and €29.5 billion (\$33 billion) in total in 2016. Chinese entities are increasing their presence there for the same reasons they are being enticed to the US.

Not all industries are moving to the West. Many firms in the low-value end of Chinese manufacturing, for example, the garment industry, are relocating to cheaper, less-developed neighboring countries, such as Vietnam. Not only is the cost of labor about half that of China, but Vietnam is taking extra measures to lure factories away

from China—Vietnam lowered the corporate tax rate to 20% last year.

According to analysis by researcher Justina Yung at Hong Kong Polytechnic University, the number of factories owned by Hong Kong companies in the Pearl River Delta near Hong Kong fell by a third to 32,000 from 2006 to 2013. Many of them have moved on in search of lower wages.

The trend is having an impact on business in China. Yao Yang, the economics professor from Peking University, worries about unemployment. “We need to see the negative impact of industry transfer,” he says. “Our government should stay neutral about moving factories overseas and encourage more manufacturers to move from southeast China to inland cities.”

For Lin Xiuquan, a female worker in a clothing factory in Guangdong, where the manufacturing industry accounts for about half of the GDP, the pain is real. She lost her job because the company she previously worked for moved its factory to Vietnam.

“I heard people there only make RMB 300 (\$44) a month,” Lin said. “There is no way we can compete.”

Advanced Future

The pace of factories leaving China for the US and elsewhere will increase in the coming years. According to the Rhodium Group, economic fundamentals point towards increasing Chinese foreign direct investment (FDI) of all types, including greenfield investments, into the US. As of December last year, Chinese companies had committed another \$7 billion to projects yet to break ground.

The 2016 Deloitte Global Manufacturing Competitiveness Index, which was conducted with 540 CEOs, concluded that the US could again overtake China as the world’s number one manufacturing nation by the end of this decade. A key reason behind the prediction is the rise of smart manufacturing. The CEOs believe the US is well placed with advanced technology and

scientific research capabilities to become the industrial hub in the smart manufacturing era.

Another survey report by Deloitte of Chinese firms, called *Transforming from World Factory to Smart Manufacturing*, shows smart manufacturing is still in its early stages in China. Compared to their American competitors, domestic manufacturers are slower to implement change due to internal management issues and high cost. Jill Qu adds that as new opportunities arise, “Chinese companies’ steps to explore production overseas may speed up.”

But the purest indication of the future comes from the manufacturers themselves—for many it is simply the next step. “We are committed to innovate our products and process to support future growth in the US,” said Wonderful Group CEO Huang Jianping, celebrating the company’s first overseas facility. “It’s a milestone for Wonderful Group to go out and make a world-class brand.”



April 2017 Ribbon-cutting ceremony for American Wonder Porcelain with CEO Huang Jianping (second from left), and Bob Rolfe, Commissioner of the Tennessee Department of Economic and Community Development (far right)

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THE WECHAT ECONOMY

China's most popular app wants to be even more indispensable

By Matthew Fulco

Image by Lisa Ye



Since its release in 2011, WeChat has expanded from being a mere messaging app to an all-purpose digital tool capable of everything from social sharing to investment, attracting hundreds of millions of users in the process. But parent company Tencent won't stop there

For Zhu Yile, WeChat is more than a handy accessory. The app has become a way of life. A Shanghai-based media sales manager and digital native, Zhu uses WeChat to chat with friends, share photos and videos, read news, pay bills, play games, shop and communicate with clients, colleagues and friends. Whether at home, work or on the move, she always has WeChat open on her smartphone.

WeChat, owned by one of China's largest internet companies, Tencent, has also dramatically reduced her use of voice calls and e-mail. "The group discussion function is especially useful when we want to have a quick chat with a client that doesn't require a face-to-face meeting," she says. "It's faster and more efficient than a conference call or sending a lot of e-mails back and forth."

Zhu started using WeChat in early 2012, about a year after its official launch. At that time, it had just over 350 million users. Today, it is ubiquitous in China with nearly a billion monthly active users as of Q1 2017, according to Tencent. The company also claims that 50% of users spend at least 90 minutes per day using the app. It seems that Zhu Yile is not alone in her reliance on WeChat.

WeChat arrived in the right place at the right time—the dawn of China's mobile internet era. Its frenetic growth has moved in tandem with the country's burgeoning smartphone market, which in 2013 became the world's largest. Backed by cash-rich Tencent, WeChat did not have pressure to generate revenues immediately. Instead, it was able to focus on building its loyal user base.

That strategy has borne fruit. WeChat is now able to monetize its legions of users by selling them games, attracting advertisers, and integrating online payment functions that encourage shopping through the app. In the third quarter of 2013, when Tencent was first trying to figure out how to monetize WeChat, company profits were RMB 4.3 billion (\$630 million). By the first quarter of 2017, Tencent's profits more than tripled to RMB 14.3 billion (\$2.1 billion), beating expectations and sending the company's share price to re-

cord highs.

With its digital payments feature, WeChat now has its eye set on becoming number one in China's lucrative payments market, long dominated by archrival Alibaba. The stakes are enormous: according to iResearch, a consulting firm, the value of third-party mobile payments in China more than tripled to RMB 38 trillion (\$5.5 trillion) in 2016. By 2019, they are expected to be over RMB 81.6 trillion (\$12 trillion).

WeChat Pays

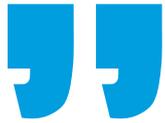
WeChat strives not only to be popular, but also indispensable. It seeks to deliver a mobile lifestyle tailored for Chinese smartphone users, serving as a platform for communication, content, gaming, shopping and even banking. The rest of the world has nothing like it.

"Outside of mainland China you need different apps to handle all the functions WeChat offers," says Jamie Lin, co-founder of the Taipei-based accelerator AppWorks and an expert on the mobile internet. He notes that Taiwanese share photos on Facebook and Instagram, chat on Facebook Messenger or Naver's Line (a Japanese app similar to WhatsApp), and use Apple Pay or a number of local providers for mobile payments. But in mainland China, "mobile internet users can do almost anything possible without ever leaving WeChat."

Integral to WeChat's rise as a dominant mobile ecosystem have been its payment functions. The WeChat Wallet, which includes WeChat Pay, comprises a selection of service providers that users can transact with after entering payment credentials. The first step is to link a bank card to one's user account in the Wallet menu. A user can then instantly complete a transaction throughout the WeChat ecosystem: on WeChat Wallet services, official accounts with products or services for sale, and affiliated promotions. Users can also use the Wallet to send money, and even to split a bill at a restaurant—all cash-free.

What really popularized the payment function was Tencent's clever co-opting of "red envelopes," the Chinese New Year tradition of giving red envelopes filled

I use WeChat like a bankcard to pay for restaurant meals, taxi rides and groceries



Rachel Chen
Recent college graduate

with cash. In a January report, the US business magazine *Fast Company* noted that WeChat’s payments users more than trebled in the month that followed the red envelopes’ debut during the 2014 Lunar New Year. Over that seven-day holiday, users exchanged 20 million red envelopes, which surged to 3.2 billion the next year.

“By injecting gaming mechanics into its digital version of red packets from the get-go, WeChat helped make peer-to-peer payments a new form of social communication: sending money no longer feels tacky but socially welcomed, with a message,” wrote Connie Chan, a partner at the Silicon Valley-based venture capital firm Andreessen Horowitz, in a July 2016 post. “These gaming mechanics also led to much higher usage of group chats.”

Online merchants have also been integral to WeChat’s ascendance. Many WeChat official accounts (a rough equivalent of Facebook corporate pages) started linking their “blogs” with WeChat stores in order to generate sales from e-commerce, according to WalktheChat, a consultancy that helps foreign firms build a presence on WeChat.

Game developers, media, content developers, governments, hospitals, and other organizations are encouraged to integrate WeChat Pay onto their service platforms. Their consumers can then make purchases with WeChat Pay, says Nephy Hu, an industry analyst with the Taipei-based Market Intelligence & Consulting Institute (MIC).

Businesses encourage the purchase of

their products and services through WeChat with incentives such as loyalty cards, membership schemes and discounts for paying online. The use of QR codes, an advanced bar code, makes it even handier—simply scan and send money.

Today, WeChat has over 300 million active users regularly using the payment functions (it launched in August, 2013.) “I use WeChat like a bankcard to pay for restaurant meals, taxi rides and groceries,” says Rachel Chen, a recent college graduate. “It’s very convenient for me because I don’t have any credit cards.”

Tenpay, which powers the Wallet, charges users a 0.1% transaction fee for withdrawing sums above RMB 1,000

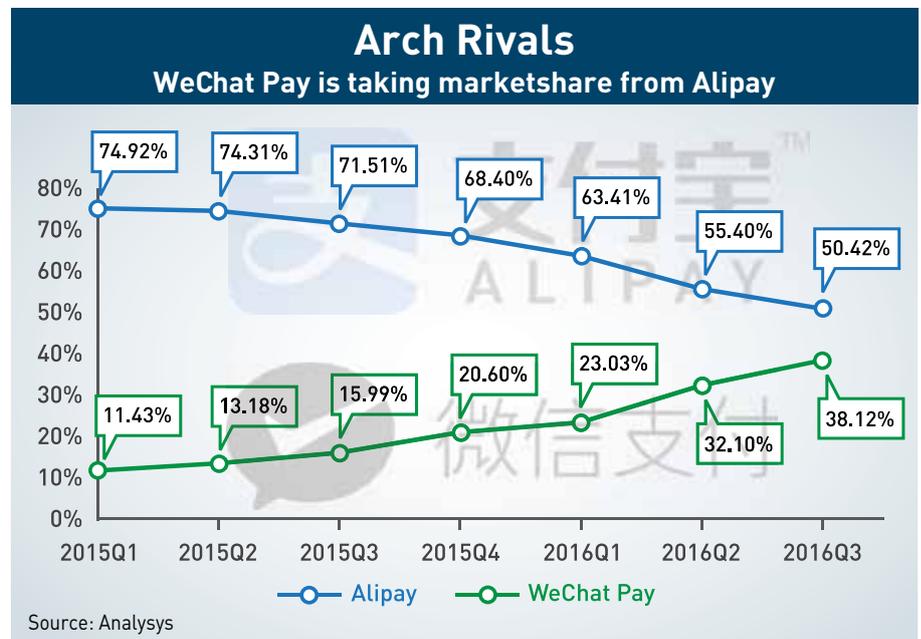
(\$147.11) from their WeChat accounts. It is easy to avoid the fee: simply leave the money in the WeChat balance or use it within the WeChat world. Observers say the fees encourage users to keep money circulating within the WeChat Wallet ecosystem and encourage spending it within the system.

Global Ambitions

With its strong presence in China, WeChat is naturally seeking to expand overseas, and some analysts are optimistic about its prospects. “The rise of technologies and connected networks in developing countries will become major growth drivers for WeChat,” says Julia Chiu, an industry analyst at MIC.

In Southeast Asia, WeChat is not the largest instant messaging app, but it has succeeded in building a strong presence in Myanmar and Malaysia, she notes. “The market conditions in Myanmar and Malaysia are favorable for WeChat as those countries have a large number of merchant stores that target Chinese customers and tourists,” Chiu says. “In Malaysia, the Chinese population accounts for 23% of the total population and they rely heavily on WeChat for family and interpersonal interactions.”

Further, WeChat has launched a service platform in Myanmar based on the Myanmar language and has successfully part-



nered with local players to increase its user base there, she adds.

Elsewhere, however, WeChat’s expansion has not gone so smoothly, even in markets close to mainland China geographically and culturally. In Taiwan and Hong Kong, most people using WeChat are those with friends and business partners on the Chinese mainland. And they typically use the app only to communicate with people based in the mainland, but not with each other.

“WeChat is still primarily used by the mainland Chinese population, and has not expanded well globally,” says Zhong Zhen-shan, Vice President of Enterprise Research at IDC China, a research firm.

To be sure, the international version of WeChat lacks many of the seamless qualities of the Chinese one, and works more like an ordinary messaging app. But even if it did offer more features to Taiwanese users, they may not use them. “Taiwanese like different apps for different things, so the idea of a single mobile ecosystem to handle everything isn’t so attractive,” says Lin from AppWorks.

In many developing countries, WhatsApp has been more successful than WeChat, Lin says. “WhatsApp goes for market share first and functionality second. They keep the platform light to begin. It’s effective in building up a large user base quickly.”

Further, the WeChat user experience is inconsistent outside of China, Lin observes. “The Great Firewall of China is a problem,” he says. “Since the servers are all based in China, WeChat simply works better for users who are within the confines of the Chi-



nese internet.”

In some cases, WeChat has failed to do its homework on the countries where it expands to. In May, Russia blocked access to WeChat for several days because the company failed to provide its contact details to the Russian communications watchdog. “Russian regulations say online service providers have to register, but WeChat doesn’t have the same understanding (of the rules),” a Russian official was quoted as saying in an Agence France Presse report.

Despite such setbacks, WeChat remains undaunted. In April, the company expanded to the UK and plans to set up operations in continental Europe next year, but the focus will be as much on Chinese users as

Europeans.

“The main reason for WeChat to expand to Europe is to allow European brands to sell products internationally on its platforms,” says Chiu from MIC. “This not only helps European stores to increase sales in China, but also serves Chinese consumers visiting Europe.”

In an interview in May with the *Financial Times*, Tencent’s European Director Andrea Ghizzoni noted that close to 95% of luxury brands now have a presence on WeChat, up from 75% in 2015 and 50% in 2014. WeChat’s expansion to Europe could also provide small- and medium-sized retailers with an effective channel to enter the Chinese market by helping reduce the cumbersome process of gaining sales approval for products in China.

By doing so, more users in Europe can access retailers’ store and product information more directly, “thereby enhancing WeChat’s importance worldwide,” Chiu says. IDC’s Zhong agrees: “WeChat’s massive user base... is full of potential for any company operating in China,” he says.

In May, Chinese business magazine *Caixin* reported that Tencent is aggressively trying to build up its network of merchants that accept WeChat pay in the US,

Outside of mainland China you need different apps to handle all the functions WeChat offers

Jamie Lin
Cofounder, AppWorks

but again, the reason is largely domestically focused. Chinese tourists spent \$261 billion on outbound travel in 2016, with the United States a top destination. Tencent wants to make some of that spending abroad more convenient, and of course capture some of the money at the same time.

Home Game

Back on its home turf, WeChat has a different set of priorities. With a strong foothold in so many aspects of Chinese users' lives, the next step is to become even more indispensable. To what degree is that possible?

In the mobile payments segment, Tenpay, Tencent's behind-the-scenes service powering WeChat Wallet, has grown exponentially over the past few years, leading some observers to predict it will eventu-

Hu says. As WeChat users spend an increasing amount of time on the app, with Alibaba offering nothing comparable to lure them away, "WeChat's threat to Alibaba is increasingly acute."

However, to win really big, WeChat would need to overcome the enduring popularity of Alibaba's Taobao platform, the top online marketplace in China. Users cannot pay for transactions on Taobao with Tenpay.

Rachel Chen, who regularly shops on Taobao, says she's happy to use WeChat and Taobao for different things. "Of course, WeChat doesn't want users to leave their ecosystem, but they can't force me to stay," she says. "When I need to buy something online, the first app I think of is Taobao." With Taobao's huge selection of goods, she

adopting WeChat Enterprise. "WeChat Enterprise has become essential for foreign firms in China as it serves as an important internal communications channel between the enterprise and the employee," says MIC's Chiu.

Meanwhile, analysts say there is one thing that could potentially make WeChat much more dominant than it already is: mini-apps. Introduced in 2016, these mini-programs are similar to apps on Google's Android operating system and Apple's iOS, but use much less data. They include familiar tools like ride-hailing, buying movie tickets and applying filters to photos. "The goal is to greatly increase the things users can do inside WeChat, to the extent they never have a good reason to leave the platform," says AppWorks' Lin.

However, in January, WalktheChat's Thomas Graziani questioned the viability of the mini-apps. WeChat mini-programs require developers to write in a Tencent proprietary language. "Setting a new development standard might well keep WeChat mini-programs from going mainstream," he wrote. At the same time, the mini-apps have no official store, "leaving all the responsibility of discoverability to the publisher."

Graziani compares the WeChat mini-apps unfavorably to Google's Android Instant Apps. The latter, which can be accessed instantly without installation to a mobile device, boosts interconnectivity among different apps, he notes. In contrast, "WeChat is about reducing this interoperability by constraining everyone to its own ecosystem."

Even if the mini-apps flop, it is uncertain whether WeChat's business will be impacted, given its universality in China. Still, as a cautionary note, AppsWorks' Lin points to the preeminence of Microsoft's MSN Messenger during the PC era a decade ago. "MSN had hundreds of millions of users globally and earned a lot of advertising revenue," he observes. "But it completely missed the transition to smartphones."

Can WeChat avoid the fate of MSN? "Let's just say WeChat will be dominant until the next paradigm shift," he concludes. 

WeChat's threat to Alipay lies in its integration of payments with social communities



**Nephy Hu
Analyst**

Market Intelligence & Consulting Institute

ally surpass Alibaba's Alipay. Alipay was launched in 2004 to support online payments for Alibaba's e-commerce platforms, and in 2014 became the world's largest online and mobile payments platform.

Today, Alipay remains the market leader in China with a 54% market share in the quarter ending December 2016, but that figure fell sharply from 71% in the third quarter of 2015, according to Chinese research firm Analysys. Tenpay's share, on the other hand, reached more than 35% in the fourth quarter of 2016. Its functionality is on par with Alipay, but its edge comes from how it fits into the whole WeChat platform.

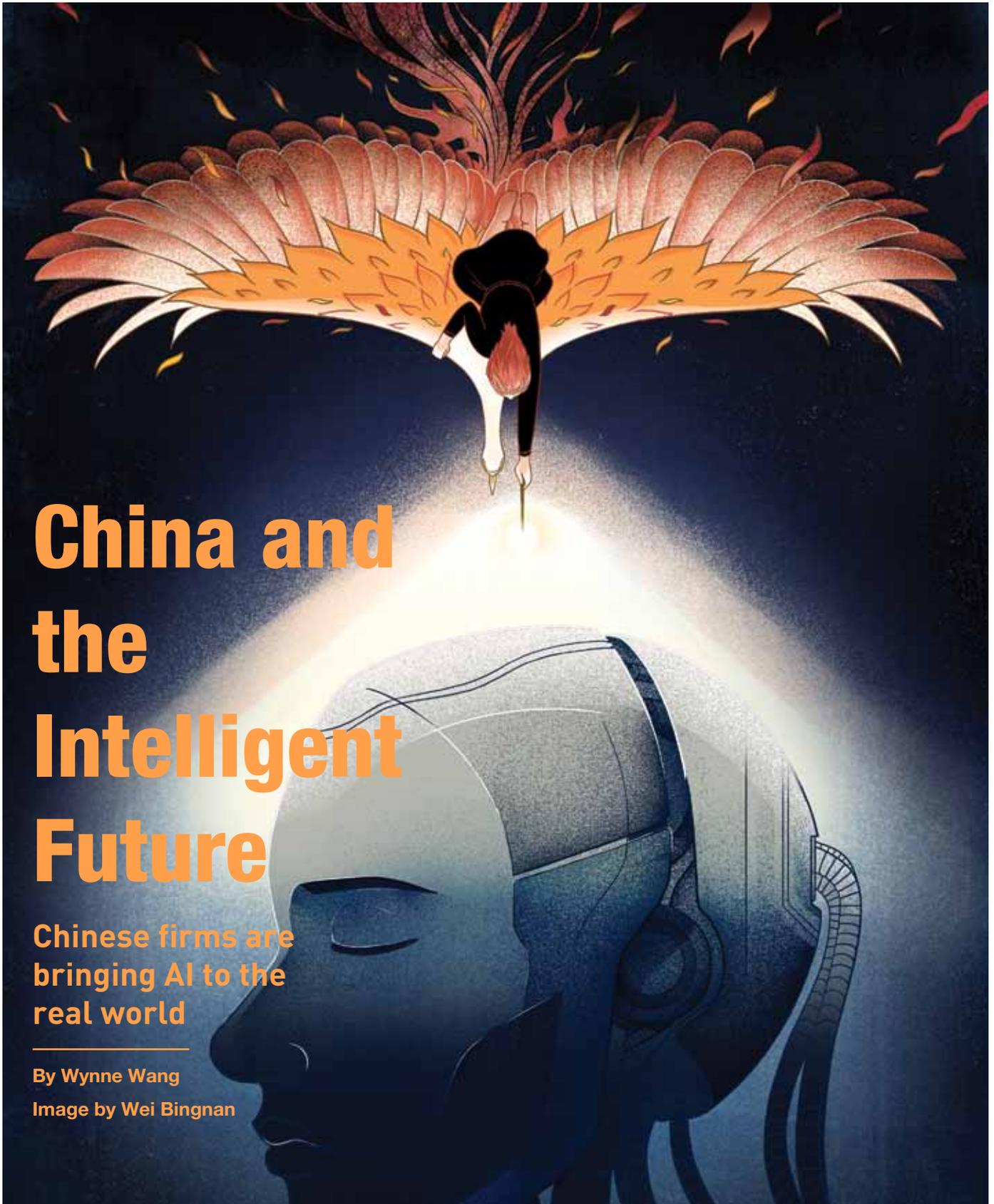
"WeChat's threat to Alipay lies in its integration of payments with social communities and instant messaging services,"

says, "It's more convenient for buying cosmetics, clothing and electronics."

But while the future of that all-important battle is uncertain, WeChat is simultaneously addressing other opportunities to boost engagement. One such effort is an attempt to tap China's growing enterprise messaging market with WeChat Enterprise.

WeChat's Enterprise accounts allow a company to set up forums, similar to the channels in Slack, a popular work collaboration app. Unlike individual WeChat accounts, the Enterprise accounts must be purchased. On the accounts, firms can conduct payroll management and enterprise-to-enterprise transactions, for which WeChat charges a 0.6% fee per transaction.

And it is not just Chinese companies



China and the Intelligent Future

Chinese firms are
bringing AI to the
real world

By Wynne Wang

Image by Wei Bingnan

The United States is the undisputed leader in developing artificial intelligence technologies, but China is a very important second. While not on the cutting edge of research, Chinese companies are implementing AI in ways that will change the world

Anyone who has ever tried to transfer large sums of money from one account to another in China knows how frustrating the experience can be. The standard procedure is to go to the bank in person, queue up, present your ID card, fill out lots of paperwork and then, depending on the length of the queue, wait an hour or more for it to be processed.

