

CKGSB

KNOWLEDGE

CHEUNG KONG
GRADUATE SCHOOL
OF BUSINESS

Volume No. 47
APRIL 2023



CHARGING FORWARD

**Growth in the number of China unicorns has been slowing
due to economic headwinds and changing attitudes**

- The future of AI raises philosophical questions as well as practical concerns
- The purpose of the BRICS grouping is shifting, but it remains relevant
- China is struggling to hit the Sustainable Development Goals that go beyond its national priorities

GLOBAL UNICORN PROGRAMS 2023

Intensive programs to
deep-dive into
unicorn-making



Dubai

Feb. 15-17 2023

South Korea

Sept. 12-15 2023

Berkeley

Oct 31-Nov 4 2022

Singapore

May 16-19 2023

The first unicorn-themed global programs for the next-generation business leaders

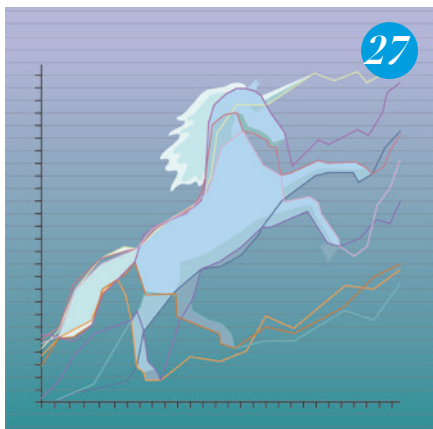
- ✓ Acquire unparalleled regional knowledge
- ✓ Construct your own regional ecosystem
- ✓ Harness the power of exponential tech
- ✓ Thrive in today's world of accelerating change

Partners:

Cover Story**Fairytale or Folly?**

27

Growth in the number of unicorns in China has been slowing due to economic headwinds and changing attitudes

**Economy and Policy****Humanity in the AI Era**

5

How will people's jobs and values change in an era accelerated by AI?

Diverging Paths

8

The BRICS countries no longer share similar economic trajectories, but the grouping still has a role to play

Issue: April 2023
Vol. No. 47

Editor-in-Chief

Zhou Li

Managing Editor

Patrick Body

Executive Editors

Cathy Chen

Ralf Qiao

Design

Jason Wong

Cover

Jamie Stevenson

Produced By

SinoMedia

ISSN 2312-9905

Publisher

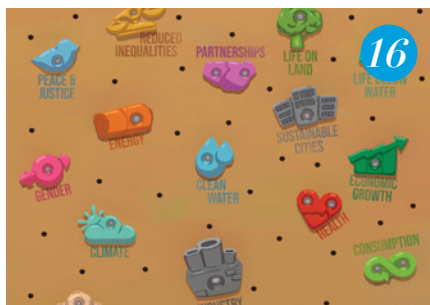
CKGSB GLOBAL LIMITED
Suite 3203, 32/F, Champion Tower,
3 Garden Road,
Central, Hong Kong

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

Troubled Ties

13

India's former Ambassador to China and Director of the Institute of Chinese Studies, Ashok K. Kantha, discusses the intricacies of the India-China relationship

**Priority Targets**

16

China's progress towards sustainability-related goals aligns with national priorities, but meaningful progress is still a ways away

Ratings, Risks and Readjustments

24

Thomas Torgerson, Co-head of Sovereign Ratings at DBRS Morningstar, discusses China's economic development and the challenges it faces

**A New Energy Cycle**

32

China is adding new solar capacity at a globally unparalleled rate, but it needs to ramp up even further to meet its climate goals

Business Trends**Changing Supply Chains**

21

China has become highly innovative in recent decades and is set to become even more so due to geopolitical changes

Bargaining Chips

37

Author Chris Miller discusses the importance of semiconductor chips to the global economy and the fight for control over their production

Bulls, Bears and Dragons

40

China's stock markets are growing in number and size, but too much state control poses a risk to future development

Tech-ionic Shifts

45

China's tech giants were the face of its booming economy for many years, but Beijing's recent crackdowns have reined them in

Venturing Out

48

Perry Jung, venture capitalist and co-founder of Korean VC firm Vision Creator, on the right approach to entering the Chinese market

Business Barometer

56

CKGSB's Business Conditions Index shows a number of positive improvements in the Chinese economy

Companies**Direct Delivery**

51

Robots are the future of warehouse logistics automation with Geek+ leading the pack, and increasing labor costs around the world offer a perfect opportunity for expansion

Dairy to Dream

58

Yili Group is using internationalization in its quest to become the world's largest dairy company over the next decade

Downtime**Ground Zero**

61

China is consuming more coffee than ever before and is on track to become one of the largest markets in the world

Snapshot

66

Feeding the world's largest population requires both the production and importing of vast quantities of food

China Data

68

The economic trends you may have missed: From COVID costs to stock connections

Bookshelf

70

Author and China finance expert, Fraser Howie, recommends books to acquaint the reader with the realities of modern China

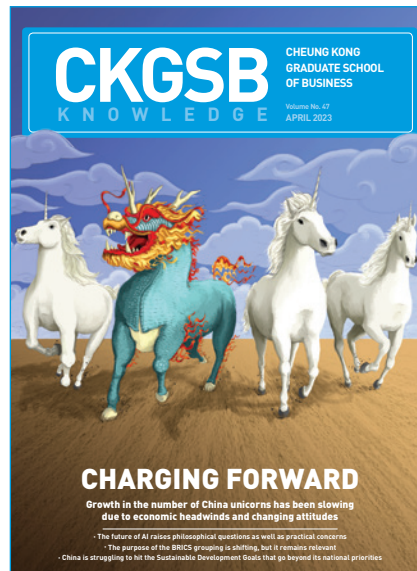
New year, new China?

We now find ourselves in the calm after the storm, with China emerging from three years of turbulence and disruption caused by COVID and other issues including geopolitical problems. And the new leadership, ushered in March 2023, would appear to be facing significant challenges. Looking a little deeper, however, in many areas of business and governance the country has been showing continuous development throughout the last few years. One result of this is that China is now home to over 300 unicorns, and these \$1 billion startups are starting to appear in a wider range of industries than before. But the prestigious unicorn title comes with a great deal of pressure, the effects of which we discuss in detail in our cover story “**Fairytale or Folly?**” on page 27.

The challenges presented by climate change are also increasingly becoming a guiding force in global decision making. These issues, alongside social and governance targets, are the topics covered by the UN’s Sustainable Development Goals (SDGs), and China has been moving towards reaching these goals over the past few years. There are two areas where the country has excelled—eradicating poverty and providing quality education for all. But in many other areas, especially those that do not align with existing national priorities, there is still a long way to go. We take a closer look at China’s SDG progress in “**Priority Targets**” on page 16.

Another topic of great importance worldwide has been the granting of public access to AI chatbot ChatGPT. The almost magical seeming nature of the technology has prompted global discourse on how its integration will affect all aspects of people and society. In this issue’s commentary, “**Humanity in the AI Era**” on page 5, we take a philosophical look at the impact of AI on the education process and on personal spiritual fulfilment.

Elsewhere in the issue we discuss the divergence of some of the BRICS countries from their predicted courses (page 8), the structure and efficacy of China’s stock market system (page 40) and the impressive growth of China’s solar sector (page 32). We are also pleased to be joined by India’s former Ambassador to China, Ashok K. Kantha, who discusses the two countries’ fraught relationship (page 13), author Chris Miller on the topic of semiconductor diplomacy (page 37), Co-Head of DBRS Morningstar’s Sovereign Ratings Thomas Torgerson, illuminating



China’s economic ups and downs (page 24), and Korean venture capitalist Perry Jung on the best way to enter the China market (page 48).

Also, on the topic of personal choices, we discuss the growing interest of Chinese consumers in coffee and the explosive growth of the industry at large. While per capita consumption remains low overall, in major cities it already rivals that of the US and other coffee-loving countries. The unique rise of boutique cafés, the development of localized products and Shanghai’s status as a bellwether for the rest of the country are all elaborated in “**Ground Zero**” on page 61.

So pour yourself a cup of coffee as you sit down to savor this issue and get a grip on the latest hot topics in China. As always, we

hope you find the topics addressed in the magazine to be exciting and illuminating at this time of great change. If you have any comments or opinions to contribute, please feel free to contact us at lzhou@ckgsb.edu.cn.

Yours Sincerely,

Zhou Li
Editor-in-Chief, CKGSB Knowledge

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

COMMENTARY

Humanity in the AI Era

How will people's jobs and values change in an era accelerated by AI?



Zhou Li, Editor-in-Chief of CKGSB Knowledge

All commentaries reflect the personal opinion of the author and are not necessarily the official position of the school and the magazine

The recent release of ChatGPT has caused millions of people around the world to discuss the possibilities of a future containing such a capable AI. But it has also caused the re-emergence of a fundamental question, one which has been previously asked to a lesser degree numerous times, including when AlphaGo shocked the world by beating Go champion Fan Hui in 2015: If AI can do so many things better than people, what is there left for people to do?

Every new technological or social advance generates concerns about what the future may hold, and for many it is easier to hold on to those worries than to be optimistic. But with the magical-feeling nature of ChatGPT and its counterparts, it is clear that we are moving into an exciting new period of development.

Man vs machine

In years past, humans have often examined what sets us apart from the rest of the animal kingdom. Advanced cognitive

abilities that allow us to create languages for communication and problem solving, are one such delineator, as well as the capacity for empathy and compassion and our creative output. The innovations, technologies and economic systems that we have produced as a species, in a way that dogs and dolphins have not, continue to evidence our differences.

As a society, we are now at a point where we are having to not only consider what sets us apart from animals, but also from rapidly-advancing computer technology and AI. What has become particularly apparent is that AI is quickly approaching, and in some cases has already surpassed, humans in many of the attributes that we see as differentiating ourselves from animals.

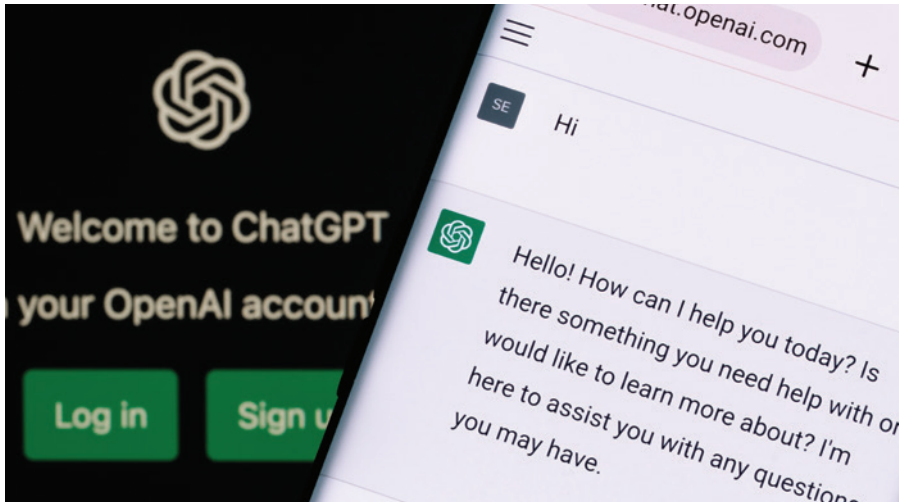
There has been a massive number of articles published in the months since ChatGPT's release discussing the phenomenon, with many of them focusing on the technological advancements—including some which argue the change

may not be as revolutionary as many believe. In contrast to this, and having little tech background, I would instead like to draw readers' attention to the potential changes in areas like jobs, self-fulfillment and education, and the implications of these shifts for the future of business and the healing of an increasingly divided world.

Jobs: lost vs kept

It has consistently been true that advances in technology often affect the blue-collar roles of that era. The invention of the loom, for example, revolutionized materials manufacturing, but the effects of the integration of AI into our lives will push this process to a new level.

Given ChatGPT's ability to write, research and code based on instructions, we now expect it to affect a larger range of roles, mostly white-collar jobs, through the automation of data-based processes. A recent study led by CKGSB Professor Sun Tianshu found that text-based workers, such as editors and proofreaders, and IT



New Colleague: A wide range of jobs will be affected by AI integration in the coming years

software personnel are likely to see a high level of impact given that the requisite job skills are easily affected by AI integration. At the same time, occupations based on offline scenarios that rely on physical labor will be less affected.

That being said, there are a great many opportunities for the use of AI to enhance and expand job roles across a wide range of sectors. With a massive well-educated workforce potentially facing great career changes, there may be an increase in demand for things like mental health support services to get them through this challenging time. The best way to head off possible problems relating to the transition is through a process of social innovation, ideally driven by partnerships between corporates, governments and NGOs.

And AI can also help here too, but don't just take my word for it. Here is ChatGPT's opinion on the role of AI in mental health support:

"Chatbots and virtual assistants can provide a supportive space for individuals to open up about their struggles, without fear of judgment. Additionally, AI can be used to monitor and track individuals' mental health, alerting them when they might need additional support or resources."

Business vs life

With the streamlining of many work processes, there will be a shift in employment that will likely result in a

greater level of free time for many people. The question is, then, what will they do with their time once they are released from their boring repetitive office jobs?

With the resources available today, basic physical needs are now being met in most areas of the world, and with better distribution, global poverty and hunger could be solved in a flash. Access to any other physical goods we may want is also possible, at least for the right price. But at a certain point, as Maslow told us almost a century ago, the pursuit of physical goods has diminishing returns on the value it adds to our lives, as well as an unsustainable impact on the planet as a whole.

Although not very conclusive, there are some studies that indicate a difference in approach to free time depending on wealth. One such study conducted by researchers at Harvard Business School and a few other schools found that millionaires engaged in more "active" leisure activities such as socializing, exercising and volunteering, while non-millionaires engaged in more "passive" leisure activities such as watching TV, napping or doing nothing. The study also found that in their free time, millionaires often choose to undertake work in roles with greater or full autonomy.

Access to these more autonomous roles for more people will likely also be expanded through AI. Possibly in a similar fashion to the introduction of the internet and e-commerce, the barrier to starting

one's own business will be dramatically lowered. It is expected that more people will pursue their own careers, most likely on their own, on the basis of their interests, spiritual requirements or satisfaction, instead of the previous more practically-limited motivations. AI combined with Web 3.0, which solves the problems of contracts and payments, may completely reshape the business landscape.

Outside of work, we may also start to look further inwards. With more time, many people will want to increase their involvement in hobbies. Spirituality today is a much broader notion than simply belonging to a religion or belief system. It is no longer intrinsically linked to a religion of some kind and what it means varies depending on the individual. We view spirituality in terms of the intangibles of life: experiences, relationships and the pursuit of knowledge, to name but a few.

Artistic pursuits may also see a rise in engagement, but with AI production of art and literature already becoming more common, these digital tools have the potential to completely reshape and replace some parts of our creative output. And this could have a direct impact on our feelings of spiritual fulfilment.

Education vs training

Since the launch of ChatGPT, many educational experts in China have openly warned of the end of Chinese education as we know it, with its emphasis on rote learning instead of creative and critical thinking. This means we must explore the differences between education and training. To me, Professor Sun and our other colleagues at CKGSB, education is learning to ask the right questions while training provides the right answers.

If you have played with ChatGPT, you may have noticed that it will always give you an answer to the questions you ask. However illogical a question may be, it will always make up an answer for you. But even for the answers to perfectly logical questions, it is still up to the person to judge whether those answers are accurate, as they are nothing more than the result of trawling the massive, and often contradictory,

database that is the internet.

This last point is particularly important, because if the adoption of AI results in a fall-off of critical thinking and inquiry-related capabilities, then this will have a myriad negative effects, including leading to a further dependence on the technology that brought us to that point.

Fundamentally, education can be an engaging, enjoyable and often very individual process. Finding your own solutions to issues can give you a level of spiritual fulfilment that does not come from simply being handed information. With this in mind, we can view the adoption of AI, the greater flexibility it will provide and the easier access to information that comes with it as the start of a liberating phase for many.

Ease of access to new tools brought by new technologies like ChatGPT also helps to create a level playing field for those who have not previously had the opportunity to pursue a certain level of education or training. This will allow for creativity and ingenuity to become a greater differentiator in society. Already, AI-equipped artists are the most active and dynamic group in the art market.

From a business school point of view, this will change the nature of the way things are done, but not the overall goal. People are still going to want to create businesses and managers will still need training, AI could simply become another tool in the business school arsenal, just as Excel and other number-crunching software did decades ago.

On the other hand, schools that only teach “evergreen” content may face serious challenges. When ChatGPT can consistently write high-quality reports or financial statements, it necessitates a fundamental shift in syllabi and teaching priorities. I have always thought that the best professors are those who act as facilitators in the guiding and conceptualization of student discussions, rather than those who lecture simply to pass on facts.

Division and reconnection

The US and China are likely to develop their own discrete AI-based systems, as

How can we become better humans with the support of AI?



they have done for many other recent technological innovations. ChatGPT cannot be downloaded in China, including Hong Kong, without a VPN connection. This may mean that the tools continue to separate people rather than bringing them closer together as the scientists and developers, many of them with roots in China, might have originally intended. Where we saw the separation and parallel development of Google and Baidu in the internet era, we are likely to see an even larger divide in this new, AI-driven world.

But there are ways in which AI can help bridge these growing gaps, and many of these also involve some form of education. ChatGPT again:

“AI can be used to develop language learning tools that can help individuals learn a new language in a more interactive and engaging way. This can help people connect with others who speak different languages, broadening their understanding of different cultures and ways of life.”

It adds: “AI can also help people develop empathy by simulating real-life situations and allowing individuals to walk in someone else’s shoes, helping individuals gain a deeper understanding of the experiences of others.”

AI can provide better tools for people to reconnect. But it is up to people to decide whether and how those tools will be used.

The future is now

Although there are some that argue that ChatGPT passing the Turing test means that it could be considered sentient, it feels disingenuous to confer that status on something that is still so far from being able

to think on a human level. On top of this, people have feelings, a heart and a soul, and these lead to interpersonal connections that cannot yet be matched by AI. AlphaZero can beat humans at Chess, but most of us still want to play with humans rather than a machine. The same goes for AlphaGo. A similar case may be that there are still more people who would like to listen to the piano played by a person with individual emotions and even errors, rather than a technically flawless version played by a machine.

What cannot be dismissed, however, is that the adoption of AI will have a great effect on many aspects of our lives, and with that will come a large number of changes as to how we live, work, learn, socialize and find fulfilment from our lives. With all this being said, there is a question worth pondering as we move into the near future:

How can we be better humans with the support of AI?

To conclude, I would like to borrow the idea of “learning to be human,” the theme of the last World Philosophy Congress that CKGSB’s Professor Tu Weiming helped develop, which was about Confucianism, but I believe it goes much further than that. Education will not only be about skills that can be taught by AI. Education is also for character-building, and the starting point and source of inspiration for character-building is self-cultivation. I hope ChatGPT and AI in general can help everyone do a better job of self-cultivation to be a better person. Then we will have a better chance to build a better world for all human beings.



DIVERGING PATHS

The BRICS countries no longer share similar economic trajectories, but the grouping still has a role to play

By Mable-Ann Chang



Image by Rómulo Gandolfo

China and India have shown solid growth in recent decades, but the other BRICS countries have not fared as well

At first glance, the BRICS organization seems like an odd group: five clearly disparate countries bundled together. But when economist Jim O'Neill coined the acronym BRIC two decades ago, he was looking at one clear commonality: Brazil, Russia, India and China were the world's largest emerging markets. Back then in 2001, O'Neill boldly predicted that the grouping would overtake the six largest Western economies by 2050.

We are now almost halfway through that 50-year period and the world has changed drastically since those nations were first grouped together. For starters, they have a new member: South Africa officially joined the BRIC grouping (henceforth known as BRICS) in 2011. The context has changed as well: there have been global economic crises, political upheavals, a global pandemic and even a war waged by a key BRICS member. So how credible is O'Neill's hypothesis at this point? Today, most people, including O'Neill himself, consider it to be at best a tall order.

"Much has happened in the two decades since the BRICs became a group to watch in the twenty-first century," O'Neill wrote in 2021. "While some of them have surpassed expectations, others have fallen short, as have the relevant global-governance institutions."

"From an investment perspective, BRICS made sense when it was formed," says Mandira Bagwande, senior research fellow at The Nelson Mandela School of Public Governance, University of Cape Town. "But today, it's unlikely that all five countries will get to where O'Neill had in mind."

Foundational blueprint

The BRIC concept, originally formulated by O'Neill in a Goldman Sachs study in 2001, quickly became an analytical category that was most successfully used as a marketing tool for investors and as a basis for a number of funds and stock indices. At the time, the four countries represented a combined 8% share of world GDP, and the expectation was then that, in the coming decades, China would become the world's factory, Brazil its food

supplier, India its service provider and Russia its gas station. That's not exactly how things played out, but nevertheless the countries together now account for around a quarter of global GDP.

The BRIC foreign ministers first met in 2006, and the first official summit was held three years later in Russia, where ambitious plans were unveiled. As a result, BRIC became something more than just a concept for the financial markets and an official organization was established, which is now headquartered in Shanghai.

"What transformed the BRIC concept from an investment thesis was the global financial crisis of 2008-2009," says Zongyuan Zoe Liu, a fellow for international political economy at the Council on Foreign Relations in New York. "During this crisis, people started questioning the Western-led financial system because it was collapsing. BRIC stood for an alternative to the Western hegemony."

South Africa was formally invited to join the bloc in 2011, transforming it into BRICS. At the time, the country had the largest economy in Sub-Saharan Africa, accounting for about a third of the region's GDP, and its inclusion was intended to make the whole group more credible as a representative of the Global South.

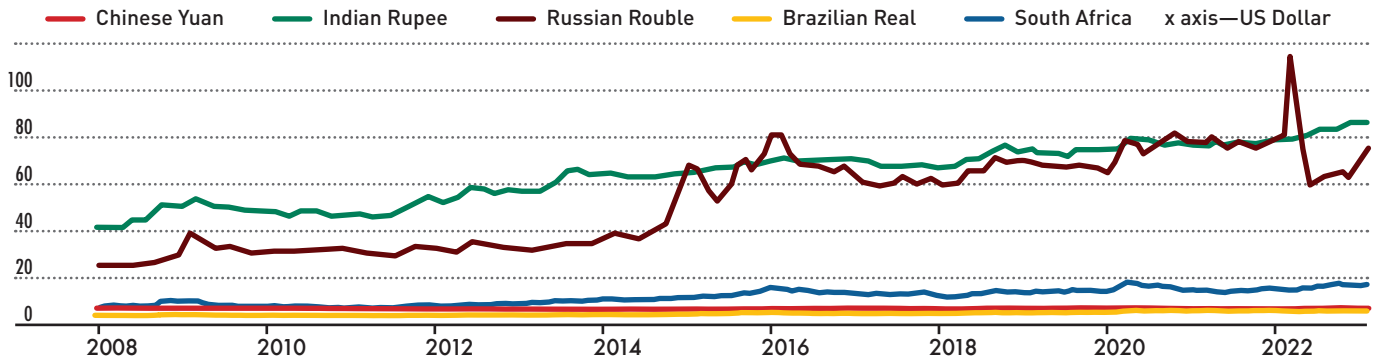
Today, according to World Bank figures, the BRICS nations have a combined GDP of more than \$24.7 trillion, around a quarter of the global total of \$95 trillion. The five countries also represent 40% of the world's population, dwarfing the G7 countries—the world's most advanced economies—which make up only 10% of the global population.

Officially, the primary purpose of the BRICS organization is to broaden cooperation among members and enhance support for a multipolar world order. But due to the geographical disconnect, economies being at different stages of development, and a fair degree of ideological dissonance, things have not worked out as originally predicted.

"BRICS is really a loose semi-institutionalized, semi-partnership grouping," says Liu. "People can put forward all kinds of agendas. No country

VALUE FLUCTUATIONS

The BRICS country currencies still remain a long way off challenging the dominance of the USD in the international market



Source: CUEX

is dominating the conversation. So, from that perspective, it is very different from the US' financial system. Essentially, every country has veto power."

But the group has been able to chalk up some accomplishments in the past two decades, the most notable of which is the establishment of the BRICS bank, called the New Development Bank (NDB), which lends money for infrastructure and other projects aimed at boosting growth.

The NDB has an initial authorized capital of \$100 billion, which is divided into one million shares. The five BRICS nations initially subscribed 100,000 shares each, which endowed the bank with an initial \$50 billion in capital. The remaining shares are either still unallocated or have been opened up to other countries, including Bangladesh which has 9,420 shares and the United Arab Emirates with 5,560 shares.

Since its founding, the NDB has signed more than 30 strategic partnership agreements with other international and national financial institutions and approved nearly \$32 billion in loans to support over 90 infrastructure and sustainable development projects. It has since committed to lending a further \$30 billion over the five-year period between 2022-2026 while also extending financing in local currencies by 30% as it attempts to shift further away from the US dollar.

The NDB's portfolio features investments in areas such as clean energy, urban mobility, water, sanitation, transport

and, social and digital infrastructure, which aligns with the goals of China's Belt and Road Initiative of creating sustainable development projects.

Critics have highlighted the imbalanced weight and influence that China has in the bank, with the NDB's headquarters located in Shanghai, Chinese credit rating agencies being the first to give the bank high ratings for its activities and the China Interbond Market issuing most of the bonds the bank has agreed to.

Another downside is that due to its limited membership, it has access to less funding than other similar multilateral development banks. Credit terms are also unclear, with ministries in Bangladesh appearing uninterested in a \$5 billion loan from the bank, claiming that they are unaware of credit terms. Economists have been pushing for setting the scope of loans first, as it is said that loans are becoming more expensive.

"BRICS is a pragmatic group," says Jinghan Zeng, Professor of China and International Studies at Lancaster University. "But that pragmatism doesn't mean that BRICS is going to be the IMF. It's about broadening their voice through their own institution while also using their institution to pressure existing institutions to change."

A good start

The BRICS countries emerged from the 2008-2009 financial crisis relatively unscathed, but aspirations of catching up with the West were set back by the

commodity crash of 2014. And while collectively BRICS has moved back into growth territory, contributions from the constituents have been very uneven.

World Bank data has shown that Brazil, Russia and South Africa's share of global GDP has shrunk since 2000, dropping to a combined 2.98% down from 3.16%. While at the same time, China and India's share of the global economy as a whole has grown to 5.43%, up from 4.94% in 2001.

"The idea's inception was based on the fact that these economies were clustered together because of their growth potential," says Mihaela Papa, Adjunct Assistant Professor in Sustainable Development and Global Governance at Tufts University. "Yet when we look at the past two decades, their individual growth trajectories varied, especially in the last decade."

Brazil, which had been experiencing robust growth, suddenly entered a recession in 2014 from which it is yet to emerge. Its manufacturing base has shrunk but services industries have not developed enough to achieve the levels of growth expected by O'Neill in 2001.

Russia meanwhile, formerly a superpower in its own right, has seen its economy plateau and decline, particularly since its 2014 annexation of Crimea, and compounded by the major shock of the Ukraine war and the sanctions that accompanied it. Prior to the conflict, the country's GDP was just half the size of the state of California, despite being the most resource-rich state on earth.

South Africa, whose economy is handcuffed to the world's commodity markets, has for years suffered from high unemployment, endemic inequality and massive corruption.

India has seen tremendous growth over the two decades, with a surge in foreign direct investment and a more commercially-minded government under Prime Minister Narendra Modi, but its economy today is still just one-fifth the size of China's.

China, on the other hand, as the second-largest economy in the world, the largest consumer of energy and minerals, and the largest exporter of goods and services, has seen such consistent growth that it has actually changed the way that economic power is distributed globally. Its 2022 GDP of \$18.32 trillion is more than double that of all the other four BRICS combined.

"You could go as far as to say that China alone is BRICS," says Bagwande. "Brazil, Russia and South Africa's growth rates have not fared very well over the years, and the other BRICS economies are significantly dwarfed by China."

