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China's Emerging Frontiers | Asia Pacific

China's Next Industrial Revolution

China is entering a new phase of industrial development, moving beyond its historical advantages of low-cost and manufacturing scale towards ecosystem and innovation leadership. We see profound implications for China's industrial supercycle, manufacturing profit migration, and its position in global manufacturing value chains.



China's manufacturing story is often reduced to overcapacity, low prices, margin pressure and 'China+1'. We believe the more important story is what comes next. China is moving from being the world's factory towards becoming the world's industrial operating system – combining scale, automation, AI, supply-chain depth and global deployment. We see this transition as China's Industry 5.0, following digitalization and connectivity in Industry 4.0.

China's Industry 5.0 starts from a powerful position, with ~28% of global manufacturing value-added, coverage of all 666 subcategories as defined by the UN, and a no.1 ranking in over half of global export products. More than 30K smart factories and 100mn connected industrial devices provide the physical and data infrastructure for the next phase. The key question is whether China can make its industrial system adaptive, sovereign and globally embedded.

#1 Industry 5.0: Built on the pillars of Industrial Intelligence, Resilience and Leadership (IRL)

China's proven strength is industrial deployment; Industry 5.0 aims to extend this model upstream. In the next phase, we see five key breakthroughs. On intelligence: 1) AI-native adaptive factories, and 2) embodied AI that turns physical labor into

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software-upgradable capital. On resilience: 3) sovereign and evolvable industrial stacks, and 4) export of industrial ecosystems, not just products. And on leadership: 5) technological leadership in selective areas – the larger opportunity is to lead the upstream foundational layers that improve many downstream industries at once.

#2 This is a physical investment supercycle

China's Industry 5.0 will require a major rebuild of the production system. We estimate approximately US$12tn, or Rmb80tn, of incremental industrial capex (out of a total cumulative US$50tn of industrial capex) for industrial IRL during 2026-35 in China. Spending will flow into: AI, power and digital infrastructure; factory automation, robotics, sensors, controls and software; and strategic capacity in semiconductors, advanced materials, energy, mobility and other frontier industries. We estimate investment will accelerate to a 6-7% CAGR over 2028-35, after a slower start of 4-5% over 2025-27 due to ongoing anti-involution efforts.

#3 The expected payoff will be productivity, margins and global share

By 2035, we believe China's Industry 5.0 should have delivered three major benefits, likely in a J-curve pattern:

- Industrial margins: Profit margins rise from approximately 5% to 8%, as value shifts towards software, equipment, materials, services and platforms.
- Potential GDP: China's potential GDP level rises by approximately 3.5%, with productivity benefits becoming more visible from the late 2020s.
- Manufacturing share: China's share of global manufacturing value-add increases from ~28% to 30%.

#4 Multipolar global system: 'Made in China' becomes 'Made by China'

China+1 and reshoring is the current trend, but we think it will struggle to replicate China's full upstream ecosystem quickly. The next phase will increasingly be 'Made by China' in that China supplies the components, machinery, production systems, technology, and service networks for manufacturing overseas, while embedding standards in global industrial ecosystems, as the global system becomes more multipolar.

#5 China's Industry 5.0 won't be linear

China's path to Industry 5.0 will likely hinge on policy, technology and geopolitics: stronger policy support for household demand, faster industrial-AI breakthroughs, and stable overseas market access could accelerate monetization, productivity and deployment. The core risk remains economically inefficient success: premature fiscal tightening and supply-centric investment could create 'smart overcapacity', deflation and weak returns, while technology bottlenecks, prolonged outbound investment controls and trade friction could delay adoption and overseas expansion.

#6 Equity implications: Structural opportunities

Industry 5.0 should create an efficiency and ROE cycle. We expect key beneficiary groups will be: 1) Industrial intelligence enablers, such as software, automation, controls, sensors and robotics; 2) Sovereign bottlenecks: wafer fab equipment

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(WFE), electronic design automation, computer numerical control (CNC) machine tools, metrology and advanced materials; 3) Frontier platforms: humanoids, autonomous systems, electric vertical take-off and landing aircraft (eVTOL), and aerospace; 4) Ecosystem exporters: EV-battery-charging, solar-storage-grid, smart factories; 5) Global leaders: autos, electronics, semiconductors, and machinery.

We identify 45 stocks that are best positioned. **What's priced in:** Near-term capex broadening out, localization theme. **Not priced in:** Long-term potential of China's transition, ROE recovery from productivity, upstream software/equipment profit migration, and global TAM potential.

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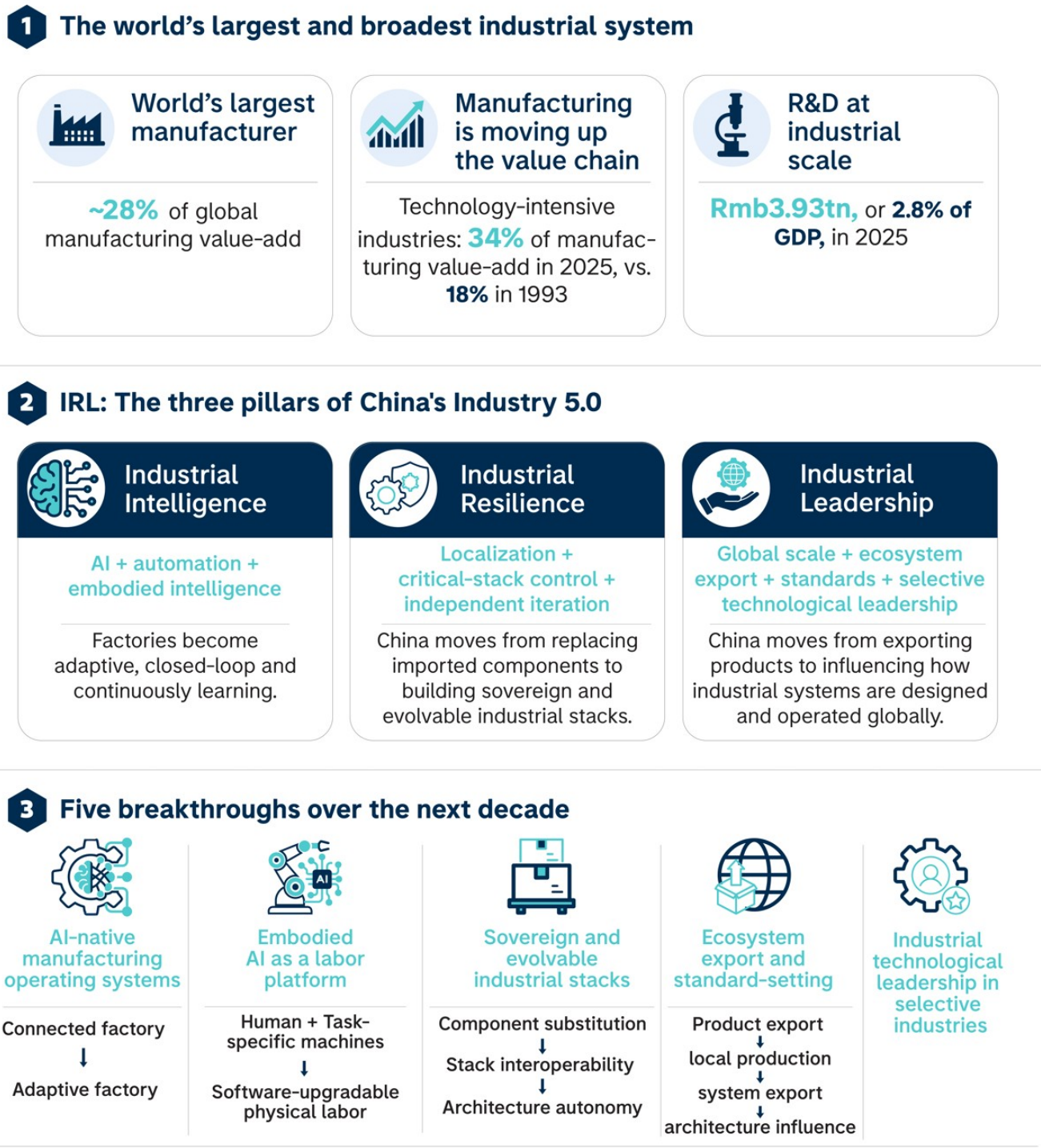
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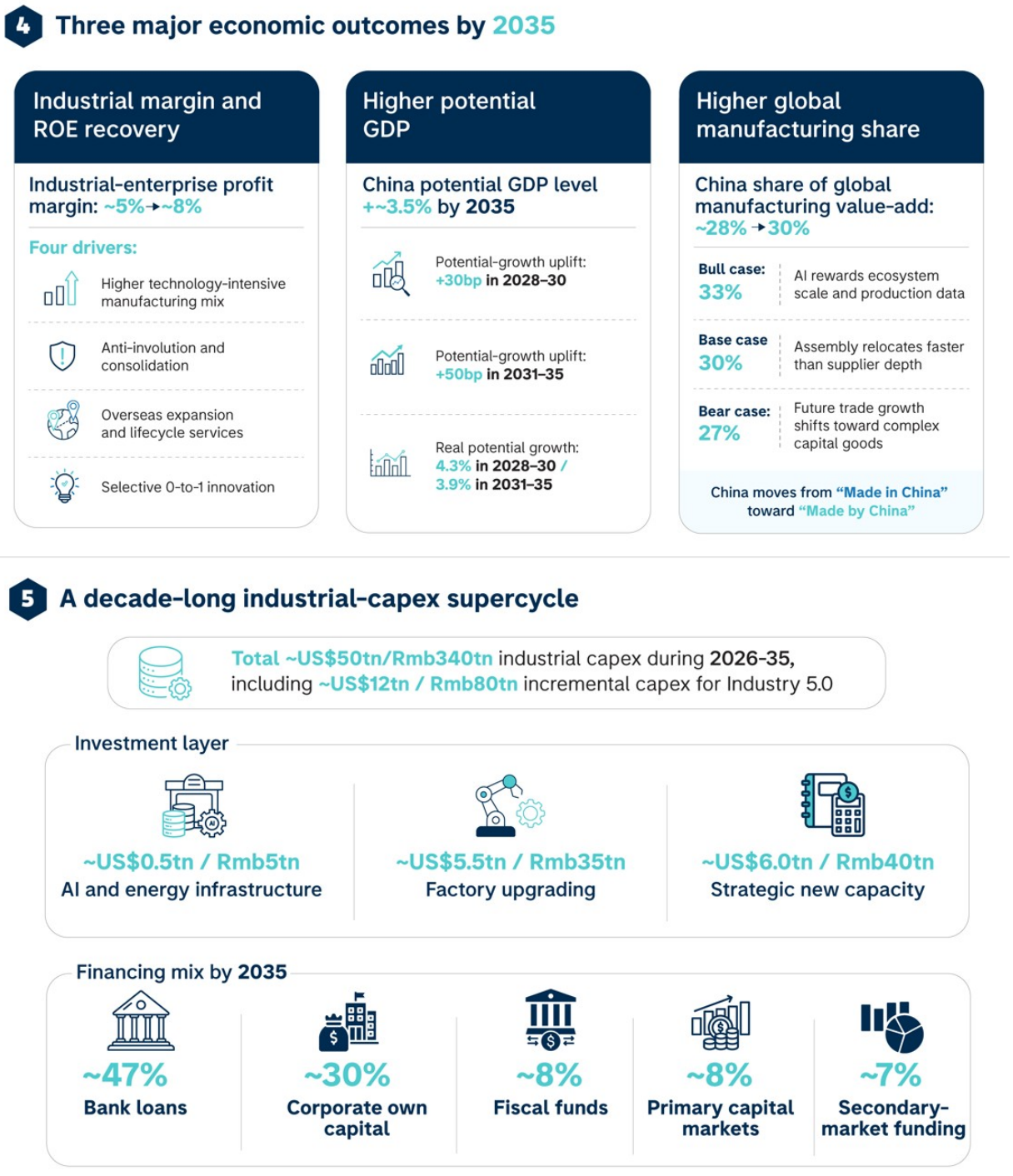
China Entering Industry 5.0 with its Third Industrial Upgrade

Exhibit 1: China's Industry 5.0 Overview



Source: Morgan Stanley Research

Exhibit 2: China's Industry 5.0 Overview (Continued)



Source: Morgan Stanley Research.

Please refer to Appendix I – Evolving Through Industry 1.0 to 5.0 .

China's Industry 5.0 Stock List

Exhibit 3: China's Industry 5.0 stock list

Ticker	Company name	GICS Sector	Market cap US$mn	Avg daily trading US$mn	Trading currency	Share price close 9/9/2026	MS stock rating	TP Local currency	Upside to target price	Analyst name	Category
Auto											
1211.HK	BYD	Consumer Discretionary	97,378	193	HKD	83.9	Overweight	121.0	44.3%	Hsiao, Tim	Leadership
9660.HK	Horizon Robotics	Information Technology	8,947	73	HKD	4.4	Overweight	8.7	96.8%	Hsiao, Tim	Industrial Intelligence & Leadership
3606.HK	Fuyao Glass	Consumer Discretionary	18,488	21	HKD	55.6	Equal-Weight	53.5	(3.7%)	Wang, Shelley	Leadership
Consumer											
000333.SZ	Midea	Consumer Discretionary	96,695	274	RMB	85.2	Overweight	99.0	16.3%	Lou, Lillian	Industrial intelligence & Leadership
688169.SS	Roborock	Consumer Discretionary	4,904	133	RMB	126.9	Overweight	155.0	22.1%	Ling, Hildy	Industrial intelligence & Leadership
Energy											
300750.SZ	CATL	Industrials	229,884	1,298	HKD	335.5	Overweight	595.0	77.4%	Lu, Jack	Industrial Intelligence & Leadership & Resilience
Healthcare											
688271.SS	United Imaging	Health Care	13,033	73	RMB	107.0	Equal-Weight	140.0	30.8%	Yan, Alexis	Leadership
300760.SZ	Mindray	Health Care	30,673	227	RMB	170.0	Overweight	210.0	23.6%	Yan, Alexis	Leadership
2675.HK	Edge Medical	Health Care	1,824	2	RMB	36.7	Overweight	75.0	104.6%	Yan, Alexis	Leadership
0853.HK	MicroPort	Health Care	1,485	10	RMB	6.1	Equal-Weight	10.5	72.8%	Yan, Alexis	Leadership
6699.HK	Angelalign	Health Care	2,075	8	RMB	94.8	Equal-Weight	105.0	10.8%	Yan, Alexis	Leadership
2359.HK	WuXi AppTec	Health Care	73,715	157	RMB	195.4	Overweight	220.0	12.6%	Tam, Laurence	Resilience & Leadership
600521.SS	Huahai Pharmaceutical	Health Care	3,529	88	RMB	15.9	Overweight	22.0	38.5%	Tam, Laurence	Leadership
603707.SS	King-friend	Health Care	1,886	18	RMB	7.8	Overweight	12.0	53.1%	Tam, Laurence	Leadership
Industrials											
601100.SS	Hengli Hydraulic	Industrials	20,406	95	RMB	102.1	Overweight	145.0	42.0%	Zhong, Sheng	Industrial intelligence & Leadership
2338.HK	Weichai Power	Industrials	35,011	75	RMB	32.0	Overweight	46.0	43.9%	Zhong, Sheng	Leadership
600031.SS	Sany Heavy	Industrials	27,146	175	RMB	20.0	Overweight	32.0	60.2%	Zhong, Sheng	Leadership
3808.HK	Sinotruk	Industrials	14,960	34	RMB	42.9	Equal-Weight	45.0	4.9%	Zhong, Sheng	Leadership
688017.SS	Leaderdrive	Industrials	7,992	398	RMB	292.5	Overweight	631.0	115.7%	Zhong, Sheng	Industrial intelligence & Leadership
688188.SS	Shanghai Bochu	Information Technology	5,897	36	RMB	97.6	Overweight	122.0	25.0%	Wang, Chelsea	Industrial intelligence & Leadership
002008.SZ	Han's Laser	Industrials	14,686	636	RMB	95.7	Overweight	188.0	96.4%	Wang, Chelsea	Industrial intelligence & Leadership
Materials											
601899.SS	Zijin Mining	Materials	133,452	1,243	RMB	33.9	Overweight	58.0	71.3%	Zhang, Rachel	Resilience & Leadership
603993.SS	CMOC	Materials	60,086	635	RMB	18.9	Overweight	24.5	29.4%	Zhang, Rachel	Resilience & Leadership
2600.HK	Chalco	Materials	19,746	43	RMB	9.0	Overweight	11.2	24.0%	Zhang, Rachel	Resilience & Leadership
1378.HK	Hongqiao	Materials	29,453	89	RMB	23.5	Overweight	28.6	21.6%	Yang, Hannah	Resilience & Leadership
9696.HK	Tianqi Lithium	Materials	7,591	23	RMB	34.8	Overweight	66.2	90.4%	Zhang, Rachel	Resilience & Leadership
1772.HK	Ganfeng Lithium	Materials	9,671	60	RMB	36.4	Overweight	70.0	92.3%	Zhang, Rachel	Resilience & Leadership
6680.HK	JL Mag	Industrials	2,893	5	RMB	16.5	Overweight	27.8	68.9%	Zhang, Rachel	Resilience & Leadership
600176.SS	China Jushi	Materials	24,672	1,421	RMB	41.4	Overweight	88.5	113.8%	Zhang, Rachel	Resilience & Leadership
688295.SS	Zhongfu Shenying	Materials	5,073	29	RMB	38.6	Overweight	63.8	65.3%	Yang, Hannah	Resilience & Leadership
603799.SS	Huayou Cobalt	Industrials	10,697	352	RMB	38.0	Overweight	75.0	97.5%	Jiang, Chris	Resilience & Leadership
Semiconductor											
2577.HK	Innoscience	Information Technology	5,041	27	RMB	43.2	Equal-Weight	60.0	38.9%	Dai, Daisy	Industrial intelligence & Resilience & Leadership
300373.SZ	Yangjie Technology	Information Technology	7,001	218	RMB	86.8	Overweight	136.0	56.6%	Dai, Daisy	Industrial intelligence & Resilience & Leadership
603986.SS	Gigadevice	Information Technology	40,454	2,417	RMB	386.0	Overweight	750.0	94.3%	Yen, Daniel	Industrial intelligence & Resilience & Leadership
688256.SS	Cambricon	Information Technology	99,231	1,832	RMB	1,059.0	Overweight	1,408.0	33.0%	Chan, Charlie	Industrial intelligence & Resilience & Leadership
603501.SS	Omnivision	Information Technology	14,996	215	RMB	80.5	Equal-Weight	111.0	37.9%	Chan, Charlie	Industrial intelligence & Resilience & Leadership
TMT											
1810.HK	Xiaomi	Information Technology	87,912	485	HKD	26.9	Overweight	33.0	22.6%	Meng, Andy	Industrial Intelligence & Leadership
0100.HK	Minimax	Information Technology	14,751	706	HKD	331.2	Overweight	900.0	171.7%	Yu, Gary	Industrial Intelligence
2513.HK	Z.Ai	Information Technology	54,391	832	HKD	916.0	Overweight	1,800.0	96.5%	Yu, Gary	Industrial Intelligence
BABA.N	Alibaba	Consumer Discretionary	280,031	1,495	HKD	112.7	Overweight	180.0	59.8%	Yu, Gary	Industrial Intelligence & Leadership
0700.HK	Tencent	Communication Services	500,774	1,231	HKD	435.4	Overweight	550.0	26.3%	Yu, Gary	Industrial Intelligence & Leadership
Utility											
300274.SZ	Sungrow	Industrials	27,003	831	RMB	87.9	Overweight	230.7	162.6%	Hou, Eva	Industrial intelligence & Leadership
002028.SZ	Sieyuan Electric	Industrials	16,262	292	RMB	139.5	Overweight	237.0	70.0%	Hou, Eva	Leadership
002487.SZ	Dajin Heavy	Industrials	3,147	107	RMB	33.1	Overweight	42.9	29.6%	Hou, Eva	Leadership
603308.SS	Anhui Yingliu	Industrials	4,569	134	RMB	42.1	Overweight	60.5	43.7%	Li, Tom	Leadership

Source: Company data, Morgan Stanley Research estimates

Executive Summary

Over the past two centuries, every major industrial revolution has reshaped the global economic order. Britain led mechanization through steam power in the 19th century. The United States dominated mass production and electrification in the 20th century. Germany and Japan became synonymous with industrial precision and engineering excellence. The digital revolution of the past three decades has elevated the US into the world's dominant software and internet power.

Now, with the rise of AI, we believe the next industrial revolution is around the corner, and will become the most consequential industrial transition since the rise of electrification and the internet. Unlike previous industrial revolutions centered primarily on technological progress, China's Industry 5.0 is simultaneously a productivity revolution, a geopolitical response, a manufacturing reorganization, and a strategic capital supercycle.

What is China's Industry 5.0?

Industry 5.0 represents the move into Physical AI following Mechanization (1.0), Electrification (2.0), Automation (3.0) and Digitalization (4.0). At its core, we believe China's Industry 5.0 is built on three mutually reinforcing pillars:

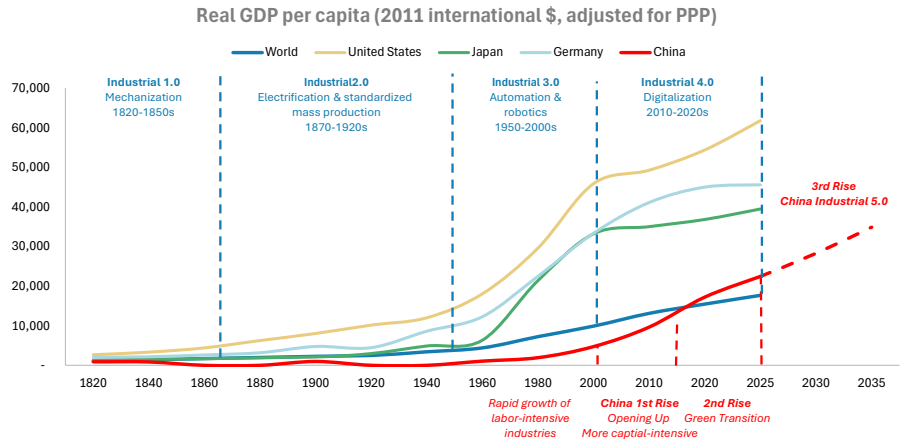
1. Industrial Intelligence: This is represented by AI-enabled manufacturing, robotics, autonomous systems, industrial software and embodied intelligence. Industry 4.0 connected factories and made production digitally visible; Industry 5.0 seeks to make them adaptive.

2. Industrial Resilience: This is demonstrated by localized, sovereign and controllable industrial systems spanning semiconductors, energy, aerospace, materials and advanced manufacturing. The objective is not produce 100% domestic content. It is to eliminate irreplaceable single points of failure, control critical interfaces and preserve the ability to redesign around external restrictions.

3. Industrial Leadership: This means building global ecosystems through scale, standards setting, industrial platforms and next-generation manufacturing capabilities, as well as leading technology innovation in selected industries.

Together, the IRL (Intelligent + Resilient + Leading) pillars will be critical to defining China's pathway towards next-generation industrialization. These pillars form a flywheel, where Intelligence raises productivity and generates data; Resilience secures and improves the critical stack; and Leadership expands the installed base overseas, creating additional data, profits and commercial feedback for the next innovation cycle.

Exhibit 4: In the past few decades, China has been catching up the world's centuries of economic growth; now China is poised to rise again with Industry 5.0



Source: Madison Project Data, IMF, Morgan Stanley Research estimates.

How will Industry 5.0 transform the industrial landscape?

In the next decade, we expect China's manufacturing leadership will evolve from scale and cost towards ecosystem and industrial innovation leadership. We identify five transformational trends below.

1. AI at the heart of manufacturing operating systems; automated becomes adaptive

The largest productivity gains from steam and electricity came only after factories reorganized around them. We believe AI will follow the same pattern, meaning factory and operational platforms will be built with artificial intelligence as their core architecture, as AI actively coordinates workflows, predicts problems, and makes decisions rather than just acting as an added software tool. There is much early evidence of productivity gains through shorter lead times, lower defect rates, higher labor efficiency, and less energy consumption in factories, such as those of Valeo, Midea and CATL. China has the world's largest physical manufacturing base; more than 100mn industrial devices are already connected. The strategic opportunity is to turn those connected assets into a common sensing, reasoning and execution system.

2. Embodied AI: physical labor becomes software-upgradable capital

Manufacturing will be increasingly conducted by groups of embodied AI, including embodied-AI machines and various robots, e.g., humanoid, industrial, and collaborative robots, AMR/AGVs, autonomous vehicles, and VTols. Physical labor will become software-upgradable capital equipment, extending automation from highly standardized production into flexible high-mix manufacturing, and converting their deployment into data generation. This is not only about productivity improvements, but also about offsetting the demographic and skills constraints that are gradually becoming severe in China. China has a leading edge in manufacturing high quality robots at lower cost, an important factor to support deployment. Based on our forecasts, robotics sales across the above categories in the Chinese market will rise from approximately 8mn in 2025 to 29mn in 2030 and 76mn in 2035.

3. Sovereign industrial stack development: localization gives architectural autonomy

China's largest sovereignty gaps are concentrated upstream, in the industrial 'brain, nervous system and precision layer', i.e., advanced semiconductors and related equipment/ materials, industrial software and control systems, high-end CNC, qualified advanced materials, and foundational processes. These technologies will determine whether China can independently design, operate and continually upgrade complex industrial systems. We expect these gaps to narrow materially over the next decade, because China's large downstream market provides lead customers, qualification opportunities and operating feedback, and it is also second globally in R&D spending (Rmb3.93tn; absolute amount), although progress will likely be uneven. With the breakthrough of foundational layers, we also expect the creation of interoperable and evolvable domestic technology stacks, i.e., autonomy of the value chain.

4. Exporting ecosystems: from general product shipments to architecture and industry standards

China already exports more manufactured products than any other economy. The trend is towards gradually exporting the full system around them, such as an EV ecosystem that includes batteries, charging or swapping, intelligent-driving software, energy management, financing and recycling. A smart-factory ecosystem combines robots, controls, production lines, software, commissioning and maintenance, areas in which China as a major provider will be able to take share. Standards influence will also follow commercial adoption, not precede it, in our view. Global standards require installed scale, interoperability, certification, safety acceptance, service support and an attractive economic proposition for third-party participants.

5. AI-accelerated industrial discoveries: increasing the lab-to-fab pathway

This is the least mature of the five breakthroughs we expect, but potentially the most transformative. The breakthrough is a shift from sequential, human-led R&D towards a closed-loop, discovery-to-manufacturing system. We expect China to lead industrial technology innovation in some areas, especially in foundational layers, such as advanced materials, precision equipment, sensors, semiconductor processes and biotechnology, where it has made significant investments. This would greatly lift multiple downstream industries simultaneously rather than benefit only one product category.

Why is China uniquely positioned to lead?

Industrial 5.0 is being built on the world's largest and most diversified manufacturing base, which is both a solid industrial foundation and self-reinforcing industrial ecosystem

China is not building Industry 5.0 from scratch: it is based on an industrial system already operating at unmatched scale, with ~28% of global manufacturing value-add, and full product category coverage. Government policy establishes long-term direction and lowers early adoption barriers, and often acts as both a growth accelerator and a risk mitigator. Large downstream customers provide qualification and operating data; local industry clusters connect equipment, components, materials and software; engineers and competing firms refine products rapidly; China's financial system reinforces this process

through bank credit, policy lending, industrial funds, and local-government support, which provides relatively stable, long-tenor funding for strategic sectors, and allows companies to absorb lengthy qualification cycles before commercial returns emerge. Well developed and highly efficient infrastructure enables low cost, fast product iteration, and accelerates deployment.

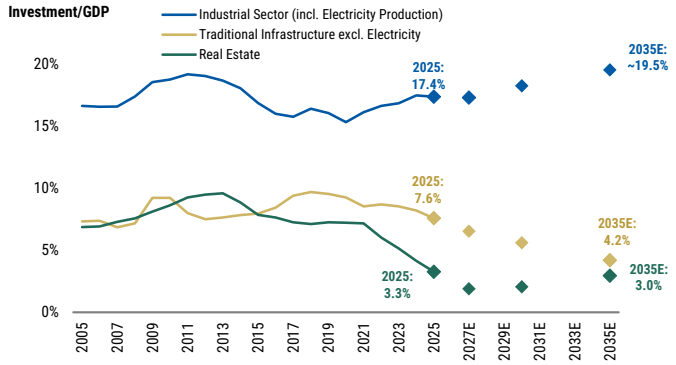
China's NEV rise provides the clearest evidence. China reached approximately 51% of global NEV sales in 2025 after combining central policy direction, infrastructure support, local-government competition, complete industrial clusters and intense private-sector iteration. China's battery, motor, power-electronics and charging ecosystems then created a reinforcing scale advantage: CATL alone accounted for approximately 39% of global EV-battery installations in 2025. The Yangtze River Delta's "four-hour industrial circle", existing capabilities in electronics, machinery and power equipment, and abundant engineering talent and capital turned an initially policy-supported market into a commercially competitive global ecosystem. We believe the same execution model, now amplified by AI, can be redeployed across adaptive factories, embodied intelligence, advanced equipment, industrial software, materials and other frontier industries.

What Will Drive the Change to Industry 5.0?

A Decade Long Capex Supercycle – US$12trn of Incremental Opportunities

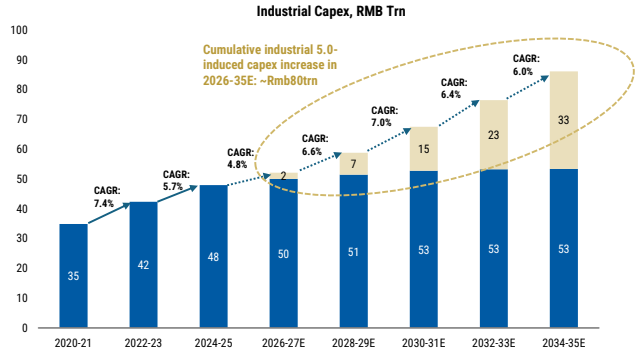
We expect ~Rmb340trn (or US$50trn) cumulative industrial investment in 2026-35, with Industry 5.0 creating ~Rmb80trn (or US$12trn) of incremental capex demand: Industrial revolutions have always been capex intensive. As AI diffusion raises demand for both intangible and physical investment, the global capex supercycle should support external demand and facilitate overcapacity absorption. We thus expect the industrial capex/GDP ratio to rise from 17.4% in 2025 to ~19.5% by 2035 (slightly higher than its previous peak of 19.2% in 2011), providing a counterweight to structurally weaker property and traditional infrastructure capex due to aging demographics and local-government debt problems. This would bring ~Rmb80trn (or US$12trn) additional industrial capex over the next decade vs. a non-Industry 5.0 trajectory, where the share of industrial capex in GDP could slip to ~14.0% given overcapacity, loss of manufacturing competitiveness amid an aging population, and weak support from external demand.

Exhibit 5: Industry 5.0-driven capex to be the main counterweight to China's broader capex slowdown…



Source: Haver, Morgan Stanley Research. E= Morgan Stanley Research estimates

Exhibit 6: …unlocking ~US$12trn (out of a total US$50trn) of incremental capex opportunities in 2026-35, though with a slow start



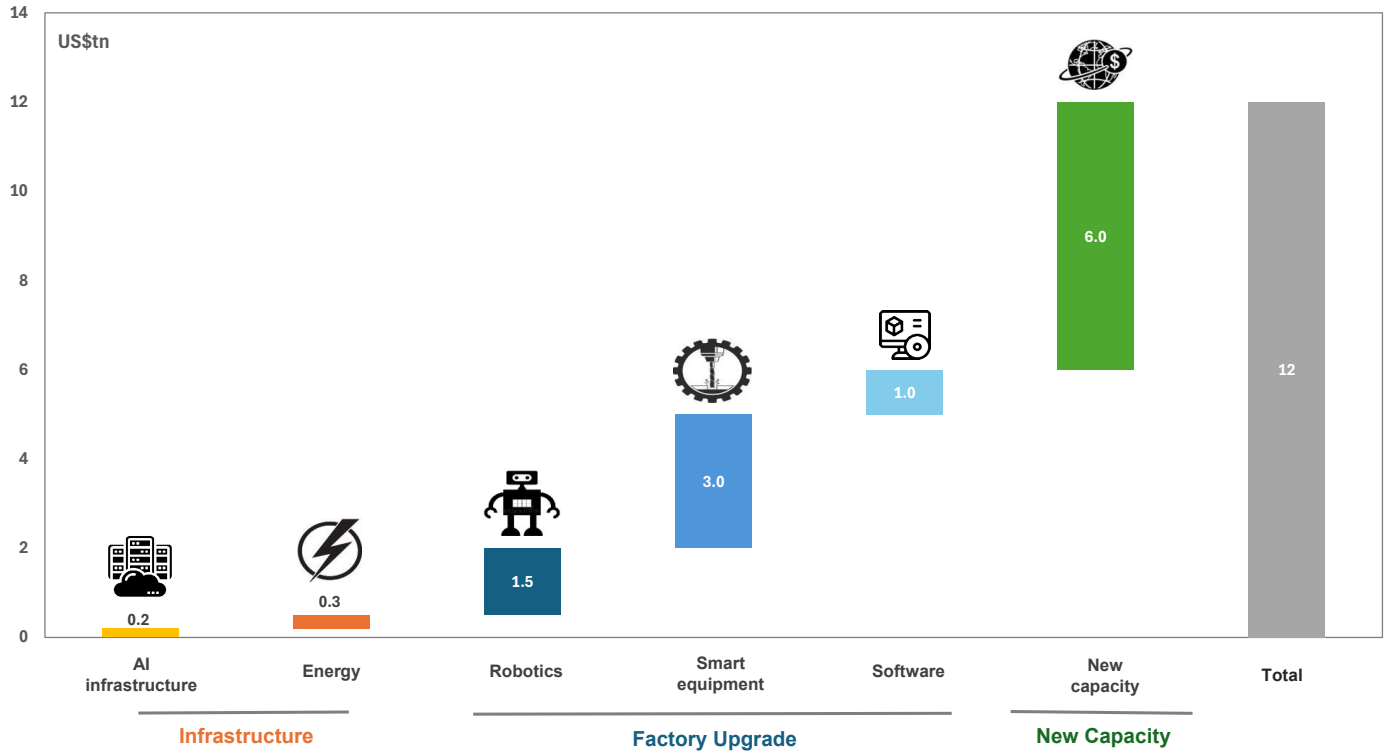
Source: Haver, Morgan Stanley Research. E= Morgan Stanley Research estimates

Specifically, we expect Industry 5.0 to unlock three reinforcing layers of investment at once:

- 1. Infrastructure (including AI infrastructure) – US$0.5 trillion: the enabling backbone of Industry 5.0.
- 2. Factory upgrades – US$5.5 trillion: the core deployment layer, and likely the largest bucket.
- 3. New capacity – US$6 trillion: the strategic overlay that extends the cycle (global market-share gains and new frontier industries).

The cycle will likely start slowly, and accelerate as capacity and technology constraints ease: Despite the rising global capex supercycle and increasing policy support, constraints from lingering excess capacity, curbs on duplicative buildout and advanced-chip accessibility will likely keep near-term capex spending slow, at 4-5%p.a. in 2026-27 (vs. 5.7%p.a. in 2024-25). That said, with gradual over-capacity digestion, easing tech bottlenecks with rising semi-localization, and a shift of AI deployment towards broader factory adoption and then to large-scale commercialization, we estimate industrial capex growth will accelerate to 6-7%p.a. from 2028.

Exhibit 7: We estimate US$12trn incremental capex from Industry 5.0: ~US$0.5bn for infrastructure, ~US$5.5bn for factory upgrades and ~US$6bn for new capacity from existing industries' expansion and new frontier industries



Source: Morgan Stanley Research

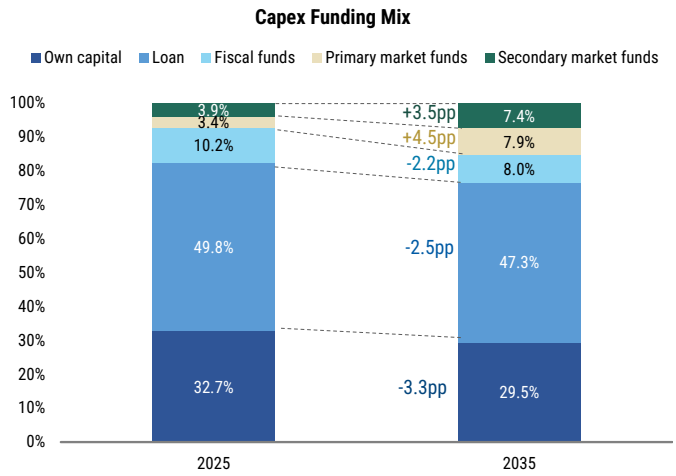
How to finance the US$12trn?

China has a comprehensive financial system for industrial growth. Based on our China Financials team's estimates, external funding already accounted for roughly 60–70% of annual industrial capex during 2020–25. Going forward, the team expects:

- **Bank loans** to remain the anchor at approximately 47% of funding over the next decade, reflecting banks' broad industrial coverage, supply-chain penetration and capacity to provide long-tenor financing. This implies around 6.3% annual growth in industrial medium- and long-term loans.
- **Corporate retained earnings and own capital** should provide roughly one-quarter to one-third of funds.
- **Fiscal funds** (cash subsidies, land support and government-led investment) **and capital markets** (China and Hong Kong, split broadly between private-market funding and public-market financing through IPOs and follow-on issuance) will provide the strategic and risk-bearing layers. Capital markets will be an increasingly important source.

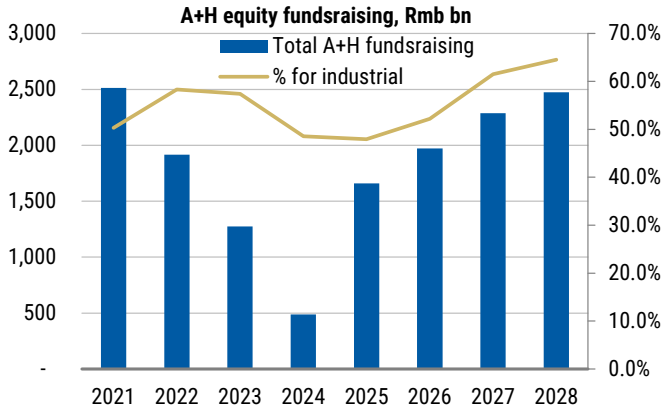
This financing structure is well suited to a long-duration transformation: bank credit funds mature equipment and infrastructure, fiscal capital helps de-risk strategic bottlenecks, and equity absorbs the higher uncertainty of frontier technologies.

Exhibit 8: Where will the US$12trn be financed from? Bank loans will remain the largest part; Capital market importance will increase



Source: CEIC, WIND, PBOC, NFRA, IMF, PE Data, Company data, Morgan Stanley Research

Exhibit 9: Rising industrial capital demand to facilitate China's equity market fundraisings in the next three years



Source: CEIC, WIND, PBOC, NFRA, Company data, Morgan Stanley Research

What will be the Main Economic Benefits to China?

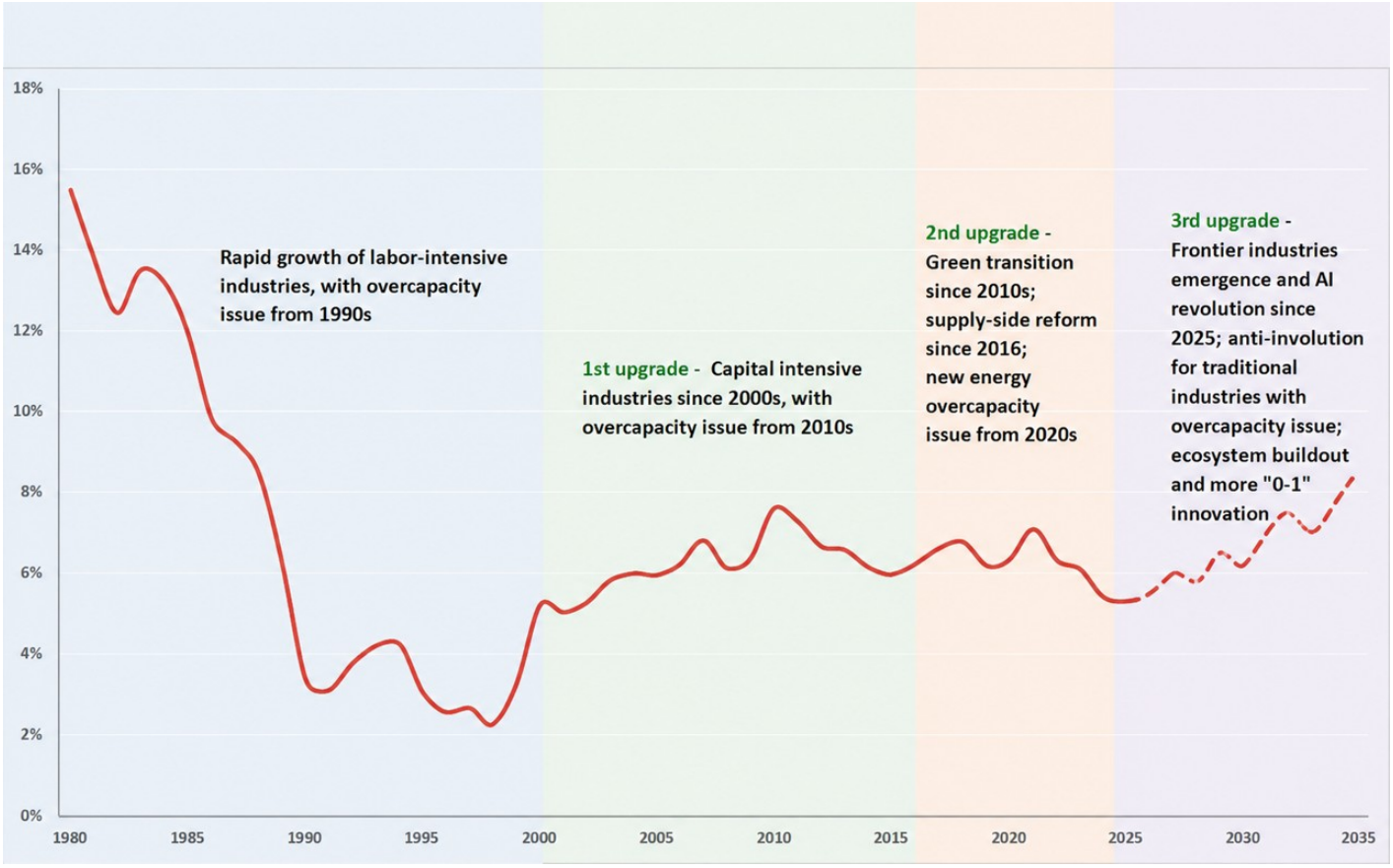
#1. Industrial margin and ROE recovery to higher quality profit pools

We expect China's industrial-enterprise profit margin to recover from ~5% in 2025 to ~8% by 2035, on four forces: 1) a rising mix of higher-margin technology-intensive manufacturing; 2) anti-involution policies and industry consolidation that improve utilization and pricing discipline; 3) overseas expansion into markets with stronger pricing and lifecycle-service economics; and 4) selective participation in new 0–1 industries (i.e., innovation from scratch instead of adapting existing ideas), where Chinese companies capture innovation economics.

But this is unlikely to be uniform margin expansion across manufacturing; rather, Industry 5.0 should drive profit-pool migration from downstream capacity and assembly towards upstream foundational technologies, software, precision equipment, qualified components, services and ecosystem platforms.

ROE to improve 2-3% by 2028: MSCI China ROE has already edged up from a trough of roughly 9–10% in mid-2023 to around 11% as of May 2026, an early indication that the decade-long erosion may be stabilizing. Our China Strategist expects a broader improvement in listed-sector ROE. Looking forward, unlike the prior two cycles, we believe this round is more about an efficiency-driven revolution, which could help lift both major AI-related sectors and overall index ROE. We expect Industrials ROE to improve 2-3% by 2028.

Exhibit 10: #1. China's Industrial margin to recover from ~5% in 2025 to ~8% in 2035, on four main drivers: capturing higher value on ecosystem buildout globally, more '0-1' innovation, frontier industries ramping up, and anti-involution



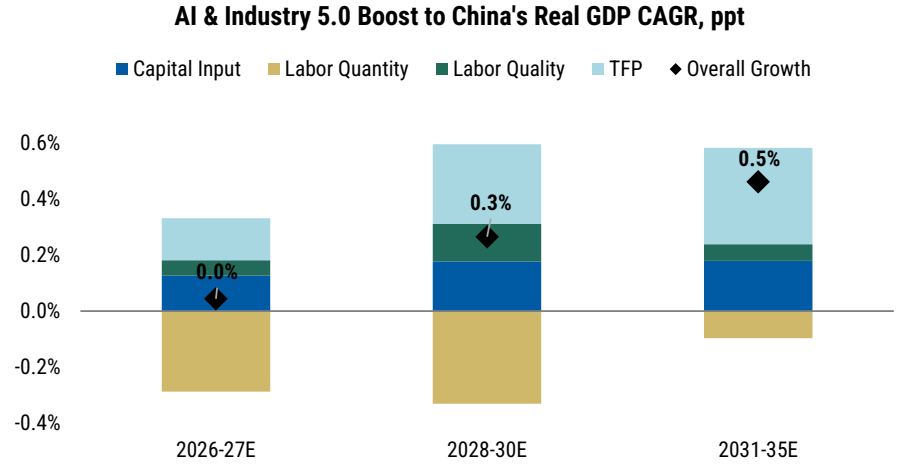
Source: NBS, Morgan Stanley Research estimates

#2. A boost to potential GDP to reach Beijing's long-term growth target

AI and Industry 5.0 should lift China's potential GDP by ~3.5% by 2035, partially cushioning the demographic drag. We raise potential growth forecasts by 30bp to 4.3% for 2028-30 and 50bp to 3.9% for 2031-35 – enough to meet Beijing's 2020-35 GDP-doubling target. The uplift reflects a capex-heavy industrial transformation and a 3pp cumulative Total Factor Productivity (TFP) gain from economy-wide AI diffusion. Near-term impact should stay broadly neutral, as excess capacity and J-curve labor adjustments offset early gains, before turning more positive from the late 2020s as deployment broadens.

Policy rebalancing to stay calibrated, keeping China in lowflation over the medium term: A supply-centric policy framework and calibrated rebalancing make decisive demand-led reflation unlikely. We expect the GDP deflator to remain weak through 2026-27, then grind toward 0.5-1.0% from 2028 as housing stabilizes, investment becomes more disciplined, external demand absorbs capacity and margin gains gradually spread to wages.

Exhibit 11: #2. AI and China's Industry 5.0 to lift China's potential GDP level by ~3.5% over the next decade, enough to meet Beijing's 2020-35 GDP-doubling target



Source: CEIC, Morgan Stanley Research (E) estimates

#3 Higher global manufacturing share

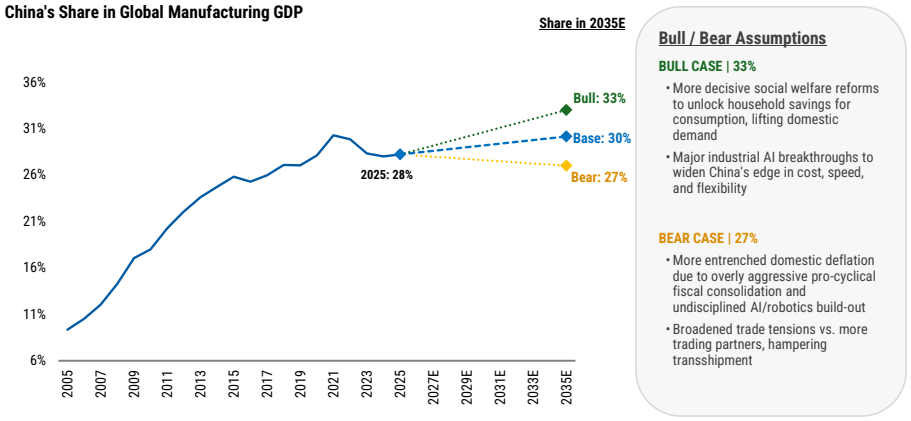
At first glance, our call is counter-intuitive: tariffs, China+1 diversification and AI-enabled reshoring should weaken China's manufacturing position, while aging and higher labor costs erode its traditional cost advantage. Yet we expect China's share of global manufacturing value-add to rise from ~28% today to ~30% by 2035. Our logic is threefold: Industry 5.0 increases the value of ecosystem scale and production data; trade diversification is shifting final assembly faster than upstream capacity; and China is moving into the complex, capital-intensive sectors driving the next global trade cycle:

Manufacturing. Industry 5.0 should compound the advantages of China's installed manufacturing base. Other economies may lead in selected technologies, but many must rebuild capital stock and supply chains while adopting them; China is upgrading a system already operating at scale.

Upstream supplier. Final assembly can shift relatively quickly; supplier depth, process know-how and capital-equipment capacity cannot. Many remain reliant on Chinese intermediate inputs, components, machinery and production systems, therefore China can retain substantial value-add upstream and become the system-level supplier behind manufacturing growth elsewhere.

Complex production. Future gains should come from complex production at scale, not renewed low-cost assembly, in sectors where China is adding productivity-enhancing capital, localizing bottlenecks and moving towards upstream technologies, industrial software and ecosystem control. This underpins our 2ppt share-gain call.

Exhibit 12: #3. China manufacturing's global market share to grow from ~28% in 2025 to 30% by 2035, as production data, supplier depth, engineering speed and system integration become more important sources of competitiveness than scale and labor costs alone



Source: Haver, Morgan Stanley Research (E) estimates

Implications for a Multipolar World

China's role in global trade is changing form, rather than diminishing. Tariffs, technology controls and China+1 strategies have reduced direct US–China trade, but the evidence points more to trade rerouting and selective final-assembly relocation than wholesale migration of productive capacity. We estimate that only around 40% of China-to-US exports can be readily substituted: supplier depth, process know-how and capital-equipment ecosystems are considerably harder to replicate than assembly lines. Indeed, while China's share of US imports has fallen from 21.6% in 2017 to around 8%, its export share in the rest of the world –which accounts for roughly 90% of Chinese exports – has increased from 12% to 16%.

The next global trade cycle should reinforce China's upstream role. Demand is shifting toward complex capital goods and production systems, where scale, supplier coordination and cumulative engineering experience matter more than low-cost assembly. Reshoring also raises import demand in its early phase, as countries must acquire the industrial inputs needed to build domestic capacity before local supply networks can mature. This points to a reconfigured form of globalization: final production becomes more geographically dispersed, while Chinese capabilities remain embedded in industrial expansion overseas. ***In other words, it marks a shift from "made in China" toward a broader "made by China" model.***

AI and physical-AI diffusion should create a multipolar industrial-capex cycle, benefiting global capital goods demand, with different regions capturing different layers of value. The result is a multipolar industrial system: the US leads in frontier technology, capital and demand; Europe in selected software, automation and complex equipment; Japan in precision and production efficiency; and China in scaled physical deployment and integrated industrial ecosystems.

- The **US** has the strongest demand, technology and capital-market position, but must rebuild industrial depth. It is best positioned to benefit from AI

infrastructure, reshoring and electrification. However, high production costs, permitting constraints and shallow domestic supplier networks mean that near-term reshoring will remain import-intensive and dependent on overseas machinery, components and materials.

- **Europe** faces a more challenging structural pressure, but its differentiated industrial champions remain well positioned, benefiting from both China's industrial upgrading and US reshoring. Less differentiated and energy-intensive industries therefore face continued competitiveness pressure.

- **Japan** should remain a critical supplier of precision and efficiency technologies across this multipolar buildout.
- **Korea and Taiwan** are likely to remain central to the technology-intensive upstream layers of the AI cycle.

