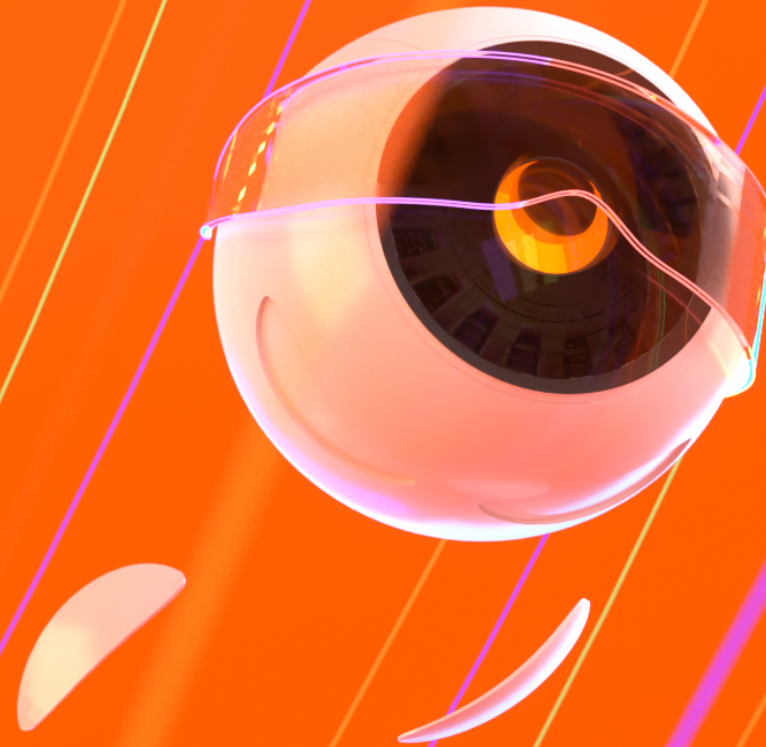


Investment Recipes

by  AtonRā Partners



12 MAY 2021

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BREAKTHROUGH OR NOT?

A Game-Changing Rule

FDA approval is only the halfway point to success

After obtaining Food & Drug Administration (FDA) approval, medical devices get often trapped in the so-called "valley of death", a time gap between marketing authorization and reimbursement.

- The delay in obtaining national coverage can take between one and four years.

A regulatory freeze

In January, the Centers for Medicare and Medicaid Services (CMS) finalized a new rule granting instant national Medicare coverage upon approval for all Breakthrough designated devices. CMS had planned to have the rule take effect mid-March, but following public criticism, it decided to review it and postponed a final decision to mid-May.

- The main objections concerned higher costs for the healthcare system without sufficient evidence of technologies' safety and effectiveness.
- By 15 May, the new rule could be implemented, delayed, or abolished.

Pushing for innovation and faster adoption

The actual implementation of the new rule would only impact part of the medical device industry in the short term. Still, it has the potential to incentivize innovation and provide faster and easier access to breakthrough technologies. The rule has strong bipartisan support as well as patients and physicians backing.

- Among the stocks in our portfolios, Insulet and Abbott would be the primary short-term beneficiaries.

SOURCE:

[Medicare Program; Medicare Coverage of Innovative Technology \(MCIT\) and Definition of "Reasonable and Necessary"](#)



What Is The Rule About?

The “Valley of Death”

The medical device industry has long lobbied for faster coverage of its innovations. Companies that receive FDA approval can start marketing their products. Still, given the structure of the American medical market, sales only take-off once reimbursement policy has been approved, a period known as the “Valley of Death”.

- The average national or local coverage determination takes 9 to 12 months to finalize, and for nationwide coverage, study completion can take up to four years.

An eagerly awaited pathway

In March 2019, the CMS drafted the so-called Medicare Coverage of Innovative Technology (MCIT) pathway to avoid the time gap between marketing authorization and reimbursement. The MCIT rule would enable immediate coverage of any approved device designated as “Breakthrough” by the FDA for four years.

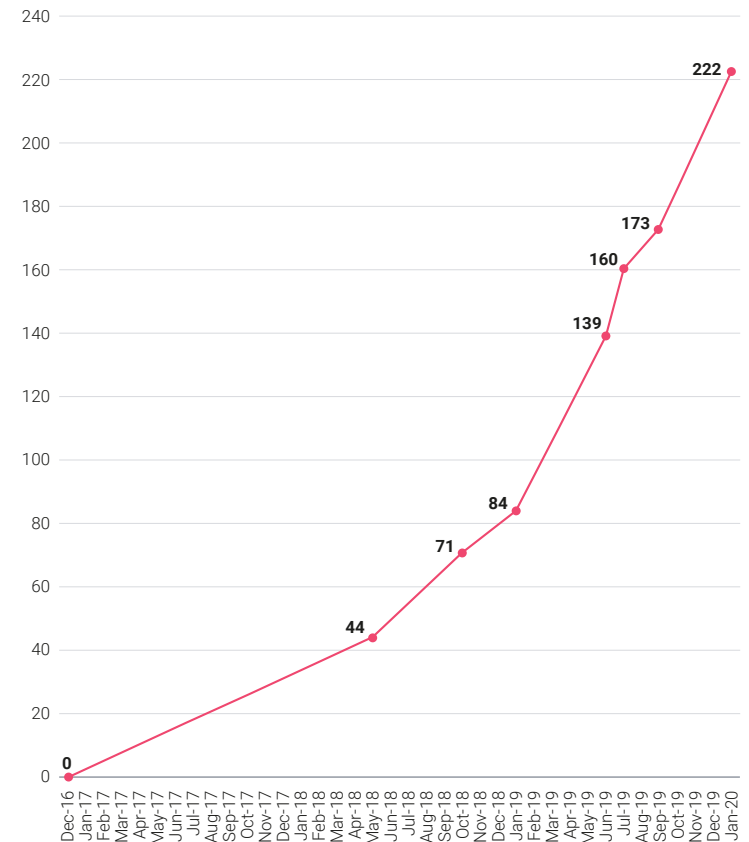
- At the end of the four years, the CMS would re-evaluate the reimbursement based on new real-world evidence.

It’s raining breakthrough designations!

The Breakthrough designation pathway, already implemented in 2018 by the FDA, offers a faster path to approval for medical products that help patients with life-threatening or irreversibly debilitating diseases. The number of Breakthrough designations has been sharply increasing since, resulting in many candidates for the MCIT program.

- As of mid-February 2021, more than 400 devices had been designated as “Breakthrough”.

BREAKTHROUGH DESIGNATIONS



Not So Fast

CMS gives the yellow light

Following some public criticism of the finalized version presented in January, the CMS decided to halt the rule implementation to collect additional feedback from patients and industry players before finalizing the coding and payment processes.

- The rule needs to be better integrated with other existing policies for durable medical equipment.
- In-vitro diagnostic companies claim a redefinition of the criteria required to get the coverage of laboratory-developed tests.

Supporters don't give up

Supporters urge the federal agency to implement the rule without any further delay. Not implementing the rule may prevent patients with life-threatening conditions from getting access to new medical solutions. The agency may decide to go ahead or gain more time by further pushing the deadline down the road.

- Supporters propose to use existing coding and payment processes.

Opponents claim for a no-go

The fiercest opponents argue that the eligible devices may have generated insufficient clinical evidence at the time of coverage, potentially endangering patients' safety and increasing healthcare costs. They believe that the cost estimates made by the CMS are far too optimistic and ask for a re-evaluation.

- Under the new rule, companies won't be asked to perform clinical studies on Medicare-like populations and complete post-marketing studies.
- The CMS foresees spending more than \$2bn on 14 MCIT-eligible devices by 2024.

SOURCE:

[Early experience with the FDA's Breakthrough Devices program](#)



Possible Scenarios

The light turns red

The CMS could bode to the pressure and repel the rule. Although this would be a short-term blow to the hopes of many players in the Medtech space, it would not change much from the status quo.

- Breakthrough devices benefit from a fast-track approval process with the FDA.
- New technology may still receive “early” reimbursement through the New Technology Add-On Payment (NTAP) process.

“Breakthrough designation” does not mean “market authorization”

A softer approach would come by coordinating the FDA and the CMS work. As not all the Breakthrough-designated devices will be FDA-approved, to keep the numbers under control, the FDA may raise the bar for granting its Breakthrough designation.

- As of now, the FDA has approved only 22 Breakthrough devices.

The blue-sky scenario

The rule, if implemented, would offer coverage not only for breakthrough technologies but also for some conventional medical technologies. Also, the rule can accelerate the adoption of Breakthrough-designated devices, therefore the companies’ top-line.

- In our Bionics strategy, Insulet’s artificial pancreas, Abbott’s left ventricular assist device, and Exact Science’s liver test are potential beneficiaries.
- Other beneficiaries include Renalytix AI’s kidney platform, Johnson & Johnson’s ablation system, Medtronic’s ventricular assist device, and Boston Scientific’s duodenoscope.

SOURCE:

[Early experience with the FDA’s Breakthrough Devices program](#)



Catalysts

- **Accelerating adoption.** If the MCIT rule gets the green light, 60mn Medicare beneficiaries will have faster access to the latest medical technology.
- **A push for innovation.** The implementation of the rule will incentivize companies to invest in medical innovation.
- **Collecting more data for sustained reimbursement.** During the 4-year coverage, companies will have the opportunity to collect more data to apply for further reimbursement.