Relationship goals

China's massive rise has also impacted the relationship between all the BRICS members. "Not every BRICS country benefited equally from the grouping," says Liu. "Essentially, China can be without BRICS if it comes down to it, but BRICS cannot be without China, and this fundamentally affects the relationships between the countries. BRICS has also seen damage to its reputation because of Russia's invasion of Ukraine, making Russia more of a liability to the group right now."

"None of the BRICS members have openly criticized China or Russia over US-China tensions or the Russia-Ukraine war," says Bagwande. "Brazil, India and South Africa have to play a very careful balancing act. China and Russia are valued political and economic partners, especially in the Global South, so they wouldn't want to rub them the wrong way."

Longer-term challenges remain, including the volatility of commodities markets and the world economy, the economic impact of climate change and

environmental degradation, an aging population in the case of China and coming to terms with the implications of digitalization. How they react to these challenges will determine how each of these players will fare in the lead-up to O'Neill's 2050 target.

"Major long-term economic development challenges for all BRICS countries include managing and adapting to climate change and being proactive about the AI revolution and its impact on trade flows and labor," says Papa. "What we need to examine is whether these countries are making investments that can help them operate in a world facing climate stress and the Fourth Industrial Revolution."

"Having massive populations and cheap labor used to be an advantage for these countries," says Liu. "But they are slowly losing that advantage."

While the fate of the five players diverged in ways which were never predicted, the BRICS as a concept and as an organization has still managed to stay together with an interlinked financial infrastructure that provides cohesion and value to some extent.

This includes the Contingent Reserve Arrangement, which can provide liquidity for member countries in times of economic crises, and individual alternatives to the SWIFT system. These tools have, to some extent, offered a safety net for Russia—

after being kicked out of the SWIFT system in February 2022—and China, with Chinese entities being at increased risk of being sanctioned as part of the US-China decoupling process.

The New Development Bank, and the over \$30 billion that it has already lent, has also been crucial in supporting infrastructure and sustainable development projects in BRICS and other developing countries. There are a large number of important clean energy, urban mobility and transport projects that would not have been possible without NDB funding.

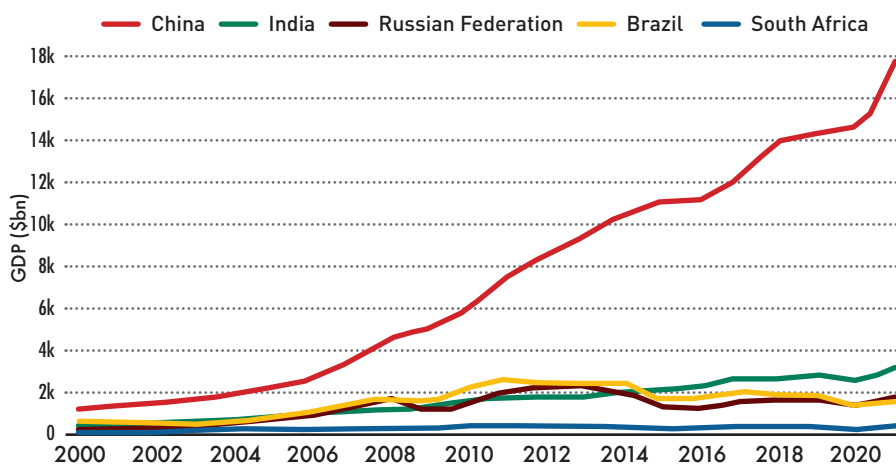
"Those are indeed emerging markets' attempts at establishing their own alternative financial governance body, as an alternative to the existing legacy institutions like the World Bank and IMF," says Liu. "For a country to raise capital in the international market, you have to be evaluated based on sovereign risk and customer credit rating. So if you don't necessarily have a good credit rating, in many ways, you cannot raise funds cheaply, or at all."

Future expansion

At the 2022 BRICS summit hosted in Beijing, China's leader Xi Jinping compared the BRICS economic bloc to a "giant ship" sailing forward "against raging torrents and storms." But huge disparities in the economic might of BRICS members and their deep differences on various issues

GROWING PAINS

Aside from China, the BRICS economies are not growing as fast as predicted



Source: World Bank

have raised questions about the accuracy of this metaphor.

Russia and India characterize themselves as allies in many ways, and Russia also has a comprehensive partnership and strategic cooperation with China, a major rival to India. India has long regarded China as a threat, and the two countries have occasionally been embroiled in border skirmishes. China is viewed as being fundamentally supportive of Russia, despite the invasion of Ukraine presenting a problem for its partners in many contexts, including BRICS.

Brazil and South Africa, on the other hand, are leading powers in their own regions. Moreover, despite disagreements, it is highly unlikely that Brazil will leave the BRICS group, as the country is highly dependent on Chinese imports and therefore needs to maintain good relations with Beijing.

“Geopolitical tensions have had a dual effect,” says Papa. “On one hand, they increased distrust among BRICS, and now it is less clear what BRICS stands for. On the other hand, they have led to broader realignments around BRICS in contemporary politics. BRICS has candidate countries and needs to decide how—and whether—it makes sense to scale its operations and what kind of members would be a good fit.”

Since 2013, non-BRICS countries have been invited to attend the annual summit, and, in 2017, China proposed a “BRICS Plus” framework, naming countries like Indonesia as potential new members. Other countries that have expressed interest in joining an expanded BRICS-plus framework include Nigeria, the United Arab Emirates, Saudi Arabia, Kazakhstan and Thailand.

“A lot of people think that countries like Indonesia would make a good addition,” says Zeng. “But adding countries to BRICS needs to be considered carefully to avoid what happened when the idea was created. It did not have a methodologically sound approach to explain why some countries were included and others not. BRICS also represented a phenomenon that today isn’t as significant as it was before.”

“When we are looking at these countries

that want to join BRICS, they are also not on an equal playing field at all, just like the original BRICS countries,” says Liu. “These countries wanting to join shows that they have a hedging strategy in mind; they need an insurance policy against things like Western sanctions.”

Alternative options

For other emerging countries looking to join international groupings, there are alternatives to BRICS including other inter- and intra-regional alliances such as the MIKTA—an informal partnership between Mexico, Indonesia, South Korea, Turkey and Australia created in 2013—IBSA—India, Brazil and South Africa—and the Shanghai Cooperation Organization (SCO).

“The formation of informal groups is now a common way of doing business beyond the state level, so we are likely to see more of such groups in global governance,” says Papa. “Since the BRICS countries are divided on security issues, other groups like IBSA may become more appealing to these countries.”

The SCO, for instance, is a Eurasian political, economic and security forum founded in 2001 that is now comprised of nine member states: China, India, Kazakhstan, Kyrgyzstan, Russia, Tajikistan, Pakistan, Uzbekistan and Iran.

“The SCO follows the old idea of having a group of countries which agree with each other and support each other,” says Zeng. “But I don’t think organizations like this will work in the future. Of course, we need geopolitically-based organizations like the SCO, but can they evolve into something like BRICS? Or will they become something different? It is still too early to tell.”

MIKTA is a grouping of foreign ministers of the member countries and aims to support effective global governance. IBSA is a forum, formalized in 2003, used as a platform for its three members to discuss political and economic issues.

“Other than BRICS, there are no significant groupings that really stand out,” says Bagwande. “There were talks of MIKTA in 2013, but when you look at the group’s makeup, they will more often than not dovetail and support the G7 when

it comes to voting on problematic issues. BRICS can be considered the multilateral muscle of the developing world.”

Whether these alliances can replace the role that BRICS plays depends on whether they can find a way to effectively address common issues faced by the countries.

“It depends on how the world’s political landscape might eventually evolve,” says Zeng. “When it comes to climate change, for example, China and India support each other. But when it comes to other issues, they don’t. So instead of moving from a bipolar world to a multipolar world, you see an issue-based world order. It is different from how we understand the world now.”

Increasing insulation

Some analysts argue that BRICS members likely realize the group is a limited-purpose partnership, in which political barriers will always get in the way of it reaching its full economic potential, but still feel it has value, albeit in a limited way. Globalization on the wane, each BRICS member nation prefers to pursue its own geopolitical and economic interests.

Long-term, there is potential to step up economic growth and trade between the member countries by intensifying their integration. In the meantime, BRICS will likely continue to be a group of emerging nations that exists to discuss global issues of mutual interest.

“Over the next 10 years, volatility will be high,” says Liu. “I think this will not necessarily be driven by economic and financial markets but by geopolitics. So I would advise my clients or investors looking into BRICS countries to be cautious in terms of pricing.”

“BRICS will still exist in 2050, but how much weight and power it has to influence the global political and economic system is the question,” says Bagwande.

“Not every country in BRICS is going to achieve what Jim O’Neill had in mind,” says Zeng. “But some of them still have considerable potential, like India and China. So we cannot say that O’Neill’s hypothesis was wrong, but you can see that some countries are on track to achieving the original goal while others are not.”

Troubled Ties

Director of the Institute of Chinese Studies and India's former Ambassador to China, Ashok K. Kantha, discusses the intricacies of the India-China relationship

India and China share a border, make up over a quarter of the world's population and share a number of other parallels in terms of development and economics. But the relationship between the two countries has encompassed a number of tensions, particularly in recent years.

In this interview, Ashok K. Kantha, India's former Ambassador to China and director of the Institute of Chinese Studies in Delhi, discusses the relationship between the two countries, India's journey to a greater level of self-reliance and the prospects for greater cooperation in the future.

Q. As India's former ambassador to China, how would you say the relationship between the two countries has changed over the years?

A. Between 2014-2016, during my tenure as ambassador to China, it was a period of hope and possibilities for India-China relations. We visited at the summit level between the two countries and both leaders visited each country. During this period, and especially during these two high-level visits, we could put in place a forward-looking agenda of bilateral engagement, including what we described as a closer developmental partnership. We also explored a framework for the simultaneous re-emergence of India and China as major countries, which was essentially predicated on the two countries respecting each others' interests, concerns and aspirations. There were other structural challenges, but we were making progress.

Today, India-China relations are passing through a difficult period, with the real point of contention being the skirmishes on the

border. If there is no peace and tranquility in border areas, that will lead to problems in India-China relations overall, and that is what

we are seeing today. Some disengagement and de-escalation has happened at certain friction points, but not to a major degree.

Apart from that, there are structural challenges that predate these troubles, ranging from boundary questions and a trade imbalance, to China's perceived lack of sensitivity to India's interests. For instance, when it comes to our shared periphery, we find that China is seeking hierarchical order, both in Asia and eventually globally, where it will be the preeminent power. India, given its size, population and civilizational heritage, is not prepared to play a subsidiary role, whether that be to China, the US, or any other country.

What we need today, is what India's Minister for External Affairs has stated on many occasions, the "three mutuals." Mutual respect, mutual sensitivity and mutual interests, and with these, hopefully, we can move towards a more stable relationship.

Q. Despite the other issues, China remains India's largest trading partner. How would you characterize the trading relationship between the two countries?

A. In the 2021 financial year, our overall trade with China was in excess of \$115 billion, but there is a trade imbalance of \$73 billion to our disadvantage—38% of our global trade deficit—and that doesn't even include Hong Kong. The trend line is also not very encouraging, with imports from China increasing in



Ashok K. Kantha is an Indian diplomat. He is currently the Director of the Institute of Chinese Studies in Delhi and was formerly the Indian Ambassador to China.

2022, and our exports contracting. Moreover, the product mix is also not at all desirable. China is primarily buying stuff like iron ore, cotton and low-value-added items from India. Whereas we are sourcing high-value items like electronics and machinery from China.

Q. In 2020, India announced a move toward self-dependence or Atmanirbhar Bharat. To what extent is that a realistic goal? And if it succeeds, what kind of impact would it have on the India-China business relationship?

A. Firstly, Atmanirbhar Bharat, or self-reliant India, is not just an inward-looking approach with only Indian interests in mind. It is more about building domestic capabilities. India is the fifth-largest global economy and has the second-largest population, and we believe that we must have adequate domestic capabilities across multiple different areas, and not be too dependent on outside sources. For instance, India was previously dependent on food imports, but it is now a major exporter of agricultural products. We want to move towards a similar level of self-dependence across the board because at the moment manufacturing makes up just 16% of India's GDP and that is not adequate.

Changing this will be done through greater engagement with the global marketplace and not through isolating ourselves. In recent times, India has signed a trade agreement with Australia and is negotiating major agreements with many other countries.

Indian companies
can also do more
to overcome the
cultural challenges
and bridge the
cultural gap that
exists between the
markets

This shows our desire to integrate more with the global economy and become a larger player when it comes to global and regional value chains.

I don't see agreements with other countries negatively affecting India-China relations, because the whole approach is to build more linkages with the world's major economies, and China is one of them. Also, if we take care of the problems in India-China relations, there is no reason why economic engagement cannot be expanded in the future.

Q. To what degree do you think there are prospects for greater cooperation and a smoother relationship between India and China? In which areas do you see potential?

A. Obviously, with India-China relations passing through a difficult period, we are bound to see negative impacts on our ability to work together, whether on bilateral or multilateral issues. At the same time, when it comes to transnational issues like climate change, the global economy or the pandemic, the two countries are still working together as these are the areas where we have shared interests and concerns and we should continue to expand our collaboration.

Likewise, notwithstanding problems in our bilateral relations, India has remained fully engaged in platforms like the Shanghai Cooperation Organization (SCO) and BRICS, where China is a leading player. India will be hosting the SCO summit in 2023, and it will also host the G20 summit, which will provide the opportunity for India and China to work together in advancing a shared agenda on a lot of issues. So, while the state of relations no doubt acts as a constraint, we are at the same time working together on regional, multilateral and global issues to the extent possible.

Q. How do you see India's geopolitical role in the world developing, and how does this compare to China?

A. Historically, India has played a major role, but the country's primary preoccupation for the foreseeable future will be its development. India remains a developing country with a huge backlog of poverty to overcome and there are major developmental challenges. As a result, it will develop its role in a manner that sustains, supports and nourishes its developmental agenda.

After this, India will seek a more balanced and multipolar international order and a greater democratization of said order through reformed multilateralism. This will involve the restructuring of UN organizations like the Security Council, which fails to represent countries like India and the entirety of Africa.

I don't think India is seeking any preeminent role, whether in our neighborhood or globally, and I think this differs from China's ambitions. China appears to favor a more hierarchical global order with itself at the apex, which is different from the geopolitical arrangement that India has in mind. While China talks about multipolarity, its actions seem to be somewhat different. And we also have this overarching theme of strategic contestation between the US and China for preeminence.

So, we have a difficult geopolitical situation where India would like to contribute, to see greater clarity, stability and also more balance in terms of a multipolar world, while at the same time advancing its own developmental agenda.

Q. To what degree are the Indian and Chinese economies comparable?

A. India and China are very different, and China's economy is significantly larger. We've seen China's economy develop over the last few decades and we have also seen an, albeit slower, development of economies like India, Indonesia and several other countries.

The Indian economy has certain advantages. Since we launched our economic reforms in 1991, India's GDP has grown at the rate of 6-7% per annum, and we are hopeful about maintaining that kind of growth rate for the foreseeable future, if not accelerating. India is a relatively new innovative economy, with a core competence in software and is fast becoming a preferred destination for multinational companies to set up offices. There is also the size of the population and the fact that the median age is only 28, so quite young, with the possibility of deriving a demographic dividend until at least 2050. This provides a rather extended window of opportunity, during which the country has the potential to grow and emerge as one of the largest economies in the world and also bring about a change in living standards, an increase in trade, and people coming in.

I think the main thing India would want to emulate from China is infrastructure development. China has put in place world-class infrastructure compared to what it had 40 years ago. India is making progress in this regard, but much more remains to be done.

Q. There are many manufacturing companies, both foreign and domestic, looking to diversify away from China to other countries. To what degree are they moving operations to India and what are the opportunities and barriers affecting this shift?

A. The global value chain is changing thanks to, among other things, the pandemic, increasing strategic contestation and a growing desire to shift away from excessive dependence on a single country. All of this is leading to a greater diffusion of manufacturing capacity and also some reshoring.

India would like to play a larger role in the global value chain because at present its role is relatively limited. A shift of manufacturing to India is obviously welcome, but the country can also benefit from the strengthening of manufacturing bases in its strategic partners. To properly benefit from this will require a greater enabling environment to ease doing business. It is something that is very much a focus of Atmanirbhar Bharat.

Q. Indian companies appear to be less visible than their US or European counterparts in China. Given the geographical proximity of the two countries, why do you think this is?

A. I've been watching the progress of Indian companies in China for nearly three decades, and we've encouraged Indian companies

I think the main thing India would want to emulate from China is infrastructure development



to expand their footprint in the country. Some are doing relatively well, Tata Motors for instance. But there are several other major Indian companies such as TCS, Infosys and Ranbaxy, among others, that have been present in the China market for a long period but have not been able to make a significant dent, for a variety of reasons.

Take the pharmaceutical industry: companies have found it exceedingly difficult to get their products and formulations approved and the process takes a long time. India offers some of the most efficient and affordable pharmaceutical products, including generics, but they're not available in China because of regulatory constraints.

Indian companies can also do more to overcome the cultural challenges and bridge the cultural gap that exists between the markets.

Q. How do you see the overall relationship between the two countries developing over the next five to 10 years?

A. I think if the current set of issues are addressed properly, and I believe they can be, there will be a significant expansion of economic engagement between India and China.

When it comes to the future of India-China relations, I think it is particularly important that each country learns to respect each other's interests, concerns and aspirations. That's the only way our relations will develop in a vibrant and positive direction. There is a certain inclination in China to look at India and India-China relations through the prism of intensifying strategic contestation with the US, and that leads to certain incorrect conclusions. There are concerns in China about India's participation in the Quad, but India is also participating in BRICS and the SCO.

India is pursuing the policy of strategic autonomy, where we take care of our national interests, and we'll continue to do that. I think Chinese friends should understand and accept that. ■

Interview by Patrick Body

PRIORITY TARGETS

China's progress on the UN's Sustainable Development Goals is mostly limited to existing national priorities

By Patrick Body



Image by José Luna

China has made great strides in some areas of the SDGs, but others, particularly the protection of natural habitats, still require a large amount of work

In 2015, China's leader Xi Jinping stood on stage at the UN Sustainable Development Conference in New York and pledged to help end poverty, fight inequality and tackle climate change by 2030. It was China's first step along the road to meeting the newly announced Sustainable Development Goals (SDGs).

"The UN conference on sustainable development has adopted the Post-2015 Development Agenda [including the SDGs], which is the hard won result of the joint efforts of all developing countries," he said. "We need to build on this momentum to implement the Agenda and make even greater progress."

As part of the pledge, Xi promised the creation of 100 programs in six areas of international development. Summarized as the "Six 100s," they covered trade facilitation, ecological protection and combating climate change. Since then, China has made several further high-level statements aimed at guiding the country towards meeting the 17 SDGs, but they are not simple goals, and for a country the size of China, they are proving immensely complex to reach.

"China is enormous, and the level of diversity across the country makes SDG governance very difficult," says Linda Chelan Li, professor and director of the Research Centre for Sustainable Hong Kong at the City University of Hong Kong. "The implementation and monitoring of policies has always been difficult and a major challenge in such a complex system, and the SDGs are no different."

Good progress has been made in some areas, but significant issues remain for most targets, and the 2030 Agenda may well prove to be a challenge too hard for China to crack.

Locking on target

The 17 SDGs, which came into effect on January 1st, 2016, set out the global agenda for achieving a prosperous, inclusive and sustainable society for all by 2030. Covering a wide range of issues, including decent work and healthy economic growth, gender equality and responsible consumption, the goals, divided into 169 specific targets,

cover all three dimensions of sustainable development: economic growth, social inclusion and environmental protection.

China's basic commitment to achieving the SDGs was made public at the time of their introduction, then re-confirmed in 2020, with the release of the UN Sustainable Development Cooperation Framework for China 2021-2025. The document set out a plan for post-2020 development, taking into account the difficulties created by the COVID-19 pandemic, and centered China's ambitions under three key labels—*People and Prosperity*, *Planet* and *Partnerships*.

"I think it's natural that China has approached some issues rather than others," says Tony Wong, founder of Alaya Consulting, which focuses on environmental, social and governance (ESG) issues. "If the government already has infrastructure or priorities in some areas, then it makes sense to pursue them over other issues requiring much more money, time and effort. The same argument can be made for businesses approaching the SDGs."

People and Prosperity relates to achieving innovation-driven, coordinated development, resulting in fairer high-quality economic, social and human growth—goals that are shared with China's existing common prosperity and business innovation policies. The *Planet* goal, which targets green development, aligns with the country's dual carbon goals—peaking emissions by 2030, and becoming carbon neutral by 2060—and an expanding green business sector—solar energy and new energy vehicles, for example. *Partnerships* refers to greater South-South and humanitarian cooperation to facilitate increased contributions to meet the SDGs. Originally, many of China's South-South partnerships were driven by the Belt & Road Initiative (BRI), which predates the SDGs but shares a number of commonalities. "It's not necessarily explicit or in an organized way, but we can easily observe some absorption of the SDGs into the BRI through official rhetoric," says Li. "In fact, the government has literally described the BRI as the 'Green Belt and Road Initiative.'"

Approaching the SDGs from an angle that aligns partially or fully with existing national policy targets is not unique to China and other countries are doing much the same. India, for example, has committed to improving health care services by 2027, especially for the most disadvantaged, while South Africa's SDG-related aims are underpinned by the need to improve inclusivity in economic growth, social transformation and governance.

Scored any goals?

China ranked only 56th out of the 163 countries included in the 2022 Sustainable Development Report, an assessment of countries' progress towards reaching the SDGs produced by a number of prominent academics including Columbia University's Jeffrey D. Sachs. The country's Index Score

was 72.4, which reflects the percentage of SDG targets achieved. Finland topped the rankings with a score of 86.51, while South Sudan came in last with a score of just 39.05.

The good news is that China has already met the requirements for two of the 17 SDG goals—*Poverty Eradication* and *Provision of Quality Education*. But beyond these, there are only three other areas in which the country's scores are improving fast enough to reach the targets by the 2030 end date—*Clean Water and Sanitation*, *Responsible Consumption and Production* and *Industry, Innovation and Infrastructure*.

The country is also facing difficulties in utilizing partnerships to reach the goals. Despite being one of China's three main target areas, rising geopolitical tensions have seen a growing number of problems with effective cross-border partnerships.

"Currently partnerships are actually something of a weak point for China, which is unfortunate," says Li.

Another major challenge is the *Life Below Water* goal, which is unlikely to be met as a result of massive overfishing, dredging, and lack of protection for underwater biodiversity. A similar lack of protection means that this is also the case for the *Life on Land* goal. Improvements in these areas have faltered and without a serious shift in policy or business-led countermeasures, China will fail to reach the ascribed targets.

Government involvement

The SDGs have been mentioned in several high-level government statements but the goals were not explicitly included in the country's two most recent Five-Year Plans,

THE SDGS

The UN Sustainable Development Goals are a set of wide-ranging progress indicators for the sustainable growth of a country



Source: UN, Designed using freepik.com

covering 2016-2025. However, there are content overlaps, with both featuring strong emphasis on green development and innovation, but diverging in others, such as gender equality.

“Based on government priorities over the last few years the two goals that stand out are poverty alleviation and climate action,” says Tony Wong. “Beyond these two I think the main thing businesses are responding to from the government is innovation, it permeates everything they do.”

In order to tell how much progress is being made, there is a need for more comprehensive and transparent data on which policy decisions can be based. China is the only one of the 163 in the Sustainable Development Report that doesn’t have a national SDG monitoring system or some level of online report in place.

In 2021, the country made its first concrete steps in the collection and analysis of SDG-related data with the creation of CBAS, a research center hosted by the Chinese Academy of Sciences. CBAS uses high-performance computing, Big Data analysis and AI services to process and distribute data and is intended to be a one-stop-shop for SDG indicator-related monitoring and evaluation. In November 2021, the organization also launched the first-ever satellite developed specifically to help with the implementation of the UN 2030 Agenda.

Despite the clear ambition of the CBAS project, the platform is currently limited to producing data on just six of the 17 SDGs, but usefully, two of the six are targets where the country needs to show the most improvement—*Life on Land* and *Life Below Water*.

“Reports from CBAS cite quite a bit of data, and in the areas that they are focusing on there appears to be progress,” says Li. “But the fact that it doesn’t touch on the other SDGs at all is still a major issue.”

Another major issue is data reliability. There is a lack of any independent means to validate the data or conclusions in CBAS reports, a common issue with Chinese data. Another problem arises from the sheer size of the country, with priorities in Shanghai

being dramatically different to those in the rural areas of western Yunnan province, for example.

“Even within 30 minutes travel from Beijing or Shanghai, you will have businesses with a whole different set of objectives and desired outcomes,” says Raphael Chan, managing director of NAREE, a consultancy that provides project management services for sustainable development projects. “It’s so hard to standardize anything in China.”

“The country’s diversity makes governance much more difficult,” says Li. “Implementation and monitoring of policies have always been a major challenge in such a complex system. Historically, some level of decentralization has been used in order to stop the center becoming overloaded and help design better national policy and service delivery, but for the SDGs that has yet to be fully evolved.”

Business and the SDGs

One option is for the government to delegate more responsibility for the solutions to SDG-related issues to the vast number of companies, both private and state-owned, that form a crucial part of the country’s economy.

Government statements on SDG attainment contain a large number of references to the importance of public-private partnerships, as well as private enterprise involvement and investment in stimulating progress towards the goals. But turning statements into tangible outcomes is still proving tough. According to a report produced by the UN Development Program (UNDP) in China focusing on private sector awareness of the SDGs, 89% of Chinese enterprises know about the SDGs, but just 10.1% have taken any specific measures to address them.

“For many businesses, especially small and medium-sized enterprises (SMEs) the barriers are twofold,” says Chan. “The first is that survival is the main priority for many, and the second is that while many business leaders are aware of the SDGs, they lack the expertise to actually implement anything. Some of the bigger companies do have capacity, though.”

Given that SDG-generated economic growth is expected to reach \$12 trillion, or 10% of the current global GDP by 2030, with China alone being responsible for around \$2.3 trillion of that, it is clear that there are a great number of opportunities for businesses. And many are starting to take advantage of them.

One such organization is the Yibao Program, China’s first financial institution aimed at providing targeted medical protection for low and middle-income people, directly contributing to progress towards the *Health and Well-being* goal. It provides specifically-tailored products that offer protection against the most common medical issues faced by those in these socio-economic groups, as well as helping prevent a slide back into poverty due to disease.

Companies are also working to encourage growth in areas where the government is currently falling behind, such as international partnerships. Master Kong, China’s largest producer of instant noodles, has embarked on multiple partnerships in Malaysia, Brazil and Indonesia, sharing agricultural management expertise and food safety control technologies.

And these partnerships are clearly SDG-motivated. Master Kong’s 2021 Sustainability Report details six clear actions taken, and four major achievements, including the “assessment of the environmental and social risks of 876 suppliers, the provision of 125.14 customized training hours per employee, and the implementation of the Supplier Relationship Management system which helped train upstream suppliers.”

“Multi-party partnerships are definitely necessary to achieve the goals,” says Chan. “But one problem they often face is a lack of alignment from the individual players in terms of outcome priorities.”

The UNDP is also working with Baidu and Tsinghua University to utilize Baidu’s Big Data capabilities for tracking the progress of SDGs, mapping rural poverty, identifying gaps in electrification, water and sanitation, as well as access to services. The project also looks at mapping similar service trends in urban civilization across the country, aiming to provide



Based on government priorities over the last few years, the two goals that stand out are poverty alleviation and climate action

Tony Wong
Founder
Alaya Consulting

policymakers with a clear idea of where improvements are necessary.

And while the Baidu project is an example of improved reporting, the lack of reliable information collection and disclosure remains a major problem for businesses, as with the government. According to the UNDP report, 42% of the businesses who had heard of the SDGs had no clear idea how to evaluate their relationship to the goals, and 38% had never released any SDG-related information. Only 27% of Chinese businesses have produced sustainability reports, while globally that figure is 72%.