Equity implications – Structural Opportunities

Industry 5.0 should be an efficiency- and ROE-driven equity cycle, rather than another indiscriminate capacity trade. Morgan Stanley China Strategist Laura Wang estimates potential ROE improvement by 2028 of approximately 6–7% for Energy, 2–3% for Materials, 2–3% for Industrials and 8–9% for Information Technology, together contributing around 2% to MSCI China's overall index ROE.

We favor a barbell of structural technology and industrial-growth opportunities alongside quality dividend plays. Near-term earnings visibility is strongest among the upstream enablers receiving the first wave of capex – semiconductors, optical components, industrial automation, advanced equipment, power systems and selected materials. This opportunity is disproportionately represented in A-shares: high-end upstream manufacturing and hard-core technology companies account for approximately 44.8% of the CSI 300, versus 14.7% of MSCI China and 8.3% of the Hang Seng Index. The value pool should migrate over time from companies building the chips, equipment, automation and infrastructure towards adopters that use AI to improve products, workflows and unit economics.

Autos and machinery illustrate the shift from downstream volume toward higher-quality control points. China's EV ecosystem remains a major industrial leadership platform, but the sector analysis favors differentiated auto-component suppliers over undifferentiated OEM capacity. Selected parts leaders generate gross margins around 4–6ppt above vehicle manufacturers, such as ADAS chips and controllers, intelligent chassis, smart glass, steering and safety electronics. Construction-machinery leaders are using electrification and service capabilities to differentiate overseas. Home appliances provide more mature proof of the ecosystem-export model by moving from product exports toward localized R&D, production, distribution and services globally.

Healthcare, materials, semiconductors and power represent the higher-value foundational layers of the theme. In healthcare, China is progressing from low-cost manufacturing toward high-end medical imaging, IVD, surgical robotics and innovative-drug manufacturing, with overseas revenue to exceed 50% for many leading medtech companies within 3-5 years, while more than 30% of US FDA-approved on-patent novel drugs could be manufactured in China by 2030, and China already supplies around 30% of

global API volume. Materials provide the physical foundation: copper and aluminum support grids, data centers and storage; lithium and battery materials enable electrification; rare-earth magnets support EVs, wind and humanoids; and glass and carbon fiber serve AI hardware, aerospace and low-altitude transportation. We favor high-end, qualification-intensive or supply-constrained materials over generic commodity capacity.

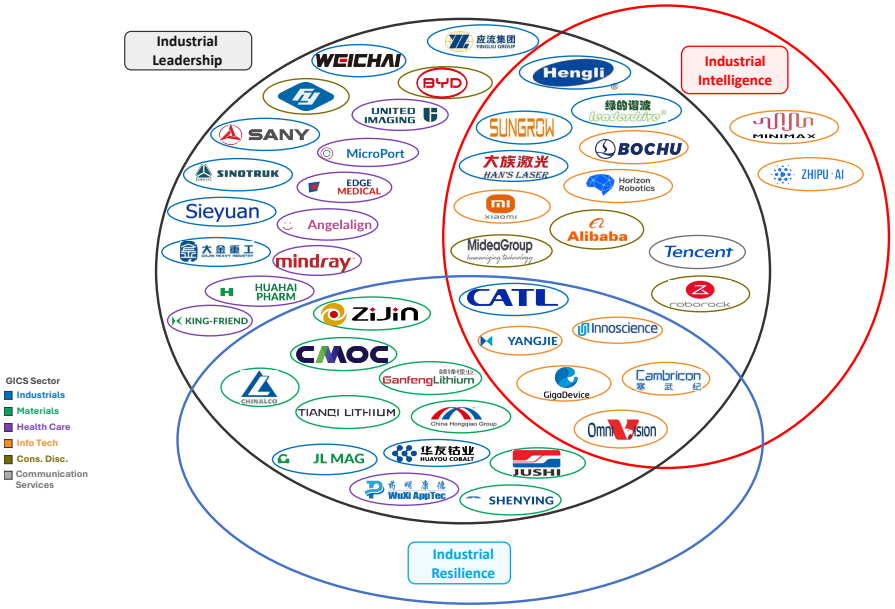
Semiconductors, automation, robotics, power equipment are among the clearest cross-pillar beneficiaries. Smart factories require a full 'sense–think–act–connect' semiconductor stack: analog, power, MCU and mixed-signal devices provide high-volume distributed intelligence, while domestic CPU, GPU and AI accelerators capture disproportionate value in industrial inference, machine vision and factory-wide optimization, through automation and robots. The opportunity combines factory-intelligence capex, localization and globalization. China automation localization could exceed 70% by 2030, while machinery exports grew at a 12% CAGR during 2020–25 and accelerated 18% YoY in 4M26. Power is the other indispensable layer: we forecast approximately Rmb4.1tn of China grid investment during 2026–30, 49% above the prior five-year period.

Exhibit 13: The key beneficiaries lie in five categories, and will create a new generation of winners across automation, robotics, semiconductors, materials, etc, for foundational layers, and Industry 5.0 productivity adopters to achieve global leadership

BENEFICIARY CATEGORY	IRL	EQUITY-MARKET INDUSTRIES / FRONTIER OVERLAYS	PRIMARY VALUE CAPTURE
1 Industrial Intelligence enablers	I	• Application & systems software; factory OS; industrial AI agents • Automation & robotics; PLC/DCS/CNC; motion control • Industrial/edge semis; sensors; vision; networking; OT security	• Software attach & recurring revenue • Higher intelligent-equipment content • Workflow and control-layer ownership
2 Sovereign technology bottlenecks	R	• WFE, EDA, advanced packaging and semiconductor materials • High-end machine tools, precision motion, metrology and testing • Scientific instruments; specialty chemicals; qualified advanced materials	• Localization and qualification runway • Process IP and switching costs • Higher domestic value-added capture
3 Frontier & innovation platforms	I L	• Humanoids / embodied AI; autonomous vehicles and machinery • eVTOL / low-altitude aviation; commercial space; quantum; fusion • Synthetic biology, autonomous labs, AI discovery and next-gen storage	• New TAM and proprietary IP • Early ecosystem and standards optionality • Highest upside; lower near-term visibility
4 Ecosystem exporters	L	• EV + battery + charging + software; solar + storage + grid • Power equipment and smart grids; industrial automation and smart factories • Emerging: ports/logistics, construction equipment, green maritime, rail	• System integration and architecture influence • Software, service and aftermarket • Overseas installed base and standards
5 Industry 5.0 productivity adopters	I	• Auto, electronics/3C, batteries/solar and semiconductor fabs • Machinery, warehousing/logistics, pharma and life sciences • Chemicals, metals, food and other process manufacturing	• Yield, uptime and labor productivity • Lower inventory and faster product ramp • Global share gains if savings are retained

Source: Morgan Stanley Research

Exhibit 14: Investment implications – 45 stocks to own



Source: Morgan Stanley Research

Industry 5.0 Will Not Be Linear – Potential Bottlenecks and Risks

Industrial revolutions have not always progressed smoothly. Railroads, telecoms, semiconductors, solar, and EVs all experienced prolonged periods of capital destruction before consolidation and ecosystem dominance emerged. Similarly, China's Industry 5.0 may initially suppress returns before creating long-term winners. The largest risk is not technological failure, but economically inefficient success. China excels at scaling capacity, cutting costs and diffusing technology fast – but the same strengths could breed overcapacity, deflation and margin compression when demand cannot keep up the pace with supply. The road from investment to productivity, profits and income is thus likely to be bumpy, and policy or external shifts could quickly alter its pace and quality.

Along these lines, we present two alternative scenarios to our base case, with policy, technology and geopolitics being the key swing factors.

Bull case: Accelerated economic rebalancing, healthy reflation. By pairing its supply-side push with faster pension, healthcare and 'hukou' reforms, alongside stronger housing stabilization, the government reduces precautionary savings and negative wealth effects, and unlocks stronger household consumption. Firmer domestic demand absorbs rising industrial output, curbs price-destructive competition and improves corporate earnings, cash flow and wages, creating a virtuous cycle of consumption, investment and innovation. This lifts potential GDP growth to 4.7% in 2026–27, 4.5% in 2028–30 and 4.2% in 2031–35, supported by stronger capital deepening and total factor productivity (TFP) gains, while bringing the GDP deflator toward 1.5–2% over the medium term. Lower reliance on external demand and faster industrial-AI breakthroughs also ease trade friction and lift China's share of global manufacturing value-add toward 33% by 2035.

Bear case: More entrenched deflation amid premature policy tightening: Aggressive pro-cyclical fiscal consolidation amid continued household deleveraging and property weakness further depresses domestic demand, while low-return investment in AI infrastructure, robotics and smart factories creates 'smart overcapacity' and renewed margin pressure. At the same time, restrictions on manufacturing outward foreign direct investment (OFDI) slow overseas localization, provoking broader protectionism from more non-US trade partners. In this scenario, potential GDP growth falls to 4.4% in 2026–27, 4.0% in 2028–30 and 3.5% in 2031–35, with the cumulative GDP uplift from AI and Industrial 5.0 limited to ~2% by 2035, which is largely offset by an AI-induced labor replacement effect. The GDP deflator remains at -0.5% to -1.0% over the medium term, reinforcing deleveraging and constraining innovation, while China's share of global manufacturing value-add is capped at ~27% through 2035.

Exhibit 15: China Industry 5.0 - Base/Bull/Bear summary

Scenario	Real GDP Growth (% p.a.)	Inflation	Share in Global Manufacturing GDP, 2035E
Base Case Calibrated rebalancing, continued low-flation • China enters Industry 5.0 era, powered by policy support + global capex supercycle. • AI & Industry 5.0 to boost capex and productivity, outweighing AI-induced labor disruptions.	4.6% (2026-27E), 4.3% (2028-30E), 3.9% (2031-35E)	**Low-flation persists** • GDP deflator to slip from 0.8% in 2026 to 0.2% in 2027 with oil price normalization, but would grind to **0.5–1.0% from 2028** on housing stabilization, reduced excess capacity, and margin improvement under Industrial 5.0.	30%
Bull Case Decisive rebalancing, healthy reflation • Industrial-AI breakthroughs widen China's edge. • Stronger domestic demand lift imports, helping ease risk of broader trade tensions.	4.7% (2026-27E), 4.5% (2028-30E), 4.2% (2031-35E)	**A healthy reflation** • Decisive economic rebalancing to lift GDP deflator from lowflation in 2026–27 toward **1.5–2% over the medium term,** easing debt-deflation pressures and reinforcing private-sector balance-sheet repair.	~33%
Bear Case More entrenched deflation • Pro-cyclical fiscal tightening and undisciplined AI / robotics overbuild. • Broader trade frictions with non-US trade partners, given China's increased overcapacity problems and prolonged OFDI restrictions.	4.4% (2026-27E), 4.0% (2028-30E), 3.5% (2031-35E)	**Entrenched deflation** • Premature fiscal consolidation, undisciplined industrial investment and weaker external market access would reinforce a demand-deflation overcapacity loop, sending GDP deflator to outright deflation from 2027, which would stay at **-0.5% to -1.0% over the medium term.**	~27%

Source: Morgan Stanley Research estimates

Steps to China Industry 5.0: Proven Scale and Cost Leadership in Manufacturing

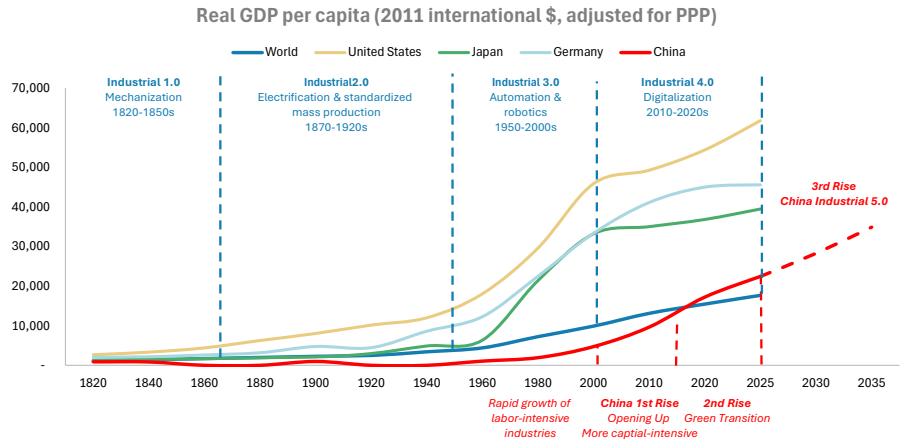
Since China began to open up in the late 1970s, its industrial base has undergone a continual upgrade, where it now has ~28% of global manufacturing value-add. Manufacturing in China has evolved into a large, cost competitive and efficient base, rapidly catching up to global developed markets (DM). We believe its scale and global leading industries, such as solar, batteries, EVs, and drones, will extend to more frontier industries, such as embodied AI and upstream localization under Industry 5.0.

Elevated global manufacturing growth during Industry 3.0 and 4.0

Industry 3.0: Automation – the automation era (from the mid-20th century to the 2000s), was defined by computer automation, programmable logic controllers (PLC), and industrial robots, together pushing toward higher throughput and lower unit cost. Industry 3.0 raised productivity by automating repetitive and standardized tasks, resulting in lower costs with higher output volumes. The increased use of robots contributed 0.36ppt to annual labor-productivity growth in 17 developed countries, over 1993-2007, according to Graetz & Michaels *"Robots at Work"*.

Industry 4.0: Digitalization – starting in the 2010s, the digitalization era made manufacturing digitally visible, connected, and increasingly automated. The core idea was to connect cyber, physical, and enterprise systems, optimizing the production process. Industrial 4.0 connected production devices for better optimization. In China, among 230 excellence-level smart factories reported, on average, 22.3% higher production efficiency, 50.2% lower defect rates and 28.4% shorter product-development cycles, according to MIIT. China's labor productivity recorded a 9% CAGR over 2010-25, although this reflected industrial upgrades, deepening capital, urbanization and automation, as well as digitalization.

Exhibit 16: In the past few decades, China has been catching up the world's centuries of 1.0-4.0 progress



Source: Madison Project Data, IMF, Morgan Stanley Research estimates.

China became the world's largest manufacturing base

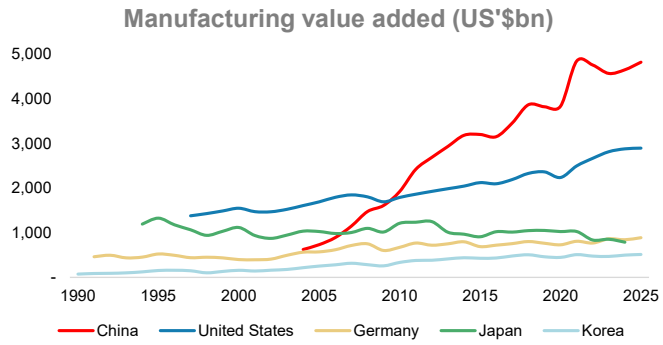
China has upgraded its industrial base quickly to catch up to DMs:

- **Declining proportion of high energy-consuming industries**, driven by continued supply-side reform and de-capacity in these sectors since 2015, and accelerated capacity upgrades after 2020 when the carbon neutrality target was launched. In 2023, China's energy consumption intensity (standard coal in tons per value-added in US$mn) of the manufacturing sector was 699t/US$mn, declining by 6% p.a. from 2,182t/US$mn in 2004, according to NBS.
- **Significant increase of high-value added manufacturing industries**, such as electrical and computing machinery and medicine related products. The percentage mix of manufacturing value-add for these China technology-intensive industries doubled to 34% in 2025 from 18% in 1993, according to NBS.
- **Significant decline of labor-intensive industries**, particularly light industries such as textiles, apparel and leather goods. The percentage mix of manufacturing value-add for these China labor-intensive industries declined to 15% in 2025 from 28% in 1993, according to NBS.

According to the World Bank, China accounted for 27% of global manufacturing value add in 2025. Large and integrated supply chains have driven efficiency gains and cost reductions. While labor has become more expensive over the years, increasing penetration of automation and digital technology will continue to facilitate cost reduction and process refinement in China, in our view. Moreover, overall manufacturing remains cost-competitive thanks to synergies and complementarity between China's different industries, helped by the country's robust infrastructure.

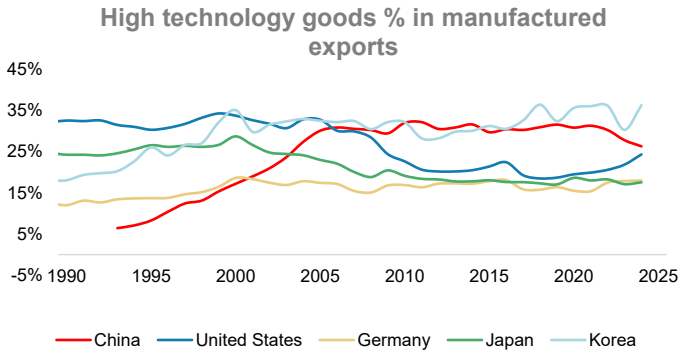
In addition to China's edge in production, its large domestic market has provided a testing field before going global. Despite criticism of intense competition and low margins, the large domestic market has allowed companies to test products rapidly, collect customer feedback, scale successful products, customize production for diverse demand, and strengthening product competitiveness for global market competition.

Exhibit 17: After surpassing the US for the first time in 2010, China has remained the world's largest manufacturer with a widening gap…



Source: World Bank, Morgan Stanley Research

Exhibit 18: …with high-tech goods contributing more to China's manufactured exports than in DMs, despite a slight decrease following trade tensions with the US



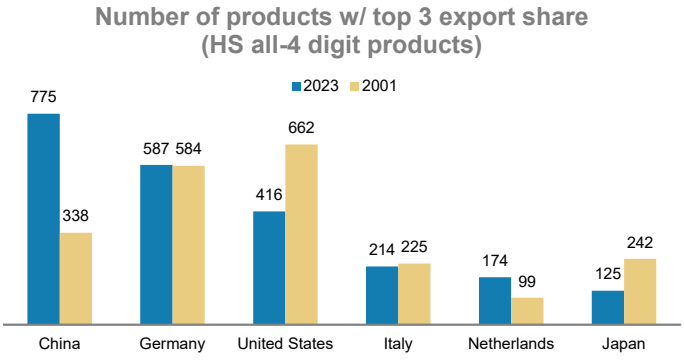
Source: OECD, Morgan Stanley Research

The industrial sector in China is the most comprehensive globally

Not only scaled up, but scaled out: During China's industrialization, it also expanded its capabilities across products. According to the MIIT, China – with 41 headline industrial categories, 207 industrial categories, and 666 industrial sub-categories – is the only country that covers all categories listed in the United Nations Industrial Classification. Furthermore, China's Economic Complexity Index (ECI, which focuses on ubiquity and diversity of export capabilities) continues to trend higher, reflecting China's expansion into a broader mix of advanced manufactured goods.

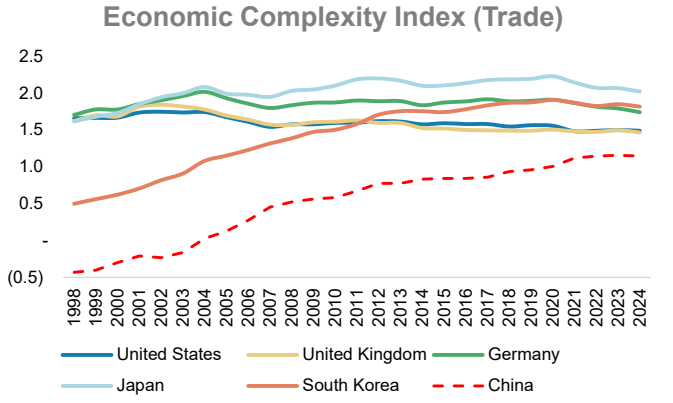
Decentralized supply chains with strong efficiency: Many of China's industrial firms, both big and small, were created in the pursuit of greater efficiency. They have developed into decentralized industrial supply chains, dotted across China. With such a large number of companies, the pressure to outcompete on either superior products or lower cost is extremely high. This level of intense competition has resulted in strong cost competitiveness and ensured speed to market for many industrial products, in a global context.

Exhibit 19: The number of China's products with 'top 3' global export market share doubled from 2001 to 2023, indicating China's strong depth and breadth



Source: WITS, Morgan Stanley Research Note: HS all-4 digit products refer to product categories under Harmonized System (HS), a system used by customs to identify goods for global trade.

Exhibit 20: China ECI ranking is improving



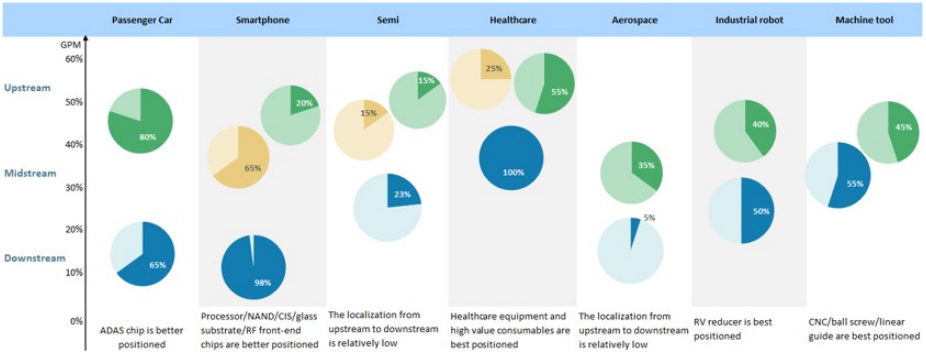
Source: The Observatory of Economic Complexity (OEC), Morgan Stanley Research

Continual industrial upgrades – further localization and frontier industries expansion to continue

China's move up the 'smile curve' remains intact… After decades of industrial upgrades, China has improved its localization rate among different up/mid/downstream industries. We expect this trend to continue, given it's a natural path for China to move up the value chain to capture the higher upstream value-add. China's advantages in machinery, strong downstream foundation, huge domestic demand and dense supplier networks support the gradual localization process. We note that localization in the auto/3C supply chain, and automation equipment more generally (including robots, FA components, and machine tools), has accelerated sharply in the past few years, riding the tailwinds of China's strong manufacturing cycle in 2020-22. While localization in semis, healthcare and aerospace in general is still low, it has already improved greatly.

…as well as leading in frontier industries. Past examples such as solar and new-energy vehicles demonstrate how China can convert a large domestic market, supportive industrial policy, intense competition, rapid capacity expansion, and cost advantages into global leadership in emerging sectors. We believe China's technology base and manufacturing know-how from mature industries (such as autos and precision components) have formed a solid foundation and can support the development of emerging industries, such humanoids and electric vertical take-off and landing aircraft (eVTOL).

Exhibit 21: Supply chain – Moving up the value chain 'smile curve' is key to upgrading – i.e., upstream has a relatively lower localization rate but higher margin



Source: MIR, FactSet, Wind, Company Data, Morgan Stanley Research. Note: the darker color in the pie charts shows the localization rate. Blue pie is downstream localization rate, yellow pie is midstream equipment localization rate, and green pie is upstream localization rate.

Industry 5.0 – Striving For Ecosystem and Industrial Innovation Leadership

China's goals under Industry 5.0 are to achieve Industrial Intelligence, Resilience and Leadership. We believe China will move from cost and scale leadership towards ecosystem and industrial innovation leadership in this phase, achieving a new level of breakthroughs and increasing China's industrial base.

Over the next decade, we believe China will lead the way in building AI-native manufacturing operating systems and embodied-AI labor platforms. The resulting step-change in productivity should power two strategic outcomes: 1) the export of integrated industrial ecosystems and rising influence over global standards in industries where China already leads; and 2) the creation of sovereign, evolvable industrial technology stacks, together with selective leadership in industrial innovation, reinforced by AI-accelerated discovery.

What is Industry 5.0?

We are at an AI inflection point

Industries are now gradually shifting to generative and agentic AI, moving from single-equipment applications to system-level applications. Industry 5.0 factories combine the digital foundation of 4.0 with advances in AI and robotics to create self-optimizing systems. Beyond existing factory automation, software can coordinate various applications and processes within factories to dynamically optimize scheduling, quality control, material flow, maintenance timing, and even engineering change responses in real time.

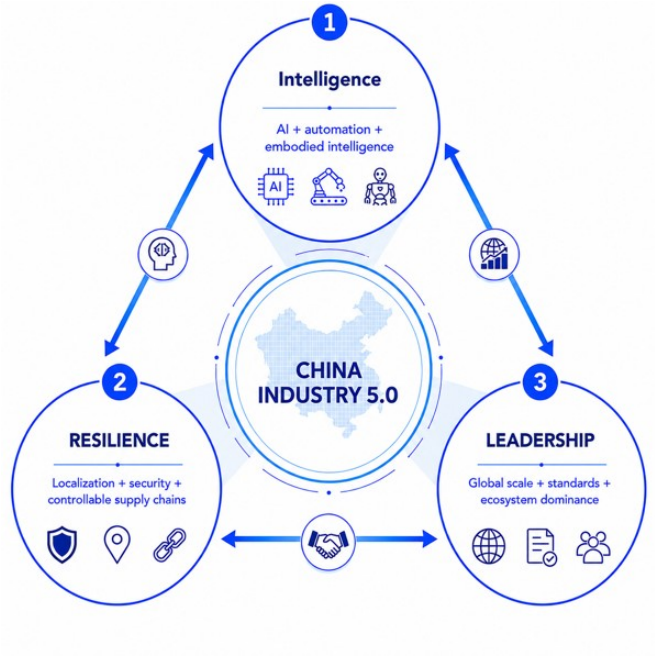
China's unique industrial revolution

China starts from a position where it has 1) state-guided agenda for frontier industries (not just AI, but various industries, such as embodied intelligence and biotech), 2) unrivalled manufacturing scale, 3) comprehensive supply chains, 4) continuous technology iteration, 5) a unique capital system, 6) a massive supply of engineering talent, and 7) ample physical infrastructure. No other country has all of these attributes in such depth, and therefore we believe China's Industry 5.0 approach will be unique, leveraging its strong industrial base, empowered through industrial intelligence, industrial resilience and, as time progresses, increasing industrial leadership.

Three Pillars of Industry 5.0 – IRL: Intelligence, Resilience, and Leadership

1. Industrial Intelligence – Fusion of AI, Automation and Embodied Intelligence. The future of manufacturing is in closed-loop, adaptive and replicable systems that improve with every production cycle. Industrial AI becomes more valuable as a reusable platform, improving efficiency throughout the equipment and production lifecycle. The self-learning ability of AI will be key. Every production defect, maintenance event, or operator intervention will generate incremental proprietary industrial data, creating a compounding flywheel of better models, higher yields, lower costs, and faster learning.

Exhibit 22: China's Industry 5.0 – Three Pillars Reinforce Each Other



Source: Morgan Stanley Research

2. Industrial Resilience – Controllable Supply Chains In a Multipolar World. We believe gaining control over key bottlenecks is a key target for China, including industrial software, advanced equipment, critical materials, energy security and supply-chain chokepoints. In a multipolar world, localized and resilient manufacturers are critical.

3. Industrial Leadership – Achieving Ecosystem Dominance. China has been a follower since the original Industrial Revolution, but with new frontier industries (humanoids, low-altitude economy, etc) emerging and China's industrial upgrades, we believe China's target is to become a leader in more manufacturing areas along the value chain, from downstream to upstream, and setting standards across industries such as EVs, batteries, automation, humanoids, and smart infrastructure, similar to how the US shaped the global digital economy through tech hardware, internet and software platforms.

Together, the three pillars form a self-reinforcing flywheel. Industrial Intelligence makes factories and supply chains smarter with every production cycle, generating better data and stronger models. Industrial Resilience protects that system by securing the critical layers and supply-chain chokepoints, operating through disruptions. Industrial Leadership then converts this accumulated capability into ecosystem control, letting suppliers, customers and partners build around. In our view, the three pillars form an integrated industrial architecture.

Next Decade: Striving for Ecosystem and Industrial Innovation Leadership

In the last two decades, the dominant pattern was deployment-led catch-up: China first created a very large domestic market, then used that scale to shorten engineering cycles, localize tools and components, improve process know-how, and eventually export either finished products or manufacturing systems themselves. This pattern is visible in solar PV, EVs, batteries, high-speed rail, home appliances, electronics assembly, and, increasingly, automation equipment. That pattern was supported by a very large industrial base, dense cluster formation, and rising innovation.

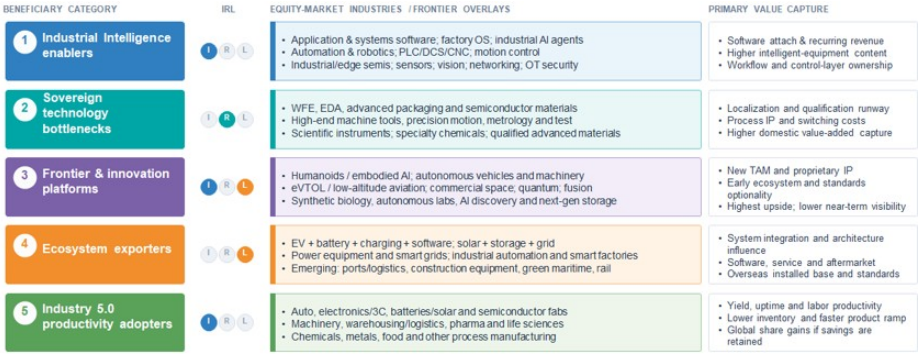
We believe the next stage will be different, as China's manufacturing advantage will be systematic. We expect China to move from large-scale application to foundational industrial innovation, converting its scale and cost advantage into ecosystem and industrial technology leadership.

We expect five breakthroughs to occur in the intelligence, resilience and leadership layers in the next decade:

1. **AI-native manufacturing operating systems** – automated factories become adaptive factories.
2. **Embodied AI as a labor platform** – physical labor becomes software-upgradable capital.
3. **Sovereign and evolvable industrial stack** – localization advances from component substitution to architecture control.
4. **Ecosystem exports and industrial standard-setting** – China moves from product exporter to industrial-system orchestrator.
5. **Industrial technology Innovation leadership** – China evolves from fast industrializer towards industrial discovery engine in selective industries

The first two sit primarily within Industrial Intelligence; the third defines Industrial Resilience; the fourth & fifth express Industrial Leadership. **Many industries will see huge growth opportunities, either as Industry 5.0 enablers or beneficiaries.**

Exhibit 23: The key beneficiaries lie in five categories, and will create a new generation of winners across automation, robotics, semiconductors, materials, etc, for foundational layers, and Industry 5.0 productivity adopters to achieve global leadership



Source: Morgan Stanley Research

1. AI-native manufacturing operating systems – from automated

factories to adaptive factories

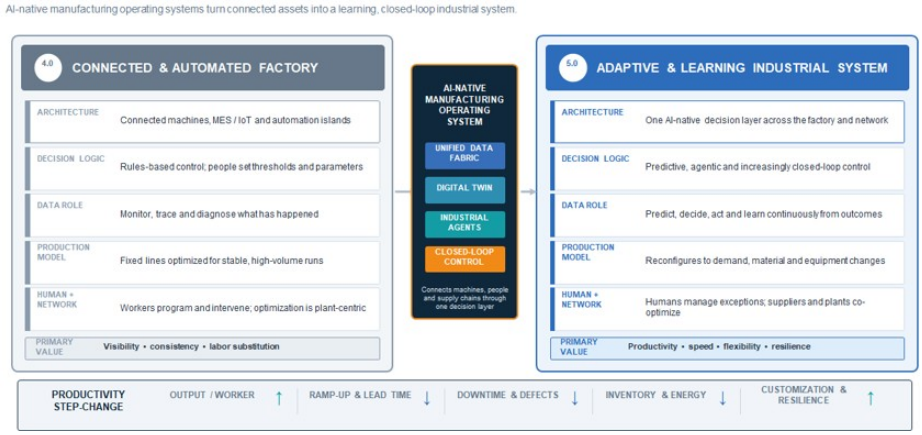
Industry 4.0 connected machines and digitized workflows. An AI-native manufacturing operating system would coordinate product design, process engineering, production scheduling, quality inspection, maintenance, energy use, logistics, procurement, and supplier response. A factory can sense, decide, act and learn across the entire production system, to continuously adjust to changes in demand, materials, equipment conditions and product mix.

The historical lesson: general-purpose technologies require organizational redesign. Steam power and electricity did not transform manufacturing only because they supplied a new source of energy. The largest gains emerged when factories changed their scale, layout, division of labor and production organization. The implication for AI is likewise straightforward – putting AI on top of a legacy workflow is unlikely to create a manufacturing revolution. Reorganizing decision-making, data flows, machinery and supply chains around AI could.

The adaptive factory would improve productivity in several ways, which are critical for the manufacturing competitiveness.

- Higher labor productivity: AI agents can perform production planning, troubleshooting, documentation, quality analysis and maintenance diagnosis. Human workers move from repetitive monitoring and manual coordination towards exception handling, engineering and system supervision.
- Higher equipment productivity: through predictive maintenance and closed-loop process control, lifting overall equipment effectiveness and reducing the amount of capex required for each unit of output.
- Lower quality and material losses: AI-based process controls can detect defects earlier and identify causal relationships across equipment conditions, raw materials and process parameters. This reduces scrap, rework, warranty costs, and customer complaints.
- 4. Economical mass customization could be realized in adaptive factories for the first time.

Exhibit 24: Industry 4.0 connected the factory whereas China's Industry 5.0 makes it adaptive



Source: Morgan Stanley Research

Why we think China can lead

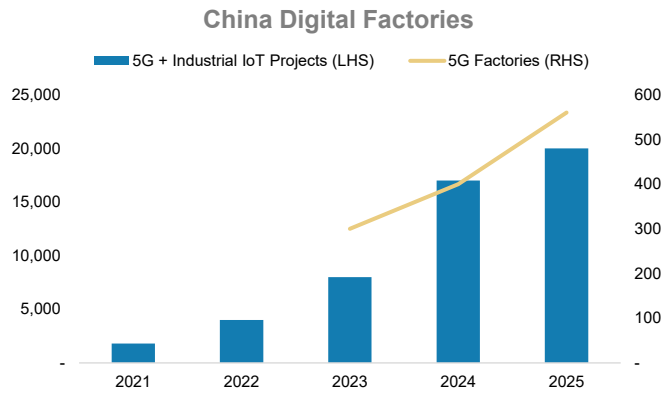
The largest addressable manufacturing base. China accounts for roughly 30% of global manufacturing value-added and is the only economy covering all traditional and emerging categories in the UN industrial classification, with 41 headline industrial categories, 207 categories and 666 subcategories. This gives industrial AI an unusually broad set of real-world applications and cross-industry learning opportunities.

The deployment base is also becoming more intelligent. China already has the world's largest industrial-robot installed base and has rapidly increased automation and digital adoption. The foundation is therefore sufficiently developed for AI to move from isolated pilots toward system-level optimization. By early 2025, China had built more than 30,000 basic-level smart factories, more than 1,200 advanced-level smart factories and more than 230 excellence-level smart factories. By end-2025, China also had more than 4.83mn 5G base stations and 2.9bn mobile-IoT terminal users, giving it one of the world's deepest physical-digital industrial infrastructures.

Policy is shifting from "digital factory" to "industrial agent". China's 2026 "AI+ Manufacturing" program targets is to achieve more AI adoption in manufacturing by 2027, including: three to five general-purpose models deeply deployed in manufacturing, 1,000 high-level industrial agents, 100 high-quality industrial datasets, 500 representative application scenarios, and two to three globally influential ecosystem-leading companies. The significance is not merely the number of pilot projects. The policy focus has moved toward the data, model, agent and ecosystem layers required for an industrial operating system.

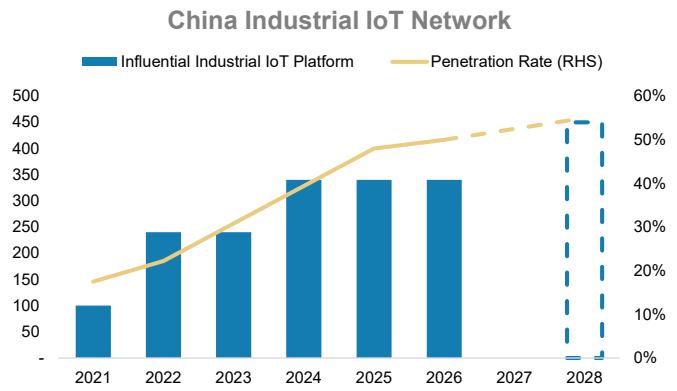
We have already seen very active AI adoption in manufacturing factories, for example, Valeo's Shenzhen facility deployed AI-enabled manufacturing and advanced algorithms across 42 use cases. The site reported a 60.2% increase in productivity, a 45.9% reduction in finished-goods defects, a 34.5% reduction in lead time and a 27.1% reduction in unit energy use. Midea's Wuhu operation implemented 113 digital use cases, 35% AI-enabled, including real-time order management, advanced planning and a supply-chain control tower. End-to-end delivery lead time fell 39%, inventory days fell 30% and market defects declined 86%.

Exhibit 25: China has rolled out a large number of digital factories



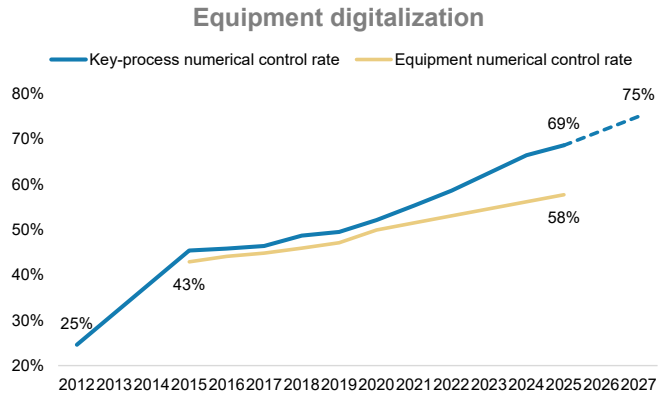
Source: MIIT announcement, Morgan Stanley Research

Exhibit 26: Over 100mn industrial devices are connected, with a goal of 120mn by 2028, implying the penetration rate for influential industrial IoT platforms reached 50% and could reach 55% by 2028. This is the key foundation for industrial intelligence.



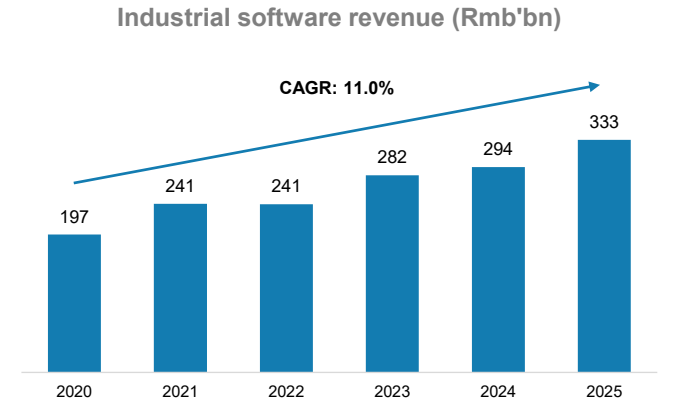
Source: MIIT announcement, Morgan Stanley Research. Note: dotted line represent government target. This is not the exact number, the government report often uses "over/exceed" 340 platforms.

Exhibit 27: China's equipment digitization has reached a high level with a policy target to further improvement



Source: Huawei, MIIT, NDRC, Morgan Stanley Research. The dotted line to 75% represent policy target.

Exhibit 28: China's industrial software market is scaling steadily, providing the control layer for smarter equipment



Source: MIIT, Morgan Stanley Research.

An early Industry 5.0 case study: CATL's manufacturing – Complexity and Intelligence

CATL's manufacturing demonstrates exceptional complexity and intelligence, characterized by self-developed production lines, extensive real-time quality control, and massive data processing capabilities that create significant competitive advantages and high barriers to entry. Our battery analyst Jack Lu visited the CATL factory last year; below are some key numbers to consider:

- *Self-designed production lines with over 25,000 units of components;*
- *Daily output of 2.2mn+ cells;*
- *6,800+ real-time quality control points that secure high yield rates and quality premiums; and*
- *340k data transactions per second.*

How does CATL achieve these?

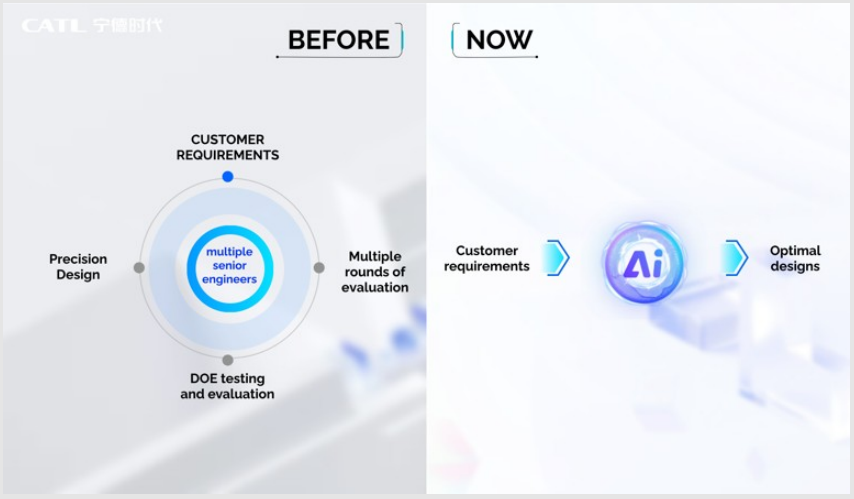
Platformization – CATL's replicable intelligence + Data Loop Compounding for 20 years: CATL operates five data platforms spanning R&D, testing, manufacturing, operation and after-sales, backed by more than 100 billion data assets. It also says 95% of production equipment is connected, more than 7,000 quality-control points are monitored in real time, and product-quality data are traceable for more than 20 years.

- In 2021, its Ningde plant was first recognized as a Lighthouse factory. It leverage AI, advanced analytics and edge/cloud computing to achieve 75% improvement in labor productivity and 10% reduction in energy consumption per year.
- In 2022, its Yibin plant was also recognized as a Lighthouse. CATL further layered AI, IoT and flexible automation on top of its Ningde model, with 40,000 sensors via NB-IoT and 5G. It achieved 17% higher line speed, 14% lower yield loss and zero carbon emissions.
- In 2023, its Liyang plant was also recognized as a Lighthouse. It combined big-data simulation for quality testing, additive manufacturing for faster changeovers, computer vision for micron-level inspection. WEF's reported a 320% output increase, a 33% reduction in manufacturing costs, a 47.4% reduction in normalized emissions and a 99% reduction in quality defects.

End-to-end adaptivity – from manual design to forward design and prediction: In January 2026 CATL was recognized by WEF for its AI-driven next-generation battery-design platform that shifts development from manual trial-and-error towards forward design and prediction before production.

Exhibit 29:

CATL's Intelligent Cell Design



Source: CATL

2. Embodied AI as a labor platform – from task-specific equipment to software-upgradable physical capital

A traditional robot's function is largely fixed at installation. An embodied-AI machine could acquire additional capabilities through new models, fleet learning and over-the-air updates without a complete mechanical redesign, i.e. the same physical machine can potentially learn additional tasks. **Physical labor becomes software-upgradable capital equipment.** Over its life, its mechanical hardware still depreciates, but its task library, perception, reasoning and coordination capabilities can improve. Therefore, embodied AI could extend automation from highly standardized production into flexible high-mix manufacturing, intralogistics, inspection, maintenance, rework and other activities that remain difficult to automate economically.

In addition, **the embodied AI platform converts deployment into data generation**. Each deployed machine can generate data, and the data flows back into model training, the installed base becomes a learning network. More deployment improves capability; greater capability unlocks additional use cases; additional use cases drive more deployment. This is potentially a more durable advantage than one-time hardware cost leadership.

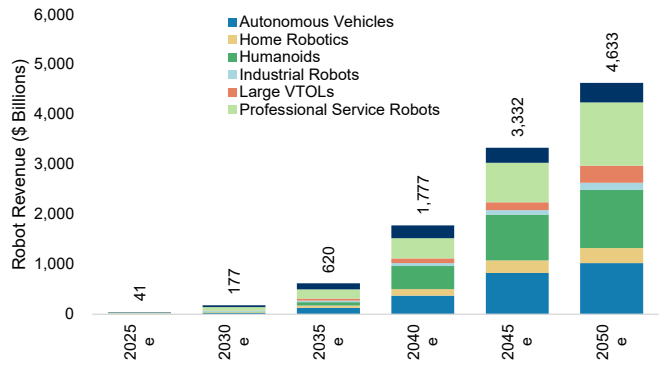
Beyond humanoids, embodied AI is much broader, including autonomous commercial vehicles, industrial robots, mobile manipulator, collaborative robots, AMRs/AGVs, drones/ VToLs, etc.

- Humanoids are particularly relevant in brownfield environments designed for human bodies: standard doors, stairs, aisles, workbenches, tools, and shelf heights. Their potential advantage is reduced infrastructure modification and a broader task envelope.
- Dedicated machines should remain superior where volume is high and the task is stable. They can be faster, cheaper, more energy-efficient and easier to certify.

Based on Morgan Stanley Research forecasts, unit sales across these categories will rise from 8mn units in 2025 to 29mn in 2030 and 76mn in 2035. Embodied AI changes manufacturing economics, potentially extends automation to autonomous manufacturing, addressing the large portion of industrial labor that conventional fixed automation has struggled to automate economically.

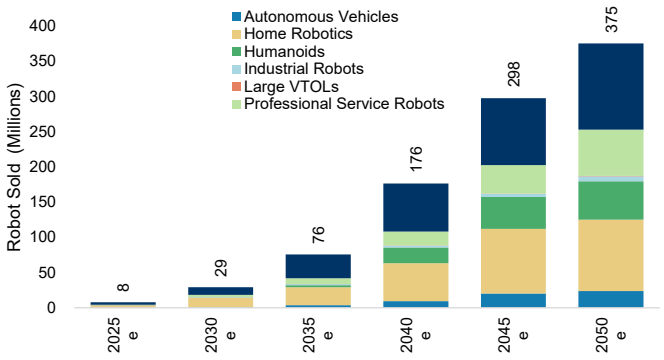
- *For a copy of the Morgan Stanley Global Robot model, please reach out to your Morgan Stanley representative.*

Exhibit 30: China's robot market to reach US$5 trillion in revenue by 2050...



Source: Morgan Stanley Research estimates

Exhibit 31: ...with an annual sales volume of 375mn in 2050



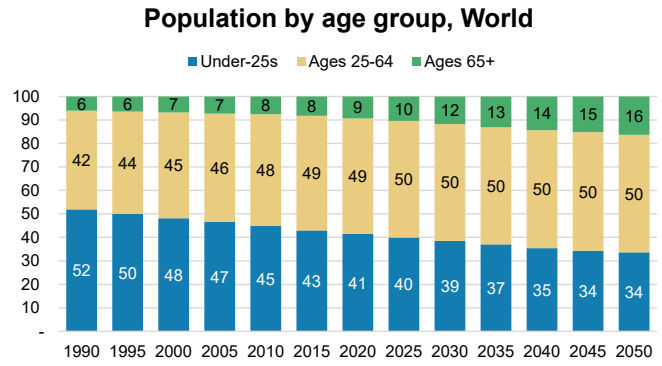
Source: Morgan Stanley Research estimates

What can we expect in terms of manufacturing productivity improvement? There are three key aspects, in our view.

- Direct operating productivity, from labor hour substitution, longer operating windows, greater consistency and better safety;
- Capital productivity and manufacturing flexibility, which is more important, on lower stranded-asset risk, faster new product ramp and elastic surge capacity;
- Learning productivity and network effects.

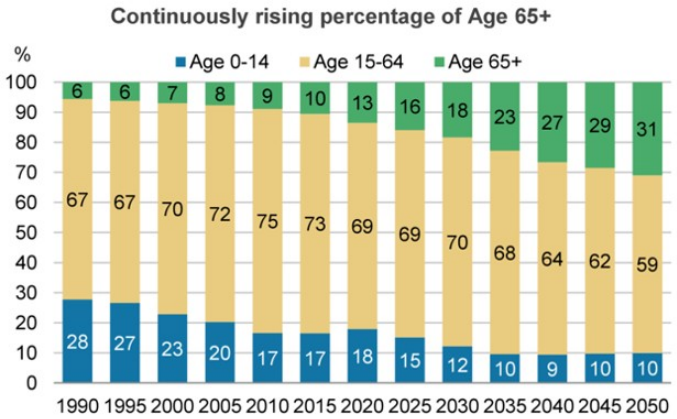
Demographic and skills constraints would be offset by the embodied AI working platform as well, while the pre-condition is that there are sufficient manufacturing know-how/data to perfect the AI manufacturing operation system. The world aging problem and labor shortage are expected to worsen in the coming decades. United Nations projects the world's population aged 65+ will reach 16% in 2050, from 10% in 2025. The situation in China is more concerning. China population YoY % change has turned negative since 2022. China's population aged 65+ reached 16% in 2025, and this will accelerate when the over 300mn people in the 1970-80s reach retirement age in the next 5-10 years. Humanoid robots will likely drive labor force restructuring in the mid/long-term. Based on our survey data, an average of 11% of jobs will potentially be replaced by robots in five years, increasing to 28% in 10 years.

Exhibit 32: United Nations projects the world's population aged 65+ will reach 16% by 2050...



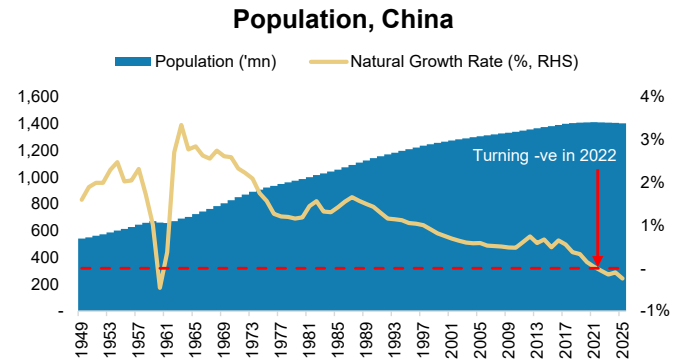
Source: UN, World Population Prospects (2024), Our World in Data, Morgan Stanley Research.

Exhibit 33: ... while China is more concerning at 31%



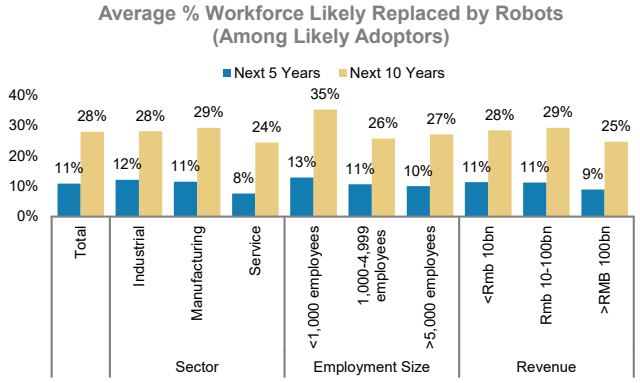
Source: United Nations Department of Economic and Social Affairs, NBS, MOHRSS, Morgan Stanley Research.

Exhibit 34: China's natural population growth rate has been negative since 2022



Source: NBS, Morgan Stanley Research.