Not anymore, thanks to AI (artificial intelligence). China Merchants Bank, a major bank in China, recently released a new version of their mobile app that allows customers to transfer large sums from anywhere and to have transactions securely verified by face scan using artificial intelligence. The whole process takes about a minute.

“The app is quite smart,” says Lily Zhao, a busy woman in her early 30s in Shanghai who uses the technology. “It asks to scan your face if you’re not using your own phone or if it suspects anything unusual—even if you are transferring a small amount of money.”

The company that developed the AI-based facial recognition used by the bank’s app is Chinese. Yitu Technology was founded in 2012, received angel investment the next year from ZhenFund, a Chinese venture capital firm, and later secured additional funding from California venture capital giant Sequoia Capital, among others. In addition to banking security, Yitu provides facial recognition capabilities to Chinese customs to help identify known smugglers, as well as technology to manage city traffic.

Silicon Valley may hog the AI limelight, but startups like Yitu, along with tech giants like search company Baidu, are making China a strong competitor. “China is pioneering in several AI sectors such as voice and face recognition and the technologies are well incorporated into real-world uses,” said Lu Yanxia, Research Manager for China’s Enterprise System and Software Research at IDC, a market intelligence firm. Her focus is big data and artificial intelligence.

According to a McKinsey Global Institute research report titled *Artificial Intelligence: Implications for China* published in April, “China is one of the leading global hubs of AI development.” China’s advan-

tages include its vast population and a diverse industry mix that has the potential to generate huge volumes of the data needed to feed AI systems. That population also provides an enormous market for AI-related products.

Tech giants like Baidu and Tencent are pouring billions of dollars into AI research and China has a slew of startups that are attracting funding from both local and international sources. From 2015 to 2016, 226 AI companies obtained investment capital at an average amount of RMB 40 million (\$5.9 million), according to a research report from 36Kr, an internet media company focused on startups.

MOZI Health, a Shanghai-based company founded last year, is among them. The company uses AI to assist in drug discovery. “It is kind of like the Wild West,” says Kent Zaitlik, the 29-year-old founder and CEO of MOZI Health. “We have the opportunity to become a number-one company here in China.”

It is not just private money that is feeding the boom. “We also noticed strong support from the government,” says Lu. The Chinese government has vowed to invest \$15 billion into the AI industry by 2018. It hopes to nurture world-class companies to compete with the likes of Google and IBM in building intelligent machines. It also singled out the AI industry as a key area of development in a report released during the National People’s Congress last March.

Even foreign companies are becoming involved. Volkswagen, the German automaker, announced a \$180 million investment into Chinese AI firm Mobvoi in April. The tie-up will focus on implementing Mobvoi’s AI technology, such as its voice recognition feature and a smart rearview mirror, to improve the driver experience.

Yet, despite all the positive developments, the AI sector in China faces huge hurdles, especially in terms of talent. And while some areas are surging ahead, others like self-driving cars lag well behind the market leaders. Some analysts also fear that, with the amount of money being poured in, a bubble could be growing.

Natural Advantages

The term “artificial intelligence” can conjure up frightening images of a world where machines lord over their human servants. Think of HAL, the homicidal robot in *2001: A Space Odyssey*, the works of Isaac Asimov or the apocalyptic Skynet system in the *Terminator* films. Incidents such as the triumph of Google’s AlphaGo over Ke Jie, the world champion of Go, China’s ancient abstract strategy game, in a three-match playoff in China in May hardly allay such fears.

Yet, visions of such advanced self-sustaining robots remain firmly embedded in popular sci-fi. Where we are today is more about intelligence amplification. Instead of autonomous machines functioning in a manner detached from humanity, intelligence amplification is humanity leveraging computing power to enhance its own abilities—such as to make faster, more secure bank transfers or assisting in medical diagnoses.

This is where technology is becoming dramatically transformative for our world. Underpinning these developments is the idea of machine learning. Simply put, a modern computer program has the ability to find patterns in data and then, as it receives more data, gradually become better at that pattern recognition. That is, it can “learn” on its own through a feedback loop that as-

sesses how humans react to the information it presents.

This process is how AlphaGo became the greatest Go champion ever, and how Yitu continues to improve at recognizing faces. Such machine learning requires three elements: advanced algorithms, powerful hardware capable of processing huge amounts of data quickly and the raw data itself. In the world of cutting-edge AI development, the first two are easy to access. What is more difficult is obtaining the raw data.

“It’s not who has the best algorithm that wins. It’s who has the most data,” runs an AI science truism often attributed to Andrew Ng, one of the world’s leading scientists in the field. Ng founded the Google Brain project and led Baidu’s AI team as Chief Scientist from 2014 to March 2017.

With about 731 million internet users, more than half the total population of the country, China generates more data than most other countries. This data is collected from online content and browsing, interactions with apps, digital purchases, sound libraries and other digital interactions. Sometimes it even comes directly from the Chinese government.

“China’s security department offered some Chinese AI companies [access] to a database of 1.6 million faces,” said Jiang Wei, a venture partner with ZhenFund. The company is a seed fund founded in 2012 by

Bob Xu Xiaoping and Victor Wang Qiang, co-founders of the language training company New Oriental, in collaboration with Sequoia Capital China. The focus of ZhenFund is technology, media and telecommunications (TMT).

Apart from any provision of data by the government, Chinese people are generally less touchy about privacy issues. “Chinese attitudes on privacy are slightly different from the West,” Jiang says. More Chinese are likely to accept a tradeoff concerning use of their personal information than in the West, as long as they get a convenient, functional app in return. Access to data helped facial recognition companies develop AI that can identify faces with low error rates, even under adverse weather conditions or with different garments.

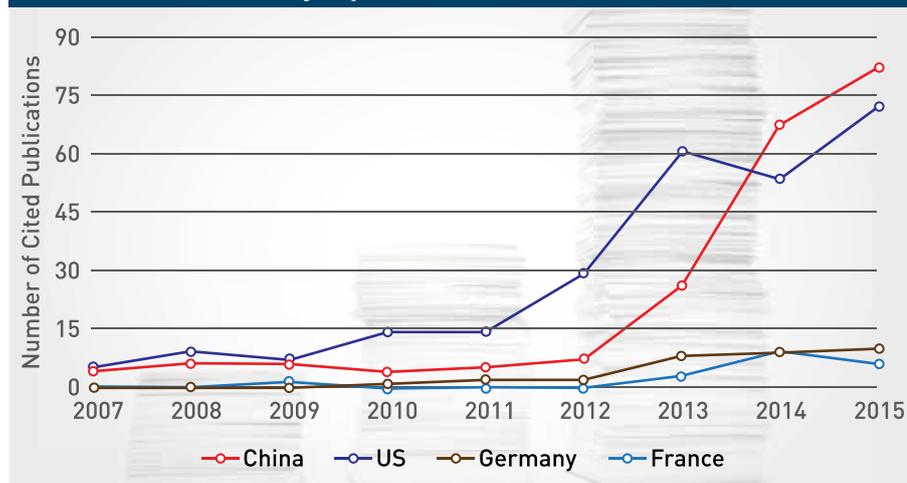
Voice recognition technologies developed in China are among the most advanced in the world. *MIT Technology Review* ranked Baidu at No. 2 on its “50 Smartest Companies 2016” list because of work on speech recognition and conversational interfaces (think Apple’s Siri or Amazon’s Alexa). Baidu recently rolled out Deep Voice 2, which a Baidu spokesperson said “can learn the nuances of a person’s voice with just half an hour of audio, and imitate them perfectly.”

Access to voice data is a key reason behind the success. “Chinese tech giants have advantages in access to large voice databases,” says Jiang. Baidu is able to collect raw voice data through its various apps and services. Tencent, a competitor also investing heavily in AI, has similar access to voice and other data via its WeChat app. WeChat users last year made an average of 100 million calls per day (see article pages 20-24), all of which were recorded on WeChat’s servers.

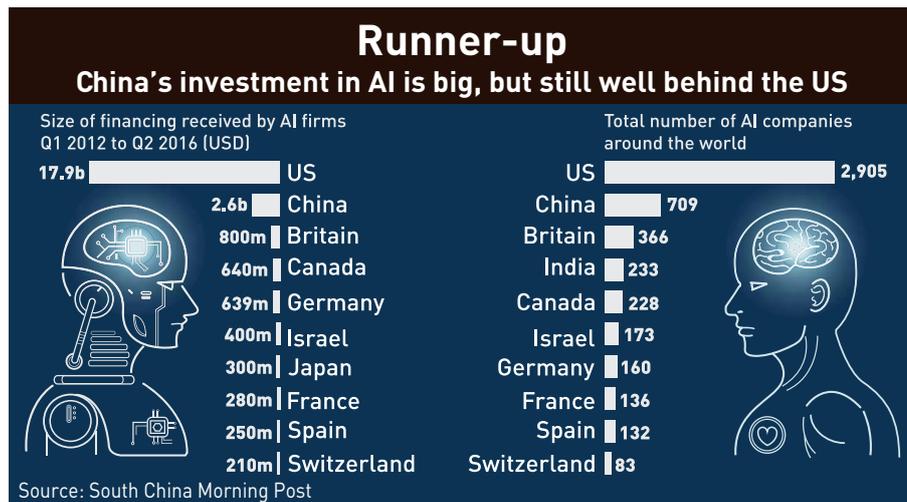
The strategy for such tech giants is to produce valuable, revenue-generating services, and the prospect of all that revenue has attracted big-ticket investment in R&D. According to the Baidu spokesperson, the search giant began investing in AI six years ago, “before any other Chinese company did.” Baidu now employs 1,300 people working on AI, and has spent \$2.9 billion on R&D over the past two and a

Paper Pushers

China is a major producer of AI scientific research



Source: US Office of Science and Technology Policy



half years, mostly on AI. Tencent has 50 AI scientists in its WeChat lab. Alibaba has also begun to develop its AI capabilities, but as a direct offering to customers. The company aims to create a cloud-based, AI-driven service that will help companies analyze their data.

“AI is definitely going to be a huge moneymaker for everyone,” says Zaitlik. “It will create new industries, it will change current industries, it offers huge opportunity to save money, to cut costs, and also to vastly increase funds and cashflows for current operations.”

Changing Lives

As amazing as this all is from the business perspective, AI is also making a much deeper impact by saving lives. In this field, the area of AI-assisted healthcare, China is also at the forefront although, admittedly, often because of sheer drastic necessity.

“Doctors in small and local Chinese hospitals often lack advanced skills,” says Lei Ming, former co-founder of Baidu and Director of the Artificial Intelligence and Innovation Center at Peking University. “AI diagnosis assistance can hugely improve medical care quality... and relieve pressure in large hospitals.”

Real tools are already available. In April, the Zhongshan Ophthalmic Centre in the southwestern city of Guangzhou began using the “CC-Cruiser,” an AI-driven diagnostic program that spots a rare form of cataract. In just a few short months, CC-

Cruiser diagnosed more than 300 cases—with 93% accuracy.

“We first targeted congenital cataracts as it’s such a rare disease that many doctors may not have any experience with it,” says Lin Haotian, leader of the AI team at the hospital. Professor Lin said the Zhongshan Ophthalmic Centre has accumulated more than 2,000 cases involving congenital cataracts to train the AI platform. The number, while seemingly small, actually represents the world’s largest dataset concerning this disease, he says.

The Centre expects the AI platform will learn to diagnose more common eye diseases in half a year and be able to direct patients to appropriate doctors. As China’s best ophthalmic center, Zhongshan’s doctors serve thousands of patients every day. Professor Lin says the tool will save time by directing patients towards the best specialist for their cases, enabling more patients to be treated.

Another Chinese AI medical technology company is Airdoc, a Beijing-based startup focused on medical image analysis. The company worked with Shanghai Changzheng Hospital to implement Airdoc DR to screen for diabetic retinopathy, a diabetes complication that causes blindness. The technology was unveiled in May at the Microsoft Build 2017 developer conference.

“There are 100 million people with diabetes in China,” said Wei Ruili, Director of Ophthalmology in Changzheng. In a video produced for the Microsoft conference, Dr.

Wei said early diagnosis is critical because once patients display symptoms it may already be too late to save their vision.

According to Airdoc, there are only 36,000 ophthalmologists in China, or one for every 39,000 people. In the United States, there is roughly one for every 13,000 people. This shortage places a heavy burden on hospitals and doctors that specialize in the field and it makes the plight of patients seeking treatment difficult. To help speed up diagnosis, doctors from the hospital are helping to perfect the AI application.

“Experienced doctors tag [images of diseased tissue]. Tags agreed on as indicating the disease by most doctors are then used to train our AI platform,” says Ray Zhang, CEO and co-founder of the company. Airdoc says the system’s diagnostic capabilities in some areas, such as in retinopathy, are beginning to approach human professional-level accuracy. In addition to working on eye diseases, Airdoc is also cooperating with hospitals to develop AI for skin treatment and other areas.

Sticking Points

Although China has made some stunning developments, it still faces significant hurdles. “China is moving fast in integrating advanced technologies into [real] uses [for customers],” says Lei Ming, but it is still behind in terms of theory. “We lag behind big US corporations and academic institutions in terms of... leading edge research.”

According to the same report from McKinsey Global Institute research, China and the US are the world leaders in AI development. In 2015 alone, they accounted for nearly 10,000 papers relating to AI published in academia journals. Yet, although China produces a large number of widely cited AI-related papers, the United States and United Kingdom are far more influential.

McKinsey Global Institute said China lacks the vibrant AI ecosystem of the US, which has produced substantially more AI startup companies than China. The US ecosystem is large, innovative and diverse and has advantages based on the well-established strengths of the Silicon Valley tech world, such as talent pools, incubators and funding.

“They [China] are not up to par yet with Silicon Valley,” says Zaitlik. “This is definitely changing, but I think China has a ways to go before they can actually reach that [level].”

That is why China’s AI community reacted with shock when Andrew Ng stepped down as Chief Scientist of Baidu in March. In his resignation letter, Ng noted that while China is good at inventing and quickly shipping AI products, the US is very good at inventing new technologies. As such, his departure from China raised questions about how Chinese companies and institutions can become cutting edge.

One important AI frontier is autonomous cars, and China is visibly lagging in this field. While Waymo, the self-driving company of Google’s parent, Alphabet, is already offering an early rider program to transport passengers in real traffic, Chinese counterparts are stalled at a far earlier stage.

In June 2016, Baidu CEO Robin Li disclosed a five-year goal for the mass production of driverless vehicles, but analysts wonder if the departure of Andrew Ng has disrupted plans, especially as Baidu is taking its self-driving research to the West. In March, Baidu announced it is expanding in Silicon Valley, with a new office in Sunnyvale, California, aimed at autonomous driving research.

Baidu is also trying to remedy the situation with “Project Apollo,” launched in April, which opens up the company’s driving technology to developers. The company spokesman said it is aimed at “creating a robust ecosystem, encouraging the AI community and partners to grow.”

Didi Chuxing, the ride-hailing firm, is also moving West. After absorbing Uber’s China business, Didi opened its own AI lab in Silicon Valley, creating a distinct unit to drive research for intelligent transportation. Didi has already poached a number of engineers for its new lab, including Charlie Miller (formerly of Uber’s autonomous vehicle security unit) and Jia Zhaoyin, a senior software engineer at the Waymo unit of Alphabet.

Companies are also aggressively hir-

China is moving fast in integrating advanced technologies into [real] uses [for customers]

Lei Ming

Former co-founder of Baidu
Director of the Artificial Intelligence and
Innovation Center, Peking University



ing in the US, with a preference shown for young Chinese talents who received higher education in the US. Baidu hired Lu Qi, a veteran Microsoft artificial intelligence specialist, to act as Chief Operating Officer earlier this year. Similarly, Tencent, developer of WeChat, hired Zhang Tong, a Stanford-trained researcher to lead a team of 250 researchers and engineers and has begun investing in AI companies based in the United States.

For Kent Zaitlik, whose MOZI Health startup lacks the resources of the cashed up technology giants, it is an uphill battle to find suitable talent. “It has been a huge problem and I still haven’t found the people we need in China,” says Zaitlik. “People here lack many of the essential skills required.”

Too Hot?

Whether struggling for suitable talent or not, AI is still a top priority in China. Earlier this year, AI became a component in the Chinese national scientific and technological innovation strategy planned out until 2030.

The Chinese Association for Artificial Intelligence is also pushing for higher academic status for AI courses, such as machine learning and computer vision. Chinese academic institutions are competing for space against the far more accessible online American education hubs.

The wave of interest that this all has inspired has nurtured hundreds of AI startups in China. It does not seem to matter if these startups will ever deliver on their

revenue promises—their valuations still seem to rise inevitably. In a survey published in late 2016 by AI Era, an online AI hub in China, 98 AI companies interviewed were together valued at RMB 101.4 billion (\$15 billion), with an average valuation of roughly RMB 1 billion (\$147 million). And yet only 32 of the companies reported revenue from the previous year, with an average of RMB 20 million (\$2.9 million) each.

“I met someone in underwear manufacturing who claimed to be from an AI company,” Kai-fu Lee said in a public speech in March, according to Xinhua News Agency. Lee, a former Microsoft and Google executive who is now Chief Executive Officer of Sinovation Ventures, said, “It’s extremely abnormal. There are serious bubbles arising in artificial intelligence.”

Although China is yet to experience high-profile AI busts, this could easily occur. “Investors expect too high a return on investments, and valuations of Chinese AI enterprises are much more expensive than those in the US,” said Wang Xiaochuan, Chief Executive Officer of Chinese internet company Sogou, at the Boao Forum in March.

Kent Zaitlik of MOZI Health is more positive. Although AI in China is running hot right now, he expects the future to be a more slow-but-steady development. “The opportunities here are immense,” he says. “And China has the hunger and need to develop technology such as this over the long term.”





Less-than-Rational Actors

Daniel Kahneman, grandfather of behavioral economics, talks about how the field came to be and the impact it has had

By John Christian

Traditionally, the field of economics assumes individuals in markets to be rational—that is, always inclined to act out of their own self-interest to maximize personal gain. Reality, of course, is a bit more complex and thanks to biases, emotion and blindspots, people sometimes make decisions that appear to be quite counter to their own interests. In recent decades, a new way of approaching economics, one which tries to take these realities into account, has emerged: behavioral economics.

The field has become very popular and its influence has spread to the world of government and policy, which attempt to use the insights into our less-than-perfect decision-making approach to influence (or “nudge”) people into doing what they wouldn’t necessarily have chosen to do.

Psychologist Daniel Kahneman, with his research partner Amos Tversky, helped pioneer the ideas that became behavioral economics. In 2002, he was awarded the Nobel Memorial Prize in Economic Sciences for the wide-reaching impact of his work. In this interview, Kahneman talks about the history of his research, how psychology came to be a part of economics and the impact it has had on the world.

Q: Together with Amos Tversky and Richard Thaler, you invented the field of behavioral economics. When you were first doing your work in the 1970s, did you have a sense that what you were doing was revolutionary?

A: Absolutely not. However, I should correct your statement. Amos Tversky and I certainly did not invent behavioral economics. If anybody invented behavioral economics it is Richard Thaler. At most [Tversky and I] were the grandfathers or godfathers, as both of us were psychologists, not economists. Richard Thaler is an economist, and he really introduced our ideas into economics.

Q: So then what were your thoughts when these ideas were being introduced into economics?

A: In the first place, we were not primarily interested in influencing economics. We

were psychologists. We published our main article, the most important one it turns out, in *Econometrica*, which is an economics journal. The reason we published it there was not to influence economics, but because at the time this was the most prestigious journal in decision theory. We had a decision theory paper, so we sent it to the best journal available. That made our work visible to respectable economists. It made a very big difference because if we had published exactly the same article in a psychology journal, it would not have had nearly the same influence on economics that it had.

Q: Was the impact immediate, or was it more of a gradual growth?

A: It was quite a slow process. There were a few landmarks along the way that I could mention. One important early figure was Eric Wanner. In 1983, he was working at the Alfred P. Sloan Foundation, and he was interested in bridging psychology and economics. The first grant that he gave was to Richard Thaler to spend a year with me in Vancouver. That year was very important, I think, to the development of behavioral economics. I collaborated with Richard and with another economist. I learned a lot of economics, and our publications during that year were in economics journals. We published about the endowment effect, which has become very important, and we published about fairness. These eventually had a significant impact.

Then I think the most important thing, and one that few people know about, was the role of Nobel laureate Joseph Stiglitz—he was not a Nobel laureate at the time. In the 1990s, he was the editor of the *Journal of Economic Perspectives*, which every member of the American Economic Association receives as part of their subscription package. Joe Stiglitz invited Richard Thaler to write a regular column. They ran under the title “Anomalies,” and they were all challenges to established economic theory—Richard Thaler wrote them brilliantly. He always had a co-author who was a respected person in the field, and the articles were highly readable and almost invariably funny because Richard has an excellent sense of humor. They were read by everybody. I think that it was primarily those columns that made people in economics aware of behavioral economics, aware of Richard Thaler and aware that something useful was going on that was a challenge to standard economics.

Q: How does challenging the idea that people are rational challenge economic theory in its entirety?

A: The assumption of rationality is essential if you are going to do economics, and the reason is the following: economics is really about markets, but markets consist of individual buyers and sellers. The way economics works is it predicts the behavior of individuals in a market situation. The assumption of rationality simply means that every one of those individuals follows his or her best interest, and if they find an opportunity, they use it. This makes economics able to predict human behavior, because all you need to do then is to define the market in terms of the opportunities that it provides to the individual agent, and then you assume that each agent will use all the opportunities available to them to the maximum. You can then

The way economics works is it predicts the behavior of individuals in a market situation

ask how will the market behave if everyone behaves in that way.

The moment you allow different types of individuals and different levels of rationality and so on, economics just becomes so complicated that it becomes virtually impossible to make market predictions. The assumption of rationality is really central to economics. Even today, when behavioral economists make predictions, they still assume rationality, albeit with some exceptions. The way that theory is done is that you say that people are rational, except that they have too much faith in small numbers. People are rational, except that they are myopic. You make that assumption, and that assumption predicts some anomalies, but the basic mechanism of exchange still assumes people act in their own best interest.