“While they do communicate companies’ impacts, the majority of businesses that produce sustainability-related disclosure do so primarily to fulfill regulatory requirements, which depend on the stock exchange they are listed on or the country they operate in,” says Verna Lin, head of the Global Reporting Initiative’s Greater China Region.

Up until recently, many bourses have only required financial statements, but that is no longer enough in many places, and sustainability reporting is becoming a must. “There are business benefits to reporting,” says Lin. “Industry leadership can develop into future value by providing transparency to their global stakeholders, investors and customers, which in turn translate into business opportunities. But developing this understanding in Chinese businesses is a long process. Once they understand,

though, they are usually very positive about it.”

The Chinese government could therefore dramatically increase the proactivity of Chinese companies with regard to SDG goals by mandating the tracking and reporting of data.

Educating the masses

As stressed by a recent UNESCO conference on the subject, providing education for sustainable development (ESD) as early as possible in life supports efforts to equip learners with the knowledge, skills and attitudes needed to contribute to a more sustainable world.

Unfortunately, in this regard, a 2019 academic survey indicated that across residents in five cities in China, knowledge of the SDGs was scarce. But a generational difference was clear, and young people showed a much higher knowledge than the public average, particularly on the social and environmental dimensions of sustainability.

One organization that is trying to take on the task of ESD in China is Education in Motion (EiM), which offers school education for a sustainable future and runs a group of 10 educational institutions across China, and a few others in Southeast Asia.

“Our strategic aim is to equip our students with knowledge of ESD concepts and vocabulary, and the ability for them to promote the concepts in the next stages of their life,” says d’Arcy Lunn, Group Head

of Sustainability and Global Citizenship at EiM. “It’s important because I think that most Chinese students have come across the ideas before, but there sometimes isn’t really a lot of deeper understanding. And this sort of ESD education and context can provide solutions both for China today, and for the country’s future.”

But EiM, along with some other educational institutes, are moving ESD forward and are eager to see active government involvement in the sector so that further progress can be made. “The Chinese government has set targets of peak emissions, carbon neutrality and other progressive policies and we hope to see even more encouragement to enhance ESD education so these targets and policies can become reality sooner than later,” says Lunn.

Adoption or alignment?

China is definitely making progress in meeting the SDGs, but mostly where that progress aligns with the government’s own pre-determined targets.

“There are many areas in which China is moving towards SDG attainment, but that is not necessarily because they are targeting the SDGs,” says Wong. “Every government in the world has their own agenda, their own targets and their own issues.”

While a fundamental shift in China’s approach to the SDGs is unlikely to be forthcoming, a clearer mandate for data tracking and reporting would allow businesses to increasingly take up the SDG mantle.

“The importance of sustainability reporting is growing and ESG issues are having an increasing financial impact on companies,” says Lin. “It’s a global trend, but especially given the top-down governance approach in China, reporting really needs to be an explicit policy goal.”

Despite the challenges, it is not all doom and gloom. “Globally people have highlighted dealing with climate change as the most urgent of the SDGs that need to be met,” says Li. “Action needs to happen now and the Chinese government is rightly focusing a very large amount of attention in that area.”



Changing Supply Chains

Global supply chains are changing and China may fare better by approaching this shift with a more open and market-oriented approach



By Li Haitao, Professor of Finance, CKGSB

Deepening globalization has been the main factor behind human societal development, particularly over the past century. Between 1990 and 2007, globalization developed at its quickest rate, thanks to the upgrading of transportation infrastructure, advances in communication technology and the lowering of trade barriers. These changes, fueled by a desire for greater efficiency and cost reduction, have reshaped the supply chains of almost all industries around the world.

In this globalized supply chain model, production processes are distributed to different countries or regions, which tend to focus on specific production stages, rather than completing the entire production process alone. As a result, larger multinational companies are often shuttling components and semi-finished products around the globe, between smaller specialized suppliers.

The result of the global distribution approach is that countries that are active participants, such as China, Thailand and Vietnam, have all experienced a boost in productivity and income to various extents.

But the reversal of the globalization trend in recent years is challenging these globally-diverse supply chains, the expansion of which began to slow after the Global Financial Crisis in 2008. More recently, US-China trade tensions, the COVID-19 pandemic, and the Russia-Ukraine conflict have increased pressures on supply chain layouts.

The pandemic has had an extremely negative impact on the global economy, across the supply side, demand side and distribution chains.

In the first half of 2022, for example, the number of container ships waiting at the port of Shanghai and the nearby port of Ningbo Zhoushan more than doubled

after a virus outbreak in Shanghai and surrounding areas. Because of the resulting delays, the production flow of major companies, including Tesla and Honda, was greatly affected, and supply chains around the world were disrupted.

The Russia-Ukraine conflict has had a massive impact on the global supply chain. The first is its effect on the supply of a large number of commodities. Both Russia and Ukraine are important sources of oil, gas, grain and many non-ferrous metals, and as long as the conflict continues, the regularity and quality of supply of all of these products will be affected.

The second major impact has been Russia's increasing exclusion from global institutions and supply chains. Since the outbreak of the Russia-Ukraine conflict, the United States, the European Union and other Western countries have imposed sanctions on Russia, removed the country

from various trade organizations and many multinational companies have withdrawn from the Russian market. Major Russian banks have been excluded from the SWIFT payment system, and their overseas assets have been confiscated or frozen.

These factors have dealt a blow to the status quo of the global multilateral trading system, with political decision-making being prioritized over existing trade rules. Due to the wide-ranging sanctions placed on the country, the Russian economy is now in the process of decoupling from the Western economy, which has hurt the globalization of supply chains.

According to the Global Supply Chain Stress Index, produced by the Federal Reserve Bank of New York, there has been an obvious increase in pressure on global supply chains since early 2020, and these pressures show no sign of abating.

Based on the pressure on global supply chains and the changes in the international political and economic environment, countries and many enterprises around the world have started to rethink their globalization strategies, and the restructuring of global supply chains has become a new trend.

Impact on China

Supply chain restructuring is bound to have a huge impact on the economic development of countries around the world,

and as the so-called factory of the world, China will certainly see major changes.

The country has already started to see an outward shift of manufacturing capacity in several industries. Looking at electronic equipment manufacturing, Samsung closed all of its smartphone factories in China in 2019, making Vietnam the company's largest production base outside of South Korea. Over 50% of Samsung's cell phone exports and one-third of its electronics shipments are now produced in Vietnam.

In April 2022, ON Semiconductor, a leading global chipmaker, announced that it would relocate its Shanghai distribution center, one of its four distribution centers in Asia, to Singapore and would close its global distribution center in China.

China's share of furniture imports by monetary value into the US, Europe, Japan and South Korea has dropped from 52.8% to 43.5% between 2018 and 2020, and the proportion of telecom devices has dropped from 62.6% to 57.4%. Vietnam replaced China as the largest furniture supplier to the US in 2020, with Vietnam's wood products and furniture exports amounting to \$14.5 billion, in 2021, up 17.2% year-on-year.

A similar offshoring trend is also apparent in the textile industry. Since 2014, Tianhong Textile, one of China's largest cotton textile manufacturers, has

been developing the Haihe Industrial Park in Vietnam, with plans to create a full supply chain base, going from raw material production to processing and sales. Chinese colored yarn spinning giant Blum Oriental has also already relocated 60% of its total capacity in Vietnam and plans to expand its output there by another third.

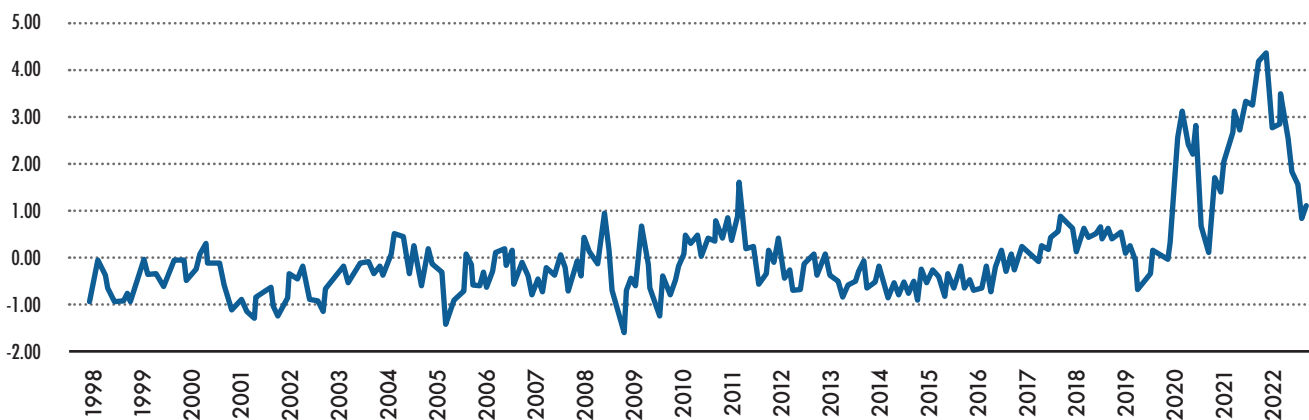
This outward flow of manufacturing has resulted in concerns that there may be a hollowing out of Chinese industries and a general reduction in the country's global competitiveness. But it is important to note that supply chain shifts are not a new phenomenon, and many even larger-scaled industry shifts have occurred across modern economies.

For example, after the middle of the 19th century, along with the industrialization process of the United States, European industries moved across the Atlantic on a large scale. Secondly, after World War II, along with the post-war reconstruction process, parts of US industries moved to Europe, Japan and other places. Thirdly, in the 1970s, some Japanese industries such as home appliances and chemicals were transferred to South Korea, Taiwan, Southeast Asia and other regions.

Having said that, with the development of the Chinese economy and the improvement of living standards across the country, some of China's original advantages, such as cheap and abundant

UNDER PRESSURE

The global supply chain stress index has recovered somewhat from its pandemic-related highs



Source: Federal Reserve Bank of New York

labor supply, have gradually diminished. And under such circumstances, some industries are bound to choose new manufacturing locations that can offer greater comparative advantages.

This type of industrial transfer is consistent with economic trends, and both parties can benefit from the shift. Taking ASEAN, the largest destination for China's industrial out-migration, as an example, in 2020, ASEAN replaced the EU as China's largest trading partner. In 2021, China's exports to ASEAN amounted to \$483.69 billion, up 26.1% year-on-year, and imports from ASEAN amounted to \$394.51 billion, up 30.8% year-on-year, showing a clear benefit on both sides of the relationship.

Letting the market work

The inevitability of the global supply chain shift is set out by the laws of the market. However, it is vital that the market is allowed to function properly while this transformation takes place.

In recent years, the view of many is that the US has launched industrial policies aimed at safeguarding its interests, which could have a detrimental effect on the market's ability to properly regulate itself.

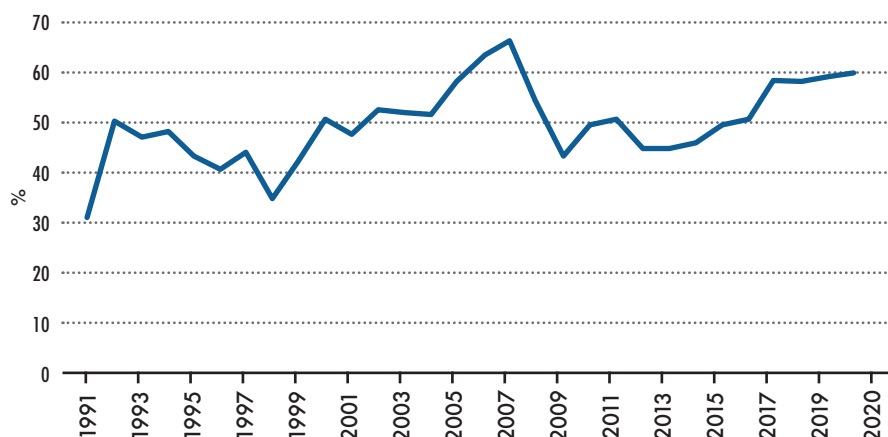
An example is that the US used the US-China trade deficit as a justification to substantially raise tariffs on imports from China. The average tariff rate on Chinese products exported to the United States rose from 3.8% in June 2018 to 19.3% in mid-2022, and these tariffs cover approximately 66% of Chinese exports to the US. Non-market-based tariff increases have hurt normal trade between the US and China and have hurt the world economy.

In May 2022, the US also announced the Indo-Pacific Economic Framework (IPEF) program, which consists of 13 countries, including the US, Japan and India, and accounts for about 40% of the global economy, but does not include China. US Trade Representative David Deitch has publicly stated that the IPEF is a "China-independent arrangement."

There is also the example of the Chip and Science Act introduced in the United States. The bill explicitly requires that 40% of the mineral materials used in new

CASHING IN

The contribution of China's technological progress towards its economic growth has almost doubled in the last three decades



Source: CKGSB

energy batteries be mined and processed by countries with which the US has free trade agreements, and this percentage will rise to 50% by 2024, 80% by 2027, and 100% of battery components must be manufactured in North America by 2029.

Among the world's major economies, China is the only country that is competitive in the new energy industry but does not have a free trade agreement with the United States.

Restructuring response

China's response to the global supply chain restructuring will define its future role in global development, and there are several areas where the country must focus its efforts. First, China's future economic development will increasingly correlate with its scientific and technological progress, which will facilitate industrial upgrading, going a long way to mitigating the effects of the global supply chain shift.

China's investment in scientific research has been increasing in recent years, and the contribution of scientific and technological progress to economic growth has, in turn, been rising.

Secondly, while strengthening its research investment, it can't simply close its doors. It should be noted that in many fields, the developed Western countries are still in a leading position compared to

China, and learning from other countries, including the US and Europe, is still an important way for China's economy to improve.

China's photovoltaic (PV) industry is a good example of successful industrial upgrading through external learning. Before the 1990s, China's PV technology and industrialization levels were very weak, and almost all PV products were imported. At present, China's PV industry is already a global leader and its products not only meet China's domestic demand, but are also exported to over 200 countries and regions.

The analysis of the industrial chain shift shows that passive resistance or resignation to the fate of the global industrial chain restructuring is not the way to deal with it, but active adaptation to the changing environment is the right response.

For some domestic industries that have lost their competitive advantages, it is wise to take the initiative to move to more competitive countries or regions. A more important direction of development is to increase their technology and innovation capabilities.

But it is worth remembering that, with the world's largest single market and a rich engineer's dividend, China is still very competitive in this new configuration of global industrial supply chains. ■

Ratings, Risks and Readjustments

Thomas Torgerson, Managing Director and Co-head of Sovereign Ratings at DBRS Morningstar, discusses China's economic headwinds and the challenges they pose

After years of double-digit GDP growth, China's economic development has begun to slow. While often this is seen as a bad thing, it is widely acknowledged that the country's previous economic trajectory was unsustainable, and a correction was due. But understanding the implications of this change in growth is imperative to assessing the country's future potential.

One way to form an assessment is through the use of sovereign credit ratings, which are a tool for investors looking for an independent view of a government's capacity and willingness to pay its debts on time. Global markets are particularly responsive, over the short- and long-term, to an upgrade or downgrade in a country's rating, meaning that the process for rating development needs to be as precise as possible.

DBRS Morningstar currently has an A-high rating for China, but with a negative trend, reflecting an expectation of weaker macroeconomic performance for the Chinese economy in the medium term. In this interview, Thomas Torgerson, Managing Director and Co-head of Sovereign Ratings at DBRS Morningstar, discusses the key elements that go into the development of sovereign ratings, the economic challenges facing China, and the possibilities for future growth.



Q. How are sovereign ratings calculated and how often do they change, particularly in relation to China?

A. Our sovereign rating methodology contains six building blocks, which assess all the key elements of sovereign creditworthiness. We look at fiscal management and policy and debt and liquidity, which together encompass public finances and the overall performance of a government. With regard to its finances, we also assess economic structure and performance, monetary policy and financial stability, and the balance of payments, all of which typically cover the macroeconomic fundamentals of a country and the performance of policymakers in fostering stable capital flows and predictable policies. And of course, the political environment relates to that as well, as does the strength of governing institutions, the overall political process, and the efficiency of policymaking.

China's ratings have not changed significantly in recent years. We've had an A-high rating on China since 2014. What has changed and has been reflected recently in a negative trend on our rating, is China's fiscal position in particular, which has deteriorated significantly over the course of the past seven or eight years, and remained weak during the COVID years. And in addition to that, we see weaker growth and some elevated financial stability risks from the property market. Those together

have been reflected in the negative trend, but again, the rating itself has been quite stable for many years.

Q. To what extent do you see the Chinese policy process as being predictable?

A. Chinese policymakers are pretty transparent in laying out their objectives, and fairly pragmatic about adjusting those when conditions require. What I think is lacking, particularly in comparison to other countries that we rate, is the feedback mechanisms of local press and investors, who will often voice independent views of those policies, and at times point out risks and challenges ahead that policymakers often should respond to.

In the West, you have these mechanisms, but there is also a lot of “noise” to get through in order to get the useful information, and this is perhaps lessened in the Chinese environment. But there can also be value in this “noise” and the feedback mechanisms that it enables. What we worry about in the Chinese context, is that those feedback mechanisms will be muted, and therefore result in larger future changes if policymakers miss key changes or key trends that they otherwise would have caught.

Q. What have been the main reasons for China’s slowing economic growth in recent years and how does it impact the country’s ratings? To what extent do you expect this to change, both in the short- and long-term?

A. This is a complex topic, where there are positives and negatives to slowing growth. On the positive side, China has been on what was ultimately an unsustainable growth trajectory, achieving very high growth by importing expertise and technology which made it very productive, but that only gets you so far. China needs to generate that productivity growth domestically, and as it modernizes it is always going to slow, as we have seen in all the advanced economies—it’s much harder to achieve high productivity growth when you’re close to that production possibility frontier. So this, plus the demographic changes in the country, mean that China’s growth really should slow. And in many respects, I would be more worried if we saw extremely rapid growth continuing, because that would suggest rising leverage and rising investment into infrastructure, housing and commercial real estate beyond what the country can usefully deploy.

But slower growth has its challenges as well, particularly when it is caused by frequent short-term disruptions to economic activity, which we saw in the numerous COVID-related shutdowns. There is also a broad decline in the property markets, which poses financial stability risks. Whether those risks can be contained in the property development sector or if they will spread beyond that remains to be seen. So these are worries for us, and beyond that, the international environment has become increasingly tense regarding trading, with China’s trading partners less hospitable to Chinese export growth in the future. And that can compound domestic challenges, even for a large economy like China’s. So all of those headwinds are a concern. But of course, I’d be more concerned if growth were still 10% for the wrong reasons.

Thomas Torgerson is Managing Director and the Co-head of Sovereign Ratings at DBRS Morningstar. As one of two group co-heads, he is responsible for methodology development and manages the group’s data support team.

Q. China’s property market has experienced a number of difficulties in recent years. However, we have recently seen a return of lending availability for property firms, among other changes. To what degree do you think these rollbacks have a significance for the Chinese economy?

A. This is also difficult to say, because to some extent healthy corrections can be a positive. What we’re worried about is that some quarters are still fairly opaque and it’s hard to tell what’s really happening. We’re worried about the impact it will have on local government finances, especially because there are still strong incentives to foster more investment even when it’s not necessarily productivity-enhancing. And looking at growth-generating investment in China, it looks like that has deteriorated very significantly. So there is a need to redirect investment into areas that will foster more productivity growth, and we think that’s substantial. Above all, though, we are worried about the quality of investment, and whether it will help China return to a stable growth path, or whether we’ll continue to see very weak growth as a result.

For China to be able to stimulate private consumption, what you ultimately need is households that are confident enough in the future



Q. How does the structure of China's economic system impact the country's ratings?

A. This is a question we have been watching since the mid-2000s, and I'd point to one statistic in particular. China's measure of gross debt to GDP was roughly 140% in 2007, by the second quarter of 2022 it was 295%. This has been shifting since the global financial crisis, and it is how China avoided a substantial slowdown within its economy. The shift was partly made possible by the structure of the system because it was able to continue to support economic growth through a period of very weak global growth. And China's performance has been very important to the global economy over that period.

Our worry now is the leverage that created the buildup of debt, which is on par with many advanced economies, while China is not yet, in terms of just per capita GDP levels, a fully advanced economy. Meaning you have a still-emerging market, with very high levels of debt. If you combine that with the limited transparency within local government debt, the inter-linkages between government and quasi-government entities, which suggests there may be future government liabilities that are not fully represented in the debt levels, you can see there are fiscal implications for the future.

Centralized control has, in the past, been very effective in boosting investment and in ensuring that the state-owned enterprises, for example, remain key contributors to that growth story

Q. How do you see the country's growth engines shifting following China's 20th Party Congress?

A. Centralized control has, in the past, been very effective in boosting investment and in ensuring that the state-owned enterprises, for example, remain key contributors to that growth story. But the way China is seeking to change the composition of growth requires a different approach, and centralized control is not going to be as effective in promoting that. But I think policymakers see that and they have been attempting to shift the growth model and investment towards consumption and services. There has been some progress, but when you look at private consumption relative to output, it's still quite low at 38% of GDP. China has the highest investment-to-GDP ratio among large economies, but there is a weaker growth trend there and it again raises questions about quality of investment.

For China to be able to stimulate private consumption, what you ultimately need is households that are confident enough in the future, that they are willing to save less and spend more of their current income. That requires expanding social safety nets and doing things that enable people to have a level of comfort that their savings are adequate and will be adequate. And it's difficult to achieve that at a time when property, which is one of the key household assets, has been declining in value. So that's where I think the challenges lie for China. At the Party Congress they articulated some of the things that need to be done, but it is unclear whether they will be able to achieve that with all of the headwinds they face.

Q. How do you expect China's economy to develop over the next five to 10 years? And how would you expect this to impact its sovereign ratings?

It's clearly a slower growth story, which we expect to be mid-to-low single digits. Compared to the past, this alone will not have a negative impact on the rating, but that could change depending on the fiscal challenges that China faces and how the government reacts to that low-growth environment. It's more challenging and costlier to reduce fiscal deficits when you have weak growth.

But I'm always hesitant to dismiss the potential of an economy that has seen tremendous change over my whole adult life, and I think the potential for furthering development is certainly still there. But again, the trend growth rate is going to gradually creep lower, and in the near term, there are still a number of challenges to be addressed before we would really see that being stable and solid growth in the 3-5% range, which I think China is certainly capable of.

There have been some real successes in China's track record, particularly in its economic development over the past few decades. The worry we have going forward is whether that track record will continue, or whether there is a risk of bigger challenges emerging that will really change the growth trajectory.

Interview by Patrick Body

FAIRYTALE OR FOLLY?

Growth in the number of unicorns in China has been slowing due to economic headwinds and changing attitudes

By Sean Matthews



Image by Jamie Stevenson

The prestigious unicorn classification can lead to a number of new pressures for growing companies

When US investor Aileen Lee coined the term “unicorn” in Silicon Valley in 2013, she introduced 39 unlisted firms with a valuation of \$1 billion or more, and not one of them was Chinese. Today, more than 1,300 companies claim unicorn status, according to Shanghai-based Hurun Research Institute, with about one-quarter of the herd emerging from China—including the world’s most valuable, ByteDance.

In China, these billion-dollar startups, once as rare as their mythical quadrupedal namesake, have nearly tripled in number over the past five years from 120 in late 2017 to 312 by the end of June 2022, growing in tandem with the country’s recent tech boom. But growth has been slowing and the suggested fairytale future that once lay ahead is no longer a guarantee.

ByteDance, and many of China’s other well-known unicorns, are all companies that have been enabled by leading-edge digital technology, a growing Chinese middle class, new capital-raising opportunities in Shanghai and elsewhere, and the enthusiastic entrepreneurial zeal of their founders.

“The outstanding performance of Chinese unicorns is rooted in the country’s global leadership in some areas,” says Teng Bingsheng, Professor of Strategic Management at CKGSB. “China’s massive economic volume and activity, scientific research output and the training of talent all play a part.”

But headwinds, including a shift of national policy away from economic growth at all costs, have left the economy facing a significant slowdown, smothering the conditions that helped nurture China’s first waves of unicorns. And some experts are even starting to question the unicorn tag, with many pointing out the dangers of runaway valuations and the demands that come with them, a case in point being the Luckin Coffee debacle.

Here, there, everywhere

The dynamism and size of the world’s second-largest economy mean China is now home to the most unicorns outside of the US. The number grew rapidly over the

last decade, as Chinese consumers flocked to smartphones and the mobile internet. According to Hurun, each year since 2012 has seen an average of 22 unicorns being minted in China, less than one-third of the 73 established in the US over the same period, but far higher than India’s average of nine and the UK’s six.

In China this growth has decelerated sharply in recent years, but in other countries meanwhile, unicorn numbers are on the upswing. India added more unicorns than China in 2022—23 versus 11—for the second year in a row and while China and the US were virtually neck-and-neck in terms of unicorn numbers as recently as mid-2019, the US now has twice as many.

“In 2022, the US grew quite substantially in terms of new unicorns, and that’s based on the health of the US economy,” says Rupert Hoogewerf, chairman and chief researcher at Hurun. “There were many more new Chinese unicorns than we expected, but then there were quite a number of drop-offs as well, so the net increase was relatively minimal.”

China’s unicorns are concentrated in internet and software, where major names such as ByteDance and Shein reign. “The first big wave of unicorns in China was in the internet sector,” says Henry Zhang, president and managing partner of Hermitage Capital, a tech-focused global private equity firm with \$1.5 billion of assets under management and invested in more than 20 unicorns in China and the US. “It began in 2000 when Sina became the first Chinese tech company to list in the US via the variable interest entity (VIE), which basically kickstarted the sector’s 20-plus year boom.”

Some of China’s other tech giants started out as unicorns too—Alibaba, for instance, was valued at \$130 billion before its blockbuster New York listing in 2014—so it is no surprise that these companies have close ties to the current crop of most-valuable startups. Ant Group, Alibaba Cloud and logistics company Cainiao, worth a combined \$300 billion, are all Alibaba spin-offs, while JD Technology, another unicorn, is the fintech unit of JD.com.

But the internet sector is not alone, and several other areas have been fertile ground for unicorn growth. “There have been a number of decent Chinese startups in other sectors besides tech, like consumer,” says Zhang. Prominent names currently in this category are fresh tea chain HeyTea, worth \$9.3 billion in mid-2021, and healthy beverage maker Genki Forest, which had eyed a \$15 billion valuation in late 2021.

The country’s emphasis on manufacturing as a key pillar of its economy means there are unicorns in hardware and industry too—DJI, a Shenzhen-based consumer drone manufacturer, is globally renowned, and other players include battery maker SVOLT Energy Technology and Horizon Robotics.

“What we’re now seeing is less internet but more tech-driven players coming up,” says William Bao Bean, managing director of accelerator program Orbit Startups. “It includes deep tech and hard tech, from artificial intelligence (AI) and semiconductors to industrial automation and blockchain.”

Growing fat off the land

The rise of highly valued tech startups over the past decade speaks to the strength of China’s economy, which has more than doubled in size since 2010. And many Chinese unicorns came of age in this era when money-making and economic rationality trumped everything else.

China’s unicorns have also enjoyed near-exclusive access to a huge and vital domestic market full of newly prosperous consumers who are largely out of reach for the rest of the world, thanks mainly to protectionist policies.

“We have 1.4 billion users who are largely homogeneous, sharing a common language, culture and spending pattern,” says Wilson Chow, leader of the global technology, media and telecommunications practice at PwC China. “It’s been so easy for many of the unicorns here to address the lifestyle needs or the pain points of those 1.4 billion people. Just capturing 10% or even 5% of them is enough to be crazily successful.”

It helps that Chinese consumers are

some of the most tech-savvy in the world. China has ranked first in online retail sales since 2013, with the US in a distant second place and India even further behind. China’s online retail sales in 2021 jumped 14.1% to ¥13.1 trillion (\$1.81 trillion), and while growth slowed to 4.0% last year due to the weak economy, it bounced back to 6.2% in the first two months of 2023.