Exhibit 35: 11% of jobs could be lost to robots in 5 years, rising to 28% in 10 years

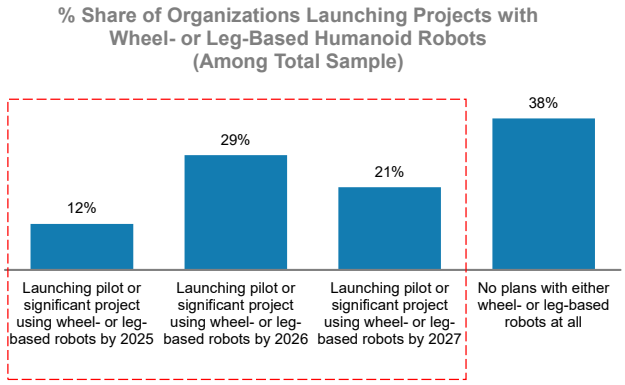


Source: AlphaWise, Morgan Stanley Research. Likely adopters n=53

Why we think China can lead

China has a broad physical-AI ecosystem that spans all of the embodied AI items mentioned above (autonomous vehicles, robots, drones, etc), putting it ahead in the adoption of physical AI in the manufacturing loop. For example, even though it's still early in the adoption of humanoid robots globally, Chinese enterprises have a higher adoption willingness for humanoids. In addition, fast adoption in real factories could provide useful feedback, which should support faster product and model iteration. Our AlphaWise survey of Chinese businesses indicates 62% of respondents are likely to adopt in humanoids over 2025-27, indicating significant potential. This year we have seen initial adoption across multiple industries, notable examples being logistics sorting (SF Express), industrial material handling (Sany RE), battery pack production (CATL), F&B reception (Haidilao). Adoption in real working scenarios is strongly encouraged and supported by government, vs. trials and lab testing. The recent MIIT and SASAC initiative is use-case-driven, targeting 10k level deployment capacity and >100 high value applications by end 2026. Local governments and SOEs must identify operational sites (≥20/province, ≥10/central SOE) for humanoid training. State Grid has placed a Rmb6.8bn (US$940mn) order to procure 500 humanoid robots, 3k dual-arm robots, and 5k quadrupeds.

Exhibit 36: Looking ahead to 2027, 62% of respondents plan to launch pilots or significant projects using humanoid robots, according to our China humanoid survey in 2025



Source: AlphaWise, Morgan Stanley Research. Total respondents n=86.

Exhibit 37: China's humanoid development has been rapid but we are only in the early stage of commercialization



Source: Morgan Stanley Research.

Existing supply chains materially lower the cost hurdle. A realistic key decider of embodied AI adoption is the new system ROI. As we analyzed earlier, scale and cost are the key advantages of China's manufacturers, and based on our comparison of key robotics components, China's supply chain cost is normally 20-50% of global brands' costs. We expect that Chinese-made components will close the gap with global brands in terms of precision, product life and stability, by solving any issues through materials, process refinement, design and AI compensation.

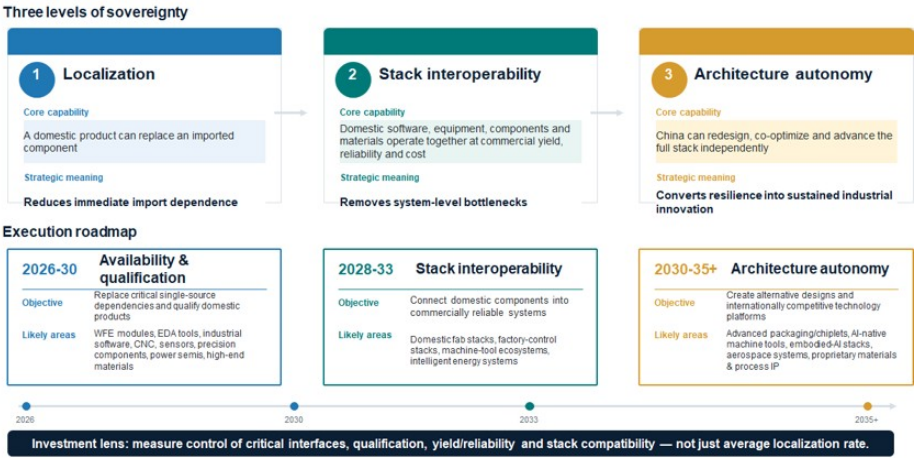
3. Sovereign Industrial Technology – from component localization to architecture autonomy

The key difference between localization and autonomy is that localization lets China keep producing, while **an evolvable sovereign stack lets China keep improving**. China has spent the past decade localizing components across semiconductors, automation, machinery, power electronics, and advanced materials. The higher-level industrial breakthrough would be the construction of integrated technology stacks that can operate and continue to improve under external constraints. We also emphasize that architecture autonomy does not require 100% domestic content. Full autarky would often be economically inefficient. The practical test is whether China retains the ability to operate, repair, redesign and continue improving critical systems without a single external point of failure.

A resilient industrial base has three characteristics, in our view, which are: 1) no irreplaceable single-point dependencies, 2) sufficient control of critical interfaces to redesign around disruption, and 3) the ability to improve performance independently over time.

Achieving industrial architecture autonomy is critical. **It not only ensures production continuity, but faster domestic innovation loops, higher domestic value-added and profit-pool migration (to software, chips, high-end equipment and materials, services, etc), and we also expect these foundational abilities to enable frontier industries and ecosystem exports** (discussion in below breakthrough layer #4).

Exhibit 38: Sovereign industrial stack roadmap: the breakthrough is architectural autonomy, not domestic content alone



Source: Morgan Stanley Research

Where are China's most significant sovereignty gaps, and hence the opportunities?

We use 6 factor screening framework as listed below

- Criticality: Could the absence of the technology stop production or block an entire downstream industry?
- Current gap: Is China still materially dependent on a small number of overseas suppliers?
- Downstream anchor: Does China have sufficient domestic demand to support qualification and scale?
- Technical traceability: Can domestic suppliers reach commercially acceptable performance by 2035?
- Stack leverage: Does progress in this layer unlock several downstream industries?
- Profit-pool quality: Are barriers based on process knowledge, software, qualification and service—or only on temporary scarcity?

China's most significant sovereignty gaps are concentrated not in downstream manufacturing scale, where it is already globally competitive, but in the upstream "brain, nervous system and precision layer" of industry—semiconductors and compute, industrial software and control, high-end machine tools and metrology, and selected advanced materials. These technologies determine whether China can independently design, operate and continuously upgrade complex industrial systems. The gap is deepest in frontier semiconductor equipment and compute, but the most attractive opportunities are often one layer adjacent: WFE, EDA, advanced packaging, industrial control software, high-end CNC, precision motion, sensors and qualified specialty materials, where China has large domestic demand, a viable customer-qualification path and significant room to move up the value chain.

The opportunity is therefore less about blanket import substitution and more about building interoperable, commercially reliable technology stacks. We see the strongest medium-term potential in areas with broad downstream pull across multiple industries – especially industrial software, precision equipment and advanced materials – because progress there can unlock semiconductors, robotics, aerospace, medical equipment and AI-

native manufacturing simultaneously. Aerospace and scientific instruments also represent important strategic gaps, but their commercialization is likely to be more selective and slower due to long certification cycles, smaller production volumes and greater dependence on accumulated scientific and systems-engineering capabilities.

Exhibit 39: Technology sovereignty gap and 2035 opportunities

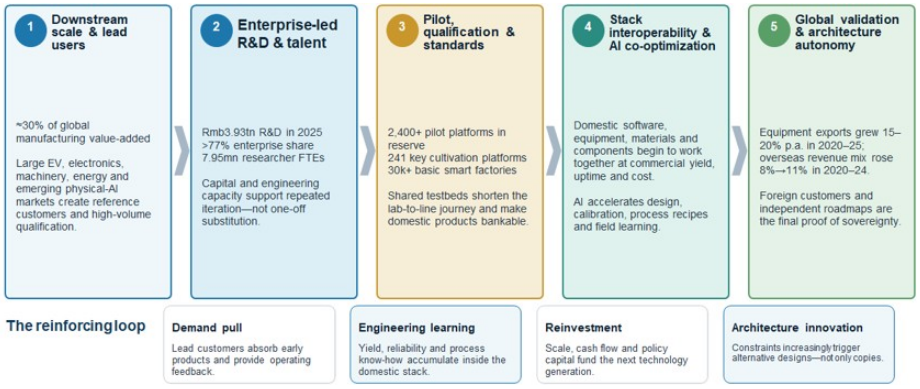
Technology stack	Sovereignty gap	2035 opportunity	Best investable layers	Main limitation
Semiconductors and compute	Very high	Very high, but selective	WFE, EDA, advanced packaging, semiconductor materials, power/analog/auto, semis, edge AI	Frontier-node equipment and advanced compute remain highly constrained
Industrial software and control	Very high	Very high	CNC/PLCs/DCS, MES/SCADA/PLM, digital twins, industrial AI, cybersecurity	Customer stickiness, long validation and historically weak software monetization
Industrial machine tools, metrology and instruments	High	Very high	High-end CNC, precision motion, ball screws, sensors, inspection and test equipment	Precision, reliability and process know-how require long learning cycles
Advanced materials and foundational processes	High	High	Semiconductor materials, ceramics, high-end alloys, carbon fiber, magnets and thermal materials, surface/heat treatment	Qualification cycles and batch-to-batch consistency
Aerospace and strategic mobility	Very high	Medium-high, selective	Materials, manufacturing equipment, flight control, avionics-adjacent systems, testing and MRO	Long certification cycles and complex system integration
Scientific and medical instruments	High	Medium-high	Imaging components, precision sensors, analytical instruments, customized biotech equipment	Small volumes, high validation barriers and dependence on scientific ecosystems

Source: Morgan Stanley Research

How can China advance from localization to industry technology sovereignty?

China's ability to move from localization to technology sovereignty rests on a structural advantage that few other economies possess – **a very large downstream manufacturing system capable of financing, testing and refining upstream technologies at commercial scale.** As analyzed above, sovereignty requires domestic software, equipment, components and materials working together with acceptable yields, reliability and lifetime costs; the system must then be capable of redesigning itself and funding its next generation. China's approximately 30% share of global manufacturing value-added, complete industrial coverage and dense clusters in electronics, machinery, EVs, batteries and emerging physical-AI industries provide unusually powerful lead-customer and qualification mechanisms. We are confident of this localization to sovereignty transition for several reasons given below.

Exhibit 40: The involutional loop towards Industrial Technology Sovereignty



Source: NBS, MIIT, Morgan Stanley Research

1. China's innovation system is becoming larger and more enterprise-led. National R&D spending reached Rmb3.93tn in 2025, or 2.80% of GDP, up from Rmb2.44tn and 2.36% in 2020. China also had the equivalent of 7.95mn full-time researchers in 2025. Enterprises now account for more than 77% of R&D spending, while the country has 1,921 nationally

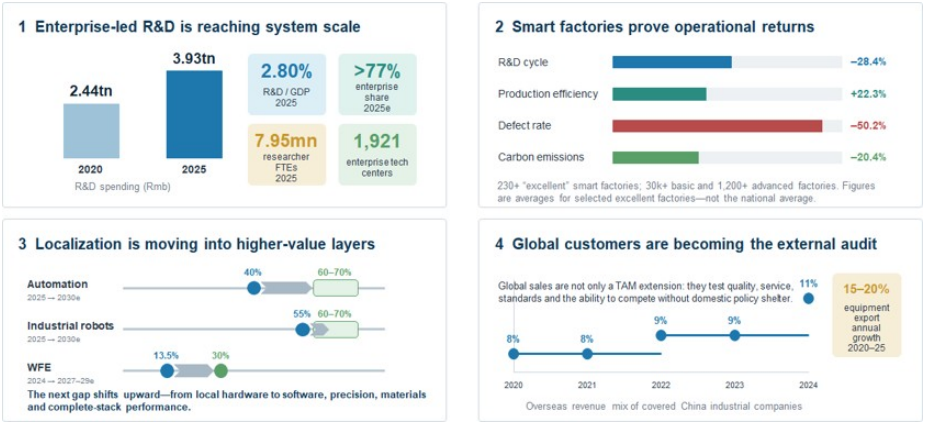
recognized enterprise technology centers and more than 17,600 "little giant" specialized SMEs. This matters because industrial sovereignty is built through repeated improvements in yield, uptime, precision and process control, rather than a single laboratory breakthrough. An enterprise-led R&D system is more likely to connect research directly to market demand and factory operating data.

2. China is building the commercialization infrastructure between the laboratory and mass production. By August 2025, MIIT had included more than 2,400 manufacturing pilot platforms in its reserve pool and selected 241 for the first key cultivation cohort. These platforms assess whether a prototype's technology pathway, product consistency, production process, and economics are mature enough for mass production. At the other end of the commercialization chain, China had built more than 30,000 basic-level, 1,200 advanced-level, and 230 excellent-level smart factories by early 2025. Among the excellent-level factories, average R&D cycles were 28.4% shorter, production efficiency was 22.3% higher, defect rates were 50.2% lower, and carbon emissions were 20.4% lower. While these factories represent selected leaders and outperform the national average, they demonstrate China's growing ability to translate advances in equipment, software, and manufacturing processes into measurable industrial outcomes.

3. Cross-sector learning. Technologies developed in one large Chinese ecosystem can be redeployed into another. The capabilities built in EVs (motors, power electronics, batteries, sensing and control) are now supporting humanoids, autonomous machinery and low-altitude aviation. Solar-equipment suppliers have accumulated knowledge in thin-film deposition, coating, vacuum systems and process control that can be adapted selectively to semiconductor equipment. In Morgan Stanley Research's 2026 China Industrials outlook, we estimated automation and industrial-robot localization at approximately 40% and 55%, respectively, in 2025, potentially rising to 60-70% by 2030. The next localization frontier is therefore moving upward from generic hardware into semiconductor equipment, machine tools, high-precision sensors, screws, specialty materials, software and control systems.

4. Overseas expansion is beginning to provide an external audit of domestic capability. China equipment exports grew an estimated 15-20% annually during 2020-25, while overseas revenue among the Chinese industrial stocks under Morgan Stanley coverage increased from 8% in 2020 to 11% in 2024. Companies that progress from following Chinese customers overseas to qualifying with multinational clients are moving closer to genuine technology sovereignty and, eventually, industrial leadership, in our view.

Exhibit 41: China now combines rising enterprise-led R&D, commercialization infrastructure, localization progress and growing overseas validation



Source: NBS, MIIT, Morgan Stanley Research estimates

4. Ecosystem exports and industrial standard-setting – from product exporter to industrial-system orchestrator

China is already the world's largest goods exporter. The next level of industrial leadership is not simply about exporting more products but complete operating ecosystems that combine products, lifecycle maintenance, infrastructure, software, technical standards, and localized supply chains. The competitive unit changes from the product to the system.

We see five stages unfolding in China's industrial globalization. Many companies are already at stages 1-4, and we believe more companies can achieve stage 5, which represents industrial leadership rather than export success, along with their higher penetration in overseas local operations.

- Stage 1: Product exports. Chinese companies sell finished equipment overseas, often competing through price and delivery speed.
- Stage 2: Following Chinese customers. Suppliers accompany Chinese EV, battery, electronics and infrastructure customers into overseas markets.
- Stage 3: Local production and service. Companies establish local plants, distribution, maintenance, engineering and management to meet local-content and customer-support requirements.
- Stage 4: Penetrating global customers. The supplier moves beyond China-linked customers and qualifies with multinational OEMs, utilities and industrial companies.
- Stage 5: Ecosystem and standard control. The company or industry influences interfaces, protocols, certification, service practices, data formats, infrastructure design, financing models.

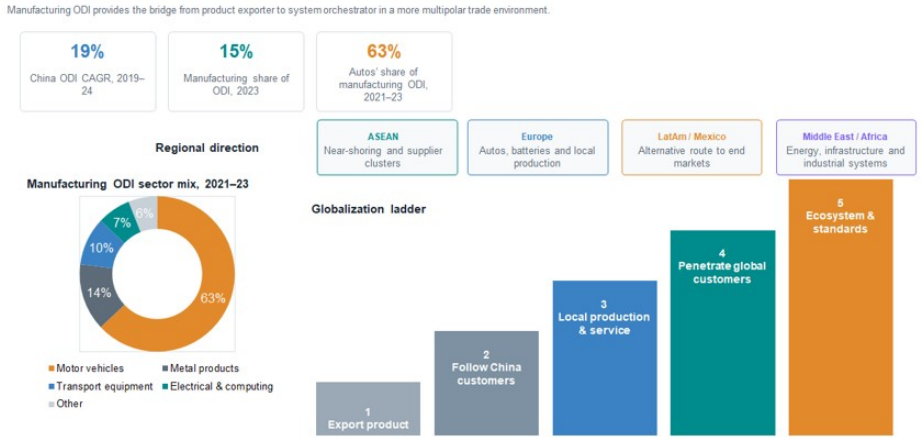
China is moving up the ladder, from export products to ODI

China's outward investment is also becoming more manufacturing-oriented. Overseas direct investment (ODI) grew at a 19% CAGR over 2019-24, and manufacturing represented 15% of total ODI in 2023. China's manufacturing ODI has increasingly focused on autos, metals and transport equipment, reflecting a shift from exporting products toward placing production and supply chains closer to final markets. Investment has been

increasing in ASEAN, Latin America and parts of Europe as companies localize production and mitigate trade barriers.This provides the starting point for ecosystem exports: products establish the installed base; overseas factories and service networks increase customer dependence; interfaces and standards then become more influential.

This process is likely to accelerate in a multipolar world. Tariffs and local-content requirements make pure export models less sustainable, but they also encourage leading Chinese manufacturers to develop local operations to meet local demand.

Exhibit 42: China's globalization is shifting from exports toward local production, service networks and ecosystem embedding

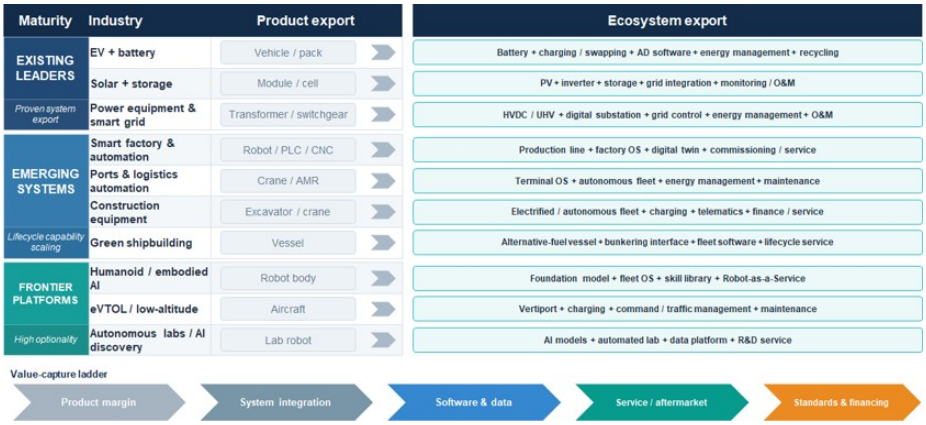


Source: Ministry of Commerce, SAFE, CEIC, Morgan Stanley Research

China has already demonstrated selected system-export capability. CATL is licensing cell-to-pack technology and providing production-line and manufacturing know-how in Thailand, while Ford's Michigan LFP plant is designed to use CATL battery-cell knowledge and services. China has also delivered two overseas Hualong One nuclear units in Pakistan, showing that complex regulated systems can be exported selectively.

In the next decade, we expect more industries will extend product exports to ecosystem exports. EVs and battery systems, solar-plus-storage, and power equipment and smart grids are the most advanced, as China already combines globally competitive products with infrastructure, software, integration and lifecycle services. A second group including smart factories, ports and logistics automation, construction equipment and green shipbuilding, has credible system-export potential, in our view, as China has strong manufacturing scale, yet still needs deeper overseas service networks, software capability, certification and lifecycle support. Humanoids, eVTOL and autonomous laboratories represent frontier options, which are potentially powerful ecosystem and standard-setting platforms, but their commercial economics, safety and international acceptance remain unproven.

Exhibit 43: Potential ecosystem-export opportunities from existing leaders, emerging industries and frontier industries



Source: Morgan Stanley Research

How can China become an ecosystem exporter?

1) China possesses powerful market share. Standards emerge more readily where deployment is large enough to reveal engineering problems and amortize infrastructure. China has 27% of global manufacturing value-added, the world's broadest industrial-system coverage, leading positions in many new industries such as EVs, batteries, solar, equipment and electronics, and large domestic infrastructure networks. China's industrial operation is more on ecosystems (equipment, software, component, energy, services, infrastructure, training, etc) at a scale, setting the foundations for ecosystem exports.

2) Overseas investment is shifting China from exporter to local operator. China's ODI grew at an estimated 19% over 2019–24, while manufacturing accounted for 15% of total ODI in 2023. China's manufacturing ODI has also increasingly focused on autos, metals and transport equipment, reflecting a shift from exporting products toward placing production and supply chains closer to final markets. In our view, this provides the starting point for ecosystem exports, with the products establish the installed base, while overseas factories and service networks increase customer dependence, and interfaces and standards then become more influential. This process is likely to accelerate in a multipolar world. Tariffs and local-content requirements make pure export models less sustainable, but they also encourage leading Chinese manufacturers to develop local operations to meet local demand.

3) China's cost position makes ecosystem adoption affordable, especially in emerging markets. The recent wide adoption of China's LLM is a good example of the importance of cost affordability. A multipolar world also increases demand for alternative industrial architectures. China is particularly well positioned where customers prioritize cost, speed and turnkey delivery. In the near future, the strongest opportunities are likely in ASEAN, the Middle East, Latin America, Africa, and select parts of Europe, rather than uniform global adoption.

Having said that, although we are positive on China's export evolution, the path will be bumpy, especially given geopolitical resistance. Certification and trust also take time to build.

4) Industrial Technology Innovation Leadership – from fast industrializer to an

industrial R&D engine

This is the least mature of the five breakthroughs, but potentially the most transformative.

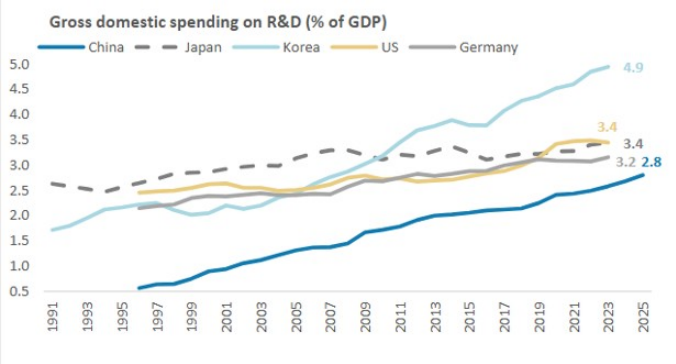
China's established industrial advantage lies in engineering, commercialization, scale-up and cost reduction. In the AI era, the advantage will support upstream extension, into discovery by shortening the cycle between scientific knowledge, simulation, experimentation, pilot production, manufacturing feedback, achieving a closed discovery-to-manufacturing loop, in our view.

Many global industry leaders are mainly strongest at research copilot and predictive design, while China's potential differentiation lies in pilot scale optimization and manufacturing feedback, because it has a large physical base for experimentation, pilot production and commercialization. AI's industrial value will be narrowing the "lab-to-fab" gap.

Evolution from adopter to leader

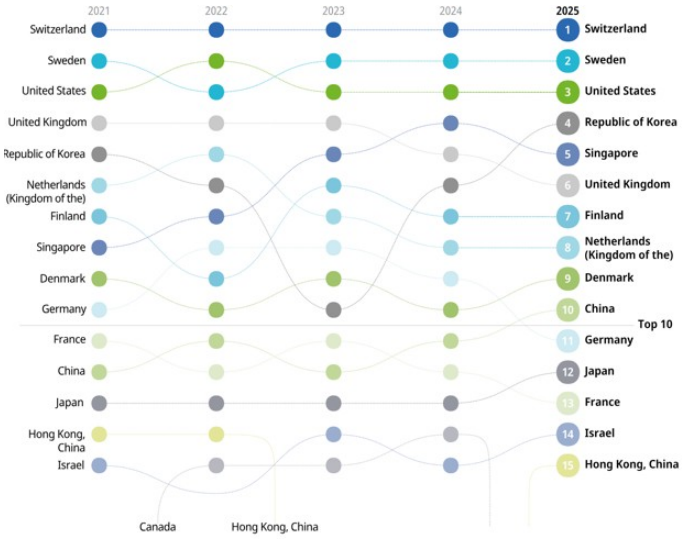
As mentioned above, China's national R&D expenditure rose to around 2.8% of GDP (US $550bn annually) in 2025, second only to the US in absolute terms. A deepening R&D ecosystem strengthens its ability to localize, refine and commercialize next-generation industrial technologies, providing a credible innovation base for long-cycle manufacturing upgrading. China is now an increasingly important source of industrial innovation, with the world's largest concentration of top innovation clusters and a sharp increase in patent filings.

Exhibit 44: China's R&D spending rose to 2.8% of GDP in 2025



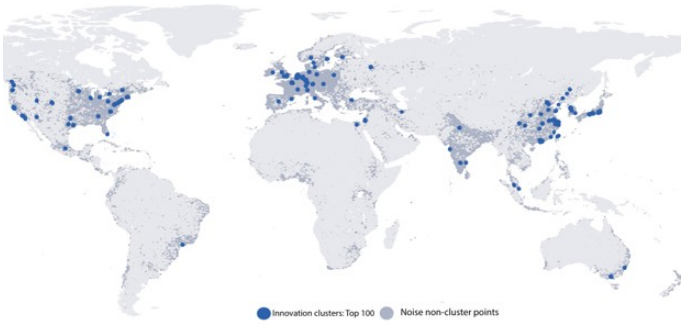
Source: World Bank, CEIC, Morgan Stanley Research

Exhibit 45: China enters the Global Inovation Index's top 10 for the first time in 2025



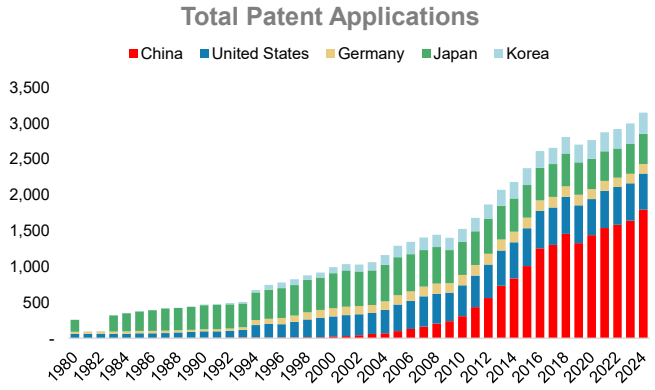
Source: WIPO

Exhibit 46: China leads globally in top innovation clusters, with 24 clusters in the top 100, underscoring the depth of its R&D ecosystem



Note: Gray points (noise) refer to all inventor/author locations not classified as being within a cluster.
Source: WIPO Statistics Database, May 2025

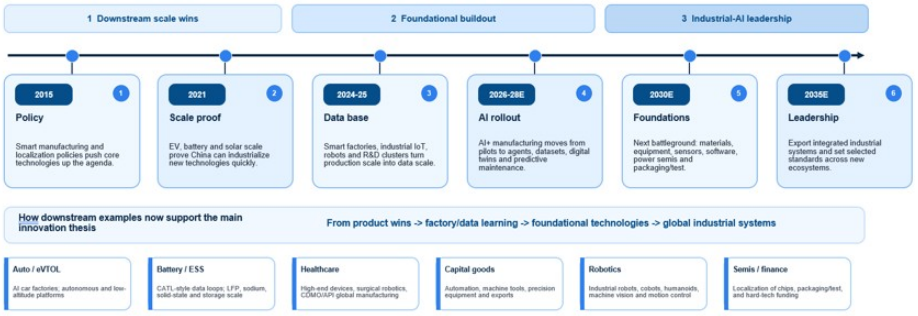
Exhibit 47: From follower to inventor, China is filing the most patent applications globally



Source: WIPO Statistic Database, Morgan Stanley Research.

China could potentially achieve breakthroughs across a broad range of industries, in our view, with upstream advanced materials and equipment serving as the foundational layer underpinning progress across the industrial value chain.

Exhibit 48: China Industrial Innovation: From downstream scale to foundational layer



Source: Morgan Stanley Research

Exhibit 49: What do foundational layers include?

Foundational layer	What it improves	Industrial spillover
Advanced materials	Strength, weight, heat resistance, conductivity, corrosion resistance	Aerospace; robotics; machinery; power equipment; semiconductors; autos
High-end precision equipment	Tolerance, yield, automation, throughput, process stability	Machine tools; semicap; medical devices; electronics; molds; auto parts; aerospace
Sensors / metrology / testing	Measurement, defect detection, feedback control, reliability verification	Every AI-enabled factory, robot, process plant and industrial asset
Motion control / core components	Precision movement, actuation, reliability, uptime	Robots; CNC; logistics automation; packaging equipment; industrial machines
Industrial software / simulation	Design speed, virtual testing, process optimization, digital twins	Faster R&D cycles across sectors
Power semiconductors / industrial compute	Energy efficiency, electrification, edge intelligence	EVs; grids; automation; robotics; industrial drives; renewables
Specialty chemicals / consumables	Yield, purity, process stability	Semiconductors; batteries; displays; PV; high-end manufacturing
Advanced packaging / substrates / interconnects	System integration, heterogeneous integration, thermal density, signal integrity, module reliability	AI servers; industrial edge compute; automotive electronics; power modules; sensors; semiconductors
Industrial control systems / PLC-DCS-SCADA / embedded controllers	Real-time control, safety, deterministic execution, equipment integration	Process plants; smart factories; robotics; machine tools; utilities; energy systems
Industrial networking / data infrastructure / cybersecurity	Low-latency connectivity, interoperability, trusted data exchange, secure remote operations	Connected factories; supply chains; predictive maintenance; industrial agents; cross-plant optimization

Source: Morgan Stanley Research

Why does this matter? Foundational innovation has a much larger multiplier

A downstream sector win benefits one value chain. A breakthrough in materials,

equipment, sensors or industrial software can lift many value chains simultaneously. It raises the performance ceiling of what Chinese manufacturers can make, while lowering the cost floor of producing it.

If China becomes a global leader in selected foundational layers, it can define cost curves, product specifications, process standards and export platforms. Profit pools would migrate upstream into materials, equipment, components and industrial software. China would also gain stronger standard-setting power and greater resilience against geopolitical restrictions, and a stronger manufacturing flywheel.

If China becomes a strong follower rather than a global leader in other foundational layers, the impact is still significant. It can reduce bottleneck risk, lower the cost of industrial upgrading, increase bargaining power in supply chains, shorten engineering cycles and preserve competitiveness in both mid-end and high-end manufacturing.

Broad industry benefits

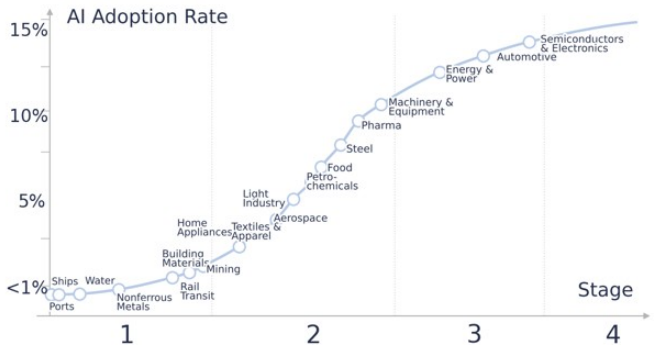
Industrial intelligence – AI enabler, AI adopter

Industrial AI beneficiaries split into AI enablers and AI adopters.

AI enablers are the physical capex layer: Data-center power equipment, grid equipment, liquid cooling, storage and backup power, optical interconnect, automation industrial robots, cobots and humanoids, machine vision, motion control, CNC machine tools and industrial software.

We separate AI adopters into 1) the product side, where AI will be adopted for product upgrades, such as autonomous driving, and 2) the factory side, and we think the fastest downstream adopters are sectors with abundant standardized process data and clear ROI. From this perspective, auto, electronics, batteries and solar, and machinery should move first because inspection, scheduling, predictive maintenance and digital twins can be scaled across many similar lines.

Exhibit 50: AI adoption by downstream – Semiconductor, electronics, auto, new energy penetration is faster



Source: China Academy of Information and Communications Technology, Morgan Stanley Research

Exhibit 51: The development of AI technology will deepen the integration of industrial robots and processes, and increase the penetration of robots in complex application scenarios



Source: MIR, Morgan Stanley Research. 2030 is MIR estimates.

Resilience – Energy security, defense, semiconductor, emerging frontiers

Resilience beneficiaries are the sectors where capex is no longer purely discretionary. In a more fragmented and increasingly multipolar world, supply-chain autonomy and energy

security make semiconductors, semiconductor equipment and materials, industrial software and OT security, machine tool, grid equipment, energy storage, defense and aerospace, and advanced materials structurally favored. We would also include future-security sectors such as embodied AI, quantum technology and 6G, which have already moved into the formal policy funding agenda.

Leadership – setting standards, gaining global market share

Leadership and standards beneficiaries are the sectors where China's scale can translate into rule-setting power, not just export volume. The clearest existing leaders are EVs and intelligent vehicles, batteries, solar PV, storage and power electronics, and industrial robotics. China accounted for almost two-thirds of global EV sales in 2024, 80% of global battery cell production, more than 80% of solar-PV manufacturing across all stages, 95% of PV wafer manufacturing capacity, and 54% of global industrial robot installations.

Policy is becoming more explicit on standards as well – MIIT's 2025 standards work plan highlights smart manufacturing, industrial internet, PV, batteries, storage and embodied AI, and targets more than 100 international standards led by Chinese entities. We believe the sectors with the largest installed bases and export scale are best positioned to turn manufacturing leadership into ecosystem and standards leadership.

Industry 5.0 – A Long Capex Supercycle

Industry 5.0 is set to anchor China's next industrial capex supercycle, taking cumulative industrial investment to Rmb340trn (US$50trn) in 2026-35 and creating Rmb80trn (US$12trn) of incremental capex demand versus a non-Industry 5.0 path, even as economy-wide investment growth slows with the aging population. The opportunity reflects a decade-long reconfiguration of China's production system: AI should raise returns from upgrading its vast installed industrial base, while policy priorities and a stronger global capex cycle sustain the incentive to reinvest. The cycle should start gradually, with capex growth at around 4-5% in the next two years as lingering excess capacity, curbs on duplicative buildout and advanced-chip constraints weigh on spending, before accelerating to 6-7% from 2028 as capacity is absorbed, semiconductor localization advances, and AI shifts from infrastructure buildout to factory-wide deployment, production redesign and commercialization.

A New Capex Cycle – Unlocking a US$12trn Opportunity by 2035

Industrial investment has become the main counterweight to China's broader capex slowdown: Since the demographic tide turned from 2015 – tilting the economy towards net consumers over income earners – the national saving rate has trended down, pressuring investment's share of GDP. Yet industrial capex – including investments on factories, manufacturing equipment, industrial-related software and R&D, and electricity production & grids – has bucked this trend, with growth at an 8.8% CAGR in 2021-25, up from 6.1% in 2016-20, lifting its share of GDP from 15.4% to 17.4%. The industrial capex resilience has been powered by Covid-era closed-loop production, the new-energy boom, and surging AI and frontier-sector spending, and should be further supported by the rising Asia capex supercycle driven by AI and AI-related infrastructure, energy transition, defence, and a rise in regional industrial capex. These have cushioned the drag from property (share in GDP down 4pp to 3.3%) and traditional infrastructure (down 1.7pp to 7.6%).

Industry 5.0 should extend this upcycle as a capex-heavy transformation, not a light-asset digital upgrade or an ordinary cyclical recovery: It requires simultaneous investment across three layers: (1) enabling infrastructure – including AI compute, data centers, power systems, grids, storage and cooling; (2) factory upgrading – including intelligent equipment, robots, sensors, edge semiconductors and industrial software; and (3) strategic resilience and leadership – including supply-chain autonomy, critical technologies and capacity to sustain global market-share gains. Because each layer enables and reinforces the next, the cycle should be broader and more persistent than a normal replacement upswing.

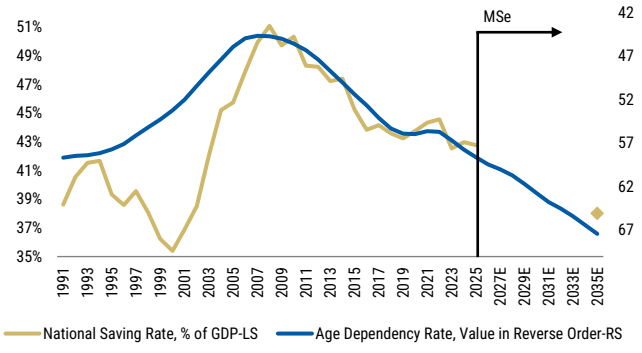
We expect Rmb340trn cumulative industrial investment in 2026-35, with Industry 5.0 creating Rmb80trn of incremental capex demand: This represents a major shift in investment composition, not a reversal of the economy-wide capex growth slowdown –

we expect total investment/GDP to decline from around 39% today to 36.5% by 2035. The key potential drag will likely be structural weakness in property and traditional infrastructure spending, given demographic aging, local-government debt problems, and a still-large housing inventory overhang. That said, Industry 5.0-induced capex should outperform, as AI diffusion raises demand for both intangible and physical investment, while the global capex supercycle supports external demand and facilitates overcapacity absorption.

We thus expect industrial capex/GDP ratio to rise to ~19.5% by 2035 from 17.4% in 2025, slightly higher than its previous peak of 19.2% in 2011. This would bring US$12trn (or Rmb80trn) of additional industrial capex over the next decade vs. a non-Industry 5.0 trajectory, where share of industrial capex in GDP could slip to ~14.0% given persistent overcapacity, loss of manufacturing competitiveness amid an aging population, and weak support from external demand.

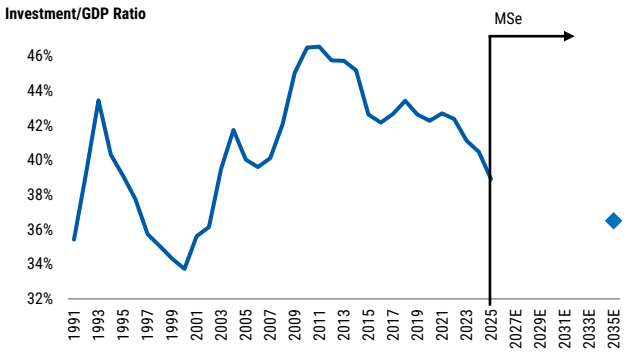
The cycle should start slowly and accelerate as capacity and technology constraints ease: Despite the rising global capex supercycle and increasing policy support, Industry 5.0 will hardly bring a broad-based manufacturing capex boom from day 1, given still pervasive excess capacity and Beijing's efforts to reduce repetitive buildout across regions/ sectors under the "unified national market" initiative. Meanwhile, China's ample existing power capacity reduces the need for a US-style surge in power-infrastructure investment, while datacenter deployment remains constrained by the availability and performance of domestically produced advanced chips. We thus expect industrial capex growth to remain slow over the next couple of years, at about 4-5% annually (vs. 5.7% p.a. in 2024-25). With overcapacity digestion, easing tech bottlenecks owing to rising semiconductor localization, and a shift of AI deployment towards broader factory adoption and then to large-scale commercialization, industrial capex growth could accelerate to 6-7% p.a. from 2028.

Exhibit 52: China's national savings rate has been on a downtrend since 2015 due to the aging population…



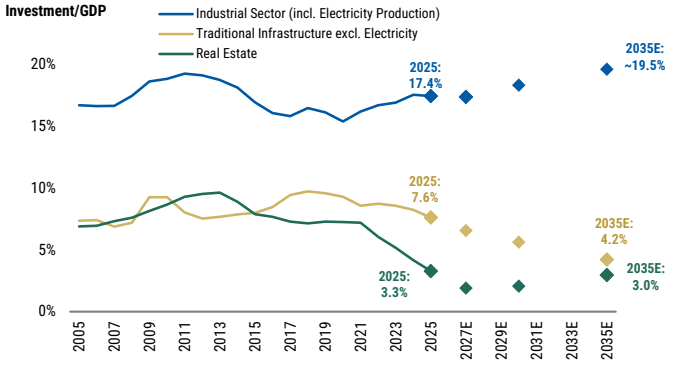
Source: Haver, Morgan Stanley Research. E= UN estimate on age dependency, Morgan Stanley Research estimates on national saving rate

Exhibit 53: …keeping investment/GDP on a downtrend



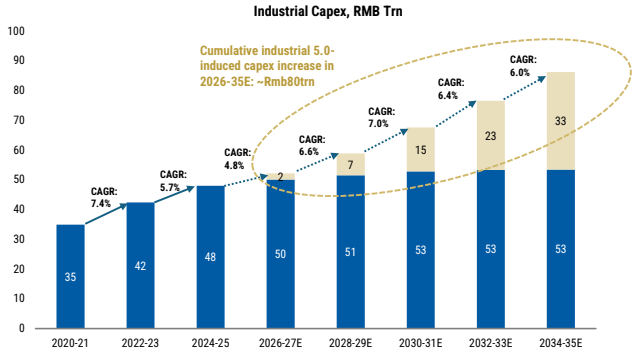
Source: Haver, Morgan Stanley Research. E= Morgan Stanley Research estimates

Exhibit 54: But stronger Industry 5.0-induced capex expansion would partly offset slower structural capex in property and traditional infrastructure



Source: Haver, Morgan Stanley Research. E= Morgan Stanley Research estimates

Exhibit 55: Industry 5.0 to unlock about US$12trn incremental investment opportunities in 2026-35, though with a slow start



Source: Haver, Morgan Stanley Research. E= Morgan Stanley Research estimates

Why we believe this will be a stronger and longer supercycle

Learning from history: The history of industrial revolutions suggests that capex can remain elevated for extended periods when:

- A new general-purpose technology coincides with large-scale physical deployment and complementary system redesign. For example, US electrification beginning in the 1880s required massive investments in power generation, grid infrastructure, and factory reorganization.
- An economy undergoes industrial transformation. For example, Japan's shift toward capital-intensive industries beginning in the 1960s drove substantial investment in heavy industry, high-efficiency equipment upgrades, and automation technologies.
- Supply chains are reallocated. For example, China's rapid gains in global export market share following its WTO accession in the 2000s triggered significant investment across manufacturing and export-oriented industries.

When multiple factors occur simultaneously and reinforce one another, they can create multi-year industrial reinvestment cycles. (Details in Appendix III – Long Capex Cycle for Industrial Revolutions Historically.)

Industry 5.0 is revolutionary, requiring intensive capex for longer

This is not a normal cyclical capex upswing driven by inventory restocking, but a structurally elevated industrial capex cycle with the potential to last close to a decade. **AI + autonomy + sovereignty + industrial ecosystems** are all happening simultaneously, which means each round of investment is likely to create the need for the next one. AI drives data-center, power, cooling, and network capex; autonomy drives robots, sensors, motion control, machine tools, and software; sovereignty enables domestic substitution, redundancy, and strategic capacity build-out; and dense industrial ecosystems accelerate replication across suppliers and downstream users.

1. AI + physical AI's fast penetration

The capex expansion from industrial intelligence in our view stems from three core tailwinds: 1) the AI revolution itself requires heavy-asset infrastructure investment. 2) AI will contribute to a manufacturing upgrade cycle that unlocks new sources of efficiency, resilience, quality improvement, and export competitiveness across China's factory base. The penetration of intelligent equipment and AI agents will see an exponential acceleration. 3) Chinese capital goods companies benefit from global AI construction demand with expanding market share.

Meanwhile, it is also more recurring and networked than past capex waves. China has more than 15k 5G+ industrial internet projects covering all 41 industrial categories, has already built 4k+ 5G factories, and is targeting 10k 5G factories by 2027. Combined with the smart-factory rollout, that means this cycle is not a one-off plant build; it is an ongoing upgrade loop across equipment, connectivity, software and data.

Industrial Revolution 1.0 was built on coal and steam, 2.0 on electricity and oil, 3.0 on automation and the grid, and 4.0 on digital systems layered on electrification, and 5.0 is increasingly defined by AI at scale running on electricity at scale. China is uniquely positioned because it combines the three capabilities this new era requires in one system: a vast power network, the world's deepest manufacturing base, and a dense industrial ecosystem that can turn AI demand into physical deployment. In other words, China is not just building LLM models; it is building the electricity, grid equipment, cooling systems, storage, robots, machine tools, sensors, and downstream applications that allow AI to move from software into the real economy, and industrial capex reinforce each other in a long-duration cycle.

Exhibit 56: AI expands the industrial capex pie across the full value chain



Source: Morgan Stanley Research

2. Reshaping the capex landscape – skewed to equipment

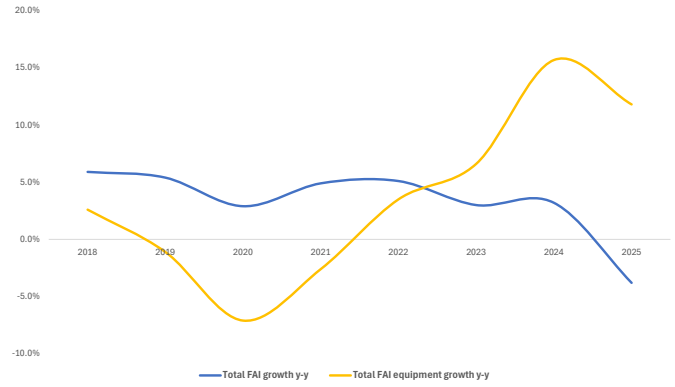
Equipment capex to surpass construction capex. Industry 5.0 is not just enlarging China's capex pie – it is decisively rotating it toward equipment, automation, controls, digital industrial infrastructure, and frontier manufacturing. The clearest proof is that China's equipment capex is materially outperforming headline investment in the past few years and has sustained into 2026.

We estimate equipment capex as a share of nominal GDP will rise to approximately 9% by 2035 under the China Industrial 5.0 scenario. This implies a 10-year average of roughly 7.5%, above the 2016-25 average of 6.0% but below the 8.5% average recorded in 2006-15. The increase reflects (1) greater investment in intelligent equipment to achieve higher levels of factory autonomy, and (2) an accelerated shift in manufacturing cost structures from labor expenses (opex) to capital investment, driven by an aging population and rising labor costs, which improve the return on equipment investment. As a result, **we expect**

equipment capex to grow at a CAGR of 8.7% during 2026-35, accelerating from 4.6% in 2016-25.

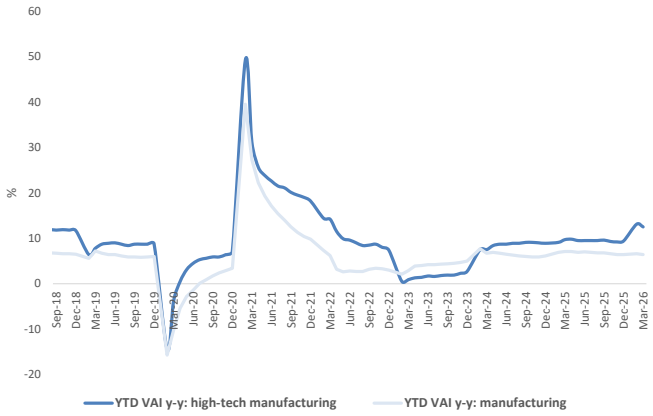
The next capex cycle will be structurally skewed toward high-end equipment and frontier technologies. In recent years, China's high-tech manufacturing value-added growth has consistently outpaced overall industrial value-added growth. This suggests that the next phase of industrial investment is unlikely to resemble a broad-based rebound in traditional industries. Instead, investment is likely to concentrate in advanced equipment, robotics, industrial AI, electronics, and precision components. While narrower than previous industrial upcycles, this investment wave should be higher quality, more innovation-intensive, and more supportive of emerging manufacturing supply chains.

Exhibit 57: Industrial equipment capex outperformed total industrial capex driven by both new capex and equipment upgrades



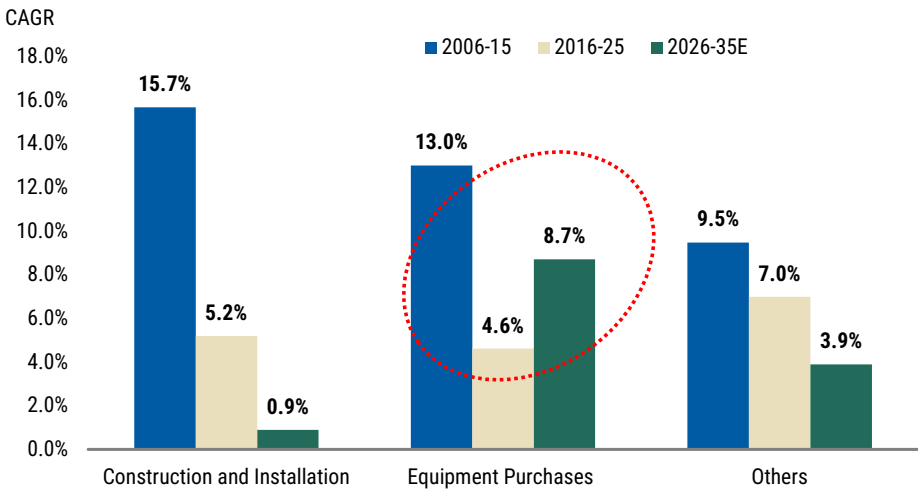
Source: NBS, Morgan Stanley Research

Exhibit 58: The high-tech manufacturing VAI y-y outperformed total VAI notably



Source: NBS, Morgan Stanley Research estimates

Exhibit 59:
We expect China's equipment capex growth to accelerate notably to around 9% in 2026-35 from 4.6% in 2016-25



Source: NBS, Morgan Stanley Research estimates. Note: Others include land use expenses, management and service expense, as well as other expenses related to project construction.

3. Security priority

In this cycle security has become a capex accelerator in its own right. In a more fragmented and increasingly multipolar world, capex is no longer being determined only by demand growth or near-term ROI; it is also being pulled forward by the need for resilience, sovereignty, self-sufficiency, energy security (green transition after energy shocks).

Exhibit 60: We expect China's semiconductor self-sufficiency ratio to reach 32% by 2028



Source: Gartner, WSTS, Morgan Stanley Research (e) estimates.

Exhibit 61: China's push toward energy independence is becoming increasingly critical in the wake of renewed geopolitical disruptions



Source: Morgan Stanley Research

Capex: How to Finance and Where to Invest?

We place the US$12tn (approximately Rmb80tn) incremental capex TAM under China's Industry 5.0 into three layers: (1) Infrastructure, (2) Factory upgrades, and (3) Resilience/leadership new capacity from global market share gain. Industry 5.0 is ultimately about embedding intelligence into the physical economy. That said, AI infrastructure and energy are the enabling base, factory upgrades is the largest deployment layer, and resilience/leadership is the strategic overlay that makes this cycle longer, more policy-anchored, and less like a normal cyclical rebound. From a scale perspective, new capacity and factory upgrades are broadly similar, each with capex at ~US$6tn over 2026-35, followed by ~US$0.5tn from infrastructure.

From a financing perspective, the bank loans will likely remain the largest capital supply source for tangible industrial capex (to make up 47% of industrial capex in the next 10 years, the same as the average mix seen in the past five years), due to banks' unique positioning – wide reach and deep penetration – in industry supply chains. China's (including HK) capital markets could eventually contribute ~15% of industrial capex funding, roughly evenly split across primary the market (PE, VC) and secondary market (IPO, follow-on) fund raising.

We frame the capex opportunity under Industry 5.0 as a three-layer stack: Infrastructure, Factory upgrades, and Resilience/leadership. The key investment point is that this is not one single spending bucket, but a multi-layer buildout in which each layer reinforces the next.

1. Infrastructure (AI infrastructure + energy): the backbone to enable Industry 5.0

Infrastructure provides the compute backbone and electricity required to run AI, automation, and digitalized manufacturing at scale. This includes hyperscaler spending on GPU/ASIC clusters, AI servers, networking, edge compute, and data-center buildout, as well as the associated power systems, cooling, grid reinforcement, storage, transformers, switchgears, and backup power. Infrastructure is not a standalone tech spend or a background utility cost; it is the upstream enabling capex that allows intelligence to move into the real economy.