*Q: Your 2011 book *Thinking, Fast and Slow* brought your science to a wide and general audience. To what degree do you think understanding our flaws at the individual level helps us to live better lives?*

A: I don't think it has any significant influence at all. *Thinking, Fast and Slow* is not a self-help book for individuals. Where I think there is potential is for organizations to adopt procedures and processes that take into account human limitations among their employees. They already do that with respect to their clients, that is what advertising is, but internally they do not do this. I think of large organizations as decision factories. They produce decisions, but do they produce the best decisions that they are able to produce? My impression is that the answer is negative, and that organizations, because they do not try to optimize their decision-making at every level, leave a lot of money on the table, for example.

Q: So how are the principles of behavioral economics applied in the real world?

A: The main impact of behavioral economics has been on policy, and it has been through the activities of Richard Thaler, and his book *Nudge*. That impact has been quite substantial, mainly through the whole movement of “nudges” it created, which can change the nature of the interaction between governments and citizens. The idea of “nudges” is to change the way that the choic-

es that citizens face are structured, which Richard Thaler calls “choice architecture.” The idea is to present the choices in such a way that allows the individual freedom, but at the same time encourages people to make a decision that is actually fairly advantageous. Nudges have been quite popular and influential, and moderately useful. You have seen units devoted to this sprout up in governments.

Q: Can you give an example?

A: There are many laws that provide an individual with rights or entitlements that, if they reach a certain age, they are eligible for something. The take-up on these entitlements is very far from perfect because they are not communicated well. Or in the US, there are loans that are available to young people to go to college, but the forms that you have to fill out to get the loans are so complicated that there are thousands of people every year that do not go to college because they cannot fill out the forms. So part of it is simplifying the choices that individuals face.

On a different side of it, sometimes the challenge is to protect individuals from organizations because organizations deliberately present people with information that is very difficult to understand. This happens sometimes when you sign on to a new website: you have to scroll through a very long contract and at the end you have to say do you agree or disagree and of course you click “I agree,” and that establishes a relationship. Now, in the computing domain it is not very important. But when firms that issue mortgages, or firms that issue credit cards handle very long contracts that people do not understand, this is not to the individuals’ interest.

These ideas had some influence in the Obama White House, where they were introduced by law professor Cass Sunstein, who was Richard Thaler’s co-author on *Nudge*. What they were doing was to try to compel institutions that interact with individuals to simplify their communication, to reduce the ability that financial institutions have to mislead individuals. That was quite strongly resisted by the corporate world, I should add, and I am quite sure that any efforts will be reversed by the Trump administration.

Q: Some people find the idea of the government influencing people through nudges to be a bit unsettling, or “creepy” to use the popular word. What is your view on this reaction to nudges?

A: Nudges are explicitly paternalistic. I think clearly there is a danger of manipulation because the whole idea assumes that people can be moved, and it furthermore assumes that there are a lot of interested parties out there in the economy that want to manipulate people to their own ends. But now in the United States, this idea of “creepiness” is associated with a long-standing cultural tradition that emphasizes freedom and responsibility. And so you can expect that anything that allows bureaucrats, as they like to say, to do things that intentionally affect the behavior of people to sometimes have that connotation.

I think the answer to this controversy, which has been proposed by Richard Thaler, is easy. He points out that there always is a choice architecture. It is not as if the existing situation is neutral. The exist-

Behavioral economists
still assume rationality,
albeit with some
exceptions

ing situation in many cases has been shaped either by people who did not care about the outcome, or by people with a self-interest. So the idea that you can have a system that is completely neutral and that behavioral economics is creepy because it intervenes is I think completely unrealistic. The field is not neutral.

Q: There seems to be a political dimension to the argument, at least the way it is framed in the United States.

A: Behavioral economists are, massively, I would guess, pro-Democrat. They very much preferred Hillary to Trump as compared to non-behavioral economists. So there is a political difference, and the “creepy” adjective I can almost guarantee you is probably used on the right of the political perspective.

It is unfortunate, but it is always true that policy applications involve political preferences and the whole idea that people need protection against their own mistakes is an idea that has been rejected by conservative economists. That has a long history. Milton Friedman, who was sort of a guru of conservative right-wing economics, although perhaps he was less extreme than some of his followers, emphasized personal responsibility in his book *Free to Choose*. It is a long story.

Rationality, the assumption that people are rational, means that they don’t need to be protected against their own mistakes. That’s the main issue that separates the people who believe in nudges from those who do not—it is whether the government has a responsibility to protect people from their own mistakes. Right-wing economists and conservatives in general in the United States were against social security, because of the idea that people are responsible for their own fate, and if they are going to be old and they will need money when they are old, well they are responsible for saving. And if not, well, poor them. The idea that people are myopic and therefore do not save enough is viewed by some as imposing a responsibility on the government to protect people by helping them save.

The liberal idea is to help various ministries in their interactions with citizens, to help citizens make good decisions, but I think that in the US this is already a thing of the past. I don’t believe the behavioral psychology unit will survive long in the Trump administration. ■



It's a Bird, It's a Plane...

Xu Huabin, Vice President of Drone Maker DJI, talks about the future of the market

By Liu Sha

Inventor Frank Wang loved model planes as a child. Ten years ago, in a college dorm room, he turned that early passion into the makings of a business that has since gone on to control 70% of the fast-growing market for consumer drones. Indeed, his company, DJI Innovation, has largely shaped the idea of what we think of as a drone.

Remote-controlled model aircraft had long been high-end toys for rich niche hobbyists, but DJI Innovation took the notion mainstream. The company's increasingly ubiquitous quadcopters are an easy to use, affordable and eye-catchingly sleek consumer product. They feature built-in camera, stabilizers, GPS and an increasing range of useful modes. Revenue of the company increased 100-fold between 2011 and 2015.

Xu Huabin, Vice President of DJI, explains how the firm grew from a maker of model planes to become the world's largest commercial unmanned aircraft manufacturer. He also provides insight into the down-to-earth philosophy and product-focused orientation that got it there. As the commercial drone market continues to expand, DJI is developing drones with industry-tailored features for customers as diverse as engineers and farmers.

Q: In 2016, the total sales of DJI exceeded RMB 10 billion (\$1.45 billion). How has the company evolved to become such a smash hit?

A: As the drone market has developed, DJI has gone through several phases... Initially we made model planes and in China the total value of that market was less than RMB 100 million (\$14.7 million). At the time, we were trying to solve a technology problem: how to make a winged craft fly smoothly as well as hover. When we solved this, we discovered many people needed aerial photography and video, but a manned helicopter costs too much. DJI had then found its focus: developing drones that offered quality aerial photography technology. We then began selling our products as camera equipment and cooperated with outdoors sports companies,

The main development trend lies in information and data collection... The major advantage [of drones] is low cost and flight precision

as well as organizers of events, such as marathons, and ski and motor races, because they all need to be filmed and photographed. TV producers and journalists are also clients. In 2016, we entered the markets for agriculture and geographical mapping, so we have a diversified sales channel.

Q: Can you tell us more about the move into agricultural drones? Are there other markets that DJI plans to enter?

A: A challenge for all drone makers is how to adapt to the needs of different industries. In agriculture, the needs of farmers differ from location to location. In China, farms are relatively small and scattered, and it is hard for farmers to use large machines, so drones are used mainly for pesticide spraying. In the United States, farms are large and small drones could not handle such a job. Drones are better used there for surveying, inspection, mapping and collecting growth data to reduce pests, improve irrigation efficiency and make harvest predictions more accurate. If we want to enter an industry, it is not just about the drone itself, it is about how different industries require different functions. We tailor our products to the different needs in terms of the hardware, software, service and operation system. Now, we are expanding into the energy sector where solar energy companies are using our cameras to inspect rooftop solar panels. Another area we focus on is infrastructure construction, as our models can be used in geographic mapping. We think that in the industrial market, drones are best used for capturing and collecting data.

Q: Do you have other sales channel expansion plans?

A: We want to expand the female portion of our market. Over 60% of our customers are male, but as our models get smaller, more portable and simpler to operate, we have noticed more women are interested in them. For example, the OSMO model launched last year has a mode that can replace the selfie stick. With the “ges-

ture selfie” mode, you make a certain gesture and the camera will take a photo or start filming. The OSMO series also has a silver-colored model targeted at female customers—most DJI models are black and white.

Q: The DJI headquarters are in Shenzhen, an economic zone that is also home to tech companies like Huawei, ZTE and Tencent. The area has a higher degree of market liberalization than many other Chinese cities. Is there a connection between DJI’s growth and the city of Shenzhen?

A: Shenzhen is a place where enterprises can innovate. It provides a free and flexible platform. It neither emphasizes hierarchy, nor separates locals from newcomers, so everyone has a chance. The second thing is the surrounding manufacturers, many of whom have been operating for years and who have rich experience. That supply chain capacity enables us to launch new products quickly. So far, DJI has no OEM [original equipment manufacturer] factories. All our drone models are produced in our own factories located in the Bao’an district of Shenzhen. We attach great importance to production and I think that is a difference between DJI and some other drone makers, which may pay greater attention to design or software. For DJI, the manufacturing of the hardware is a core competitive element. Companies are in a position to realize technological innovations and launch new products in a speedy manner only if they have access to a solid supply chain.

Q: How much more will DJI invest in hardware development? Now that you are expanding into different markets, will DJI shift more to developing software to adapt to different uses?

A: We are already emphasizing software-hardware adaptation. When we started in aerial photography, we relied on an app to control the hardware. In aerial photography, the software is quite standardized, but you are right, the app used for aerial photography is not appropriate for other markets, so we tailor the software to meet different demands. What DJI now faces is a move from a simple and standardized industry space, which is that of the camera drone, to a more diversified market. The move relates to our positioning. In the beginning, we spent most of our effort and money on consumer drones, but with many professionals such as firefighters and engineers starting to use drones, demand is diversifying.

Q: Although DJI is doing well as a Chinese brand, some critics say that the reliance on imported chips and components is a limitation. How do you think DJI can push past this?

A: I think, as with many other products, drone production requires a global supply chain. For example, take China’s Comac C919, a twinjet airliner. Many parts are imported, but the integration and production is completed in China. DJI creates the core technologies like the flight control algorithm, film stabilizer and drone sensors... We not only put all these technologies together in a machine, but ultimately lower the cost to make it affordable to average consumers and build a strong market.



DJI's new gesture-controlled Spark drone in Shenzhen in May

Q: Some consumers complain that DJI drones do not have a long battery life. How is DJI responding?

A: Battery life is the choke point of many electronic devices. We follow developments in battery technology and our battery life has increased from 23 minutes two years ago, then to 27 and now to 29 minutes. However, cost is also a factor. Some cutting-edge technologies would expand battery life, but raise the price, require new chargers and involve a more complicated charging procedure. Yes, battery life is important and we are trying to improve, but it is not the only concern of our users. When we looked at the demand side, we found that the main requirement for drones is to complete a certain task. For example, engineers completing aerial survey want to finish as soon as possible—they are not concerned about the battery life. What DJI can do is to improve the efficiency for such users by optimizing the hardware and software.

Q: AI is a hot topic these days and it seems every industry is looking into it. What is the take of DJI concerning AI technology?

A: There is much talk and many concepts flying around concerning AI technology. We, however, have a different approach. DJI is a company driven by actual products. We try to develop functions that make our products unique. For example, we recently developed the “follow focus” mode, which enables a camera drone to follow and film the controller. We also have the “gesture mode,” as I mentioned earlier. Simply put, we care more about whether concepts can be realized and then manufactured... The philosophy of DJI is down-to-earth in this regard. We don't like talking about pie-in-the-sky concepts or drawing up long-term plans using colorful PowerPoint slides.

Q: Another area for drones seems to be the logistics industry. E-commerce giant Amazon and one of its Chinese equivalents, JD.com, say they will start using drones for deliveries. Does DJI plan to pursue this opportunity?

A: We think the main development trend lies in information and data collection. Drones, especially with rotary wings (the most common type seen and produced now), have limited load capacity and battery life. The major advantage is their low cost and flight precision. We don't think that drones can be a good platform for deliveries using current technology. Perhaps in urgent situations, such as in an earthquake, rescue drones can do critical lifting work. Otherwise in daily life, it will be challenging due to concerns about flight safety and urban airspace regulations. I am not saying that drones will never undertake deliveries, but at least for now, it is not an interest for DJI.

Q: Is this also because of the “down-to-earth” philosophy of DJI?

A: If a product cannot be delivered to market within a reasonable time period of, say, three years, then what is the point of announcing it? To raise funds? For visibility? DJI does not need these because we have a healthy cash flow and good public awareness. For us the key is to make quality products.

Q: Where do you see the company and the consumer drone market in three to five years?

A: For DJI and the drone market, there are three trends. First, drones will be smaller and more portable. Second, drones will be more intelligent with less need of human control. Finally, drones will be used in far more industries and have functions tailored to the needs of specific industries. 

Float of the RMB

The 'redback' wants to
be free... eventually

By Tom Nunlist

Image by Lisa Ye



China has attracted much criticism in recent years for how it manages the RMB. It is not a free-floating currency, but in reality, the consequences of China's currency controls are complex, and the road to achieving a more open currency difficult

On the campaign trail last year, Donald Trump constantly deplored China as a currency cheat. At the core of his accusation was the idea that the country manipulates the value of its currency, the renminbi (RMB), to make exports cheaper and gain market share. If elected President, he promised to officially label the country a “currency manipulator” and put a 45% tariff on imports on his first day in office.

As with so much else during his Presidency so far, Trump later backtracked. On April 12, shortly after a one-on-one meeting with President of China Xi Jinping, he declared that China was not a currency manipulator.

“We have repeated that China has no intention to spur exports through competitive currency devaluation,” said China Foreign Ministry spokesman Lu Kang on April 13th, the day after Trump’s turnaround. “It’s an objective fact that China is not a currency manipulator.”

This is debatable—the RMB is certainly not a free-floating currency—and China’s central bank sets the daily rate with movements allowed only in a narrow 2% band around that rate. “You basically have a market that has one leg tied and one arm tied,” says Fraser Howie, author of the book *Red Capitalism* and noted commentator on the Chinese economy. “The fact that the volatility is so low makes no sense. This is the world’s second largest economy.”

The Chinese government has talked for decades about liberalizing the RMB and making it convertible on the capital account, but has so far not done it. Meanwhile, it has mounted a campaign to internationalize the currency with considerable success despite its continued controlled status. In October last year, after years of pressure from Beijing, the International Monetary Fund added the RMB to its Special Drawing Rights (SDR) basket, which also includes the US dollar, the Euro, the British pound and the Japanese yen. It was a symbolic victory, but analysts say it has little practical impact, at least in the short-term.

Shortly after it happened, Paul Donovan, the Global Chief Economist of UBS said, “In the longer term, this should be seen as a political ego-stroking exercise.” And in

fact, while the RMB was the world’s fifth most used currency in 2015, it slid to sixth place in 2016, being overtaken by the Canadian dollar, which is not in the SDR basket.

Achieving a wider role for the RMB around the world, and getting to the point where the currency can move according to market forces rather than the decisions of Beijing bureaucrats, will require parallel liberalization of the economy. “The reason why the Chinese government should liberalize its currency is to facilitate trade and investment,” says Yang Du, former Director of RMB and China Strategy at Thomson Reuters.

But the pace of such reforms is likely to remain uncertain.

“While there is a lot of rhetoric about the introduction of market mechanisms, I don’t think China... likes what the consequences of those market mechanisms really are,” says George Magnus, former Senior Advisor to UBS and Fellow at the Oxford China Centre. Therefore, instead of significant reforms, “you get a little bit of this trial-and-error stuff.”

Training Wheels

The status of the RMB today, like China’s wider economy, is a legacy of the planned Soviet-style economy in force from 1949 through to the death of Chairman Mao in 1976. Since then, reforms have massively boosted China’s economic strength, its GDP and people’s living standards, but basic state control has remained inviolable and change has generally been gradual, avoiding “shock therapy” measures.

“It has been a trade-off between liberalization and the stability of the whole economy,” says Yang.

At the beginning of the reform period in 1980, the RMB was officially valued at 1.5 to the American dollar. In 1981, to stimulate China’s new export sector, the government devalued the RMB to 2.8, and over the next 15 years or so, China allowed it to drift downwards until it was pegged in 1995 at 8.3 to the dollar, a rate that was maintained for a decade. The dollar peg at that level helped tame economic instability and fueled China’s transformation into the so-called “factory of the world.”

By the mid-2000s, China was still enjoying annual double-digit GDP growth, but the government was facing mounting economic and political pressure, most notably from the United States, to let the value of the RMB appreciate. In July 2005, Beijing relented and revalued the RMB upward by 2.1%, and introduced a “managed float” system, still used today, under which the currency fluctuates in a very narrow range fixed each day by China’s central bank.

The currency peaked in value at around 6.05 to the dollar in January 2014 and then market sentiment turned, largely relating to a sense that China’s fast-growth phase of three decades was ending. After that, the RMB entered a period of steady decline, which the Chinese government sought to control. Pressure built up until there was a shock devaluation of 2% on August 11th, 2015, when China also began setting the daily RMB fix based on the closing value of the previous day’s interbank forex market.

The general view for much of 2016 was that the RMB was inevitably heading below seven to the dollar—a mark nearly broken in January this year. Since then, it has stabilized and risen slightly. “If it breaks seven, it will damage the central reserve... it will damage the GDP further,” says Yang. “It may crash the [domestic] financial system as well.”

Love, Hate, Manipulate

Along with the general turn in market sentiment against the RMB, the years since 2014 have seen the US dollar become more robust. Many analysts see this as a key factor in the weakening of the RMB, with sellers mostly buying US dollar-based assets in return.

“The number one reason is the strengthening of the dollar,” says Shen Jianguang, Chief Asia Economist at Mizuho Securities, a Japanese investment bank. “Against any other major currency the RMB has actually appreciated: against the British pound, against the Euro.”

If controls were lifted, to what rate would the RMB move? This is, of course, unknown, but the assumption of most experts is that it would be lower than today. How to transition the currency through to being directly market-driven is a conundrum, and the effects of such a move, including those on other countries, would be significant.

This is where the irony in Trump’s accusation comes in. Yes, China is meddling with the currency, but in recent times not to suppress the value against the American dollar. Beijing has actually fought fiercely for the past two years to stall the slide of the “redback,” an effort that has contributed to

China’s foreign exchange reserves falling \$513 billion in 2015, and a further \$320 billion last year.

Despite these efforts, the currency hit an eight-year low against the dollar in November 2016, following bullish US sentiment in the wake of Trump’s unexpected victory, before bouncing back slightly this year. In all, China’s currency fell 5% against the dollar in 2016, starting at around 6.5 to the dollar and ending below 6.9.

Efforts to hold the RMB rate steady against the US dollar have had an impact on China’s export sales to all other markets. But Beijing’s money managers have had no choice due to the psychological importance of the greenback rate. “While the authorities have been moving towards a currency basket system, domestically people still think of the exchange rate vis-à-vis the US dollar,” says Andrew Fennell, Director of Sovereigns at ratings agency Fitch in Hong Kong. “The bilateral exchange rate with the US dollar has a big impact on market sentiment.”

China’s broad economic slowdown, which is at the heart of the RMB’s weakness, looms large in perceptions, despite continuing high GDP growth numbers being reported by Beijing—6.5% percent for 2016 and 6.9% for the first quarter of this



year. “The reality is that the economy is decelerating fast,” says Shen. “I think the official GDP is very distorted.”

This is worrying for wealthy Chinese people, especially the middle class and companies that do cross-border business. For them, the prospect of a fall in property prices is less scary than a fall in the value of the RMB, which would affect the valuation of all assets in China. One businesswoman and homeowner in Shanghai, who asked not to be named, said she fears a devalued RMB more than she fears a bursting housing bubble.

Beijing is caught in a bind—it cannot strengthen the RMB in line with Western urgings because market forces will not allow it. It also cannot let it fall because the masses will not stand for it.

In the view of some analysts, the situation has arisen because the economy of China is built on an outmoded structure. “China has not embraced the market by any means. It has the appearance of a market,” says Howie. “But the currency has never traded anywhere near the 2% band apart from [August 11th, 2015].”

Further falls in the RMB could have all sorts of implications for China—not only economic, but social and political too.

“A significant devaluation from the lens of trade theory would help exporters, but that is not really in line with the broader policy goals of rebalancing the economy towards consumption,” says Fennell. “A devaluation would basically be a transfer of wealth away from the household sector and towards exporters.”

Fear of market forces driving the evaporation of value has already resulted in large capital outflows. China has responded with ever-tightening restrictions to stop the flood.

Underlying Economy

Despite constant political criticism from the West, management of the not-so-free RMB and the sort-of market-driven economy of which it is a part has complicated consequences for the world economy. A stable RMB and stable Chinese economy are not just good for China, but have benefits for the entire world. A declining RMB would

[RMB policy] has been a trade-off between liberalization and the stability of the whole economy

Yang Du

Former Director of RMB and China Strategy
Thomson Reuters



boost Chinese exports by making them cheaper, but it would also exacerbate trade tensions and further hurt what remains of manufacturing in other countries.

While Yang from Thomson Reuters believes a major devaluation could crash the Chinese financial system, George Magnus thinks that China could handle a big devaluation, but that its trading partners will have trouble. So if control of the RMB is currently desirable for China and its trading partners, when can the government let go the reins and ride the free market?

It is hard to say because the Chinese market has no experience with anything other than a controlled currency regime. Liberalizing forex policy at this point, says Yang, would be like trying to teach your kid to swim “while pouring more water into the pool.”

There is also the issue of capital flight, which is a puzzling trend given the amazing growth rates that China continues to experience.

“What China needs to do is focus on reforming the economy,” says Howie. “Allow the private sector a greater role, allow households greater returns, stop funding the SOEs and diverting all this money to needless projects.”

Howie and Yang agree that until such structural shifts are implemented, freeing up the RMB is out of the question and, barring some sudden changes, could be a couple of decades away. It is probably harder to make the transition now than it would have been a decade ago, given the slowing economy and a sense of reduced flexibility.

Noting how well the economy performed in the 2000s, Howie says, “When things are going well, do the difficult [tasks].”

Trust Trade-off

The ultimate stated goal of China’s RMB policy is internationalization—widespread acceptance by traders—and eventual use as a major reserve currency by other countries. How well China is progressing towards this goal depends on your perspective.

According to analysis by Fitch using data released by the IMF, at the end of 2016, RMB-denominated assets represented just 1.1% of global reserve holdings of central banks. This was higher than the Swiss franc, but well below the other currencies included in the survey.