China’s rise up the unicorn rankings also reflects a longstanding entrepreneurial zeal, encouraged by the market reform era initiated by Deng Xiaoping, that sets it apart from Asian peers.

“Like people in many other countries, the Chinese are smart and hardworking, but what differentiates us is our keen sense of entrepreneurship,” says Zhang. “The top Chinese talents always want to be their own boss and found their own businesses. They are self-confident and eternally optimistic, and failure is not in their vocabulary.”

A new breed of unicorn

As Beijing cracked down on a decade of free-wheeling expansion by consumer-facing internet giants, investor attention pivoted toward strategically important sectors aligned with Beijing’s policy goals, such as hardware, enterprise software and software-as-a-service.

Fulfilling the latter two categories is Shanghai-based XTransfer, which raised \$138 million from investors in September 2021 to join the unicorn club. Founded by

Ant Group veterans in 2017, the startup has provided currency and payment management services to more than 300,000 small and medium-sized enterprises (SMEs), mostly in China.

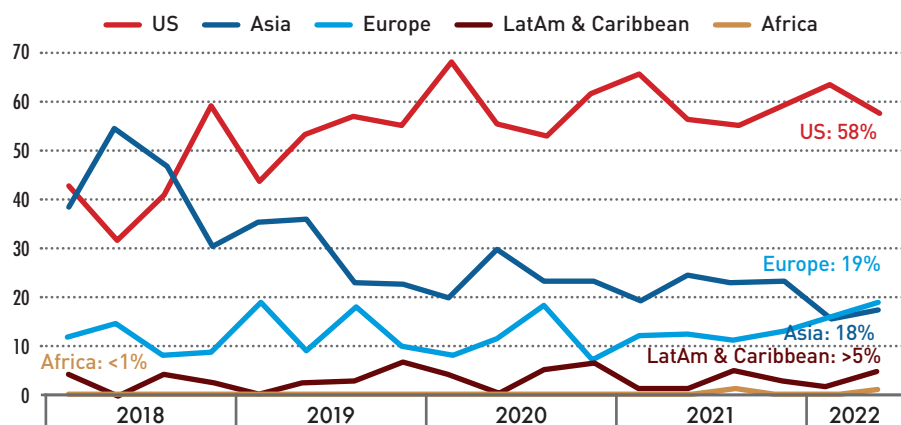
Business-facing fintech companies like XTransfer are seen as promising as they support national priorities, such as the digital economy and digitalization, SMEs and rural revitalization—all towards the main goal of achieving “regulated, balanced and high-quality development.”

“We are targeting pain points like the huge gap in the business-to-business (B2B) cross-border payments sector between the services provided by traditional financial institutions and the needs of B2B SMEs engaged in foreign trade,” says XTransfer’s chief executive Bill Deng.

Other startups like Beijing-based Horizon Robotics—a leading provider of computing solutions for advanced driver assistance systems and automated driving for passenger vehicles—are generating excitement as they work to push Chinese leadership in key technologies vital for any major economy, such as semiconductors and AI. The localization rate of China’s integrated circuit market—which includes chips that power everything from cars to data centers—is tipped to grow from 15% in 2020 to 19% by 2025, meaning a vast potential market for Chinese startups with the engineering know-how to replace foreign tech and circuitry.

UPS AND DOWNS

Europe has surpassed Asia for the first time in terms of the share of newly minted unicorns



Source: CBInsights



Big Byte: China's ByteDance is the world's most valuable unicorn

But the path to success for these startups will be significantly more arduous than the one the first wave of internet unicorns experienced, which could limit how many emerge as winners, according to Zhang. “During those booming days of internet, startups could be IPOed three years after their first round of funding, as success could be derived from business model innovation,” says Zhang. “That doesn’t exist in the hard tech sector. To succeed in hard tech requires a lot of hard work and dedication, endless pursuit of cutting-edge technology, extensive first-hand experience and years of R&D efforts.”

These hardware startups are nevertheless on the rise in China, supported by Beijing’s longstanding emphasis on tech innovation, a vast domestic market, an unparalleled manufacturing ecosystem, and world-leading matriculation of STEM graduates. Drone giant DJI is China’s most valuable hardware unicorn and its eighth-largest overall with a valuation of \$18 billion as of mid-2022, according to Hurun Research Institute. The Shenzhen-based manufacturer is credited with turning drones, once a high-end toy for rich hobbyists, into a mainstream commercial product and commanded 54% of the global commercial drone market in 2021.

China has “some of the great universities in the world, ecosystems driven by raw talent,” says Hoogewerf. “Then

you’ve got the existing entrepreneurs that young entrepreneurs will inevitably get to meet and be influenced by.”

Thinning the herd

China’s first generations of unicorns were built on the back of rapid changes in the country’s economy. But growth engines are no longer firing on all cylinders—GDP expansion in the 13th Five-Year Plan period of 2016-2020 failed to meet an official target for the first time since market reforms began in 1978—and the primacy of runaway economic growth has been deemphasized through policies such as common prosperity.

General sentiment towards the Chinese market was summed up by US venture capitalist Tim Draper, an early backer of Baidu and Tesla, who opined in November 2022 that China was no longer a place to invest and had left “the free market.”

Dramatic changes in government policy have eviscerated some of China’s household-name unicorns in recent years, such as DaDa, an online education platform that was on the unicorn list in 2019 but has since discontinued its services after China banned the for-profit academic tutoring sector in mid-2021. Startups have also been caught in the geopolitical crossfire of frictions between the US and China, with the biotech and semiconductor sectors hit particularly hard.

“China wants to be more self-sufficient in certain technologies that are important for any major economy, which explains why those particular sectors are attracting investments,” says Zhang.

“Things have slowed down a bit,” says Bean. “China is maturing as a market, with increased competition.”

The downward slope for private enterprises has shown up in a sharp drop for venture funding—Chinese companies including startups raised \$83.1 billion in funding in 2022, down by 41% from \$142.1 billion a year earlier, according to data compiled for CKGSB Knowledge by Preqin. This compares with a 42% and 41% decline over the same period for American and Indian companies respectively. The mounting financial and economic pressures raise questions about the near-term outlook for unicorns.

Souring public opinion of China around the world—particularly in the US, Canada, Europe and parts of Asia—is also fomenting a more hostile operating environment for Chinese enterprises looking to globalize. This is especially true in the US where the idea of decoupling from China has rare bipartisan support in Washington, and is also gaining some traction in European capitals.

Labelling oneself as a Chinese enterprise or based in China used to be a no-brainer geographic categorization but has now become politically charged, with some now looking to play down their Chinese association. For instance, Guangzhou-based Miniso Group apologized twice in August 2022 after the Muji-like budget lifestyle retailer was accused of trying too hard to pass as Japanese at home and in overseas markets.

Some of China’s best-known tech players have been singled out by national governments suspicious about their security risks and connections with Beijing.

“No matter where you are in the world there’re going to be headwinds when a company comes from one country to another country, and then starts to take over,” says Bean. “It’s pretty normal that the locals will fight back. Our general advice is, don’t make so much noise.”

Heavy lies the crown

Unicorns might be seen as emblematic of great innovation and a healthy startup ecosystem within an economy, but a hefty price tag may not always be a good thing. Valuations were arguably inflated due to flush capital markets pumped up by quantitative easing that Western central banks have now dialed back.

This has led to the risk of price bubbles bursting, as Big Tech's beatdown in China last year demonstrated, and plummeting valuations for unicorns upon listing. The Hang Seng TECH Index—representing the 30 biggest tech companies listed in Hong Kong, including Alibaba, Tencent, Baidu, SenseTime and Meituan—hit its lowest-ever level in October 2022 since peaking in February 2021 and remained choppy over the first quarter of 2023.

“At this moment, there are certain potential investors who are not looking to be too aggressive,” says Chow. “We are in a cooldown period for people, investors and companies to observe the direction of government and the exact requirements of policies and regulations, so as to structure their way of doing business moving forward.”

“Venture capital has changed a lot recently with market sentiment,” says Hoogewerf. “Valuations have all been coming down. That's obviously had a big impact on the amount of money that venture capital is willing to fork out and on valuations as well. But I think local government is still very eager, they've seen the success stories [and] they realize that it's very competitive.”

Sky-high valuations may also give venture-backed giants less room to maneuver than an established brand when the going gets tough. Many startups became highly prized in an unprecedented era of record-low borrowing costs amid loose monetary policy. That came to a screeching halt in 2022 as central banks shifted gears to fight rising inflation, which Moody's Analytics estimated at 15.9% globally in February 2023. This could dampen the appetite of investors for making risky bets, such as funding startups.

Achieving unicorn status is no

AT THE TOP

Five of the top 10 highest value unicorns are from China, all of them part of the digital economy

Rank	Rank Change	Unicorn	Valuation (\$bn)	Valuation change (\$bn)	Country	Sector	Year Founded
1	0	Douyin	200	-150 ↓	China	Social Media	2012
2	1 ↑	SpaceX	125	25 ↑	US	Aerospace	2002
3	-1 ↓	Ant Group	120	-30 ↓	China	FinTech	2014
4	0	Stripe	62	-33 ↓	US	FinTech	2010
5	11 ↑	Shein	60	40 ↑	China	E-commerce	2012
6	15 ↑	Binance	45	30 ↑	Malta	Blockchain	2017
7	1 ↑	Databricks	38	0	US	Big Data	2013
8	3 ↑	WeBank	33	3 ↑	China	FinTech	2014
9	2 ↑	JDT	30	0	China	Digital Technology	2013
10	11 ↑	Checkout.com	28	13 ↑	UK	FinTech	2012

Source: Hurun Research Institute

guarantee of future success either. The rapid scale-up of manufacturing required to meet the outsized demand of a billion dollar or more valuation is something that can lead to unhealthy and unsustainable growth, which can have lasting effects.

Those companies that fail often leave investors—who may include the founder's family and friends, as well as deep-pocketed institutional firms—with a deep or even total loss. For instance, major shareholders in Didi Global barely had time to celebrate its blockbuster listing in New York in June 2021 before regulators in Beijing hit the ride-hailing giant with accusations that tanked its share price.

“The challenge is that most entrepreneurs look at the unicorn number—\$1 billion or more—and not at the fine print in the legal documents,” says Bean. “They want that valuation, but the key thing is the legal docs and the rights.”

Shifting gears

All enterprises in China have faced a tremendously challenging past two to three years, and unicorns have shown more resilience than most, but with a similar number of businesses losing unicorn status as gaining it, the growth of the herd has plateaued.

In part, this stagnation is thanks to the fact that the Chinese economy has slowed and matured, with areas once ripe for rapid business expansion now facing a drop in confidence, and the general air of optimism surrounding China's economic prospects has faded.

Also, attitudes towards unicorns are changing. For the Chinese government, there is a rise in the importance of common prosperity, meaning there is no longer the acceptance of allowing some to get rich first—a mantra that inspired many of the country's most successful entrepreneurs. And investors and businesspeople all over the world are starting to shift aspirations away from instant sky-high valuations and towards steadier, more sustainable growth.

These shifts mean that while there are more unicorns on the horizon in China, coming from a number of different sectors, the rapid expansion seen over the last decade is likely no more. “It's going to be a different mix,” says Hermitage's Zhang. “We're going to see more hard tech companies joining the unicorn ranks, powered by China's ‘localization’ efforts in a broad range of technology sectors. There will be more unicorns to come but not at the speed minted during the internet days.”

A NEW ENERGY CYCLE

China is adding new solar capacity at a globally unparalleled rate, but it needs to ramp up even further to meet its climate goals

By Shi Weijun



It seems fitting that a desert named after the Mongolian word for sky is where China is building one of its biggest-ever solar energy projects. The expansion of the photovoltaic (PV) power base in the Tengger Desert, straddling the Chinese regions of Inner Mongolia and Ningxia, will have three gigawatts of generation capacity once finished, making it one of the largest globally and big enough to power nearly three million Chinese homes annually.

In 2010, China had only 1 GW of solar power capacity, but ended 2021 with 306.56 GW, and added a further 87 GW in 2022, which is not far off the total existing solar capacity in the US today.

“At the very beginning, China’s solar industry had no domestic raw materials, no domestic market and no domestic equipment,” says Jin Boyang, a senior energy transition analyst at financial

company Refinitiv. “Now China is the top manufacturer, has the most installed capacity and generates the most PV electricity. The achievement is truly impressive.”

How it’s made

The booming solar photovoltaic (PV) industry is broadly comprised of three segments. The making of a solar panel starts with the raw material polysilicon, an ultra-refined crystalline form of silicon that is cast into ingots and then sliced into thin wafers. Tongwei Solar—interestingly also a leading fish feed maker—and New York-listed Daqo New Energy are two of China’s, and the world’s, largest polysilicon producers.

Once finished, midstream giants like LONGi Green Energy Technology—the world’s biggest producer of solar panels—wire up the wafers into cells which convert

electrons excited by photons of light into electricity. These are then used in the final stage—the construction and operation of solar power plants, such as the one in the Tengger Desert.

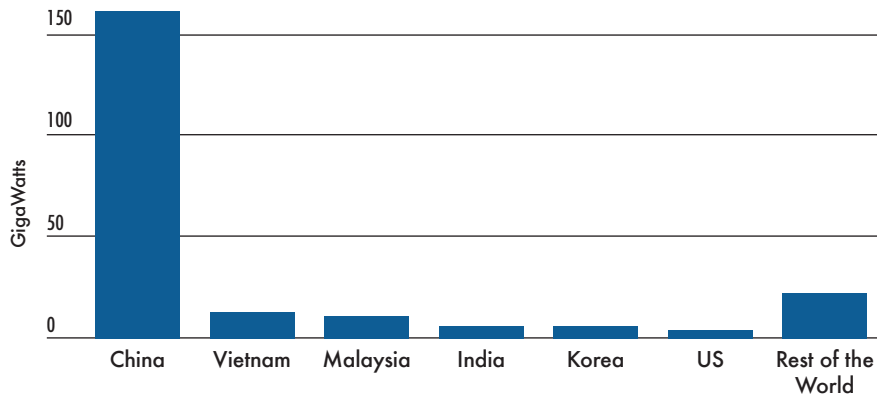
Today, the solar-powered future is being assembled in China. The country’s share of all three manufacturing stages of solar panels—from polysilicon, ingots and wafers, to cells and modules—exceeds 80%, and the country is also home to the world’s 10 top suppliers of solar PV manufacturing equipment.

But the domestic PV market suffered from a lack of profitability during its early years. Adoption was held back by high prices, a lack of government support and challenges with installing solar panels, leading to 90% of aspiring PV companies closing due to overcapacity, weak demand and uncompetitive production.

“Hundreds of Chinese companies

SOLAR SPEARHEAD

Production of PV modules in China in 2022 was well over double the rest of the world combined



Source: Bloomberg

attempted to get into making polysilicon between 2006 and 2012,” says Jenny Chase, head solar analyst at energy research firm BloombergNEF. “The vast majority failed and went bankrupt, but a few like Tongwei and Daqo succeeded in making adequate-quality polysilicon.”

China’s solar system

China’s energy footprint this millennium has been defined by two ongoing developments, the sharp rise and now slow-motion decline of coal and the small-but-growing use of renewables.

Coal still supplies more than 51% of primary energy demand, and despite dropping from around 75% in the early 1990s, absolute consumption has nearly quadrupled since then, reaching a historic high last year. On the other hand, the country is now a clean energy superpower, accounting for 44% of new wind and solar added globally in 2021. Solar now makes up 4% of China’s total energy supply, up from 0.6% in 2012.

In 2022, solar started to outshine wind in leading China’s energy transition, with cumulative installed solar capacity reaching the number one spot for the first time in August. Starting from a total of 306.56 GW of capacity, China added 58.24 GW of solar capacity in the first 10 months of 2022—overtaking the previous year’s total of 54.93 GW with two months to go despite rising material and panel costs.

China generated more electricity from

solar PV last year than the US, Japan and India, the next three largest producers, combined. But the country leads not only in power generation, but also in technological innovation.

“As the leading solar manufacturing country, China is at the center of innovation in solar manufacturing as measured by patents, not just by number but their importance in the field,” says Anders Hove, a senior research fellow at the Oxford Institute of Energy Studies. Chinese companies and organizations, led by State Grid Corporation of China, make up four out of the top five solar patent holders, with Samsung the sole outlier.

PV technology has been around since the 1950s but Chinese researchers are continuing to push the envelope. In November 2022, LONGi broke a five-year-old record for power generated by a silicon cell, with a cutting-edge heterojunction (HJT) design converting 26.81% of sunlight into electricity—the first time a Chinese company has occupied the top spot.

While LONGi’s new record is approaching the 32.33% ceiling for the maximum possible efficiency of silicon cells, China is already developing cells using a next-generation solar panel material called perovskite that could mean lower costs and even higher efficiency. Chinese companies held 68% of all perovskite battery patents in October 2022.

“China is at the forefront, they definitely rank among the top countries in terms of

technology,” says Frank Haugwitz, a senior advisor at German clean tech consultancy Apricum, with two decades of experience in China’s solar sector. “But what is really interesting is there are now innovation platforms where dozens of Chinese companies contribute expertise—instead of competing all alone, they all compete together in pursuit of technological advancements.”

Global solar PV manufacturing capacity has migrated from Europe, Japan and the US to China over the last decade, with Beijing investing more than \$50 billion in new PV supply capacity—ten times more than Europe—and the creation of more than 300,000 manufacturing jobs across the solar PV value chain since 2011.

Today’s leadership in solar energy generation means these homegrown giants are supporting buildout in the rest of the world, bringing down costs worldwide, benefitting a world confronting climate change. Chinese solar product exports more than doubled year-on-year to \$25.9 billion in H1 2022, not far off the \$28.4 billion exported for all of 2021.

Sunshine policy

The Chinese government has supported the solar industry for decades through low-interest loans, cheap land and energy, tax rebates and other subsidies, to build the world’s most integrated and efficient solar PV supply chain—although other countries offered generous financial support too. Central policymakers were hands-on from the beginning, first with the ‘Brightness Program’ in the early 2000s to electrify rural communities via solar and wind power installations, and then began to offer lines of credit to manufacturers in 2006-2012, although many of them were never drawn down.

“China was quick to recognize the solar industry as a strategic industry, something to invest in for the long run,” says Haugwitz. “You could execute projects at a faster pace because it was given priority. The time to get all the paperwork done for setting up a solar factory was shortened to as little as possible—as it is for any prioritized industry in China.”

“The consistency of support helped Chinese companies build scale and co-locate manufacturing plants for cells and modules with those for glass, encapsulant and other key materials. China’s scale and commitment has been a major factor in bringing down the price of solar modules from \$4.20 per watt in 2008 to \$0.25/w today,” says BloombergNEF’s Chase.

The inclusion of clean energy goals in China’s recent five-year plans (FYPs) has underlined Beijing’s political support for renewables, encouraging commitment from investors and local bureaucrats. Specific FYPs for solar helped ensure industry development stayed on track and set targets for capacity installation, many of which were reached several years early.

Government support has remained robust even as China’s solar sector has matured into a world-class industry. For instance, in September 2021 the national energy regulator kicked off a ‘whole-county’ program to boost rooftop solar by aggregating small projects into larger batches, luring bigger developers. Some 676 counties and cities are taking part and could eventually add another 600 GW of capacity. “This kind of intervention is very unlikely in the West, but it will certainly become a major incentive for the industry in China,” says Jin from Refinitiv.

Other countries have looked to emulate Beijing’s stellar policy support. BloombergNEF’s Chase notes that India—another fast-growing solar market—has supported its manufacturers since 2013 and now boasts several brands with international recognition such as Waaree Group and Vikram Solar.

The US is also working to catch up to China’s enormous spending on clean energy, a new front in the geopolitical competition between Washington and Beijing, introducing regulation that is forecast to result in 69% more solar deployment over the next decade.

Still, China leads the world in its commitment to solar. “The level of support is peerless internationally,” says Jin. “It’s unimaginable that the US or Europe would be willing to push forward policies such as new energy hubs or the whole-county

solar program because they may not be economically feasible.”

Growing pains

As China races toward a solar-powered future, new challenges, such as solving the intermittency of supply from renewables, need to be overcome. Pairing solar energy systems with high-quality battery storage is seen as the most viable solution, but the domestic battery storage sector is underdeveloped. Battery storage projects in China currently have the lowest utilization rate of any major generation source, and, thanks to high lithium battery prices, cost more than coal power plants, pumped hydro storage and other storage options.

China’s massive solar installation volumes mean waste disposal and end-of-life management are a looming issue, with the weight of retired panels predicted to reach up to 1.5 million tons by 2030. Recycling is now getting national attention, with the 14th FYP for developing a circular economy including the recycling of solar panels among its key priority projects.

“The average life span of a solar panel is now as long as 25 or even 30 years,” says Haugwitz. “But China does not want to wait until it has so many panels that it doesn’t know how to properly dispose of them, and so the national government is looking into how solar panels will be properly recycled in the long run.”

Then there are structural problems related to the design of wholesale electricity

markets in China that have restrained renewables adoption. Hove explains that China’s power market, the biggest in the world, still relies on monthly and annual electricity contracts for generators, which are dictated by the central government and a poor fit for variable solar. Spot markets, where products are bought in real time, are more suitable but still in their infancy in China, where they account for a fraction of electricity sales, according to Hove. This contrasts with Europe and the US, where spot market price signals help integrate variable renewable energies into the power system.

While China’s solar industry currently casts a shadow over all others, the sector has gone through boom-and-bust cycles before. Ten years ago China’s first solar boom fizzled as a string of major players—including Suntech Power, once the world’s biggest panel maker and at one time worth \$16 billion—went bust. The market at the time was heavily export-driven, and outside demand dwindled following the 2008 financial crisis, an issue compounded by the anti-dumping investigations conducted by the US and Germany, among others.

China’s tight grip on the solar supply chain has also come under greater international scrutiny after Russia’s invasion of Ukraine in early 2022 flagged the risks of relying on a single provider for anything. Solar manufacturing is concentrated in China, and 2022 saw a two-month lockdown in Shanghai, a factory fire



Rising Sun: China’s solar industry is going from strength to strength

in Xinjiang and a drought-induced power crisis in the southwestern province of Sichuan all interrupt exports of polysilicon.

But for other countries, localizing the production of solar PV technology won't be easy or cheap. The US would need to invest \$25.1 billion upfront to onshore enough manufacturing of a solar panel's key components to meet its PV demand by 2030. The cost would be \$44.1 billion for Europe, and both bills would not include operating costs, such as energy, labor and materials, which are generally more important than upfront investment.

Lighting the way

While PV technology is largely mature, innovations are still ongoing in the crystalline silicon cells that dominate the industry. A shift to more efficient monocrystalline wafers accelerated last year, while a more efficient solar cell design known as "passivated emitter rear contact" expanded its dominance to nearly three-quarters of the market.

Even higher efficiency "n-type cell" technologies—such as modules produced with tunnel oxide passivated contacts (TOPcon) cells and panels based on cells with a HJT design—expanded commercial production last year to capture one-fifth of the market. As TOPcon and HJT become mainstream, China is poised to reap the benefits as 220 GW and 150 GW of new production capacity is currently planned for TOPcon and HJT respectively.

The gains are mostly marginal, according to Haugwitz. "There is no older or newer technology. It's all based on silicon so the raw material hasn't changed—just the composition of the materials used in order to harvest more of the sunlight and convert it into power."

With China adding a record 87 GW of new solar capacity in 2022, the sky is the limit for PV's contribution in the world's biggest energy market. To achieve Beijing's pledge of carbon neutrality by 2060, an average of 200.8 GW will be built every year through 2060, dwarfing the 37.6 GW installed annually in 2015-2020. At that rate, solar is projected to overtake coal as the country's primary energy source by around 2045.

China's grandest solar ambitions may even take it off-world. LONGi said in September 2022 that it would send panels into space as the first step in plans to test the feasibility of harnessing the sun's power in orbit and transmitting it back to Earth. The announcement came three months after Chinese researchers at Xidian University in Shaanxi province successfully tested a full-system model of a power station that captured sunlight 55 meters above the ground, converted it into microwave radiation, beamed it through the air to a receiver station on the ground, where it was then converted into electricity.

But Haugwitz is skeptical that space-based solar power will lift off soon, if at all. "It's a question of who can afford it. I don't

see commercial implementation happening in our lifetime," he says.

More down-to-earth applications for solar energy have plenty of potential. The industry focus has shifted since 2020 from massive solar farms to rooftop solar, which made up more than half of China's newly installed capacity last year. The transition has strong policy support—an official plan for peaking CO2 emissions in urban and rural construction in July 2022 called for rooftop solar to be fitted on half of new public buildings and factories under construction by 2025.

A new dawn?

No other country has done as much to pave the way for a solar-powered future as China. Beijing went all in on solar manufacturing and now boasts a world-class industry that appears unbeatable. "Several policies such as the US Inflation Reduction Act and the European Commission's Net-Zero Industry Act have been introduced by the West to promote local manufacturing of solar power components, but unless they make really serious investments in the solar industry in the coming years, it will be an uphill battle for the West to challenge China," says Jin.

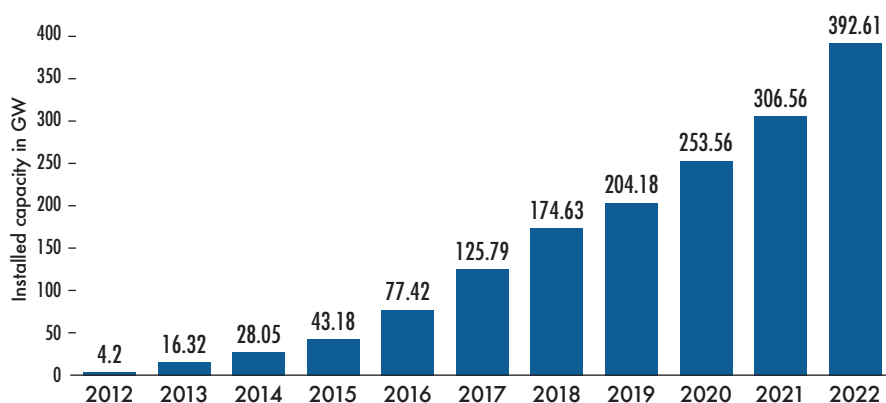
While China looks dominant, it is the frontrunner in a global industry that has seen different leaders over the decades. "China has the world's most integrated solar manufacturing bases and most experience," says Chase. "But before China did, it was the US, and before that Japan. Who knows what's next?"

Similar to the shakeout a decade ago, industry consolidation is looming as recent trends like the polysilicon price spike correct themselves and competition intensifies. "The market will continue to grow but compete viciously, and there will probably be some bankruptcies," says Chase. "Solar manufacturing can sometimes be a terrible business to be in and often loses money."

Haugwitz is confident that Chinese solar will only go "up, up, up," but agrees it will be reshaped. "China will lead globally no doubt, but the industrial landscape will change. You have incumbent companies being challenged by new contenders at home and abroad. The story's not over." ■

POWERING UP

China's cumulative installed solar capacity has grown steadily over the last decade



Source: National Bureau of Statistics China

Bargaining Chips

Author Chris Miller discusses the importance of semiconductor chips to the global economy and the fight for control over their production

Semiconductor chips have been referred to by a number of experts as the oil of the 21st century, and the recent chip shortage during the pandemic highlighted the centrality of these electronic wafers to the functioning of the global economy. Pretty much anything with an on-off switch contains a semiconductor of some kind, and almost all of the most advanced chips are produced by just one company—Taiwan Semiconductor Manufacturing Company (TSMC).

Thanks to the integral role they play in advanced technologies, especially military tech, control over the production of chips has naturally become a geopolitical battleground, with the US imposing strict rules governing China's access to chips and chipmaking capability. In this interview, Chris Miller, author of *Chip War*, discusses the impact of the US' restrictions on China's ability to produce chips, the monopolies present in global chip production and the knock-on effects of the battle over semiconductors.