Risks

- **Patients' safety and efficacy.** The coverage may pose the patient's safety and efficacy at risk.
- **Higher healthcare costs.** The rule may require significant resources to be implemented and may increase insurance costs.
- **Higher competition.** The rule may incentivize companies to invest in the latest technologies, increasing competition in the most innovative MedTech sectors.

Bottom Line

- Medical devices often get trapped in the "valley of death", a time gap between marketing authorization and reimbursement. In January, the CMS passed a new rule facilitating the reimbursement of Breakthrough-designated technologies. However, the agency has recently taken a step back and is reviewing the rule again.
- We believe that, if implemented, this regulatory change will ultimately stimulate the U.S. medical device sector and especially innovation. We keep monitoring the potential impact of such an event on our Bionics strategy.

Companies mentioned in this article:

Abbott Laboratories (ABT US), Boston Scientific (BSX US), Insulet (PODD US), Medtronic (MDT US), Johnson & Johnson (JNJ US), Renalytix AI (RTNX US)

SOLVING A COMMON ASSET ALLOCATION MISTAKE

China's Underweight Puzzle

Portfolios are misaligned

The world's economic and political center of gravity has been shifting east for years. Institutional portfolios have failed to adapt to this paradigm and remain underweight on China (<5%).

- We wrote a similar asset allocation article focusing on the technology sector, [Technology is taking over the world](#).

Indices do not account correctly for China

Many institutional investors switch their portfolios to passive investment strategies. Stuck with poorly built indices, they will not benefit from the financial and governance reforms undertaken by the Middle Kingdom.

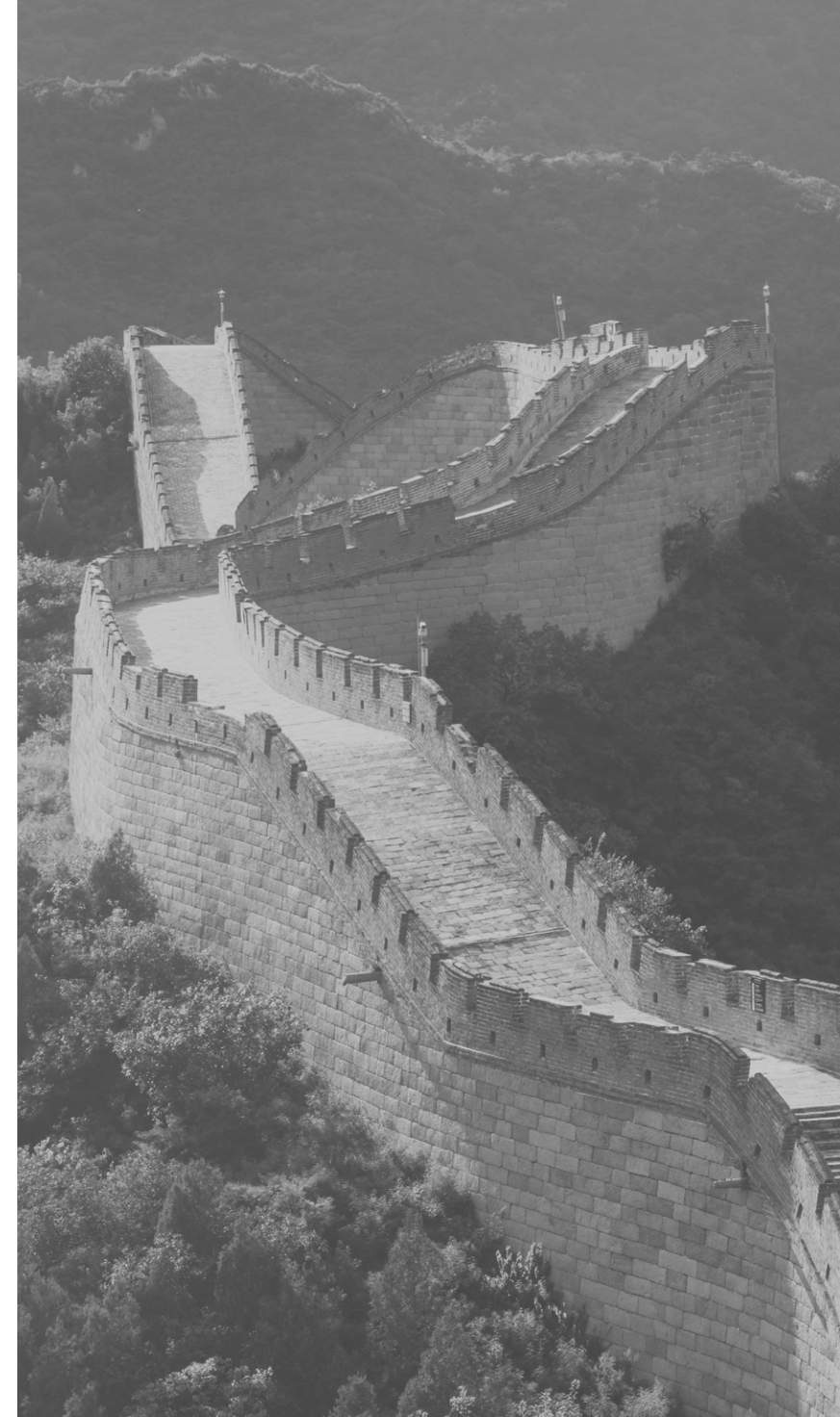
- In the U.S., passive funds account for ~50% of the total assets invested in equity funds (2020, vs. <5% in 1995).
- China's weight in MSCI World is <5%, while it accounts for 22% of world total market capitalizations.

Asset allocation remediation

China is at an inflection point as it seeks its technological independence from the U.S. Our sectors of interest – technology, healthcare, and (renewable) energy, will benefit the most from the changes in the country.

- The weight invested in China in our portfolios has increased significantly since inception and remains on an upward trend.

SOURCE:
Morningstar, MSCI



Resistance To Adapt And Change

Institutional investors are underexposed to China

The Chinese exposure of pension funds, endowments, and foundations is nowhere near where it should be. Given the importance of asset allocation in portfolio performance, institutional investors should correct their exposure to capture the growing contribution of China to global GDP.

- Chinese allocation is only at 4.6% globally, boosted by Asian investors.
- 70% of investors use Emerging Market strategies and do not have direct exposure to China.

China is now an open market for professional investors

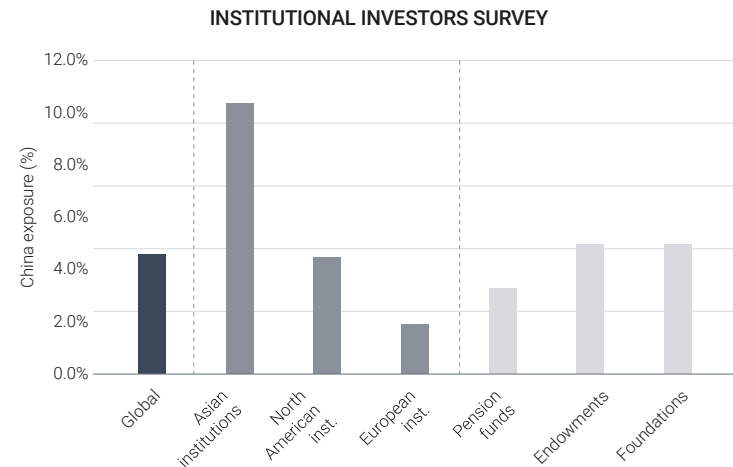
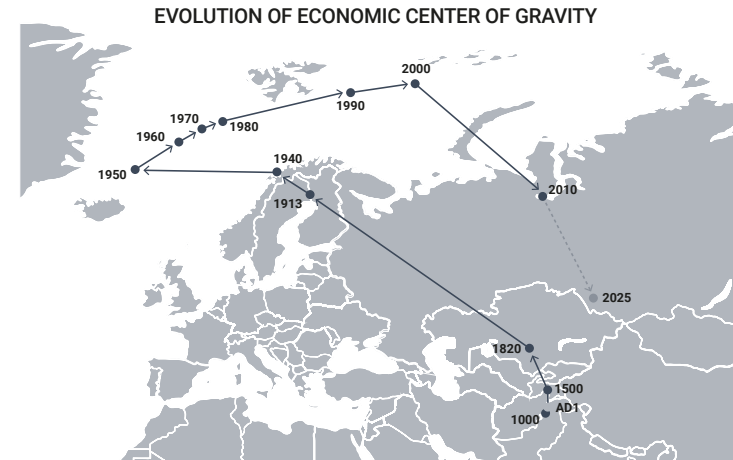
The low exposure to China is a legacy from when capital markets were closed to foreign investors. Such reasons do not hold anymore, as multiple routes have been opened for foreigners to access local markets.

- Foreign direct investment was authorized in 1978.
- Foreigners access local stocks through the Qualified Foreign Institutional Investor program (launched in 2002) or Stock Connect (2014).

Not an immature market anymore

The supposed immaturity of the market is another reason to explain the low Chinese exposure. However, Beijing has multiplied the reforms to boost its currency and the country's attractiveness on the international scene. Sophisticated investment solutions are now accessible to foreign investors.

- Foreigners can trade commodity futures and lend local stocks since 2020.



SOURCE: McKinsey, Global Institute, Greenwich Associates, Matthews Asia

Time To Drop These Indices

Several indices, one exposure

The rise of passive management has not encouraged institutional investors to increase bets on China. The oligopoly of index providers applies similar methodologies, resulting in similar weights in China for all indices.

- Average China weight in the main indices is <5%, similar to the holding of North American investors.

Partial inclusion of A-shares

Index providers only partially include Chinese A-shares into their indices. This weight is far from reflecting China's importance in the global GDP or the size of its stock markets.