However, the RMB has progressed reasonably well as a currency in which trade deals are denominated. In 2014, London became the first offshore settlement center for the RMB. It has since been followed by centers in Doha, Frankfurt, Luxemburg, Paris, Singapore and Toronto. These offshore pools enable the RMB, in Yang’s words, to be “freely usable” in trade activities. How much demand there is to accept settlements in RMB is another story, but setting up the international infrastructure to handle it is a significant achievement.

The next step, according to Yang, is to make the RMB “freely investable,” and this is more difficult. There are already ways to invest the RMB, such as RMB-denominated “dim sum bonds.” There is also the CNH, or “offshore RMB,” that is more ex-

posed to market forces, but the CNH is confusing, and according to Yang does little good. Deposits in Hong Kong have fallen by about half since 2014, and Howie says investors were only there in the first place to take temporary advantage of higher interest rates.

More fundamental is the point that making the RMB a currency for investment means having something to invest in—in other words, opening the capital account. There is great international clamor for China to do this, and it has often been a point of political friction with the US and the European Union. Indeed, in March this year, China relaxed rules on foreign investment into domestic bond markets.

“[The government remains] committed to these reforms, although the pace of capital account liberalization has slowed in recent years as a response to the onset of capital outflows in mid-2014. What we now expect over the coming years is an asymmetric opening of the capital account,”

says Fennell. “We will probably see further measures making it easier for foreign enterprises to bring capital into China and participate in its domestic capital markets, while restrictions on capital outflows are likely to remain in place.”

Howie is less optimistic, referring to this as “tinkering”—and the tepid response from investors to the bond market initiative seems to support his assessment. In any case, Howie sees fundamentals as being the greater problem. “How would [internationalization] ever happen if you don’t have trust in the underlying marketplace?” he says. “The key thing underpinning all markets is this idea of trust.”

Slow and Steady

Solving underlying market problems, opening up the capital account in such a way that does not create a crisis, and giving the RMB the market freedom that will make it a stable store of value beyond Chinese shores could take either a long time or a

real wrenching change. It is already nearly three decades since Chinese officials started talking about capital convertibility being a few years away, so no one is holding their breath.

Analysts are generally optimistic, although few hazard a guess concerning the timeline. “I am still hopeful, especially that something will happen after the 19th Party Congress (to be held in October 2017),” says Shen. “I think maybe they will progress faster regarding financial liberalization and break down the monopolies of SOEs, and that probably will facilitate the use of RMB further.”

There is, however, a large contrast between long-term prospects and the short-term forces that continue to buffet the RMB, precisely because of its controlled status. “For the time being the currency will be very closely managed,” says Magnus. “I don’t think the leadership wants any currency turbulence or market disruption for the foreseeable future.”



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6-piece Mooncake Package RMB198

(3 creamy egg custard flavored mooncakes and 3 plain egg custard flavored mooncakes)

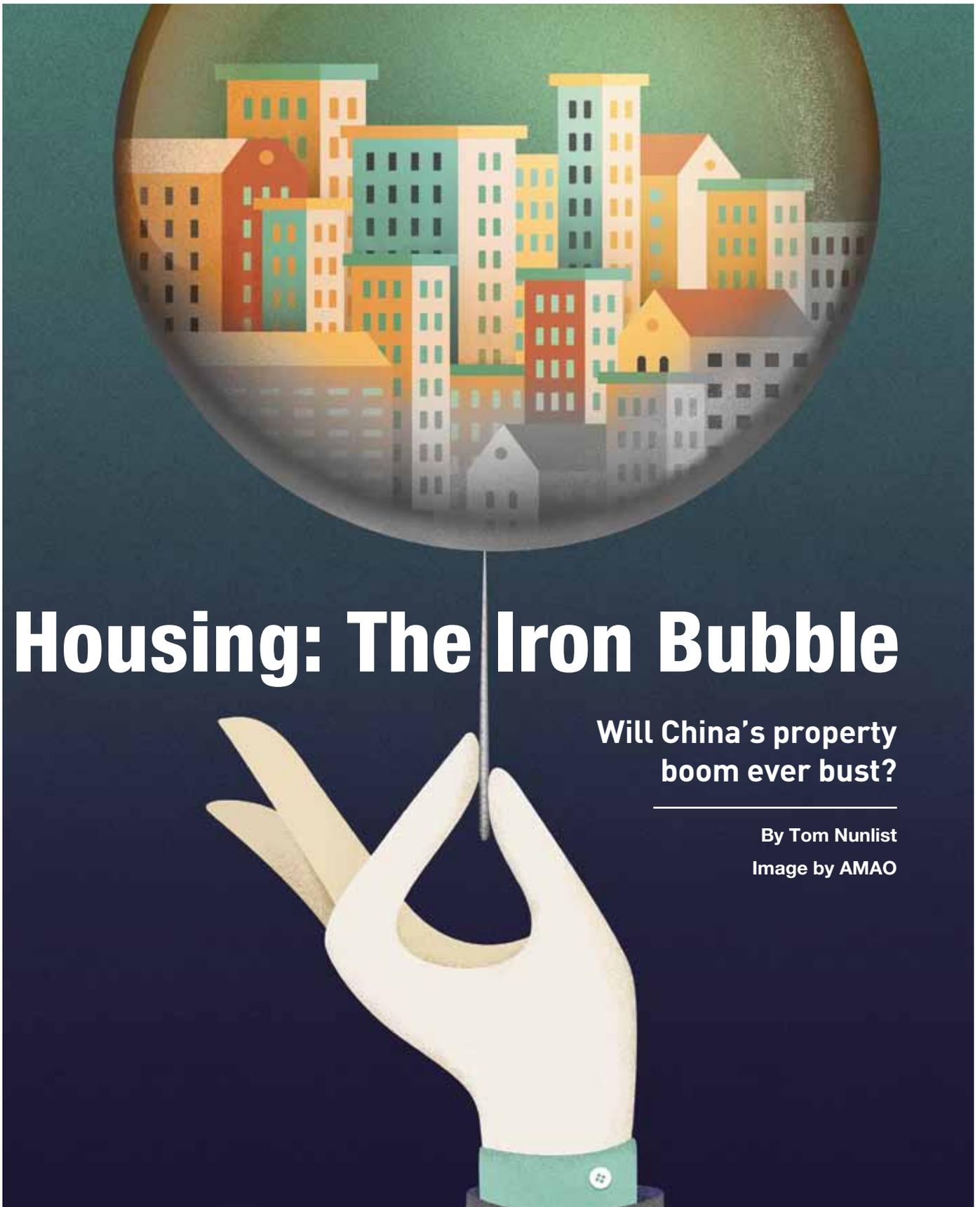
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Housing: The Iron Bubble

Will China's property boom ever bust?

By Tom Nunlist

Image by AMAO

China's housing market in top-tier cities has been on fire for years, while in lower-tier cities it may be straining under the weight of oversupply. But is there a looming crisis? In the near term, the answer seems to be no

Just when it seemed they could not go much higher, property prices in China's tier one cities made another gravity-defying leap last year. By September, new home prices had jumped 27.8% in Beijing, 32.7% in Shanghai and a meteoric 34.1% in Shenzhen year-on-year. Reacting to the news, China's richest man, property mogul Wang Jianlin, declared the country's real estate market the "biggest bubble in history."

By December, price growth had slowed a bit, but this has done little to calm the tone of many commentators who see disaster looming. China's property market was virtually non-existent 25 years ago, but it is now one of the most critical pillars in the world's second-largest economy and the source of incredible wealth for many of China's citizens. The health of this pillar remains a top concern of the government and citizens alike.

The price increases in recent years have been dizzying. Valuations in many Beijing and Shanghai districts are now comparable to those in other major international cities, even though average salaries are well below those of the West. According to Numbeo, a consumer price tracking website, in May this year the average price per square meter for a flat in central Beijing or Shanghai was approximately \$13,000. In New York it was \$11,800 and central London \$18,000.

People who bought early have done well. Lynn Huang, a 34-year-old co-founder of a private English academy in Shanghai, bought an apartment in the Pudong district of the city seven years ago for RMB 13,000 (\$1,900) per square meter. Its value has risen to RMB 50,000 (\$7,300) per square meter, but she cautions this is to some extent theoretical. Government restrictions introduced late last year to take the heat out of the market mean she cannot easily sell the unit.

"The price is rising, but as long as I cannot sell it, it is just paper value," she says. "It doesn't mean anything to me... I still have to work."

Growth of a Nation

After the communist victory in 1949 and until the early 1990s, there was no Chinese

housing market. People lived in communes in the countryside, or in work-unit housing in urban areas. In neither case did they own the accommodation.

China began opening up to the world after 1978. Reforms then, and again after 1989, resulted in a sell-off of urban state-controlled housing to residents and the beginnings of a property market. Initially people were unhappy with the change, as it meant paying for an item once provided free of charge, but it was an asset sale at bargain basement prices, and as the economy picked up, so did property values. In 1995, a small, 60-square-meter apartment in Beijing cost about RMB 200,000 (\$30,000). That same apartment could now sell for RMB 5.5 million (\$810,000).

Today, housing is a major store of value for Chinese people. According to a survey by the state-run *Economic Daily* of 25,000 families across 25 provinces, real estate accounted for 65.61% of per capita household wealth in 2015. "For most individuals the single biggest investment in mainland China is a house," says David Hong, Head of Research at E-house (China) Enterprise Group in Hong Kong.

Driving the rapid price increase are investors piling into the market. A dramatic stock market rout in 2015 in particular left many seeing property as one of the few secure investment options available on the Chinese mainland. "There are few investments products that offer the same degree of security as real estate," says Sam Crispin, CEO of ABP Investment Management in Hong Kong.

China's banks also see property as a secure bet. About half of all new lending in 2016 went into real estate, largely through mortgages with bank loans to developers and homebuyers totaling RMB 26.68 trillion (\$3.87 trillion). This was up 27% from 2015, according to data from China's central bank. Agricultural Bank of China, the country's third-largest lender by assets, had 82% of its new loans go to housing.

Wealth Lockout

The creation of the housing market led to the emergence of China's middle class. It

has helped create vast wealth in many parts of society and has had a huge positive impact on the economy, the growth of which for 30 years now has exceeded more than 6% annually—the fastest sustained economic growth in history.

About 70% of middle class wealth in China is tied-up in property and this group is carrying China’s consumer economy forward. “The explosive growth of China’s emerging middle class has brought sweeping economic change,” wrote McKinsey in a 2013 report, *Mapping China’s Middle Class*.

Unfortunately, not everyone caught that first property wave in the 1990s, and with the sharp and continued rise in prices, many people now seem permanently locked out of the market. Those migrating from the countryside to the big cities have even less chance of buying a home. With urbanization proceeding rapidly in the world’s most populous country, this is creating serious social pressures.

“A property-owning class is emerging

that is quite distinct from the non-property-owning class,” says Michael Cole, founder of China real estate analysis website Mingtiandi. “The only way for young people to afford a house, for example, is with assistance from their parents. The only way their parents have that kind of money is because they themselves have bought property.”

Alan Li, a 28-year-old consultant at an education company in Beijing, believes his chance of owning a home is distant at best. “Property in Beijing is way overpriced and it puts a heavy burden on the people of this city,” says Li.

The sky-high prices in China’s top-tier cities have not only seen the emergence of a divide between haves and have-nots, but the overall situation of unaffordability has also raised the specter of social instability. According to Numbeo, the price-to-income ratio for New York City housing is 13. Beijing’s ratio is more than 33 and Shenzhen’s more than 44. In other words, for the average person, it can now takes more than 30 years’ salary to be able to afford a

90-square-meter flat in the central areas of China’s main cities.

With the cost of buying an apartment so high, the lifetime fortunes of homeowners and their families ride on the property market remaining solid. The government is aware of this, but also of the mounting discontent at the rising prices and is attempting to “contain excessive home price rises,” according to a recent statement. Authorities, however, cannot afford to clamp down too hard because the economy also depends on a buoyant property sector.

According to Moody’s Investors Service, about 25% to 30% of China’s GDP is linked to the property and construction sectors. “This means developments in the property market can have large macroeconomic effects,” said Michael Taylor, a Chief Credit Officer for Asia-Pacific at Moody’s, in a report in March.

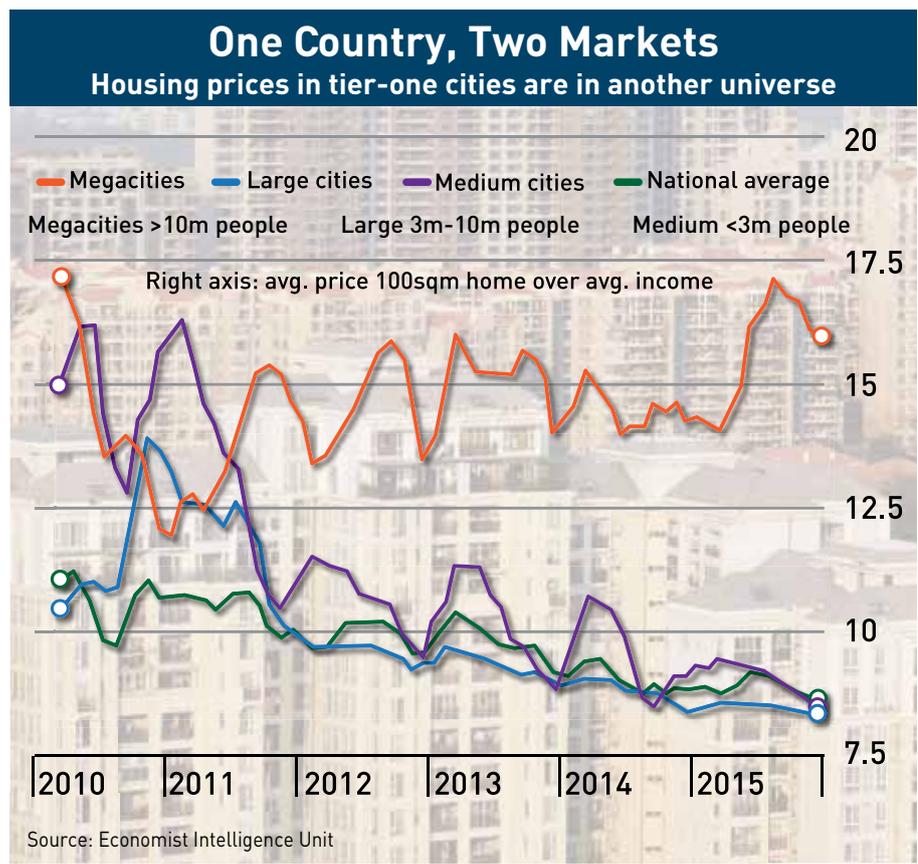
Property development and apartment sales are also key sources of revenue for local governments, so they have an incentive to keep land sales going. According to the Chinese business magazine *Caixin*, income from the sale of land-use rights totaled RMB 3.75 trillion (\$551 billion) in 2016, nearly 30% of the combined annual income of local governments, with some areas depending on sales for as much as 50% of their revenue.

“Property is the goose that lays the golden egg,” says Crispin. “They (governments) are dependent on that revenue stream—if they lose it what will take its place?”

Decompression

The Chinese government has a greater responsibility for the stability of the national housing market than governments in other countries because in China there is no freehold ownership. All property, including apartments, villas and factories, have only usage-rights leases with a maximum duration of 70 years. The state remains the ultimate owner.

Nobody, the government included, understands the full implications of this because the market is still so young. But a small window on matter opened up last year. In April 2016 in the eastern city of



Wenzhou, some residents were dumbfounded when the local government informed them that the 20-year usage period on their homes had expired and a payment of up to one-third of current market value was required to roll over the leases. Homeowners were irate and quickly took to social media to protest.

A tense standoff lasted for months as the government grappled with a precedent that had national implications. In late December, it was announced that the Wenzhou leases would be rolled over free of charge, which kicked the issue down the road but left the core issue of ownership rights unclear. Such uncertainty, long-term, is a destabilizing factor.

“[A bursting bubble] would be catastrophic for the Chinese state,” says Crispin. “The government is in control of land sales, the government is in control of construction, the government basically sets prices by approving the pricing of sales... so it’s the government’s fault if it goes wrong. They have no mechanism to cope with [a crisis].”

Measures implemented in recent years have tried to cool down the market. These include raising minimum downpayments, which can be up to 80% in major cities, and outright restrictions on home purchasing, for example by making it illegal in some places to buy a second apartment.

Such restrictions can, however, have the opposite of the intended effect. “Qualified buyers will treat policy tightening as a signal of ‘buy!’,” says Hong of E-house. “If there is a policy tightening, that means

demand is far higher than supply, so I must buy if I am qualified. People will then try every way possible to make themselves qualify.”

Results have ranged from the predictable, like using a relative’s name to buy a second apartment, to the creative. Late last year there was a spike in divorces in Beijing and Shanghai as married couples discovered a legal loophole. More rules followed concerning how long you had to be divorced before you could buy a “place of your own.”

For people like Lynn Huang, the whole thing is a headache. Her job is about a one-hour commute from the apartment she bought years ago and she would like to sell it and purchase a new one. However, the new rules mean she has to wait six months after the sale to buy a new apartment. Not wanting to run the risk of ending up “homeless,” Lynn now has an empty apartment on one side of the city and a rented unit on the other.

For others, control policies cause real grief. Some developers have marketed commercially-zoned real estate as residential—this offered cheaper prices for those aching for first homes, even though it was illegal. When Shanghai decided to enforce the law and void those sales this June, about 100 people came out to publicly protest—days later the government relented.

Bubble, or Not?

Whether or not these problems amount to a “bubble” is highly debatable, especially as demand shows no signs of abating.

One of the factors that will continue to support prices is an intense cultural desire to own a home. Having an apartment is usually a prerequisite for marriage in China, which means people buy early. According to a survey by HSBC earlier this year, 70% of Chinese born 1981-1998 already own property. The equivalent number is only 35% in the United States.

At a glance, this seems strange given the enormous gap between incomes and home prices. Close relatives, however, usually help foot the bill. “Lots of people argue that as housing prices get higher and higher, that you may need 20 years without food in order to buy a house in Beijing for a normal household,” says Hong. “[But] most people buy a house with the sponsorship of their parents.”

Hong describes how decades of the one-child policy (scrapped only last year) have created an inverted pyramid family structure. This means the financial resources of two parents, and even up to four grandparents, can be marshaled to buy a house for a single offspring on a meager salary.

Surprisingly, not all Chinese property buyers are inclined to believe that property prices are too expensive. “I think prices are reasonable,” says Lynn Huang.

David Hong agrees. “Although the property prices sound high... [they are] still in a reasonable range,” he says. Even if China real estate is, as some believe, a bubble, it would appear for the near future to be an iron one and not in danger of bursting.

“I never use the term bubble because it gives people the sense that this is a US-type of situation,” says Cole from Mingtiandi. He expresses exasperation with foreign-based analysts who predict imminent collapse based on loose parallels to Western markets.

China’s property market is clearly different from that of the United States, the epicenter of a housing crisis that in 2008 resulted in the largest global financial crisis since the Great Depression. Using the US subprime crisis as a measuring stick of bubbles reveals the differences. China’s lending rules are far stricter, they demand far larger down payments and all mortgages are held to maturity by the issuing banks.

I never use the term bubble because it gives people the sense that this is a US-type of situation

Michael Cole
Founder, Mingtiandi

Still, there are grounds for disquiet. Some Chinese financial institutions have circumvented restrictions through “shadow” lending, most prominently via wealth management products (WMPs). These off-the-books instruments are poorly regulated and non-transparent. The International Monetary Fund has flagged WMPs as presenting a systemic risk to China’s financial sector. According to the China Banking Wealth Management Registration & Depository Center, which tracks WMPs, about RMB 2.5 trillion (\$368 billion) derived from these funds was invested in property in the first half of 2016, or 13% of total WMP funds.

The fact that modern China has never experienced a significant real estate correction also has some people worried. Given the importance of the property market to China’s financial wellbeing, any trouble arising in housing prices would affect the wider economy, which would then feed back into the property market.

For the past few years, the Chinese government has been spending furiously to keep GDP from dropping too fast—China’s debt-to-GDP ratio was 279% in 2016 (the US is currently about 104%). One of the primary destinations for stimulus is China’s “old-economy industries,” such as steel and concrete. These are, of course, building materials and while some of it goes into infrastructure projects or are exported, much goes into housing development.

Tiered Cities, Tiered Housing

China’s biggest property problem may be that the market is immature and people have known only good times since it opened up less than three decades ago. The market is psychologically poorly prepared for a downturn. Hong tempers his long-term outlook for just that reason.

“It is not a mature market like the US,” he says. “You’ve never seen a real bubble burst in mainland China, so no one can tell you what the [consequences will be if it happens].”

The sharp rise in prices in China’s top-tier cities in recent years has not only seen the emergence between haves and have-nots, there is also a widening gap between

Qualified buyers will treat policy tightening as a signal of ‘buy!’

David Hong
Head of Research
E-house (China) Enterprise Group



the first-tier cities and other parts of China. While the property market in Beijing and Shanghai remains tight, cities elsewhere face the opposite problem of empty apartments.

According to the National Bureau of Statistics, China had more than 450-million-square-meters of unsold residential housing space at the end of 2015, an area twice the size of Boston. A 60-square-meter apartment in the center of Xi’an, a city of almost nine million people in northwest China, would cost about RMB 650,000 (\$96,000), an eighth of the price in Beijing.

David Hong from E-house speaks plainly. “[Some central cities] need to figure out a way to digest that supply,” he says. “Or eventually [prices] will collapse.”

The scale of this potential problem is so large as to sometimes appear almost comical. An analysis by Chinese state-run *Xinhua News Agency* in July 2016, for example, said new projects planned by China’s small cities could accommodate 3.4 billion people by 2030, or two-and-a-half times larger than China’s current population.

Building the Future

The Chinese government is invested heavily in keeping the property market strong, but not too strong: it is a balance that is difficult to maintain. “I think [the market] should be open,” says Lynn. “But the government should provide... cheap apartments for the people that can’t afford it, like Singapore.” Singapore provides housing for about 80% of its population. While

China has subsidized housing, few people have been able to benefit, according to a *Caixin* report in April.