Q. What is the role of semiconductors in life and the global economy and how did we come to be in this situation?

A. The typical person relies on hundreds or even thousands of semiconductors every day, even though most of us hardly ever see a chip. And they are, as a result, one of the most critical devices to all of the goods we rely on, whether that be automobiles or dishwashers and certainly computers and smartphones. So they're absolutely fundamental to the operation of the global economy, but the production of them is controlled by a small number of companies and countries. And as a result, the supply chain for producing semiconductors is one of the most critical in the entire world.

*Q. Your book is titled **Chip War**. In summary, what is the war about, who are the main combatants and what are the knock-on effects?*

A. There are different aspects to the competition. There is competition between the types of technology to produce the

Chris Miller, the author of *Chip War: The Fight for the World's Most Critical Technology*, is an Assistant Professor of International History at the Fletcher School of Law and Diplomacy at Tufts University.

most advanced systems, with companies competing for market share and dominance in the key technologies. And then there is competition between countries as well, because the semiconductor has major geopolitical importance, given its use, not only in all of the economic aspects I mentioned before, but also for defense systems, because military equipment today is more reliant on computing power and therefore on semiconductors than ever before.

Q. And have there been knock-on effects on consumer-based products as well?

A. Certainly, it's absolutely critical to have semiconductors for all sorts of consumer devices. And it's not only the things you think of as having computing power, like dishwashers or smartphones and PCs, but also any number of household appliances—basically, any device with an on-off switch has some number of semiconductors inside.

China is already a big player in terms of lower-tech chips, and it's made real strides in the past couple of years in catching up in certain spheres

Q. Who are the main players in the production and development of microchips?

A. The biggest players today are Taiwan and South Korea in terms of the production of semiconductors. But it is a bit more complex than that, because Taiwan and South Korea rely on very complex supply chains that stretch across Japan, the United States and Europe as well. This means that in reality, no country is self-sufficient in the production of advanced chips, and everyone relies on the ability to source materials and ultra-specialized chip making tools from key countries. And those key countries include not only the producers of chips like Taiwan and South Korea, but also Japan and the US and the Netherlands which produce some of the key equipment involved.

Q. What has been the impact of the chip war and where do we find ourselves now?

A. Around the world there has been an increasing understanding over the past couple of years, particularly thanks to the pandemic, of the extent to which semiconductors define the modern economy and are critical to its operation. This has been demonstrated by the supply chain crises for semiconductors that we've seen. And as people begin to look more at the way supply chains are structured, the extent to which they rely on a small number of key companies, has raised questions about their security, especially in times of geopolitical crisis.

And so I think the fact that Taiwan is the producer of most of the world's most advanced processor chips, as well as many of the world's semiconductors, is a matter of some concern, given the escalating geopolitical tensions across the Taiwan Strait.

The second aspect is the extent to which semiconductors are critical for military weapons, because although most semiconductors go into consumer devices, today, more than ever before, defense relies on automation and computing power. So there's a direct relationship between the ability to produce the most advanced semiconductors, and the ability to field the most advanced military equipment. And that's why the US is trying to restrict access to some of the most critical chips and chip-making tools, because it wants to ensure that only it and its allies have access to the computing power that these chips produce.

Q. You, among others, have called semiconductors the oil of the 21st century, but it could be argued that semiconductors are limited by knowledge rather than access. To what degree do you think this is true?

A. What is interesting with the oil comparison is that the production of chips is actually much more concentrated than the production of oil. If you look at the oil industry, Saudi Arabia, which is arguably the most influential player in the oil market, produces less than 15% of the world's oil. Whereas in semiconductors, Taiwan produces 90% of the world's most advanced processor chips and the Dutch company ASML produces 100% of the advanced lithography machines needed to make chips.

Additionally, the knowledge and expertise in chipmaking is also much more concentrated than in the oil industry, so that has made semiconductors a device that has been subject to political influence in terms of how supply chains are structured. And that's why the US thinks that because the key tools to make advanced chips are produced by companies in the US, Japan and the Netherlands, and that many of the most advanced chips are designed in the US, that it has a fair amount of ability to control access to both chips and chip-making machines.

Q. How do you think we ended up at a point where there are such significant monopolies in the semiconductor supply chain?

A. I think there are two main reasons. One is that the amount of capital investment necessary in the chip industry is extraordinarily large, and it just doesn't make sense for many countries to try to compete for these markets, because you need to spend so much money. Second is that it takes a long time and a lot of accumulated expertise to develop the capabilities that we're talking about. And so once one company has developed capabilities, they've got a really strong advantage. In both the machine tool space and the fabrication space, there is a really substantial impact of being the first mover to the market, and having that technological advantage is hard to overcome.

Q. What chance do you think China has in developing to a point where it can produce some of the more advanced chips?

A. I think China is already a big player in terms of lower-tech chips, and it's made real strides in the past couple of years in catching up in certain spheres. It's still quite reliant on others overall, but in certain aspects of the chip industry it has to some extent caught up. But in the short run, the recent export controls that the US has imposed will be really tough for China to get around. Both because of the complexity of the machines that have been restricted and also the extent to which it will no longer be possible to produce certain types of chips for China in Taiwan's advanced facilities. In the longer run, it's harder to say, because it's difficult to predict how Chinese policy and US policy will both evolve. I would be hesitant to make predictions for over a decade's time, but I think we're talking about a period of at least multiple years before China can make meaningful progress in finding alternative sources of supply for some of these critical machine tools.

Q. What do you think China's options are in terms of supply chain diversification?

A. It is really quite tricky. China can try to build alternative systems domestically, but the challenge in doing so is that in some of the areas, it doesn't have the accumulated expertise that competitors have built up over decades. The domestic Chinese market is also a lot smaller than the global chipmaking market. So any efforts to replicate the existing international supply chain domestically is going to be a very expensive proposition for China. And it might not work. This is the real risk. In trying to achieve self-sufficiency, China has to spend a lot of money over a long-time horizon with

The production
of chips
is actually
much more
concentrated
than the
production of
oil



no real guarantee of success.

It would be much easier for China to try to find ways to retain access to the international chip supply chain. And the challenge right now for policymakers in Beijing, is that their foreign policy doesn't line up with the optimal situation for China's tech sector. Foreign policy and military modernization goals are in the foreground and the tech sector is taking a backseat in terms of its influence on the political elite in Beijing. This will create real challenges for the Chinese tech sector, and even if you assume that will get a fair amount of financial support from the government, it is still going to be quite difficult for them to find alternatives.

Q. How do you see the semiconductor industry developing over the next five to 10 years?

A. For the foreseeable future, we will all be relying on silicon chips for all the tech we use and for the functioning of the world economy. But I would say, that the biggest change that's coming will be that a number of other countries, like Europe, the US and Japan, invest more and more in trying to build up their own chip industries. And so I think we are going to see some diversification in terms of the geography of chipmaking. And also a reduction in Taiwan's absolutely central role, although I still think that in five or 10 years' time, Taiwan will still play a pretty critical role in the world's chipmaking.



Interview by Patrick Body

BULLS, BEARS AND DRAGONS

China's stock markets are growing in size and number, but too much state control could limit future development

By Seb Murray



Image by Jamie Stevenson

Despite a recent rule change, there are still concerns over the ability to access money in Chinese investments

In November 2021, China launched a new stock market to provide an opportunity for the country's small companies to raise money through public listings, but trading of 10 of the stocks on that first day had to be suspended due to overwhelming demand, with one stock surging by a whopping 494%.

The Beijing Stock Exchange (BSE) was launched to act as a stepping stone for low-value Chinese businesses on their way from non-listed status to a potential initial public offering (IPO) on one of the country's larger exchanges.

But with just 169 companies listed on the board, the BSE hasn't caught on in the way that it was hoped, despite offering a less rigorous listing process, less control on share price movements and better access for foreign investment than the more regulated exchanges of Shanghai and Shenzhen. For China, with its highly-centrally-controlled system, emulating the flexible market-driven exchanges in the West is not an easy process.

Upgrading the structure of China's markets is particularly important now that Chinese companies are under increasing pressure to list domestically, as the country tightens restrictions on overseas listings and businesses listed abroad face increased scrutiny from regulators. But the underlying central control, and the concerns it raises particularly for foreign investors, inevitably inhibits the future international competitiveness of the Chinese markets.

"China has learned a lot of lessons from the West in terms of markets and the country's markets are in many ways successful," says Fraser Howie, author and China analyst. "But the overriding requirement of control by the authorities is a factor that will continue to limit their development."

Taking stock

Securities trading in China dates back to the 19th Century, with the first stock exchange established in Shanghai in 1891. All markets were closed after the Communist Party took power in 1949, but today's Shanghai Stock Exchange was launched in 1990. China's capital markets have come a

long way since then.

"There's been an acceleration over the past few decades," says Thomas Gatley, a China strategist at Gavekal Dragonomics in Beijing. "Equities have turned from being a side-show, a casino, into something operating at a vast scale."

The Shanghai Stock Exchange now ranks third in the world by total company market capitalization, behind only the New York and NASDAQ markets. And in 2022, the Shanghai and Shenzhen bourses became the world's first- and second-largest destinations for IPOs in terms of funds raised, thanks in large part to the government's domestic listing push.

"[China] has been developing and improving its multi-level capital market system, with the total market value continuing to grow and market activities maintaining a high level over the past 30 years," says Nelly Su, leader of the China Capital Markets Advisory Group at KPMG.

There are three mainland entities in the Chinese stock market system—the Shanghai Stock Exchange (SSE), Shenzhen Stock Exchange (SZSE) and the National Equities Exchange and Quotation (NEEQ)—plus the Hong Kong Stock Exchange (HKEX).

The Shanghai and Shenzhen markets are mainland China's oldest and largest bourses, mainly serving companies in traditional sectors like manufacturing, energy and property. By February 2023, the SSE had listed 1,676 companies on its main board, with a total market capitalization of ¥46 trillion (\$6.74 trillion), and in 2019, it also launched a subsidiary board, the STAR Market. Designed to serve the country's burgeoning tech sector, the STAR is now home to companies with an overall market value of around ¥6 trillion (\$890 billion).

Similarly, the SZSE has around 1,500 companies listed on its main board, and a tech-focused subsidiary board called the ChiNext Market. ChiNext was set up in 2009 and is about double the size of the STAR Market.

The third mainland entity, NEEQ, is an exchange for over-the-counter trading of stocks in smaller 'public limited companies,' and is seen as something of an

entry-level system for smaller companies to raise capital prior to listing on one of the larger bourses. The SME-focused BSE, operated by NEEQ, is the mainland's smallest bourse, with just 169 companies listed and a total market value of ¥240.63 billion (\$35.3 billion).

The HKEX is the largest of the Chinese exchanges in terms of the number of listed companies, topping 2,250, and is also the seventh-largest market in the world in terms of market capitalization. It also has the advantage of being a truly international market, with many Chinese companies holding dual-listed status on the HKEX and another Western bourse. The exchange is also often used as a tool for Chinese companies to receive the benefits of foreign investment, through the round-tripping of funds through Hong Kong back into the mainland market.

Financial functions

China's markets, although growing at a rapid pace, function somewhat differently from those in other areas of the world, with heavy state influence on exchanges, as well as stringent limitations on the movement of money.

Chinese firms seeking to list on the Shanghai or Shenzhen exchanges have always required individual approval, but draft measures released in February

2023 will remove this requirement. Many Chinese companies also struggle to meet the three-year profitability targets required to be eligible for an IPO. These exchanges also impose share price movement limits to curb market volatility: generally, stock prices cannot rise or fall more than 10% in a day, 20% for firms traded on ChiNext.

"Chinese markets are shaped by the government's broader strategic priorities," says Gatley. "In other large markets in the world, the choice of who is allowed to list and the way in which investors engage with valuations and picking winners and losers in those places is not so strongly tied to the state's thinking."

The state's influence on stocks was evident during the time of China's strict zero-COVID policy, with large market swings resulting from perceived mixed messaging from the authorities. But perhaps the most obvious impact in recent years, was the fall in Chinese tech stocks after a regulatory crackdown on the sector was launched in 2020. Fintech company Ant Group was forced to abandon its public listing, undermining confidence in the markets.

"The price movements over the last year of Alibaba, Tencent, and the other internet platforms have been completely divorced from any reality of their market position and are a function of this extremely tough

regulatory environment," says Gatley.

The large number of speculative day-traders has also always amplified volatility in Chinese markets, especially as trading is dominated by reactions to sudden government announcements and the preference for more liquid and explosive stocks. "Because of capital controls, there's a large amount of trapped domestic money that chases whatever return story is attractive at the time," says Douglas Arner, professor specializing in economic and financial law at the University of Hong Kong.

Open for business?

There are also barriers for foreign investors looking to buy and sell Chinese stocks. Historically, purchasing stocks has been difficult—unlike the freely-accessible stocks on Western bourses—and the fact that the renminbi is not fully convertible, has meant that foreign investors have had to be cautious.

"There is no argument that China's stock markets are now huge, yet they still remain somewhat separate from global financial flows," says Howie. "But access is now possible."

The various different classes of shares available in China represent companies' ownership structure, incorporation location and the exchange it is listed on, but most importantly, their availability for purchase. A-shares, for example, are RMB-denominated stocks of companies incorporated in the Chinese mainland and listed on one of China's stock markets, and make up the majority of shares on mainland Chinese bourses—there are over 3,600 A-share companies. A-shares are available to non-domestic investors through the Qualified Foreign Institutional Investors (QFII) or Renminbi Qualified Foreign Institutional Investors (RQFII) channels.

There are also B-shares, which are shares issued by Chinese companies that are traded in either USD or HKD on the China exchanges. These shares are available to any trader with foreign currency bank accounts. Around 35% of the shares traded in China are B-shares.

In 2014, in response to the fall in

In other large markets in the world, the choice of who is allowed to list and the way in which investors engage with valuations...is not so strongly tied to the state's thinking

Thomas Gatley
China Strategist
Gavekal Dragonomics

overall listed company valuations, the government introduced measures to make an investment in China stocks by both domestic and international investors more attractive. The Stock Connect scheme, which links the Hong Kong bourse with those in Shanghai and Shenzhen, has since become the main route for international investors to buy mainland securities. The scheme was expanded in December 2021, boosting the number of mainland stocks eligible for trading through the link from 1,458 to 2,516, but A-share trading through the Stock Connect scheme only accounts for about 4.3% of total trades.

The Chinese bond market has also become more accessible to foreign investors, who can trade fixed-income securities more easily and freely than ever before. One example is China's rollout of so-called low-carbon transition bonds to fund decarbonization efforts, in 2021.

"It's easier for a foreign investor to invest in China," says Arner. "In the past five-to-10 years, we have seen a growing amount of institutional investment both from pension funds and social security funds, as well as mutual funds and asset managers."

Increasing support

China has also recently shown a desire to further liberalize its capital markets, starting with some of the newer exchanges such as the STAR Market being much less heavily regulated than others—share price movements are not restricted and a company simply has to meet the conditions of the exchange to list. For Shenzhen's ChiNext sub-board, the government has loosened rules on IPOs and scrapped previously challenging profitability requirements.

The largest change in policy will be effected as a result of a number of draft measures announced in February 2023, which will result in the approvals system for listing on the Shanghai and Shenzhen exchanges being replaced with a registration-based system. These regulations will shift the decision on company listings away from the China Securities Regulatory Commission and into the hands of exchanges themselves.

"The registration-based IPO reform marks a key milestone in China's reform of capital markets," says Su. "It has borrowed from international best practice in alignment with Chinese characteristics and China's stage of development. The reform is market-oriented to create a freer market for a disclosure-based, open and transparent end-to-end IPO system."

The overall price-to-earnings ratio of China's stocks has fallen sharply in recent years, suggesting a lower level of investor confidence in the Chinese economy. At 13 times earnings, P/E ratios are down more than 60% on the Shanghai Composite Index from two decades ago. In comparison, the average P/E ratio for the S&P 500 is 19.

A key factor is the strict controls on the convertibility of the Chinese currency, which both inhibits foreign investors from coming into the market, but also encourages Chinese investors, restricted from exporting their cash, to pump their money into mainland bourses. "The A-share market is relatively impervious to what the rest of the world thinks about China, as it's all domestic," says Andy Maynard, head of equities at China Renaissance in Hong Kong.

Other measures introduced by the government in recent years to increase money flows include the removal of the \$300 billion overall ceiling on total asset purchases under its Qualified Foreign Institutional Investor (QFII) scheme. That freed global investors to purchase securities without a hard limit. Restrictions on moving

investment capital back out of China have also been loosened, with a three-month lockup period being scrapped.

China's markets also received an outside boost in June 2017, when Morgan Stanley started including A-shares in their MSCI Indices. Originally with an index inclusion factor (IIF) of just 5% in the Emerging Markets index, this was increased in November 2019 when they increased the A-share IIF, and therefore investor exposure to the Chinese market, to 20%.

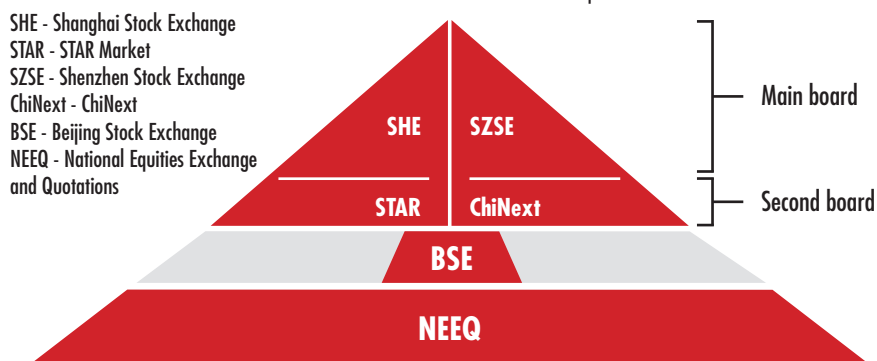
The MSCI move is reflective of the global equity balance, but given the level of government influence over Chinese markets, it also exposes global shareholders to the risks and unpredictability associated with government policy changes—a risk not replicated to the same degree in Western market exposures.

But without solving access issues and removing the markets from overbearing government influence, central government policy will continue to be the biggest factor in the growth and competitiveness of the country's equity markets. "There is a view that the safest way to invest in China is to follow the sectors the government wants to support at any given point in time," says Arner.

"From an investor perspective, the major drawback of investing in China is that the most important thing going on is what the government wants to do," he says. "Reading the policy tea leaves is very important."

AS INTENDED?

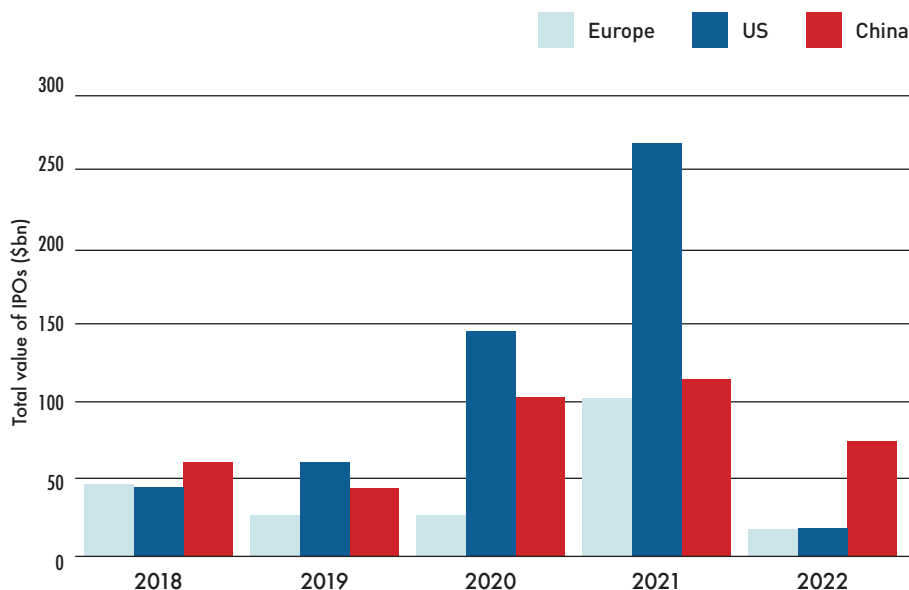
China's markets are designed as a pyramid with progression to the top the main goal, but things haven't worked out as planned



Source: CKGSB

A NEW HOME

In 2022, money raised through IPOs on Chinese bourses dwarfed that of markets in Europe and the US



Source: Refinitive Eikon

International concerns

Confidence in Chinese securities has also been tested by concerns over the quality of audit work. US regulators threatened to delist over 200 Chinese companies from American stock markets—until they were granted the previously unheard-of permission to inspect the audits late last year, somewhat cooling the dispute.

There are also still strict rules governing access to corporate information and the disclosure of financial information outside of China. “This undermines trust in Chinese markets,” says Gatley. “For stock pickers, there are questions around corporate governance and auditing. It’s certainly not as good as elsewhere in the world.”

Arner agrees. “The key to the sustainable development of the Chinese markets is going to be improving the quality of financial information that companies produce and that investors have access to.”

Other major concerns include a swathe of geopolitical issues, including the decoupling of China from the West, as well as concerns brought on by the Russian invasion of Ukraine. Foreign investors dumped Chinese shares last year on the back of fears that Western countries would sanction Beijing if it supported Russia in

the conflict.

Although the initial concerns over possible sanctions have passed, the future direction of Chinese markets are still heavily dependent on the state of US-China relations. “Prior to the trade war, the direction was pretty good,” says Gatley. “It is tough to say whether we are still on that pathway.”

Debt difficulties

Closer to home, there are concerns over the outsized role that SOEs play in the market as they control more than 56% of the corporate assets listed. Given their highly-leveraged nature—in 2016 China’s SOE liabilities equaled two-thirds of total assets—worsening economic conditions can often have a direct impact on Chinese markets. And given China’s currently slowing economy, this current market makeup could pose a threat to Chinese stocks.

“You are seeing slower growth rates across the Chinese economy and less effectiveness from additional levels of debt and leverage in generating growth in the Chinese economy,” says Arner. “It is a very strong possibility that additional debt in a more slowly growing economy is likely to

result in lower performance from Chinese companies.”

However, given their SOE status, they enjoy a level of protection from the government that may make them impervious to failure. And for Maynard, he sees Chinese markets as more driven by growth stocks than SOEs. “As a contrary indicator, it may be true that SOEs are under pressure and more exposed to an economic slowdown,” says Maynard. “But I believe Chinese equities should continue to perform strongly as China’s economy reopens.”

The number of private firms in China has quadrupled in the past decade or so, reaching 44.57 million in 2021, reflecting the grassroots dynamism inherent in the country’s economy.

Outlook so-so

China’s markets are now huge and play a significant role in China’s economy, but it’s still not settled what this role is, how they are regulated, and how they fit into the global financial structure. The extent to which the markets become less centrally controlled and more reflective of the market force-driven exchanges in the West will be determined by the play of forces pulling in two different directions: the determination of the Party to maintain strong central control vs the dynamism of markets that are set free and allowed to react to market forces.

For Su, China’s markets have a key role to play within the bounds of governmental priorities, “China is a socialist market economy, and its capital markets should play a more active role in demonstrating and implementing medium and long-term national development plans.”

But for others, the prevailing opinion is that this state control will likely hamper market development. “China’s markets have made huge progress in opening up access to allow foreign capital to invest, foreign institutions can basically access all aspects of the capital markets now according to the latest rules,” says Howie. “But government influence remains significant and even after such opening, market forces still play a limited role.”

Tech-tonic Shifts

China's tech giants were the face of its booming economy for many years, but Beijing's recent crackdowns have reigned them



By Andrew Collier, author of *China's Technology War: Why Beijing Took Down Its Tech Giants*

When Jack Ma, the billionaire founder of the Chinese e-commerce company Alibaba, gave a speech to the country's political and financial elite at the Shanghai Bund Forum on October 24, 2020, he seemed clearly unaware that his talk would be the catalyst for a new era in China.

He attacked certain officials—many sitting in the room—for how they treated innovation in the internet industry and blamed them for failing to properly regulate the financial industry. “Today’s banks continue to have a pawnshop mentality,” said Ma, also the founder of the online financial service provider Ant Group.

He gave his speech on a Friday. Just a week later, the country’s most important financial regulators struck back. Ma was

summoned to Beijing for a meeting, and the next day, in a move that shocked the world’s investors, the Shanghai Stock Exchange suspended Ant’s \$34 billion listing—on the eve of the launch. The *Wall Street Journal* reported that Xi Jinping had personally approved the decision.

The world soon discovered that Ant was just one chapter in a much larger book. The crackdown on one company soon broadened to include other technology firms. Over the succeeding months, the regulators in Beijing imposed a series of draconian rules on Alibaba and other technology firms. Alibaba was fined ¥18.2 billion, or roughly \$2.8 billion, for monopolistic practices. Didi Chuxing, the Chinese equivalent of Uber, was accused of going public before completing a review

by the country’s internet watchdog, the Cybersecurity Administration of China (CAC). Didi was forced to take down more than 25 apps from online stores, and remove the “super-apps” that were the main interface for tens of millions of users, badly harming its business.

The app removal program came four days after Didi had launched a \$4.4 billion initial public offering in New York, one of the biggest American stock market debuts of the past decade. Its share price immediately started plummeting and chagrined American fund managers initiated a lawsuit accusing Didi of misleading investors. The online gaming industry was the next target. Regulators summoned the top gaming companies to a joint meeting with the CAC and the Ministry of Culture and Tourism,

Andrew Collier is the author of *China's Technology War: Why Beijing Took Down Its Tech Giants*. He is also an Analyst at Global Source Partners, a macroeconomic and geopolitical research firm focused on emerging markets.

which proceeded to impose restrictions on minors in the gaming industry.

What at first blush appeared to be a regulatory action against the platform economy was then expanded into a larger economic and cultural campaign. Shortly after the technology crackdown began, the government launched a set of new policies under a populist theme called common prosperity. While short on details, common prosperity promised to better the lives of the average citizen by improving their economic welfare.

A change of heart

The crackdown was the result of two forces, one economic and one political. On the economic side, there had been growing concern that the platform companies were detrimental to China's growth. They were accumulating monopoly power at the expense of other companies and were seen as excessively wealthy in a country that prides itself on equality. For example, the *People's Daily* said China's goal was to "first make the 'cake' bigger and better

through the joint efforts of the people of the whole country, and then divide the 'cake' well and distribute it well through reasonable institutional arrangements." The "divide" part of the equation was viewed as being missing. In addition, it was felt in Beijing that the dominant size of the platform companies posed a risk to the stability of the financial system. The majority of transactions, loans and payments were channelled through only a handful of large companies and were lightly regulated by the government. Regulators felt it was time to step in more forcefully.

Politically, whether they had a regulatory function, all of the policies were designed to reinforce the influence of the government and the ruling Communist Party. This occurred through several transmission methods. The new policies would shrink the power of the platform economy, increase government ownership or control of several economic functions, and heighten the involvement of the party in the technology sector and the lives of the Chinese people in general. The leadership

is clearly convinced that the party is central to the future existence of the Chinese state. The government viewed the size, power and large capital base of the platform companies as a potential second power center. Jack Ma's speech was a highly visible symbol of this threat.

We can summarize below a number of key policy goals:

Aggressive "regulatory catchup" by ministries in Beijing. Central government departments whose authority had declined due to the rising power of the technology sector were now emboldened to step up their oversight.

Achieving self-sufficiency in key technology. The years of the Trump trade war, along with US technology sanctions, confirmed a long-standing conviction that China needed to develop as much of its own technology as it could. It was too dangerous to rely on the US and other nations for key components such as semiconductors. The rise of platform companies, and their use of scarce resources, was not viewed as helpful in achieving technological self-sufficiency.