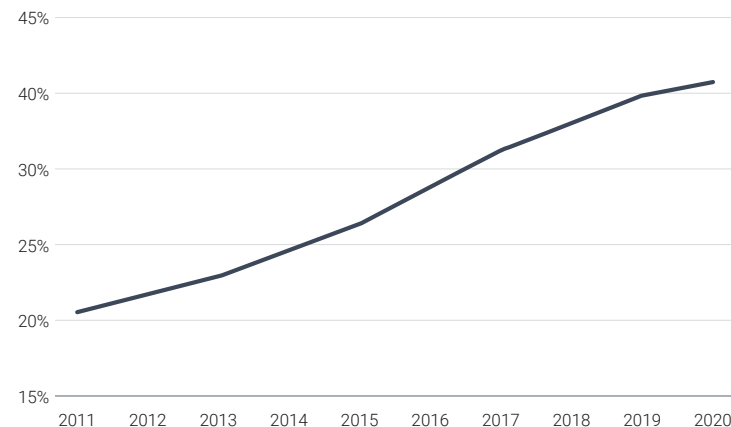
- Inclusion of A-shares in MSCI indices started in May 2018, and the inclusion factor rose to 20% in 2019.
- A full integration would increase the weight of China in the MSCI Emerging Markets to >50% (vs. 37% today).

More inclusion will not happen soon

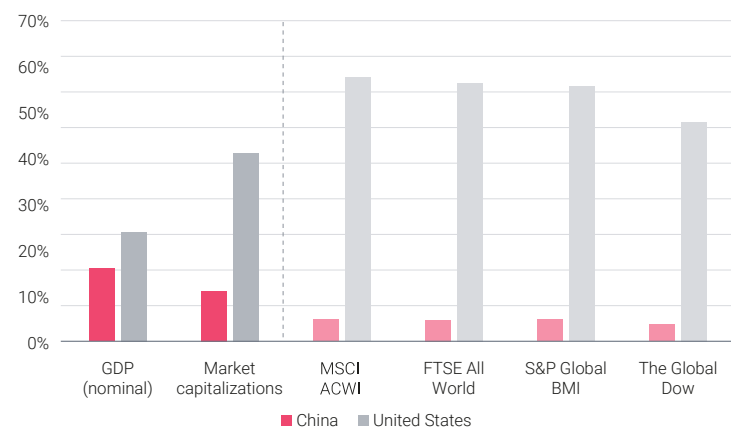
MSCI wants additional reforms before considering increasing the inclusion factor. All the required changes focus on market microstructure and are not blocking factors for the operations. Institutional investors should not expect more inclusion from the passive solutions soon and have to look at other products to fill the gap.

- Improvement requests include better access to derivatives for international investors, alignment of holidays between onshore and Stock Connect, omnibus trading mechanism, and alignment of settlement cycles.

MARKET SHARE OF PASSIVE FUNDS (ALL ASSET CLASSES, UNITED STATES)



CHINA & US INDICATORS AND WEIGHTS IN EQUITY INDICES



SOURCE:

Morningstar, MSCI, FTSE, S&P, World Federation of Exchanges, World Bank
 GDP as of 2019, Indices as of March 2021, Market Capitalizations as of December 2020

The Basics Of Asset Allocation

A forward-looking approach should prevail

Asset allocation errors often result from a backward-looking approach. Investors should instead identify what the structural forces and future forces that shape our economies are. Leaving China out-of-the picture is not conceivable.

- At AtonRâ Partners, we apply a forward-looking approach to identify our themes and our portfolios' construction.

GDP-based asset allocation

There is a strong correlation between high-growth countries and greater stock market returns over long periods. A simple strategic asset allocation model should start with GDP levels adjusted by forecasted GDP growth.

- Such a model would, for instance, underweight Europe and overweight China.
- Stocks being a leading indicator, this correlation may not hold over shorter periods. Tactical asset allocation reduces such risk.

A GDP-based portfolio in practice

China will overtake the U.S. economy within this decade, should the current trend continue. Using a GDP-based approach, institutional investors should increase their Chinese exposure by a factor of at least 3–5x to be correctly positioned.

- China's nominal GDP is close to 16% of total GDP (2019) – this share keeps increasing.
- China is already the largest economy in terms of GDP adjusted by purchasing power parity.

SOURCE:

[How Covid led to a \\$60 billion global chip shortage for the auto industry](#)



An Attractive Financial Market

Recognizing the breadth and depth of the market

The time when investors had to choose between banking and telecom state-owned enterprises in China is over. Small- and mid-sized public companies are flourishing in innovative sectors.

- Investors can choose from 4'800 listed companies (vs. 4'400 in the U.S.).
- 561 companies went public in 2020 in China and raised \$240bn (compared to 494 raising \$174bn in the United States).

Bringing portfolio diversification

China stock markets behave differently from the rest of the world due to the country's unique political system and economic policies. Correlation has historically been low with developed markets. The risk-adjusted return of a diversified portfolio may improve by simply increasing China's weight.

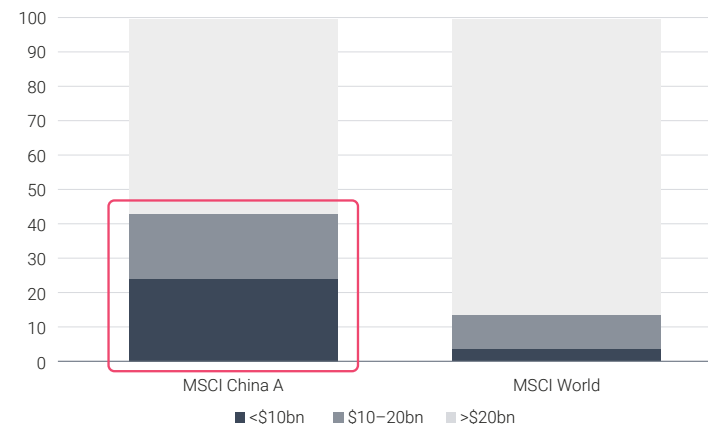
- The country's internationalization could increase correlation in the future – global equities could have a higher sensitivity to local news.

A market tailored for active management

China's stock market is characterized by high participation from retail investors. Abrupt movements and sector rotations are frequent. Portfolio managers with a longer-term view and focusing on fundamentals may benefit from these inefficiencies and generate alpha.

- >80% of the traded volume is done by retail investors (vs. ~20% in the U.S.).

MARKET CAPITALIZATION OPPORTUNITIES IN OUR PREFERRED SEGMENTS



INDICES CORRELATION (5-YEAR)

	CSI 300	MSCI World	S&P 500	Nasdaq	Euro Stoxx 50	SMI	Nikkei 225
CSI 300	1.00						
MSCI World	0.58	1.00					
S&P 500	0.58	0.98	1.00				
Nasdaq	0.61	0.93	0.94	1.00			
Euro Stoxx 50	0.36	0.83	0.78	0.66	1.00		
SMI	0.31	0.77	0.73	0.62	0.90	1.00	
Nikkei 225	0.44	0.79	0.76	0.72	0.75	0.66	1.00

SOURCE: Factset, MSCI, Refinitiv, FTSE Russell, AtonRā PartnersGraphs data as of April 2021

Driven By Innovation

The Chinese decade

While the '10s were a lost decade for the stock market due to slowing domestic growth and U.S.-China rising tensions, the '20s bring optimism. The government targets technological independence, which will transform its economy and offers rare investment opportunities.

- China's strategy was unveiled in late 2020 in its 14th Five-Year Plan.

Investing in structural change

China's growth miracle will not be equally spread across all sectors. Investors must allocate capital to the trends reshaping the country – digitization, climate change, social developments, etc. Our themes are well exposed to the sectors that will generate the highest growth.

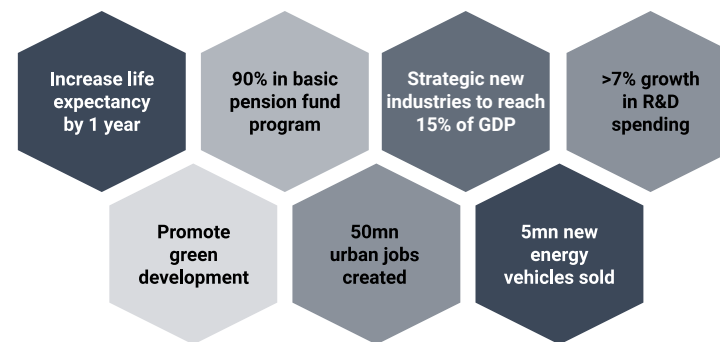
- We introduced the growing importance of China for our themes in a [special bi-weekly](#).

From economic rise to financial rise

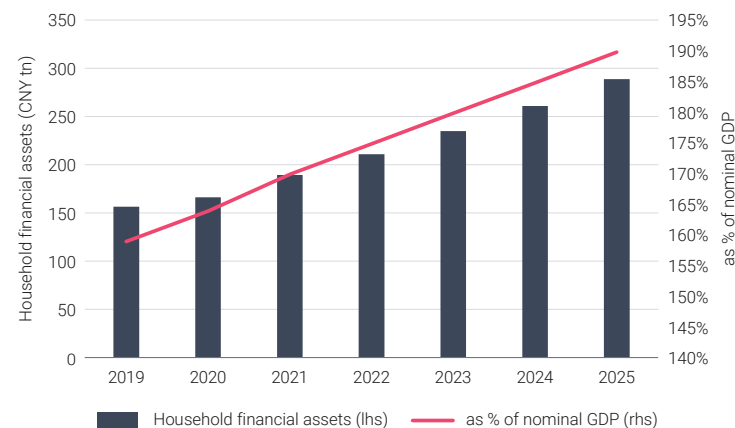
The past decades have been about China's economic rise and the next ones will be about China's financial rise. As a result, the local stock market should benefit from the wealth creation that is taking place.