An answer to the government need for buoyant revenue would be a property tax. The authorities in Shanghai and Chongqing have tried to implement such a tax on a test basis, but have abandoned efforts due to virulent opposition from property owners. A more practical solution for big cities would be to release more land for residential development, which is something that Beijing is doing. In April, the government in the capital announced it would make land available for up to 1.5 million new homes between 2017 and 2021, in the hope that that will cool the market.

“Part of the government’s focus this year is trying to find an alternative to one-size-fits-all solutions to housing issues,” Michael Cole says.

Sam Crispin, on the other hand, still sees government policy as confused—boosting big cities where the economy is booming, at the expense of smaller cities that have been left out. “It is the most successful cities that get more government support, like free trade zones,” he says. “Why not make the whole of China a free trade zone? Or put them in the less developed parts of the country?”

Many ordinary people are just plain worried, especially in light of historical precedent. “Japan’s housing market crashed in the 1990s and [it] is still struggling to pull itself out,” says Alan Li, the consultant in Beijing. “The government is doing everything possible to prevent that.”

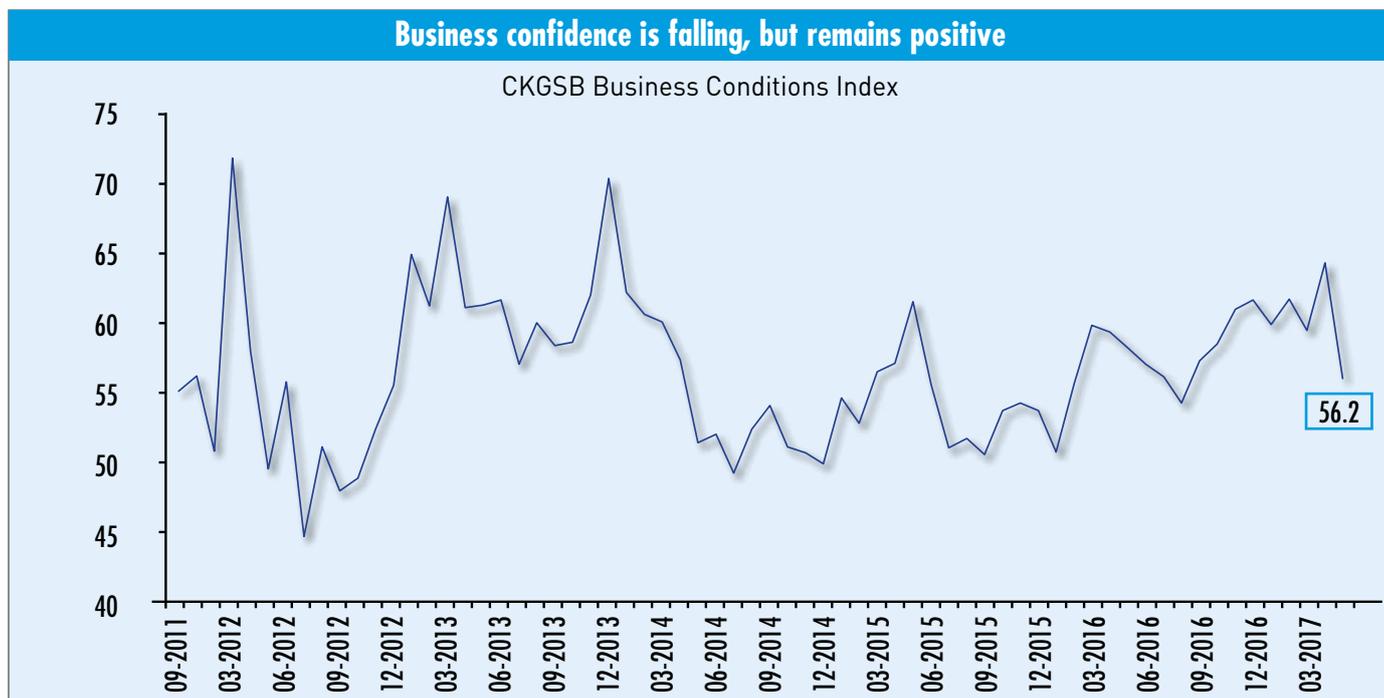
CKGSB BUSINESS CONDITIONS INDEX CONFIDENCE TAKES A HIT

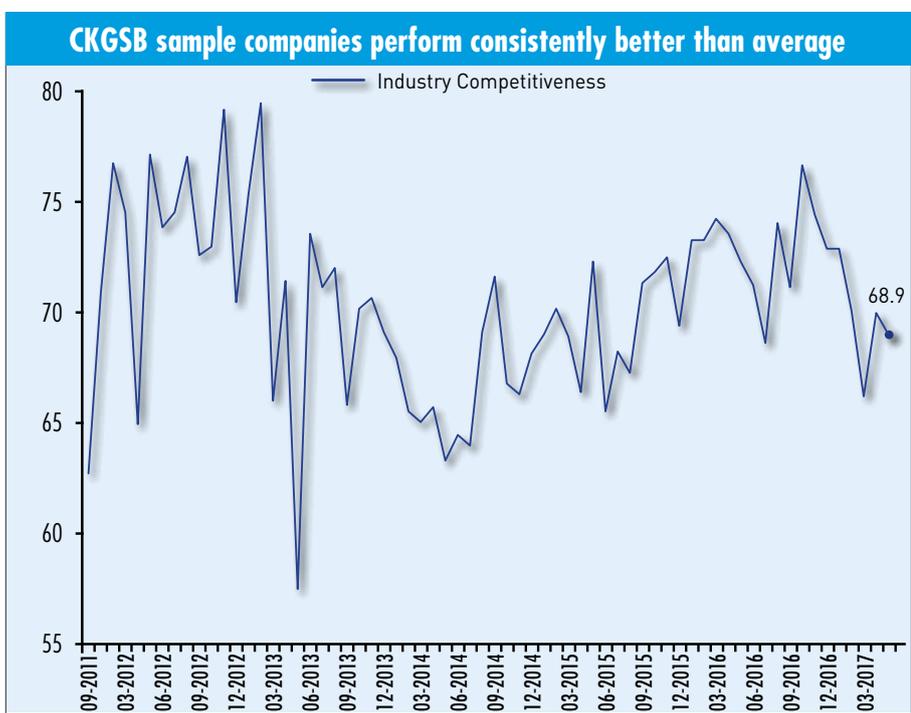
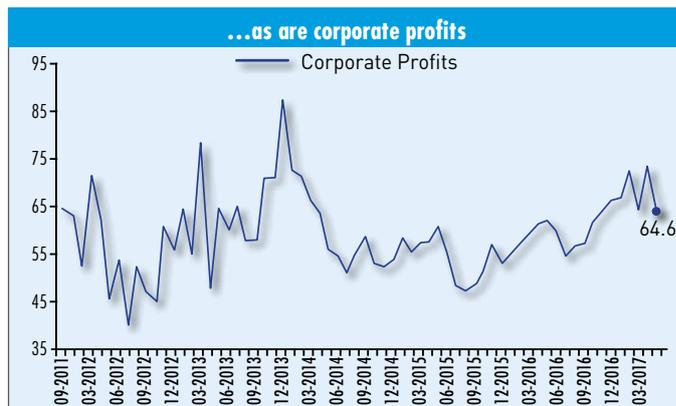
Businesses are still optimistic, but much less so

The CKGSB Business Conditions Index (BCI) registered 56.2 in May, a sharp drop from the previous month's index of 63.9. While the figure has stayed above the confidence threshold of 50, showing that most sampled firms are optimistic about prospects for the next six months, the extent of their optimism has fallen. Moreover, all four sub-indices comprising the BCI fell. Corporate sales and corporate profits fell from 84.3 to 74.8 and 73.2 to 64.6 respectively, but remain healthy. The financing environment index slid from 46.7 to 40.1, and the inventory

index fell from 49.7 to 46.0.

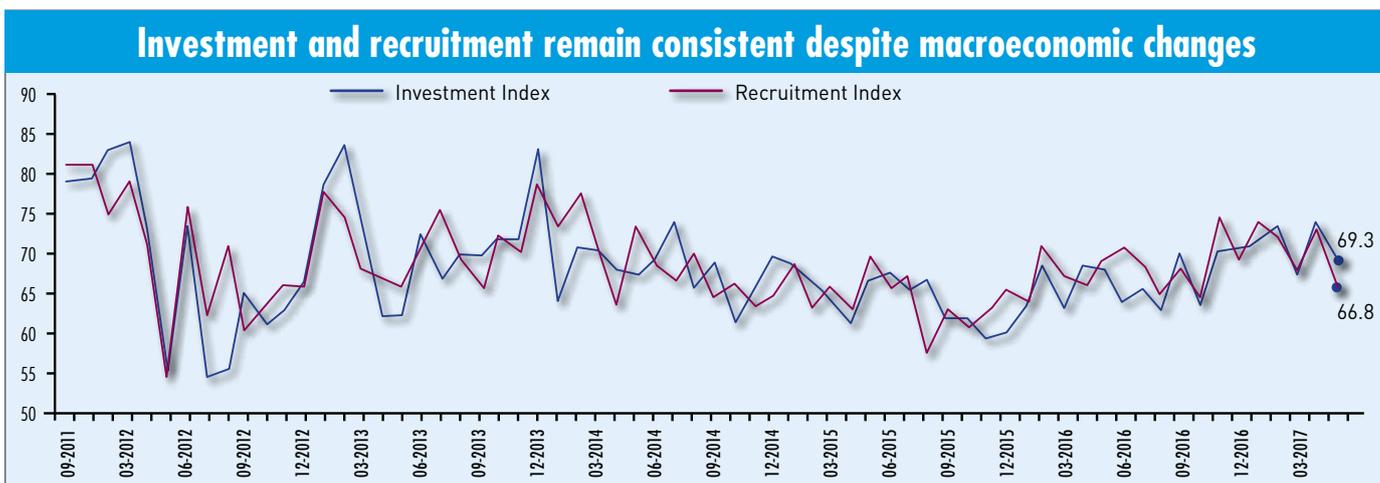
The BCI, directed by Li Wei, Professor of Economics at the Cheung Kong Graduate School of Business, asks respondents to indicate whether their firm is more, the same, or less competitive than the industry average (50), and from this we derive a sample competitiveness index. As our sample firms are in a relatively strong competitive position in their respective industries, the CKGSB BCI indices tend to be higher than government and industry PMI indices.





The financing environment index has been consistently low for CKGSB alumni, and, given that our sample consists mainly of China’s leading private economic powerhouses—the SMEs—this is a critical issue for reformers to address. Inventory levels reflected in this index have also been a long-term problem. However, the competitiveness index records our sample’s relative strength in the market. As our sample mostly comprises the companies of CKGSB alumni, their competitiveness is consistently higher than the average in their respective industries.

May’s investment index was 69.3, and the recruitment index 66.8. Although China’s macroeconomic conditions have changed since the BCI began in September 2011, investment and recruitment have always stayed high and stable, despite big fluctuations in costs and profits.

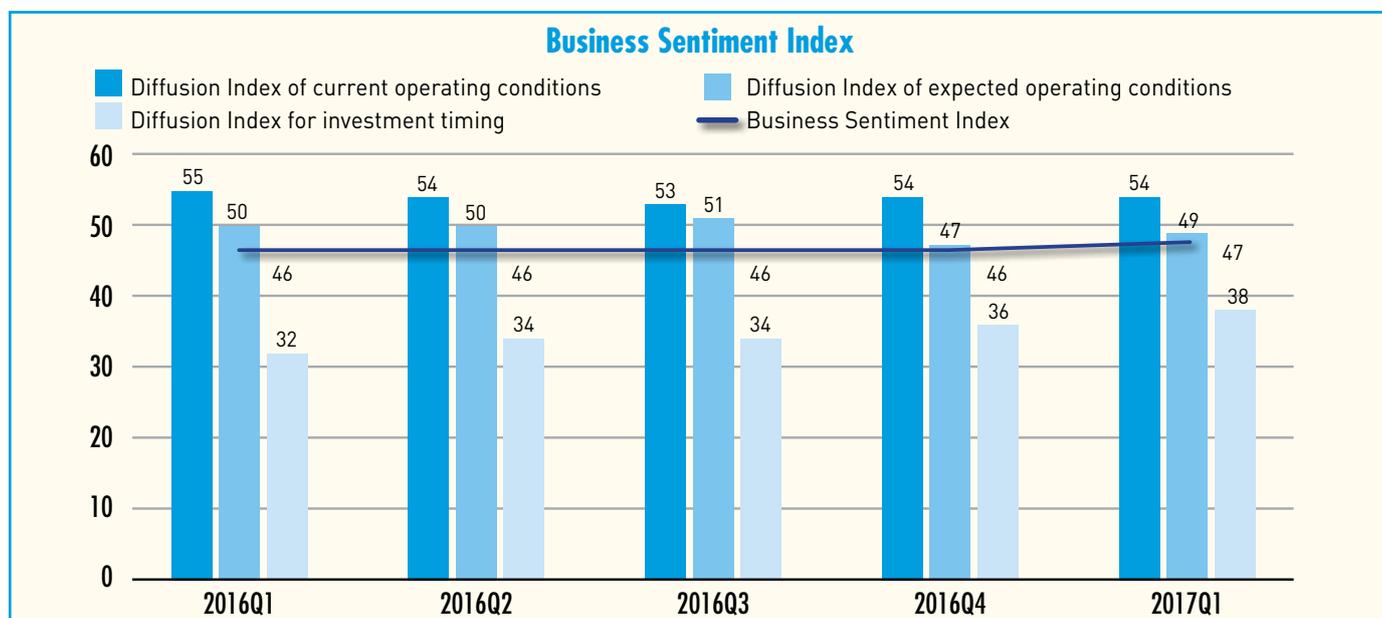
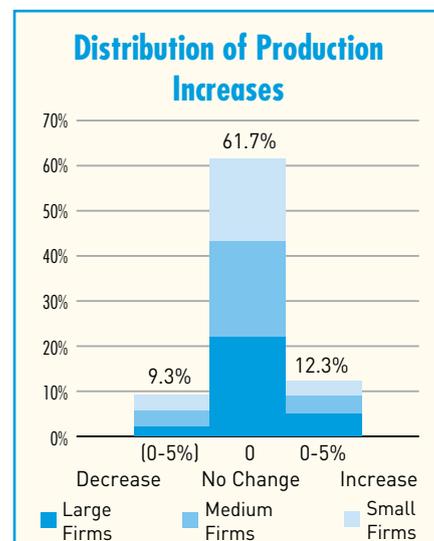


CKGSB BUSINESS SENTIMENT INDEX 2017 Q1: STILL UNDER PRESSURE

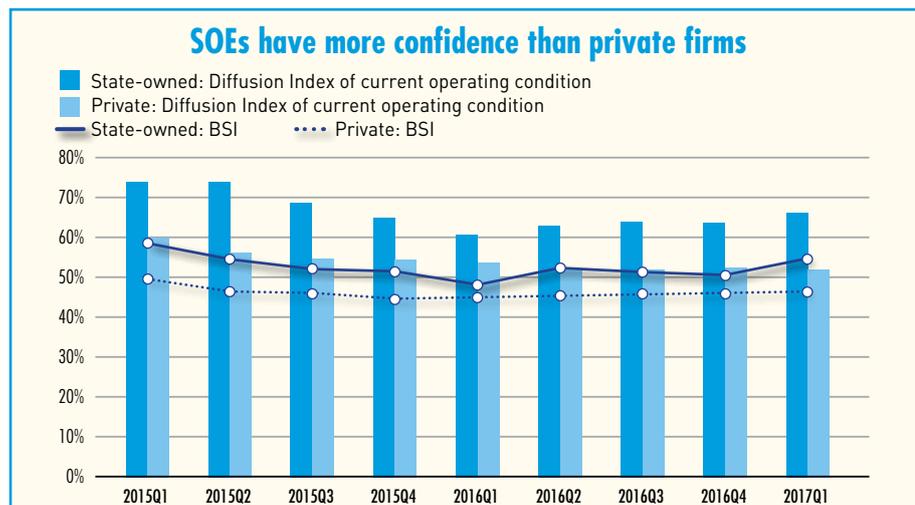
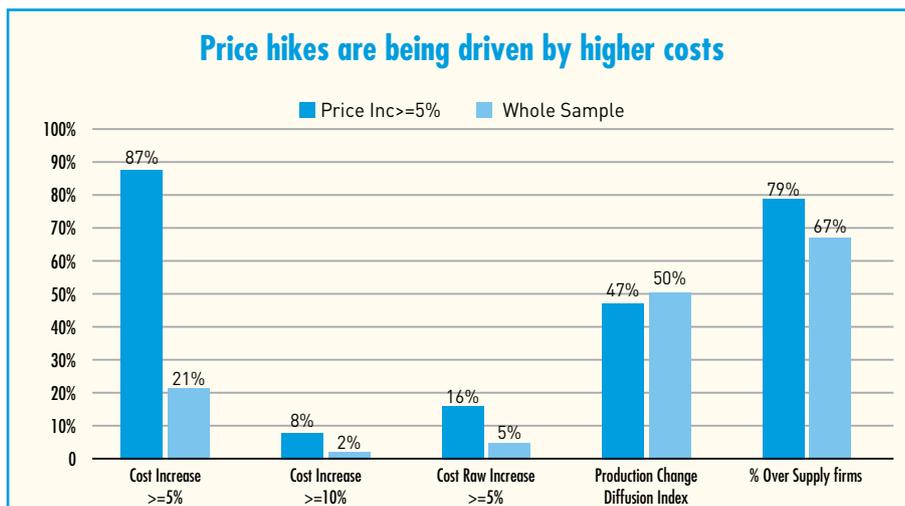
Business sentiment is up slightly, but still low overall

Although official data for first-quarter GDP and industrial growth exceeded expectations, we found that the industrial economy has not yet bottomed out. Our Business Sentiment Index in the first quarter stood at 47, one point above the previous quarter, but still indicating a slight contraction. Overcapacity remains at a historical high, both in terms of its prevalence and severity. The low BSI in Q1 was, again, a result of weak investment. Only 1% of the firms considered it a “good” time to make fixed investments, with a diffusion index of 38, far below the turning point of 50. In reality, only 8% of firms made any fixed investments in Q1 and a mere 2% made expansionary investments. The sluggish investment is not likely to improve in the near future: only 12 firms (0.6 %) said they planned to make investments in the next quarter.

The BSI, directed by Gan Jie, Professor of Finance at the Cheung Kong Graduate School of Business, is the simple average of three diffusion indices, including current operating conditions, expected change in operating conditions and investment timing. The index ranges between 0 and 100—a larger value indicates better operating conditions, with 50 marking the turning point between expansion and contraction. Compared with other economic indices, the BSI is more forward-looking and is a reflection of the absolute level of economic activities.

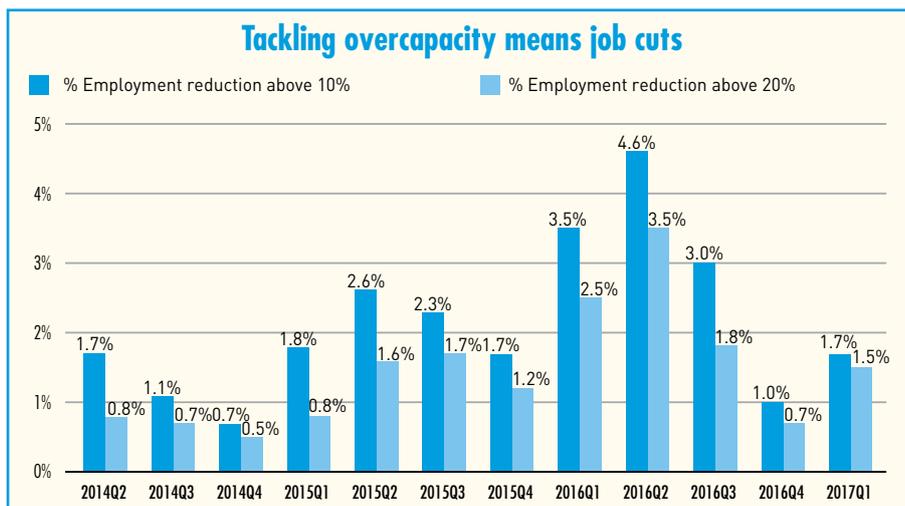


As in 2016 Q4, cost rises have been the driving force behind price rises. Among firms with product costs inflation above 5%, cost rises were the most prominent. The proportion of firms with unit cost increases above 5% and 10% were 87% and 8%, respectively, far above the whole sample. Unit cost increases are mostly related to raw materials costs—16% of these firms reported raw materials cost rises above 5%. Meanwhile, these firms were similar to the whole sample in terms of production expansion and overcapacity. This points toward price inflation driven by cost run-ups, rather than by increased demand.



The advantage of state-owned firms over private firms has increased in recent quarters, in terms of business sentiment and operating conditions. After two years of capacity curtailment, state-owned firms fared better in production and investment in Q1, as compared with private firms. This chart also suggests that the recent media reports of export expansion in Q1 have been due to the fact that exports of state-owned firms dropped in the past year before recovering significantly in Q1. As for private firms, their exports did not shrink last year and stayed flat in Q1. Private firms represent the vast majority, with overall exports staying flat in Q1.

In Q1, the proportion of firms reducing workers by more than 10% was 1.7%, while the proportion of firms reducing workers by more than 20% was 1.5%, up from 1.0% and 0.7% in Q4. We estimate that a total of 650,000 jobs were lost in 2017 Q1. Consistent with an improved industrial structure, firms with severe overcapacity are more likely to reduce employment and production. Among those with severe overcapacity (above 20%), the proportion of firms reducing production by more than 5% and 10% were 26% and 17% respectively, both significantly more than that of the whole sample (10% and 5%).





Risk in China is Changing, but Opportunity Remains

Kent Kedl, Senior Partner with British consultancy Control Risks in Shanghai, talks about the changing risk environment in China

By Tom Nunlist

With a growing economy and the world's largest population, China has for decades been a key destination for foreign companies expanding abroad. As a rapidly changing country, the difficulties of doing business here have never been small. In the past few years, however, China has in some respects become an increasingly risky place to do business, in part because of the Chinese government's efforts to modernize regulations and crack down on bad actors. For many foreign companies, this changing regulatory environment may be a bigger hazard to business than any faced before in China.

Founded in 1975, the UK-based firm Control Risks was originally set up to help companies avoid and resolve kidnap and ransom situations. Since then, it has expanded into a global risk consultancy with 36 offices around the globe, doing work in three primary areas: integrity risk, political risk and security risk. The company's mission is, in short, to help companies deal effectively with uncertainty.