Reducing financial risk. This had been a top priority for the leadership since the 2008 global financial crisis. America's inability to control its financial system and avoid the financial crisis convinced the leadership in Beijing that they, too, needed to be on guard for a similar fate in China. The platform companies were becoming key players in online payments and lending. In the eyes of the leadership, the private sector's level of control in China's financial system had gone too far.

Tightening control over online data. The platform companies were beginning to assemble large batches of consumer data. This included spending patterns, total wealth and entertainment expenditure. This was a huge advantage to these firms but also had implications in terms of political control. For example, Didi Chuxing's geospatial data could track the location of senior officials, which was not acceptable.

China confronts inexorable economic challenges that make it extremely difficult to achieve such broad goals as the redistribution of income and improving social welfare. These challenges include a declining labor force, reduced rural-to-urban migration, and slowing economic growth

Rewriting the social contract with the Chinese people.

No longer would wealthy entrepreneurs be allowed to conduct business that ran against Beijing's goals and immensely profitable to themselves. The powerful educational training and gaming firms were reduced in size or eliminated, and the "gig economy" that forced workers to accept substandard wages, became more heavily regulated to avoid exploitation of cheap labor. The government also promoted a more equal distribution of income.

Strengthening the control of the party.

Although the crashing prices of technology company shares came as a shock to the world, the new regulatory structures were in line with the enhanced position of the party in the Chinese system. Many of the actions taken since 2020 suggest that the rise of technology entrepreneurs and the influence of their companies was viewed as a threat. Some saw the future of the Party as being at stake, along with the Chinese state itself.

The bigger question was how far would this go. Were these new policies a return to the dark days of the Cultural Revolution when ideology ruled? Would China become completely isolated, gradually retreating from the economic integration that it has pursued for four decades? Was the tech crackdown a one-time action designed to rein in a few unruly upstart capitalists? Or was it part of a long-range plan to increase the alignment of China's burgeoning capitalists and its political system?

Despite their impact on the technology sector, the new rules have done little more than tinker around the edges of China's vast political and economic system. For example, although it was trumpeted as heralding a new age of equality, the common prosperity program is likely to do very little to improve China's highly unequal distribution of income. That would require a far greater effort through reform of the state sector and China's inefficient tax system.

There has also been a renewed focus on "hard" technology like semiconductors



Bursting Bubbles: China's tech companies are struggling in the face of increased pressures

over "soft" technology like Meituan food services. But these policies so far have failed to deliver improvements in industries that require decades of growth.

China confronts inexorable economic challenges that make it extremely difficult to achieve such broad goals as the redistribution of income and improving social welfare. These challenges include a declining labor force, reduced rural-to-urban migration, and slowing economic growth. In addition, China has a crushing debt burden, an unstable tax system and a housing bubble. One of the main impediments is state control of so much of the economy. The continued advocacy of state-controlled firms at the expense of the private sector is inefficient and negative for GDP efficiency and growth. China will not be able to tackle these problems simply by attacking the platform economy and fomenting populist campaigns. Beijing can fiddle at the margins, but unless the government is willing to engage in significant structural reforms these problems will not be solved.

There are, however, two areas that appear to be more permanent features of the current policies. One is the state of US-China relations. There is likely to be continued financial decoupling between the two countries, including political and economic sanctions, and some limits on

mutual capital raising.

The second is the role of the party in China's political system. All of these programs—whatever their actual or perceived benefits—ultimately aimed at strengthening the current system.

The larger issue is that the challenges of running an economy that many believe has already passed its peak growth period, relying on an unprecedented increase in debt, is going to restrict Beijing's options. The political hardening since 2020 may have been a determined effort by the leadership to steer the conversation away from slowing growth toward socially accepted goals. Ideology may have to replace what political scientists call "performance-based legitimacy." As Pascal Lamy, former director general of the WTO, has said: "One interpretation can be that Xi Jinping is moving further into a strategy of increasing control over the economy, behaving as if there was a threat for the system and the party, even though the indications we have don't point in the direction of there being a threat."

Recent events, including the country's opening up post-COVID, suggest there may be some changes afoot, including a softening stance towards the global community. But the protection of the current system from domestic challenges is likely to remain a permanent feature. ■

Venturing Out

Perry Jung, venture capitalist and co-founder of Korean VC firm Vision Creator, whose most recent project was with medical device maker EOFlow, on the right approach to entering the Chinese market

Across the board and around the world there has been widespread digitalization of products and services in recent years and nowhere is that more true than in the health care industry.

Korean companies have taken a leading position in digital medical devices and China has become a major market for them.

One such company is EOFlow, which produces a disposable wearable insulin patch, that lasts for 84 hours and costs around \$20 in Korea, which would be a significant cost reduction from other portable insulin pumps on the market in China which can cost upwards of \$800 for the main unit. The company has recently entered the China market through a joint venture with Chinese medical giant Sinocare.

But the China market, while massive, poses unique challenges. Perry Jung, venture capitalist and co-founder of Korean VC firm Vision Creator, discusses the key

values Korean companies can provide in the Chinese market, the difficulties of transferring sensitive data out of China and the benefits of having a high-quality partnership with a Chinese firm.



Q. What was the motivation behind EOFlow entering the China market over other global markets?

A. The China market is our first major venture outside of Korea, although we do have some links to European and Southeast Asian markets and companies. The fundamental benefit offered by the China market, despite its complexity, is its size. Taking a very simple view, that means more opportunities for sales and therefore income.

As well as the direct financial benefits of the size of the China market, the massive user base provides the opportunity for rapid product and service development. The more

users we can gather data and feedback from, the quicker we can produce newer iterations of products and services to better suit target demographics.

Q. What are the key areas of value that Korean companies can provide to Chinese partners and customers?

A. For complex things like medical devices, there is a large manufacturing technology gap between China and Korea. It would certainly take Chinese manufacturing well over two years to catch up, it's likely closer to between three and five years in some areas. And this means that the manufacturing capability and expertise offered by Korean firms is attractive to potential Chinese partners. EOFLOW, for example has recently created a joint venture with Sinocare for the production of devices domestically in China, where costs of production are lower.

There is a strong trend for Korean companies to target Asian markets, particularly China. EOFLOW has a global top-tier insulin pump technology, but it is not unique in this. Its main competitor Insulet (PODD, Nasdaq), for example, is a large company that also produces wearable small insulin pumps in the US and the EU markets, but not China. Everyone is aware of the massive market opportunity in China, where technology production is somewhere between three and five years behind, but Insulet shows no sign of entering the Chinese market, simply because it does not have the production capacity to do so. The company originally aimed at the EU and US markets and will stay there until it develops to a size where it can look to expand, but for EOFLOW, the product was developed with Asia in mind.

Q. What advantages did you gain by entering the China market as part of a joint venture (JV)?

A. The China market is not an easy place to set up a business without a Chinese partner. It also helps if you find a much larger company to partner with, again because of the size of the market. EOFLOW focused on finding a top-tier Chinese counterpart to work with in order to make sure that access to the market would be easy and, more importantly, the registration process of the product would be smooth.

Foreign companies find it much harder to handle the detailed localization work in China, so you need a qualified, sincere and capable partner. In most joint ventures, the foreign companies will contribute a lot in the first two or three years, such as their products, technology and know-how. But in the long run, the Chinese companies will be the ones doing the heavy lifting, otherwise the venture will struggle to be successful. Nationwide branding and marketing, among other things, are extremely difficult in China, sometimes even for Chinese brands, so expecting a foreign company to do it themselves would be unwise.

This is also why we were happy to agree to an equity split that gives the majority share in the partnership to the Chinese party. Our role is to provide the advanced technology of our product, along with a few other things, but the Chinese company

Perry Jung is a venture capitalist and co-founder of Korean VC firm Vision Creator. The company's most recent project was with medical device maker EOFLOW. He is also the author of two books on wealth management topics.

will be doing most of the work and that means it would be unfair to ask for more, in our view at least.

Q. Given the importance of the Chinese partner's role in the JV, what were your priorities in terms of choosing a partner?

A. The success rates of setting up a Chinese joint venture are pretty slim, so finding the right partner is a difficult but necessary part of the process. As well as looking for a Chinese partner with the right attributes, the non-Chinese company needs to have certain attributes, such as reputation and overseas certifications, to be an attractive option as well.

The first time we tried to approach a top-tier Chinese partner was at a point when our product was still in development, and we didn't hold a license in any of the global markets. We approached

It is important to highlight the fact that even though both potential partners are a perfect match on paper, a deal isn't guaranteed



a couple of the major Chinese medical devices companies and they all said that they were interested, but perhaps only three to five years down the line. But once we'd reached a point where we held a European license, had solid references from companies that we were already working with and had a fully-functioning product, we came back to the China market with several requirements for our potential partners.

We did not want to settle for anything below the top-tier of Chinese medical device firms for our partner. That meant that if we couldn't find one right away, then we were willing to wait a year or two rather than compromise—we have long-term goals and that will take patience. To identify such a partner we engaged in extensive market research, looking at their openness to cross-border collaboration, and their track record and capabilities in the industry, particularly in relation to the registration process for the Chinese Food and Drug Administration as we needed a clear idea of whether they were capable of doing it and how long it would take. Beyond this, the main attributes we were looking

Foreign companies find it much harder to handle the detailed localization work in China, so you need a qualified, sincere and capable partner

for are the same as any M&A deal.

I also think it is important to highlight the fact that even though both potential partners are a perfect match on paper, a deal isn't guaranteed. Personal differences, especially across cultures, can have a real effect on decision-making and sometimes it causes a break in the deal. This is the reason why we took a humble approach to finding a partner as we knew we were the much smaller player.

Q. What were the main barriers you faced when entering the China market and how did you overcome them?

A. We overcame the difficulties in finding a partner by actively coordinating with pre-existing connections in China. We also overcame the linguistic and cultural barriers through use of a team that has a huge amount of professional experience in cross-border mergers and acquisitions. We were lucky to have these aspects, but at the same time, there are still things you can learn and develop more.

The Korean market is also highly competitive, so we benefited from that in developing strong networking capabilities that really helped set us apart.

Q. How does the China market differ from elsewhere in terms of product requirements and pricing?

A. Since there is a huge user base in China, the general requirement is to provide products or services at lower prices when compared to other developed countries. However, at the same time, the country's growing middle class means that companies can create and successfully market premium products to a huge number of people. The scale of this higher-end market cannot be matched anywhere outside of China.

In terms of the requirements for the products themselves, we have found Chinese consumers to be very polarized. There is the discerning consumer, who prefers high-quality medical devices that have some proven track record and certifications in foreign markets. While another large number of people prefer very low-priced mass production products.

Q. EOFlow has recently gone public on the Korea Exchange. To what extent did entering the China market help facilitate EOFlow's successful IPO?

A. Massively so. We think that having a signed memorandum of understanding (MOU) with our potential Chinese partner right before our initial public offering on the Korean Stock Exchange was instrumental in helping EOFlow pass through the exchange's evaluation process. The MOU clearly showed that our technology was very much welcomed in the China market, which in turn did wonders for demonstrating our future viability.

The successful establishment of the JV and investment from Sinocare also helped the stability of our stock price after the IPO.



Interview by Patrick Body



DIRECT DELIVERY

**Robots are the future of warehouse logistics automation
with Geek+ leading the pack**

By Mark Andrews

Operating behind the scenes, Geek+ robots aren't widely-known, but they are an integral part of supply chains that many of us use

During peak season for George.com, the clothing brand of UK supermarket chain Asda, the company's returns center needs to handle 360,000 units coming in and then the same number back out per day. The issue is that there is only space for 70,000 units in the warehouse at any one time. The solution? A fast-moving logistics system featuring the Geek+ P-800 autonomous mobile robot (AMR).

As just a handful of warehouse workers stand by, towers of shelves wind their way towards them, filled to the brim with goods bound for various destinations and accessible from four different sides—a feature unique to Geek+ solutions. Underneath the shelves is the P-800, which looks similar to a largish Roomba, the famous robot vacuum cleaner. The AMRs have revolutionized George.com, and Asda's, logistics operations across the UK, allowing for the processing of goods without sorting and decreasing the time it takes to get each unit back on sale.

Geek+, valued at \$2 billion in August 2022 and headquartered in Beijing, is the Chinese tech unicorn you've likely never heard of, but thanks to their ever-growing number of partnerships with companies like Decathlon, Walmart and Nike it is quite likely you've reaped the benefits of their backend solutions. And as e-commerce grows worldwide and supply chains increase in complexity, robots like the P-800 will keep everything moving.

In 2021, market intelligence firm Interact Analysis not only named Geek+ as the AMR market share leader for the fourth year running, but also for the first time the global leader in mobile robots. This highlights the growing importance of the AMR market versus the older automated guided vehicle (AGV) systems that have dominated warehouses over the last few decades.

"Geek+ first developed its flagship goods-to-person solution of mobile robots carrying racks to help meet demand during peak times around the 11/11 Singles' Day sales holiday in China," says Marie Peterson, Geek+ International Business Development and Marketing Vice

President. "Today, we have offices around the world to serve a growing global client base of over 700 customers."

Geek squad

Even though the company's CEO Zheng Yong only founded Geek+ in 2015, it has already become the world's largest AMR producer by market share, according to Interact Analysis. The company is still privately held, having raised around \$540 million in total from backers including big-name tech firms such as Intel Capital and Alibaba.

While no plans for an IPO have been announced, most companies look to go public after three rounds of fundraising, and having recently gone through its fifth, Geek+ could well be looking for a listing over the next year.

AMRs are the most visible part of the Geek+ product catalogue, but the company offers a range of services to solve customers' storage issues and provide a way to efficiently get items to where they are needed. For example, its PopPick goods-to-person system increases storage density by up to four times over standard storage systems and uses movable shelves to get goods to where they are needed.

"Products and services include myriad robotic solutions aimed towards flexible picking, high-density storage handling, moving, forklifting and sorting," says Kevin Firouzian, Technical Director at, Ruigu Robotics. "Their hardware offerings go hand-in-hand with their self-developed flexible robot management system (RMS), intelligent warehouse execution system (WES), and intelligent warehouse management systems (iWMS)."

In 2019, Geek+ opened a factory in Nanjing capable of producing 10,000 AMR units a year. Furthermore, the company provides full-service solutions to customers including the option of Robots-as-a-Service which reduces the initial costs of implementing a new system by providing the option of renting robots and even operating and management support.

"Because different clients usually have varying requirements, and the requirements are usually domain-specific and highly

relevant to their business, the competition is not on the robots themselves, but rather on the overall system and service,” says Yuji Dong, assistant professor at the School of Internet of Things, Xi’an Jiaotong-Liverpool University Entrepreneur College (Taicang). “Geek+ benefits from its internal tools and platforms for fast delivery.”

According to market research firm Grand Review Research, the AMR market was valued at \$2.52 billion in 2021 and is projected to reach \$10.66 billion by 2030. The outlook seems bright for Geek+ and it is already starting to profit from the growing market. According to a company statement, Geek+ received \$300 million worth of orders in 2021 and by the middle of the year had sold over 20,000 individual robot units worldwide. The company experienced 100% year-on-year growth in order numbers in H1 2022 and was expected to continue that pace of growth through the end of 2022.

By far the largest company producing and using AMRs globally is Amazon Robotics, with a massive 520,000 units in operation. However, they are solely confined to the Amazon ecosystem and therefore it is not in competition for market share with Geek+ and other providers. There are a number of global competitors, including Japanese startup Mujin and industry veteran Daifuku, while in China there is Quicktron, used by Alibaba’s distribution arm Cainiao, and Hai Robotics.

But according to Peterson, Geek+ has no direct competitors because it covers all requirements unlike any other players. “We see a variety of players on the market depending on the projects, from traditional automation to warehouse robotics,” she says. “But we are the full package.”

Firouzian agrees, “I would argue that based on the scale of the company, its global outreach and acceptance of product and services in China and abroad, there are few strong competitors.”

More than just robots

Geek+ differs from most Chinese companies because it does more business

in international markets than domestically. For example, as well as producing the UK’s first national sorting system using AMRs for Asda, Geek+ has also provided logistics solutions for sporting goods brand Decathlon in France, where it has increased storage capacity by up to 30% thanks to the streamlined nature of the AMRs, as well as working at three times the efficiency of the previous manual operations.

It is its geographical dispersion, along with the company’s broad range of solutions and wide-ranging partnerships that have allowed them to develop so quickly into a major AMR player.

Geek+’s early AMRs were reliant on vSLAM technology—“visual simultaneous localization and mapping”—and QR codes for navigation around warehouses and factories. This system essentially used

cameras and light signals to put itself on a map. The company has since collaborated with Bosch Rexroth to upgrade robots to use Lidar—laser imaging, detection and ranging—technology, now the industry standard, which enables the units to operate far more autonomously and avoid collisions, albeit at a much more expensive purchase cost. The first Geek+ robots started to use the system in 2017, making them one of the first cohort of companies to do so.

“Geek+ did not always have the best solutions but their adaptive management style allowed them to catch up on technologies and business practices, which is encouraging for their future growth,” says Professor Diana Derval, Chief Investigator at DervalResearch, which uses biosciences to decode people’s behavior and preferences for leading brands from all industries from food to electronics.

Behind the physical robots, Geek+ is also developing a number of software solutions to increase the accuracy, maneuverability and efficiency of its logistics systems. Including a Robot Management System, Intelligent Warehouse Management System and an ever-expanding Data Platform that accumulates and provides real-time data, these systems are mostly cloud-based and allow for complete control over deployed robots.

Geek+ also has a Simulation Platform that clients can use to help find the best plan and configuration of robots before a project even starts.

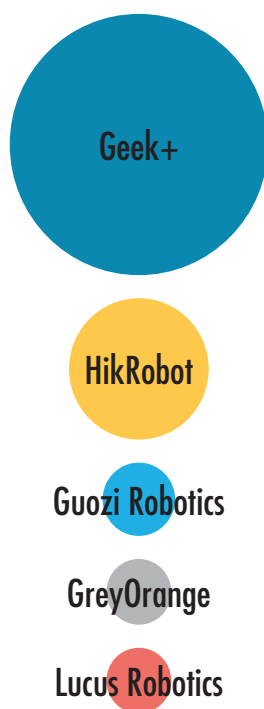
The company was also an early adopter of Robots-as-a-Service (RaaS). Especially suitable for use by small- and medium-sized companies, it allows users to implement an AMR solution appropriate to their needs with less capital cost. RaaS is more than just the rental of robot units, it also incorporates the software systems and AI algorithms which allow for the robots to be deployed according to fluctuating business needs.

ABI Research predicts that there will be 1.3 million RaaS installations across the smart warehousing industry by 2026, generating \$34 billion in revenue. Geek+ is not alone in offering RaaS, Mujin for

ROBOT ROCK

Geek+ is the largest company in the world in terms of AMR order fulfilment

Top 5 Order Fulfilment AMR Vendors by Market Share



Source: Interact Analysis



AMR Army: Geek+ robots awaiting instructions in a warehouse

example also offers the service, but the Chinese company's early adoption of the model should help it grab a substantial portion of that future growth.

Partner proliferation

Partnerships such as the one with Bosch Rexroth have been a key factor in helping Geek+ to develop and set it apart from competitors. On the physical product side, cooperation with technology partners such as Intel, Microsoft, SAP and Bosch Rexroth have helped to give the company an edge.

Geek+'s logistics solution for George.com and Asda is also in partnership with AMH, a British material handling systems company. While Geek+ provides the AMRs and the systems that allow them to function properly in-situ, AMH provides the conveyor belts and sortation/storage systems that the AMRs facilitate. The companies work closely with clients to design highly-tailored and often unique solutions.

For Asda's South Elmsall depot, the Geek+ AMRs work within a large open space in the center of the facility, around the edges are multiple conveyor inputs and output areas sorted by product or destination. The inputs and outputs, produced by AMH, are serviced by S-series Geek+ robots fitted with a rotating conveyor belt on top, that can be used to move the product in any direction. Because the robots work within an open space, the solution's capacity is essentially infinitely expandable, only limited by the size of the warehouse itself.

In 2018, Geek+ entered into a global strategic partnership with the German company Körber Supply Chain. "I would argue that this partnership has had the biggest impact on Geek+'s business development," says Firouzian. "After joining hands in 2018, the two companies have worked very closely together to assist companies worldwide to streamline their operations using smart AMR solutions and

establish themselves as market leaders." Working with an established player has helped the relatively new company gain a foothold in projects internationally.

Geek+ has also used its cooperation with Körber to increase its knowledge base and experience in particular industry areas. The company's technology spans robotics, software and algorithms, which are offered to the market in clearly defined product lines.

"The partnerships yield more case studies to bolster an already impressive portfolio of successful projects and deliver valuable knowledge on how to further shape and adapt their products for the growing and ever-changing demand for warehouse automation," says Firouzian.

The company aims to offer tailored solutions to clients based on the specific requirements of particular industries. "Business competition in this area is not on the robots themselves, but rather the overall system and service provision," says Dong. "Clients have different requirements, and the requirements are usually domain-specific and highly relevant to their business, so Geek+ benefits from its internal tools and continuous platform development."

It's the economy, stupid

Through advanced R&D, knowledge accumulation and early adoption in some areas, Geek+ has largely set itself apart from competitors, and the real threats to the company's future lie in the health of the global economy and bubbling geopolitical issues.

The domestic market has faced a general slowdown in recent years, thanks to regulatory crackdowns on a number of industries as well as the knock-on effects of COVID-related restrictions. Recent policy changes have signaled the end of zero-COVID, but the economy is still some way from a full recovery and is also unlikely to reach the high GDP growth numbers of previous years. Outside of the China market, many countries are also trying to come to grips with the impacts of geopolitical turmoil such as the war in Ukraine.

While these issues may cause companies in any number of industries to delay new investments, they may represent an opportunity for Geek+ thanks to the improved efficiency and reduction in long-term costs that the company can provide.

“The Chinese government is very interested in further developing the manufacturing sector in the coming years and the concepts of AMR and warehouse automation solutions are actively being promoted,” says Firouzian. “Geek+ clearly benefitted from the Made in China Industrial Plan, for example.”

That the structural changes currently being made to the Chinese economy should offer opportunities for Geek+ is a view echoed by Dong. “With the increasing labor cost and exchange rate, the traditional labor-intensive logistics sector is facing higher pressure than ever,” he says. Interact Analysis predicts that the logistics industry will top manufacturing as the main source of mobile robots sales and revenues by 2024, and logistics’ share of the market will continue to grow until 2027. With Geek+’s strength lying more in the logistics area, this is a bullish case for the company.

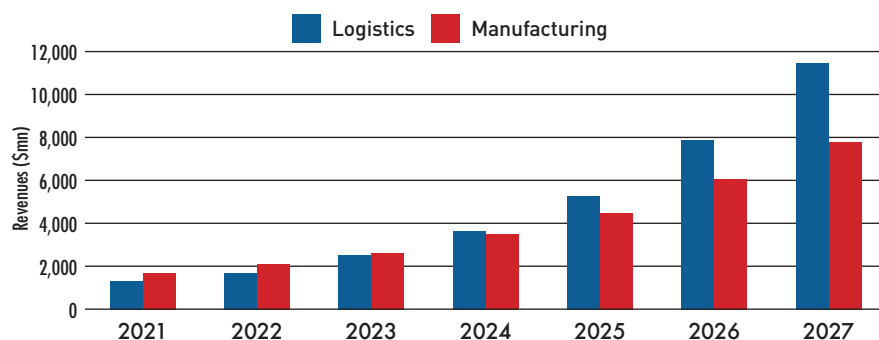
Inflation over the past year in many markets has put similar pressures on many industries, and stronger players are likely to invest more in automated solutions, gaining the upper hand over less well-capitalized competitors. “Wise companies will invest in automation, digitalization and ‘intelligentization,’” says Dong. “Geek+ can benefit from this kind of investment if they can continue to deliver quality products that help meet these needs.”

While there are geopolitical risks that could threaten its expansion, Geek+ already has a broad geographical footprint and it is not too dependent on any one market. It has also clearly positioned itself as an international player rather than simply a Chinese company. And although there are obvious perception issues that come with being a Chinese tech company, the nature of the company’s tech and the benefits from it are likely to shield Geek+, to some extent, from related issues.

And with some manufacturing moving away from China, the international image

ROBOT REVENUES

The global AMR market is predicted to grow at a rapid rate, with the logistics sector set to be the most lucrative



Source: Interact Analysis

of the company presents opportunities. “Given the relocations of industries toward Europe or other Asian countries like Vietnam, AMRs can help mitigate the rising cost of labor in China and make firms more competitive,” says Derval.

And while Geek+’s prospects appear to be good, there is a need to continue considering partnerships for the future. Increasingly in the warehousing logistics sector, there is a need for interoperability between machines from different companies, and perhaps the days where one company can go in and impose their branded solution on everything are numbered.

“The warehouse automation market is slowly moving towards holistic automation adaptation,” says Firouzian. “The challenge there is to combine and integrate a large cluster of hardware and software and incrementally move away from any traditional warehouse handling and management procedures.”

“But I think they’re more than up to the challenge,” he adds.

A packaged future

With current economic conditions likely to push more companies to invest in solutions such as those offered by Geek+, the company’s current level of success may well be the tip of the iceberg. “Warehouse applications are growing exponentially year over year with more and bigger warehouses being installed each year to meet e-commerce growth,” says David Cheskis, senior director at TriEye,

which manufactures automated sensory technology. “We are at the early stages of robotics in warehouses with very low penetration rates currently, and there are opportunities in both new and existing facilities.”

As Derval succinctly puts it, “reliable yet affordable sensors and collision avoidance algorithms that minimize idle time are the sinews of war in AMRs.”

Going forward, the battle will be on sensors and integration. AMRs are still at a relatively early stage using first-generation 3D sensing solutions, which are costly and not always very reliable. Geek+ is no doubt working on creating solutions through partnerships with technology companies and by its own R&D. With increasing automation, there will likely be more problems with how to get machines working together in an optimized manner and not colliding with or holding each other up. Here Geek+, which offers a holistic solution alongside its partners, has an obvious advantage over its competitors.

Growing labor shortages in China and other key markets will also be key drivers for further automation, along with the desire to boost efficiency and decrease costs. Geek+ with its solutions covering many industries, proven track record and partnerships, looks set to benefit. “We expect an increasing number of businesses to make the transition to flexible automation and smart technologies, meaning that we will be quite busy for the foreseeable future,” says Peterson.

CKGSB BUSINESS CONDITIONS INDEX

Positive Trends

CKGSB's Business Conditions Index, reflecting confidence levels in China business, shows big improvements in China's economic outlook



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

In February, the CKGSB Business Conditions Index (BCI) registered 57.6, a vast improvement from January's score of 49.7. This month, apart from the company competitiveness index (which measures company positioning, not operational performance), all indicators rose, showing that China's economic recovery is in process. The BCI is improving, and with this, the year's economic outcomes should be something to look forward to.

Introduction

The CKGSB Business Conditions Index (CKBCI) is a set of forward-looking diffusion indicators. The index takes 50 as its threshold, so a value above 50 means that the variable that the index measures is expected to increase, while a value below 50

means that the variable is expected to fall. The CKGSB BCI uses the same methodology as the PMI index.