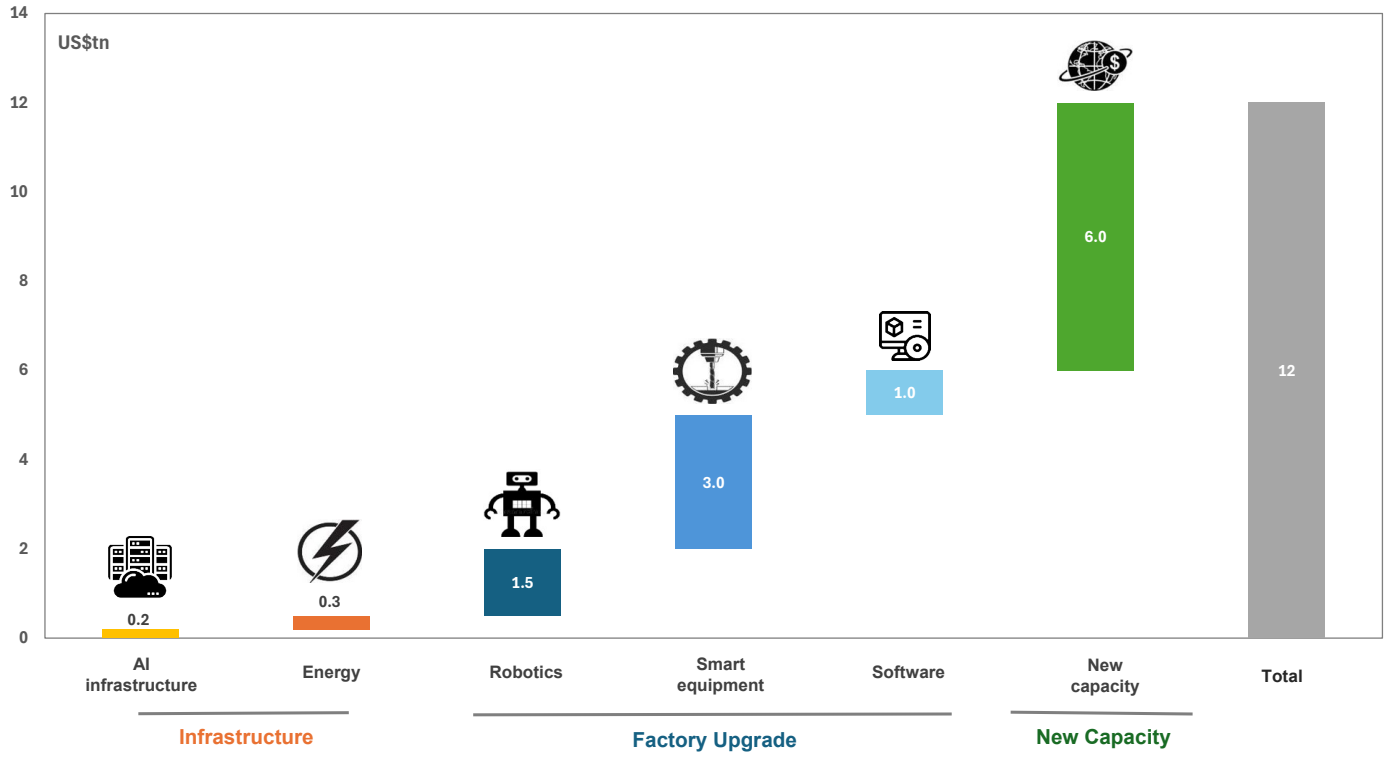
2. Factory upgrades: the core deployment layer

Factory upgrades is the main deployment layer, where intelligence is embedded into the installed manufacturing base through intelligent equipment, robotics, sensors, edge semis, and industrial software. The investment case is compelling because China already has a very large manufacturing base, which means the opportunity is not mainly greenfield construction, but the retrofitting and upgrading of existing factories into smarter, more flexible, and more resilient systems. This is also the layer where AI translates most directly into productivity gains.

3. Global market share gain / resilience: the strategic overlay that extends the cycle

Resilience/leadership is the strategic overlay that makes the cycle broader and longer than a normal industrial recovery, as localization, security, standards, and global market-share ambitions all become part of the capex equation. This includes spending on semiconductors, semiconductor equipment and materials, industrial software, critical components, defense-related manufacturing, grids and storage security, and frontier sectors where China wants to build long-term leadership.

Exhibit 62: We estimate US$12tn incremental industrial capex in Industry 5.0 in next decade, including ~US$0.5bn for infrastructure, ~US$5.5bn for factory upgrades and ~US$6bn for new capacity from existing industries expansion and new frontier industries



Source: Morgan Stanley Research

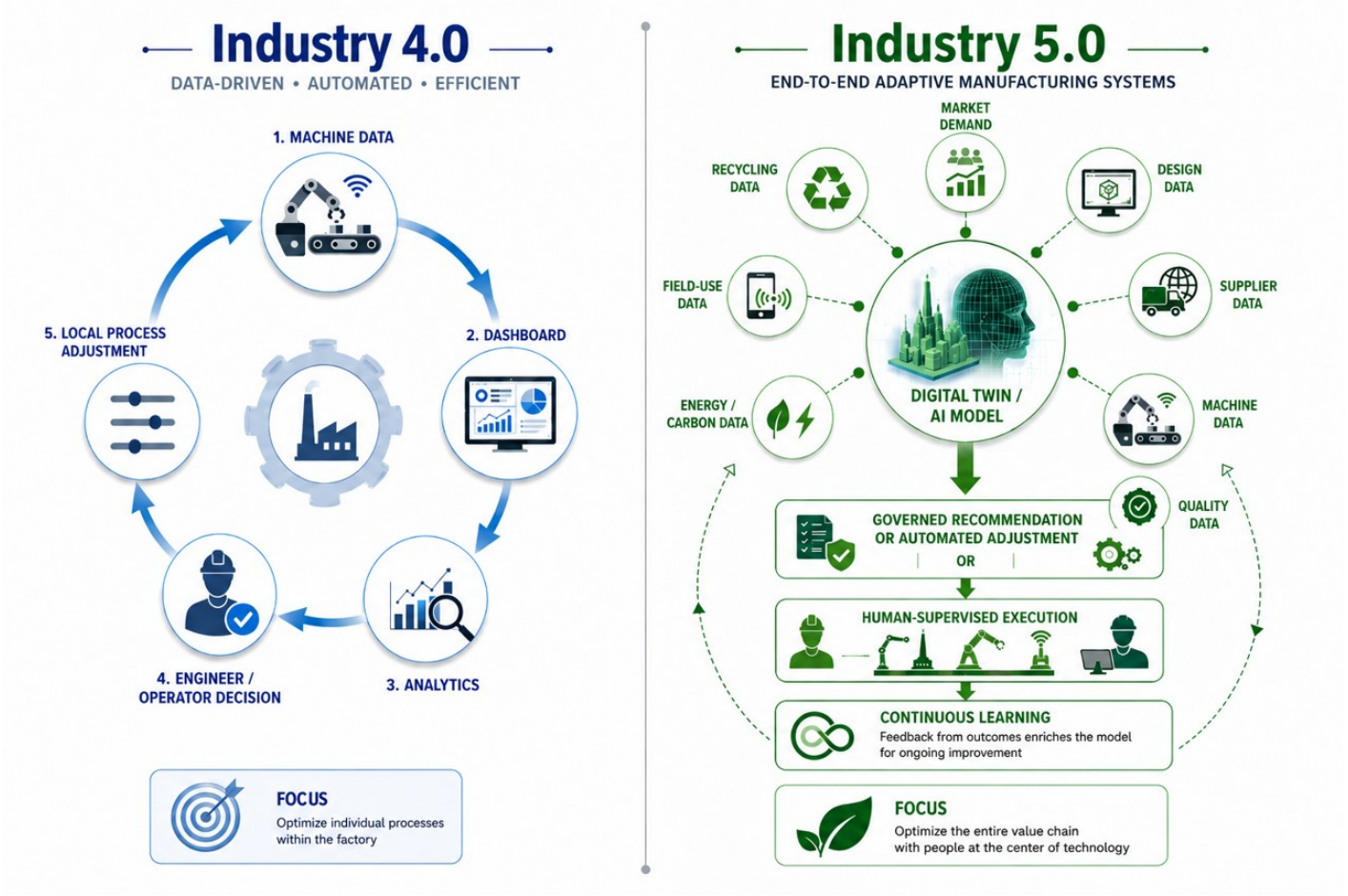
Factory upgrades - A large part of the capex

Industrial AI fundamentally restructures the manufacturing process. Industry 5.0 changes the factory workflow from a local optimization loop into an end-to-end adaptive operating system. In other words, the workflow shifts from "data → dashboard → human decision" to "multi-source data → AI reasoning → governed execution → continuous learning," making the system more adaptive, predictive and autonomous.

- In the Industrial 4.0 model, workflow is still largely linear and factory-bound: machine data are collected, displayed on dashboards, analyzed, then handed back to engineers or operators for decision-making and local process adjustment. That architecture improves visibility and efficiency, but humans remain the key decision node and the optimization target is still mostly the individual process or the single factory.
- Industry 5.0 extends the loop across the full value chain. Market demand, design

data, supplier data, machine data, quality data, energy/carbon data, field-use data and even recycling data are fed into a digital twin or AI model, which can generate governed recommendations or automated adjustments, execute with human supervision, and then learn continuously from outcomes.

Exhibit 63: Workflow comparison for Industrial 4.0 and 5.0

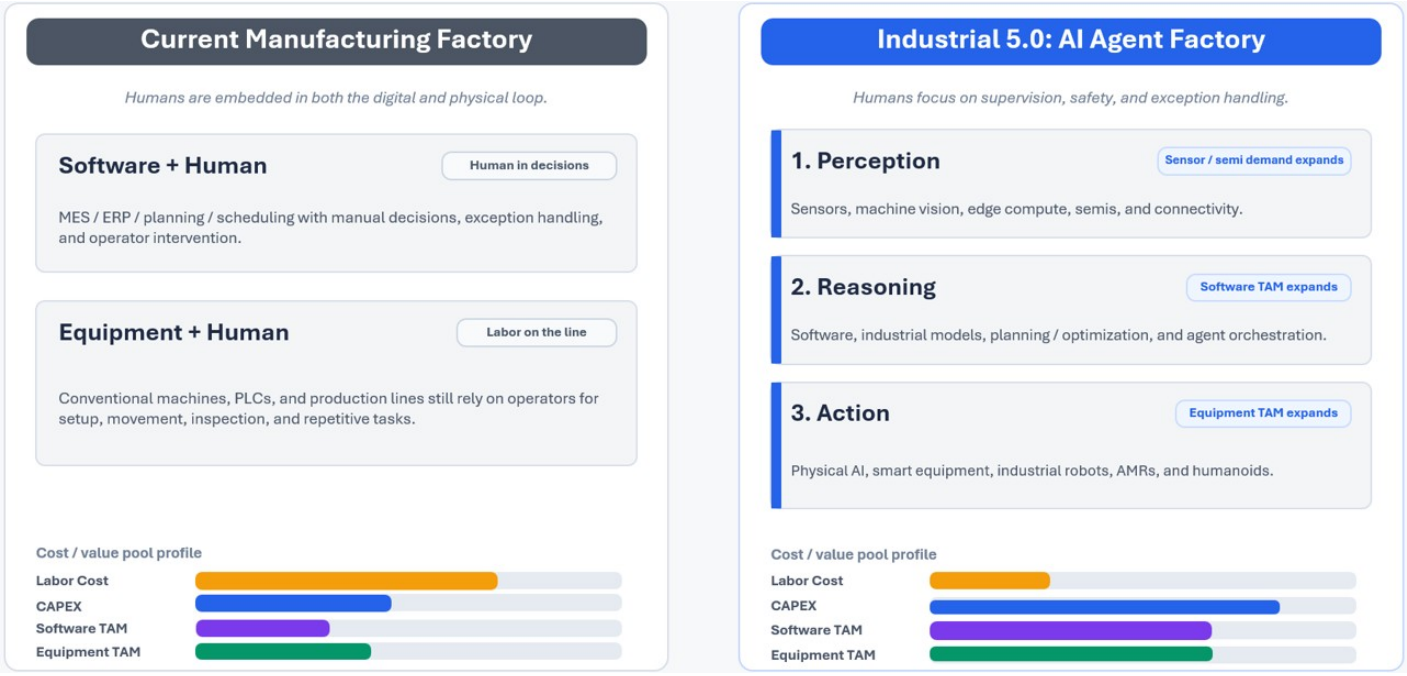


Source: Morgan Stanley Research

The workflow shift will change the factory architecture. In a current manufacturing factory, humans are still embedded in both the digital loop and the physical loop: MES / ERP / planning systems remain heavily dependent on manual decisions and exception handling, while machines and production lines still rely on operators for setup, movement, inspection, and repetitive tasks. In an Industry 5.0 "AI Agent Factory," that architecture, in our view, will shift to a three-layer model of Perception, Reasoning, and Action. The perception layer captures real-time factory data through sensors, machine vision, connectivity, and edge compute; the conception layer translates that data into decisions through industrial models, planning / optimization engines, digital twins, and agent orchestration; and the action layer executes through smart equipment, robots, AMRs, and eventually humanoids. The key implication is that ***once factory operations move toward closed-loop sensing, reasoning, and execution, both software and hardware need to be upgraded together***. This shift supports a meaningful step-up in higher equipment complexity and software content per factory, reduces reliance on manual labor and drives a broader migration of factory economics from labor spend toward technology and

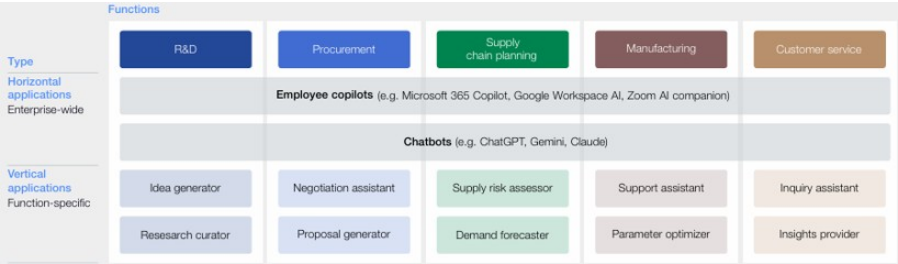
automation investment.

Exhibit 64: We expect intelligent equipment and smart robots penetration will further accelerate in an AI agent factory in the Industrial 5.0 era



Agents to become the orchestration layer: Instead of multiple isolated islands, AI can coordinate layering these systems, translating a design change, customer order or plant exception into coordinated action rather than leaving those hand-offs to humans. The orchestration layer leverages a toolbox of specialized agents across the value chain. In practice, that means horizontal agents coordinating workflows such as production planning, inventory and logistics across the enterprise, while vertical agents operate inside engineering, quality, maintenance and factory execution.

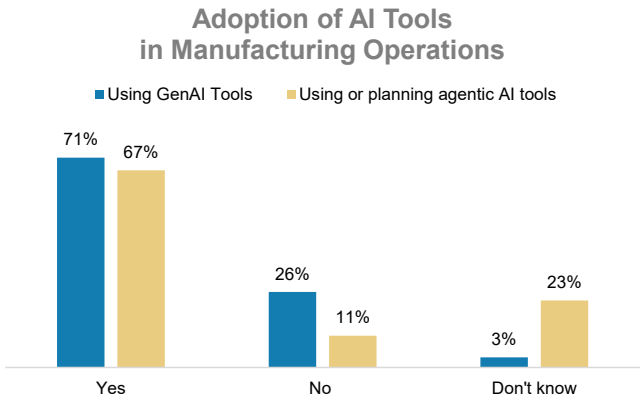
Exhibit 65: AI Agent in Horizontal and Vertical Layers



Source: McKinsey & Company, Global Lighthouse Network.

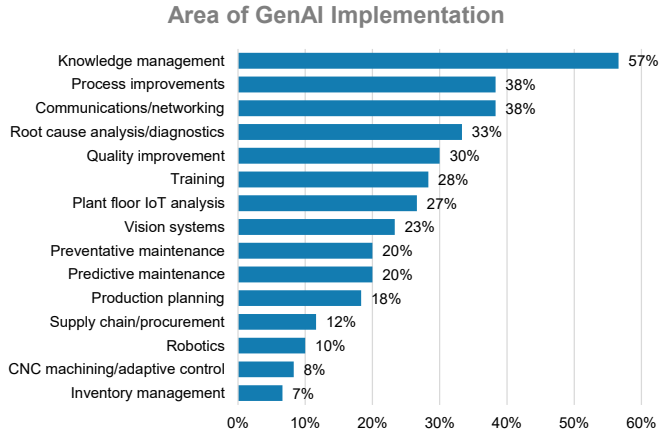
We are at the inflection point, the adoption of AI is accelerating: According to the Manufacturing Leadership Council's Industrial AI Survey 2026, more than 70% of manufacturers surveyed are currently using GenAI products (up 24ppt from 2024), as well as strong (potential) adoption of Agentic AI. Nearly 90% are planning to increase GenAI usage in the next two years.

Exhibit 66: More than 70% of manufacturers surveyed are currently using GenAI products (up 24ppt from 2024), as well as strong (potential) adoption of Agentic AI



Source: Manufacturing Leadership Council's Industrial AI Survey of April 1, 2026, Morgan Stanley Research

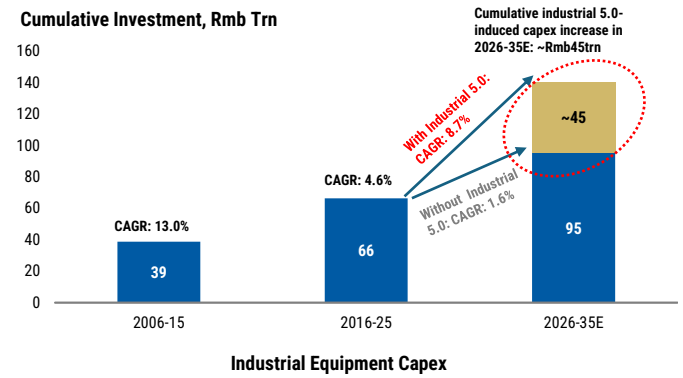
Exhibit 67: For GenAI applications, the high adoption areas currently focus on knowledge, analysis; the adoption rate for management, control, maintenance is relatively low



Source: Manufacturing Leadership Council's Industrial AI Survey of April 1, 2026, Morgan Stanley Research

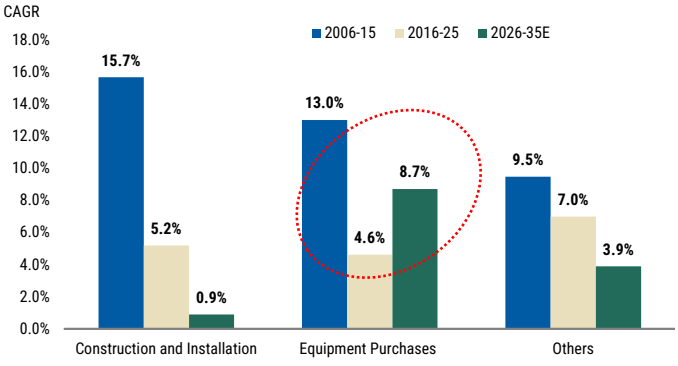
Under Industry 5.0 we anticipate US$4.5tn (approximately Rmb30tn) incremental equipment opportunity for factory upgrades. Industry 5.0 should see a rotation of investment towards high-end equipment and emerging-frontier capex, as higher factory autonomy requires more intelligent equipment. We assume: 1) total equipment capex as a percentage of total nominal GDP to continue increasing to ~9% in 2035 vs. ~6% in 2025, implying a 10-year average of ~7.5% in 2026-35, higher than an average of ~6.0% in 2016-25 while slightly below 8.5% in 2006-15; this suggests an equipment capex growth acceleration to ~9.0% CAGR in 2026-35, vs. +4.6% in 2016-25 and only ~1.6% without Industry 5.0 in 2026-35. This translates to ~Rmb45tn equipment capex uplift; 2) equipment capex for factory upgrades as a percentage of total equipment capex is ~70% based on historical patterns, suggesting a TAM of about Rmb30tn.

Exhibit 68: We estimate Rmb45trn incremental equipment capex under Industry 5.0, where we assume ~70% will come from factory upgrades



Source: NBS, Morgan Stanley Research estimates

Exhibit 69: We expect China's equipment capex growth to accelerate notably to ~9% CAGR in 2026-35 vs. +4.6% in 2016-25



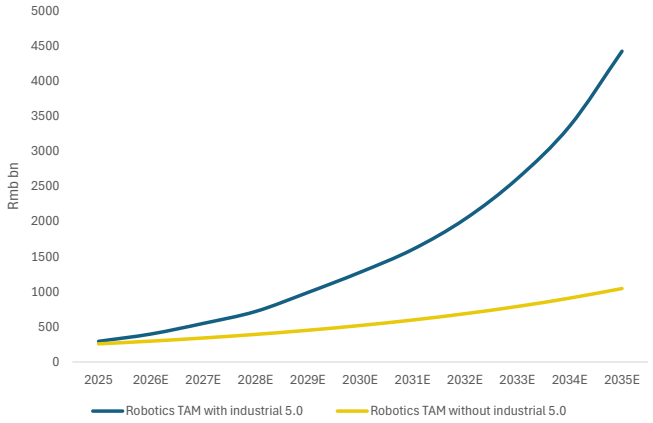
Source: NBS, Morgan Stanley Research estimates

Intelligent equipment, robotics and automation value pool will grow exponentially. The physical layer of the factory becomes more modular, more adaptive, and more AI-native. For equipment, we believe the upgrade path is from traditional equipment to

intelligent equipment with embedded AI functions. In practice, that means more cameras, machine vision, force / torque sensors, environmental sensors, controllers, communication modules, and edge semiconductors embedded into the machine itself, allowing the equipment to become more adaptive, self-diagnosing, and responsive to variable production conditions. The most direct beneficiaries should therefore be robotics and smart equipment as well as automation vendors.

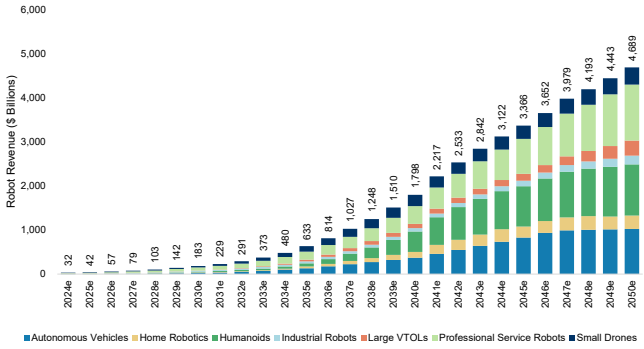
Robotics will penetrate broadly and be more versatile. We believe the robotics penetration will accelerate beyond traditional industrial arms toward cobots, AGVs / AMRs, and selected humanoids, which are better suited for flexible automation, mixed-model production, intralogistics, inspection, and selected assembly workflows. Our global robotics TAM model suggests a US$2.5tn (Rmb18tn) TAM combined for the China market during 2026-35, with 10-year CAGR at 30%. Without Industry 5.0, we anticipate the China TAM will grow at 15% CAGR, in-line with the historical robotics market growth trend – this implies a ~US$1.5tn (~Rmb10tn) robotics value uplift from Industry 5.0.

Exhibit 70: We estimate China's robotics market TAM will grow at +30% CAGR in 2026-35, vs. +15% CAGR without Industry 5.0, implying ~Rmb10tn value uplift



Source: MIR, Morgan Stanley Research estimates

Exhibit 71: We expect China's robotics TAM to grow at 20% CAGR in 2025-50 and reach US$4.7tn in 2050 – autonomous vehicle and humanoid manufacturers are key direct beneficiaries



Source: Morgan Stanley Research estimates

Software becomes more valuable in smart factories

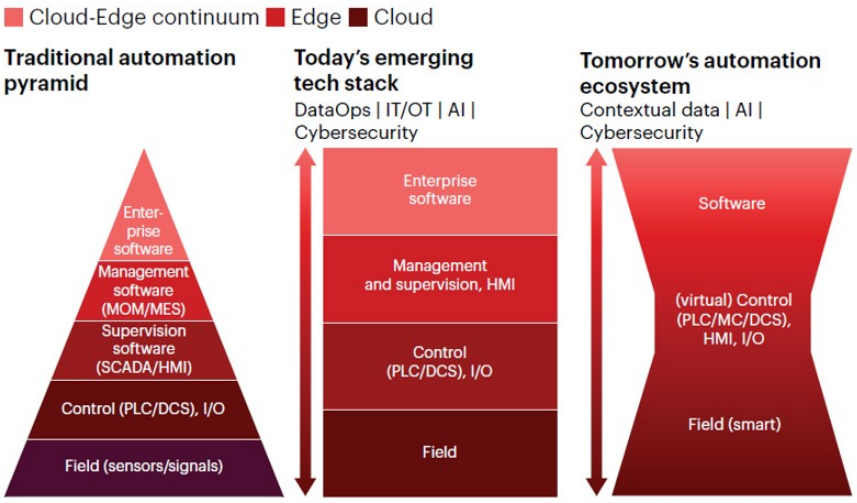
Beyond the equipment upgrade itself, we believe the important structural change is that factory architecture is shifting from a hardware-led automation pyramid to a software-defined automation ecosystem in the Industry 5.0 era. In the traditional automation pyramid, software was mainly placed above the field-device and control layers, including SCADA/HMI, MES/MOM, and enterprise systems, and was primarily used for monitoring, reporting, scheduling, and supervisory control. In the Industry 5.0 model, software is no longer just a dashboard or support tool sitting on top of the factory. It becomes the intelligence layer that connects perception, reasoning, and execution. As factories move from the old workflow of "data → dashboard → operator decision" toward "data → model / agent → governed action," software's role rises from a supporting function to core production infrastructure.

This shift should drive both a larger software TAM and higher software value capture. On the TAM side, factory intelligence creates new and expanding software categories,

including industrial data platforms, digital twins, AI training and simulation, AI orchestration, production optimization, predictive maintenance, energy management, industrial cybersecurity, edge management, virtual PLC / soft control, and eventually agent-based factory management. These tools are required across the full factory lifecycle: digital twins and simulation help design and validate production lines before deployment; MES/MOM and AI scheduling optimize throughput, inventory, labor, and power usage during production; machine vision, predictive maintenance, and edge-control software improve yield and uptime at the equipment layer; and industrial DataOps platforms connect sensors, PLCs, SCADA, MES, ERP, and cloud-based AI models.

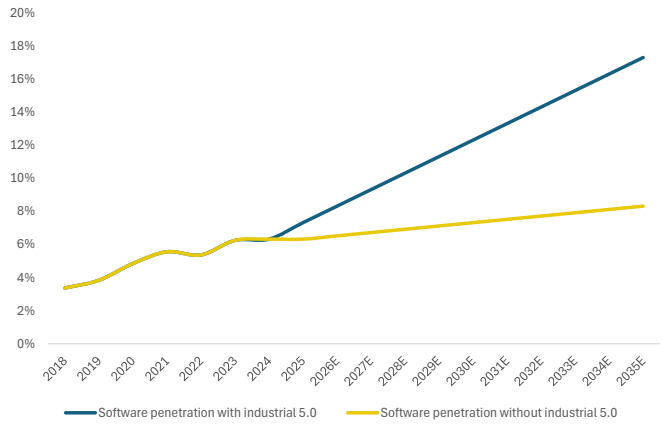
China's industrial software was a ~Rmb340bn market in 2025, according to MIIT, representing ~7% of manufacturing equipment capex, vs. ~3% in 2018, as it was often treated as an add-on to hardware. Without the AI-driven factory upgrade, we expect this penetration rate would slowly increase to ~8% by 2035. However, as AI factories, digital twins, cloud-edge collaboration, virtual control, intelligent robots, and autonomous production systems scale over the next decade, we estimate industrial software's share will rise toward ~17% in 2035 – this will create around a Rmb7tn increment industrial software market in 2026-35, we believe.

Exhibit 72: As the role of software grows, the automation tech stack shape is shifting from a pyramid to an hourglass



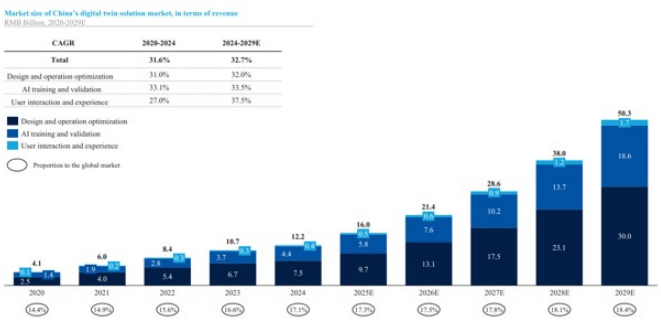
Source: Bain analysis. Notes: I/O is input/output module; PLC is programmable logic controller; DCS is distributed control system; SCADA is supervisory control and data acquisition; HMI is human-machine interface; MC is motion control; MOM is manufacturing operations management; MES is manufacturing execution system; IT is information technology; OP is operational technology

Exhibit 73: We expect the industrial software penetration in industrial equipment capex to increase quickly in the next decade



Source: Ministry of Industry and Information Technology, Morgan Stanley Research estimates

Exhibit 74: The digital twin market size should accelerate in the future with GenAI



Source: Public information, Expert interview, Frost & Sullivan, Morgan Stanley Research

New capacity for both new and existing industries

AI will further amplify China's manufacturing competitiveness with improved productivity… China already has strong advantages in supply-chain depth, engineering talent, manufacturing scale and ability to iterate quickly. With AI, these advantages should become more powerful, allowing China to improve productivity and further move up the global manufacturing value chain. We believe that the share of China's manufacturing sector in its GDP could be maintained at the current level of ~25% over the next decade, in-line with 15th FYP's guidance to "keep the share of manufacturing in the national economy at an appropriate level". Besides continued policy support for manufacturing upgrades, this would also be backed by two factors:

- **Industry 5.0 could offset the demographic drag that would normally dilute manufacturing.** Conventional wisdom holds that an aging population lifts the services share, as a shrinking workforce pulls resources out of goods production and the elderly consume more services. For China, both legs bite less. On the supply side, AI-enabled factory retrofits, robotics, smart equipment and industrial software substitute directly for the missing labor – China already leads Germany and Japan on robot density and holds the world's largest robot stock. On the demand side, China's manufacturing is anchored by rising global market share and a decade-long domestic capex supercycle – demand streams that are far less exposed to the domestic aging-driven tilt toward services.

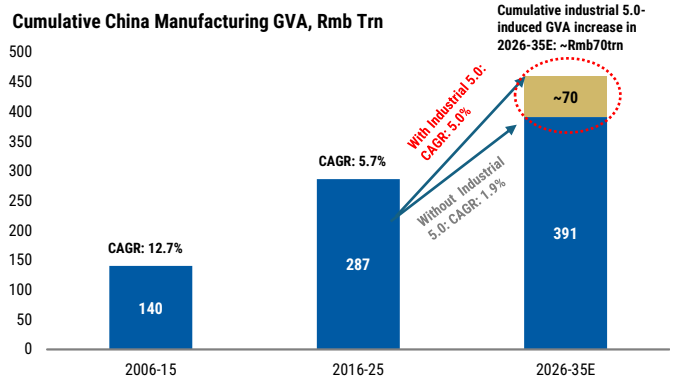
- **Manufacturing should become more value-add intensive, not just larger in volume.** Faster factory productivity would ordinarily compress the nominal manufacturing share, as cheaper goods lose weight against costlier services. China could escape this trap over the medium term by broadening its technology-intensive frontiers – advanced equipment, automation, robotics, semiconductor tools and industrial software – where unit value-add and pricing power rise fast enough to more than offset the deflationary pull. Indeed, Korea, Germany and Japan have shown this pattern: economies that have automated and specialized

have kept manufacturing share elevated, despite an aging population.

Without Industry 5.0, we estimate China's manufacturing share in GDP would gradually decline in the next decade to 20%. The difference between these two scenarios implies roughly Rmb70tn of manufacturing value-add uplift over the next decade.

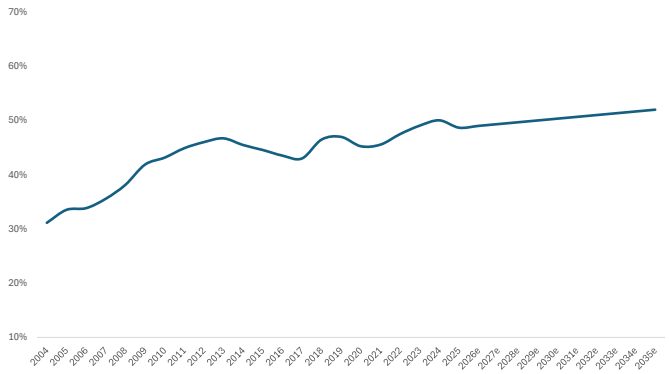
…together with a higher manufacturing capex intensity. Historically, China's manufacturing capex intensity has continued to rise – manufacturing capex as a share of manufacturing value-add increased from 30%+ in the 2000s, to 40%+ in the 2010s, and close to 50% into 2020s. This, in our view, also reflects the structural upgrade of China's manufacturing base from labour-intensive production toward capital- and technology-intensive production. In the Industry 5.0 era, each unit of incremental output will require more advanced equipment, automated production lines, robotics, smart logistics, precision machinery, testing equipment, power systems, digital infrastructure and AI-enabled factory systems, and this should structurally lift capex intensity. We assume China's manufacturing capex as a percentage of manufacturing GDP will continue to rise mildly from ~49% in 2025 to ~52% in 2035 with Industry 5.0. ***This, combined with the Rmb70trn Industry 5.0-induced manufacturing value-add uplift, means that new capex expansion could reach ~US$6tn (or ~Rmb40tn) over the next decade.***

Exhibit 75: We expect around Rmb70tn incremental China manufacturing value-add in 2026-35 with Industry 5.0, with rising share in total GDP…



Source: NBS, Morgan Stanley Research estimates

Exhibit 76: …and this will bring around Rmb40tn incremental capex, per our estimates, with capex intensity rising mildly



Source: NBS, Morgan Stanley Research estimates

How industrial capex is funded in China historically

Our financing analysis focuses on tangible industrial capex, which accounts for ~85% of total industrial investment and captures the project-based spending most directly supported by bank credit and other funding sources. Intangible investment is less readily mapped to specific funding channels, making tangible capex the more relevant and measurable basis for this analysis.

We estimate external funds consistently accounted for 60%-70% of annual industrial capex between 2020 and 2025.

Bank loans, in particular mid-to-long term loans lent to industrial sectors, are the single biggest funding source, which represented 50% of total funding in 2025. The gross origination each year is based on the PBOC disclosed industrial loan balance and assuming

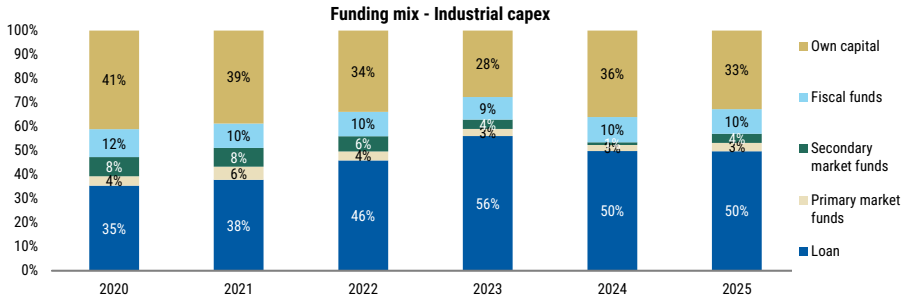
an average three year tenor. Notably, mid-to-long term industrial loans origination stayed at around Rmb10tn a year from 2023 to 2025.

The primary and secondary market at its peak in 2021 supplied 13% of industrial capex funding, which subsequently moderated to mid-single digits in 2024 and 2025 following a sharp cool down in fundraising in A shares. Looking ahead, as capital intensity rises in the current innovation cycle, we see the capital markets' role in funding innovation and industrial capex to rebound steadily, especially in areas like semis, high-end manufacturing, robotics, etc., which sit at the forefront of the industrial upgrade or have been identified by the government as chokepoints in technology.

Fiscal funds have made up about 10% of industrial capex funding in recent years. This included:

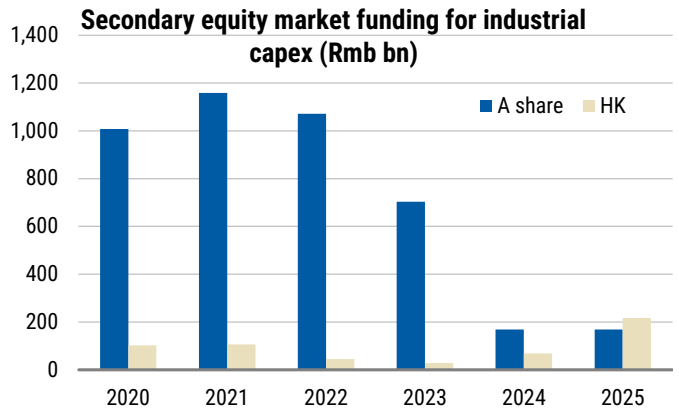
- Fiscal cash subsidies: We estimate the subsidy rate based on reported government subsidies divided by gross profit of listed firms. Then we apply the ratio to industrial value-add.
- Land subsidies: This is based on an IMF study where it estimates the land subsidies (measured by the discount when government grant industrial lands compared to market value) are around 0.5% of annual GDP.
- Fiscal-led investments and others: This includes in-budget fiscal fund investments as well as major national industrial project developments backed by special government bonds in recent years.

Exhibit 77: External funds have consistently accounted for 60%-70% of annual industrial capex between 2020 and 2025



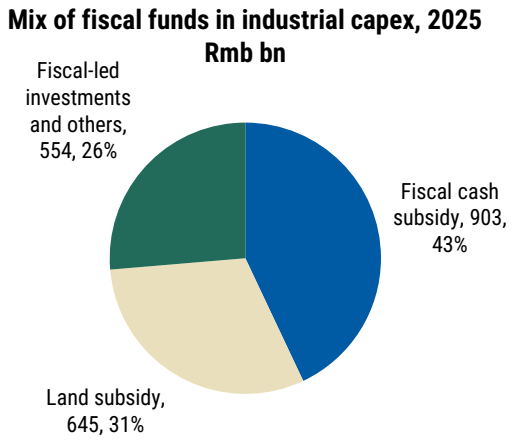
Source: CEIC, WIND, PBOC, NFRA, IMF, PE Data, Company data, Morgan Stanley Research

Exhibit 78: Secondary equity market's role in supplying capex funding has moderated in recent years



Source: CEIC, WIND, IMF, PE Data, Company data, Morgan Stanley Research

Exhibit 79: Fiscal supports to capex mainly include cash subsidy, land subsidy and government led-investments



Source: CEIC, WIND, IMF, PE Data, Company data, Morgan Stanley Research

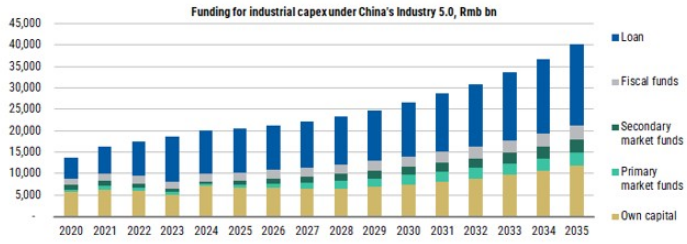
Internal funds account for 30-40% of industrial capex – likely a substantial portion of overall industrial firms' annual profits

In 2025, we estimate industrial firms' own funds contributed to Rmb6.7tn of capex. This is likely a substantial share of overall industrial firms' profits in the year: NBS reported above-scale industrial profit of Rmb7tn plus profit at smaller scale industrial firms (not in official statistics) plus profit at many smaller firms along the supply chains, such as wholesale trade.

Opportunities arise from funding China's Industry 5.0

Driven by China's Industry 5.0, our industrial analysts expect capex to rise at 6.9% CAGR from 2025 to 2035, reaching Rmb40.1tn by 2035e. This will create strong demand for capital in the next 10 years to be served by various financial firms.

Exhibit 80: We expect bank loans will remain the largest capital supply source for industrial capex



Source: CEIC, WIND, PBOC, NFRA, IMF, PE Data, Company data, Morgan Stanley Research

In particular, we expect bank loans will remain the largest capital supply source for industrial capex, due to banks' unique positioning – wide reach and deep penetration – in industry supply chains. We forecast bank loans to make up 47% of industrial capex in the next 10 years, the same as the average mix seen in the past five years.

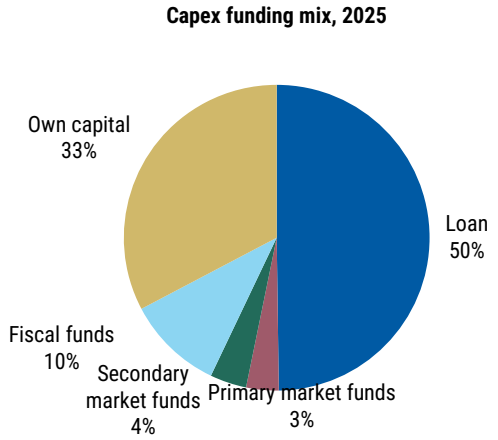
This will translate into 6.3% 10 year CAGR for industrial mid-long term loans. As overall industrial loans make up slightly over one-fifth of total credits, we see the loan demand

from Industry 5.0 to support overall credit growth to maintain at a level around 4-7% over the next 10 years.

Note that although we show that the growth rate of industrial mid-long term loans will pick up linearly in the next 10 years, ending at ~9% by 2035, this is for illustration purposes only. In fact we believe the growth will most likely be uneven and cyclical, which is typical for industrial loans, with the average annual growth rate staying at 6-7%. An uneven growth curve is also more desirable as it allows periodic recalibration of credit allocation and risk digestion.

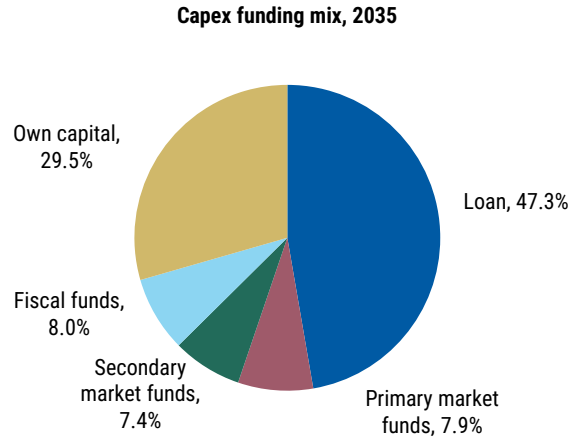
On the other hand, we expect China's (including HK) capital markets could eventually contribute around 15% of industrial capex funding, compared to the previous peak of ~13% in 2021. This will be roughly evenly split across fund raising in primary markets (PE, VC) and secondary markets (IPO, follow-on). We expect industrial mix in secondary market fund raising to temporarily rise to 64.5% by 2028, from 47.9% in 2025, before moderating to ~57% of total by 2035. This is because we think industrial upgrades should also drive income growth which could bring more listing opportunities in the service and consumer sectors over time, which typically offer higher ROE and are also appreciated by capital markets.

Exhibit 81: Capex funding mix in 2025



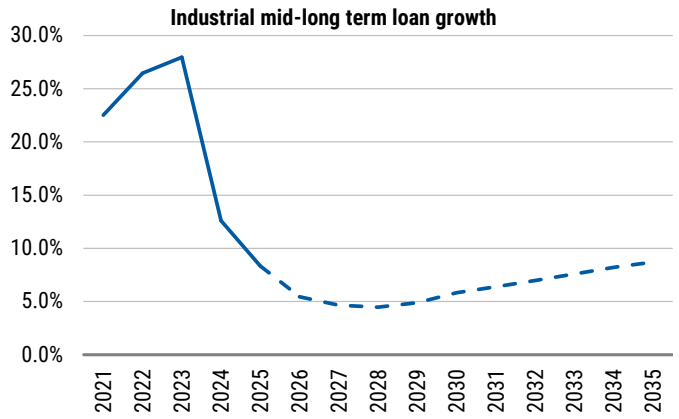
Source: CEIC, WIND, PBOC, NFRA, IMF, PE Data, Company data, Morgan Stanley Research

Exhibit 82: Capex funding mix in 2035



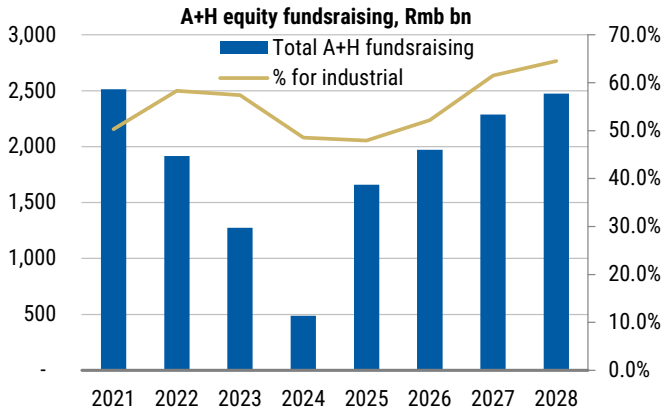
Source: CEIC, WIND, PBOC, NFRA, IMF, PE Data, Company data, Morgan Stanley Research estimates

Exhibit 83: The average annual growth rate of industrial mid-long term loans could stay at 6-7% in the next 10 years



Source: CEIC, WIND, PBOC, NFRA, Company data, Morgan Stanley Research

Exhibit 84: We expect a major recovery in China's equity market fund raising in the next three years, partly helped by industrial capital demand



Source: CEIC, WIND, PBOC, NFRA, Company data, Morgan Stanley Research

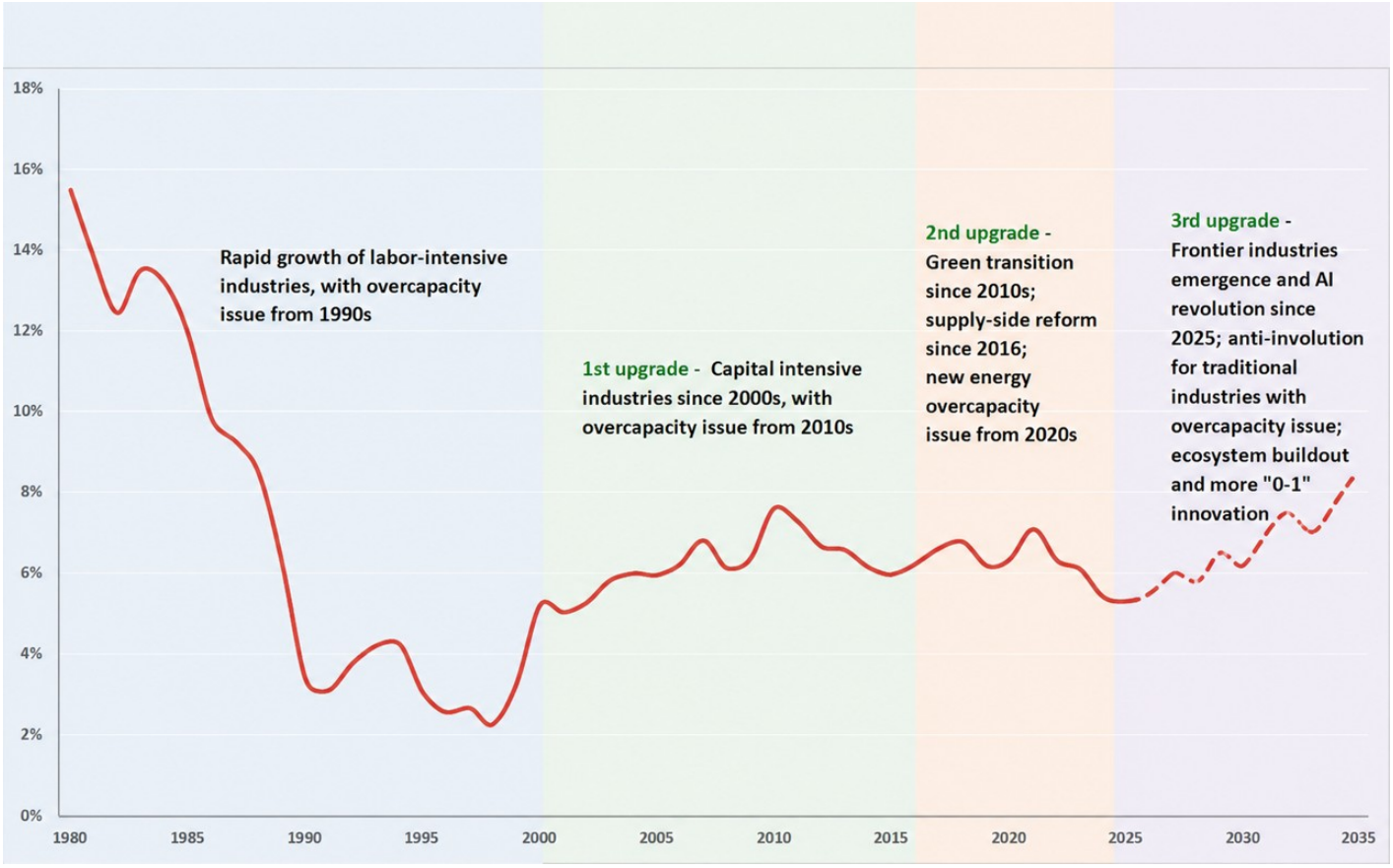
Industrial Margins and ROE Upward Trajectory

Industrial enterprise margins will be in an upward trajectory

We anticipate the industrial profit margin to sequentially improve to ~8% in 2035 from ~5% in 2025, even slightly higher than the 2010-11 peak, on the following key drivers:

1. **China's investment rotates from downstream scale industries into foundational layers –** China is progressing in foundational innovation – such as upstream materials, semiconductor equipment, precision machinery, industrial software, sensors, motion controls and power semiconductors – which have higher margins than the downstream and assembly manufacturers.
2. **The overcapacity issue to be resolved gradually amid the government's anti-involution initiative –** China made efforts in key leading industries in last cycle – such as NEVs, solar, batteries, wind, etc. Similarly, with previous overcapacity cycles of light manufacturing in the 1990s and heavy industry in 2010s, margins recovered when the overcapacity issue was solved and new industries ramped up.
3. **Moving from domestic competition to global expansion –** In the globalization phase, leading domestic companies with proven cost leadership, manufacturing scale, engineering capability and supply-chain control can access larger overseas profit pools.
4. **China to gradually lead new 0-1 industries –** In frontier areas such as nuclear fusion, commercial space, 6G, humanoid robots, quantum technology, next-generation AI infrastructure, advanced semiconductors, and new materials, China has the potential to participate at the beginning of the innovation cycle.

Exhibit 85: We expect industrial enterprise margins to improve in the next decade with ongoing industrial upgrades to more high-tech industries and emerging frontiers



Source: NBS, Morgan Stanley Research estimates

***China's industrial margin cycle**: China's industrial margin history can be viewed as a series of recurring upgrade cycles in which capacity expansion initially runs ahead of demand, compressing pricing and profitability, before supply-side adjustment and industrial upgrading restore returns.*

- **1st upgrade**: *During the first scale build-out from 1979 to 1997, rapid industrialization created a large manufacturing base, but labor-intensive capacity growth outpaced improvements in productivity and market efficiency, driving margins to a trough by the late 1990s. The subsequent restructuring and WTO scale-up phase from 1998 to 2007 marked the first major recovery: state-owned enterprise reform, the exit of inefficient capacity, stronger utilization, export growth and productivity gains allowed margins to rise steadily.*
- **2nd upgrade**: *The same pattern re-emerged after 2008, when investment-led expansion – particularly in heavy industry – generated excess capacity and increasingly intense price competition, causing margins to weaken through 2015. Supply-side reform from 2016 then supported another recovery through de-capacity, industry consolidation, better utilization and a gradual shift toward higher-value-add manufacturing.*
- **3rd upgrade**: *The 2020–2025 period represents the latest capacity-led phase of this cycle. Large-scale investment in electric vehicles, batteries, solar equipment and other advanced manufacturing sectors accelerated China's industrial upgrading and*

strengthened its global competitiveness, but capacity expanded faster than near-term demand in several industries. The resulting oversupply and "involution" – characterized by aggressive price competition, product homogenization and declining returns – contributed to a renewed fall in industrial margins. This compression should not necessarily be interpreted as a failure of the industrial-upgrade model; rather, it reflects the familiar transition from capacity creation to profit normalization.