As Senior Partner at the firm, Kent Kedl leads the Compliance, Forensics and Intelligence practice in the Asia-Pacific region. He first arrived in China in the 1980s as an English teacher, and then worked with various companies that entered China throughout the 1990s, eventually founding his own strategy consulting firm. He joined Control Risks in 2011. In this interview, Kedl talks in-depth about the highly challenging regulatory risks that have emerged in China, particularly since President Xi Jinping took office with a clear agenda to address corruption in all its various forms. Kedl explains how the challenge is not only for foreign companies to understand and comply with new rules, but to make compliance into a competitive advantage.

Q: Control Risks consults in some of the most dangerous places in the world, including war zones like Iraq. China does not have that type of danger, but what are the risks here for foreign companies?

A: China is not a high security risk environment. It's not a Mexico, it's not a Nigeria,

It certainly is a lot easier to try to bribe someone than it is to really pitch your product and show how it is going to improve a business. It's the wimp's way out

it's not any place like that. We say the most dangerous thing we do here is cross the street. However, the risks that China has in spades are those that companies hate most—complexity and uncertainty. If [the system] is so complex that you cannot understand it, then that is the most challenging business environment, because business relies on stability and consistency.

For almost twenty years China was becoming a more stable environment, year-on-year growth was predictable. You could predict that your business was going to grow double digits every year. If 30 years ago somebody would have told me that China was going to become stable and predictable in a relative sense, I would not have believed it. But that has happened and some companies have done well.

However, since the beginning of the Xi Jinping administration, there has been a level of uncertainty that has been introduced to the China market. Xi Jinping is making some fundamental changes to how things are run in China, which is going to have an impact on multinationals, especially in the regulatory environment. The biggest concern of many foreign companies in the past ten years has been the FCPA [US Foreign Corrupt Practices Act]. They are still concerned about that, but now they are concerned about Chinese regulations as well: laws on anti-bribery, anti-corruption, anti-trust, the environment, food safety, tax—you name it.

The challenge is that the laws in China are pretty vague. So foreign companies are not sure how to interpret policies and regulations in terms of how they might be enforced. Part of what we are doing is helping clients understand what the regulatory environment could be, what the enforcement could be, and how they need to design and run their businesses to be as legal and profitable as possible.

Q: It is interesting that you see more uncertainty now. Shenzhen in the 1980s must have been wild, but was it in some ways easier to deal with?

A: Yes, it was very uncertain in the 1980s, but companies weren't risking a lot. It was all opportunity, blue ocean, I've-never-done-this-before. However, the more assets you build here, the more people you hire, the more reputation you have to protect, the bigger your brand is, then the more you have at risk. Probably the best years were the 2000s into 2011 or 2012. Former Premier Wen Jiabao and former President Hu Jintao were engineers, and they designed the system to be boring and stable—bring us your investment, and we will make sure you get a return. Yes, policies were unclear at times, and you had fights with joint venture partners, and you had competitors that would do weird things, but it was all strangely predictable. Now no one is quite certain what is going to happen.

So given how they are reorganizing things, is this a market that [foreign companies] still want to play in? The answer for most companies is yes, they still want to play. But the horse you rode in on is not the horse you ride out.

Q: Because the environment has changed so much, do you find veteran companies coming to you saying, "We thought we understood this"?

A: Absolutely. The biggest challenge is for companies that have been here 15 or 20 years, because the rules have changed. When those companies came in the biggest priority was finding a way to grow. Companies would see that they needed to find partners, but they would not do any due diligence on them before bringing them on. Companies would ask lawyers what to do about players demanding bribes, and their lawyers would advise them to stick a distributor in the middle to insulate themselves. You can no longer get away with things like that.

The market conditions have changed as well. For example, for a fast food company that came in 15 years ago, there was a certain growth pattern, and a certain way they needed to conduct business, but now the consumer industry has completely changed. With rising internet penetration, and the rise of WeChat and Taobao and so on in the last five years, the way consumers shop has completely changed. So even from a commercial strategy, it is a very different environment. If you have been here 15 or 20 years, you thought you had this stuff figured out, but it is all changing.

Q: Do you think some companies would prefer to use the old methods instead of doing challenging compliance work?

A: Early on in my career, I ran a software company here, and so I faced situations where people were doing it the "old way." It certainly is a lot easier to try to bribe someone than it is to really pitch your product and show how it is going to improve a business. It's the wimp's way out. When I was running that company I refused to give bribes, and we "lost" some deals. My management overseas would point to the growing market and growing competition, and I would have to explain to them that they are achieving fast growth because they are bribing, and I won't do that. It is not only that is

it is wrong, but also it's not sustainable. The first time you do that you step on the slippery slope. I think for a foreigner I understand China fairly well, but I could not manage that kind of thing. I was going to be completely out of my depth. And so it is an issue of sustainability.

And that is the term we are helping clients to understand right now: you can build a business that grows, but can you grow it sustainably? The companies that have been investigated, they had fast-growing businesses, but was it sustainable? When they got investigated and got fined, they lost 80% of their business. That to me is not very good business. If you are going to put a business together on the premise that you can grow 30% annually but you have to go work in dodgy areas, I would say by definition from a strategic standpoint that those are not addressable markets. If you do business in a way that is more above-board, the market size becomes smaller, and your growth is sometimes limited. But I would argue it is more high-quality, sustainable growth.

This has been a difficult message to deliver. I had to give a speech a couple years ago to a group of CEOs on "Compliance as Competitive Differentiator." The message was that if you are more compliant, and more transparent, and you are following the rules better, this is a competitive differentiator for you. It was a hard position to state at that time, because so many competitors were using dodgy tactics to win market share. But since the 2013 GlaxoSmith-Kline bribery scandal, which resulted in a \$490 million fine and untold reputational damage, compliance is now coming to be seen as more of a competitive differentiator.

Q: How does Control Risks work with Chinese companies that are expanding into other parts of the world?

A: We work for state-owned enterprises (SOEs) that are investing in oil and gas, construction, telecommunication and so on. We are also doing work for Chinese investment firms, sovereign investment funds and individual investors, private equity firms and also Chinese private companies that are buying companies overseas. We undertake the same kind of pre-investment due-diligence and risk advisory work for all Chinese companies going international as we do for foreign companies entering China. Chinese companies are starting to realize that this is important.

Take Africa for example. China has been investing in Africa for 40 years, but they have gone in with a certain point of view, that they'll bring in millions of dollars in investment, and bring construction firms, and also bring thousands of Chinese workers. They also build schools and roads for communities, and so they end up wondering why they receive so many threats from the locals. This is because the local people see the situation differently. They become hostile because they want both jobs and schools.

Q: How much risk does Control Risks itself face operating in China, and how do you deal with it?

A: I spend a good portion of my time just managing our own risks. We are admittedly in a gray area in China, and we can be seen as the enemy sometimes, especially if we are doing investigations into

Foreign companies are not quite sure how to interpret certain policies and certain regulations in terms of how they might be enforced

political figures or in other sensitive areas. This means that much of my job involves meeting with Chinese government officials to make sure they understand what we are doing, and how we are doing it. Our job is to help foreign companies do business legally in China. The advice we give to companies is not how to get around regulations, but how to understand them so that they can work with them. We also help them to get to know some of the proper officials themselves so they can get their own information and navigate the landscape independently.

Working with the SOEs is good also because it gives us credibility among them. We work with the Ministry of Foreign Affairs and state security and a number of other organizations that are helping companies going outbound, and that helps increase our reputation as well.

Q: Given the increased uncertainty of today's business environment in China, are there reasons to be positive?

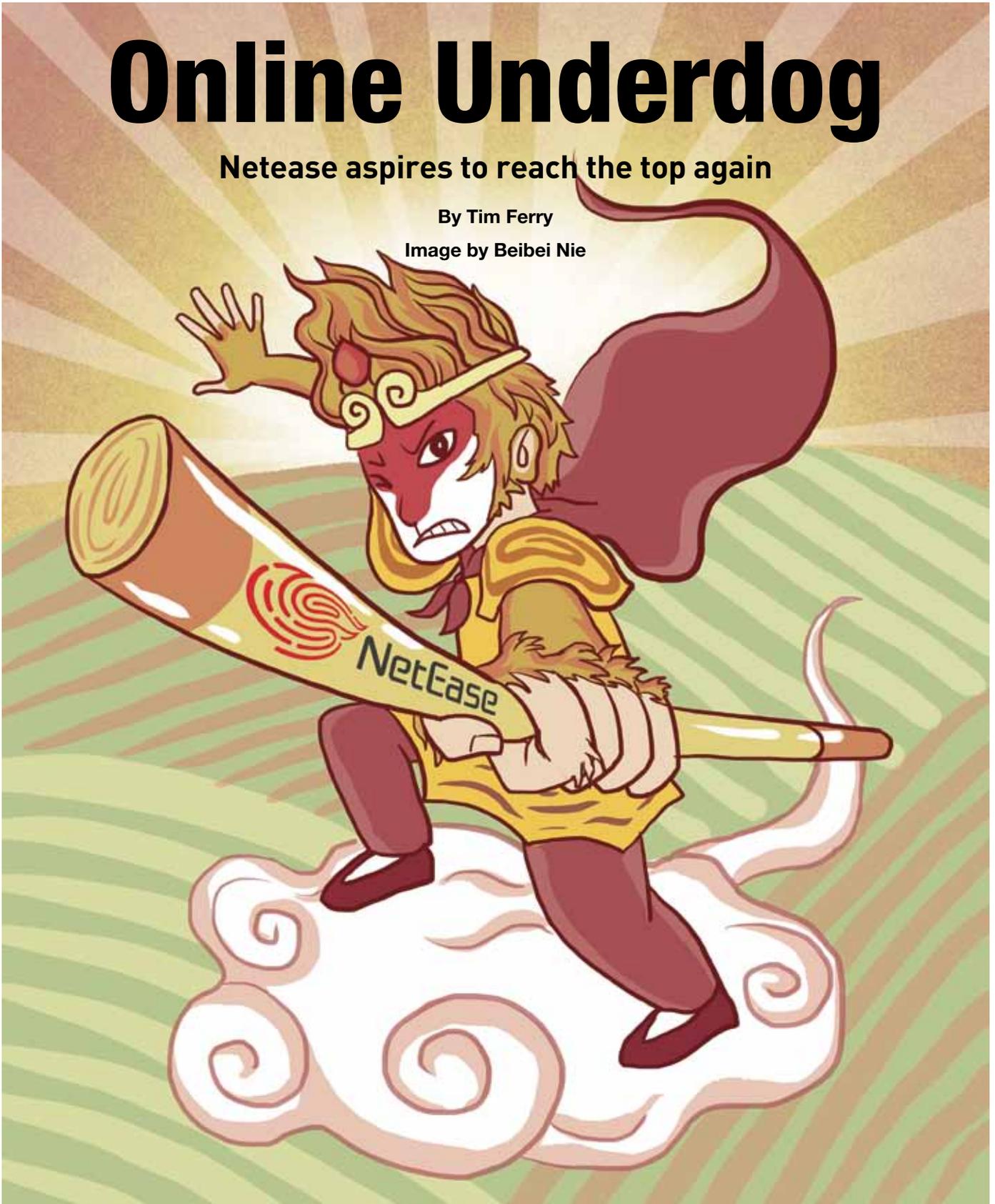
A: I am constantly encouraging companies to look for opportunity. I ask them to go back to the reason they came to China in the first place. There was opportunity for new growth, new product development and new ways of competing. There were new value chains to break into. That hasn't changed. There still are opportunities, but they are not diamonds lying on the beach that you just bend down and pick up. They are hidden and encased by a pretty hard shell of risk. To get at the opportunity, you have to deal with that risk, which globally I think has increased in complexity and uncertainty. But the opportunity is still there. If companies keep their eyes on that prize, adjust how they define that opportunity as well as how they pursue it, then reaching their goal is a matter of managing the increased risks. That is of course a doable task. 

Online Underdog

Netease aspires to reach the top again

By Tim Ferry

Image by Beibei Nie



NetEase is the internet pioneer you may have never heard of. A dynamic survivor, the company faced down death in the dot-com bubble, and has come back as a potential challenger to China's biggest tech firms

Nestled in the pleasant countryside of Anji County, in China's eastern province of Zhejiang, is Weiyang Farms, an 80-hectare facility raising some 20,000 Jeju black pigs. A Wi-Fi-enabled speaker system pumps out music synced to the pigs' waking, eating and sleeping schedules, a hint that this is not a normal pig farm. It is owned by the Chinese tech company and online games giant, NetEase.

NetEase is the Chinese internet pioneer you have probably never heard of, and it has learned the hard way that diversification is the only alternative to death. Founded in 1997, before its bigger and better-known Chinese internet peers Baidu, Alibaba and Tencent (collectively known as BAT), it is largely unknown outside of China.

Along with its founder and CEO Ding Lei, it is a dynamic survivor. Lei faced down entrepreneurial doom after the dot-com bubble, but thanks to courage, wits and diversification—largely into games—he turned the operation around and is currently ranked number six on the *Forbes* list of China's wealthiest, worth an estimated \$17 billion.

NetEase reported \$5.5 billion in revenue in 2016, with \$4 billion from online games, 60% generated from its mobile offerings, including the hit titles *Fantasy Westward Journey*, *Speedy Ninja*, and *SpaceX Fighter*. The company's profit for the year was \$1.7 billion, a 73% increase on the year previous. Its shares, listed on Nasdaq, have skyrocketed in recent years, and the company is currently valued at around \$40 billion, and it employs nearly 13,000 people.

"NetEase is now China's second largest online game operator," says Peter Wu, an analyst with the Market Intelligence & Consulting Institute (MIC) in Taiwan. More importantly, the company is not complacent. "NetEase's future trajectory as a company is to continue to focus on diversification."

NetEase is currently making big pushes into many new businesses. In addition to pig farming, admittedly a peripheral concern for a multi-billion dollar tech company, NetEase has been investing in e-commerce, online learning, music streaming and a host

of other businesses.

But it still has a long way to go to climb back to the top of the China tech tree, so as to turn BAT into BANT. Its valuation lags behind the others—\$64 billion for Baidu, \$343 billion for Tencent, and \$355 billion for Alibaba. Analysts note that NetEase lacks the breadth of its rivals' businesses, and that will likely stymie its growth, unless it can continue to diversify successfully.

"I think NetEase still needs a long way to be a top firm in the world," says Johnny Zhou, Market Analyst with tech industry research firm IDC.

On the other hand, NetEase has surprised skeptics in the past, and has found massive success in markets where few saw any potential at all.

Early Days

Ding Lei, also known as William Ding, established NetEase way back in 1997, a time when only 290,000 PCs were connected to the internet in China, and there were only 620,000 internet users, according to an article by the China Education and Research Network (CERNET), a state-internet provider for educational institutions.

"I was one of the first internet users in China," Ding told the *South China Morning Post* in 1999. "I began to realize at that time that the internet would be very popular."

In 1997, with RMB 500,000 (\$74,000) earned from the sale of telecommunications-billing software that he had developed, Ding quit his job and set up NetEase in Guangzhou. The company first developed a Chinese-language software system that enabled internet service providers (ISPs) to offer free e-mail to China's web surfers. Its still-current web address, 163.com, referenced the number internet users in those days needed to dial to access the web.

"NetEase is one of the four biggest internet portals, together with sina.com, qq.com and sohu.com," says John Song, Deloitte Consulting Partner and Head of the Logistics and Transportation Practice at Deloitte China. "It still has a solid brand name and customer base."

Ding quickly expanded the NetEase range of services to include a search engine, online chat, news, web hosting and other services much like a Chinese version of Yahoo! By 1999, China had 6.7 million internet users. NetEase was recording about 4.2 million daily page views, bringing in \$2 million a year in revenue and had 1.7 million registered users for its free e-mail service.

Investors took note. In 2000, NetEase raised \$70 million and, along with Sina.com and Sohu.com, was listed on the US stock exchange, Nasdaq. However, the experience was rocky as the internet bubble burst. By mid-2001, as billions of US dollars were wiped off the Nasdaq-listed stocks, NetEase's share value dipped to as low as 13 cents (it was valued at \$300 per share in June 2017).

Adding to the company's problems, in May 2001, NetEase announced that it had discovered accounting malfeasance in which contract terms had been misrepresented in financial statements. The readjustment removed \$4 million in revenues from its balance sheets, approximately 52% of the year's total revenues. The company was suspended from the Nasdaq and threatened with delisting. CEO King Lai and COO Susan Chen both resigned.

The wider bubble put the entire future of

the internet in China into question. Duncan Clark, founder of consultancy BDA China and author of *Alibaba: The House that Jack Ma Built* told *The New York Times* in 2001 that the internet in China was being "absorbed into the traditional economy."

Rebirth

But Ding Lei remained a believer. He saw an opportunity with the emerging online games industry, and over the objections of his own board of directors, that was where he took the company.

NetEase launched its first game, *Fantasy Westward Journey*, in 2001 and it became China's first popular Massively Multiplayer Online Role Playing Game (MMORPG), in which huge numbers of players can simultaneously play in a persistent fantasy world. Inspired by the classic 16th century Chinese novel, *Journey to the West*, the game became a phenomenon and helped give birth to the industry.

"With *Journey to the West* and *Journey to the West II*, NetEase witnessed a great success with a whopping 449% year-on-year growth in 2003, 209% in 2004, and 119% in 2004," says Peter Wu. The game eventually attracted some 300 million users. By 2003, Ding had become China's wealthiest person and its first internet billionaire.

NetEase produced a string of original hits, including *New Westward Journey Online II*, as well as other games, such as *Tianxia III*, *Heroes of Tang Dynasty Zero* and *Ghost II*. "Instead of distributing games from international brands, NetEase has concentrated on developing homegrown games," says Wu. Of approximately 40 games launched by NetEase in 2016, over 70% were homegrown.

NetEase has also teamed up with a number of foreign games makers, including Blizzard Entertainment, which owns the blockbuster *World of Warcraft* series, to publish many of their global offerings in China, contributing even more to the company's bottom line. According to its first quarter 2017 finance report, NetEase revenue reached \$1.98 billion, a year-on-year growth rate of 72.3%, with online games contributing \$1.56 billion, or nearly 79% of the total.

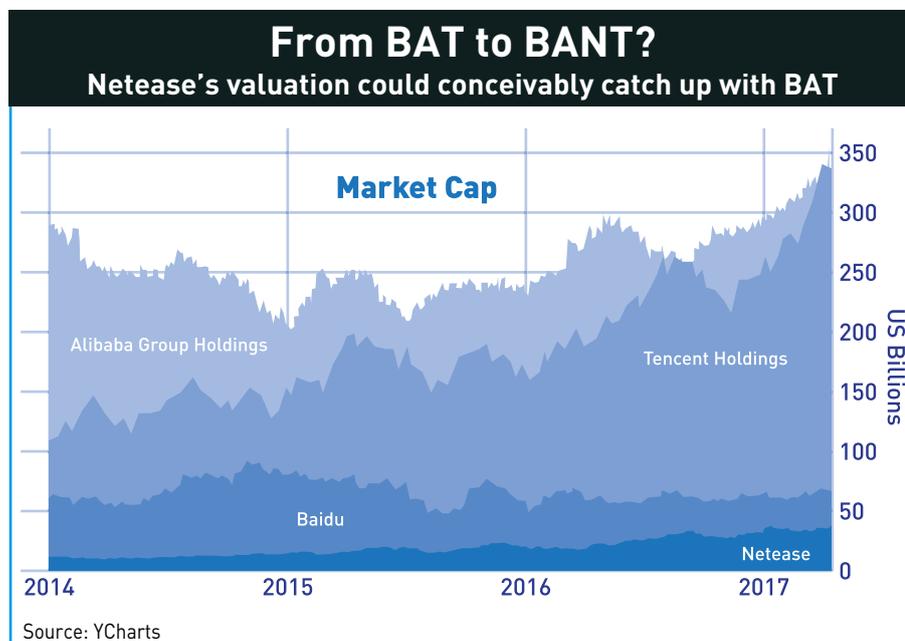
The market for games is starting to change, moving from PC to mobile, but NetEase seems well set for the switch because Chinese mobile gamers are still demanding the kind of big multiplayer games that NetEase has experience in developing. But there is a lot more competition in the mobile space. NetEase released a mobile game based on the *Kung Fu Panda* movie franchise in 2015, which disappointed some gamers.

"At first I thought the graphics were amazing," says Tao Jiayuan, a 28-year-old coder in Shanghai. "But after three days of playing, I discovered that it is actually just like *Fantasy Westward Journey*."

In contrast, Tao said another mobile game, *King of Glory*, holds his attention for hours, and, indeed, it was a big hit this year. Unfortunately for NetEase, it was released by rival Tencent, which is now the largest games company in the world.

"When it comes to mobile games development, NetEase was relatively late compared to Tencent," says Peter Wu, but he notes that overall the company has done well in catching the mobile game wave. NetEase's online games revenue grew 62% to RMB 28 billion (\$4.1 billion) in 2016, thanks in large part to mobile games.

Its continued success in the games area





NetEase's success is not only a one-time success... maybe they will someday develop a product like WeChat

John Song

**Director Logistics and Transportation
Practice, Deloitte China**

resulted in NetEase's share price doubling to \$300 this February from a year previous. Even at that rate, NetEase is still considered a bargain by investment analysts. Its larger rival, Tencent, has a price to earnings ratio of 50; NetEase's is around 20.

China and Southeast Asian video gaming market research firm Niko Partners noted that while NetEase is still likely to remain second to Tencent in the China mobile gaming market, the smaller firm is catching up fast.

"Tencent dominated the China mobile games market in 2016 with around 50% market share, but NetEase's mobile game revenues grew by more than 2X to quickly chase Tencent for the top spot," the firm noted in publicized findings. "We expect NetEase to maintain the No. 2 spot in the market and once again grow faster than Tencent."

Beyond Games

On the back of that gaming success, NetEase has expanded into a number of other ventures, including such diverse areas as organic farming.

NetEase still provides free e-mail services in China. It has added new and updated features such as voice search and facial recognition, as well as fee-based premium e-mail services for corporate users. "[NetEase's] e-mail is still quite good, still widely used by people in China," says Song.

The e-mail service currently has about 60 million users and NetEase has cre-

atively leveraged this into an e-commerce business that is integrated into its mail services.