Key Findings

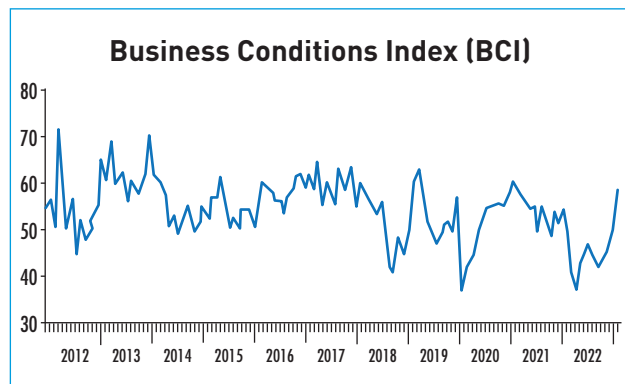
- February saw an unusual rise in all four sub-indices
- There was a 7.9 point rise in the main BCI index, a vast improvement on previous months
- Much of the improvement can be accredited to the scrapping of zero-COVID policies and changes in real estate regulation

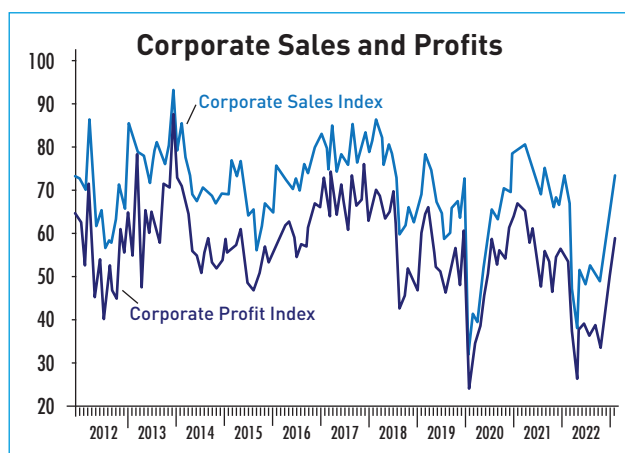
Analysis

The BCI's four sub-indices are corporate sales, profit, financing environment and inventory. Three of the four are forward-looking indexes, while the financing environment index measures the current situation.

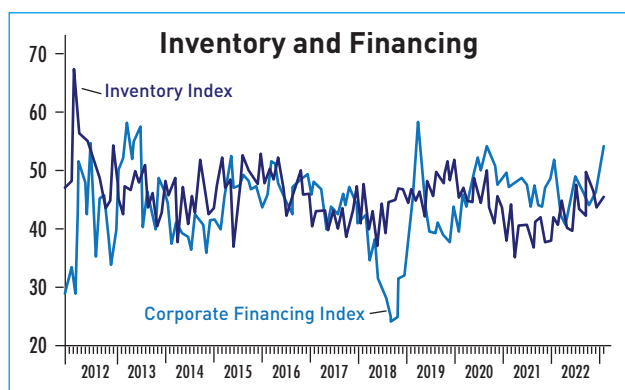
The sales outlook rose sharply this month, from 59.9 last month to 73.1 this month. Profit prospects also registered a steep incline, landing at 58.7 this month compared with 45.9 last month.

The financing environment index lifted from 49.5 to 54.3 in February (Figure 4). Optimism regarding financing crossed the confidence threshold of 50.0. As for inventory, our survey respondents reported an improvement in warehousing that saw the index rise from 44.0 to 45.1, albeit remaining below the confidence mark, the only subindex to do so this month (Figure 5).

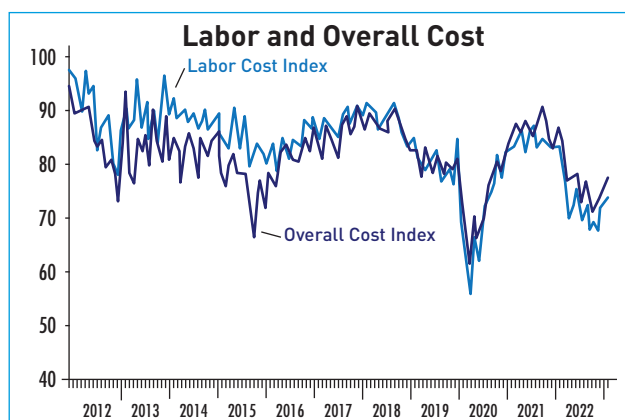




This month's rise in labor cost expectations means that more companies believe they will be paying more to employ people in the next six months, a prediction that impacts business operations and is felt in overall cost calculations too. However, this could be a sign that as the economy picks up, companies have more demand for labor and expect costs to rise because of increased business activity.

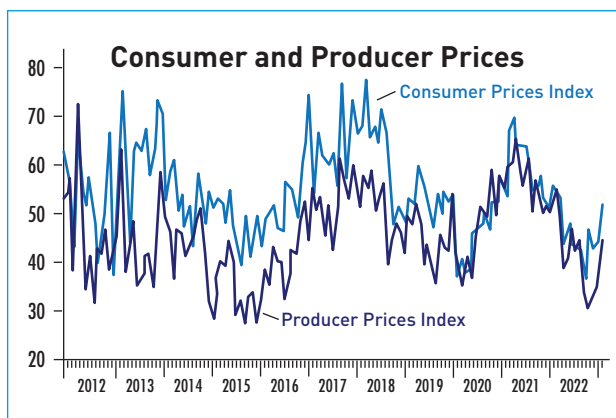


The index registering consumer prices rose significantly this month, from 44.0 last month to 51.7 (Figure 8). The index showing producer goods price expectations also rose sharply



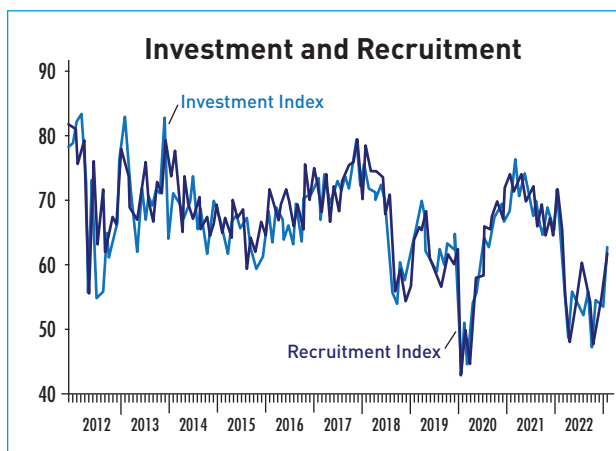
this month, from 34.4 last month to 44.2 (Figure 9).

Investment and recruitment indices were high for a long time, but more recently sank into the doldrums. From this weak base, they both rose significantly in February, and since the Chinese economy is largely investment-driven, and investment is strongly tied to recruitment, this suggests that the Chinese economy is on the mend.



Conclusion

In February, all four sub-indices of the CKGSB BCI rose, something that has rarely happened in the 12 years in which we have conducted our monthly study. Many of the indicators, including the main index, have risen sharply. If the recovery goes on like this, China's economic results this year will be worth the wait.



Why have the BCI and similar indices shown such a big improvement in such a short period of time? The author agrees with most commentators that at the bottom of this seemingly remarkable economic recovery lie two factors: the dropping of Zero-COVID rules, and changes in real estate-related policies.

The rapid recovery of China's economy reflects its resilience, but we still have to confront structural problems that are in need of urgent resolution.

CKGSB CASE STUDY

Dairy to Dream

Yili Group is using internationalization in its quest to become the world's largest dairy company within the next decade

Tao Zhigang, Professor of Strategy and Economics, CKGSB,
and Qiao Yiyuan, Senior Researcher at the Case Center, CKGSB

In 2020, Yili Group became the fifth-largest dairy business globally, thanks to a solid foundation in the Chinese market and a robust internationalization strategy. The worldwide dairy market is expected to reach a value of \$1.03 trillion by 2024, and Yili aims to become the largest player in the market within the next decade.

Yili, based in the northern-Chinese grassland-heavy province of Inner Mongolia, began its overseas development efforts in 2010 and it is now the fastest-growing of the top 20 dairy companies worldwide, according to Rabobank, surpassing ¥100 billion in revenue for the first time in 2021. The company's product line currently includes a wide range of dairy products, such as regular milk, milk powder, yogurt, cold drinks and cheese. Yili is now expanding into other beverage markets outside the dairy industry.

Yili traces its origins back to 1956, and in 1996 it was listed on the Shanghai Stock Exchange, raising ¥96.9 million. The

company has grown rapidly ever since, but it has not been without challenges.

The Chinese dairy market faced several systemic issues in its early development. Firstly, milk production used to be based on small-scale highly-diverse production, because of its short shelf life. But Yili was the first to introduce ultra-high temperature (UHT) milk to the China market, extending the shelf life of the product to between 6-8 months, allowing the company to develop a single large-scale production site in Inner Mongolia.

Yili also invested heavily in R&D to improve the formulation and processing of dairy products to address the symptoms of lactose intolerance suffered by most Chinese people. Third, Yili had to address the low daily dairy consumption across China, partly caused by lactose intolerance issues. In response, the company ran a multi-platform advertising campaign, positioning its products as "healthy foods" and itself as a quality producer.

Thanks to these efforts, by 2005 Yili had become one of the top two dairy companies in China. But in late 2008, a scandal involving milk producer Sanlu Group raised product safety concerns nationally. This, combined with the Global Financial Crisis around the same time, forced many companies, including Yili, to rethink their plans.

Yili recognized that after stressing rapid development within the China market for a decade, the company had to look outward and develop its brand globally, integrating the world's best resources, technology and talent into its processes.

Eyeing internationalization

In 2015, Yili officially laid out its goal to "become the world's most trusted health food provider." In an interview with Harvard Business School, Yili's chairman Pan Gang explained how the company was approaching this mammoth project. He stated that Yili was pursuing a global

networking strategy to concentrate top-tier dairy resources worldwide. This would see Yili build the world's largest integrated dairy production base in New Zealand, rally research initiatives with prestigious universities in the US and food R&D centers in Europe, and reach out into the vast markets covering Asia, Europe, Oceania and the Americas.

Yili's approach to internationalization focused on three strategic areas: raw materials, technology and markets.

'Moo'ving forward **Raw materials**

Most of the world's best grazing areas, and therefore primary dairy production regions, are located between 40°-50° north and south of the equator. This means that while demand for dairy products continues to expand globally, production is limited in a physical sense. Therefore, for Yili, it is imperative to acquire as much access to these natural resource areas as possible to be globally competitive.

Yili's efforts to secure high-quality raw materials overseas have led to cooperation with enterprises such as Fonterra, New Zealand's largest dairy company, and Conaprole, the largest in Uruguay. The company has also established partnerships with the Netherlands and Denmark to produce dairy products using local milk sources.

The company has also made several major business acquisitions including two New Zealand firms, Oceania Dairy Limited and Westland Dairy. The latter accounts for around 3% of the country's annual milk harvest. Through cooperation and acquisition, Yili now has 14 overseas production bases.

Milk supply across Yili's home territory of Inner Mongolia has also been improved, and now serves to fill gaps during the off-peak seasons in the Northern and Southern hemispheres, as well as mitigating the risk posed by regional disasters. The growing strategic synergy of Yili's production layout has further enhanced the company's ability to respond to market demand, control costs and guarantee the supply of raw materials.



Cowabunga! Yili has ventured out into a number of different international markets

R&Dairy

Yili championed R&D throughout its early years of domestic expansion, but upon entering the international market, the company found that competitors, particularly Western-based firms, were well ahead. They had benefited from years of strong economic growth coupled with a long tradition of dairy consumption.

Yili also understood that many of the mature international markets were highly saturated, and therefore not suitable targets for entry. However, it still saw an opportunity for increasing product competitiveness through high-quality R&D, so the company undertook projects with leading dairy research institutions on dairy cow rearing, product nutrition and taste, and food safety.

In 2014, Yili established a European R&D Center in cooperation with Wageningen University & Research in the Netherlands, which is renowned for its expertise in agricultural and forestry sciences, focusing on dairy farming, dairy research and food safety. It also signed a cooperation agreement with Lincoln University in New Zealand to establish the Oceania Innovation Center, which focuses on dairy farming and farm management technologies.

During a state visit to the US by Chinese leader Xi Jinping in 2015, Yili led the implementation of the "China-US Food Wisdom Valley" program, connecting a number of leading universities in the US and Canada. As reported, the program covers "nutrition and health, product development, food safety, agricultural science and technology, animal husbandry, veterinary medicine, ecology and environmental protection and business management."

According to the company's annual report, it also has plans to set up innovation centers in Tokyo and Bekasi, Indonesia.

Emerging Markets

Building on its success in China, Yili sees growth potential in emerging markets. And it believes that instead of entering mature developed markets and competing with established multinational dairy companies, it is more advantageous to target emerging markets with large populations and promising economic development. The company considered many of the BRICS countries, but it settled on the Southeast Asia region, because of its large population base, young demographic, deep market development potential and greater cultural similarities.

The company has already set up wholly-owned manufacturing and trading subsidiaries in Indonesia, Malaysia, Vietnam and Myanmar. It has also acquired companies such as Thai ice-cream maker Chomthana, improving their operational efficiency, while benefiting from their cultural expertise and domestic reach.

A cash cow?

Since the launch of its internationalization strategy in 2010, Yili's overseas network has come to make up 14.60% of the company's total assets, and supply around 15% of the total raw materials used. In 2018, the company set up an International Business Department to develop overseas markets, which has been growing at a compound annual growth rate of 56% since. The company also saw a 58% year-on-year increase in international business revenue in H1 2022.

Doing it properly

To efficiently internationalize operations, three major issues need to be considered.

Finding pragmatic M&A targets

When entering a new market, the two common options are starting from scratch or acquiring an established entity. The acquisition model is often preferred because of the speed with which results are reflected in a company's financial statements. But this speed also drives buyers to chase after higher-value targets, which can make it more difficult to integrate production and management after the completion of the transaction, meaning the deal may not yield the desired results, despite the higher price tag.

For this reason, Yili conducts a multifaceted review when looking for M&A targets and has established a database to track potential acquisition targets and their valuation, business size, synergistic fit and alignment of strategic objectives. To make the cut, a company needs to meet several criteria: fill a gap in Yili's ecosystem or supplement an existing business area, provide core competitiveness and good development prospects in its home market

and be of a size that can be easily absorbed into the ecosystem.

Overseas localization

Overseas operating entities are often far from company headquarters, and geographical distance can make management more difficult. Therefore, a certain degree of carefully implemented localization in overseas branches is required.

The core concept behind successful localization is problem-specific analysis, i.e. successful management experience in the home country will not necessarily lead to overseas success. The degree of localization is also important—too much or too little localization has proven to be problematic. In the case of personnel systems, for example, the right balance of employees must be found to avoid hindering day-to-day operations.

For Yili, the Muslim customs of Indonesia and Malaysia, the Buddhist beliefs of Thailand, the non-English speaking environment and introverted workplace cultures of Japan, and the increasingly delicate bilateral relationships between Australia, New Zealand and China in recent years are all issues that require careful case-by-case consideration.

Overall, Yili's overseas operations methodology can be summarized as "focus on the big and let go of the small." The Chinese headquarters is positioned to manage financial targets, approve and allocate resources, communicate and implement high-level strategies, and coordinate collaboration between business units; the day-to-day management and operations are largely left to the overseas entities, which also have most of the financial and personnel autonomy. For example, the New Zealand operating entity has retained or locally recruited most of its personnel after the acquisition, with the exception of the resident director and a few other core positions.

Choosing a market

Deciding on a suitable overseas market is a two-stage process, the first of which is choosing the specific area of a market to enter. To do so requires evaluation of the industry

size and growth rate, country risks—such as political stability and openness to foreign investment—market competition, and a host of extra-business factors such as language, culture and religion.

The second stage is the development of a tailored sales strategy according to the specific market's demands. For example, despite the complementary nature of Southeast Asian markets, they have their own peculiarities, which require market research, brand positioning and product design considerations prior to entry.

Yili has said that in the future when conditions are ripe, it will consider developing the African market, which has many similar environmental conditions to Southeast Asia.

An international future

Yili's approach to internationalization shows the requirement for a long-term approach, with high-level strategies, both practical and localized tactics, and reliable execution to turn said strategy into tangible, positive results.

Yili's philosophy of specifically tailoring solutions to individual issues is reflected across the company's approach to internationalization. In market selection, the similarity to the domestic market is considered, so Southeast Asia was chosen; in entry methods, the degree of local economic development, infrastructure completeness, and even bilateral relations with China are considered, so Yili trades in Vietnam, executes M&As in Thailand, and builds capacity in Indonesia; in brand selection, the maturity of the local market and consumer acceptance were considered; in terms of product design, Yili also had to take into account the preferences of local consumers, so it focused on developing chocolate flavors available in smaller-sized portions; and so on.

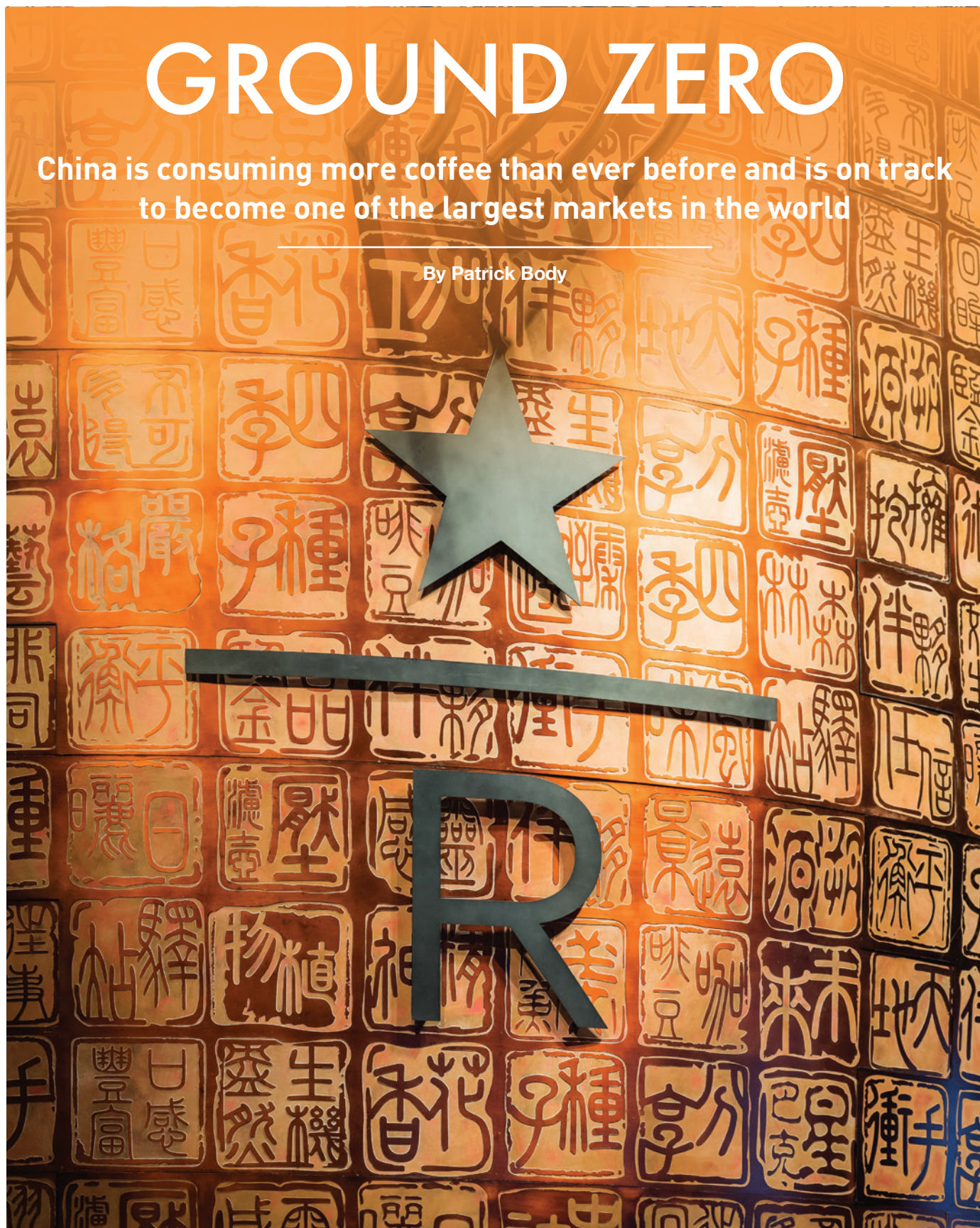
To do business across borders, you cannot rely entirely on past domestic experience, nor can you stick to the same set of strategies. Different tactics should be developed according to the actual situation to be successful in a new market, and this is something that Yili has shown itself to be good at.



GROUND ZERO

China is consuming more coffee than ever before and is on track to become one of the largest markets in the world

By Patrick Body



The Chinese coffee market is unique in its use of localized products and boutique cafés to bring in new customers

An elegant tangle of copper pipes, stylized conveyer belts and detailed roasting drums, the Starbucks Reserve Roastery in Shanghai is a coffee lover's paradise. One of only six in the world, the spacious, aroma-filled hall offers customers both a wide range of specialty coffee products as well as a glimpse into how their favorite drink goes from bean to brew.

The Reserve is far from being Starbucks' only foray into China, and in September 2022, the company revealed plans to almost double their store count in the country. It now aims to have 9,000 stores in operation by 2025, a feat that would require opening one new location every nine hours for the next three years.

China has been an important market for Starbucks over the last decade—the country is already second only to the US in its total number of outlets—but this doubling down, especially with the heightened pandemic restrictions at the time of the announcement, was a sign of significant faith in the market. Coffee consumption across China is exploding, and it is not just Starbucks that is trying to make the most of it—a whole host of businesses, large and small, are springing up to fuel China's growing coffee needs.

Although China's per capita consumption is still low from a global perspective, the size of the market and the speed with which Chinese consumers can change their habits, make this the biggest beverage opportunity globally since the British became addicted to tea in the late 18th Century. Revenues have tripled over the last 10 years, and per capita consumption in major cities has now reached well over 300 cups per year, almost rivaling the US' 329 cups per year.

Global chains, local competitors and swathes of boutique cafés are all competing for a slice of the pie. For Chinese drinkers, who have shifted from enjoying coffee as something cool and international to making it a regular habit, this is very good news.

"Coffee has definitely been one of the fastest developing industries in China over the past five years," says Sun Tingting,

co-founder and partner of MM Capital, a Shanghai-based bank focused on the coffee industry. "We have witnessed cafés opening on every street corner, and Shanghai has now become the city with the largest number of coffee shops in the world, with almost 7,000. What's more, lower-tier cities are also experiencing the rapid penetration of coffee culture, both from the supply and demand side."

Going teatotal

From a Western perspective, the perception of China as a tea-drinking nation—the country's 1.4 billion people are responsible for around 40% of global tea consumption—would seem a major barrier to coffee. But although tea and coffee are often mentioned alongside each other in the Western world, the motivations behind consumption of each in China are unrelated, and a burgeoning coffee scene has been growing unhindered by the country's long history with tea.

China's relationship with coffee really only started in the early 19th Century, when a French missionary in the southwestern province of Yunnan began to grow coffee around his church. To this day, Yunnan still accounts for 60% of China's domestic coffee production.

But, despite some visibility of instant coffee after the initiation of market reforms in the late 1970s, it was not until Starbucks opened their first branches in Shanghai and Beijing around the year 2000 that the drink really started to make inroads into the China market.

"The market has experienced absolutely massive growth since the turn of the century," says Felipe Cabrera, founder of Shanghai-based Ad Astra Coffee Consulting. "The compound annual growth rate (CAGR) between 2000 and 2017 was around 14%, and it actually increased after that. There was a small dip due to the pandemic, but it then bounced back stronger than before."

Today the market's CAGR is around 10%, but the overall size of the market remains relatively small. Revenues from China's coffee market were \$14.2 billion in 2021. In comparison, France, with its

population of just 65.7 million people, generated slightly over \$13 billion, while the US coffee market, the world's largest, produced a massive \$81 billion.

Coffee offerings

Coffee culture has grown in China in a way that is unlike any other place: boutique cafés, a wide range of unusual flavors—beetroot latte, anyone?—and a business growth rate which has surprised even the most optimistic of analysts. “Product has increasingly followed local tastes and preferences,” says Yongchen Lu, CEO of Tims China, the Chinese unit of Canadian brand Tim Hortons. “And services industries have also experienced major changes over this time.”

According to a recent US National Coffee Association survey, just 28% of US respondents who had drunk coffee in the past day had done so outside of their home, but for China the majority of consumption is done anywhere other than at home.

“Cafés currently make up the highest proportion of coffee consumption in China, as the product is still a novelty for the majority of Chinese and requires further market education,” said Sun Tingting. “Instant coffee powder, ready-to-drink products and homemade coffee using coffee machines are also major forms of consumption in China, but just to a less extent than elsewhere.”

Grabbing a coffee on the go is easier than ever, with a wide variety of outlets seemingly on every street corner—from small kiosks inside convenience stores to boutique cafés that offer an experience as well as the product. Access is further enhanced through the country's well-developed motorbike delivery infrastructure.

“I had a coffee at my door within five minutes of ordering it once,” says Yuming Lai, an office worker in Suzhou. “The shop is less than a kilometer away, but the speed was astounding.”

Boutique cafés make up just under 90% of the 108,500 coffee shops in China, catering more towards consumers seeking higher-quality products and a more unique experience. “There are multiple types of

boutique café,” says Hu Yuwan, Associate Director at Daxue Consulting. “There are the ‘affordable’ boutiques such as Manner, premium chains like Arabica% and then a large number of coffee shops that are just individual independent stores.”

Numbers have ballooned in recent years, but they are mostly limited to Tier-1 and 2 cities. “Most of the trendy brands and coffee knowledge is concentrated in top cities like Beijing, Guangzhou and Shenzhen, with Shanghai being the most prominent,” says Hu. “Yet, lower-tier and smaller cities, especially those in places conducive to a relaxed lifestyle, such as Xiamen, Chengdu or Dali, are starting to develop their own regional spirits and features.”

“The trend in China is that people go to work in the big cities, and that's where baristas learn their skills,” says Cabrera. “Then they go back to their hometowns and spot the opportunity to create a specialty coffee shop or a little boutique coffee shop. They are bringing the coffee culture from the big cities to the second- and third-tier cities.”

A coffee from one of these boutique establishments usually costs upwards of RMB 25 (\$3.50), compared to anywhere between RMB 10-30 (\$1.40-\$4.20) at a larger chain. Although a marginally higher price, the product is usually of a higher quality and made from a specifically sourced bean.

Large corporate chains such as

Starbucks, Luckin Coffee, Costa, Pacific and Tim Hortons, make up the other 10% of coffee outlets in China, an unusually small share when compared to other coffee markets—Starbucks alone commands a 40% share in the US. These chains offer a standard range of coffees alongside more stylized premium offerings, designed to compete with the higher-quality coffee found in the boutique cafés.

“Hundreds of new brands and independent cafés are entering the industry and booming due to different positioning such as lower price, richer taste and flavors, fancier interior designs [in the cafés], etc.,” said Sun.

Starbucks and Luckin both currently have around 5,500 locations nationwide, a particularly impressive feat for Luckin, which has seemingly shrugged off a \$300 million accounting scandal that forced the company to delist from the NASDAQ in 2020.

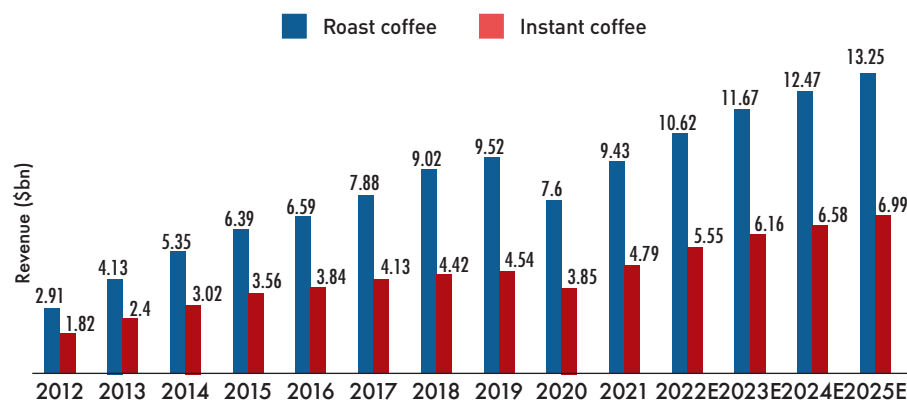
Tim Hortons is a relative newcomer, having just opened its 500th store, but its upward trajectory shows more promise than that of British chain Costa, whose plan to open 2,500 stores in China by 2022 did not materialize. They currently have around 450 in operation—a clear warning that although opportunity in the market abounds, it needs to be handled carefully.