- Household financial assets should grow at >10% p.a. (2019–2025).
- Market cap / GDP has room to expand in China (~85% vs. >200% in the U.S.).

SELECTED TARGETS OF CHINA'S 14TH FIVE-YEAR PLAN (2021–2025)



HOUSEHOLD FINANCIAL ASSETS



SOURCE:
UBS

Asset Allocation Remediation With AtonRâ

Growing exposure across all strategies

We have been increasing our exposure to China's stocks year after year. Given our conviction about the country, this trend is likely to continue. As a result, AtonRâ strategies help investors fill their asset allocation gap.

- Our Chinese exposure is currently above 10%.
- We still have room to increase our exposure, as the AtonRâ Fund prospectus sets a maximum limit of 20% on China.

Acknowledging culture differences

Local expertise is essential, e.g., to read the investor material or the financial statements that are not always available in English. Assessing if a business model is suitable for the Chinese market or analyzing the industry's value chain requires investment professionals with a local mindset.

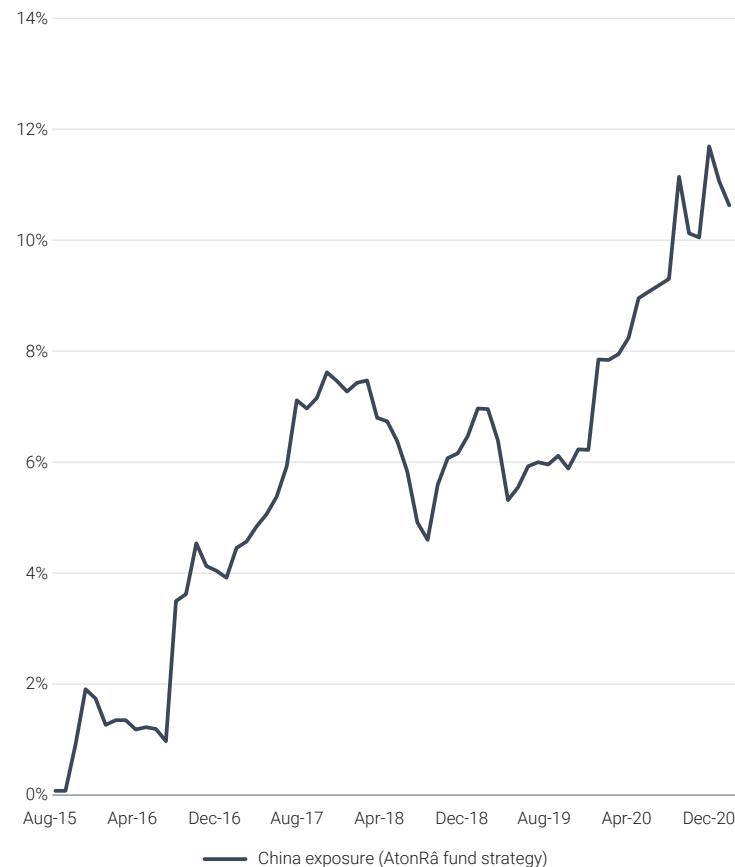
- We strengthened our team by hiring a dedicated analyst, who grew up in Taiwan, speaks mandarin, and understands the Chinese mentality.
- We share knowledge and insights with local asset managers.

More is yet to come

The shift of the Chinese economy towards its technological independence creates investment opportunities. A standalone allocation makes sense in this context.

- Stay tuned – a dedicated strategy on China leveraging our investment philosophy and approach is in the making.

EVOLUTION OF CHINA EXPOSURE (ATONRÂ FUND STRATEGY)



SOURCE:
AtonRâ Partners

Catalysts

- **e-CNY.** The to-be-launched Digital Currency Electronic Payment will eventually increase the globalization of renminbi and could facilitate access to the local markets for foreign investors.
- **ESG inclusion.** Institutional investors include ESG criteria in their selection process. Chinese regulators set a goal for mandatory disclosures for listed companies. China is catching up quickly with the rest of the world concerning responsible investing.
- **Opening-up.** More financial and economic reforms are expected. For instance, the Cross-Border Service Trade Negative List will promote the institutional opening-up in the services sector.

Risks

- **Better wrong together than right alone.** If indices do not increase the inclusion rate of China, many foreign investors will probably fear deviating from global indices.
- **Anti-trust regulation.** The Big Tech octopus drives innovation in China. The recent fine against Alibaba removes short-term uncertainty but may refrain foreign investors from going all-in on the country.
- **Accounting practices.** Scandals like Luckin Coffee revive prejudice of poor accounting practices in the Middle Kingdom. GAAP differences exist, but developed countries are not exempt from financial shenanigans – e.g., Wirecard.

Bottom Line

- Institutional investors have low exposure to China. As the country is transitioning to its technological independence and is on its path to becoming the largest economy in the world, investors should not miss this rare investment opportunity and adjust their Chinese exposure.
- The sectors that are likely to benefit the most from the country's transformation are our sectors of predilection – technology, healthcare, renewable energy. We have been increasing our Chinese exposure across our portfolios. Hence, AtonRâ strategies help investors with their asset allocation gap in China.

Companies mentioned in this article:

Luckin Coffee (LKNCY US), Wirecard (WDI GY)

CHINESE BUSINESSES ENTERING A SOFT"WAR"

Time To Go Local

Ready to fill the gap

China B2B software penetration is lagging the western world by some 15 years. The key to fill the gap is the coming digitalization of local SMEs, which will need to invest into new software to improve productivity, driving the next leg of growth in the technology sector in China.

- SMEs account for 80% of jobs, 60% of GDP but only <30% of IT spending.

Local advantage

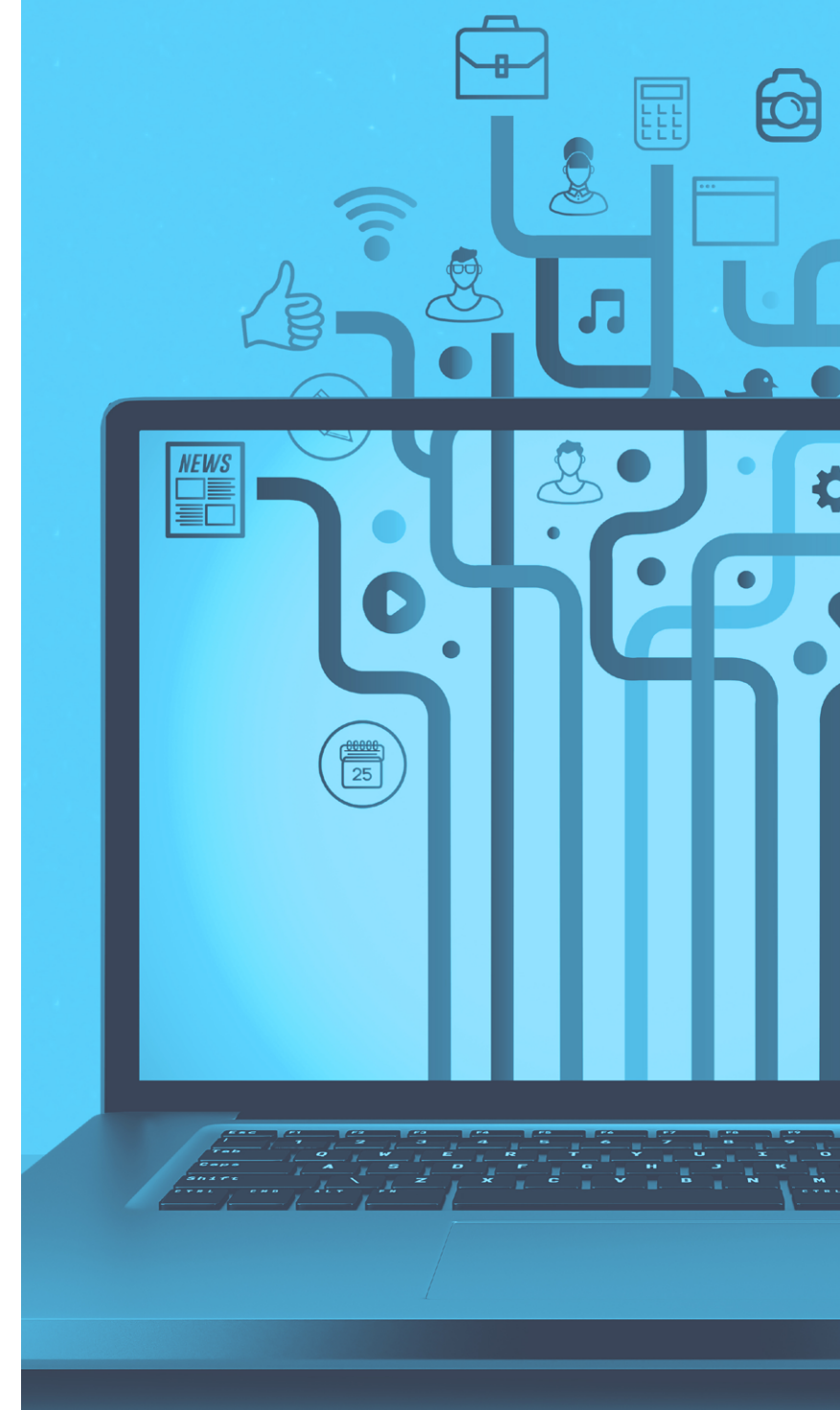
Both government policies and market structure make China a challenging market to penetrate, and the local companies are set to take the lion's share of the strong growth ahead. As the investible universe expands, investors should aim for local champions rather than overseas proxies.