NetEase attracts users that tend to be more educated and have higher incomes than average. The cross-border e-commerce platform Kaola, launched in 2015, takes advantage of this by offering high-quality foreign goods at prices that it negotiates with foreign manufacturers.

"NetEase has done a good job," says Xue Yu, an analyst with IDC in Beijing. "Growth of NetEase's e-commerce platform is about 60% per year, far above the average [30%.]"

Xue says that challenging giants Alibaba, which runs the Tmall platform, and JD.com for supremacy is more or less impossible. Rather, NetEase has managed to carve out a nice niche for high-value customers.

All told, 21% of NetEase's 2016 revenue came from e-mail and e-commerce activities, which have actually grown faster than its gaming revenue, up 117% year-on-year.

Then there are the pigs in Zhejiang, which seemed to have begun as Ding's billionaire hobby. "This is not an investment for NetEase or a way to make extra money. I hope that it will increase food product safety and work opportunities for rural folk," he said in an interview shortly after starting the farm in 2009.

Even that may have changed, however. This past February, early stage venture capital firm Sinovation Ventures joined popular daily deals company, Meituan-Dianping, in a \$23 million investment round

in Weiyang Farms, clearly seeing promise in the prospect of artisanal pork. Such initiatives aside, it is unclear how far NetEase can stray beyond its gaming mainstay.

"[NetEase] is developing in a vertical way by reinforcing the strength of game R&D," says Johnny Zhou. In his opinion, it is far easier for NetEase to be a great gaming company than it is for the company to establish itself in new fields.

Bigger Ambitions

NetEase is now successful enough to look to expand its presence globally. Its early moves lend credence to Johnny Zhou's idea that it is at its core a games maker. In August 2014, the company opened up its North American headquarters in Brisbane, California, as a steppingstone, saying in a press release that CEO Ding "has ambitious goals to achieve greater results in the non-Chinese gaming markets within the next three to five years."

A glance at the global gaming industry indicates the potential. SuperData Research Inc., a firm specializing in digital goods measurement, notes that online and mobile games generated some \$91 billion in revenues globally in 2016 and \$41 billion in mobile, the biggest year ever seen in the industry, with continued expansion expected.

Yet, rather than becoming a more global company, the immediate prize may be to rise into the ranks of the BAT brethren. This may be more feasible, especially with Baidu struggling to adjust its business model. In the latest *Forbes* list, Baidu CEO Robin Li dropped out of the Top 10 richest Chinese while Ding Lei rose to sixth.

John Song notes NetEase's steady progress in recent years. Its focus on the customers and its overall stable business model have been built on growing revenue and profit in what can be a bubble-prone Chinese tech industry. Holding it back, however, is NetEase's lack of a world-changing product, like Tencent's WeChat (see article pages 12-16).

"NetEase's success is not only a one-time success," Song says. "So maybe they will someday develop a product like WeChat and again become one of the top internet companies." 



2017 China India Insights Conference

September 28-30, 2017 | CKGSB New York Office

WHAT

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Alan Chen

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Director

Tel: +1 646-627-7735

Email: alanchen@ckgsb.edu.cn





Our Advanced Material World

Dr. Christian Haessler talks innovation, sustainability and profitability in China

By Tom Nunlist

Covestro is an offshoot of the German multinational pharmaceuticals and life sciences giant Bayer. The firm spun off in 2015 and produces advanced Chemical raw materials for plastics, foams and coatings—that are essential to produce many of the products of our modern world, such as makeup, cars, buildings and even clothes.

Today, both the Chinese government and citizens of the country are increasingly concerned about the environmental impact of manufacturing and, ultimately, its contribution to the threat of climate change. How does a material manufacturer like Covestro respond?

Christian Haessler is Head of Innovation for Covestro in the Asia-Pacific region and leads the Polymer Research and Development Center in Shanghai. He explains how the center is involved in sustainable development. Last year, for example, his lab collaborated with Chinese firms to produce longer, more productive wind blades to generate energy more efficiently. The lab has also worked on environmentally friendly coatings that can be used, for example, in better fabrics.

Haessler talked to *CKGSB Knowledge* about the forces driving the innovation at this behind-the-scenes company.

Q: Covestro is a German multinational company that describes China as its second home market. To what extent have the growth stories of China and Covestro paralleled each other?

A: China is an important country for us and our commitment in terms of R&D is already 15 years old. The Shanghai location was one of the first multi-national R&D centers we built. To date, we have invested about €3.1 billion (RMB 23.7 billion) in China in both research and production. One of the ideas was to make production local, so in many ways we are considered a local producer.

Q: How has the operation evolved over that time?

A: All of China's industry has advanced over those 15 years. For us, this means

There is market demand for sustainability

market-oriented innovation is important, so we work with our clients to create innovative solutions. As the customer advances and begins to manufacture more sophisticated products, we as a supplier must step up our technical services and operations. We have always tried to do this and so we have grown from 20 to 200 people in R&D over the past 15 years. The entire operation has also changed significantly in terms of the topics focused on, and the people and expertise we have in the R&D center.

Q: What is special about the Chinese R&D center?

A: I don't see many differences between it and our other locations, actually. We all work with chemistry, we all produce materials, we all work closely with customers and have a close network of partners. In Shanghai, the team collaborates closely and mixes creativity with efficiency. This is no different from other R&D locations.

However, one key difference is the team. Out of the 200 scientists working in Shanghai, only a few are German. The rest are

locals, but they have an international mindset and a fantastic ability to learn. The R&D center in Shanghai is really a global R&D center. It not only focuses on China, but the entire Asia-Pacific region and it contributes to Covestro's global R&D network.

Q: One of your recent achievements has been to create a wind blade from composite materials that, at 37.5 meters in length, is both lightweight and yet incredibly strong. What led to the production of this wind blade?

A: Yes, the blade is an example of how Covestro in China can achieve things not possible elsewhere. We have 15 years of expertise, as well as the team, the partners and the market opportunity. From an R&D point of view, we followed the logic of simply seeking new markets. To do this, you need to work with customers to see where a value proposition for new materials may arise. In addition, you need partners because you cannot create the solution alone. If you have the right partners and they are courageous enough, then you can work together to create new solutions that will eventually generate new business.

Still, this is a complicated process. Although we have created the blade, there is still a long way to go before we create a business based on it.

Q: What is the timeframe in which this new wind blade will appear on a commercial scale?

A: That is likely to be years. Last year it was all about the blade, and the blade was difficult enough to create. It is not just about the complexity of the manufacturing, it is also about making sure that the blade has all the right properties. That was challenging—one of



Covestro's regional R&D Center in the Pudong District of Shanghai

the most spectacular technical challenges we ever had. In 2017, the target is to create the windmill. Once we have achieved this, then we need to scale it all up because, at the end, you want to produce thousands. But different industries have different speeds. Information technology, for example, has extremely quick turnaround times from R&D to production, but change in the wind power industry takes a long time.

Q: China is not known as a “green” nation. Are China’s many environmental challenges an opportunity for Covestro?

A: China is not known for greenness, but it is moving in that direction. If you look into the most recent Five-Year Plan, there is a focus on sustainability and innovation. This fits perfectly with our strategy and that is reflected in our core projects: wind and solar module projects; environmentally friendly coatings; lightweight materials to be used in items like electric vehicles and so on. All of this concerns environmental sustainability and matches well with the direction China is heading.

Q: In what ways is the government encouraging this “greening” of China?

A: If you look at the actions of the government and at their statements, you have clear indications of the direction they want the country to go. They have very concrete numbers of what kinds of products they want on the streets. We are working on solutions that can help meet those goals. For example, we are working on materials that make cars lighter so that they can travel further with one electric charge. I hope that these materials will eventually translate into sales.



The lobby of Covestro’s regional R&D Center in Shanghai, showcasing products

China is emphasizing innovation quite a lot and this will probably take a quite different direction from Europe

Many local governments are also asking manufacturers to become cleaner or else leave their city. This is having an impact. For example, some manufacturers once used solvent-based coatings in products, but have now shifted to water-based coatings. For us, this is a business opportunity as well as an environmental one. We believe that by looking at the mega-trends and identifying where societal needs are, market-led innovation will translate into solutions and result in commercial success.

Q: Sustainability is part of the mission statement at Covestro, but obviously, profit is essential as well, as you just indicated. How do you balance sustainability with profitability?

A: Whatever we produce has to be good for people, minimize the impact of production on the planet and bring a profit. When you look at developing products, such as the wind blade, you first consider the benefits it brings to people and the planet. Yet, if we conclude the product might not be marketable, then we would not pursue it. I mean, how could it make an impact if it was not in demand by the market?

Yes, profit plays a role in how we manage projects, but I do not see a big contradiction between sustainability and commercial success. If you look at the most successful projects we have had, you will find they all have a sustainability focus. There is market demand for sustainability.

Q: Covestro recently unveiled a material derived from CO₂ taken from the air. Can you tell me about this product?

A: Part of the reason we were so excited about the wind blade was because it combines basic materials into composites. For me, the CO₂-based polymer foam is equally sensational, but for a different reason.

Otto Bayer invented polyurethane 80 years ago, so it is quite an old material. For this project, we worked with the Catalytic Center in Aachen University, Germany, to develop a catalyst that can extract CO₂ from the atmosphere so it can be used to manu-



Covestro's new composite windmill blade in front of their regional R&D Center in Shanghai

facture the material. Normally you need a lot of energy to do this because CO₂ is a stable molecule, so the process would not be energy efficient. Our breakthrough was the development of a catalyst that breaks down CO₂ using far less energy than before.

So, 80 years after these polymers were invented, we found a way to change chemistry again. Up to 20% of the content in this material comes from CO₂ extracted from the air. This is quite sensational from a technical standpoint and from an overall approach. The foam can be used in a variety of applications. You can make a hard version for insulation in refrigerators, for example, or you can make a softer version. This is what we did for the first prototype product: a mattress. It is a great material for making a mattress.

Q: Covestro is not a consumer-facing brand, but your materials do go into consumer products. How does market sentiment, especially in China with its growing consumer market, influence you?

A: Consumer behavior is not directly related to any of our materials. However, when you have a society where an emerging middle class already has its primary needs fulfilled and is now turning its attention to quality of life issues, this will have an influence on the entire society. Ultimately the influence comes from the government's response to demands for such matters as cleaner water and safer products. The effect is then seen on the regulatory level through changing product standards.

One example of this process is our work with a big name clothing brand. We supply some of the materials used in their clothes, specifically a kind of synthetic leather, which is a coated fabric. They want suppliers that have the most sustainable, least environmentally harmful solutions, but they also want a product that does not have unpleasant odor. With the water-based methods

coming in, we are able to deliver that. Customer expectations have changed, which has influenced the sourcing behavior of brands and that is a great business opportunity for us. In that sense, consumer behavior can influence us, but generally, it does not have a direct role.

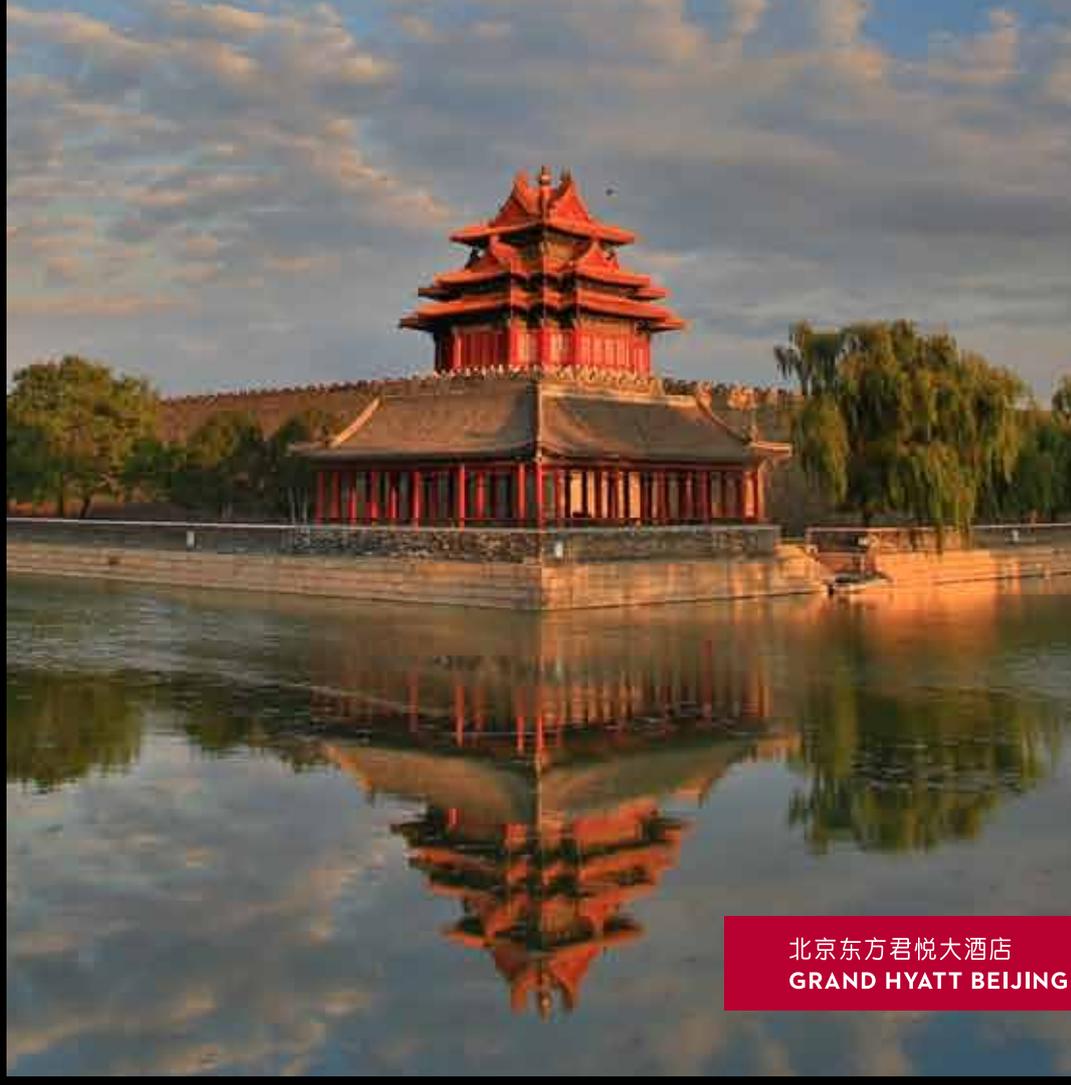
Q: What is the competitive space like for Covestro in China?

A: China is a highly competitive market, but it also provides many potential partners and opportunities. Many local firms are becoming increasingly important and branching out internationally. As they do so, they often require new materials and we can assist their requirements in different global markets.

China is also emphasizing innovation a lot, and this will probably take a quite different direction from Europe. You can already see it in the strong push for things like "Made in China 2025" and digitalization. We are well positioned in this space with production and sales, and with partners in networks in the market. The wind blade is a good example of what we can do with a set of local partners. That is why we are actively broadening our partnership network in China. We are working on partnerships in many industries.

Q: What do you see in store for Covestro, both in China and abroad?

A: We want to make the world a brighter place. Our ultimate two pillars are innovation and sustainability. We can talk about efficiency and productivity, but you have to get innovation right in the sustainability context first. That is where the world is moving and this is the development goal in COP21. Yes, President Trump has said the United States will step out of the Paris Agreement, but China is still committed to it—and Covestro believes in it. ■



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Elite Education

Ideas about schooling in China are changing

By Shasha Chen
Image by Beibei Nie



Mandy Zhang is a busy little girl. At her five-day-week private school in Shanghai, the day for the seven-year-old starts at 8am and ends after eight hours of demanding classes in Mandarin and English.

She then completes up to two hours of homework before practicing either the piano or painting—Mandy is studying both. On weekends, she plays volleyball and prepares for a July summer camp in San Francisco. This is all considered essential grounding for her future studies in the United States.

“It is all helping to develop her bilingual and creative abilities,” explains Mandy’s father, Zhang Wei, of his daughter’s packed schedule. “Equally important is that most of her classmates are from well-educated families.”

The Chinese education landscape has undergone sweeping changes since Zhang was born in 1980. Although both of Mandy’s parents graduated from prestigious Chinese public universities, they elected to send Mandy to an elite private school. Such schools did not exist when Zhang Wei was a child, but by the time his daughter was born, regulatory changes had fostered a highly diversified education industry.

The compulsory nine-year public system is free in China (up until age 15), but quality varies widely. Top public schools are very good, but access is limited. Far more often children end up in “vegetable market” public schools, so called because their parents tend to be ordinary people, such as vegetable sellers.

Newly-affluent Chinese families, desperate for a good education for their children, are willing to pay top dollar for a quality alternative. Tuition at private schools ranges from RMB 250,000 (\$36,000) to RMB 500,000 (\$72,000) per year. (China’s per capita GDP in 2015 was \$8,000.) Private schools and tutoring institutions are mushrooming in response to demand.

Pressure Cooker Education

The public system includes many top-tier schools, but Li Zixin, founder of China30s, an influential knowledge-sharing platform for middle-class professionals, explains



Kids play at a Beijing primary school during a German cultural exchange program

that these are difficult to enter. Enrolment in a public school requires a local *hukou*, an official residence permit that restricts migration, plus ownership of a property within the school district.

If parents are lucky enough to have the former, they need to be rich enough to afford the latter. According to *Caxin*, a respected Chinese business publication, a small two-bedroom apartment in Beijing costs on average about RMB 89,000 (\$13,000) per square meter (See story on Page 41). But in Xicheng District, near the highly-regarded Beijing No. 2 Experimental Primary School, prices can soar to RMB 200,000 (\$29,000) per square meter. The imposing barriers mean some families have no choice but to look to private schools. But for other families, the overall atmosphere of private schools is the draw.

“The small class sizes, the focus on personality and creativity and expat teachers... make [bilingual private schools] more appealing than public ones,” says Li.

Ahmed Hussain, Director at Wellington College, a network of three schools in

Hangzhou, Shanghai and Tianjin, echoes that view. In his experience, Chinese parents are increasingly seeking a more holistic and personalized approach in order to develop the “whole-child,” including values, mindset and identity, in addition to academic excellence.

“To be a future elite, my child will need more creativity than is involved in simply memorizing information,” says Lu Gao, a 37-year-old mother in Beijing, who placed her daughter in a bilingual kindergarten. “China’s future economy demands innovation and internationalization.”

Jeff Sprafkin, a Jewish entrepreneur in Shanghai who provides English-language educational material to Chinese schools, says public schools in China are usually exam-focused and feed students with right and wrong answers. “Jewish and Western education is more questioning, which stimulates independent thinking,” Sprafkin explains.

Parents like Lu are a major force in the demand for the materials Sprafkin offers, as well as in the impressive growth of the



entire industry. According to ISC Research, a market intelligence provider on international schools, China experienced the highest growth of private bilingual schools in the world in the past few years.

This demand is attracting investors from other industries. In recent years, Vanke and Country Garden, two of China's largest real estate groups, have launched bilingual schools adjacent to developments for wealthy Chinese families. This year, Alibaba invested RMB 1.1 billion (\$160 million) in a private bilingual school in Hangzhou, in addition to launching educational coaching services in video format on Taobao, the company's e-commerce platform.

"Internet companies are acquiring educational companies to [diversify], while real estate companies are taking a share of educational real estate for profit growth," says Roger Chung, Senior Research Manager with Deloitte in Shanghai.

Overseas and Online

Li Zixin says the diversified marketplace has generated two distinct types of elite

education. One track lies through the public school system with an exam-focused curriculum that prepares students for the college entrance exam, the *gao kao*, which takes multiples days and is considered extremely difficult.

The other is designed to support students at private schools to eventually go abroad, so those curricula are more well-rounded. Beyond core courses, there is an emphasis on art, sports, volunteering and overseas summer camps—the kind of activities Mandy Zhang is involved in. Li Zixin says the divide has become so sharp that children on Mandy's track may end up unfit for competition in the *gao kao*, which means they will be studying abroad.

Rupert Hoogewerf, founder of the *Hurun Report*, which prints a rich list similar to that of *Forbes* but China focused, says the average age of rich students going abroad for full-time study fell from 18 years old in 2014 to 16 years old in 2016. Around 83% of China's "high net worth individuals," those with liquid financial assets above \$1 million, are preparing to send their children overseas.

But the phenomenon is not only limited to the super rich—in 2015, over 500,000 Chinese students went abroad to study.

"Some [parents will] push themselves to their financial limits for a better future [for] their kids," says Chen Ji, founder of Harkness Education Consulting, which supports Chinese students applying to American high schools.

On the other hand, growth of online education, driven by improvements in technology, is also lowering the cost of access to education for other families. The industry serviced 138 million people in China in 2016, according to the China National Network Information Center (CNNIC), a government agency responsible for internet affairs in China.

"Parents born in the 1970s widely accept online education," says Cindy Mi, CEO of VIPKID. Three years ago, she established a videoconferencing business that allows Chinese children to learn English at home with teachers in North America. Users quickly exceeded 100,000 and revenues reached RMB 1 billion (\$146 million) last year.

"We subscribe to at least four types of online educational videos about 10-15 minutes each, which our daughter can watch by herself," says Mandy's father of similar services.

Global Elite

The enormous demand for quality education services represents a rising cost and stress burden for Chinese families. While public primary schools do not hold entrance exams, it is becoming more common for private ones to screen applicants. This year, Yangpu Primary School in Shanghai even tested the IQs of parents.

The story provoked an online outcry and an eventual reprimand from the Shanghai government, but that does not address the underlying problem. Spots are so limited that parents, as soon as their child is born, register for early childhood centers and high-quality kindergartens—lest their children end up in "vegetable schools."

Meanwhile, private school operators face uncertainty due to changing policies. Last September, the amendment to the Law on the Promotion of Private Education banned for-profit schools during the compulsory education period.

The impact of this new policy is unclear, but industry observers remain optimistic because demand is so high. Roger Chung of Deloitte thinks the overall policy environment will be favorable.