Drinking demographics

In many countries around the world, and particularly in the West, coffee is an

GOING (C)UP!

Coffee market revenue in China is trending upwards, despite a small dip in 2020



Source: Daxue Consulting

integral part of morning routines. Drunk on a daily basis as a way to get the day going, and from then on as a pick-me-up during the working day, it performs a functional role in life. In China, however, much of the younger middle-class population driving coffee's growth have used it as something of a status symbol.

"Right now, Chinese millennials are consuming coffee as a lifestyle thing, that's what has been driving consumption," says Cabrera. "They want to show that they can spend money on these kinds of things, so that has also driven the development of boutique cafés. They go, they buy a drink, they take a photo and post it on social media."

And, according to Hu, more categories of consumers are emerging. "Each of them with different motivations for consuming the product and different product requirements as a result."

Coffee's aroma is what attracts people first, but the taste or the effects of caffeine for newbies can sometimes be a turn-off. This has led to a growth in the number of flavored coffees, drinks with high milk content or decaffeinated coffees.

Another group of coffee consumers is attracted by the energizing effect of coffee. "I originally started drinking coffee as a student because it was the only thing that would keep me awake during an all-nighter," says Vee Hu, a graphic designer from Nanjing. "Since then it has become more of a habit and I'd say I drink one or two a day at work, either making it there or buying them from the cafés around the office."

The third group consists of more experienced coffee drinkers, who are pickier about their brews. "I drink drip coffee most days, either at home or in the office," says Lily Ma, a 29-year-old content editor in Shanghai. "I don't really have a preference on the bean variety with regard to where it comes from, but I do have a bottom line of SCA80+ when it comes to the bean quality." A Specialty Coffee Association (SCA) rating of 80 or above is considered a "specialty coffee."

And finally, there is the coffee connoisseur. Still a niche group in China,

these consumers take a similar approach to coffee as others do to fine wines or spirits. They have in-depth knowledge of coffee blending, machinery, origins and roastery techniques, among many other aspects of the drink.

Adding an extra shot

Shanghai often acts as a bellwether for future trends across China—Starbucks locating the Roastery in the city was no accident. Coffee consumption is peaking and myriad businesses have expansion plans brewing, but as coffee usage spreads across the country, companies are having to deal with different regional requirements.

"Consumption preference may differ within the same tier of cities due to specific city features," says Sun. "For example, people in Chengdu prefer cafés which offer high value-for-money products while people in Hangzhou often prefer cafés with unique designs."

Boutique chains or local independent coffee shops find it easy to meet local requirements, but it is a challenge for the larger international chains. So step one

for these corporates has been to allow their Chinese subsidiaries to operate independently. "I think it's important to understand that we aren't actually an entirely foreign brand, we are very much the 'Chinese version' of Tim Hortons, and fully independent," says Tims China's Lu. "We are given a great deal of freedom for how we develop the brand in China, while maintaining quality and overall integrity to Tim Hortons." Starbucks' China subsidiary is similarly independent.

For domestic brands like Luckin Coffee, only regional localization was necessary, but they also took steps to set themselves apart from their well-funded internationally-backed competition, by playing to the strengths of China's increasingly digitalized society.

Most of Luckin's outlets do not have seating, nor cashiers, and customers place orders through its app, either for collection or delivery. This has allowed the company to keep costs down and offer competitive prices. Other companies have attempted to imitate Luckin's model, but they have not had the same level of success.

But the use of apps is not unique to Luckin, and smaller boutique chains are increasingly following suit to encourage repeat customers and offer exclusive discounts to delivery customers. Smaller chains have also been making use of Chinese social media in order to reach potential customers through advertising and offers.

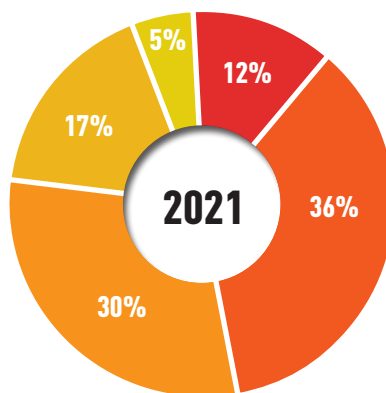
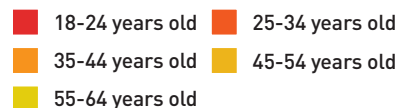
"Social media is really powerful for these independent coffee owners, and is now also more and more relevant for the big brands," says Cabrera. "Especially because we now have more coffee deliveries, so there's going to be more connection between the digital and the offline market."

Coffee's rapid expansion has also given rise to auxiliary industries and events. Coffee production in Yunnan province increased by an average of 14% between 2015 and 2020, and it now produces somewhere between 100,000 and 140,000 tons of coffee per year, according to the Yunnan provincial department of agriculture and rural affairs—that's 1% of the world's total coffee production.

YOUNG BREW

The majority of Chinese coffee consumers are under the age of 44, with almost half being under 34.

Coffee consumers in China by age group



Source: Daxue Consulting

China is also the 19th largest coffee importer in the world, but whereas historically much of China's coffee imports have been roasted beans, the import of green coffee beans is now growing.

"Chinese consumers expect a really high-quality fresh product, so it is really important to locate at least some of the production process here in China," says Cabrera. "It's why we see a greater number of brands roasting their beans in-country now."

China is also now seeing more coffee-related events, such as at the Shanghai Food and Hospitality China (FHC) festival in 2021, which had a coffee-specific exhibition hall and featured industry talks, as well as China's national coffee championships. These events are useful as a low-cost marketing tool for many Chinese coffee brands and have also been helpful in increasing sales of coffee merchandise.

Product localization

China's market is increasingly unique, not only thanks to its collection and delivery business models, but also through the creation of new products. "Chinese coffee culture has absolutely created their own style of products," says Cabrera. "Some of them are inspired by the massive milk tea industry in the country. They are heavily flavored and filled with a whipped cream-like product like the milk teas are."

The resulting array of different drink offerings is again both unique to China and also unique to different regions within the country. "We create special products tailored for those regional palate preferences," says Tims China's Yongchen Lu. "We offer mulled wine flavor brewed coffee or a fresh coconut cold brew. We are constantly innovating and develop 30 new products a year."

There are also some unique coffee outlets for consumers to visit. One such example is the Bear Claw Coffee (*hinichijou*) shop, which attracted customers thanks to its unique storefront—a wall with a single hole in the middle of it, through which a hand, dressed in a furry bear claw glove, waves and passes people the coffee they just ordered online via the QR code outside

Right now, Chinese millennials are consuming coffee as a lifestyle thing, that's what has been driving consumption



Felipe Cabrera
Founder
Ad Astra Coffee Consulting

of the shop. The shop was actually designed to help people with anxiety issues hold down a job, but its interesting presentation also helped it become popular, thanks to China's social media-centric consumption habits.

Keeping a lid on it

Coffee consumption in China is clearly on an upward trajectory, but there are still barriers that need to be overcome in order to sustain growth over the coming years.

"The potential increase of coffee consumption in the future will primarily come from low-tier cities," said Sun Tingting. "However, people there have not established coffee consumption habits and many have no need for coffee at all. Coffee businesses need to ensure localized tastes and lower prices in order to expand into this demographic." And that will, of course, require businesses to balance increased R&D investment with the need to keep the retail price down, at the same time as maintaining supply.

"The stability of the coffee bean supply could indirectly impact the growth of the market," says Hu Yuwan. "Coffee has reached a large scale in China in a relatively short period, meaning that it doesn't have particularly well-established supply routes."

For smaller businesses, the use of social media can be both a blessing and a curse. Key opinion leader (KOL) and influencer-led consumption patterns can provide short-

term business booms but, after a brief period of hype, consumers are likely to move on to the next trendy outlet. Maintaining stable, long-term growth requires companies to not rely on gimmicks, but on a fundamentally sound business model, an advantage for larger corporate brands.

The future is brown

With the coffee industry in major cities approaching saturation point, expansion into lower-tier cities is the next move, and there is no doubt that competition will be fierce. "From the demand side, better products such as more bean origins and the diversification of types of consumption opportunities will be expected," said Sun Tingting. "From the supply side, chain café brands will grab more market share from poor performing individual cafés and, in turn, improve the efficiency of the supply chain."

"There is so much room for great coffee brands to develop," says Tims China's Lu. "This will be especially true as China's middle class grows and demand for quality rises in step with lifestyle changes."

And given that Shanghai is a good indicator of what is to come, with its record number of boutique cafés and ever-updating coffee trends, things are looking very positive for the market in China. "What Shanghai does today, the rest of China does tomorrow," says Felipe Cabrera. "And that is very good news for the coffee industry."



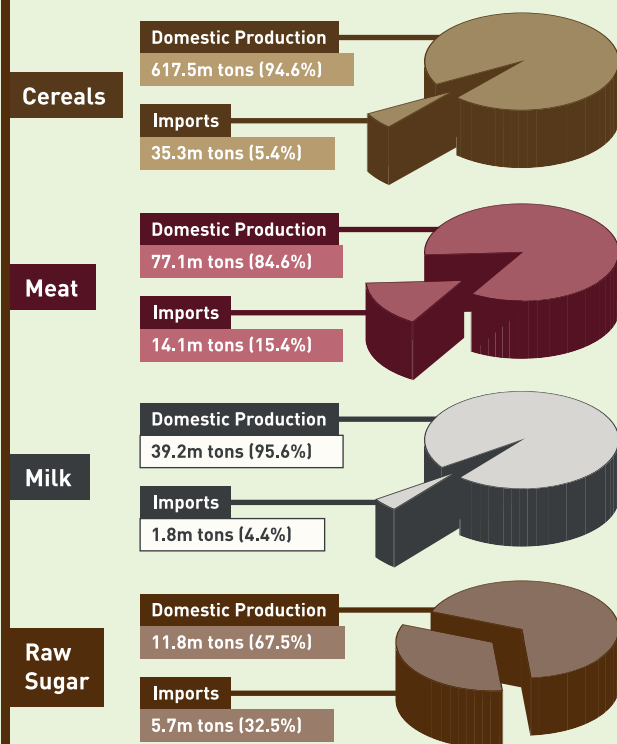
Feeding China

Feeding a country of 1.4 billion people is not an easy task, and given a growing diversity of tastes in China and the country's ambition to be self-sufficient in terms of food supply, it is becoming increasingly difficult.

While China ranks first globally in producing a wide range of food products, such as cereals (which includes corn, wheat and rice), fruit, meat and vegetables, the country still relies on imports from around the world in order to make up for a number of shortfalls.

Production & Consumption

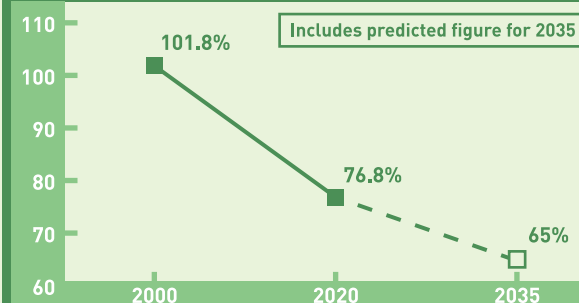
The pie charts below represent China's total consumption of various food produce: cereals, meat, milk and raw sugar. In each case, the smaller slice shows how much of each food is imported, while the rest of the pie is made up of China's own domestic production.



Self-Sufficiency

According to the National Development and Reform Commission, China's food self-sufficiency rate has been consistently falling over the past two decades, and now imports about a quarter of its food supply.

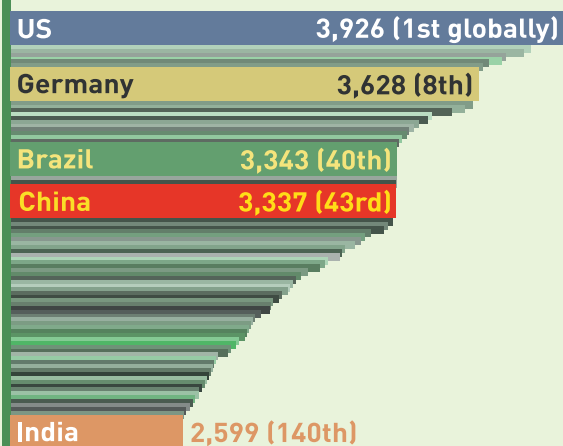
Percentage of China's food supply produced in China



Food Intake

After over two decades of meteoric growth, China has improved the living standards of hundreds of millions of its citizens. One indicator of this is that the country now sits 43rd in the global food supply rankings, indicating that China is in a comfortable position. Measured in kilocalories per person per day, the number represents the amount of food available for human consumption. It is calculated as the food remaining for human use after taking out all non-food utilization, including exports, industrial use, animal feed, seed, wastage and changes in stocks.

Food Supply (kcal per capita per day)



Soybeans

Outside of cereals, soybeans are China's most used foodstuff, with most used to feed the country's massive livestock sector. But China's production is a long way from meeting consumption requirements. The country sits fourth in global soybean production and is a significant way behind the competition, in part due to costs and inefficiency. The cost of soybean production in China is 1.3 times that in the US, and Chinese yields are 60% less efficient.

Top 5 Global Soybean Producers

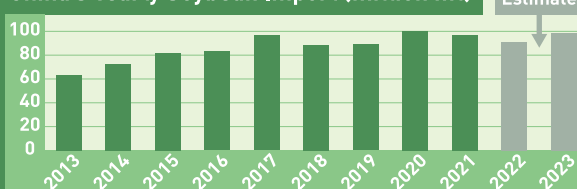


China's annual soybean production only meets 15% of its needs, meaning it has to import 85% of its soybeans. This caused it to become the largest importer of soybeans in the world in 2020, importing \$37.4 billion worth of the product.

China's Top 3 Soybean Import Sources



China's Yearly Soybean Import (million mt)

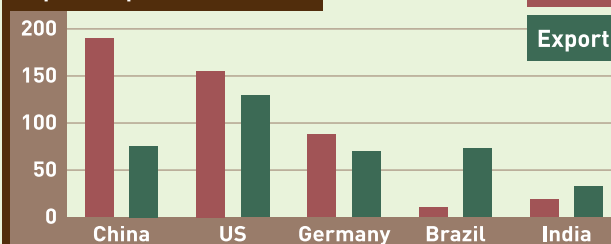


Sources: National Bureau of Statistics China, FAO, World Bank, National Development and Reform Commission

Import/Export Values

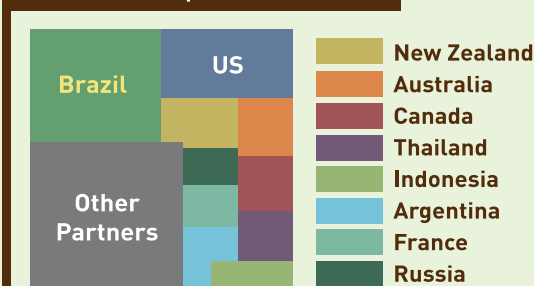
China is by far the world's largest importer of foods, with only the US coming close in terms of total value each year. The country also has the largest imbalance between import and export values, with less than half of the money spent on imports recouped through exporting other goods.

Import/Export Values (\$bn)



Given the quantity of soybeans that the country imports, it is no surprise that Brazil is China's largest trading partner when it comes to food stuffs. The story is different where processed food products are concerned, with the Netherlands topping the table, exporting over \$2.3 billion in processed goods to China in 2020.

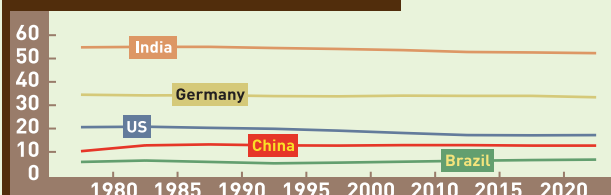
China's 2020 Import Partner Share



Arable Land

China has around one-fifth of the world's population to feed, but only around 7% of its arable land. In 2006, the Chinese government set a "red line" to reserve at least 120 million hectares of arable land for agriculture. There were 119.5 million hectares utilized in China in 2020, a number that has remained steady over the past few decades.

Arable Land (% of Total Land Area)





The stats you need to know

Macro



Growing pains

China will aim for an economic expansion of around **5%** for **2023**, its lowest target for more than three decades. If achieved, the target would represent a recovery from growth of just **3%** in **2022** after numerous Chinese cities suffered extended lockdowns in an effort to prevent the spread of COVID-19.

Source: Financial Times

COVID Costs

Chinese provinces spent at least **¥352 billion (\$51.6 billion)** on COVID-19 containment in 2022. China's biggest provincial economy, Guangdong, spent **¥71.14 billion** last year, including vaccinations, PCR testing and subsidies for medical staff. The figure is the largest among the 20 provincial economies that disclosed figures.

Source: Reuters



Rollin' Coal

China massively accelerated its coal power plans in 2022, quadrupling the number of new permits and approving enough new capacity to supply all the UK's needs. Local governments permitted **106 gigawatts** of new plants, the most since 2015. Construction has already begun on **50 gigawatts**, six times more than in the rest of the world combined.

Source: Bloomberg

Business



Special Delivery

Chinese grocery delivery firm Dingdong Maicai posted its first-ever profit in the Q4 2022, even though the industry faces mounting challenges following the country's easing of stringent pandemic controls. Dingdong's revenue climbed **13.1%** year-on-year to **¥6.2 billion (\$908.3 million)**, while net profit reached **¥116 million**.

Source: South China Morning Post

Payment Power

Airwallex, the fintech unicorn backed by Tencent Holdings and tycoon Li Ka-shing's Horizons Ventures, has secured a licence to offer online payment services in mainland China through an acquisition. The company obtained a payments business licence in China by way of acquiring **100%** of online payments and information services firm Guangzhou Shang Wu Tong Network Technology.

Source: South China Morning Post



Fintech Finance

Ant Group has converted a syndicated credit facility into a **\$6.5 billion** sustainability-linked loan, the largest of its kind in Asia-Pacific. The fintech company made the conversion to bolster its environmental, social and corporate governance goals including cutting carbon and hiring underprivileged workers. The transaction was supported by a group of **20** banks across US, Europe and Asia.

Source: Bloomberg

Taking Stock

The stock exchanges of Shanghai, Shenzhen and Hong Kong expanded their cross-border trading programs by more than **1,000** stocks and enabled eligible shares of international companies with primary listings in Hong Kong to be included in southbound trading. As part of the expansion, **598** Shanghai stocks and **436** Shenzhen stocks will join the stock connect programs, bringing the total of A-shares available to international investors to **3,623**.

Source: Bloomberg



Technology



Patently Obvious

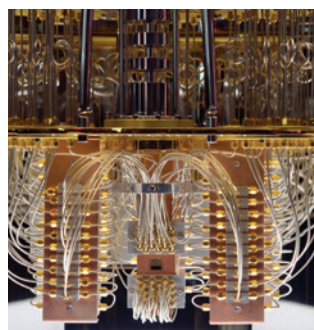
China has raced ahead of the pack in filing patents in nuclear fusion technology, pointing to its ambition to master the science and take the lead in the development of an alternative to fossil fuels. China ranked **first**, out of **30** countries and regions, ahead of **second-placed** US, which was followed by the UK and Japan.

Source: Nikkei Asia

Special Delivery

China made its first delivery of a practical quantum computer in 2022. The **24-qubit** Wuyuan system based on superconducting technology was built by Origin Quantum Computing Technology. A qubit in the quantum world performs functions akin to bits in the digital world. China became only the third country, after Canada and the United States, to deliver a complete quantum computer system to a customer.

Source: Techneworld



Moving Manufacturing

Apple partner Foxconn Technology is investing about **\$700 million** in a new plant in India to ramp up local production, underscoring an accelerating shift of manufacturing away from China. This follows a ramping up of many manufacturers looking outside of China for at least part of their supply chains.

Source: Bloomberg

Digital Ambitions

China has issued a plan calling for accelerated development of 5G, the Internet of Things (IoT), data centers and supercomputing technologies, with these new engines expected to lead future digital growth. The country aims to make significant progress in digitalization by **2025**, and reach "world-leading levels" by **2035**.

Source: South China Morning Post



Consumer



Sales Slump

China's video game industry posted a **10.3%** decline in 2022 sales to **¥265.9 billion (\$39 billion)**, the first drop in **five** years. Sales weakened as the pandemic impeded new product development and the slowing economy affected companies' financing and users' spending. Rising competition overseas also hurt Chinese game companies.

Source: Caixin

Building Momentum

China's manufacturing activity expanded at the fastest pace in more than a decade in February, smashing expectations as production zoomed after the lifting of COVID-19 restrictions in late 2022. The manufacturing purchasing managers' index (PMI) shot up to **52.6** from **50.1** in January.

Source: Nikkei Asia



Weighing In

Yum China Holdings, which owns the KFC and Pizza Hut restaurant chains in mainland China, is spending up to **\$900 million** to expand by up to **1,300** stores across mainland China in 2023. The company is adjusting to changing tastes in a fragmented and cutthroat market where consumer habits are fickle.

Source: South China Morning Post

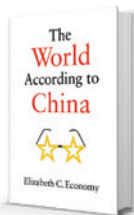
BOOKSHELF

Getting Acquainted

Author and China finance expert, Fraser Howie, recommends books to acquaint the reader with the realities of modern China

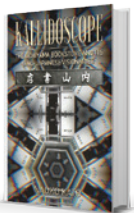
Fraser Howie first visited China over 30 years ago, since then he has spent time living in Beijing, Hong Kong and now resides in Singapore. While in China, his day job was mainly focused on the country's burgeoning financial markets, but his interests were much broader than the ups and downs of the Chinese stock exchanges. Since his arrival in the country and to this day, Fraser has dedicated an enormous amount of his time to reading and writing about various aspects of China's culture, economy and life.

What is the best book for a review of China today?



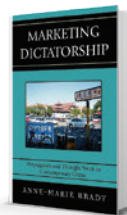
Elizabeth Economy's book, *The World According to China*, came out in late 2021, but even though so much has happened in China since then, I would still recommend this book to businesspeople, politicians and the layperson as the best snapshot of where Xi Jinping's China is today. The book covers a broad range of issues including the economic, societal, geopolitical and as well as the country's long-term ambitions. To supplement this, I would also add a second book. Bill Hayton's *The Invention of China* is an essential read for China watchers old and new. China is often thought of as this monolithic civilization stretching back thousands of years, yet Bill's book shows how much of what we think about China is misleading. The country remains a work in progress from dynastic empire to modern national state.

What book are you reading currently?



Kaleidoscope by Naoko Kato. It's a book about a Japanese bookshop opening in Shanghai in the 1930s. As a bibliophile, I like books about books and bookshops and I enjoy reading about engagement between China and Japan. Two great countries with so much in common and yet the current politics remain needlessly toxic.

Which China business book do you think is the most underappreciated?



It might not be a direct business book but it is a book which all foreign business people outside of China should read. Anne-Marie Brady's *Marketing Dictatorship* was published about 15 years ago but remains a great introduction to the propaganda system and how the CCP uses and misuses words to deliver its message. After decades of engagement with China, I am still amazed that business people and politicians still get taken in by the nice sounding words of the CCP.

What China book did you read recently?



Fragile Cargo by Adam Brookes. Adam tells the fascinating story of moving the best of the Forbidden City treasures out of Beijing and their safe keeping to avoid Japanese invasion and then civil war. The book reads like a thriller and he brings to life some heroic characters who devoted their lives to keeping the dynastic treasures safe. Like many Republican era stories, it reminds us that China's modern history could have been very different.

What China book made a lasting impression on you?



I remember reading W.J.F. Jenner's *The Tyranny of History* soon after it was published and found it heavy going. I then reread the book after a few years in China and was amazed at how it captures the essence of problems China faces. Much has changed, especially economically, since the book's release but it deserves rereading.

GLOBAL UNICORN PROGRAM &

TRY EVERYTHING 2023

📍 **KOREA**

📅 **SEP 12-15, 2023**

The CKGSB Global Unicorn program at Korea put you into an advanced startup ecosystem with a high concentration of unicorns. Benefit from global faculty insights, their deep industry connections and network with trusted partner will help you expand your business.

PROGRAM BENEFITS

- Gain Exclusive one-day full access to Try Everything, the most influential global unicorn forum in Korea
- Seek Investment opportunities from the globe through IR & Demo Day
- Learn how to become a unicorn by company visits
- Build and strengthen relations with other forward-thinking entrepreneurs

HIGHLIGHTED SPEAKERS



XIANG Bing

Founding Dean and Professor of China Business and Globalization, CKGSB



LI Wei

Associate Dean for Asia and Europe, Professor of Economics, Director of the China Economy and Sustainable Development Center, CKGSB



Dong-Sung CHO

Chairman of The Institute for Industrial Policy Studies(IPI) Korea



Anindya Ghose

Heinz Riehl Chair Professor of Business at NYU Stern



Jong-Yoon Kim

CEO, Yanolja & Yanolja Cloud



Karl Ulrich

CIBC Endowed Professor, Professor of Operations, Information and Decisions Research, The Wharton School of the University of Pennsylvania



Guan Wang

President, Gen.G Esport Global Academy



YoungJae JANG

Professor of Industrial and Systems Engineering at KAIST

CONTACT US

— South Korea: Madi Yoo
madiyoo@ckgsb.edu.cn / +82 10 5505 6239

— Americas: Renee Rong
rrong-bp@ckgsb.edu.cn / +1 (781) 3339055

— Asia (excluding Korea): Mara Yuan
ytyuan@ckgsb.edu.cn / +86 (10) 85378140

— Europe: Jennifer Wang
jenniferwang@ckgsb.edu.cn / +44 (0) 7717 748855

Program Manager
Global Unicorn
Program Korea



* Speakers and program content subject to change

GLOBAL UNICORN PROGRAM

INCLUDING

ASIA BUSINESS SUMMIT 2023

📍 **Singapore**

📅 **May 16-19, 2023**

The CKGSB Global Unicorn Program at Singapore puts you at the center of the global ecosystem for economic disruption. Gain essential insights, connections, and know-how that will help you thrive in an era of global uncertainty.

PROGRAM BENEFITS

🔍 Acquire future-proof insights

Hear from tech-savvy academic gurus and industry heavyweights on economic disruption and digital transformation

📖 Develop actionable strategies

Expand your cognitive and strategic toolkit to grasp exceptional growth opportunities and sustain competitiveness

🌐 Direct access to regional ecosystems

Engage with local entrepreneurs, policymakers, investors, key decision-makers, and like-minded business peers

🤝 Join CKGSB's unrivaled ecosystem

Build potential partnerships with a highly-influential network of 10,000+ Chinese and global business leaders



HIGHLIGHTED SPEAKERS



XIANG Bing 🇨🇳

Founding Dean and Professor of China Business and Globalization, CKGSB



Hau LEE 🇺🇸

The Thoma Professor of Operations, Information & Technology, Stanford Graduate School of Business



Karl Ulrich 🇺🇸

CIBC Endowed Professor, Professor of Operations, Information and Decisions Research, The Wharton School of the University of Pennsylvania



David Bell 🇺🇸

Former Chaired Professor, Wharton, and Co-founder and President, Idea Farm Ventures



Brian SAN 🇨🇳

Executive Director, Programmes & Strategic Development, Wealth Management Institute



FAN Min 🇨🇳

Co-founder, Vice Chairman of the Board and President, Trip.com Group



Cindy MI 🇨🇳

Founder, VIPKid



Jong-Yoon KIM 🇰🇷

CEO, Yanolja & Yanolja Cloud

CONTACT US

— Asia (excluding Korea): Mara Yuan
ytyuan@ckgsb.edu.cn / +86 (10) 85378140

— Americas: Renee Rong
xrong-bp@ckgsb.edu.cn / +1 (781) 3339055

— South Korea: Madi Yoo
madiyoo@ckgsb.edu.cn / +82 10 5505 6239

— Europe: Jennifer Wang
jenniferwang@ckgsb.edu.cn / +44 (0) 7717 748855

Program Manager
Global Unicorn
Program Singapore



* Speakers and program content subject to change