- The overall software market is poised to grow at mid double-digit rates.
- Market growth will vary according to segments and verticals, so choosing the proper exposure will be paramount.

BATs and beyond

Even though the B2C segment is dominated by a few giants, namely Baidu, Alibaba, Tencent, and a few others, the B2B segment remains highly fragmented. Numerous specialized players are trying to come out of the giants' shadows.

- A few subsectors like Security, Financials, and Healthcare do stick out in the software space – both for the relative size and potential growth ahead.



Ready To Fill The Gap

China still lags behind

Overall IT spending (and thus software spending) in China is still lagging international standards and remains well below the U.S. levels. But growth is much more robust, and China is making up ground fast.

- Chinese total IT spending is about a quarter of that in the U.S.
- The gap in software spending is even more comprehensive, with China at 0.1% of GDP vs. 1.1% in the U.S.

Supply drivers firmly in place

The Chinese government has been promoting the country's digitalization and encouraging a shift towards the cloud over recent years. Infrastructure has matured, with reliable telecom networks and widely accessible cloud offerings now in place.

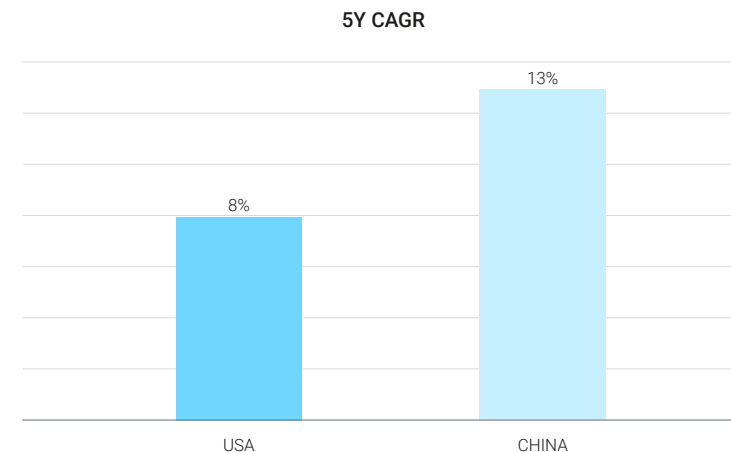
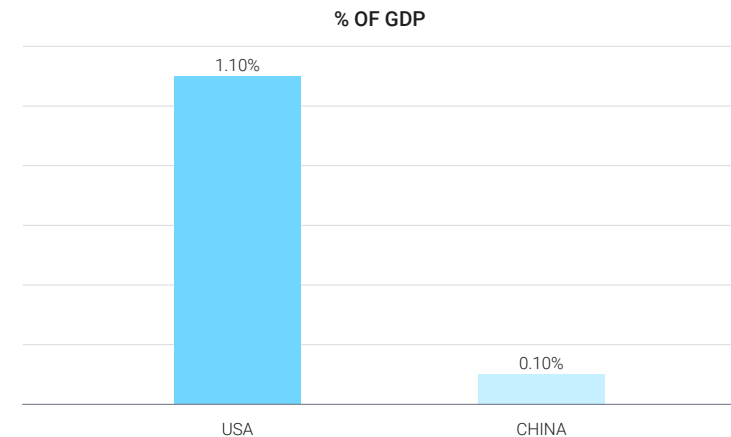
- The Made in China 2025 plan was instrumental in developing the BATs (Baidu, Alibaba, Tencent, and now a few others, making up the « Chinese FAANGs »).
- The general public has embraced smartphones, mobile internet, and e-commerce.

Demand is stirring up

Large and state-owned enterprises have so far driven the Chinese software market. But the vast population of SMEs remains largely under-digitalized and is facing rising pressure to improve operational efficiency.

- China has >32mn SMEs, contributing >60% to GDP, but representing <30% of software spending.
- Rising labor costs are forcing companies of all sizes to invest in improving efficiency to uphold margins.

SOFTWARE SPENDING



Locals Have The Advantage

A complex market to tap into

Western software giants have faced significant hurdles when expanding into China, as localization becomes a matter of mindset, not simply language translation, and cultural differences play a crucial role.

- As an example, standard CRM software that funnels cold-call-generated leads does not apply to the Chinese way of conducting business, based on networking and creating trust before negotiating.

Policies limit access

Government policies make it very difficult for foreign companies to set up shops in China. And the current trade tensions with the U.S. are adding fuel to the fire.

- Delivering internet-based content (like for a SaaS) requires a government-issued license that can be provided only to a China-based entity.
- Cybersecurity law requires data to be stored in the country and accessible anytime to the government.
- All infrastructure and servers also need to be China-based.

Local mindset still anchored in the past

Chinese companies are obsessed with data security and tend to require relatively high-level customizations, making it difficult to provide a standardized SaaS offering.

- Security software companies represent the first B2B sector by market cap (excluding the BATs conglomerates).



BATs And Beyond

A dominant position

The BATs largely dominate the domestic market in both the real economy as well as in terms of market capitalization. Thanks to their firepower, they have established ecosystems of linked companies (listed and private) that feed into their offerings.

- BATs represent 80% of the sector's market capitalization.
- Both Alibaba and Tencent have identified the B2B segment as a strategic growth relay for their cloud services, structured as IaaS. Rather than developing in-house products, they partner with 3rd party providers and integrate them into their communication platforms.

A very fragmented offering

In the B2B software market, across the different verticals and horizontals, the dynamics vary significantly, but most are very fragmented. The development is still at its early stages, and the winners may act as consolidators or get swallowed.

- BATs have extensive networks of shareholdings and are the leading suppliers of venture capital in the space.

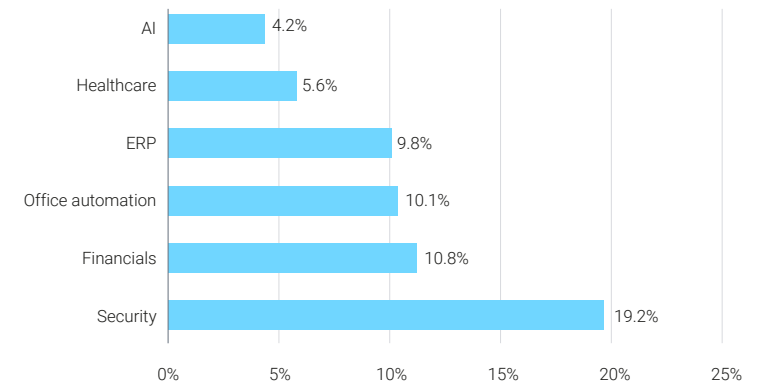
Local peculiarities favor specific sectors

The history and cultural background conditions significantly impact the development of the various market segments. Verticals like Security and Fintech are among the most interesting in the software space, offering both growth and a choice of players.

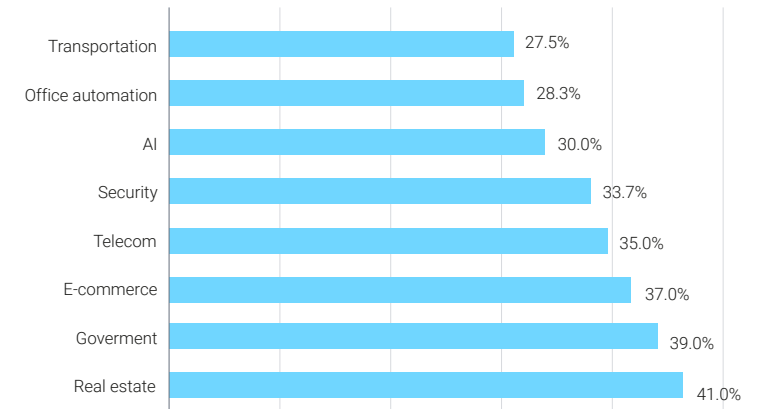
- China has been a « mobile-first » internet country, with a leading share in mobile payments – fertile ground for developing a rich fintech ecosystem.
- Chinese are obsessed with security – no wonder this segment tops the list.

SELECTED SEGMENTS

% OF TOTAL SECTOR MARKET CAP



SALES GROWTH (3Y CAGR)



Attractive Sectors

Security and cybersecurity

China's grip on IT networks and mass surveillance creates an ecosystem increasingly unreachable for foreign players, but, given its sheer scale, a source of massive opportunities for local players.

- Cybersecurity today is more than ever a political priority for the Chinese government: all actions are closely monitored and swiftly acted upon.
- The cybersecurity market could top \$17bn by 2024, at an 18% 5Y CAGR, even if the majority is represented by hardware components.

Financials and Fintech

China's latest 5-year plan bets on blockchain and fintech. Technology and the digital economy are expected to contribute a more significant portion of the country's GDP. The launch of the e-Yuan will accelerate the digital transformation of traditional financial players, bringing unprecedented opportunities to the whole supply chain.

- With 40% of the population without credit records, alternative lending is a must-have subsegment of fintech.

Healthcare

The Chinese AI healthcare market is the second-largest in the world. The shortage in medical resources, rising healthcare expenses, increased prevalence of chronic diseases have reinforced the need to apply advanced software tools to the medical field.