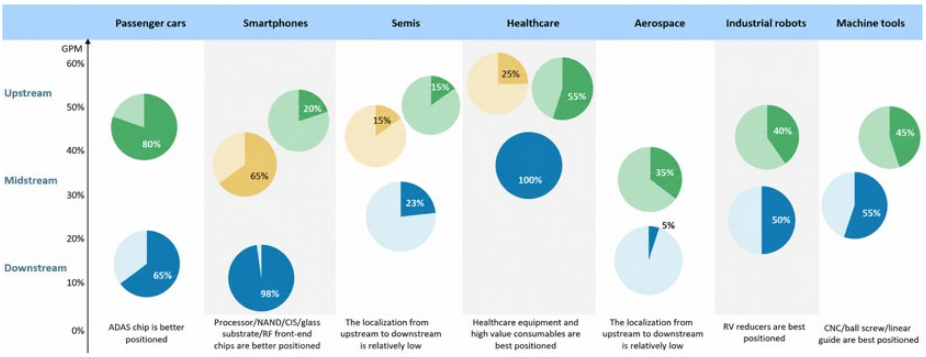
Four key drivers of the upward margin trajectory

1. Industrial structure should become more margin-accretive as the investment cycle rotates from downstream scale industries into foundational layers.

China's manufacturing value-added breakdown shows a clear structural shift over the past three decades that labour-intensive manufacturing has declined as a share of total manufacturing value-add, while technology-intensive manufacturing has steadily increased and now represents more than 30% of the manufacturing mix. China has achieved dominance in several technology-intensive sectors such as batteries, solar modules and EVs.

Looking into next decade, we believe China is progressing in foundational innovations, such as upstream materials, semiconductor equipment, precision machinery, industrial software, sensors, motion controls and power semiconductors. These upstream layers are closer to IP, process know-how and bottleneck interfaces; in many chains, their gross margins are much higher than downstream assembly or commodity manufacturing, as some examples show in Exhibit 86 .

Exhibit 86: In most industries, the mid and upstream margin is higher than the downstream, and there is still plenty of room for more localization in mid and upstream manufacturing, to support the margin upward movement, in our view



Source: MIR, FactSet, Wind, Company Data, Morgan Stanley Research. Note: the darker color in the pie charts shows the localization rate. Blue pie is downstream localization rate, yellow pie is midstream equipment localization rate, and green pie is upstream localization rate.

Case study

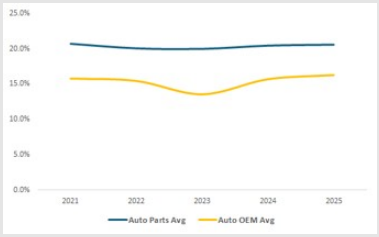
#1. Automobiles

Downstream auto OEMs bear the full force of model-cycle risk, dealer/channel spending, inventory swings, warranty expense, and frequent price cuts in an increasingly crowded NEV market. By contrast, upstream component and system

suppliers can sell into multiple OEM platforms, reuse IP across customers, and monetize bottleneck capabilities such as glass+, smart cockpit/ADAS controllers, lightweight structures, steering systems, thermal management and safety electronics. According to the data from selected listed China auto-parts leaders and OEMs, auto parts suppliers have structurally higher profitability (4-6% higher) than downstream OEMs.

The reason behind this is where technology and customer stickiness sit, in our view. A smart window, ADAS domain controller, chassis system, battery enclosure or steering module is not a generic input. It is designed into the vehicle architecture, qualified over long cycles, and often carries safety, software, materials or process know-how. Once installed across several platforms, the supplier can compound scale without absorbing the full OEM price war. The auto chain also links to globalization – parts suppliers can follow Chinese OEMs overseas first, then penetrate global customers and add aftermarket, spare-parts, calibration, maintenance and local engineering services – more recurring and less price-destructive than vehicle assembly alone.

Exhibit 87: Upstream auto parts GPM vs. downstream auto OEM GPM



Source: Company data, Morgan Stanley Research. Auto parts include Fuyao Glass, Minth Group, Ningbo Tuopu, Desay, Joyson, Huayu, Nexteer; Auto OEM include Geely, SAIC Motor, Great Wall, Li Auto, XPeng, NIO, Changan Auto

Exhibit 88: Passenger vehicles supply chain – ADAS chip is most appealing, with its relatively higher margin and lower localization



Source: MIR, FactSet, Wind, Company Data, Morgan Stanley Research. Note: the dark blue shadow indicates localization rate.

2. Overcapacity issue to be resolved gradually amid Chinese government's anti-involution initiative

China's anti-involution policy is a significant recalibration of the country's economic development model, aiming for a better balance between growth, innovation, and sustainability. While some effects are already visible, the full impact and success of these policies are expected to unfold over 2026 and beyond, with particular attention on sector-level reforms and market consolidation, supporting blended margin improvement. For example:

- **Autos:** Tighter scrutiny of price wars has curtailed OEMs' ability to respond to weaker demand through aggressive discounting or loss-leading strategies. This year, regulators and industry bodies have intensified efforts to suppress involution-style competition, pushing the sector toward more orderly, value-based growth. Earlier this year, regulators convened leading NEV OEMs and explicitly called for restraint against disorderly price wars. Collectively, these measures have constrained pricing flexibility, leaving automakers with limited scope to offset subsidy reductions or stimulate demand through promotions.
- **Solar:** Chinese officials are now deploying multiple measures to dismantle price

involution, including setting price floors and encouraging industry consolidation. While solar names are still struggling with significant loss-making and net debt positions, recent initiatives have led to recovery in industry ASPs, 2025-26.

- **Wind:** Our China utility team expects robust demand and ongoing margin recovery along the value chain to follow years of anti-involution. We expect limited wind turbine ASP downside amid the anti-involution effort, and we hold a positive view on key component names given a clear margin expansion runway, improving industry dynamics, and export tailwinds in the EU market.

Case study

#1 Steel Industry – Supply-side Reform as a Historical Precedent

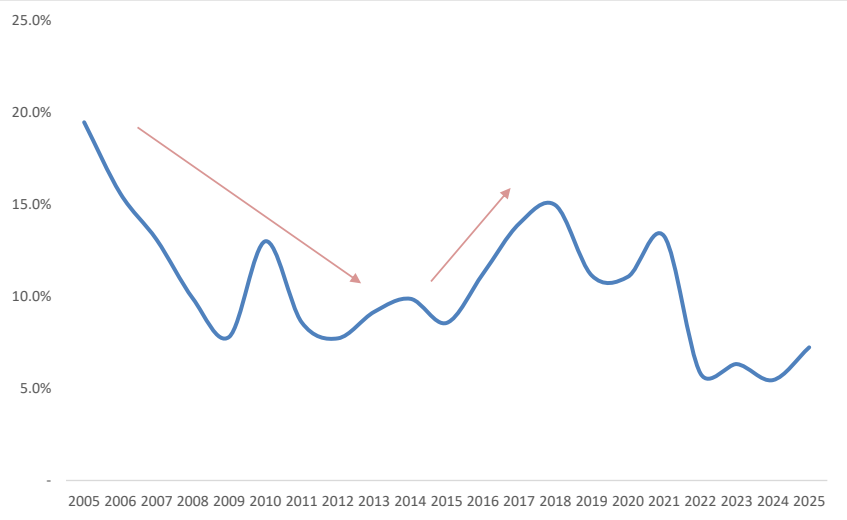
China's steel industry provides one of the clearest historical precedents for assessing the potential impact of today's anti-involution policies. Following years of aggressive capacity expansion after 2008, industry supply significantly outpaced downstream demand, resulting in persistent price competition and a sharp deterioration in profitability. Average gross margins across leading listed steel producers declined steadily between 2011 and 2015, with several companies approaching break-even levels despite relatively stable shipment volumes.

The launch of China's supply-side structural reform in 2016 marked a turning point. Capacity reduction, environmental inspections and the elimination of inefficient production materially tightened industry supply. Unlike previous demand-driven recoveries, the improvement in profitability was primarily driven by supply discipline rather than accelerating end-market demand.

Historical gross margin trends illustrate this structural change clearly. As excess capacity exited the market, industry gross margins expanded materially over the following three years while price volatility moderated. The recovery was sustained despite only modest growth in apparent steel demand, suggesting that improved industry discipline was the key driver of profitability.

We believe this historical experience provides a useful framework for evaluating China's current anti-involution campaign. Although industry fundamentals differ across sectors, the steel sector demonstrates that government-led supply rationalisation can lead to multi-year margin recovery when excessive competition and inefficient capacity are effectively removed.

Exhibit 89: Chinese leading steel companies' average GPM trend

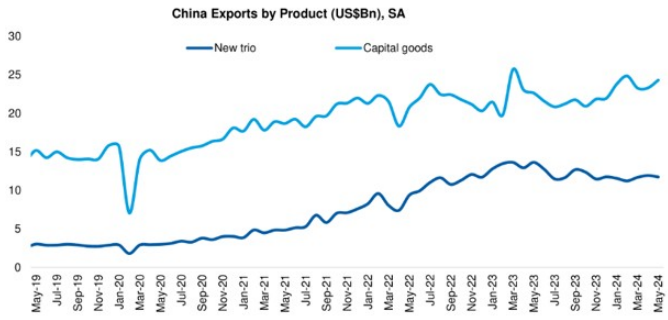


Source: Company data, Morgan Stanley Research. The leading companies include Baosteel, Angang, Maanshan, Hesteel.

3. Leading Chinese industrial companies are moving from domestic competition to global expansion.

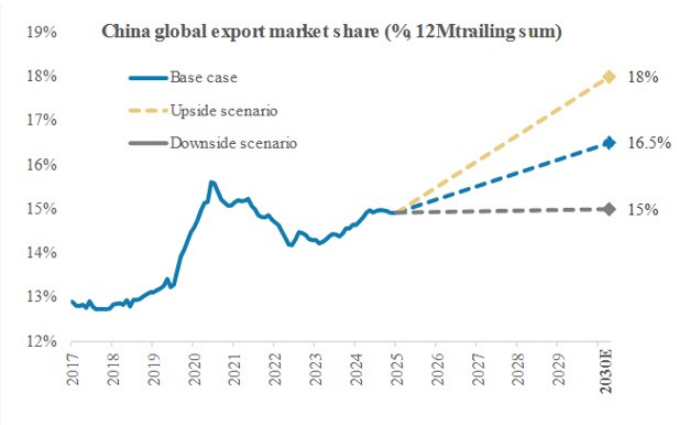
In the globalization phase, companies with proven cost leadership, manufacturing scale, engineering capability and supply-chain control can access larger overseas profit pools, where pricing is often less competitive than in China and where customers may value reliability, technology, service and integrated solutions. As Chinese leaders shift from product exports to localized production, global channels, spare parts, maintenance and financing, their revenue mix moves closer to system and lifecycle economics. For some industries, although more Chinese companies expand overseas over time and create some incremental competition, overall margins remain fairly good with broader regional market exposure.

Exhibit 90: Capital goods could support exports with demand created by global supply chain de-risking and China's stronger competitiveness



Source: JATO, Morgan Stanley Research.

Exhibit 91: We expect China's global export market share to rise to 16.5% by 2030



Source: Haver, Morgan Stanley Research forecasts

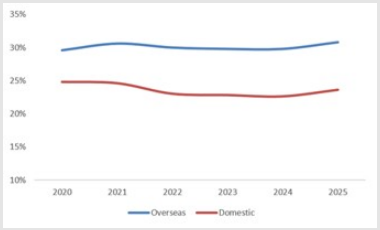
Case study

#1 Construction Machinery – Overseas expansion drives margin uplift

The construction machinery case – across Sany, Zoomlion, XCMG, Hangcha and Dingli – clearly shows that overseas markets consistently deliver higher gross margins than domestic markets, as Chinese equipment companies transition from price-based competition at home to value-based competition abroad, supported by stronger pricing power, service monetization, and less fragmented industry structures. Chinese construction machinery market competition has intensified since the mid-2010s with rapidly increasing localization rate, characterized by intense competition, price transparency, and frequent capacity cycles, leading to relatively compressed gross margins. In contrast, overseas markets tend to exhibit less fragmented competition, stronger pricing discipline, and higher value placed on reliability, service, and lifecycle performance. As a result, leading Chinese OEMs have started to accelerate overseas business operations and market share gains since 2020.

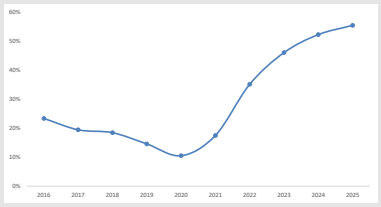
This margin differential is not merely cyclical but structural. As Chinese companies move beyond simple equipment exports toward localized production + service + ecosystem exports, they capture a larger share of the value chain. Overseas revenue increasingly includes higher-margin components such as after-sales services, spare parts, maintenance contracts, and financing solutions. Importantly, construction machinery is inherently service-heavy – lifecycle maintenance and utilization optimization can contribute a significant portion of total profitability.

Exhibit 92: Construction machinery names gross margin comparison



Source: Company data, Morgan Stanley Research. The CM names include Sany Heavy, Zoomlion, XCMG, Hangcha, Dingli.

Exhibit 93: Construction machinery names export contribution as total revenue has continued to rise rapidly since 2020



Source: Company data, Morgan Stanley Research. The CM names include Sany Heavy, Zoomlion, XCMG, Hangcha, Dingli.

4. Chinese companies are increasingly positioned to lead new 0–1 industries directly, rather than entering only after global leaders have already defined the market.

In frontier areas such as nuclear fusion, commercial space, 6G, humanoid robots, quantum technology, next-generation AI infrastructure, synthetic biology, advanced semiconductors, new materials and next-generation energy storage, China has the potential to participate at the beginning of the innovation cycle. If Chinese companies can help define products, standards, ecosystems and supply chains from day one, they may capture global leadership economics earlier and avoid the immediate commoditization pressure seen in many localized sectors. In our view, the combination of globalization of existing competitive industries and 0–1 breakthroughs in future industries creates a credible path for Chinese industrial margins to improve over the coming decade.

- **The last decade was largely a "localization-led volume growth, margin compression" cycle for Chinese industrial companies.** In many large sectors, the highest-margin 0–1 innovation phase was initially led by overseas pioneers.

Chinese companies then entered through import substitution and localization, scaling rapidly on the back of cost advantages, supply-chain depth and execution speed. However, as localization deepened, more domestic players entered, capacity expanded, product differentiation narrowed and pricing power weakened. This created the familiar "involution" pattern: strong volume growth but declining industry gross margins. New energy vehicles, photovoltaics, lithium batteries, wind power, consumer electronics, home appliances, steel, cement, textiles and LED lighting are all examples of sectors that have experienced some version of this cycle in China.

- **In next decade, Chinese companies are increasingly positioned to lead new 0–1 industries directly, rather than entering only after global leaders have already defined the market.** China is currently investing in frontier areas such as nuclear fusion, commercial space, 6G, humanoid robots, quantum technology, next-generation AI infrastructure, synthetic biology, advanced semiconductors, new materials and next-generation energy storage, China has the potential to participate at the beginning of the innovation cycle. If Chinese companies can define products, standards, ecosystems and supply chains from day one, they may capture global leadership economics earlier and avoid the immediate commoditization pressure seen in many localized sectors.

Exhibit 94: We expect China industrial enterprises' margin to be in an upward trajectory as we believe China will have more 0-1 innovation in advanced industries that enjoy high margin, as well as continual globalization



Source: Morgan Stanley Research estimates

Case study

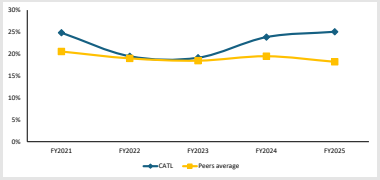
#1 CATL

CATL is one of the clearest Chinese examples of moving beyond localization into global category leadership. CATL ranked No.1 globally in power-battery shipments for nine consecutive years from 2017 to 2025, with 39.2% global share in 2025; it also ranked No.1 in energy-storage battery shipments for five consecutive years from 2021 to 2025, with a 30.4% global share in 2025. This leadership matters because battery leaders influence product benchmarks in range, safety, charging speed, lifecycle cost and energy-storage reliability.

The financial outcome also supports our thesis that 0–1 innovation and scale leadership can create structurally superior profitability. CATL had 23.8% gross margin and 21.9% ROE in 2024, both materially above the peer average. This is notable because the battery industry has been through a severe price-war and localization cycle, yet CATL has maintained returns far above most battery peers.

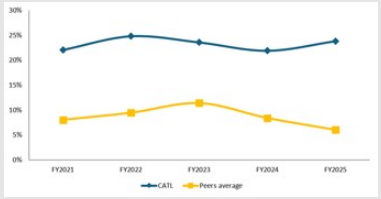
CATL's innovation advantage is multi-layered rather than based on one product cycle. It has core technological advantages across battery materials, battery systems and recycling, as well as innovation in material systems, system structure, green manufacturing and business models. Its product matrix includes LFP, mid-nickel and high-nickel ternary batteries, sodium-ion batteries, M3P batteries and condensed batteries, with performance features such as fast charging, long life, long range, safety and wide-temperature adaptability. This is the type of technology and system-level innovation that can protect margins even when an industry becomes more localized and competitive, in our view.

Exhibit 95: CATL's gross margin is superior to its peers...



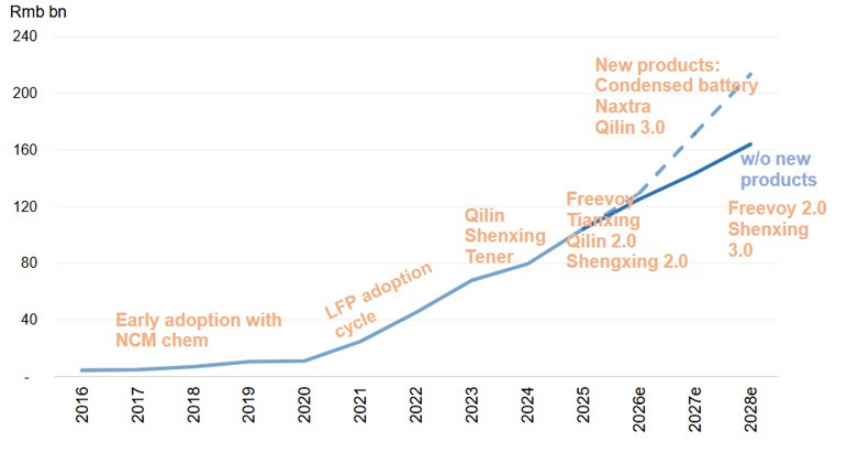
Source: Company data, Morgan Stanley Research. Note: Peers group includes LG Energy Solution, Samsung SDI, Panasonic, BYD, EVE Energy and Gotion High-tech.

Exhibit 96: ...and the same for ROE metrics



Source: Company data, Morgan Stanley Research. Note: Peers group includes LG Energy Solution, Samsung SDI, Panasonic, BYD, EVE Energy and Gotion High-tech.

Exhibit 97:
CATL's product-innovation cycles, strengthening EV model cycle, and development of energy storage market solutions, help support EBITDA growth



Source: CATL, Morgan Stanley Research (e) estimates

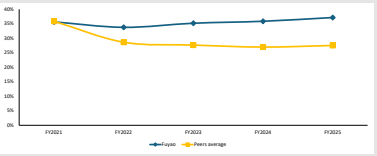
#2: Fuyao Glass

Fuyao Glass is a different but equally useful Chinese case. Fuyao is the No.1 global automotive-glass player with about 37% share in 2025. It is not a pure frontier-technology company like CATL; instead, it is a specialized global manufacturing leader in automotive glass, where the moat comes from long OEM qualification cycles, quality consistency, safety standards, global delivery and co-development with automakers.

The financial comparison shows the value of that specialization. Fuyao had 35.9% gross margin and 22.4% ROE in 2024, well above the peer average in the past few years. This return gap reflects the difference between an engineered, safety-critical, OEM-qualified autos component and broader glass peers that often have more commodity, construction or cyclical exposure.

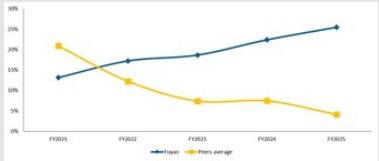
Fuyao's innovation is mainly product/process innovation and customer-solution innovation. The company benefits from functional glass trends such as panoramic canopies, smart dimming glass, antenna-integrated glass, HUD-compatible windshields, acoustic and thermal functions, encapsulation and modular assembly. In a mature industry, this kind of innovation can still create "0–1-like" economics because it turns a commodity input into a qualified system component embedded in global OEM platforms.

Exhibit 98: Fuyao's gross margin is superior to its peers...



Source: Company data, Morgan Stanley Research. Note: Peers group include AGC, Nippon Sheet Glass, Saint-Gobain, Xinyi Glass, Sisecam and Gentex.

Exhibit 99: ...and the same for ROE metrics



Source: Company data, Morgan Stanley Research. Note: Peers group include AGC, Nippon Sheet Glass, Saint-Gobain, Xinyi Glass, Sisecam and Gentex.

ROE Improvement under an efficiency-driven revolution

MSCI China's ROE has tracked each industrial stage closely. During Industrial 3.0 (2000s–mid 2010s), ROE rose dramatically, from just ~4% in 2000 to a peak of 16-17% in 2010-2011. This was the golden era of capital-intensive, scale-driven growth, with high-ROE banks and energy companies dominating the index. ROE then began to fade through the later part of this stage, settling to 13-14% by the mid-2010s as the capex supercycle matured.

During Industrial 4.0 (mid 2010s-early 2020s), the decline continued – gradually at first, hovering around 12-13% through 2017-2019, before falling more sharply to 10-11% by the early 2020s. This reflected both the natural slowdown of the investment-driven growth model and a compositional shift in the index – away from high-ROE Financials and toward newer tech and advanced manufacturing names still in their heavy investment phase.

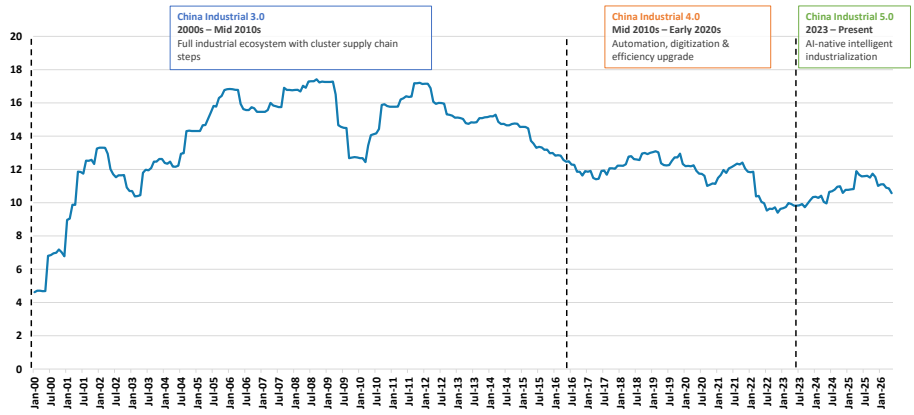
Since entering Industry 5.0 (2023-present), there are early signs of ROE stabilization. MSCI China's ROE has edged up from a trough of ~9–10% in mid-2023 to around 11%, modest, but directionally meaningful after a decade of erosion. Several forces are driving this:

- Strong export competitiveness, is supporting top-line growth and asset turnover;
- The government's "anti-involution" campaign is targeting excess capacity and destructive price competition across key industries, which should help restore pricing power and margins over time;
- Corporate self-help, including cost discipline, share buybacks, and higher dividends are improving capital efficiency from the bottom up.

The combination of these forces, exports, supply-side discipline, and AI-driven efficiency, could mark a structural ROE re-rating for China equities.

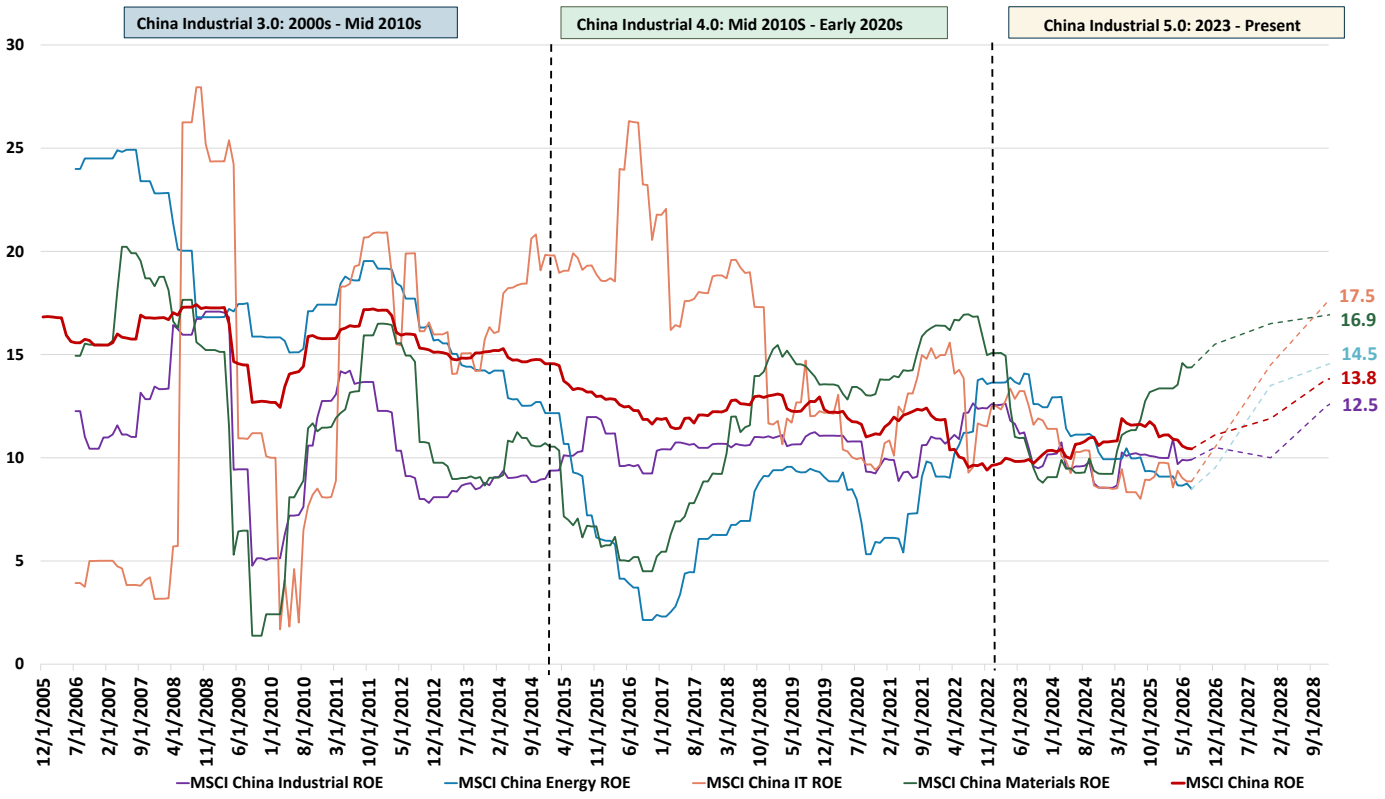
Looking forward, unlike the prior two cycles, our China strategy team believes this round is more about an efficiency-driven revolution, which could help lift both major AI-related sectors and overall index ROE. The team expects Energy (up 6-7%), Materials (up 2-3%), Industrials (up 2-3%), and Information Technology (up 8-9%) to all see a round of ROE improvement by 2028, contributing around 2% to MSCI China's overall index ROE.

Exhibit 100: MSCI China ROE – more notable improvement during China Industry 3.0 and 5.0



Source: Datastream. Morgan Stanley Research. Data as of May 31, 2026.

Exhibit 101: MSCI China ROE trajectory by industry in historical period



Source: Thomson Reuters. Morgan Stanley Research. Data as of July 31, 2026

What Does Industry 5.0 Mean for China's Long-term Economic Outlook?

Industry 5.0 should lift China's potential GDP by ~3.5% by 2035, partially cushioning the demographic drag. We now raise our China's potential growth forecasts by 30bp to 4.3% for 2028-30 and 50bp to 3.9% for 2031-35 – enough to meet Beijing's 2020-35 GDP-doubling target. The near-term GDP impact will likely stay broadly neutral, as excess capacity, tech bottlenecks, and J-curve labor adjustments offset early gains, before turning more positive from the late 2020s as deployment broadens. Overcapacity should also prove more manageable than in the past five years, supported by the anti-involution policy and a global capex supercycle. Yet a decisive reflation remains challenging, given Beijing's continued supply-centric policy framework and calibrated rebalancing. We expect the GDP deflator to move only gradually towards 0.5-1.0% lowflation territory from 2028, as housing stabilizes, capacity is absorbed and margin gains feed into wages, while renewed deflation remains a near-term downside risk if rapid household deleveraging coincides with pro-cyclical fiscal tightening.

Revising up our long-term potential GDP forecasts for China

Industry 5.0 could become an important offset to China's aging demographics, lifting the country's potential GDP level by around 3.5% by 2035 (vs. a no-Industry 5.0 path). The uplift comes from: 1) the Industry 5.0-enabled manufacturing capex supercycle, which is likely to be a capex-heavy industrial transformation across AI infrastructure, power systems, robotics, sensors, industrial software, and factory retrofits, outweighing structurally weaker capex in property and traditional infrastructure sectors. This should lift total capex input's contribution to GDP by 1.5pp cumulatively over the next decade; (2) a 3pp cumulative increase in TFP over the next decade, with broader deployment of AI across the economy enhancing decision making, optimizing resource allocation, improving coordination across supply chains and business functions, and enabling new production and service models. These should far outweigh the AI labor replacement effect (~1ppt cumulative drag to 2026-35 GDP growth).

Industry 5.0's impact on potential growth is likely to be broadly neutral in 2026-27: As discussed in Industry 5.0 – A Long Capex Supercycle , while we expect a US$12tn (~Rmb80trn) Industry 5.0-enabled incremental investment over the next decade (vs. a non-Industry 5.0 path), a broad-based manufacturing capex boom would not take place from day 1, given still pervasive excess capacity and Beijing's efforts to reduce repetitive buildout across regions/sectors under the "unified national market" initiative. The key capex driver in the near term would be AI computing, data centers, and power grid infrastructure, which would have strong growth (15-20%) yet small size (only accounting for ~2% in total investment). In particular, China's ample existing power capacity reduces the need for a US-style surge in power-infrastructure investment, while data-center deployment remains constrained by the availability and performance of domestically

produced advanced chips in the near term, and its private sector-led growth model means that capex would hinge on chip supply, utilization and monetization visibility, rather than administrative targets. We thus see a modest increase in the net capital input contribution to headline GDP, at 0.1-0.2pp.

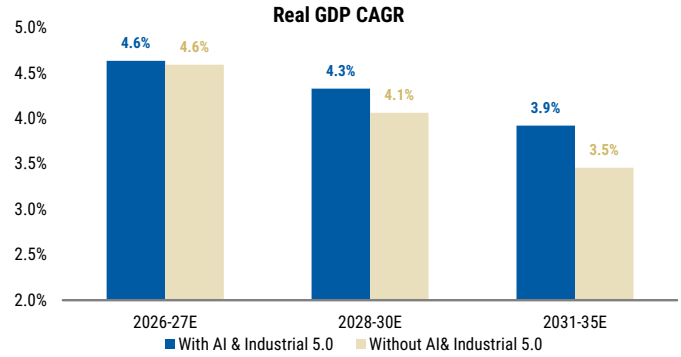
Meanwhile, the early phase of AI and automation adoption could create transitional pressure on the labor market, especially in routine, repetitive, and junior-level tasks, This is consistent with the classic "J-curve" pattern of general-purpose technology diffusion, where labor displacement and organizational adjustment costs tend to materialize ahead of broad-based productivity gains, as enterprises must first restructure workflows, reskill workers, and reconfigure production systems before the full efficiency benefits emerge.

As a result, modest gains from capital input and early productivity improvements are likely to be largely offset by labor-market adjustment costs, leaving the net boost to headline potential growth limited in 2026 27.

The contribution should turn more positive from the late 2020s, as Industry 5.0 shifts from initial infrastructure build-out to broader factory deployment and commercialization. On the capex side, capacity utilization ratio shall return to a healthier level with structurally stronger exports and more disciplined investment, and Industry 5.0 would shift from initial AI infrastructure build-out to broader factory deployment and commercialization. A virtuous cycle would be formed: higher efficiency supports competitiveness and profit enhancement, which justifies further equipment investment and data accumulation. This would lift total annual capital input contribution to GDP by 0.2-0.3pp over the medium term. At the same time, an AI-induced productivity boost would gradually outweigh its drag on labor inputs, as firms move from substitution to human-AI collaboration, with workers redeployed into higher-value roles such as system integration, robotics operations, data engineering, and equipment maintenance.

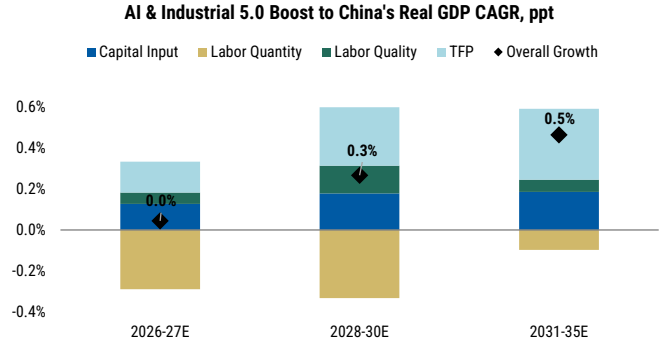
We thus revise up our 2028-30 annual potential GDP forecast by 30bps to 4.3% CAGR, and see a 50bps uplift to 2031-35 annual potential GDP growth, to 3.9% CAGR. Growth at this level would be sufficient to reach Beijing's target to double 2020 GDP level by 2035.

Exhibit 102: A J-curve in AI & Industry 5.0 impact on China's potential GDP growth



Source: CEIC, Morgan Stanley Research (E) estimates

Exhibit 103: AI & Industry 5.0's boost to capex and productivity improvement to be more notable beyond the near term



Source: CEIC, Morgan Stanley Research (E) estimates

Overcapacity issues should be more contained than in 2021-25

China's 3D challenges (debt, demographics, and deflation) have resurfaced since 2022, as the structural housing downturn and local government deleveraging met with a policy boost to industrial supply, not consumption demand, resulting in excess capacity problems. To be sure, China's supply-led model remains prone to overcapacity. But we believe the magnitude could be reduced in our base case, based on three factors:

- **Structurally stronger external demand:** Our Asia economist believes that the region is entering its strongest multi-year industrial cycle since the mid-2000s, driven by the interactions between AI and AI-related infrastructure, energy transition, defence, and a rise in industrial capex. China should be a prime beneficiary: it holds 70-90% of global capacity in the "new trio" (EVs, batteries, solar), positioning it to capture structurally stronger global energy-transition demand, while the AI up-cycle offers a multi-year runway for its exporters of hardware, AI-related equipment, robotics, where China keeps gaining share. Crucially, the demand is set to widen from tech to non-tech sectors amid broader industrial upgrading – helping ease China's excess capacity problems in more sectors.
- **Healthier capex demand under Industry 5.0:** China's shift toward Industry 5.0 tilts investment toward upgrading its existing manufacturing base rather than purely greenfield expansion, by embedding AI, robotics, sensors, and software into installed factories to lift productivity. *As this demand is largely retrofit- and replacement-driven, it skews toward higher value-add per unit rather than low-end volume.* This would help absorb the supply glut, and sharpen China's global competitiveness.
- **Smarter industrial policy:** Since July 2025, the anti-involution campaign has increasingly targeted disorderly price competition and the flow of investment and credit into sectors with overcapacity. The 15th FYP takes another step ahead by promoting "a unified national market" to address redundant construction and zero sum competition among local governments. Beijing has advocated differentiated development across regions and emphasized the need to prevent "money-burning" investment in developing future industries.

But policy-driven economic rebalancing remains calibrated

Meaningful economic rebalancing reforms remain the desired path for reflation: While stronger exports and better industrial policy could help improve capital allocation and mitigate excess capacity problems, we don't believe they can fix the supply-demand imbalance rooted in local government incentives (see *Box: The Hefei Paradox: Why Smart Industrial Policy Can't Fix Macro Imbalances*). We have long-argued that (here, here, and here) China's rebalancing and reflation require deep structural reforms to cadre evaluation (local officials), fiscal structure, and social safety nets, which would reallocate fiscal resources from investment to consumption, and help unwind the >Rmb30trn cumulative excess savings since 2018:

Cadre evaluation reform: Shift verifiable performance metrics away from output volume toward household income, consumption, and environmental quality.
Fiscal system reform: Reduce reliance on indirect taxes (e.g., VAT) that reward scale

expansion, and transition toward direct taxes linked to efficiency and profitability. Reorient central-local transfers from project-based allocation to public service provision.

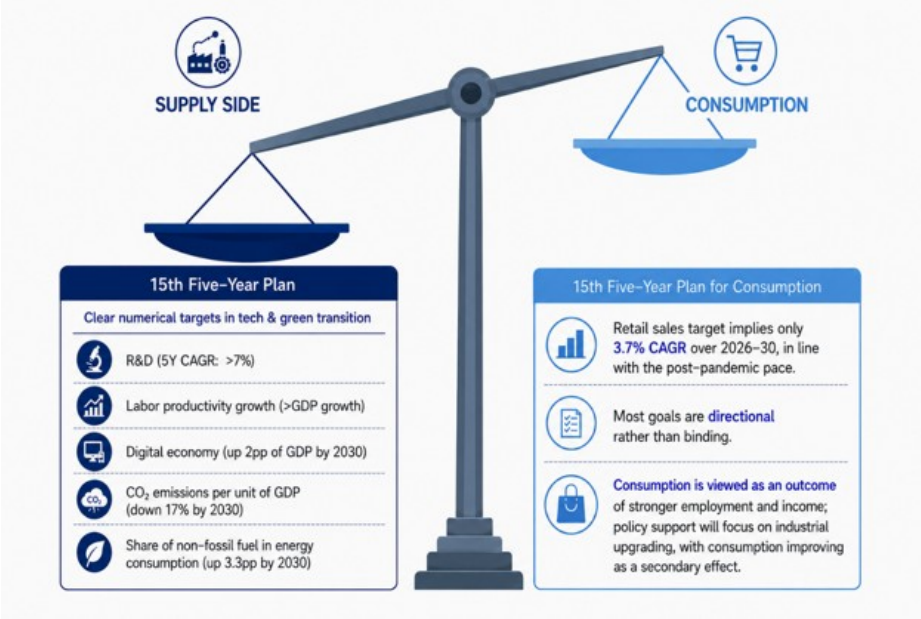
Social welfare reform: Strengthen the safety net to lower precautionary savings (currently ~33% of disposable income). This requires reallocating fiscal resources from investment, increasing SOE equity transfers, and building a multi-tier social security system.

Yet medium-term policy framework has remained supply-centric: Beijing's 2026-30 Five-Year Plan provides explicit, quantifiable innovation and productivity targets, yet support to consumption remains qualitative and non–binding. In our view, China's resilience through successive shocks – the 2025 tariffs, Middle East tensions since 2Q26, and the ongoing housing downturn – has likely reinforced policymakers' confidence in the prevailing supply-centric policy framework to prioritize tech self-sufficiency and energy security. In contrast, policymakers have continued to view consumption as a function of industrial upgrading and employment growth, not a policy lever, making direct cash transfers to households challenging. While Beijing has increasingly recognized the importance of strengthening public services and the social safety net to reduce precautionary savings, implementation will likely remain gradual, given concerns on the near-term multiplier effect on consumption and medium-term funding sustainability.

Structurally weaker fiscal revenue also constrains Beijing's bandwidth for meaningful demand support: As it is, government budget revenues and land sales revenues combined have declined from pre-Covid levels of 27-28% of GDP to 19% today, due to a housing downturn-induced land sales slump and deflation-driven tax revenue contraction. While there remains ample room for central government to increase leverage to support the economy (debt/GDP ratio remained low in 2025, at 29%), Beijing has been on the cautious side given concerns on moral hazard and public debt sustainability. This explains why policymakers have been hesitant on providing more substantial counter-cyclical demand support, and pro-cyclical at times (such as a stricter tax collection, dialing down consumption support) when public debt resolution is prioritized over short-term economic growth.

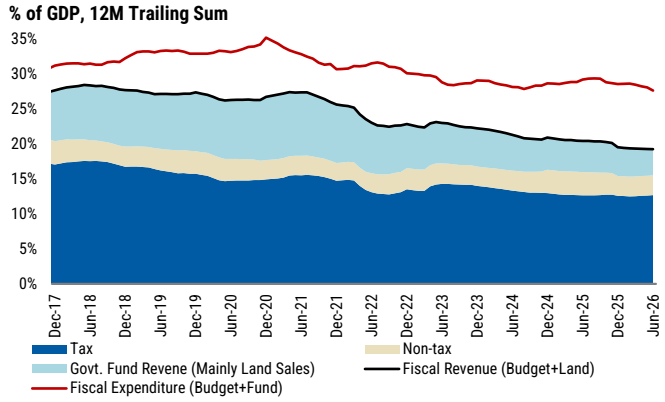
This means economic rebalancing efforts will likely remain calibrated in the coming year: Such a supply-centric mindset and fiscal constraints have reinforced policymakers' preference for investment over consumption, as the former is deemed an asset with future returns while the latter is often viewed as shifting demand forward at the cost of higher debt for future generations. This means more state resources will continue to be allocated towards energy transition and frontier technologies – AI, semiconductors, quantum computing, and advanced manufacturing – rather than household wallets.

Exhibit 104: Overall policy framework to remain supply-centric



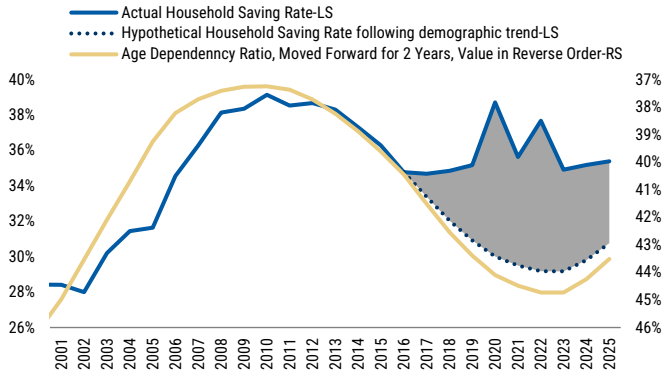
Source: Government website, Morgan Stanley Research

Exhibit 105: Structurally weaker fiscal revenue constrains meaningful counter-cyclical demand support



Source: MoF, Morgan Stanley Research

Exhibit 106: More economic rebalancing efforts are needed to unlock >Rmb30trn in excess savings for consumption



Source: Morgan Stanley Research estimates

We thus expect continued lowflation over the next decade

Deflationary pressures to linger in 2026-27 amid a two-speed economy: We view this year's inflation uptick as a false dawn driven by geopolitically-induced oil shocks, while the underlying supply-demand imbalance remains severe. The economy continues in an entrenched K-shape, with improving exports and sluggish domestic demand amid the continued property downturn, household deleveraging, and slow fiscal rollout. Pass-through from export strength to domestic demand has been limited, as the initial driver is tech- and capital-intensive, and overcapacity lingers. Yet resilient exports have eased the perceived urgency for policy support, resulting in *de facto* fiscal tightening – though we expect this drag to ease this Fall with further policy fine-tuning facilitating faster budget rollout.

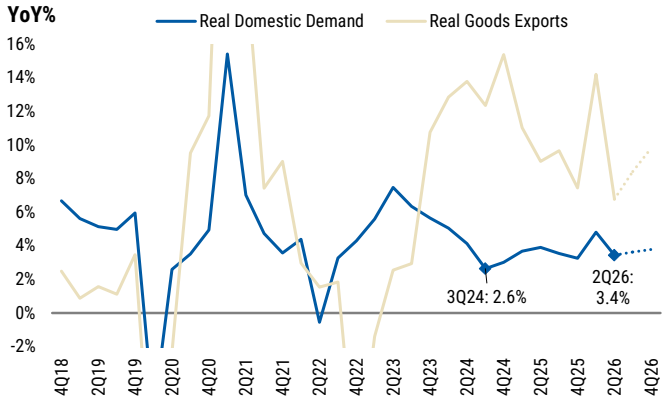
We thus see the GDP deflator slipping from 0.8% in 2026 to 0.2%Y in 2027 as oil

prices normalize, with risk tilt to the downside – should rapid household deleveraging coincide with more aggressive pro-cyclical fiscal tightening, deflationary pressures may re-emerge.

A gradual shift into lowflation territory is possible from 2028, but decisive reflation remains unlikely: Given that policy efforts in economic rebalancing will likely stay calibrated, a decisive reflation towards 2-3% will be challenging. A more probable path is a slow, shallow, market-driven shift toward 0.5-1.0% p.a. lowflation from 2028 onwards, driven by three catalysts:

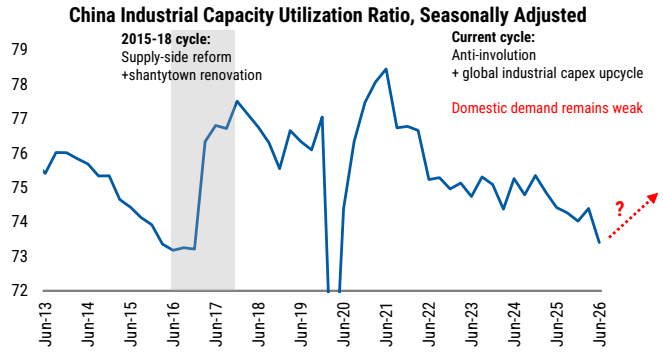
- **Stabilization of housing market in tier 1-2 cities from 2H27**, as supply contraction and demand adjustment run their course – ceasing to be a deflationary drag rather than becoming a growth driver.
- **A return of industrial capacity utilization to healthier levels in next 2-3 years**, which would be much longer than the 2016-17 cycle (when the ratio quickly rebounded from ~73% in 2H16 to a healthier level of >76.5% in 2Q17 on a synchronized housing and export recovery and supply-side reforms), given the absence of meaningful consumption/housing stimulus and more pervasive overcapacity problems.
- **Better industrial profit margin over the medium term:** We expect margins to climb toward ~8% by 2035 from ~5% in 2025, driven by a rotation up the value chain into higher-margin foundational layers, the globalization of competitive Chinese leaders, and an economy-wide productivity lift from Industry 5.0 (for more details, please see Industrial Margins and ROE Upward Trajectory).

Exhibit 107: Deflationary pressures to linger in 2026-27 amid a two-speed economy



Source: CEIC, Morgan Stanley Research estimates

Exhibit 108: Excess capacity digestion may take 2-3 years to complete



Source: CEIC, Morgan Stanley Research

Box: The Hefei Paradox: Why Smart Industrial Policy Can't Fix Macro Imbalances

Hefei – the city that rescued NIO, backed CXMT, and seeded China's rise in advanced display manufacturing – provides a prime example for the school of thought that smarter industrial policies can solve bottlenecks of emerging industries and foster global champions. But even this city has not escaped

overcapacity and deflation. We view Hefei's case as a microcosm of China's broader challenge: even with an improved industrial policy, it has only improved investment allocation towards more productive sectors, but has not fixed the supply-demand imbalance rooted in local government incentives.

What is Hefei's recipe for success? Hefei's model works better than traditional local industrial policies because the government acts less like a blanket subsidy provider and more like an ecosystem planner and VC investor. The approach included:

- Mobilizing fiscal resources as patient capital to anchor lead firms
- Promoting public-private co-investment
- Building supplier networks around them
- Conducting market-based exits
- Recycling gains into the next strategic sector

This approach has helped reduce subsidy-induced market distortion and solved funding bottlenecks at the early stage of emerging sector development – when private capital is still hesitant.

The city has cultivated various national/global champions: It supported BOE in launching China's first sixth-generation TFT-LCD display-panel line, turned the rescue of NIO into the development of an NEV hub in the city, and backed CXMT as a 'chain leader' to develop a DRAM supply chain when private capital was still in doubt. Today, the city is a major production base across NEVs, displays, and appliances, and hosts globally competitive players in PV inverters, energy storage, and DRAM. At the macro level, Hefei's real GDP size nearly doubled over the past decade, to Rmb1.4trn in 2025, and its national ranking climbed into the top 18 (from #24 in 2015).

But Hefei's recipe is hard to replicate: Its success relied on a rare alignment of timing, bold early bets, local industrial fit, and favorable demand cycles that only materialized with a lag. If many regions imitate the same surface tools (large upfront government seed capital, anchor-firm recruitment, industrial park buildout), and focus on the same frontier sectors, this may result in redundant investment nationwide, compounding the overcapacity problem.

Indeed, even Hefei is not immune to overcapacity and deflation: While Hefei has outperformed in industrial production and exports over the past five years, consumer goods sales lagged and price deflation was more severe than the national average – a reflection of overcapacity and constrained corporate earnings despite market-share gains. This reflects China's broader industrial challenge: globally competitive supply chains coexisting with compressed profitability and persistent deflation. Even with a smarter industrial policy, the shift is in what China invests in, not how much it invests – leaving the supply-demand gap unresolved.

Exhibit 109: Hefei's recipe for success: ecosystem planner, not blanket subsidy provider



Source: Morgan Stanley Research

Exhibit 110: The city has cultivated national and global champions in advanced manufacturing



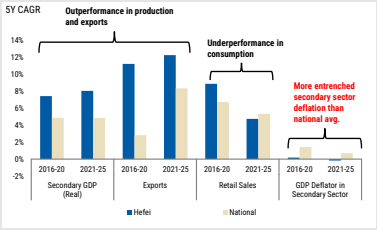
Source: Morgan Stanley Research

Exhibit 111: Hefei model is not easy to replicate



Source: Morgan Stanley Research

Exhibit 112: Even the city itself is not immune to overcapacity and deflation problems



Source: CEIC, Morgan Stanley Research

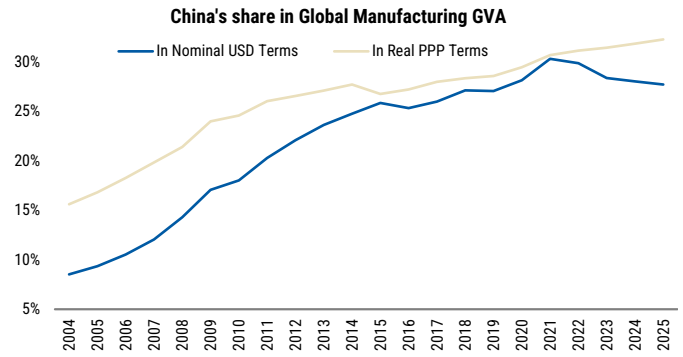
China's Global Manufacturing Share: From 28% in 2025 to 30% by 2035

While China has been the world's largest manufacturing powerhouse, we believe its share in global manufacturing GDP could rise further from 28% in 2025 to ~30% by 2035 – a ~2ppt gain. Industry 5.0 should favor China over DMs, given its scale, all-around manufacturing ecosystem, and deployment speed, to be reinforced by the 15th Five-Year Plan's focus on AI+, frontier technologies and advanced manufacturing. Future share gains should increasingly come from "complex production at scale" – machinery and electronics, EVs and batteries, robotics, industrial automation, high-end equipment and advanced materials. Tariffs may reroute supply chains, but cannot quickly replicate China's industrial depth and know-how; China can therefore capture value not only through finished goods, but also by supplying the equipment and components powering manufacturing growth elsewhere.