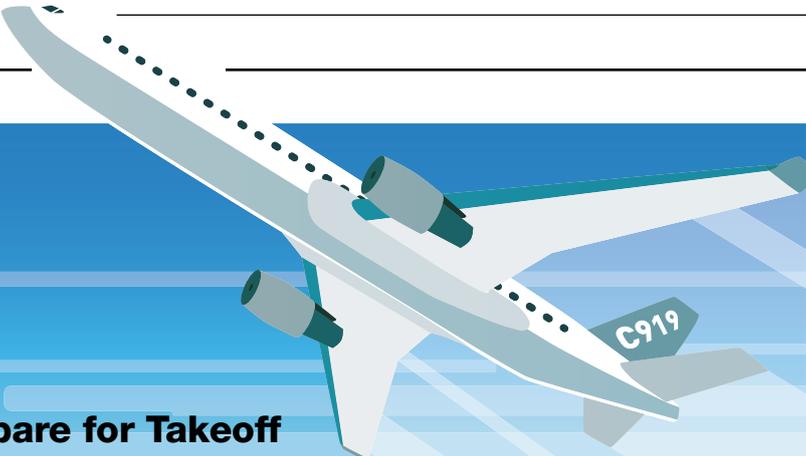
"The new regulation positively set clear boundaries within the private education sector," he says. "Non-profit private education will gradually enjoy the same tax preferential policies as public education."

Costs, restrictions and uncertainties aside, elite private education in China is, at the end of the day, a story about demand, and in that, there are many positive signs. "China is going global, and there is no reason for our kids to miss the opportunity," says Du Fengling, father of a 10-year-old in Shanghai.

Du opted for a bilingual school in Shanghai where 60% of courses are taught in English. The school claims that 60% of its students are later admitted to American universities. For him and his child, the future is clear, and also bright. ■

data CHINA data

The stats you need to know

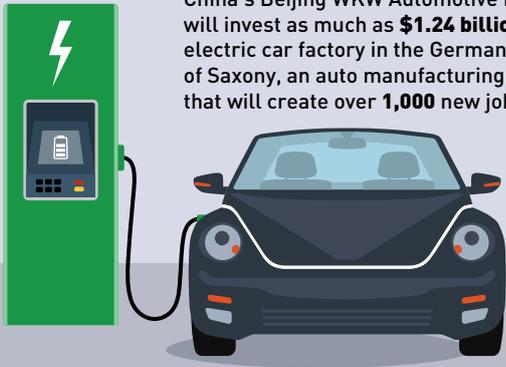


Prepare for Takeoff

China's first big passenger jet, the **C919**, had its maiden flight in May as China seeks to compete with Boeing and Airbus. Comac, the manufacturer, says it plans to build **2,300** of the **158-seat** jets over the next two decades

Source: Fortune

Das Auto



China's Beijing WKW Automotive Parts will invest as much as **\$1.24 billion** in an electric car factory in the German state of Saxony, an auto manufacturing center, that will create over **1,000** new jobs

Source: Bloomberg

Butter Me Up



Exports of avocado, or "butter fruit" in Chinese, from Latin America to China are growing by about **250%** a year, leaping from just **154 tonnes** in 2012 to more than **25,000 tonnes** in 2016

Source: Financial Times

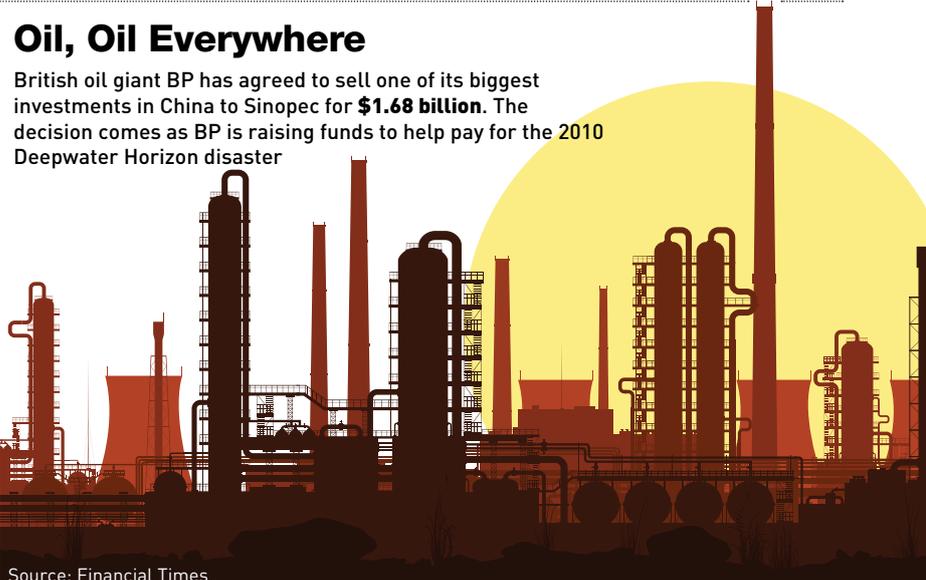
Tencent, Billions in Profit



Tech giant Tencent, owner of WeChat, saw profits jump **58%** year-on-year in the first quarter to **\$2.1 billion**. The news sent shares to all-time highs, giving the company a market cap of **\$316 billion**, making it the ninth-largest listed company globally.

Source: Financial Times

Oil, Oil Everywhere



British oil giant BP has agreed to sell one of its biggest investments in China to Sinopec for **\$1.68 billion**. The decision comes as BP is raising funds to help pay for the 2010 Deepwater Horizon disaster

Source: Financial Times

China is Hiring

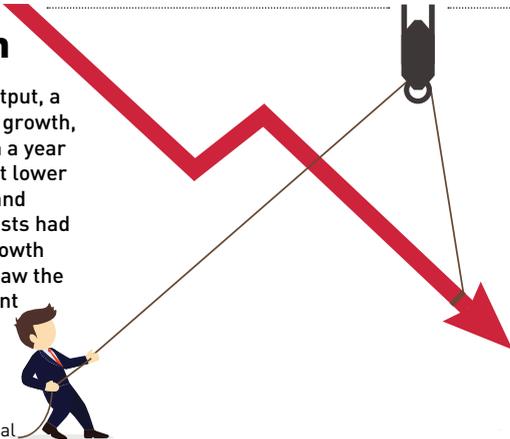
Chinese controlled firms employed **141,000** Americans at the end of last year, a **46%** increase over 2015, according to research by Rhodium Group. Investment by Chinese companies in the US also tripled to **\$46 billion** in 2016



Source: Financial Times

Slowing Down

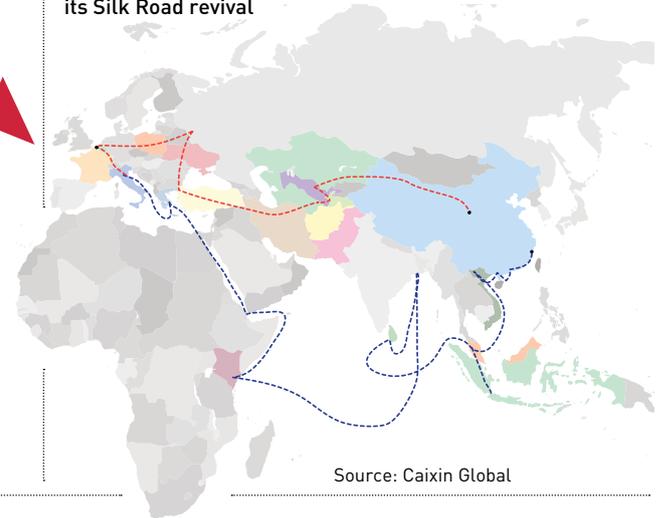
Value-added industrial output, a rough proxy for economic growth, rose by **6.5%** in April from a year earlier, a percentage point lower than the month previous and below what most economists had anticipated. After **6.9%** growth in the Q1, some analysts saw the April data as a turning point



Source: The Wall Street Journal

One Belt, One Road... and Hundreds of Projects

President Xi Jinping announced at the Belt and Road Forum in May that China has signed more than **270** agreements with **68** countries and international organizations as China pushes its Silk Road revival



Source: Caixin Global

Tax Anchor

China has unveiled plans to ease the tax burden on companies and consumers by more than **\$55 billion** this year to boost economic growth. The World Economic Forum estimated the total tax burden on businesses in China at **67.8%** of profits, among the heaviest in the world



Source: Caixin Global

Deals Down Under

Chinese investment in Australia surged **11.7%** last year to **\$11.5 billion** amid booming demand for agricultural assets and infrastructure projects. A record **103** deals were signed with Chinese companies in 2016



Source: Bloomberg

EXPATS IN CHINA

CHINA IS STILL A PLACE FOR EXPATS TO GET AHEAD

Between 1961 and 1978, the eve of China opening to the world, only some 6,400 foreigners worked in China, according to historian Anne-Marie Brady, Fellow at the Kissinger Institute on China and the United States. Since outsiders were allowed back into the country, China has attracted the ambitious and the adventurous from around the world drawn by the promise of opportunity, albeit with a bit less certainty. In the early days, it also offered “hardship” in the form of a lower standard of living compared with developed nations. However, as China developed, this has changed. Coastal cities, where expats are most likely to be found, are among the most modern in the world. Shanghai now has over 200,000 foreign residents. Largely, they still come seeking the same: adventure and opportunity.

Gender

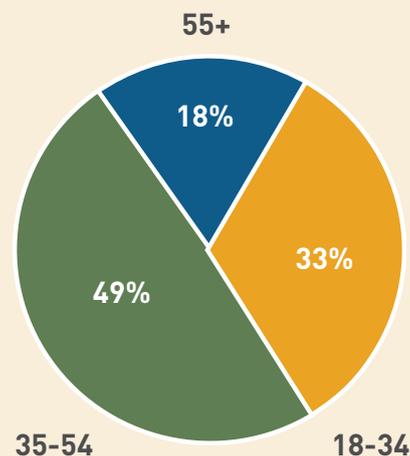


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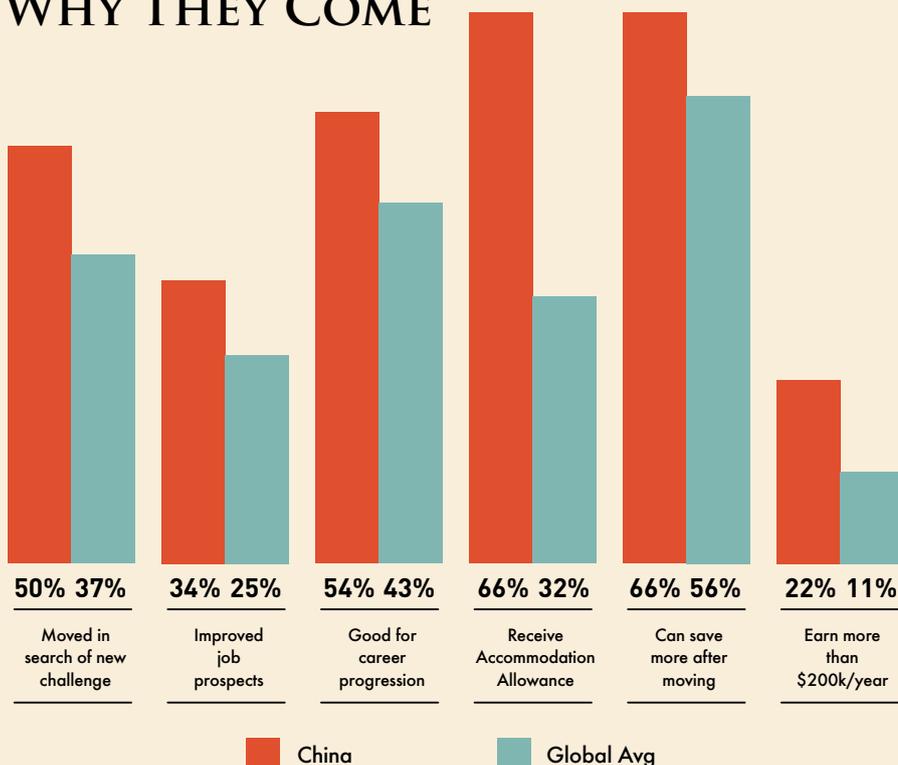


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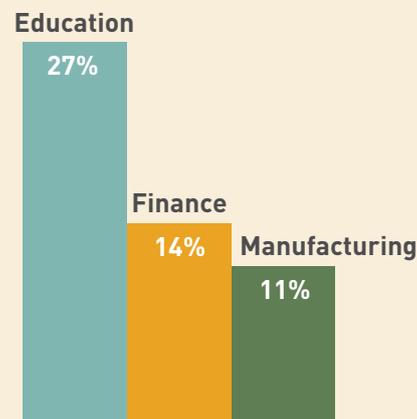
Age



WHY THEY COME

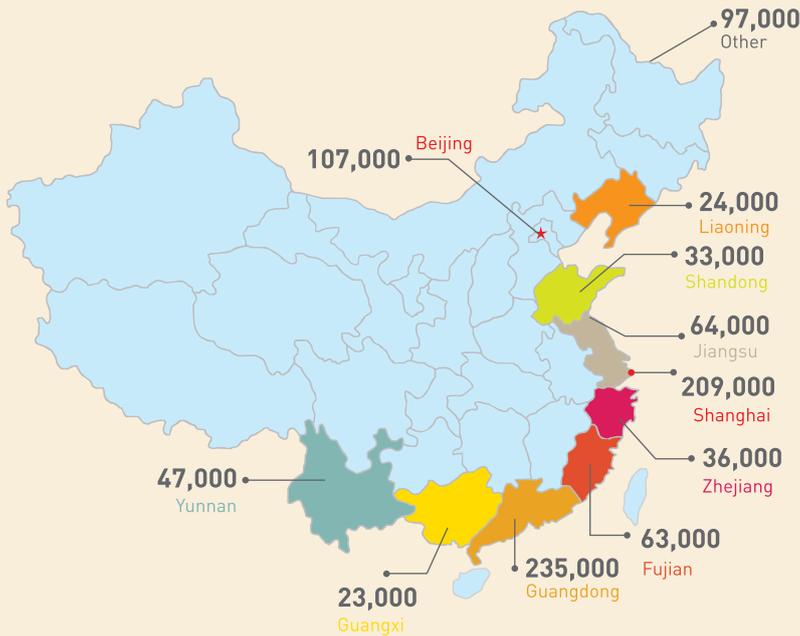


Top Three Occupations



Source: 2016 HSBC Expat Explorer Survey, China Briefing, Migration Policy Institute, Federal Statistics Office of Germany, Statistics Canada

WHERE THEY LIVE



According to the most recent census, expats are heavily concentrated in large coastal cities where living standards are high and jobs plentiful. This basic breakdown has not changed. And while more recent figures are unavailable, the numbers of expats seem to have continued to increase after 2010, but dropped slightly thereafter as China's economic deceleration deepened and some multinational companies increasingly localized positions.

**EXPATS IN CHINA: 938,000—0.08% OF TOTAL POPULATION
(2010 CHINA CENSUS; EXCLUDING HK, MACAU AND TAIWAN)**



USA
Immigrant Population
43mn, 13.5%
2015



Canada
Immigrant Population
6.7mn, 20.6%
2011

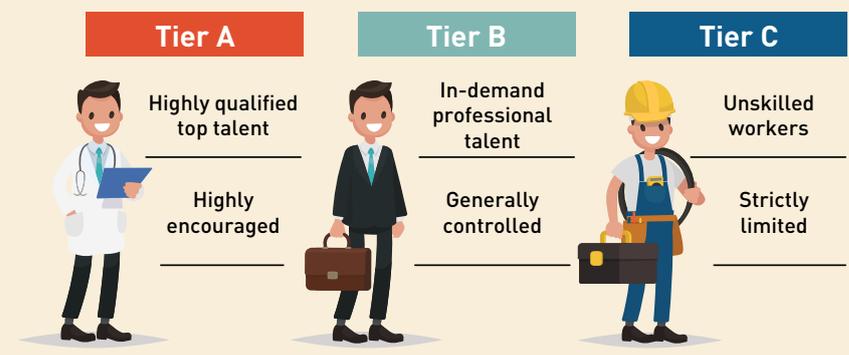


Germany

Immigrant Population
10mn, 12%
2014

ATTRACTING THE BEST

Since the 1960s, China has sought to attract foreign experts—and in the past few years this has been increasingly emphasized. On one hand, China has initiatives such as the 1,000 Talents Plan, which aims to attract highly educated foreigners into key industries with high salaries. On the other hand, China is restricting access to expats with lower qualifications, and recently introduced a three-tiered ranking system based on the criteria shown at right.



FACTORS USED FOR DETERMINING EXPAT RANKING

- Salary
- Degree level
- Non-seasonal worker
- Age
- Years of experience
- Location in China
- Chinese ability
- Prestige School
- Prestige Experience

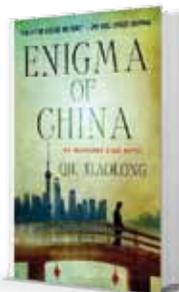
History and Fiction

Chris Ruffle shares his favorite books on China

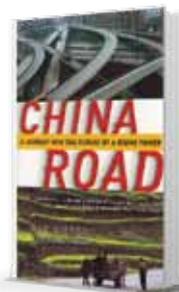


Chris Ruffle has lived and worked in the Greater China region since 1983, and is currently CEO of China-focused investment fund Open Door Capital Group, which he co-founded in 2011. His firm has investments in companies in a wide variety of industries all across China from Shanghai to Tibet. In addition, Ruffle is an avid reader, and has even found time write his own book, *A Decent Bottle of Wine in China*.

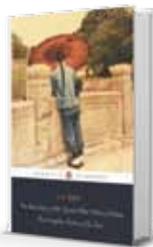
For people new to China, I recommend the *Detective Inspector Chen* series, by Qiu Xiaolong. I met the author once, and he said his original plan was to write social criticism. Instead, he has ended up expressing his ideas through detective stories. You can actually learn quite a lot about China through reading them.



China Road: A Journey into the Future of a Rising Power by journalist Rob Gifford is a fun travelogue, and also a good book for someone newer to China. The book recounts the author's 2004 trip across the country from Shanghai on the east coast all the way to the China-Kazakhstan border in the far west. It gives you a sense of just how big and diverse a place China is.



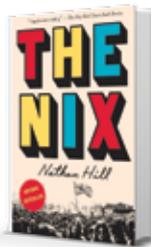
Fund Management: An Emotional Finance Perspective by David Tuckett, of University College London, and Richard Taffler, at University of Warwick, takes an absolutely fascinating look at the emotions involved when fund managers make investment decisions. Their technique analyzes the words they use, and it seems there is some market predictive power in the techniques that they are using.



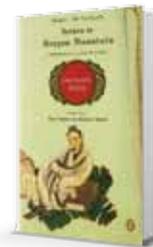
The Complete Fiction of Lu Xun,
by Lu Xun



17th-Century Chinese Paintings From the Tsao Family Collection,
by Stephen Little and Wan Kong



The Nix,
by Nathan Hill



Return to Dragon Mountain,
by Jonathan Spence



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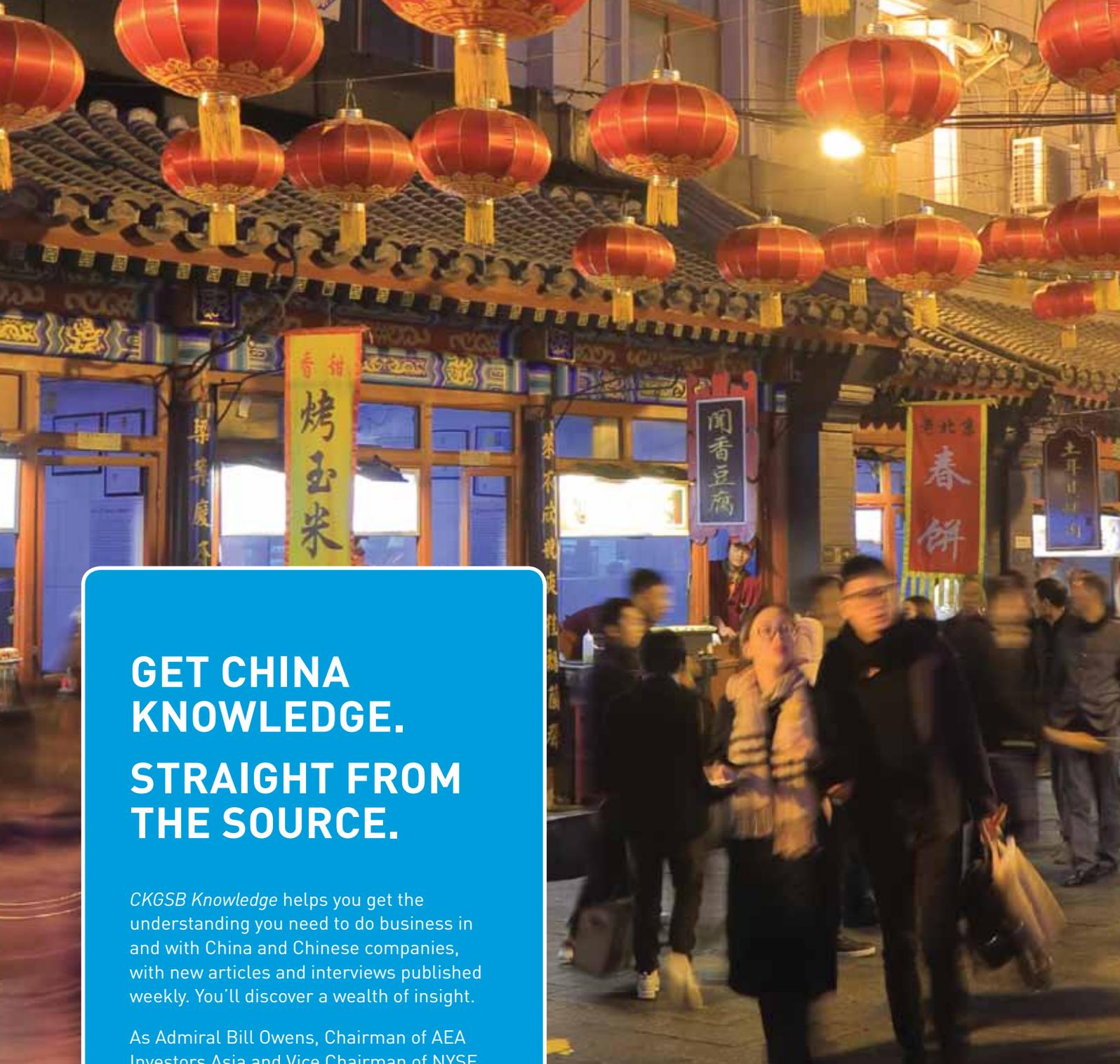
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