- A market expected to top \$2.5bn by 2024 with >40% 5Y CAGR.
- As an example, Yidu Tech's big data platform provides local analysis-driven clinical development, real-world evidence (RWE)-based research, and digital commercialization solutions.

SOURCE:
CSIS, Global Market Insights, AtonRā Partners



Catalysts

- **Catch up with western standards.** The strong growth is likely to accelerate as China plays catch-up and aims for technological independence. Local B2B software players across the board will be the beneficiaries.
- **Increasing preference towards local players.** The Made in China 2025 plan has been reinforced by successive policy decisions, aimed at boosting domestic technological competencies.
- **Talent pool.** China has the largest number of software engineers globally, who have found a local fertile ground to experiment and develop new applications with easy access to advanced infrastructure (mobile, cloud).

Risks

- **Trade tensions.** Should the U.S.-China trade war escalate, the impact on business sentiment will be immediate and be reflected by a reigning-in of capex spending.
- **Sustainability of political system.** The growth of the Chinese internal market is predicated on government planning and support. Should a change intervene in the political system, the ensuing period of disruption would shatter any growth prospects.
- **Cybersecurity law.** The requirement of full access to any data from the government implies huge costs to comply, which mechanically reduce budget availability for SMEs to spend on digitalization.

Bottom Line

- Chinese B2B software market is coming to an inflection point. Conditions are in place for SMEs' software spending to catch up with western standards, and the local companies are in a prime position to capture the lion's share of the resulting strong growth. Contrary to the B2C that is dominated by a handful of giant conglomerates, the B2B segment is highly fragmented, offering a plethora of opportunities across various business models.
- With growth and risk-adjusted expected returns varying across a large spectrum of subsectors and verticals, choosing the right players is of paramount importance. Our portfolios are already positioned on segments that stick out, like Security, Fintech, AI, or Healthcare.

Companies mentioned in this article:

Alibaba (9988 HK), Baidu (BIDU US), Tencent (0700 HK), Yidu Tech (2158 HK)

CHINA ZEROES IN ON CARBON FOOTPRINT

Going Carbon Neutral By 2060

Commitment to a zero-carbon future

In a previous note, we laid out our views on china's cleantech industry. In this report, we dive into China's paths to carbon neutrality. Compared to its major peers, China clearly lags but appears determined to catch up.

- China has announced that it will strive to bring its carbon emissions to a peak by 2030 and become carbon neutral before 2060.
- Since China is the single biggest emitter in the world, its commitment stirs the global climate change community.

The trick is shifting from old 50 to new 100

The revolution will require primary energy shifting from the current >50% of fossil fuel to renewable energy. Achieving neutrality requires China almost to rebuild the way the economy has been structured.

- The four roadmaps to the final goal are clean energy, hydrogen development, electrification, and carbon capture.
- Emission trading system can moderate domestic CO2 usage effectiveness through the market mechanism.

Golden opportunities coated in green

Chinese green energy is sweeping the world. Chinese companies have leading global positions, exporting advanced technology and addressing lucrative green opportunities.

- Emphasis is on EVs, solar power technology, and the battery industry.



Zero- Carbon CHINA

www.zero-carbon.org.cn

Climate Change Becoming World's Top Priority

Global carbon emissions need to shrink 10x faster

Since the start of the industrial revolution, global carbon emissions have been rising exponentially, amounting to 35bn tons in 2018, and are forecasted to surpass 43bn tons by 2050.

- The reduction rate needs to accelerate tenfold to meet the Paris Agreement targets to tackle climate change.

The resolutions from the major countries

World major economies have already long passed their carbon peaks and committed to reaching carbon neutrality during 2050–60.

- In 2020, the U.S. retired 11.3GW of coal plants (13 out of 241) while building no new plants.
- The U.K. scrapped a large capacity last year, seeking to eliminate all coal-fired plants by 2025.
- The Japanese government plans to suspend or shut inefficient plants by 2030.

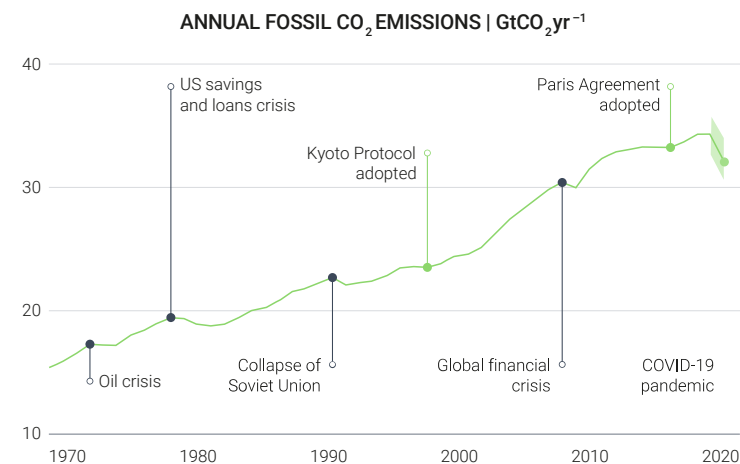
China energized international climate ambition

Since China surpassed the U.S. in 2006 and became the most significant carbon emitter globally, it has never looked back, becoming responsible for one-third of the world's total greenhouse gas emission. Its onboarding was seen as an unavoidable condition to make global reduction targets credible.

- Last year, China surprised the world by announcing its commitment to net-zero emissions within 40 years.

SOURCE:

[The World Will Store 200 Zettabytes Of Data By 2025](#),
[Cloud computing overload: How many apps is too many?](#)



Country	Time to reach peaks	Peak value (bn tons)	Per capita Emission (tons)	Time to Carbon neutrality	From peak to zero (years)
U.K.	1991	0.807	14.05	2050	59
E.U.	2006	4.854	10.28	2050	44
U.S.	2007	7.416	24.46	2050	43
Brazil	2012	1.028	5.17	2060	48
Japan	2013	1.408	11.17	2050	37
Korea	2013	0.7	13.82	2050	37
China	2030	12 (assumed)	8.5 (assumed)	2060	30

Tackling A Huge Task

The World's Factory takes on an extra challenge

Usually, carbon emissions in a given economy shall peak only after completing the industrializing process, as the economic focus shifts from manufacturing to the service industry. However, China still belongs to the developing economies and serves as the world's manufacturing factory, making the task double as hard.

- China's per capita emissions are less than half that of the U.S. and lower than Russia and Japan, albeit it has the largest absolute emissions.

Overcoming coal addiction

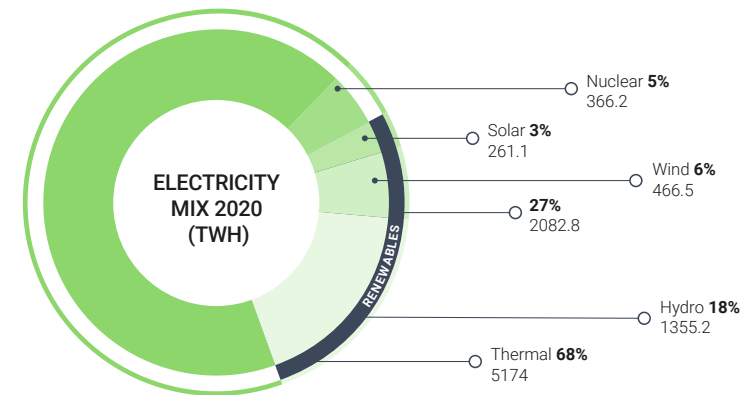
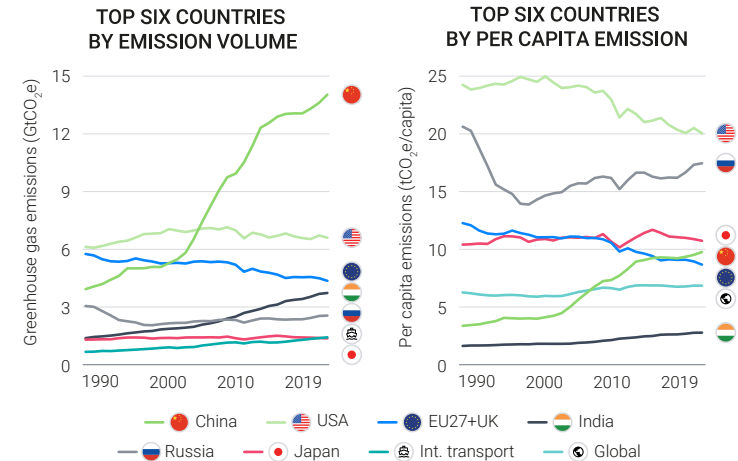
Given its industrial structure, lack of energy efficiency, and rapidly growing energy demand, the Chinese government used to consider coal as the most reliable power source to meet the needs to power its development.

- Coal accounts for 56.6% of the total energy use in 2020.
- Last year, China built coal-fired plants for 38 GW, outstripping the 8.6 GW lost from coal-fired plants that were retired.

Renewables outpacing thermal

Energy needs continue to grow, and China is expanding its overall capacity for both fossil and renewable sources. But renewables will increasingly take the lion's share of capacity addition.

- Coal-based power's capacity share is expected to drop by 16 % in 2030 but will remain the primary source at ~41% of the total installed base.
- Chinese experts forecast that renewable energy (wind, solar, and nuclear) capacity will increase to represent ~47% of the total installation by 2030.