Why China can maintain its manufacturing lead during Industry 5.0

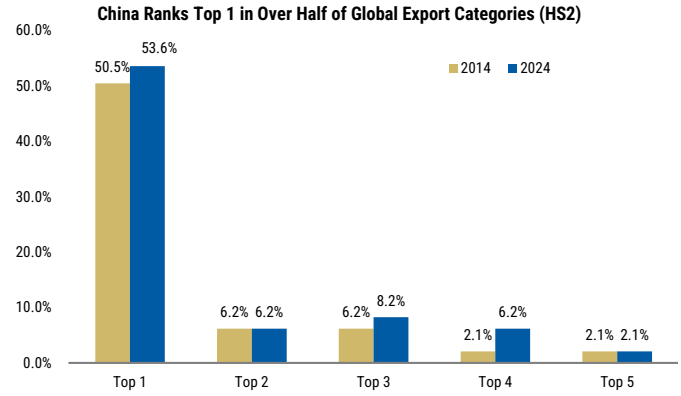
China's nominal manufacturing share decline in 2022-25 understated its real competitiveness: In nominal USD terms, China's share of global manufacturing GDP fell 2.1pp to 28% in 2022-25, fueling investor concerns over its manufacturing competitiveness amid an aging population and rising multipolarity. However, this decline was largely a function of domestic deflation and RMB depreciation against the US dollar. Adjusted for purchasing power parity and inflation, China's share actually rose 1.6pp to 32%. The underlying gains are broad-based and structural: China is now the largest exporter in >50% of global product categories (based on HS2), with its share of global industrial goods exports rising from 5% in 2001 to ~20% by 2024. While it sustained dominance in traditional sectors, it has steadily expanded into semiconductors, high-end equipment, machinery, batteries, EVs and robotics – sectors that are driving the current global trade upcycle.

Exhibit 113: China's nominal manufacturing share decline in 2022–25 understated its real competitiveness



Source: Haver, World Bank, Morgan Stanley Research

Exhibit 114: China's global export dominance is broad-based



Source: UNComtrade, Morgan Stanley Research

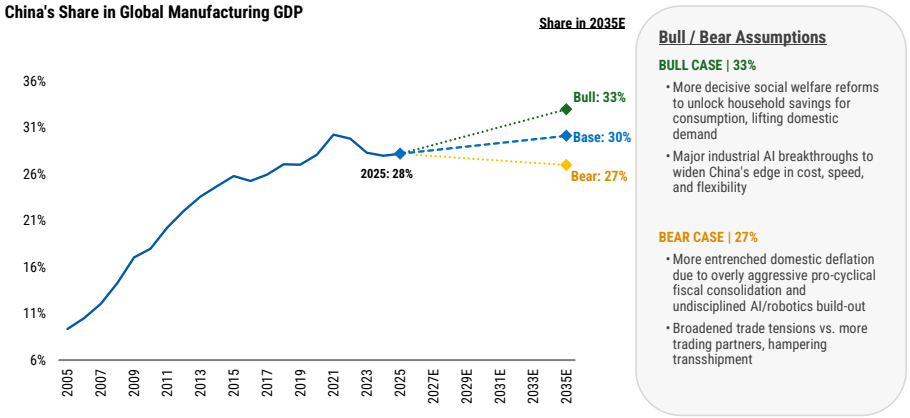
We believe China will be able to widen its lead in global manufacturing GDP by 2ppt over the next decade: To be sure, China is not the only beneficiary of Industry 5.0. AI-enabled manufacturing will reduce labor intensity, improve yield and make smaller-scale local production more economical, supporting reshoring/near-shoring in selective DM sectors such as semiconductors, batteries, defense and medical supply chains. However, this does not mean a broad displacement of China. Industry 5.0 rewards economies that can deploy new technologies across large factory networks, convert production data into process improvement, and iterate quickly through dense supplier ecosystems and coordinated policy support. In each of these dimensions, China's starting point is the advantage – the same industrial base that anchored Industry 4.0 is what now supports industrial AI scaling.

- **Scale-to-data flywheel:** China's large factory base, connected equipment and industrial internet platforms give it more real-world production data to train industrial AI models, optimize processes and improve quality control. As smart-factory adoption expands from pilots to broader clusters, productivity gains can compound across sectors, helping to offset the demographic drag.
- **Faster execution through ecosystem depth…** Industrial AI creates value only when insights can be translated quickly into design changes, process tweaks, component substitution and capacity reallocation. China's comprehensive industrial coverage and dense supplier clusters shorten this feedback loop meaningfully. DM peers – even those with strong AI stacks – still face longer supplier qualification, higher integration costs and slower ramp-up, in part because they are simultaneously trying to rebuild the underlying capital stock that China already has in place.
- **…and with strong policy support:** Beijing's support is not confined to subsidies, but its ability to identify structural demand shifts early and mobilize resources to build capacity to meet demand, even ahead of time. As an example, the case of Hefei – the city that rescued NIO, backed CXMT, and seeded China's rise in advanced display manufacturing – shows how efficient, smart industrial policies can remove bottlenecks in emerging industries, and foster global champions. The 15th FYP's focus on AI+, advanced manufacturing, robotics, high-end equipment and frontier technologies should help move Industry 5.0 from isolated

breakthroughs to scaled manufacturing productivity gains. China is deploying industrial policy to upgrade an already comprehensive manufacturing base, versus the US and Europe, which are rebuilding or defending selected strategic sectors.

- **Lower-cost diffusion of automation:** The reshoring argument assumes robots help high-wage economies offset labor costs, but China can deploy the same technologies at a larger scale with lower integration cost. Its large domestic market for robotics, automation equipment and industrial software should accelerate cost-down, customization and broader factory-level diffusion.

Exhibit 115: We expect China to gain 2ppt of global manufacturing GDP share over the next decade



Source: Haver, Morgan Stanley Research (E) estimates

Supply chain diversification will not derail China's manufacturing share gains

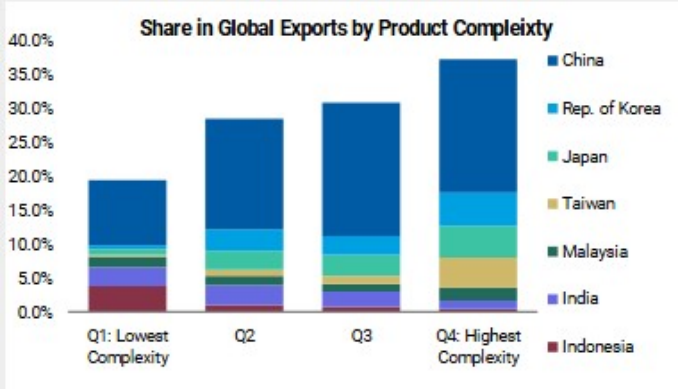
In our view, supply chain diversification will likely reshape China's role from direct exporter to system-level supplier, rather than displace it. Tariffs can redirect final assembly and trade flows, but supplier networks, engineering capabilities and scale economies are much slower to replicate. Our senior global economist, Rajeev Sibal, estimates that only ~40% of China-to-US exports can be readily substituted, while ASEAN and other emerging manufacturing hubs remain highly reliant on Chinese machinery, components and production know-how. The key test of China+1 is whether recipient countries build local capital stock, supplier depth and domestic value added; otherwise, they will likely remain assembly hubs within a China-centered production system. As a case in point, while China's share in US imports has declined from 21.6% in 2017 to 8% currently due to higher tariffs, its export market share for the world ex-US (accounting for 90% of China's exports) has gone up from 12% to 16%.

Near term, DM reshoring itself is import-intensive, which would benefit Chinese and North Asian suppliers: The current trade cycle is unusually narrow, concentrated in AI-related capital goods— precisely the categories where North Asia holds hard-to-replace upstream capacity and China dominates midstream components and equipment. Building domestic AI and manufacturing capacity therefore requires importing the very inputs it is meant to eventually replace: stronger US investment lifts imports of chips, servers,

transformers and grid equipment before it lifts domestic output. Given the long lead times to build fabs, power infrastructure and supplier ecosystems from scratch, we expect this front-loaded import intensity to persist through the current capex cycle – extending, rather than eroding, China's manufacturing share gains outside the US.

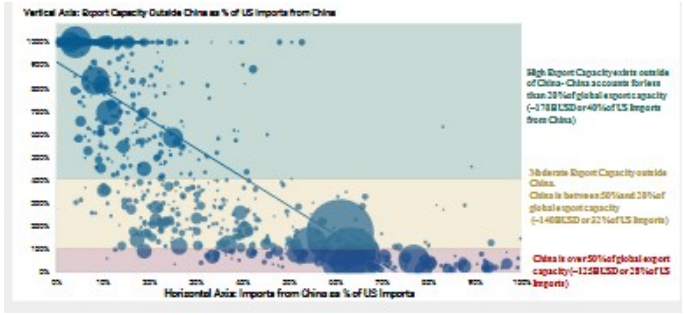
For more detailed analysis, please see China Trade in a Global Context

Exhibit 116: China has greater export capacity in high-complexity goods than all other major Asian economies combined



Source: UN Comtrade, Growth Lb at Harvard University, Morgan Stanley Research. Note: based on latest available Product Complexity Rankings.

Exhibit 117: Less than half of US imports from China have alternative production capacity



Source: USITC, UN Comtrade, Harvard Growth Lab, Morgan Stanley Research.

Where can we see more market-share gains?

We believe China's manufacturing sector still has meaningful room to gain global share because its export competitiveness has become broad-based across value-chain layers and product categories. China initially surpassed major exporters in labour-intensive products such as textiles, furniture and wood products, in the early 2000s, and since the 2010s moved into heavier and more complex categories including metals, electrical machinery, chemicals, machinery and motor vehicles. China's share has increased not only in consumption goods, but also in capital goods, intermediate goods and raw materials, suggesting China is increasingly embedded in the global industrial supply chain.

China's ongoing manufacturing upgrade favors technology-intensive industries. China's manufacturing value-added breakdown shows a clear structural shift over the past three decades that the labour-intensive manufacturing has declined as a share of total manufacturing value added, while technology-intensive manufacturing has steadily increased and now represents more than 30% of the manufacturing mix.

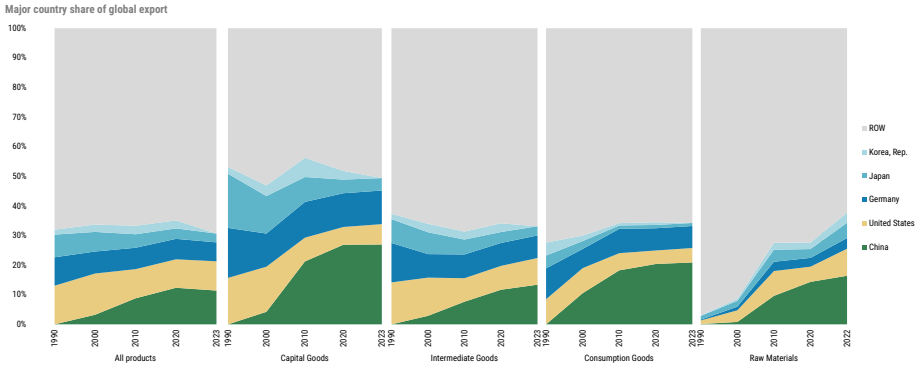
China's largest export category is Machinery & Electronics with >40% in 2025. The composition of China's exports reveals that the country's export profile has shifted decisively from textiles and light manufacturing to more advanced products that reflect deepening industrial capacity. Cars, batteries and advanced shipping have become essential pillars of China's exports, alongside smartphones, computers and integrated circuits, indicating deeper upstream capabilities, not just assembly scale.

Accordingly, China's global share in electronics and machinery has increased significantly over time, while vehicles have also accelerated notably in recent years. This suggests China's manufacturing competitiveness is moving from "low-cost production at scale" toward "complex production at scale." As China's manufacturing mix becomes more

technology-intensive, its future share gain should increasingly come from higher-value categories rather than traditional low-end exports.

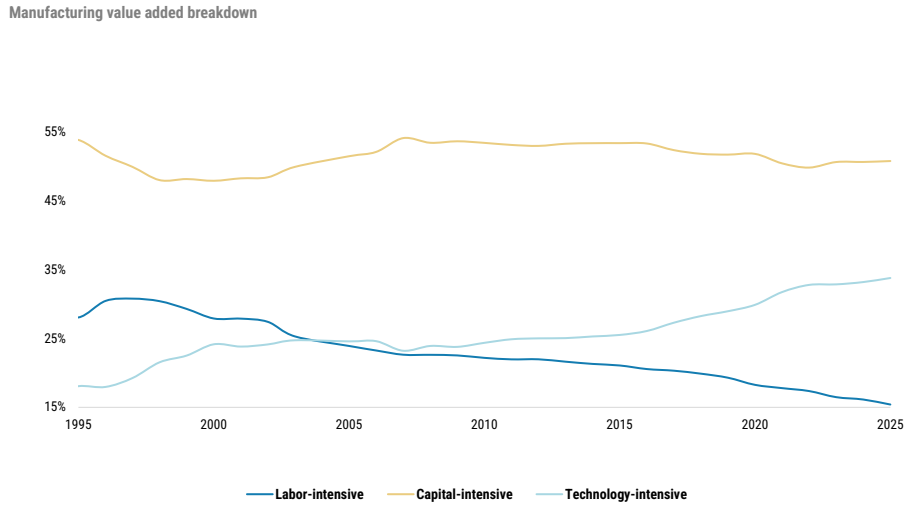
China will continue to lead in high-value industries globally. China has achieved dominance in several technology-intensive sectors such as batteries, solar modules, and EV industries. These examples show how China's share-gain playbook works: large domestic demand creates scale, scale supports supply-chain localization and cost reduction, and cost reduction plus rapid product iteration drives global competitiveness. We believe this model can extend into the next generation of high-end and emerging manufacturing sectors, including robotics, electric machinery, CNC machine tools, semiconductor, automation, and advanced materials, among others. This breadth matters because China's future share gains are not dependent on one single product cycle; they are supported by a diversified manufacturing base, and are expanding into the two ends of the smile curve.

Exhibit 118: China exported 27% of the world's capital goods, 13% of intermediate goods, 21% of consumption goods, and 16% of raw materials



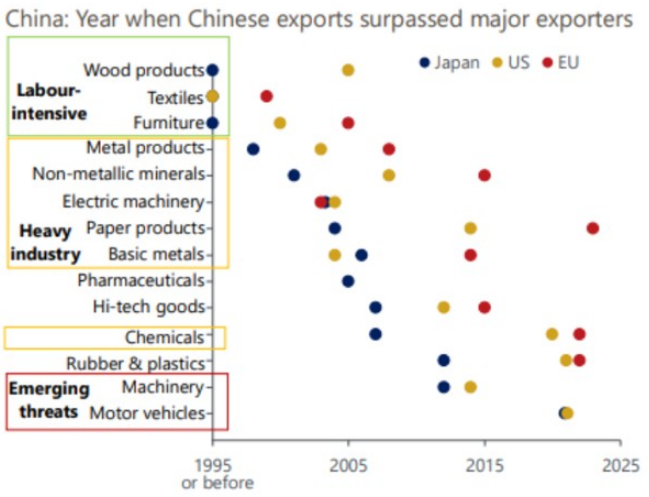
Source: WITS, OCED, Morgan Stanley Research

Exhibit 119: Technology-intensive manufacturing industries accelerating



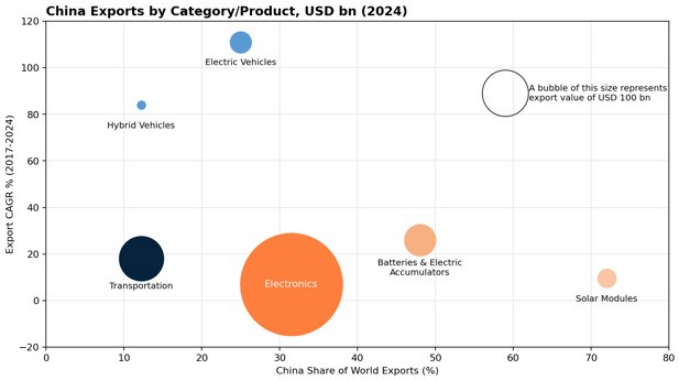
Source: National Bureau of Statistics, Morgan Stanley Research. Note: labor-intensive industries include food and beverages, textiles, wood and paper products, capital-intensive includes metals/minerals and petroleum related products, non-electrical machinery, technology intensive includes electrical and computing machinery, and medicine-related products.

Exhibit 120: China has surpassed other exporters in increasingly sophisticated sectors



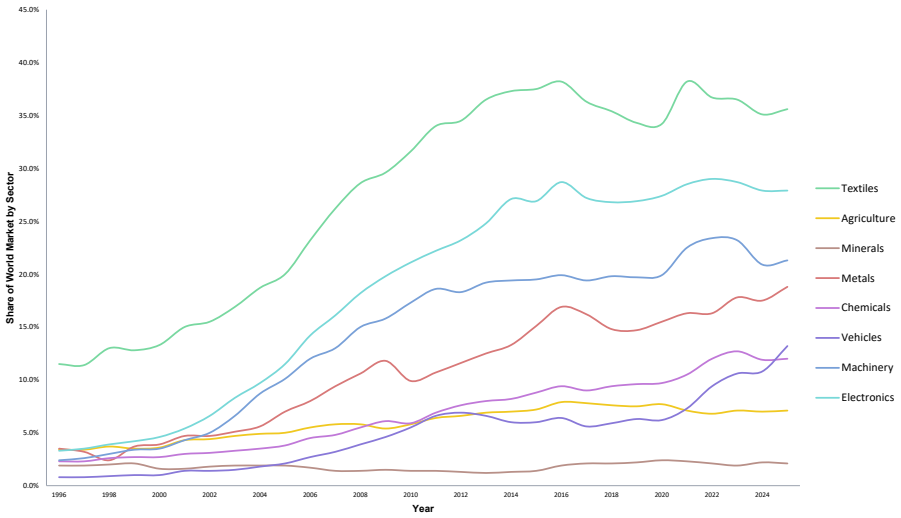
Source: Oxford Economics, Haver Analytics

Exhibit 121: China has leadership in some technology-intensive industries globally



Source: UN Comtrade, Morgan Stanley Research

Exhibit 122:
China's global market share in vehicles, electronics, machinery, metal have been increasing consecutively since the 2000s



Source: UN Comtrade, Growth Lb at Harvard University, Morgan Stanley Research

Risks to Watch

In this report, our central thesis is that even though the economy will likely remain stuck in lowflation territory with calibrated economic rebalancing, China will enter the Industry 5.0 era characterized by intelligence, resilience and ecosystem leadership, backed by policy support and a global industrial capex supercycle. This should bring strong incremental investment demand to make up for structurally weaker capex in property and traditional infrastructure sectors, enhance labor productivity to offset reduced labor input on aging demographics, and strengthen China's position across global manufacturing value chains.

Yet, structural transitions are rarely linear. The path from investment to productivity, profits and income growth often involves periods of adjustment, while shifts in domestic policy and the external environment can materially alter the pace and quality of the cycle. In our view, three medium-term risks stand out:

1. **Policy:** Cyclically, Beijing tends to withdraw policy support when external demand strengthens, but this could risk turning into a pro-cyclical tightening if it coincides with household deleveraging, continued property downturn, and still-weak exports spillover to domestic demand. Structurally, the continued supply-centric policy setup will likely keep the economy prone to overcapacity, particularly in frontier industries where local governments and firms race to secure strategic positions. Both factors could keep deflationary risks alive.
2. **Geopolitics:** Our base case is that China continues to gain global manufacturing share despite supply-chain diversification, shifting from a final-goods exporter to a system-level supplier of production abroad. This will depend on stable ties with major non-US partners. Outbound investment by Chinese manufacturers is central to this transition: it helps firms navigate trade barriers, secure end-markets, and transfer technology and production capabilities to host economies – partly easing tensions created by China's strong exports and weak imports. The recent OFDI tightening is thus a key risk to watch. While we view this as a transitory tightening aimed at enforcing existing rules and closing regulatory loopholes, a prolonged or broadly applied stance could disrupt this outbound channel and reignite wider trade frictions.
3. **Technology:** Tighter external controls and persistent gaps in advanced chips, industrial software and high-end equipment – compounded by fragmented data and insufficient organizational redesign – could delay scaled deployment and raise localization costs. If investment runs ahead of efficiency gains, commercialization, returns on capital and China's manufacturing-share gains would weaken, prolonging industry consolidation.

Along these lines, we present two alternative scenarios to our base case:

Bull case: Accelerated economic rebalancing, healthy reflation

From Industry 5.0 into a broad-based upswing: In this scenario, Beijing pairs the supply-side push behind Industry 5.0 with accelerated social-welfare reform and stronger housing-stabilization measures. Deeper pension, healthcare and hukou reforms, together with reduced negative wealth effect from housing, help release part of the excess precautionary savings for consumption. Stronger domestic demand helps to absorb rising industrial output, reduces price-destructive competition, improves corporate earnings, gives firms more internal cash flow to fund Industry 5.0, and leads to stronger wage growth and thus consumption. This leads to a virtuous cycle, accelerating the convergence of the two-speed economy by allowing the productivity gains from AI and advanced manufacturing to circulate through the wider economy.

This combination delivers stronger potential growth, healthy reflation and a firmer global manufacturing position through 2035: Stronger domestic demand raises capacity utilization and shortens the lag from investment to productivity, while improved corporate earnings and cash flow support continued innovation, workforce redeployment and organizational upgrading. We therefore estimate potential GDP growth at 4.7% in 2026-27, 4.5% in 2028–30 and 4.2% in 2031–35, reflecting a stronger cumulative uplift from AI and Industry 5.0 on TFP and capex input, at ~6pp over the next decade, alongside a smaller transitional drag from AI-related labor displacement (0.5pp). The GDP deflator rises from lowflation in 2026–27 toward 1.5–2% over the medium term, easing debt-deflation pressures and facilitating private-sector balance-sheet repair. A more balanced demand mix reduces reliance on external markets to absorb domestic capacity, easing trade frictions. Combined with faster industrial-AI breakthroughs supported by stronger corporate earnings, this widens China's advantages in cost, speed, yield and flexibility, lifting its share of global manufacturing value-add toward 33% by 2035.

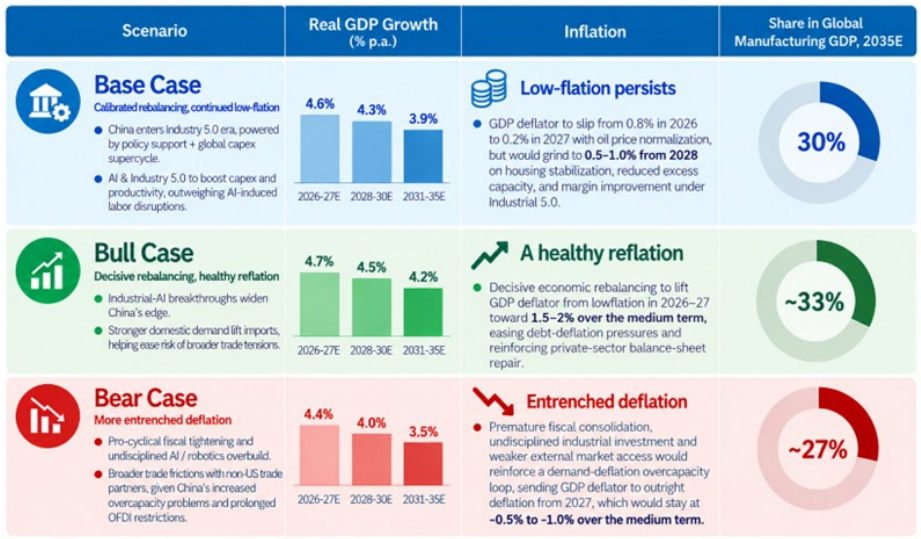
Bear case: More entrenched deflation amid premature policy tightening

Premature fiscal consolidation, undisciplined industrial investment and weaker external market access reinforce a demand–deflation–overcapacity loop: Under this scenario, Beijing prioritizes debt resolution over short-term economic growth, and aggressively tightens fiscal policy while household deleveraging and the property correction remain incomplete, further weakening domestic demand. Meanwhile, local governments and firms continue to expand AI infrastructure, robotics and smart-factory capacity without sufficient demand or return discipline, creating 'smart overcapacity' and renewed margin pressure. Moreover, prolonged restrictions on manufacturing OFDI slow overseas localization, and leave more output reliant on direct exports and transshipment. The resulting trade imbalances trigger broader protectionist responses among non-US partners, further constraining the external demand needed to absorb domestic capacity.

This adverse feedback loop results in weaker potential growth, entrenched deflation and a lower global manufacturing share: The further deterioration in supply-demand imbalance and resulting deflation depresses corporate earnings, and constrains private-sector funding for innovation and broader Industry 5.0 diffusion. We thus see potential GDP growth falling to 4.4% in 2026-27, 4.0% in 2028–30 and 3.5% in 2031–35, with the cumulative GDP uplift from AI and Industry 5.0 limited to ~2% by 2035, largely offset by the AI-induced labor replacement effect. As oil prices normalize, GDP deflator could slip back to negative territory from next year, and stay around -0.5% to -1.0% over the medium

term, raising real debt burdens and reinforcing private-sector deleveraging. China remains the world's largest manufacturing base, but weaker nominal growth, lower returns, tighter market access and partial supply-chain displacement cap its share of global manufacturing value-add at ~27% over the next decade.

Exhibit 123: China Industry 5.0 - Base/Bull/Bear summary



Source: Morgan Stanley Research estimates

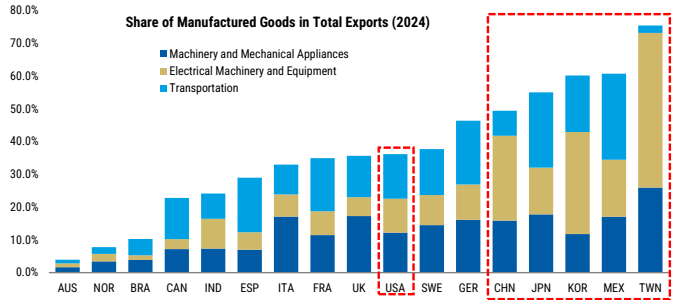
China Trade in a Global Context

Mayank Phadke, Rajeev Sibal

The global manufacturing map is changing as industrial policy and trade restrictions ramp up: direct US-China trade has declined, tariffs and technology controls are intensifying, and final shipment routes are in transition. Even though these forces drive bilateral de-linking, our analysis shows that the actual underlying productive capacity shifts are considerably slower to shift. China's role in global manufacturing supply chains remains central, and China continues to not only expand capacity but also rise up the value chain.

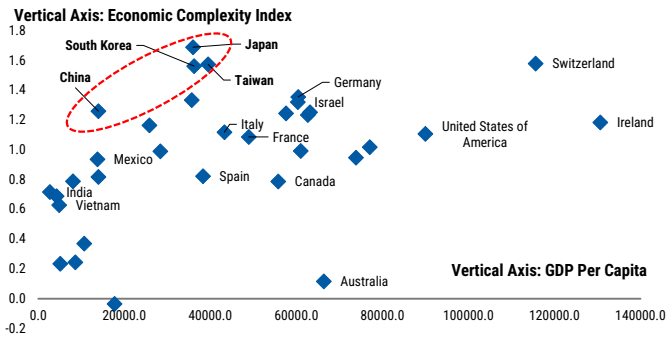
The current trade cycle is unusually narrow and focussed around complex goods with concentrated production. AI-related investment, data-center infrastructure, semiconductors, servers, power equipment, electrical equipment, and capital goods are driving a disproportionate share of global trade momentum. Going forward, robotics and their parts, and electric vehicles and similar high-tech goods tied to AI applications could drive the next wave of trade expansion. These considerations favors economies with existing manufacturing ecosystems in semiconductors, electronics, machinery, batteries, and high-complexity industrial goods – ***China is uniquely-well positioned to continue to benefit as the AI trade evolves.***

Exhibit 124: China and North Asia are most exposed to high-complexity manufacturing exports



Source: National Statistical Agencies, Morgan Stanley Research

Exhibit 125: China's export complexity is high relative to income and peers

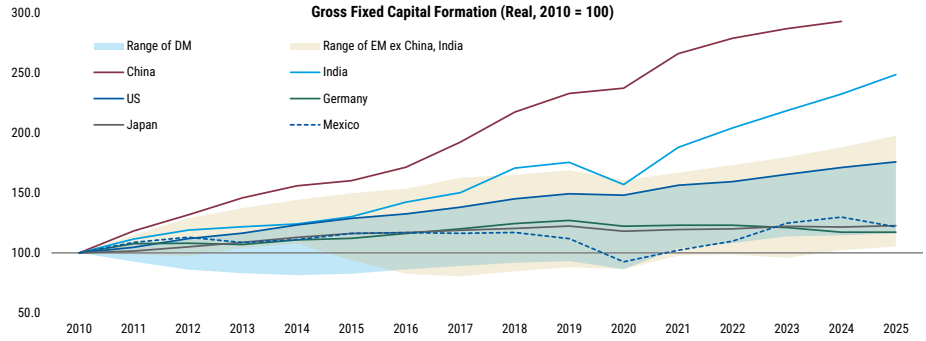


Source: IMF, Morgan Stanley Research

China's advantage is also likely to be reinforced by industrial policy and focused capital deployment. China Industrial 5.0 is an extension of its manufacturing model: using AI, robotics, industrial software, automation, sensors, power systems, advanced materials, and precision equipment to upgrade an already deep production base. The key point is not simply that China is adding capacity, but that it is adding capital stock and productivity in the same sectors driving the current trade cycle. In a world where industrial policy is increasingly shaping markets, China's advantage lies in deploying policy into its comprehensive manufacturing ecosystem to pivot to fast-growing sectors, while other

regions try to rebuild their capital stock and manufacturing base.

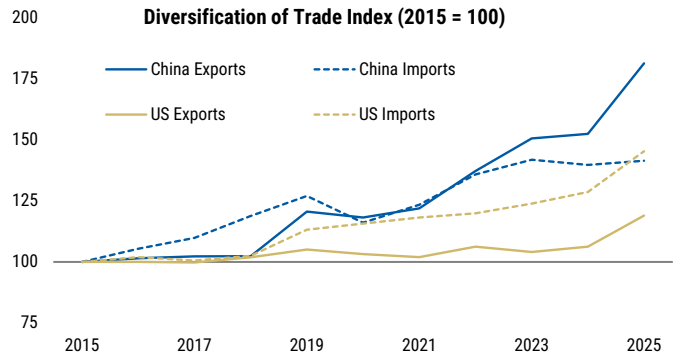
Exhibit 126: China has built capital stock faster than other major economies, and its capital stock is more geared towards goods driving the industrial cycle



Source: National Statistical Agencies, Morgan Stanley Research

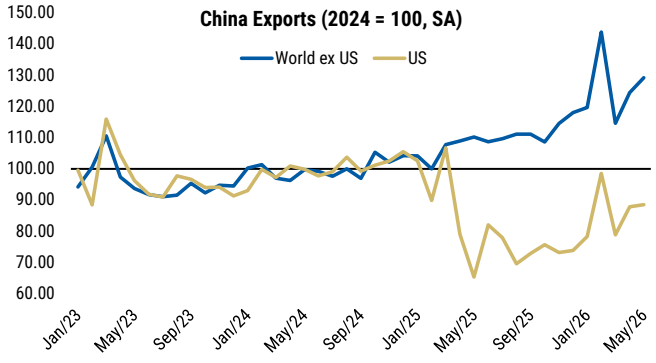
The core distinction in a global trade context is between trade rerouting and capacity relocation. Rerouting changes where goods are shipped from. Relocation changes where goods are made. The evidence so far points more strongly to rerouting, reallocation, and selective de-risking than to broad-based capacity relocation. China's influence is therefore changing form, rather than diminishing. Its direct share in US imports has fallen, but China remains embedded through intermediate goods, components, machinery, capital equipment, and regional supplier networks. As final assembly shifts to ASEAN, Mexico, and other economies, China remains central to the production system behind those exports. China's trade is broadening and exposing it to both faster growing economies and faster-growing products. The growing diversification of trade destinations has allowed exports to not only be resilient, but even be the driver of growth while trade tensions rose.

Exhibit 127: China has diversified trade more than the US since 2015



Source: IMF, Morgan Stanley Research

Exhibit 128: China's export growth has successfully shifted away from the US



Source: IMF, Morgan Stanley Research

Trade rerouting drives regional divergence. China and North Asia remain central to the manufacturing cycle. ASEAN benefits from China+1 diversification but often remains dependent on Chinese inputs. Mexico benefits from nearshoring and downstream assembly, though policy stability is critical. The US remains the demand center. The concept of reshoring will remain a policy focus – yet for now, it remains narrow and AI-linked, while broader reshoring and capacity relocation are likely to be a very gradual process. Europe faces rising competition in advanced manufacturing and competes directly

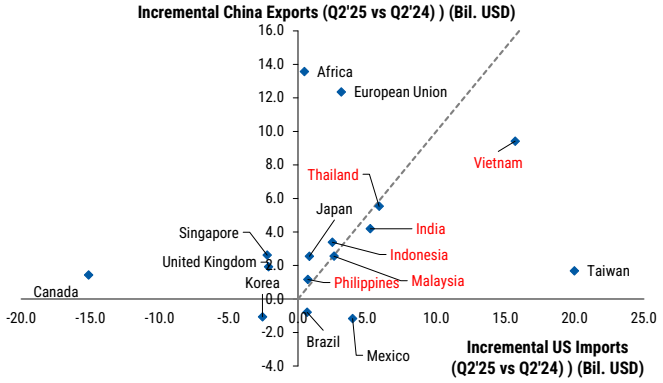
with China in key capital goods, while Canada remains strategically important upstream but is underexposed to the downstream sectors driving current trade growth.

The Trade Cycle in Context Amidst De-Globalization

Global trade is fragmenting, but not collapsing. Policy has redirected trade flows, particularly between the US and China, but production structures remain persistent. Tariffs, technology controls, industrial policy, and geopolitical risk have encouraged firms to diversify final assembly and sourcing. However, these forces have changed measured trade patterns faster than they have rebuilt productive capacity.

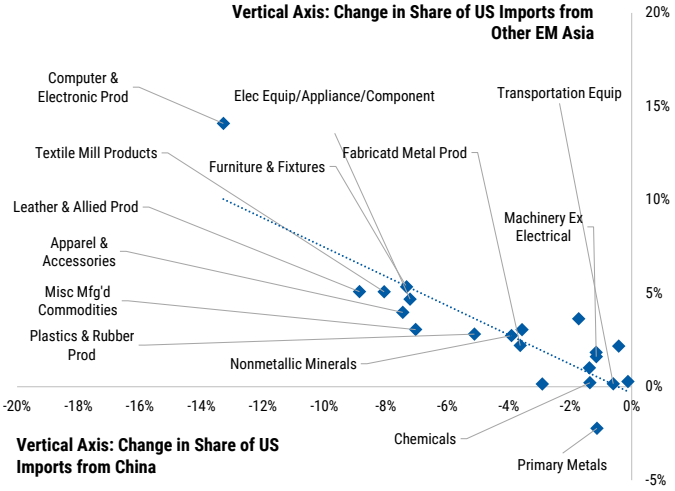
The distinction between shifting productive capacity and trade patterns is critical. A decline in direct US imports from China does not necessarily mean that Chinese production has been displaced. Indeed, our analysis suggests US imports from other Asian economies, such as Vietnam and Indonesia, increased in line with increased imports of these countries from China, which could suggest *transshipment*. At the same time, there has been a steady increase in the trade linkages between China and rest of Asia, particularly ASEAN.

Exhibit 129: Third-market export gains often coincide with higher imports from China



Source: GACC, US Census, Morgan Stanley Research

Exhibit 130: China's lost US share has largely been captured by other Asian exporters



Source: USITC, Morgan Stanley Research

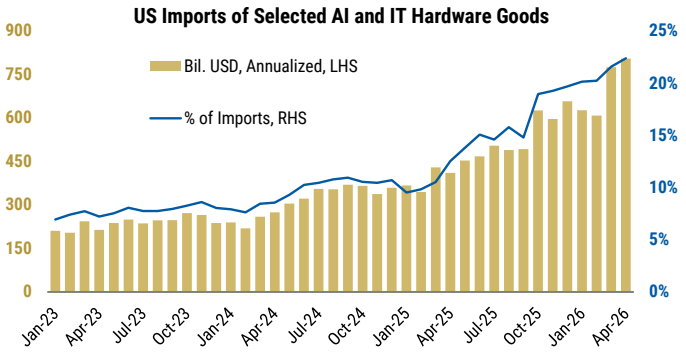
The current adjustment is therefore better described as selective re-configuration than broad relocation. Trade flows are being reorganized across Asia, Mexico, and other third markets, but production ecosystems are not moving at the same speed. Modern supply chains are complex, capital-intensive, and geographically concentrated because they depend on supplier depth, technical know-how, logistics networks, and scale economies, and shifting these is a gradual, expensive, and risky process, making any true changes in productive capacity slow.

Direct import shares are becoming a less complete indicator of supply-chain dependence. A better framework looks at China's share of global productive capacity and global manufacturing value add, its role in upstream inputs, its supply of capital goods, and its position in regional value chains.

The Current Trade Cycle Is Narrow and AI-Led

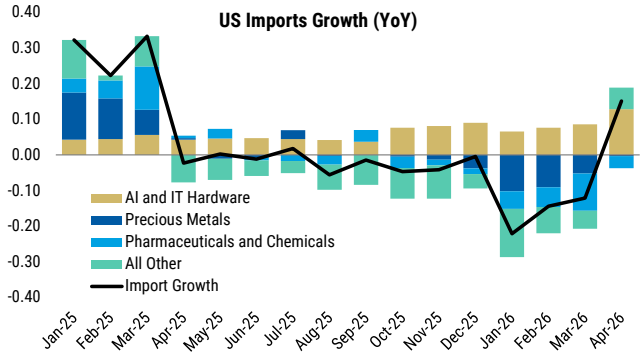
The current global trade cycle is not a broad-based goods recovery; it is narrow, investment-led, and concentrated in AI-related and capital-intensive sectors. AI hardware, semiconductors, servers, data-center infrastructure, electrical equipment, power equipment, machinery, and related capital goods have become the strongest part of the trade cycle. Outside these areas, goods demand has been softer.

Exhibit 131: AI and IT hardware have become a much larger share of US imports



Source: USITC, Morgan Stanley Research

Exhibit 132: US import growth is narrow and AI-led



Source: USITC, Morgan Stanley Research

Composition matters because AI-linked supply chains are highly import-intensive. US capex can rise sharply without immediately generating domestic production. In the early stage of the cycle, stronger investment can lift imports of semiconductors, servers, electrical equipment, cooling systems, power equipment, and other capital goods. The first effect of reshoring or capacity formation can therefore be higher imports, not lower imports.

The AI cycle also reinforces the importance of existing production ecosystems. Taiwan and Korea remain central in advanced semiconductors, memory, and other upstream inputs. ASEAN and Mexico have gained in downstream assembly and integration. China remains important across intermediate goods, machinery, electrical equipment, components, and broader manufacturing ecosystems. The result is not a clean relocation of supply chains but a more dispersed and still deeply interdependent production network.

The trade cycle is therefore reinforcing existing Asian manufacturing advantages even as policy pushes firms to reduce direct China exposure. Economies with established scale in electronics, machinery, semiconductors, batteries, clean energy, electrical equipment, and precision manufacturing are better positioned than economies that have market access but less relevant industrial capacity.

Tariff policy is another trade-cycle catalyst. The key issue is no longer only the level of tariffs, but the durability and legal form of the tariff regime. A shift toward more durable statutory authorities could reduce some uncertainty, but it would also make trade policy a more persistent determinant of sourcing decisions. That matters for global trade because firms are unlikely to commit long-duration capital unless they believe policy incentives and market access rules are stable enough to underwrite investment.

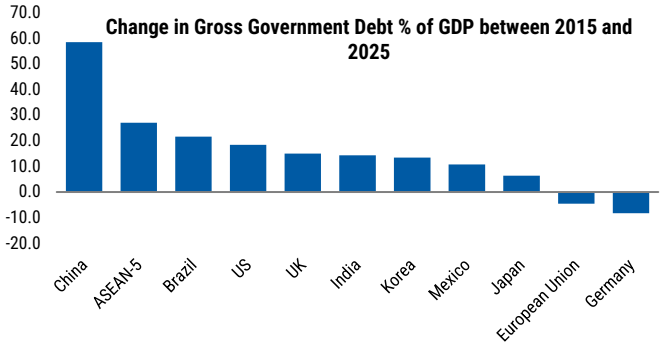
Industrial Policy Is Deepening China's Capacity Advantage

Industrial policy is becoming a more important driver of trade outcomes. Structured Industrial policy across key economies is shaping markets, moving away from episodic state support. Governments are increasingly using subsidies, localization requirements, procurement preferences, import restrictions, export controls, and investment restrictions to influence where future productive capacity is built.

China Industrial 5.0 should be understood in this context. It is the next stage of China's manufacturing model: a shift from scale manufacturing toward intelligent, resilient, and globally leading industrial ecosystems. The objective is to embed AI, robotics, industrial software, automation, sensors, power systems, advanced materials, and precision equipment into the production base, making the capex cycle both capacity-expanding and productivity-enhancing.

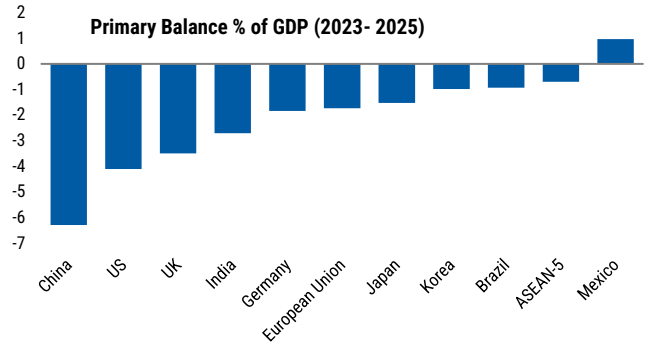
China's starting point is the core advantage. The US, Europe and other manufacturing regions are using industrial policy to rebuild or defend selected strategic sectors. China is using industrial policy to upgrade an already comprehensive manufacturing base. Policy-directed finance, local-government coordination, infrastructure provision, supply-chain localization, procurement, and domestic demand can all be deployed into existing industrial clusters.

Exhibit 133: China has used more fiscal space to support strategic investment



Source: IMF, Morgan Stanley Research

Exhibit 134: Industrial policy is being deployed against divergent fiscal backdrops



Source: IMF, Morgan Stanley Research

Supply-chain reorientation globally is a moving target – bottlenecks and strategic sectors are changing. Other economies are trying to build capacity in strategic sectors, while China is simultaneously expanding capital stock, upgrading productivity, and localizing bottlenecks in those same sectors.

China's Role Is Changing Form, Not Disappearing

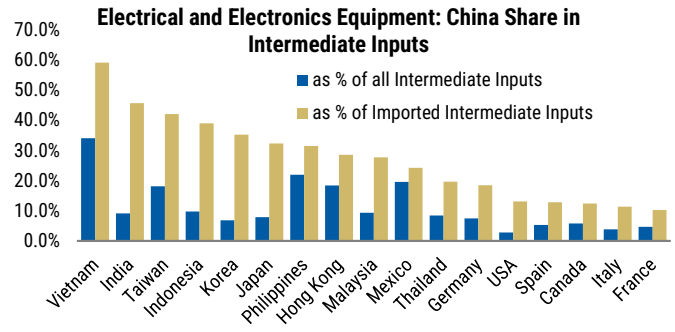
China's direct trade relationship with the US has weakened, but China's role in global manufacturing has not declined in the same way. We think the right framing is bilateral de-linking, not a global shift away from China. China can lose direct US import share while maintaining or even expanding its influence in global manufacturing. If third-country exports to the US rise alongside those countries' imports from China, the data may show diversification in final shipment terms but gloss over a continued Chinese presence in manufacturing production.

China has adapted by diversifying export destinations, deepening regional trade links,

and upgrading into higher-value manufacturing. Its export base is no longer concentrated only in low-end consumer goods. China has gained competitiveness in machinery, electrical equipment, transport equipment, EVs, batteries, solar, industrial automation, and other advanced manufacturing categories. These sectors are closely aligned with the current global investment cycle.

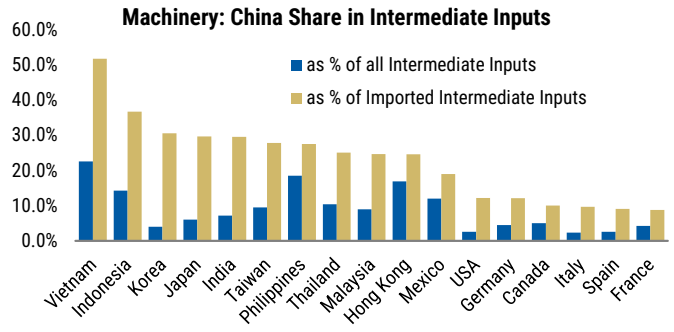
China's role is also shifting from direct exporter to system-level supplier. As final assembly moves to ASEAN, Mexico, and other economies, China can still provide intermediate inputs, components, machinery, and equipment used in those exports. This makes China's manufacturing influence broader than its direct share of US imports. Indeed, analysis of supply chains suggests that well over a third of all intermediate inputs for machinery and electrical/electronics manufacturing in Asia come from China. This position is likely to be further consolidated in coming years, putting China in pole position both upstream and downstream for goods that are likely to drive the trade cycle.

Exhibit 135: China is a key supplier of electrical and electronics inputs across Asia



ADB, Morgan Stanley Research

Exhibit 136: China is embedded in Asia's machinery supply chains



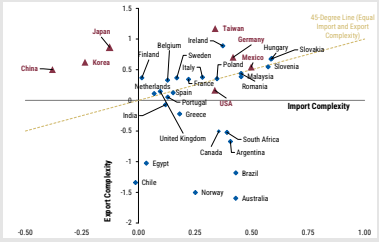
ADB, Morgan Stanley Research

Understanding the Vectors of Trade: Complexity, Concentration and Geopolitical Distance

In Supply Chain Strain, our deep dive on Global Supply Chains, we laid out a framework for assessing shifts in supply chains based on three factors: complexity, concentration, and geopolitical distance. We find that China is well situated across all three axes, and Industry 5.0 will further enhance their position.

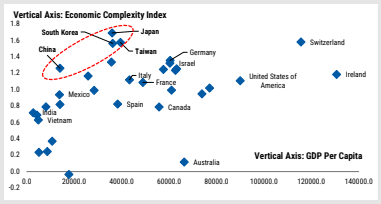
Complexity favors economies that already produce sophisticated goods at scale. China, alongside Korea, and Japan remain well positioned on this measure, as importers of low-complexity goods and exporters of high-complexity goods. Their export bases are aligned with the sectors driving current demand: electronics, machinery, semiconductors, electrical equipment, batteries, and high-end capital goods. Canada underperforms relative to income on this dimension, while Europe's challenge is maintaining competitiveness against China in sectors where it historically had strength.

Exhibit 137: China exports higher-complexity goods than it imports



Source: Growth Lab at Harvard University, United Nations, UN Comtrade, Morgan Stanley Research.

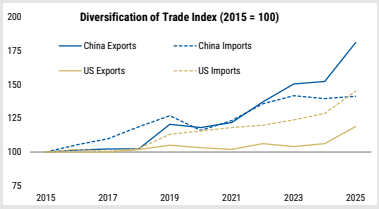
Exhibit 138: China and North Asia sit above the complexity frontier



Source: IMF, Morgan Stanley Research

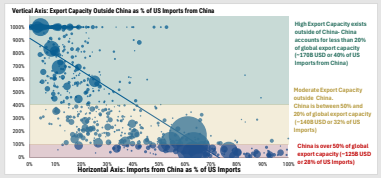
Concentration matters because the most important supply chains are not easy to relocate. Advanced semiconductors, memory, AI hardware, batteries, industrial equipment, and precision machinery are concentrated for a reason. They require specialized skills, supplier ecosystems, and large-scale capital investment. The higher the concentration and complexity of a supply chain, the slower the relocation process is likely to be.

Exhibit 139: China's trade diversification reinforces its regional manufacturing role



Source: IMF, Morgan Stanley Research

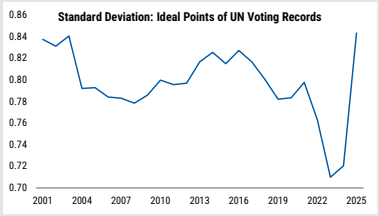
Exhibit 140: Limited non-China export capacity makes some supply chains hard to relocate



Source: Growth Lab at Harvard University, United Nations, UN Comtrade, Morgan Stanley Research.

Geopolitical distance matters because policy is increasingly shaping trade flows. Industrial policy is fragmenting supply chains by geography and by product. Tariffs, technology controls, local-content rules, and strategic-sector policies are changing the incentives around sourcing and investment. But policy can redirect trade faster than it can recreate production ecosystems. The result is a world where trade routes fragment before productive capacity relocates.

Exhibit 141: Geopolitical distance is rising across global blocs



Source: United Nations, Morgan Stanley Research.

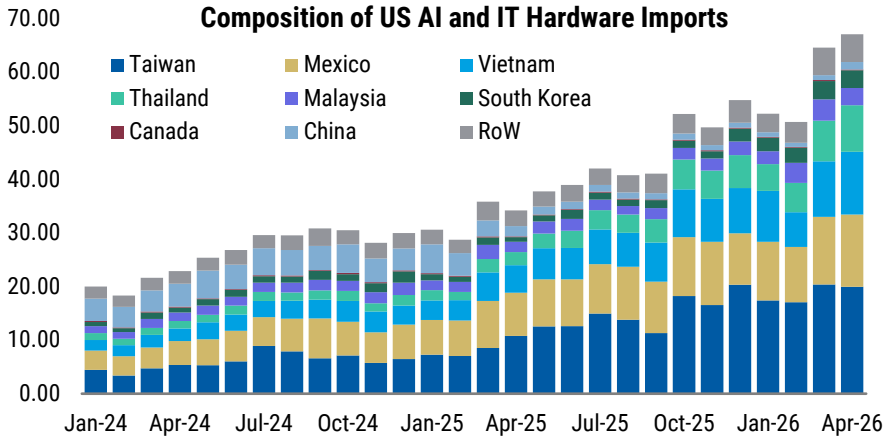
Regional Implications

China and North Asia

China and North Asia remain the core beneficiaries of the current industrial cycle, given

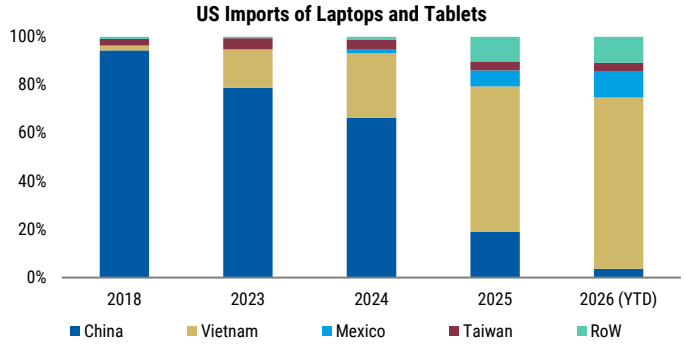
their alignment with the sectors driving trade growth: AI hardware, semiconductors, memory, electronics, electrical equipment, machinery, batteries, and clean-energy manufacturing.

Exhibit 142: US AI hardware imports are concentrated in Taiwan, Mexico, and ASEAN



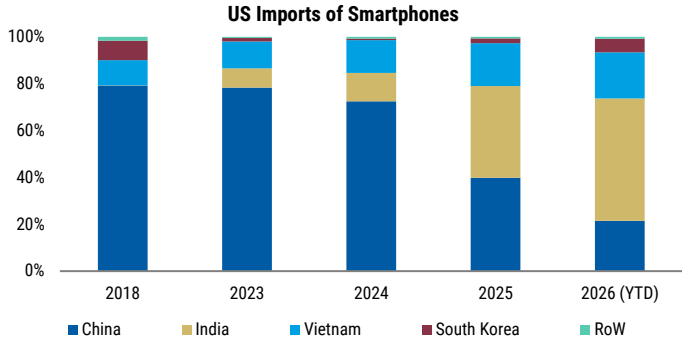
Source: USITC, Morgan Stanley Research

Exhibit 143: Vietnam has grown to become the dominant supplier of laptops and tablets to the US...