SOURCE:
[China's addiction to coal clashes with carbon neutrality pledge](#)
 Emissions Gap Report 2020

The Paths To Net-Zero

		PATH	CURRENT	2060
Energy Activity	Energy Generation	Clean Energy	<ul style="list-style-type: none"> Power generation sector is the biggest emitter, accounting for 37.6%. Coal-fired power provides 68% of the total power supply 	<ul style="list-style-type: none"> 100% clean energy Solar will dominate, followed by wind power
		Hydrogen Energy	<ul style="list-style-type: none"> Much of production tied to fossil fuel-reliant "grey hydrogen", which emits high CO₂ Hydrogen, when converted into electricity, produces only water and heat Hydrogen energy is still in the infancy 	<ul style="list-style-type: none"> Hydrogen power application in aerospace and aviation A low cost of solar power back further brings down the cost to produce hydrogen
	Energy Consumption	Electrification	<ul style="list-style-type: none"> Energy mismatch between supply and consumption Heavy industry and transportation are the focused sectors 	<ul style="list-style-type: none"> EVs & commercial electric vehicles and hydrogen-powered aircrafts Electrification in heavy industrial sectors
Industrial Process		Carbon Capture	<ul style="list-style-type: none"> Calcium oxide(lime), is a principal ingredient in the production of cement and glasses However, calcium oxide, when converted from calcium carbonate, will produce CO₂ Cement, steel, and glass manufacturing are key industrial sectors for china's development, especially for one belt one road 	<ul style="list-style-type: none"> Carbon capture, use, and storage technologies can capture > 90% of CO₂ emissions from power plants and industrial facilities. Captured CO₂ can be used in enhanced oil recovery and the manufacture of fuels or be stored in underground geologic formations

SOURCE:
<http://finance.eastmoney.com/a/202103301864319355.html>

Key Initiatives To Support Going Green

Implementing a dual control system for total energy consumption

Over the last 15 years, China’s “dual controls” – setting energy intensity targets and caps on total energy consumption – have helped drive its energy transition towards low-carbon development.

- With its 14th Five-Year Plan, China sets clear targets for different provinces and municipalities, and directly scrutinizes their performances.

Building a green financing system in a market-oriented way

\$6.4tn will be needed to build the new green power generation capacity, but the government expects only to cover a small fraction, letting banks and the capital market take the lead in filling the gap.

- Favoring the issue of green bonds with favorable terms and helping green enterprises shorten the required time to go public.

Carbon emission trading the tool to moderate the market

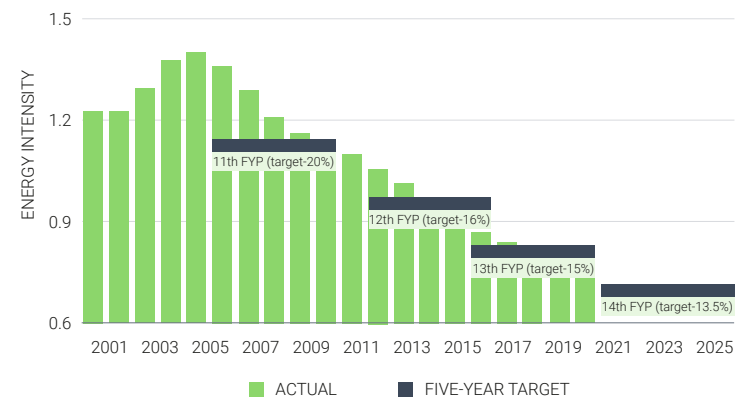
A carbon emission trading scheme allows provincial governments to set pollution caps for big power companies and manage the total emission volume. Pilot projects are in place since 2011 in 8 regions, driving major emitters to significantly reduce emissions over the years.

- For example, in Guangdong’s pilot plan, 250 major carbon emitters are listed, accounting for 70% of the provisional emissions, and their carbon emissions per unit of GDP shrank by 21.6% from 2013 to 2019.

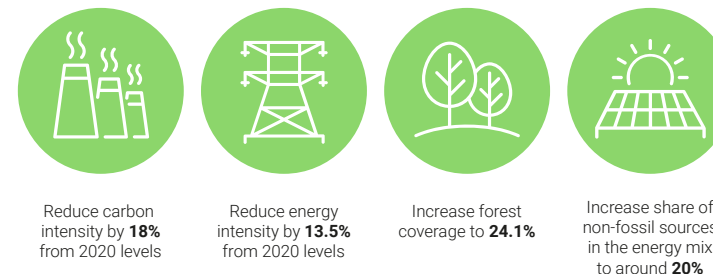
SOURCE:
New carbon trading rules take effect amid china’s efforts to go carbon-neutral

CHINA'S FIVE YEAR PLAN TARGETS HAVE DRIVEN ENERGY INTENSITY REDUCTIONS

ENERGY INTENSITY: TONNES OF COAL EQUIVALENT PER 10,000 YUAN OF GDP



THE FIVE YEAR PLAN'S CLIMATE-RELATED TARGETS FOR 2025



Putting A Price Tag On Carbon Emissions

A decade long regional journey to a national carbon market

A national-level carbon emission trading scheme, bound to eclipse the E.U.'s one in terms of size, is scheduled to start by the end of June 2021.

- The first phase of the scheme includes >2'200 companies from the power sector that account for ~30% (>4 bn tCO₂) of the total national emissions.
- The carbon trading center will be in Shanghai, while Hubei will oversee the registration of applications and overall data collection.

Trading CO₂ like gold

The emission trading scheme (ETS) is similar to the existing ones, allowing companies to trade CO₂ emission rights. Emissions reduction or removals can be either "produced" and sold or bought to offset actual emissions above the given cap.

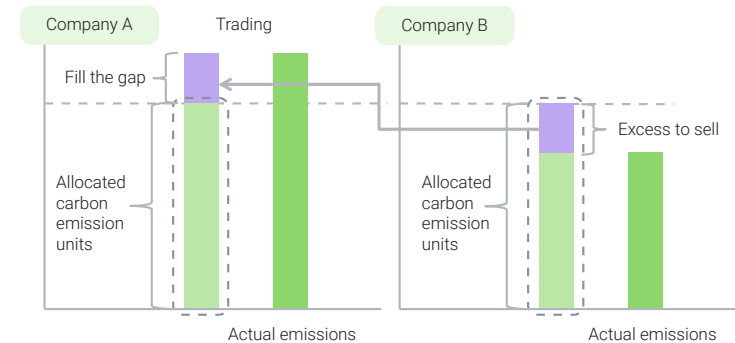
- The government determines the total target amount of local emission reduction and then allocates the allowance to the enterprises.

Acquiring extra emission quotas

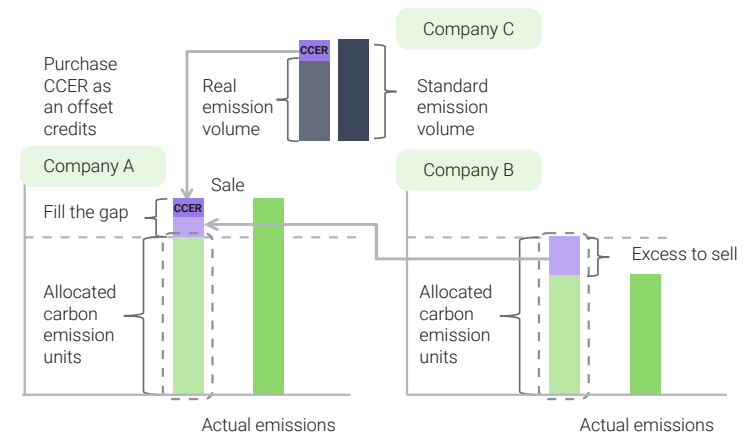
ETS allows economic freedom to trade the unused volume but within given limits. For energy-saving enterprises (renewable energy producers), the state will grant a certain carbon emission award CCER (voluntary emission reduction).

- With no more than 5% of the total allowance, a company that needs extra emission can trade with participants that have excess quota or CCER.

TOTAL CO₂ EMISSION CONTROL MECHANISM
PURCHASING EMISSION QUOTA



CARBON OFFSET MECHANISM PURCHASING CCER



SOURCE:
China's national carbon market is about to launch

China Is Leading The Race

Strong position in surging zero-carbon tech

Fundamentally underlying our investment thesis for renewable energy, decarbonizing in the power generation sector is the most critical component to revolutionize the current energy system.

- Coal-fired plants will be replaced mainly by solar and wind power.
- In 2019, China smashed solar and wind power building records, accounting for more than one-third of the world's deployments.

The cheaper, the better

Today it is less expensive to build new wind plants than new coal-fired power ones, including capital, operating, and maintenance costs, and the trend is set to continue widening the gap.

- Over the last decade, the average cost of electricity from new solar plants and new wind plants dropped 82% and 33%, respectively.
- In China, 43% of existing coal plants are running at a net loss - replacing these uncompetitive units with new renewable power generation capacity could have yielded net financial savings of \$18bn.

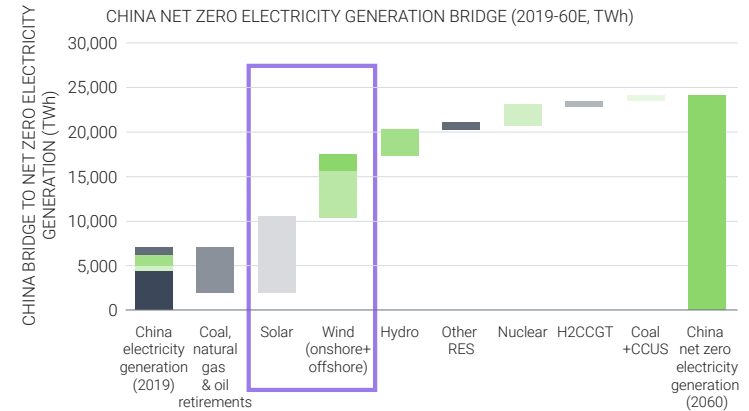
Enhancing export competitiveness

China has developed leading positions in clean techs.