Source: USITC, Morgan Stanley Research

Exhibit 144: ...while India has gained considerable share in US imports of smartphones since 2025



Source: USITC, Morgan Stanley Research

Taiwan and Korea benefit from hard-to-replace upstream capacity. Their roles in advanced semiconductors, memory, and other AI inputs are not easily replicated elsewhere. High demand can support a self-reinforcing capex cycle in which strong profitability drives investment, investment reinforces capacity, and capacity supports export performance.

China benefits through a broader channel. Even where final assembly shifts away from China, Chinese inputs and capital goods remain embedded in regional supply chains. China also continues to gain share in higher-value manufacturing categories, including machinery, transport equipment, electrical equipment, EVs, batteries, and industrial automation. This allows China to remain central to global manufacturing even as direct US-China trade declines.

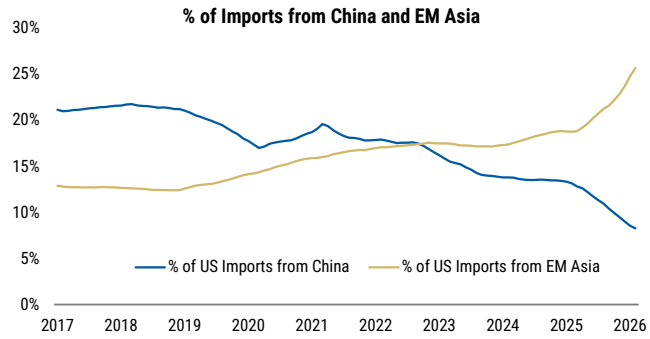
ASEAN

ASEAN is both a beneficiary of diversification and a channel through which China remains

embedded in global production. Vietnam, Thailand, Malaysia, Indonesia, and other regional economies have gained from China+1 strategies, electronics assembly, trade rerouting, and rising demand for intermediate goods.

The durability of ASEAN's gains depends on whether export-share gains translate into domestic value-added deepening. Final assembly can move faster than supplier ecosystems. A country can gain US import share while still relying heavily on China for inputs, components, machinery, and capital goods.

Exhibit 145: EM Asia has replaced China in US import share, but not necessarily in production



Source: USITC, Morgan Stanley Research

The key test for ASEAN is therefore local capex, supplier deepening, and rising domestic value added. If these follow, ASEAN becomes a more durable winner. If not, the region remains a rerouting and assembly hub within a still China-centered production ecosystem.

Mexico

Mexico is a natural beneficiary of supply-chain reorientation because of proximity to US demand, integration into North American manufacturing, and exposure to downstream assembly. It can gain from US efforts to reduce direct China exposure, particularly in autos, electronics, machinery, and selected industrial goods.

But Mexico's upside depends on policy stability. USMCA uncertainty matters because manufacturing investment decisions require long timelines. Firms need confidence in rules of origin, compliance requirements, tariff treatment, exemptions, and sector-specific policy. The agreement does not need to collapse to affect investment. Uncertainty alone can keep firms in wait-and-see mode.

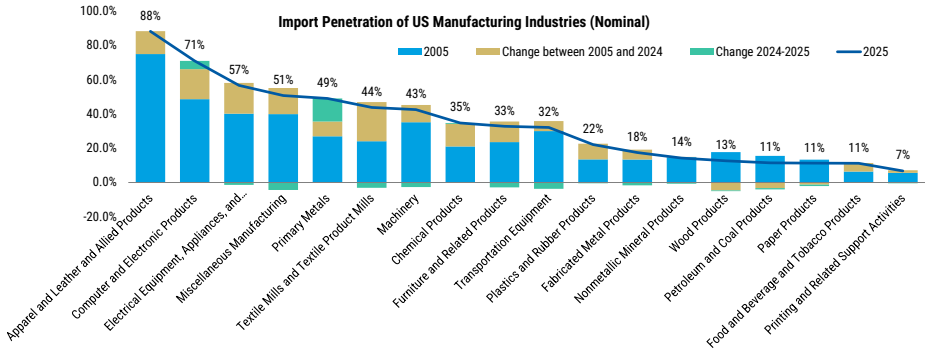
Mexico can therefore gain trade share before it gains durable productive capacity. The stronger case for Mexico requires evidence that higher exports are accompanied by capex, supplier deepening, and higher local value added.

United States

The US sits at the center of the cycle as both demand center and policy fulcrum. AI capex, data-center investment, and technology infrastructure are driving import demand, while tariffs, industrial policy, and technology controls are reshaping sourcing incentives.

However, stronger US investment does not immediately mean lower import dependence. Many of the goods required for AI infrastructure and manufacturing capacity are import-intensive. In the near term, the path toward reshoring may run through higher imports of capital goods and components.

Exhibit 146: US manufacturing import penetration remains high across key industries



Source: USITC, Morgan Stanley Research

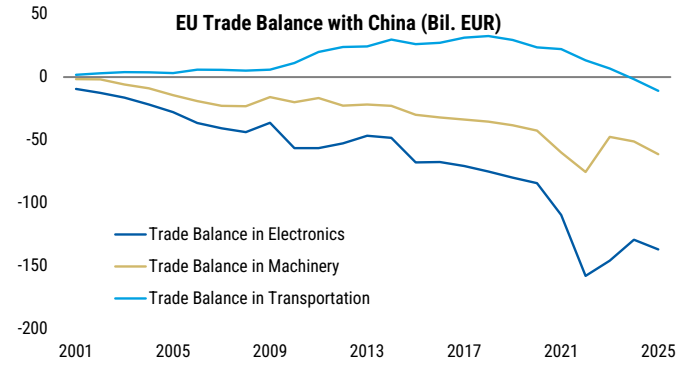
The US can build capacity in selected strategic sectors over time. But the process is likely to be narrow, technical, expensive, and long-dated. The key test is not whether imports from China fall. It is whether US domestic capital stock, manufacturing output, supplier ecosystems, and production capability rise in the sectors that matter.

Europe

Europe remains a high-complexity manufacturing region, but it faces a more difficult trade cycle. The strongest areas of global trade momentum are AI hardware, electronics, semiconductors, electrical equipment, power equipment, and selected capital goods. Europe has industrial depth, but it is less directly exposed to the AI hardware cycle than North Asia.

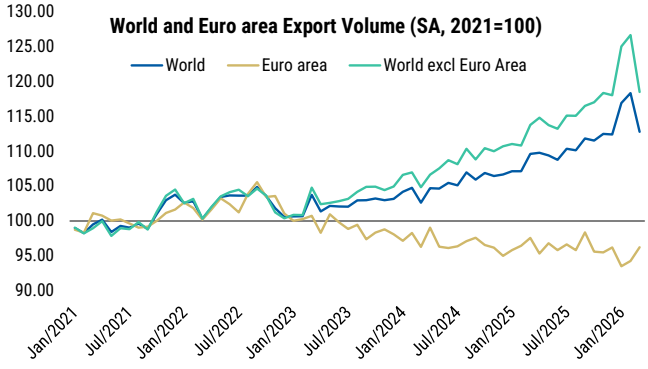
Europe also faces increasing competition from China in sectors where it historically held stronger positions, including machinery, transport equipment, electrical equipment, clean technology, and other advanced manufacturing categories. This is different from earlier phases of China's rise, when competitive pressure was concentrated in lower-value consumer goods.

Exhibit 147: Europe's deficit with China has widened in high-complexity sectors



Source: Eurostat, Morgan Stanley Research

Exhibit 148: Euro area export volumes are lagging the global trade cycle



Source: Eurostat, Morgan Stanley Research

Europe retains industrial capability, but is at risk of losing share in the current trade cycle because its export mix is less aligned with the fastest-growing sectors and because China is increasingly competitive in Europe's traditional areas of strength.

Multipolar World – US Industrials

Brandon Knutson, Toby Okwara & Christine Yao, US Industrials Multi Industry

Our Attractive view on US Industrials is underpinned by our call for an extended US capex upcycle. **We believe the entanglement of structural tech diffusion and rising protectionism will drive higher capital intensity into the US** (AI, Reshoring, Electrification). When combined with improved ROI on efficiency upgrades post inflation reset, **we see stronger and more secular demand for capital equipment and think the benefits primarily accrue into the US market** (Capex Bifurcation). Given the above, we favor US Capex exposure above all else vs. more concern on the International side – **if the US is taking share, someone else is losing** (Tale of Two Hemispheres). The objective of Trump 2.0 policy and ongoing trade negotiations is to drive a "strategic rebalance" of the country's US$1.2T trade deficit – this can only be accomplished by companies serving the US market via domestic production (both US and Foreign corps) *or* increased US exports to its key trade partners – **both options require a higher rate of domestic production and investment, and this is where the opportunity lies.** Within short-cycle, we see 1H'26 bifurcation between those tied to fixed investment vs. those tied to consumer spend. **The beneficiaries of the Western migration are not the ones selling the products but instead the ones constructing and serving the facilities, and that is US Industrials** – a group that has not seen market growth in decades but now sits atop the US policy agenda.

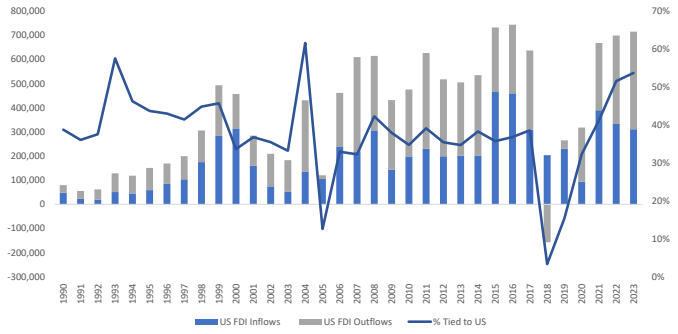
Times Are Changing

Over the last 45 years, manufacturing capex dollars have chased low cost labor – a motivation that has made it difficult for US to compete vs. low cost producing nations, but we believe this is changing. With structural Tech diffusion taking hold at an accelerated rate and companies focused on building resiliency following a period of unprecedented disruption, **we believe that capital and proximity to end user will increasingly dictate the regional allocation of capex – parameters to which the US has no equal**. As detailed below, the US touches 55% of global investment (25% inward, 30% outward), top amongst any nation. In addition, the US accounts for ~30% of Global consumption, top amongst any nation (equal to the EU plus China). The US remains a significant outlier as the only country / region that does not produce the goods it consumes (US accounts for 30% of global consumption vs. just 16% of production). Should Humanoids allow US manufacturing (Mfg) costs to achieve parity with low cost foreign producing nations, we see scope for production to move more in line with consumption, as is the case across ROW. With structural tech diffusion narrowing the global Mfg cost profile and benefiting those with access to capital (US), it is unclear why the US should remain such an outlier.

The same Tech/AI diffusion that is reshaping software productivity is now beginning to move into the physical economy. As one example, Project Prometheus (link), the Jeff Bezos-backed AI platform focused on engineering and manufacturing applications, supports our view that AI is increasingly being directed toward complex physical production, not just digital workflows. While still early, we believe the strategic implication is significant: **AI-enabled engineering, simulation, process design and factory optimization can compress the design-build-test cycle for complex manufactured**

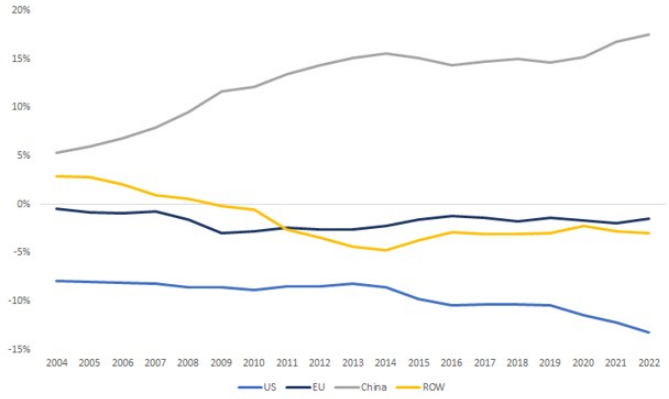
products and reduce the historical labor-cost disadvantage of producing in the US. In our view, AI can accelerate the transition from a manufacturing model defined by labor arbitrage to one increasingly defined by capital access, automation intensity, proximity to end-market, energy availability, IP protection and supply-chain resiliency – all areas where the US is structurally advantaged.

Exhibit 149: US, the global investment epicenter - US FDI Inflows + Outflows account for ~55% of Global FDI, highlighting domestic investment capacity & access to capital ($mil)



Source: UNCTAD, Morgan Stanley Research

Exhibit 150: Share of Global Mfg LESS Share of Global Consumption: The US is an outlier as the only country / region that does not produce the goods it consumes (16% production share vs 30% consumption)

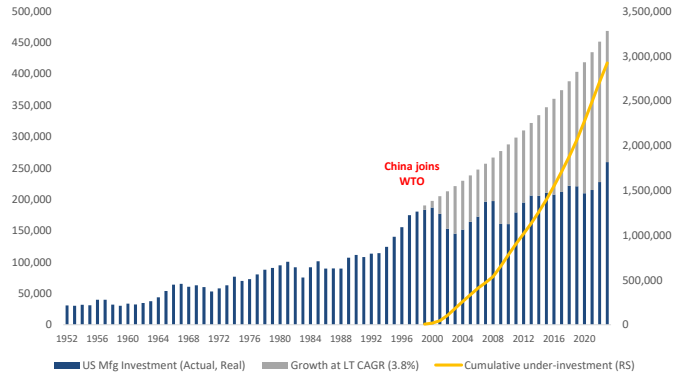


Source: Morgan Stanley Research, World Bank

We are not trying to say that we will see a mass wave of shuttered Asian facilities reopened in the US, but rather trying to determine where incremental investment will flow, and we see the scales tilting toward the US. **As the global economy grows and new technologies take hold, the world will always be adding Mfg facilities, and our aim is to determine in what geography the capacity lands**. A higher level of production requires a larger fixed asset base to support production, a driver of incremental capex. In general, the forward capex to production opportunity tracks at a roughly 1:1 relationship so if production goes higher, so will the capex / fixed assets needed to support. The forward opportunity is compounded by the simple fact that the US Mfg Economy has been under-invested over the last 25 years, compounding the level of spend needed to support ongoing US Reshoring momentum. Prior to China joining the WTO, US Mfg Investment grew at a 3.8% CAGR in real terms but growth slowed to just 0.7% CAGR over the following 25 years. **Assuming the 3.8% long-term CAGR was sustained (reasonable in the context of 4% Global Mfg growth), it would suggest the cumulative under-investment in the US Industrial economy has totaled ~US$3T since 2000.**

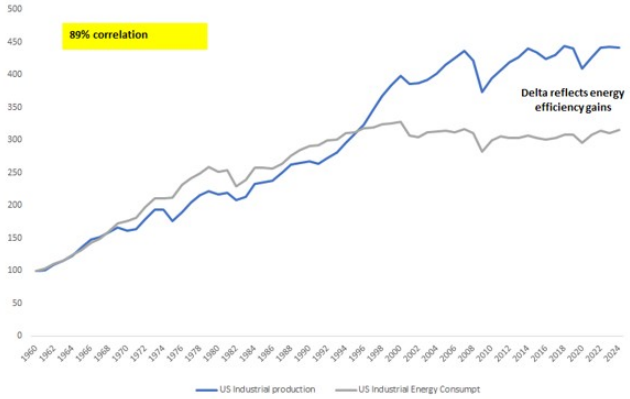
While the market is highly focused on Data Centers at ~4% of US electricity demand, **we do not think enough attention is being paid to the manufacturing economy which accounts for ~26% of domestic electricity consumption**. US Mfg electricity consumption has declined over the last 25 years as outsourcing took hold and domestic production stagnated. We believe this is beginning to change - US Mfg capacity is realizing material YoY growth for the first time in more than a decade, which will facilitate higher production rates and in turn electricity consumption as the new facilities ramp up operations (link). **Our math suggests US Reshoring can add ~200 bps of incremental growth to US Mfg production over the next two decades.**

Exhibit 151: MS math suggests the US Industrial Economy has been under-invested in by US$3T since China joined the WTO in 2000 (US$mil)



Source: UNCATD, Morgan Stanley Research.

Exhibit 152: US Industrial Production (IP) is the top driver of Industrial Electricity consumption (26% total US), and we see return to LSD growth following 25yrs of stagnation

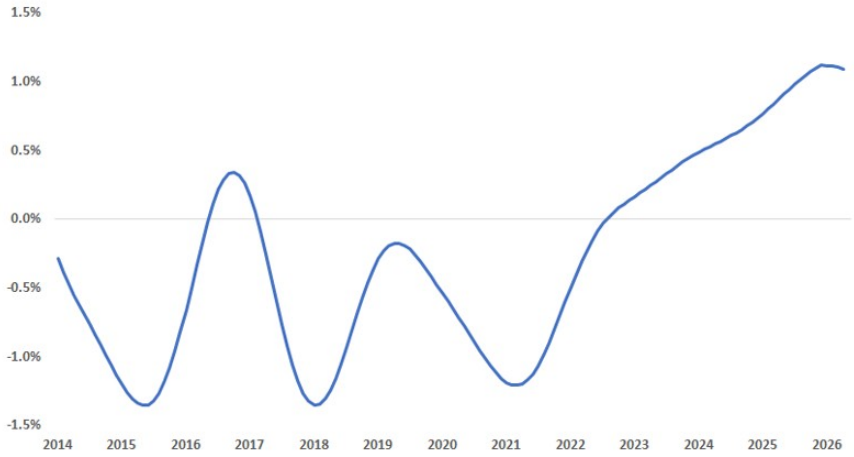


Source: Morgan Stanley Research, US Census Bureau

US Manufacturing Capacity Back on Growth, Production Will Follow

The nature of our US Reshoring incomings suggest the thematic is really just a function of policy driven headlines rather than actual impact on the ground - **we very much disagree and want to provide some concrete proof (pun intended)**. US Industrial production capacity has shown material growth for the first time in two decades as companies reshore production in response to global instability / Covid supply chain risk, US tariffs, and Structural Tech diffusion. We believe activity should continue to build over time – **Reshoring momentum begets more momentum as supply chains are established and this infrastructure can be shared / leveraged**, all in-line with our $10T US Reshoring thesis (Deep Dive). **If companies are expanding capacity in the US, higher production will follow – even if end demand disappoints**. The relocation of output into the US market in response to Trump 2.0 tariffs is the top reason we turned more constructive on the US production economy in our 2026 outlook (Layering in Cyclical Torque) – **a call that has only strengthened in 1H'26 on volatile geopolitics** which both raises the cost of International production and drives concern on supply chain reliability (More Durable Than Feared).

Exhibit 153: US Manufacturing Production Capacity (ex Utility) YoY %: Showing material growth for the first time in two decades as Companies reshore production in response to: Global instability / Covid supply chain risk, US tariffs, Structural Tech diffusion



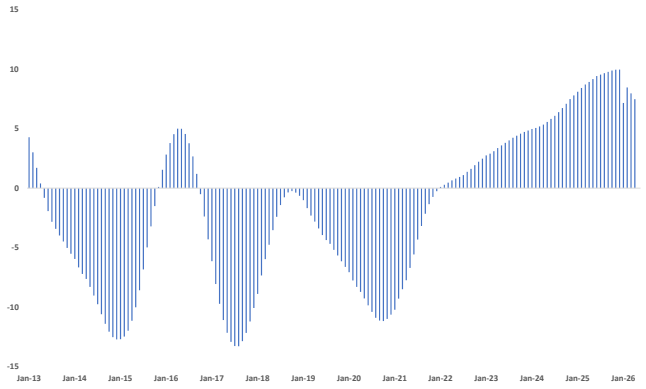
Source: Morgan Stanley Research, Company Reports

The common thread across industries adding capacity is that they fall into two buckets: **1) those with a clearly positive demand outlook** (Semis and Communication Equip, Electrical Equip), and **2) those where the US retains a structural cost advantage versus ROW** (Chemicals and Petroleum/Coal). Capacity declines are centered on Consumer facing verticals, which tells us that not all verticals react to changing supply chain costs. We have long thought that **the best US Reshoring verticals are simply industries that need to add capacity** - our call is not that we are going to see a mass wave of shuttered Asian facilities reopened in the US but rather the US is better positioned to land the incremental factory relative to any period over the last 45 years due to a flywheel of structural tech diffusion and rising protectionism (Game of Increments and Prize of Trillions). **As the global economy grows and new technologies take hold, the world will always be adding Mfg facilities and we think the scales are tiling westward.** A growing pushback to our US Reshoring thesis in recent months is that the capacity adds are simply an extension of the Data Center trade (Semiconductor, Utility, Computer Equip, Electrical Equip) – while this is true, it speaks to the point that capacity follows demand. **And what matters for the US Reshoring thematic is that these capacity adds are now coming to the US market, a marked difference vs. 5-10 years ago.** Note, Electrical Equipment capacity is currently tracking +4% yoy but saw 20%+ declines over the prior two decades after China joined the WTO. **That reversal is US Reshoring.**

The reason US producers have been able to quickly ramp up is because the initial wave of spend has been focused on efficiency and productivity investment (i.e., Automation), and smaller projects with quicker payoffs relative to large capacity expansion (link). **But what is most important is that the incremental unit of production is beginning to shift to the US market in response to changing supply-chain costs (i.e., tariffs) and this is the leading indicator for where larger capacity projects will land when it is ultimately needed**. The Attractive view on US Industrials and the "GDP +3" thesis detailed in our Sept 2024 launch (link) is underpinned by our call for an extended US capex upcycle. **US Reshoring is always viewed through a capex lens but once these facilities are completed, production will ramp higher – a tailwind for US IP that is not dependant on**

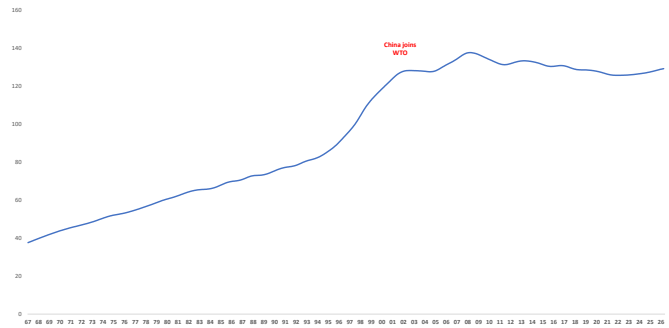
demand. If a company builds a new factory, it will be utilized. Best positioned to benefit are companies that sell maintenance, repair, and operations (MRO) into these facilities. US Mfg TAM expansion also brings under-appreciated and long-term tailwinds for US Power demand – manufacturing accounts for 26% of US electricity consumption (vs. MSD for Data Centers) and carries a ~90% correlation to manufacturing output which will follow capacity higher (link).

Exhibit 154: US Manufacturing Capacity Month on Month change (bps) – Showing material growth for the first time in ~15yrs and driving TAM expansion for US Industrials that serve these facilities



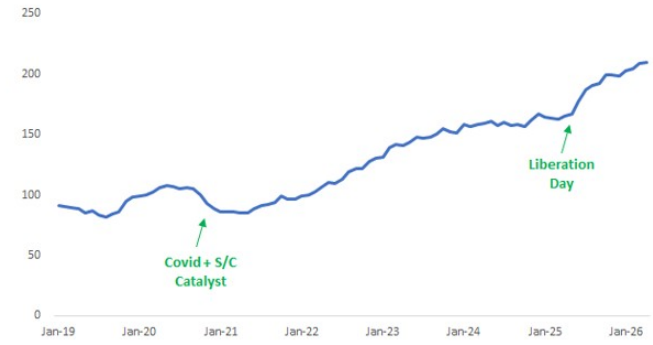
Source: Morgan Stanley Research, US Census Bureau

Exhibit 155: Total US Manufacturing capacity (Indexed) – realizing material growth for the first time in over a decade



Source: Morgan Stanley Research, US Census Bureau

Exhibit 156: US Manufacturing Construction Starts, avg. monthly announcements: The # of US Mfg projects started has inflected higher post 'Liberation Day' – while the avg. size is below what was observed during the 2021-23 Mega Project boom, we take confidence in the breadth



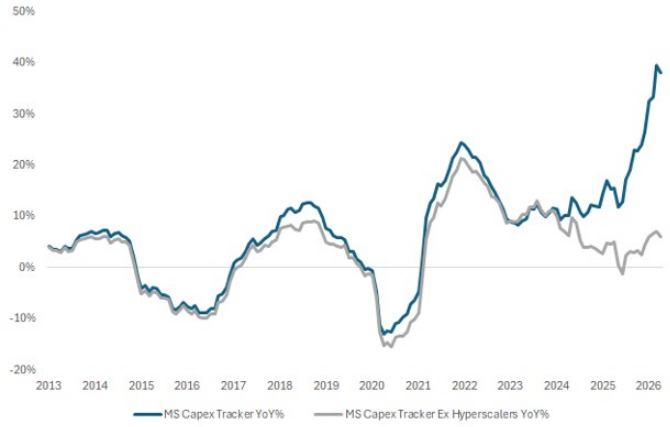
Source: Morgan Stanley Research, Dodge Analytics

Exhibit 157: Which US Manufacturing verticals are adding capacity? Chart below tracks July 2026 YoY change, along with longer-term movement vs. key events that we believe have shaped the timeline

	July 2026 Y/Y %	% ch vs 2020 (Covid Catalyst)	% chg vs 2002(China Joins WTO)
Apparel	-3.0%	-13.8%	-79.1%
Printing	-1.1%	-12.5%	-42.6%
Paper	-1.0%	-7.7%	-29.7%
Rubber / Plastics	-1.0%	6.1%	-7.4%
Nonmetallic Mineral	-0.9%	-10.7%	-22.6%
Textile Mill	-0.7%	-22.0%	-61.4%
Furniture & Related	-0.6%	1.3%	-40.6%
Mining	-0.3%	-10.9%	52.1%
Crude Processing	-0.3%	-8.8%	34.7%
Fab Metals	-0.2%	0.1%	-10.7%
Machinery	0.1%	-7.3%	-16.9%
Transport Equip	0.6%	8.7%	37.6%
Wood Products	0.7%	13.2%	-8.8%
Primary Metals	1.0%	7.8%	9.6%
Manufacturing (SIC)	1.0%	1.8%	1.1%
Food & Bev	1.1%	-2.5%	3.6%
Durable	1.1%	3.5%	20.6%
Total Industry	1.2%	2.7%	12.6%
Non-Durable	1.2%	1.8%	-9.7%
Finished Processing	1.4%	4.3%	6.6%
Primary & Semi-Finished	1.5%	4.7%	7.9%
Petroleum / Coal	1.8%	-7.8%	5.4%
Elec Equip, Appliance & Components	1.9%	-8.5%	-23.6%
Chemicals	2.8%	12.9%	-2.4%
Utilities	3.4%	17.9%	49.0%
Computers & Peripheral Equip	4.9%	18.5%	247.8%
Comms Equip	15.1%	93.1%	280.2%
Semis & Other Electronic Component	17.0%	79.7%	1622.2%

Source: Morgan Stanley Research, US Census Bureau

Exhibit 158: MS Capex Tracker: US NTM Capex plans have further accelerated post April and is now tracking +38% YoY While Data Center continues to lead, the strength has broadened in 2026 – supportive of our call for an extended US capex upcycle



Source: Morgan Stanley Research, FactSet, Company reports

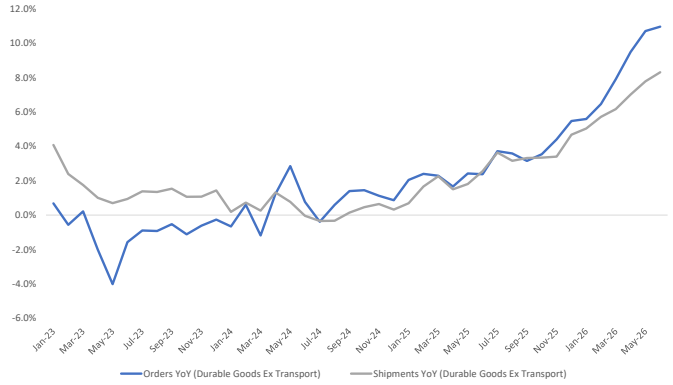
Exhibit 159: US Cap Goods NTM Capex Plans (YoY %): Encouraged by the "V-shaped" recovery after capex plans freezed up a year ago on tariff uncertainty. We take the pickup in capacity plans despite still sluggish end demand as evidence of US Reshoring intentions



Source: Morgan Stanley, FactSet, Company reports

US Manufacturing orders have accelerated sharply in 2026, building on 2H'25 momentum and driven by changes in US tariff policy, pushing incremental production plus investment into the domestic market (Exhibit 160) – in line with our 2026 outlook which turned constructive on US short cycle (Layering in Cyclical Torque) and our "More Durable Than Feared" call in mid-March amidst trough sentiment on US-Iran conflict (link). **The momentum sets the stage for a return to decade high industrial growth in 2H'26 – 2027 as the pickup in product levels layers on top of sustained capex strength** (link). Amongst all the US Industrial verticals, seeing sustained momentum in US Industrial Machinery orders is most constructive as this suggests companies are expanding US production capacity in response to tariffs, which has changed the global supply chain cost calculation – **this is positive for all US manufacturing verticals because higher production will follow these investments in capacity.**

Exhibit 160: Durable Goods (ex Transportation) Orders vs. Shipments



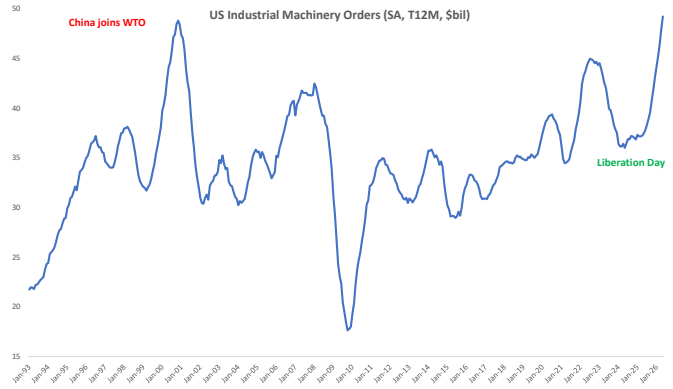
Source: Morgan Stanley Research, US Census Bureau

Exhibit 161: US Manufacturing Production (Real) vs. US Consumer Spend – After decades of lagging by ~400 bps per annum, US Mfg production is now growing in line with Consumer spend. This tells us the momentum is driven by production relocation rather than higher and demand. That is US Reshoring.



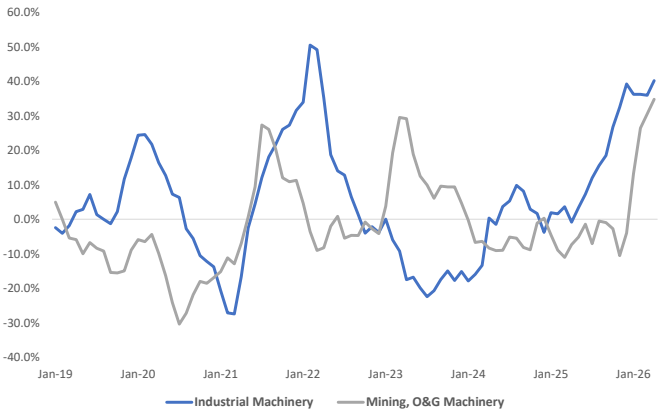
Source: US Census Bureau., Morgan Stanley Research

Exhibit 162: US Industrial Machinery Orders (Monthly, $bil , 3mo avg): After decades of declines following China WTO inclusion, US Industrial Machinery orders have begun to make new highs after Liberation Day 2025



Source: US Census Bureau, Morgan Stanley Research

Exhibit 163: While Industrial Machinery orders inflected shortly after April 2025 Liberation Day, we are now seeing Process Machinery (O&G + Mining) inflect into 2026 - importantly, this ramp up came ahead of the US-Iran conflict which could add further tailwinds in the coming months



Source: US Census Bureau, Morgan Stanley Research

Multipolar World – Europe Industrials

Max Yates, European Capital Goods

European Capital Goods companies typically are global companies, so we would expect their sales and share prices to broadly benefit from rising global manufacturing investment. Typically, regional revenue exposure tends to be 40% EMEA, 30% North America and 30% Emerging markets (15% China). China taking an increasing share of global manufacturing is both an opportunity (for some) and a risk (for others).

We think the key potential beneficiaries from rising China investment are: 1) Atlas Copco (OW), 2) Spirax (OW), and 3) Siemens (EW).

European companies are also moving quickly in the area of Physical AI within manufacturing, with key examples being Siemens' through its Digital Industries division and software, and Kion through its automated forklifts and warehouse automation segment. Atlas' industrial products (e.g., Compressors and Industrial metrology), and Spirax steam and heating systems, are also important products in improving manufacturers' efficiency. On the other hand, we continue to see ongoing risk on margin pressure from China competition for companies like Signify (UW).

If we just talk about European manufacturing spend (Industrial production and Capex), Europe's industrial base faces structural challenges, which are heightened in a multipolar world. However, this spending on industrial manufacturing is flowing into North America and to a lesser extent China, where many of our companies still have very strong #1 or #2 market positions in product areas like Industrial compressors or Factory Automation hardware.

Europe's reliance on foreign energy supply, manufacturing and defence has led to higher energy costs and years of de-industrialisation, which have created a competitiveness gap vs. the rest of the world. Multipolar world dynamics (such as Russian and Middle East conflicts, US tariffs and China's critical raw material bans, etc.) further hinder Europe's ability to cope with this gap, especially in the absence of a coordinated Industrial Policy. The European automotive sector's loss in market shares to Chinese players is a case study for how US tariffs and China's shift to higher-value chain products can combined affect European industries in the absence of anti-competition policy.

There are both threats and opportunities for European players in the context of Chinese and US industrial ambitions driving a decade-long capex upcycle. We see higher competition risks in less differentiated European sectors (such as lighting, forklifts, and wind turbines), while high-value software/equipment companies with existing market share in the US and Chinese markets are set to benefit. Automation players and Industrial AI enablers like Siemens stands out if industrial AI becomes embedded in factory automation, EDA and digital-twin workflows. Similarly, European players with large revenue exposure to these regions and localized production, will benefit from the second derivative effects of increased spending on industrial projects.

We are also starting to see some nascent AI adoption from European manufacturers with BMW piloting Humanoids and Kion's AI enabled warehouse automation at customer QXO. While these roll-outs of physical AI may be lagging some of the developments in

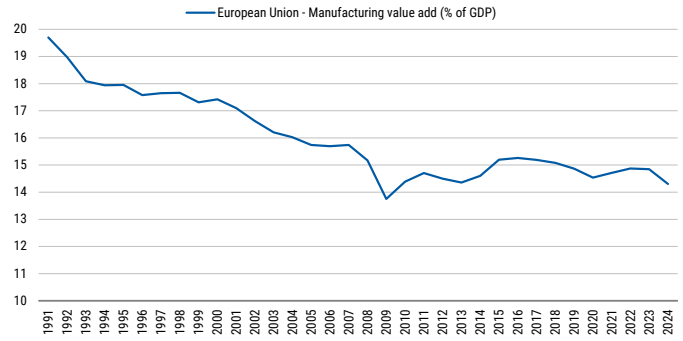
China, we still see adoption taking place. In addition, Siemens as the world's largest discrete automation company, remains well positioned to play a central role in physical AI. **Furthermore, Siemens is developing an Industrial Foundation Model** (IFM) trained on large-scale industrial and engineering data from Siemens and their customers, to enable AI applications across design, manufacturing, and operations. The model is designed to understand industrial context, including 3D models, technical specifications, and production data, delivering domain-specific insights and automation.

EU Industrial Production Trending Sideways

European manufacturing value added as a share of GDP has declined from roughly 19-20% in the early 1990s to c.15% in 2024 (Exhibit 164), and Europe's manufacturing value-add growth has lagged the US and the rest of the world over the past five years (Exhibit 103). This is in large part driven by Europe's focus on high-value service industries and its outsourcing of cheap manufacturing to lower labour cost countries like China.

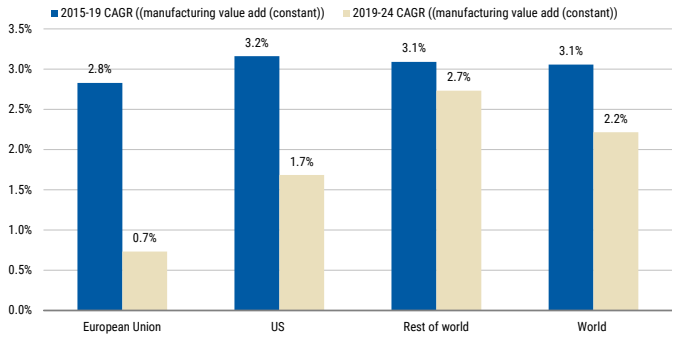
EU Industrial Production has also failed to regain sustained momentum after the 2-year industrial recession following the outbreak of the Russia-Ukraine conflict in 2022. Exhibit 3 shows that although we saw improvements in EU IP in 2025 (from a low base and some pre-buying ahead of US tariffs), European Industrial lead indicators remain mixed in 2026 and will likely continue to move sideways. For example, in Germany industrial production remains well below pre-Covid levels, and in June was flat MoM and YoY. However, in terms of the manufacturing PMIs in July , there was an interesting regional step-up in Germany (52.2), while the French manufacturing PMI continued to hover below 50. In aggregate, we think European industrial demand continues to move broadly sideways, however, this does not mean we see a clear demand deterioration.

Exhibit 164: European Manufacturing Value added as a % of GDP has declined steadily form 20% in the 90s to 14% in 2024



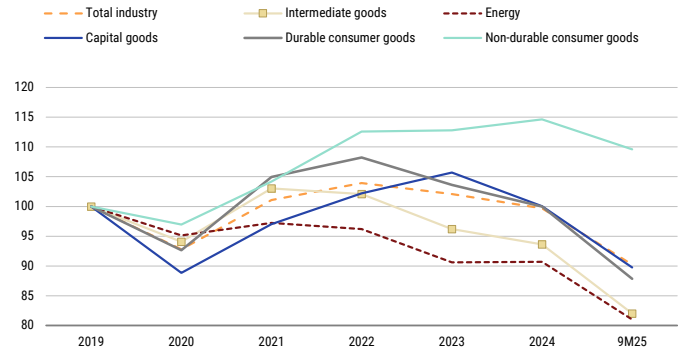
Source: IMF, Morgan Stanley Research

Exhibit 165: Manufacturing Value Add by Region. Europe has lagged in the past decade, especially in the past 5 years



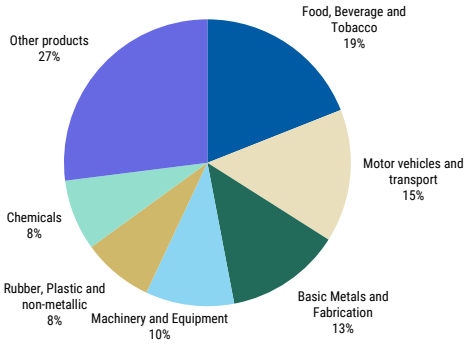
Source: World Development Indicators, Morgan Stanley Research

Exhibit 166: Indexed European Industrial Production for total industry and industry groupings (2021=100). All subsectors are down vs. 2019 except for non-durable consumer goods



Source: Eurostat, Morgan Stanley Research

Exhibit 167: Share of European Industrial Production by Industry in 2024. Europe's machinery and equipment is only 10% of IP



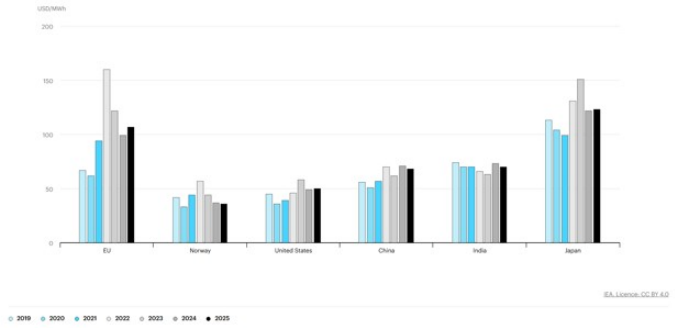
Source: Eurostat, Morgan Stanley Research

Europe faces Structural Challenges

Europe's competitiveness gap stems from a multitude of factors analyzed in depth in the 2024 Draghi Report (link). The main ones include higher energy costs (and associated physical infrastructure and permitting constraints), as well as higher and non-homogenous taxes and overall regulatory burdens that stymie innovation, growth and competitiveness.

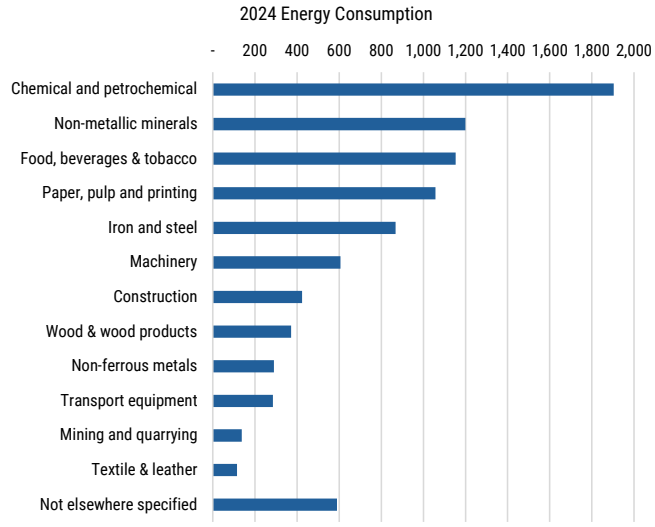
For example, Europe's manufacturing base has been hindered by elevated energy costs in comparison to their US and Chinese peers. In 2024 industrial electricity prices in the EU reached €0.199 per kWh, compared to €0.082 in China and €0.075 in the US. **This has been amplified since the Russia-Ukraine conflict, exposing Europe's, and in particular Germany's, reliance on cheap Russian gas which subsequently had to be re-routed, predominantly to the US** (42% of EU gas imports arrived as LNG in 2023, up from 20% in 2021). European industries have had to pay **higher spot prices** due to liquefaction and transport costs; moreover, energy prices have been further compounded by an under-invested energy grid. The effects have therefore been tied to the energy intensity of the business with chemicals and paper & packaging businesses suffering far more than Capital Goods, as shown in Exhibit 169 .

Exhibit 168: Estimated final electricity price for large industrial customers in energy-intensive industries, 2019-2025. In 2025, EU prices were double US and 40% higher than China.



Source: IEA, Morgan Stanley Research

Exhibit 169: Total final energy consumption by industrial sector, EU, 2024 (PJ).

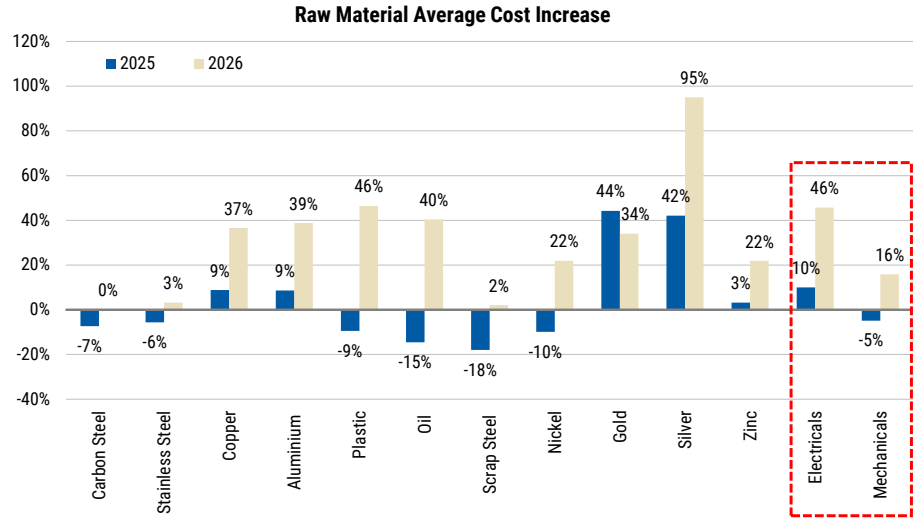


Source: Source: Eurostat, Morgan Stanley Research

The Middle East crisis added additional inflationary pressures on raw material prices for European industrial companies. Key inflationary elements are Copper, Plastic and Silver. This has an outsized impact on European Electrical equipment company's direct raw materials purchasing. Although we see this as a temporary effect, these episodes evidence Europe's reliance and risks in the context of the new multipolar world order.

European policymakers recognize these threats, but a strategic and coordinated Industrial policy is unlikely. Recent European Commission acts like the Net-Zero Industry Act, the European Chips Act, the Critical Raw Materials Act and trade defence measures such as tariffs on Chinese EV imports, alongside proposals to prioritize European suppliers in strategic sectors and accelerate investment in AI, clean technology and digital infrastructure are evidence that European policy makers are aware of the structural risks to Europe. However, fragmented fiscal capacity, slower investment cycles and regulatory complexity continue to limit Europe's ability to match the scale and speed of China's industrial strategy as well as the US's innovation cycles.

Exhibit170: Raw materials inflation in 2026 (assuming 2026 remains at spot). Key inflationary elements are Copper, Plastic and Silver driven by the Middle East Crisis. This has an outsized impact on European Electrical equipment company's direct raw materials purchasing. Mechanicals raw materials exposure is more driven by steel, and as a result the raw material pressure are relatively lower. Direct raw materials for Cap Goods companies are typically 5-10% of group revenues.



Source: Datastream, Morgan Stanley Research

This competitiveness gap has been felt across the European Industrial majors. Especially capital intensive sectors have been forced into significant job cuts with Siemens, Thyssenkrupp, BMW committing to reducing head count by 8%, 12% and 5% respectively (see Exhibit 13). Siemens highlighted the "muted demand primarily in the key markets of China and Germany coupled with increased competitive pressures have considerably reduced orders and revenue in the industrial automation business". Furthermore, Thyssenkrupp argued that the layoffs were needed to "become more competitive and secure as many jobs as possible for the future".

Exhibit 171: Recent Restructuring Plans among European Industrial players. Thyssenkrupp argued that the layoffs were needed to "become more competitive and secure as many jobs as possible for the future".

Company	Restructuring Plan	Total Workforce	% total	Date completed
BASF	"20% total fixed costs in its core business"			FY29
Siemens	5,600	68,000	8%	FY27
Thyssenkrupp	11,000	95,560	12%	FY30
BMW	7,700	155,000	5%	FY26
VW Group(1)	50,000	684,000	7%	FY30

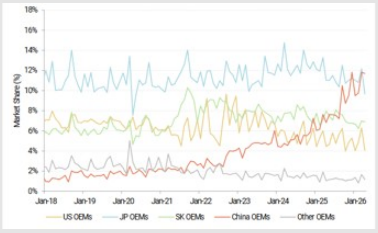
Source: Company Data, Morgan Stanley Research

Note: (1) 100,000 job cuts rumored but not officially confirmed

Automotive Sector: Case Study for European OEM Companies losing market share to Chinese players: The European auto OEMs have been gradually losing market share, declining in the EU5 from 72% in 2020 to 67% in 2025 and projected to fall to 62% by 2027. In particular, this intensified competition has been

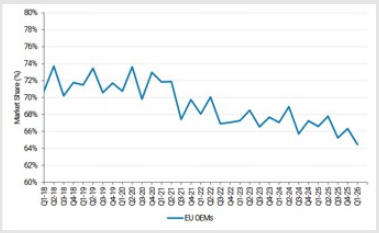
concentrated in Sports Utility Vehicle (SUVs), Battery Electric Vehicle (BEVs), Plug-in Hybrid Vehicle (PHEVs) and entry level vehicles where Chinese OEMs have particular advantages when it comes to lithium-ion batteries and scale economics.

Exhibit 172: Global OEMs' market share in Europe (EU5) has been relatively constant, except for Chinese OEMs



Source: Local Auto Associations, Morgan Stanley Research. Notes: 1) This chart includes Germany, UK, France, Italy and Spain auto sales. 2) This chart includes as US OEMs GM, Ford, Tesla; JP OEMs: Toyota, Nissan, Honda, Suzuki, Subaru, Mitsubishi, Mazda; SK OEMs: Hyundai, Kia, KGM, China OEMs: Leapmotor, Changan, Chery, Geely, Volvo, BYD, Dongfeng, GWM, SAIC, NIO, Xpeng, SWM, DR; Other OEMs: JLR, Togg, Mahindra, Tata and Others

Exhibit 173: European OEMs have continued to see market share decline in the region as a result

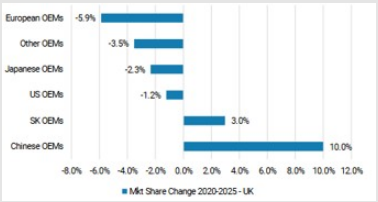


Source: Local Auto Associations, Morgan Stanley Research. Notes:1) This chart includes Germany, UK, France, Italy and Spain auto sales. 2.) This chart includes as EU OEMs: Stellantis, VW, Renault, MBG, BMW, Porsche, Iveco, Lada and Ferrari

This has not been universal with Chinese OEMs gaining the most market share in the UK, Spain and Norway where Chinese OEM market share has risen by 7-10%pp since 2020, whereas in Germany and France, OEM market share has remained stable as Exhibits 11 and 12 show below. This has been driven by both the strength of the legacy OEM in the home market (in the case of the UK there is no national champion so easier for Chinese OEMs to penetrate) and governmental policy with regards to emission taxes and subsidies.

Companies that have maintained and even grown market share have had strong brands and premium categorisation whereby they compete less with the entry level models that Chinese OEMs look to compete against. This has resulted in OEMs like Volkswagen maintaining market share whereas Stellantis stands out as the clear underperformer, with market share falling from 22% to 16%, representing the largest decline among major European OEMs.

Exhibit 174: UK Market Share Change 2020-25 – EU OEMs lost most market share whilst Chinese OEMs gained



Source: SMMT, Morgan Stanley Research

Exhibit 175: Germany: European OEM market share stability



Source: KBA, Morgan Stanley Research, Note: this chart includes as EU OEMs: Stellantis, VW, Renault, MBG, BMW, Porsche, Iveco, Lada, Ferrari, US OEMs: GM, Ford, Tesla; JP OEMs: Toyota, Nissan, Honda, Suzuki, Subaru, Mitsubishi, Mazda; SK OEMs: Hyundai, Kia, KGM, China OEMs: Leapmotor, Changan, Chery, Geely, Volvo, BYD, Dongfeng, GWM, SAIC, NIO, Xpeng; Other OEMs: JLR, Togg, and Others

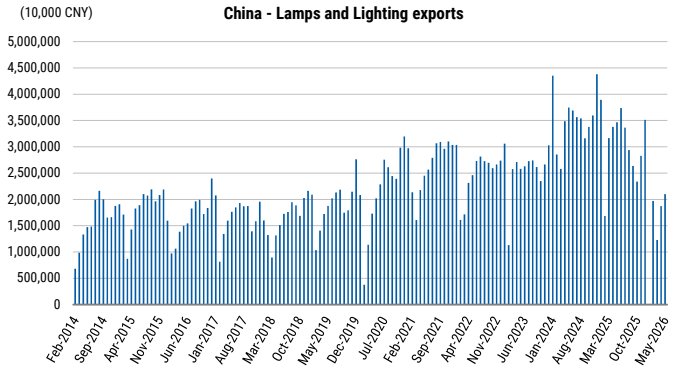
China and US Capex Upcycles create Risks but also Opportunities for Europe

In the context of Europe's structural challenges, China's Industry 5.0 creates clear competition risks. We are already seeing an increase in Chinese industrial equipment players gaining market share in Europe, especially in low differentiation products (such as lighting and forklifts).

However, Chinese companies have also clearly stated their mid-term ambition to gain market share in Europe in automation, robotics and construction equipment, areas that lack a European competition policy. For example, Industrial Automation companies are expanding capacity in Europe with management targeting 30% of their revenue coming from overseas in the mid-long term (vs. 6% currently). Similarly, Robotics players like Estun are focusing on expansion into Europe, through lower pricing (c.20% lower than European peers). Management expects robot exports into Europe to be 1k in H126, expected to grow to 10k in 2030. In addition to this, a number of Chinese Construction machinery makers have expressed their continued ambition to grow overseas market share. For example, Sany (covered by Sheng Zhong) expects 2026 overseas revenue to grow 15-20% (vs. 2025 ~15%).