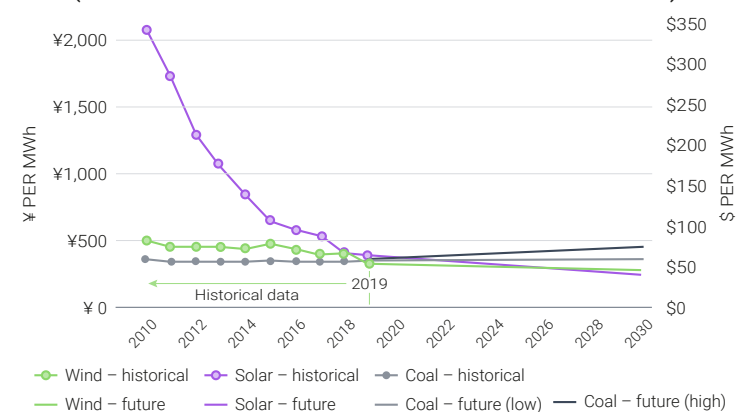
- Chinese companies make up over a third of the world's wind turbine manufacturers and built over 70% of the world's solar photovoltaics.
- China holds ~75% of the world's production capacity for lithium-ion battery cells.

SOURCE:
[China's carbon neutral opportunity](#)

FASTER POWER SECTOR DECARBONIZATION COULD INCREASE CHINA'S ECONOMIC GROWTH UP TO 15% BY 2030.



SOLAR AND WIND ARE NOW COMPETITIVE WITH COAL (AVERAGE COST OF ELECTRICITY FROM NEW PLANTS IN CHINA)



Green Solutions Create Great Opportunities

Storage a key enabler

Unlike the power and industry sectors, the specific requirements of the transportation sector make it more challenging to use wind and solar directly. Decarbonizing the sector requires developing efficient and cost-effective storage solutions.

- The lithium-ion battery has become the technology of choice for different energy storage solutions.
- The cost of battery-electric storage has plunged 85% since 2010, creating increasingly compelling economics for transportation electrification.

A bigger battery

Battery plays a crucial role in the long-term success of electric vehicles (EVs).

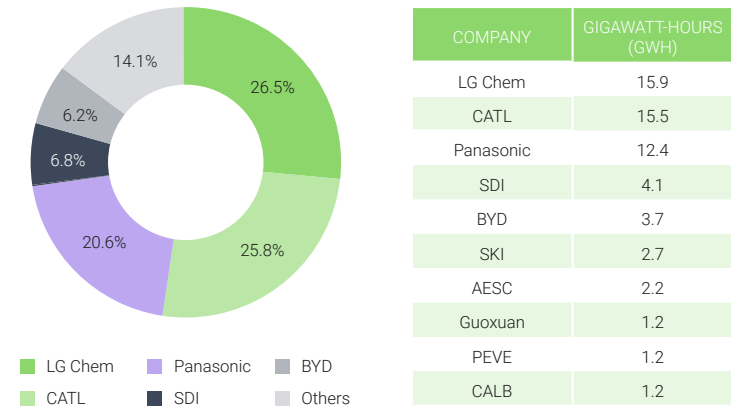
- Chinese companies accounted for more than 80% of the world’s output of battery raw materials (as of 2019).
- Two leading Chinese giants, CATL and BYD, control 32% of the global battery manufacturing market.

China in the driver’s seat

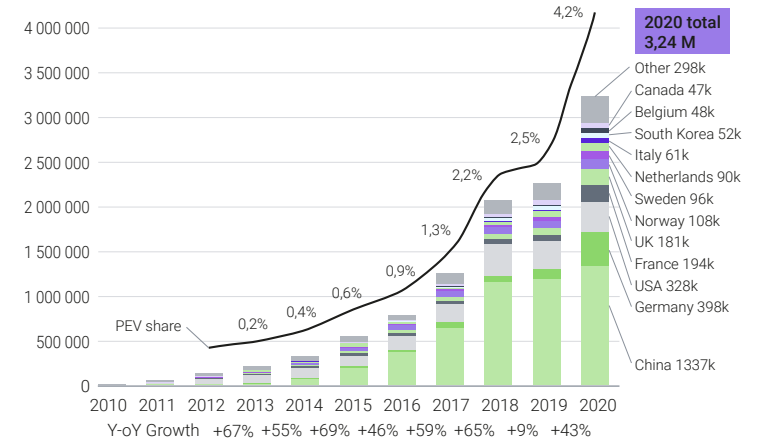
China has the world’s largest EVs market, served chiefly by domestic manufacturers such as NIO and BYD.

- 30% of global car sales were in China in 2020, up from 27% in 2019.
- By 2023, EVs can reach price parity, becoming more affordable than conventional cars, further “fueling” the sales growth.

EV BATTERY MARKET SHARE (CUMULATIVE JAN–AUG 2020)



GLOBAL PLUG-IN VEHICLE MARKETS BEV & PHEV – LIGHT VEHICLES



SOURCE:

Canalys: China’s electric vehicle sales to grow by more than 50% in 2021 after modest 2020, [China’s carbon neutral opportunity](#)

Catalysts

- **Technology leadership.** Beyond access to cheap labor and capital, China is ramping up its R&D efforts, building an innovation leadership status that will further boost its clean technology industry.
- **Reaching “China price”.** China’s zero-carbon techs are at different developing phases. Improving learning curves and greater deployments contribute to economies of scale, predictably boosting cost-effectiveness.
- **Supportive initiatives in full swing.** China will spur the industry with more well-designed policies, especially in the renewable energy sector, driving technological transformation at the required pace.

Risks

- **International pressure.** The U.S. and E.U. are realizing the importance of clean technologies and are putting efforts to develop local production, which can be a risk to Chinese companies (subject to import tariffs).
- **Banking system disability.** The government’s command to support particular industries or projects increases the credit, market, and liquidity risks of financial institutions.
- **Social pressure.** China’s climate ambitions might face social pressure, notably from the millions of Chinese working in the fossil fuel industry (e.g., coal).

Bottom Line

- China’s zero-carbon goal is sparking a structural industrial transformation that will have a major impact on a global scale. China is the cleantech factory of the world and it intends to maintain its lead by increasingly supporting technological innovation.
- Our portfolio is well-positioned to capture the unprecedented green opportunities in China’s ambitious plan as we see the tectonic shift toward sustainability, focusing on companies and sectors positioned to benefit from the transition to a more sustainable future.

Companies mentioned in this article:

CATL (300750 CH), BYD (002595 CH), NIO (NIO US)

CHARTS FOR THOUGHTS

The Need For Automation

Technology outperformance

The chart, courtesy of FS Insights, compares demographic cycles of labor shortage (i.e., when the total population grows more than working-age population) with the relative performance of the broader technological sector.

- During the two decades after WW2, and in the 90's, the U.S. experienced labor shortages, which translated into tech outperformance.
- In a labor surplus cycle, tech sector returns are in line with or slightly underperform the broad market.

The need for technology

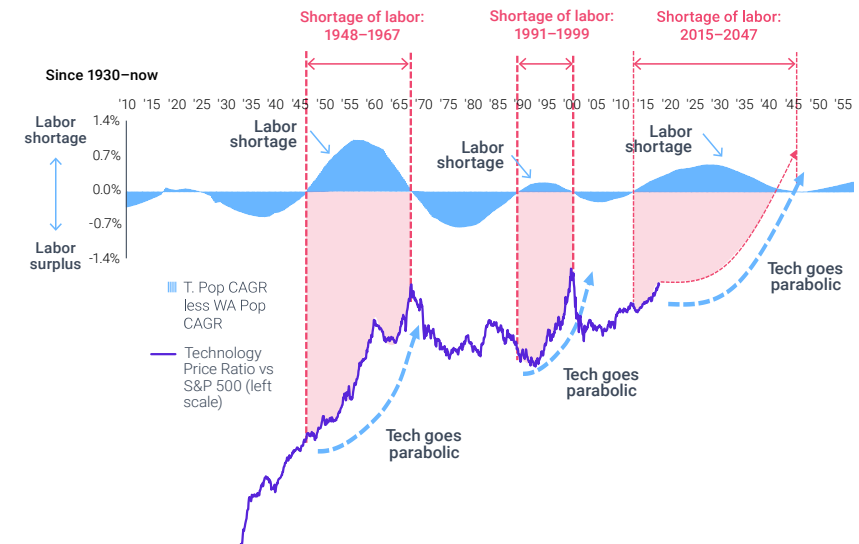
Labor shortage occurs either because the total population increase (e.g., birth rate) or because the working age population is declining (e.g., retirement). Such shortage translates into an imbalance of demand and supply (of labor), that can find an equilibrium through higher prices (salaries), or productivity gains, or a combination of both.

- Technology is key in increasing productive efficiency, thus its perceived value increases during periods of labor shortage.

Will technology replace workers?

We entered a new demographic cycle of labor shortage in 2013. Additionally, government checks or potential Universal Basic Income are reducing willingness to work and thus indirectly exacerbating the labor shortage. The impact on the need for technology, which is now ubiquitous, may thus be even stronger.

- Is the latest unemployment report another piece confirming labor shortage?



SOURCE:

[fs Insight: 2019 Strategy, Demographics helping US de-couple](#)

Invest Beyond The Ordinary

Explore our investment themes:
www.atonra.ch/investment-themes/

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