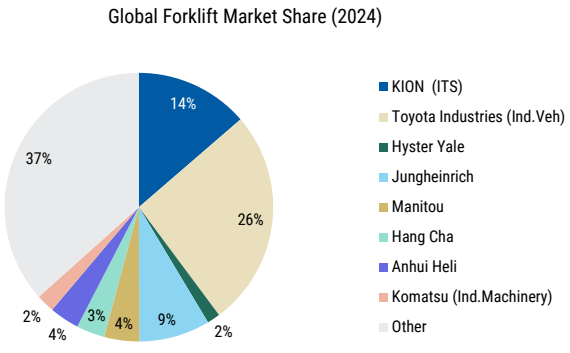
An increase in local demand driven by a Chinese capex upcycle could marginally slow down this process. However, this could be balanced out by US tariffs re-routing Chinese import flows into Europe. The indirect effect of this for the European Cap Goods sector is more Chinese products being imported into Europe, and some companies (e.g., Signify) are already highlighting increased competition in domestic European markets. **Overall, we think that it is more likely that in weaker product categories (like lighting, construction and forklifts) Chinese players will continue to target overseas markets which are higher margin regions for them.**

Exhibit 176: China lighting exports more than doubled in the last 10 years – lots of growth came after the start of China's housing down cycle in 2019 to digest the LED capacity. Although exports have come down in 2026, we see the structural trend continuing



Source: China Custom data., Morgan Stanley Research

Exhibit 177: Global forklift trucks market share: Main Chinese players Hangcha and Heli command 4%/3% respectively, but Heli's overseas revenue grew at 36% CAGR from 2020-2025, and accounted for 44% of total 2025 revenue



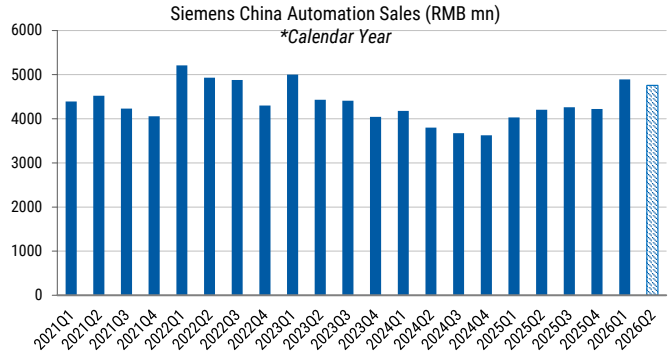
Source: Company Data, Morgan Stanley Research

By contrast, Europe remains better positioned in high-differentiation areas such as advanced automation, software, EDA, electrification and complex industrial systems, and we see selected capital goods companies set to benefit from China's capex cycle and US reshoring.

Here, Siemens stands out as a potential winner in the context of a surge in Chinese manufacturing capex. Chinese automation sales data shows that Siemens has largely maintained its pre-pandemic market position locally, despite Chinese automation vendors making large gains at the expense of Japanese firms. **However, this remains a key debate;** as domestic competitors continue to move up the value chain and target higher-end segments, we expect Siemens to face intensifying competition. Competition will not only focus on pricing but increasingly on technology and product capability.

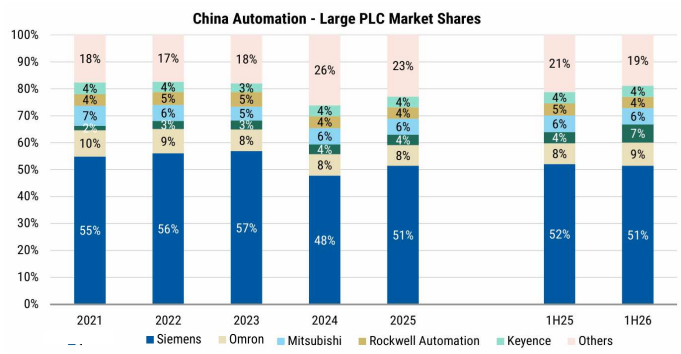
In 1Q26, Siemens lost 1% of market share in small PLC in China, but their large PLC market share was stable YOY at a high level of 52%. Siemens actually gained two points of market share in Servo this quarter (now 9%), but they remain relatively small in servo.

Exhibit 178: Siemens' automation sales in China (based on MIR data) +13% YoY. If we look at Siemens' combined China Automation sales in calendar 2Q26 (fiscal 3Q) they are -3% QoQ but that takes into account a high comp given the acceleration in the year suggesting activity remains resilient



Source: Company Data, Morgan Stanley Research

Exhibit 179: Large PLC: Siemens maintained 51% market share but lower vs. pre-Covid.



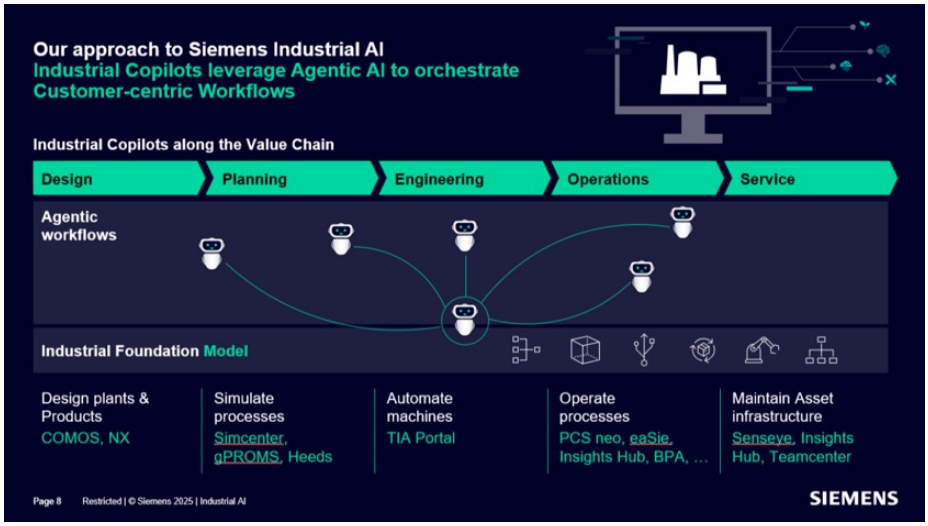
Source: MIR Data, Morgan Stanley Research, *= Chinese/Taiwanese Brands

Other clear winners from China intelligent manufacturing capex will be the enablers of Industrial AI. In Europe, Siemens offers the first example of integrated Agentic AI solutions within its Industrial Copilot and EDA software solutions. Siemens recently (LINK) integrated Industrial AI agents in the Siemens Industrial Copilot ecosystem. These Agents independently execute complete industrial workflows guided by a human. They are designed to integrate with third-party AI agents, ensuring interoperability in different industrial environments and requirements. By integrating this new technology across the entire manufacturing value chain, Siemens predicts this will bring up to 50% productivity enhancements for customers. Siemens also sees Industrial AI agents as a key solution to labour shortages in the manufacturing sector, where Korn Ferry's Future of Work report estimates 7+mn shortfall in manufacturing jobs by 2030.

In addition to this solution, Siemens has also rolled out Agentic tools within its purpose-built EDA Software called Solido. Solido harnesses Siemens' EDA AI system to deliver advanced generative and Agentic AI capabilities throughout the Solido Custom IC platform to transform next generation design and verification. But this is only the beginning for Agentic AI solutions. In a recent white paper, Siemens highlighted that "true transformation in EDA demands more autonomous AI solutions capable of reasoning, acting, and iterating independently". In terms of Agentic AI progress, Siemens estimates

that fully autonomous AI agents in EDA will evolve progressively in waves, each wave building upon prior innovations and demanding multi-domain expertise .

Exhibit 180: AI Agents in Siemens Industrial Copilot

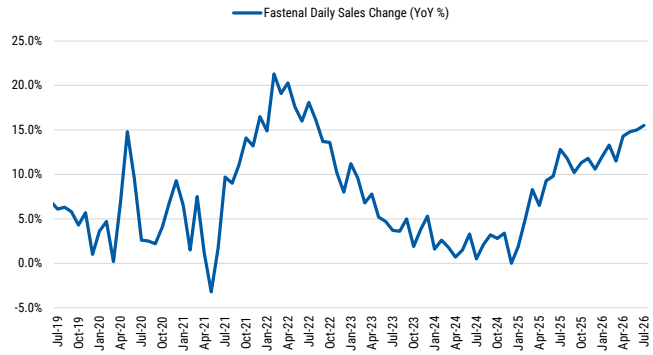


Source: Siemens 2025 Presentation

Further positive second derivative impacts from both China and US capex upcycle will benefit equipment players exposed to industrial buildout demand. Here, the main beneficiaries will be European players with local production and a defendable market share. For example in China, Atlas Copco (OW) could benefit beyond their Vacuum Technique Division (which is exposed to the semi capex upcycle), including their Compressor Technique and Industrial Technique division. We are increasingly seeing Atlas Copco as a key broadening out idea in the sector, as recent softness in AI-related names raises the question around whether we will finally start to see some of the more Industrial exposed names see a share price catch-up in 2H26.

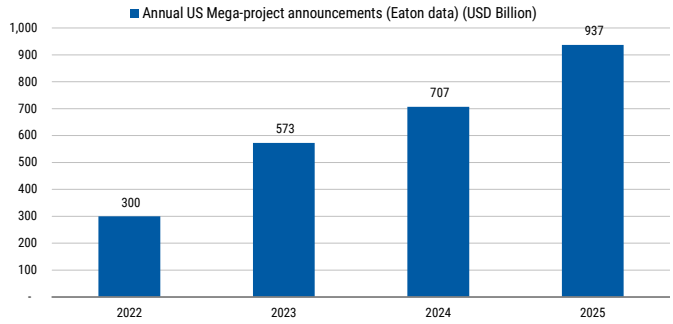
Outside of China industrial capex, we see signs of the US Reshoring thesis being intact and see companies like Schneider, Rexel and Prysmian as relatively well positioned in the mid term for a US mega-projects buildout. These companies all have >35% of group revenues come from the US and are investing capex in an effort to become more 'local for local' in the US. **We continue to see positive signs for an unlock in the pipeline of US mega-projects in 2026.** These include **1)** relatively solid demand fundamentals (US Durable goods orders, Fastenal orders), **2)** easy credit conditions from banks, and **3)** potential for some stability in tariff levels.

Exhibit 181: Fastenal Daily Sales change. Growth rates moving broadly sideways, holding up better than consumer and construction. Sales rose 9% YoY on average in 2025.



Source: Company Data

Exhibit 182: Eaton mega-projects announcements (USD billion). Eaton has continued to add more projects each year to its mega-projects pipeline. Similarly, Rockwell's CEO has discussed 'pent-up' demand on its conference call.



Source: Company Data

Multipolar World – Japan Industrials

Takeshi Kitaura, Japan Factory Automation, Heavy Industry

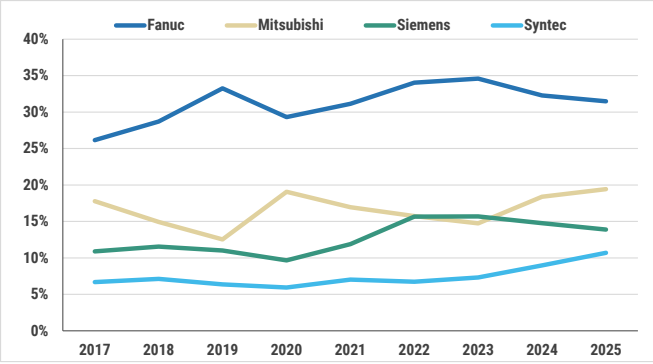
As the global economy becomes more multipolar, with growth and investment spread across a wider range of countries and regions, Japan's manufacturing sector may be well positioned to benefit from this shift. Japanese companies have long-standing strengths in areas such as advanced manufacturing, automation, materials and precision engineering, which could become increasingly valuable as companies and governments look to diversify supply chains and build production capacity across multiple markets. For Japan, this could open up opportunities to tap into new sources of growth while also strengthening its role in global supply chains and industrial partnerships.

Japanese automation equipment suppliers' diversified regional exposure could position them to capture growth across China, North America, Europe, and other parts of Asia, as rising geopolitical tensions drive manufacturers to localize production and strengthen supply-chain resilience.

Competition in China across industries such as electronics and automobiles has increased significantly over the past decade, with local manufacturers gaining share as the gap in production efficiency and product quality versus Japanese companies has narrowed. Japanese products generally continue to have an advantage in quality and durability, but are often less competitive on price given the lower manufacturing cost base in China.

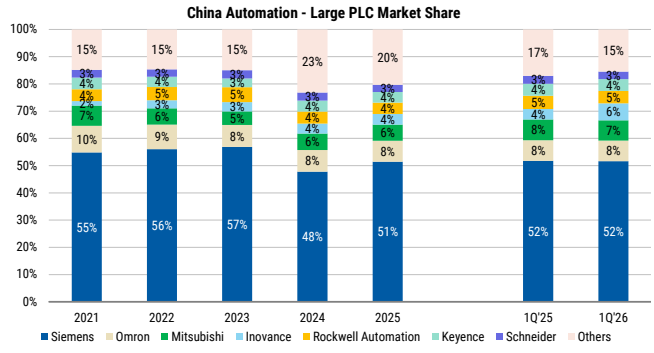
The trend has been more mixed across automation equipment. Japanese suppliers have lost some share in areas such as industrial robots and lower-end servo motors, where local products have become increasingly competitive. In contrast, **Japanese companies have maintained stronger positions** in areas where equipment performance has a more direct impact on product quality, precision, or production efficiency, including **CNC systems, high-end motors, large PLCs, and pneumatic equipment**.

Exhibit 183: CNC Market Share in China



Source: MIR, Morgan Stanley Research

Exhibit 184: Large PLC Market Share in China show resilient share for Keyence though not a market leader for the product

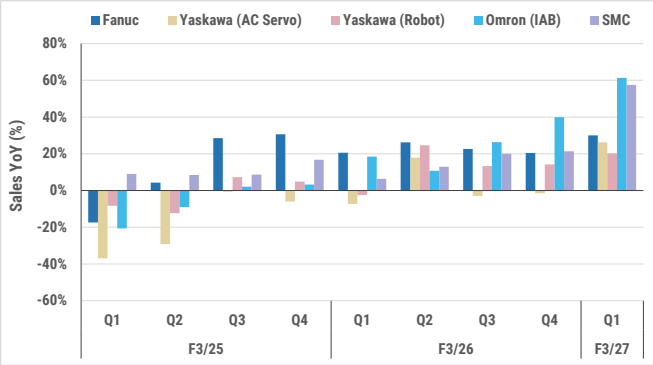


Source: MIR, Morgan Stanley Research, *= Chinese/Taiwanese Brands

Pneumatic equipment is one example where Japanese suppliers continue to have a strong presence. These products use compressed air to control movement and are widely used across factory production lines due to their simplicity, reliability, and relatively low cost. SMC remains a leading supplier in China and has significant local production operations in Beijing and Tianjin.

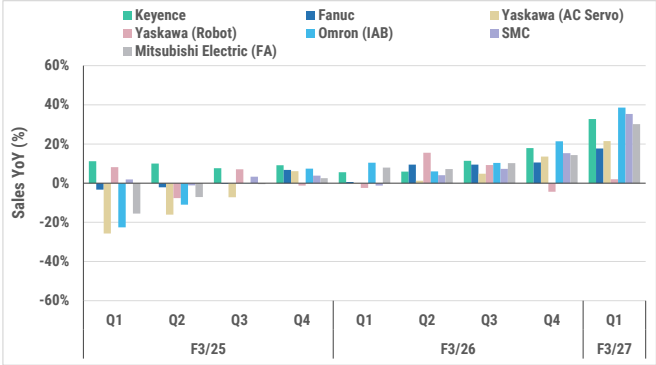
1Q (April-June) results showed China continuing to drive sales growth for Japanese automation equipment companies, with China sales growth generally running ahead of overall company growth. Continued demand for capital equipment should remain supportive for factory automation sales by Japanese corporates.

Exhibit 185: Japan FA Majors: Quarterly China Revenue (YoY %)



Source: Company data. Morgan Stanley Research

Exhibit 186: Japan FA Majors: All-Regional Revenue Growth (YoY %)



Source: Company data, Morgan Stanley Research

Japan's strength in automation equipment continues to come from high-quality production, advanced industrial tools including WFE, and a **strong focus on efficiency**, both in operations and energy use. Limited land availability and relatively high electricity costs have historically been disadvantages for Japan as a manufacturing base, but this has also pushed companies to continuously improve production equipment and processes.

Daihatsu's SSC (Simple, Slim, Compact) concept deployed in early 2010's is a good example. The idea is not only reflected in Japan's small and efficient mini-cars, but also in how Daihatsu produces them. By making better use of limited space, simplifying production processes and reducing energy use, Daihatsu was able to achieve **similar production capacity with around half the building space and roughly 40% of the equipment investment** compared with its previous factory. Recently Mazda has taken a further approach of integrating BEV production into its conventional line for ICEs as means to avoid building a new plant for BEVs all together **leading to 85% investment cost reduction and 80% reduction in time to production vs. a newly built factory**. This type of approach could remain an advantage for Japanese factory automation suppliers as manufacturers globally look for ways to reduce energy use, factory space and upfront investment.

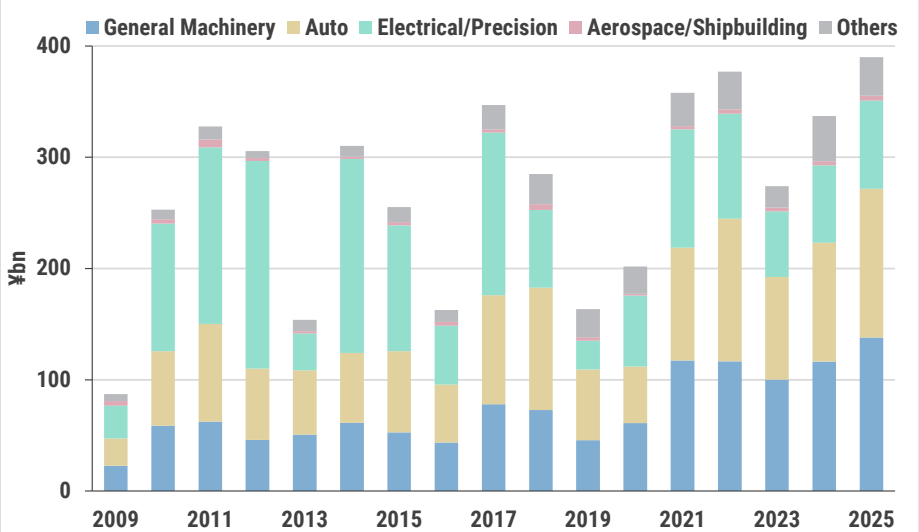
While Japan may continue to benefit from further growth in China as a manufacturing base, a more multipolar world could also create opportunities in other regions. Japan remains a major supplier of manufacturing equipment and production know-how, and

could play a role as companies build and localize factories across North America, Europe and other parts of Asia.

Japan's automation firm exposure by industry centers around chip & electronics and Autos. The combined exposure reached 50% for many companies with key competitiveness remaining high, especially in high tech semiconductor production, which needs fine control of equipment to maximize production efficiency and high yield.

High-end machine tools show continued export strength to China. Japan's export of machine tools to China continues to uptrend though some shift is likely occurring to local production and local manufacturers. Industry split of orders suggests compared to the past, electronics related orders have declined while broader general industry aimed orders and automotive orders have continued to increase. Companies like Fanuc may continue to benefit even as machine tools shift to local manufacturers, as CNC (Computer Numerical Control) market share looks resilient so far in the local China market, suggesting industrial progress in China has led to continued demand for high end CNCs from the global market leader.

Exhibit 187: Japan Machine Tool Orders from China



Source: JMTBA, Morgan Stanley Research

China made up 24% of total Japan machine tool orders in 2025, meaning it remains a key component of machine tool industry orders for Japanese equipment makers, which could continue to benefit from China's future industrial growth trend. China orders continue to grow, helping to reach the ¥2 trillion estimate by Japan Machine Tool Builders Association. Looking at Japan's domestic end market trend in machine tool orders, automotive industry orders have remained suppressed over the past 5 years post the pandemic and await recovery, as the industry continues to tackle global and local competition, and the ever changing dynamics of the industry towards electrification and autonomous driving.

Japan also continues to have a strong position in industrial robotics, with companies such as Fanuc and Yaskawa Electric among the global leaders. Japan's industrial robot production remained high reaching 38% of total global robot supply according to International Federation of Robotics. This gives Japanese companies a meaningful role in the development of physical AI in global manufacturing. By working with overseas AI

providers while also developing domestic capabilities, Japan could continue to provide automation solutions to factories globally.

In humanoids, Japan currently trails leading companies in China and the US, although activity has started to pick up across both hardware and key components. Japan continues to have strong capabilities in motors, sensors, precision components and factory automation, which could become increasingly relevant as humanoid applications develop. Geopolitical concerns may also support greater domestic development of physical AI, particularly given Japan's need to address labor shortages caused by a declining population across both manufacturing and non-manufacturing industries. Some Japanese companies announced humanoid plans this year, including Toyota, Mitsubishi Electric, Yaskawa, Mitsubishi Motors and SoftBank.

Japan's capital expenditure continues its uptrend, including software investments. Japan's Tankan Survey by Bank of Japan continues to show corporates planning to continue capital expenditure growth for the manufacturing sector while further growth is expected in software investments, which could lead to further digitalization in the country. 2026 fixed investment, including land purchasing expenses for manufacturers, non-manufacturers, and all-industries, is guided at 7.5%, 6.4%, 6.8% YoY, respectively. Software investments for the respective domains are also forecast at 21.0%, 9.6% and 13.5% YoY in 2026. Machine tool orders have started to recover in the domestic market with YoY growth extending to 50% in July orders.

Equity Market Implications

Laura Wang, Chloe Liu, Vicky Wu

China equity market's evolution through five stages of industrial revolution

China's industrial revolution has followed a clear evolutionary path since the 1950s, four distinct stages, each building on the foundations of the last, **progressively moving from basic capacity to scale, from scale to efficiency, and from efficiency toward intelligence.**

Stage 1 (1950s–1970s) built from scratch. Modeled on the Soviet heavy-industry playbook, China established its foundational industrial base – steel, coal, machinery, chemicals – through centralized Five-Year Plans and state-directed investment. The focus was on self-reliance and strategic sectors – energy, basic materials, transportation, and machinery – creating a broad if rudimentary national manufacturing capability. It was not yet globally competitive by any measure, but it created the basic infrastructure and industrial workforce that everything after would build upon.

Stage 2 (1970s–1990s) introduced reform and opening-up. Chinese leader Deng Xiaoping's market reforms, Special Economic Zones, and Open Door Policy turned China into an export-oriented manufacturing hub. Foreign direct investment surged, labor-intensive industries like textiles, apparel, and electronics assembly took off, and China began plugging into global supply chains — though at this point primarily as a low-cost assembly hub, producing to designs and specifications set elsewhere. The most important shift was structural: mass migration of labor from agriculture to manufacturing, the emergence of coastal manufacturing hubs like the Pearl River Delta, and the creation of a cost-competitive export manufacturing system that would become the platform for everything that followed.

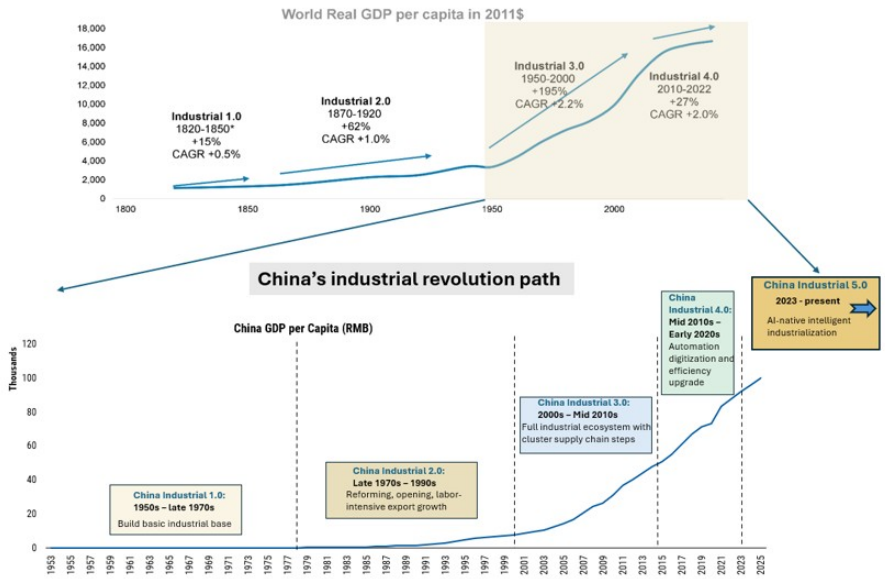
Stage 3 (2000s–mid 2010s) saw the capex supercycle that transformed China from an assembly hub into the world's most comprehensive industrial ecosystem. WTO accession in 2001 supercharged the process. Manufacturing capex grew at a 14% CAGR from 2004 to 2015, and in 2010 China overtook the US as the world's largest manufacturer for the first time in over a century. The key shift during this stage was from "cheap manufacturing" to manufacturing depth, speed, and ecosystem completeness. Massive investment poured into infrastructure and logistics, dense regional manufacturing clusters formed across the Yangtze River Delta, Pearl River Delta, and other industrial corridors, and increasingly complete upstream-to-downstream supply chains made China's industrial base structurally difficult to replicate. Policy frameworks continued to evolve, from the *National Medium- and Long-term Plan for Science and Technology Development (2006–2020)* launched in 2006 to *Made in China 2025* introduced in 2015, providing a coordinated roadmap for upgrading China's industrial capabilities and moving the economy up the value chain. China was the only country covering all categories in the UN Industrial Classification, with the world's deepest and most clustered manufacturing base.

Stage 4 (mid 2010s–early 2020s) shifted the focus from scale to productivity – automation, digitalization, and smart manufacturing. China is the world's largest industrial

robot market, with over 2 million industrial robots operating, accounting for 43% of the global industrial operational stock in 2024, with wide adoption across diverse sectors. In 2025, China's National Development and Reform Commission (NDRC) announced a state-backed venture capital guidance fund focused on robotics, AI, and other frontier technologies. The fund is expected to mobilize nearly Rmb1 trillion capital from local governments and private investors over a 20-year period. Factory digitalization accelerated, industrial software adoption deepened, domestic equipment and component supply chains strengthened materially, and companies moved up the value chain in autos, batteries, electronics, and machinery. This is when China's industrialization story became less about adding capacity and more about improving output per unit of labor and capital. It was not merely "more factories", it was a shift toward efficiency, precision, and quality, with stronger digital management of production processes and a clear policy push for smart manufacturing and advanced industry.

Looking forward, **Stage 5 (2020s and beyond)** is the next frontier. Industry 5.0 is not just "more automation." If Industrial 4.0 made the factory digitally visible, Industry 5.0 allows it to think, respond, and adapt. The core idea is embedding AI directly into industrial operations – combining the digital foundation built in Stage 4 with AI, robotics, and embodied intelligence to create self-optimizing systems that learn from every production cycle, rather than following pre-programmed instructions. We frame this around three reinforcing pillars: Industrial Intelligence (AI + automation + embodied intelligence), Industrial Resilience (localization + security + controllable supply chains), and Industrial Leadership (global scale + standards + ecosystem dominance). Over the past decade, China's strength came from scale, speed, supply-chain density, and process iteration. Over the next decade, the more important question will be whether China can become a global leader, or at least a strong follower, in the industrial foundations that sit underneath everything: advanced manufacturing materials, high-end equipment, sensors, precision components, industrial software, and power semiconductors.

Exhibit 188: The World and China's industrial revolution path

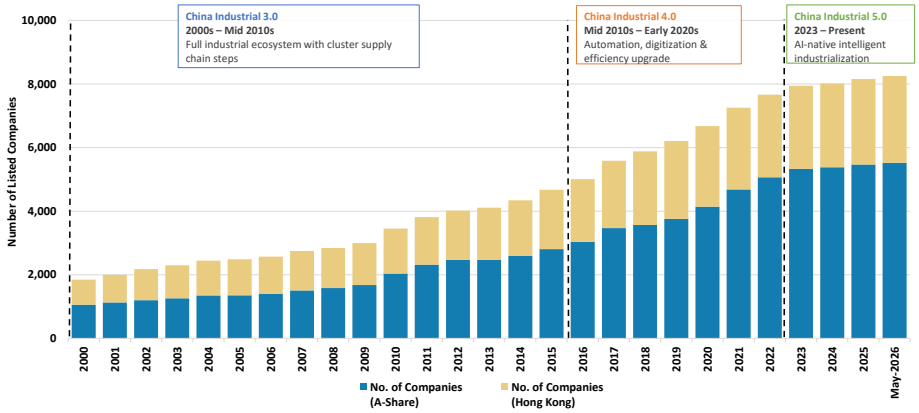


Source: Maddison Project, Morgan Stanley Research. Note: There is no consensus on the exact year of each industrial evolution, for further detail of each evolution, please see the detail in later section. Industrial 1.0 happened as early as mid-18th century, the above chart shows 1820-1850 only due to data availability.

The equity market grew up alongside the industrial base. In 2000, there were roughly 1,800 listed companies across A-shares and Hong Kong. By May 2026, that number had surpassed 8,200 – more than a fourfold increase. Most of the early growth came during Industry 3.0, as waves of SOEs and industrial firms went public, pushing the total to around 4,600 by the mid-2010s. But the real acceleration came during Industry 4.0 – the launch of the STAR Market in 2019, ChiNext's registration-based reform in 2020, and the Beijing Stock Exchange in 2021 opened the door for a new generation of high-tech and advanced manufacturing companies.

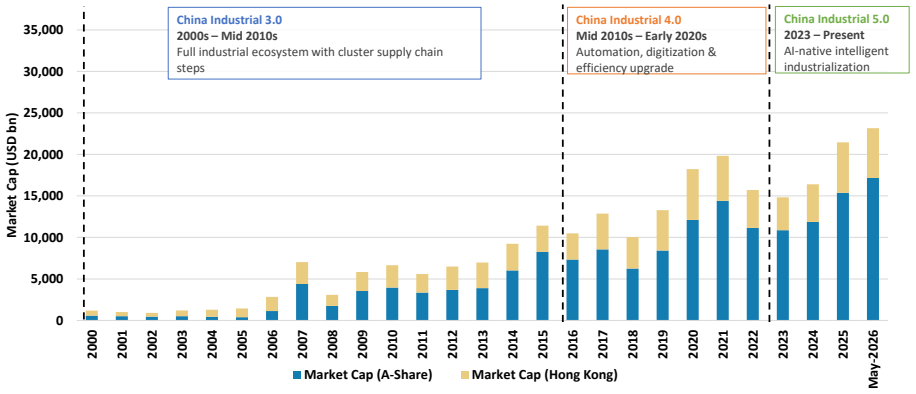
Market cap followed a similar trajectory. Combined A-share and Hong Kong market capitalization went from roughly US$1 trillion in 2000 to over US$23 trillion by May 2026, a more than 20x expansion in 25 years. Each industrial stage left its mark: the 2007 bull run took market cap past US$5tn for the first time, the capex supercycle of Industry 3.0 pushed it past US$10tn, and Industry 4.0 carried it beyond US$20tn as tech and advanced manufacturing companies gained index weight. But what's changed isn't just size – it's depth. The market today is fundamentally broader, with an investable universe that looks much more like the real industrial economy underneath it than it did even a decade ago. As China enters Industry 5.0, the equity market is better positioned than ever to capture the next wave of value creation – not just in the enablers building the AI infrastructure, but eventually in the thousands of industrial adopters across the economy.

Exhibit 189: China's equity markets evolving – listed companies more than quadrupled since 2000



Source: CEIC, Morgan Stanley Research. Data as of May 31, 2026.

Exhibit 190: China's equity markets evolving – market cap grew over 20x since 2000



Source: CEIC, Morgan Stanley Research. Data as of May 31, 2026.

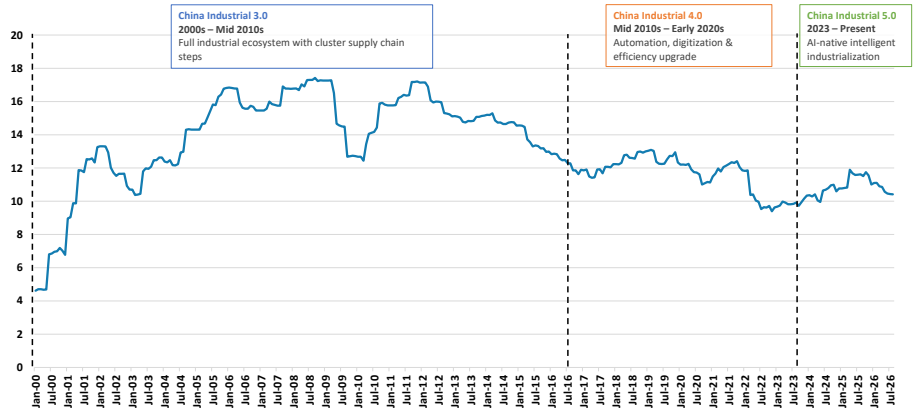
MSCI China's ROE has tracked each industrial stage closely. During Industry 3.0 (2000s–mid 2010s), ROE rose dramatically, from just 4% in 2000 to a peak of 16-17% in 2010-2011. This was the golden era of capital-intensive, scale-driven growth, with high-ROE banks and energy companies dominating the index. ROE then began to fade through the later part of this stage, settling to 13-14% by the mid-2010s as the capex supercycle matured.

During Industry 4.0 (mid 2010s-early 2020s), the decline continued – more gradually at first, hovering around 12-13% through 2017-2019, before falling more sharply to 10-11% by the early 2020s. This reflected both the natural slowdown of the investment-driven growth model and a compositional shift in the index away from high-ROE Financials toward newer tech and advanced manufacturing names still in their heavy investment phase.

Since entering Industry 5.0 (2023-present), there are early signs that the ROE has stabilized. MSCI China's ROE has edged up from a trough of 9–10% in mid-2023 to around 11% – modest, but directionally meaningful after a decade of erosion. Several forces are driving this: strong export competitiveness is supporting top-line growth and asset turnover; the government's "anti-involution" campaign is targeting excess capacity and destructive price competition across key industries, which should help restore pricing power and margins over time; and corporate self-help, including cost discipline, share buybacks, and higher dividends are improving capital efficiency from the bottom up. The combination of these forces, exports, supply-side discipline, and AI-driven efficiency, could mark a structural ROE re-rating for China equities.

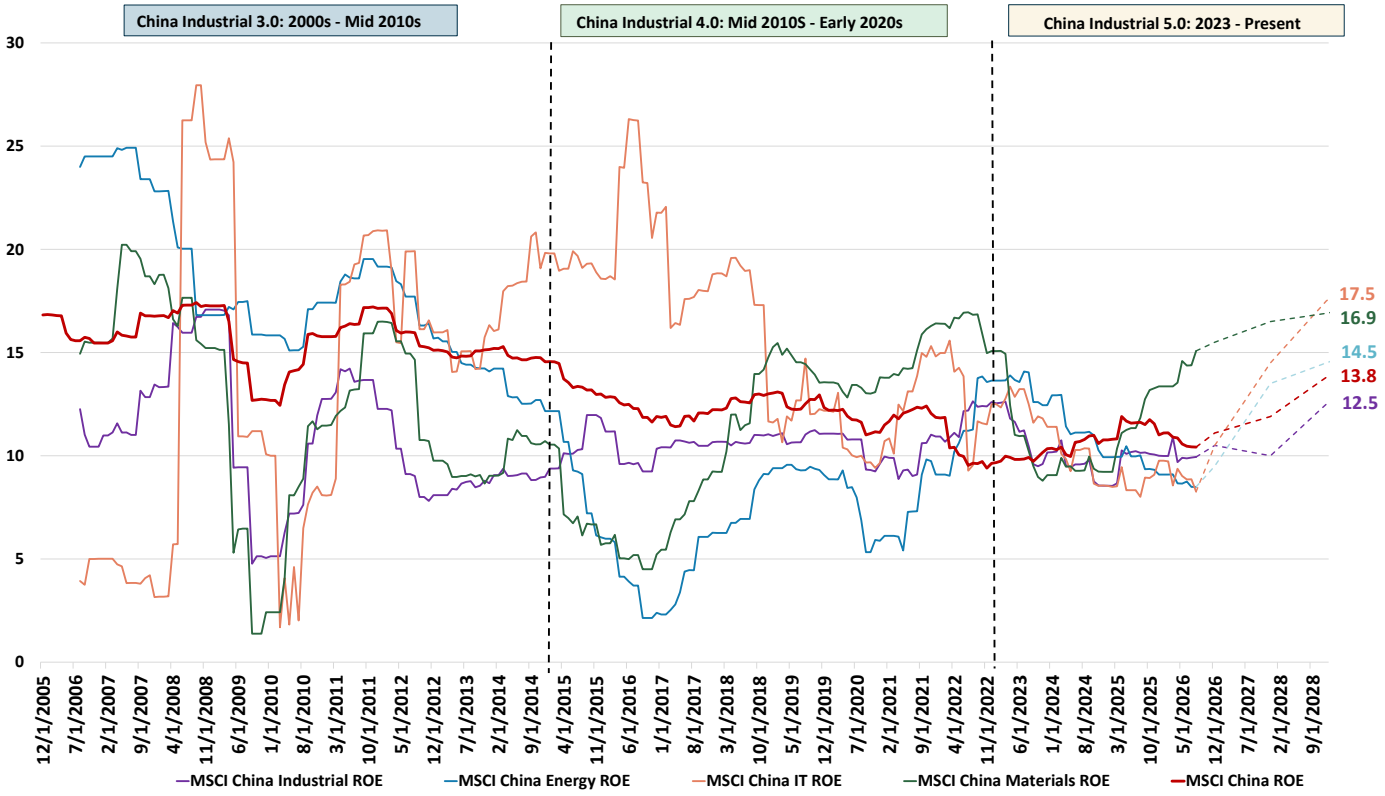
Looking forward, unlike the prior two cycles, we believe this round is more about an efficiency-driven revolution, which could help lift both major AI-related sectors and overall index ROE. We expect Energy (up 6-7%), Materials (up 2-3%), Industrials (up 2-3%), and Information Technology (up 8-9%) to all see ROE improvement by 2028, contributing around 2% to MSCI China's overall index ROE.

Exhibit 191: MSCI China ROE – more notable improvement during Industry 3.0 and 5.0



Source: Datastream. Morgan Stanley Research. Data as of August 31, 2026.

Exhibit 192: MSCI China ROE trajectory by industry



Source: Thomson Reuters. Morgan Stanley Research. Data as of August 31, 2026

A-shares the early play on AI enablers; H-shares the next leg as adopters scale up

The A-share and Hong Kong market offer very different exposure to the AI investment cycle. **A-shares are heavily skewed toward AI enablers** – among MS-covered HK/China stocks, there are 31 enabler names with a combined market cap of over US$1tn, reflecting A-shares' deep bench in semiconductors, optical components, industrial automation, and AI infrastructure. In contrast, **Hong Kong offers concentrated exposure to AI adopters**. Morgan Stanley covers 88 adopter names in the Hong Kong market, representing a

combined US$1.35tn in market capitalization. These companies are primarily internet platforms, consumer technology leaders, and enterprise software providers that stand to gain as AI becomes increasingly embedded across products, services, and operating processes.

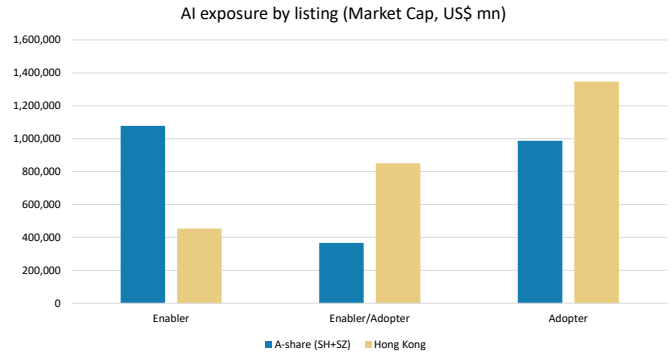
This distinction matters for how the investment opportunity plays out over time. In the early phase of Industry 5.0, capital flows toward the companies building the picks and shovels – chips, servers, optical modules, and robots – and that is overwhelmingly an A-share story. But as AI adoption broadens across industries – improving unit economics, automating workflows, enhancing customer engagement – the value creation shifts toward the adopters, and that is where Hong Kong carries more weight. So we see **A-shares as the early play on AI enablers and infrastructure; H-shares are the next leg as adoption scales up.**

Exhibit 193: MS covered HK/China stocks AI exposure by listing (number of companies) – A-share heavy on enablers, H-share on adopters



Source: Factset, Morgan Stanley Research.

Exhibit 194: MS covered HK/China stocks AI exposure by listing (market cap) – A-shares heavy on enablers, H-shares on adopters

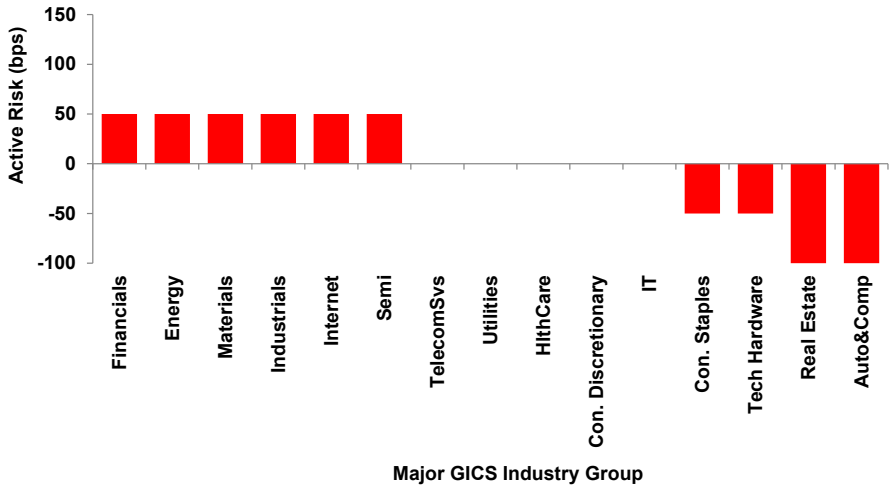


Source: Factset, Morgan Stanley Research.

On sector allocation, we strongly prefer upstream, asset-intensive sectors that are less exposed to AI-driven disruption and more likely to benefit from the Industry 5.0 capex cycle, particularly as energy sufficiency and supply-chain resilience get reprioritized globally. **This includes selected Materials, Industrials, and Energy** names, where rising global market share and improving pricing power offer structural tailwinds. We also favor the tech localization theme, which continues to benefit **semiconductors** IT, driven by both policy support and real demand pull from AI infrastructure buildout.

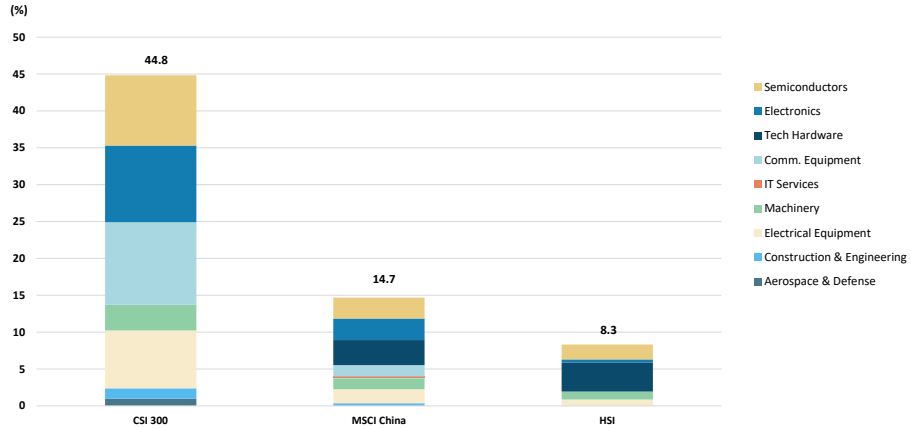
Given A-shares' higher concentration of high-end upstream manufacturing, hard-core tech companies and AI enablers, we prefer A-shares over Hong Kong in the near term. The opportunity in Hong Kong broadens as AI adoption scales, but that is the next leg.

Exhibit 195: China – sector/industry group allocation: we continue to favor a barbell approach between structural tech/growth opportunities and quality dividend plays



Source: Morgan Stanley Research

Exhibit 196: Snapshot of high-end upstream manufacturing and hard-core tech companies – Much bigger representation in the A-share market than in MSCI China and Hang Seng Index



Source: Factset, Morgan Stanley Research. Data as of June 12, 2026.

Autos

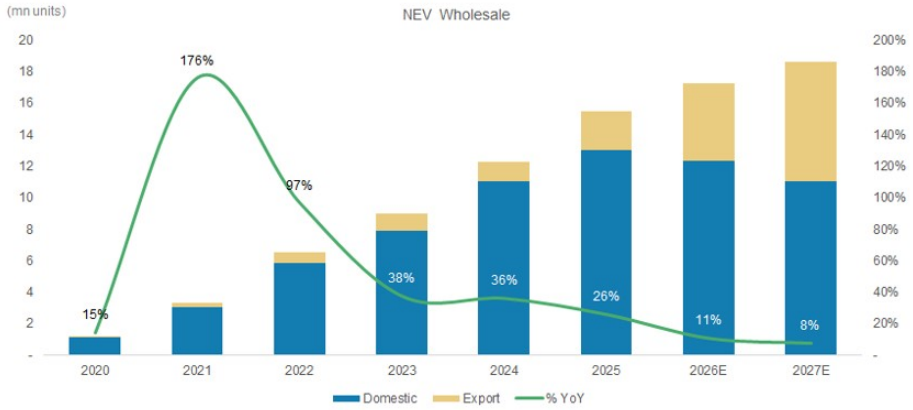
Tim Hsiao, Shelley Wang, Peggy Wang, Joey Xu

AI reshaping China EV's competitiveness

From exports to global collaboration: We expect China's EV wholesale volume to grow 11% YoY to 17.2mn units in 2026. While China domestic EV demand could decline 5% YoY, we expect EV exports to nearly double to 4.9mn units in 2026, as geopolitical energy shocks have created a powerful external release valve. We estimate China EV brands will have 30% [=16% / (1-46%)] market share outside of China by 2030, much higher than the 6% [=5% / (1-22%)] share of China ICE brands outside of China in 2023.

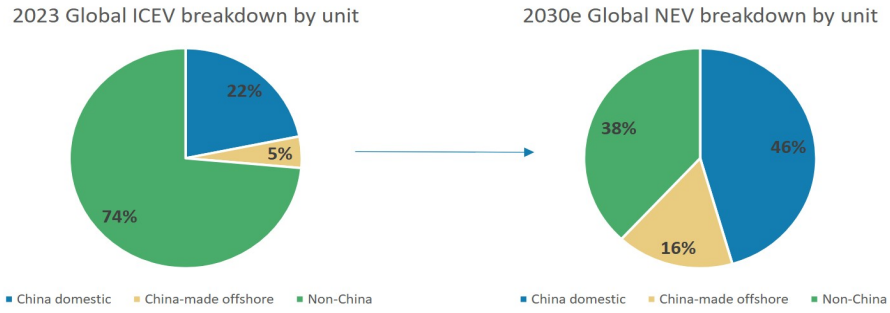
In the medium to long term, we believe multilateral collaborations (e.g., strategic partnerships, JVs) between global OEMs and Chinese EV players could create a global win-win scenario. Through potential partnerships in areas like manufacturing, component sourcing, and smart EV technology, global and Chinese auto makers could more effectively tackle the thorny issues of EV affordability, geopolitical uncertainty, and capital sustainability, in our view.

Exhibit 197: China EV growth will be mainly supported by exports



Source: China Association of Automobile Manufacturers (CAAM), Morgan Stanley Research (E) estimates.

Exhibit 198: By 2030, one in three NEVs sold outside China could be either China-made or built offshore by a Chinese EV brand



Source: Morgan Stanley Research (e) estimates

AI in EV manufacturing: AI can be used in China's EV manufacturing as a factory-wide

operating layer across design, batteries, assembly, quality, logistics, and software feedback. As BYD's 2025 Annual Report states, "AI empowerment has transcended the single domain of intelligent driving, permeating the entire value chain from R&D and manufacturing to supply chains, services, and energy management. It is now the critical determinant of an automaker's future competitiveness, efficiency ceilings, and value creation capabilities." Chinese EV plants are increasingly becoming "AI car factories" that combine robotics, computer vision, digital twins, and real-time optimization.

- **BYD (as an example of traditional EV makers):** According to EV Magazine, BYD's Xi'an facility operates with approximately 97% autonomy, employing AI-powered robotics, automated guided vehicles (AGVs), and intelligent warehousing systems. BYD has also developed "digital twins" of its battery manufacturing environments, allowing engineers to simulate and optimize production without physical testing, leading to a reported 40% reduction in battery defects and a 20% improvement in average battery lifespan. According to UBTech, BYD has deployed UBTech Robotics' Walker S1 industrial humanoid robot in its manufacturing facilities. The Walker S1 is capable of performing tasks such as screw assembly, parts sorting, and quality inspection, and can work alongside unmanned logistics vehicles, paving the way for large-scale, uncrewed operations.

Exhibit 199: BYD deploys UBTech humanoid robots in its plant



Source: UBTech

- **Li Auto (as an example of EV start-ups):** It operates two green, intelligent manufacturing bases in Changzhou and Beijing, practicing an "AI-driven manufacturing philosophy" that leverages algorithms, data, and proprietary AI technologies. It deploys proprietary systems including the Lianshan quality monitoring and early warning platform, and the Li-MOS manufacturing management system to drive intelligent efficiency gains and closed-loop quality control. Li Auto's Beijing factory reportedly generates about 2 TB of data per day. According to management, through AI-enabled inspection, modular workstations, and robotics-centered process planning, Li Auto has significantly improved production efficiency, manufacturing consistency, and maintenance stability.

AI in vehicle R&D: AI is accelerating product development cycles across Chinese EV

makers. AI-powered tools facilitate generative design and digital twin prototyping, allowing for faster experimentation with materials and technologies, and optimizing aerodynamics and safety. Meanwhile, we notice that most Chinese OEMs have guided for double-digit YoY R&D spending growth in 2026, driven by increased investment in AI, computing power, and autonomous driving. While this could risk operating de-leverage near-term if R&D growth outpaces vehicle sales volume, we also see the opportunity that it will ultimately convert into meaningful non-vehicle revenue streams (e.g., physical AI) and stronger autonomous driving (AD) based sales over the long run.

From driving cars to flying cars – eVTOL

eVTOL demand to take off: China has emerged as the world's dominant force in the eVTOL sector, with AI playing a central and multifaceted role across the entire value chain, from autonomous flight systems and intelligent manufacturing to digital airspace management and mission-critical applications. According to China's Civil Aviation Administration (CAAC), the low-altitude economy market is projected to reach Rmb3.5tn by 2035, up from Rmb1.5tn in 2025.

AI in eVTOL manufacturing: Similar to EV, AI is also integrated into eVTOL manufacturing processes in China. eVTOL manufacturers are adopting intelligent manufacturing centers with auto-grade pulse assembly lines, featuring micron-level machining accuracy and millimeter-level assembly standards. AI is also being leveraged in the design and engineering phase to optimize aerodynamics, battery management, and energy consumption, with generative AI used for simulation-driven design to accelerate development cycles.

AI in air traffic management: We believe in the future, AI can also be applied in the low-altitude unmanned traffic management, to analyze traffic density, optimize flight corridors, and orchestrate simultaneous takeoffs and landings, integrating weather forecasts, infrastructure constraints, and regulatory inputs for safe and efficient operations.

Batteries

Jack Lu, Kaylee Xu

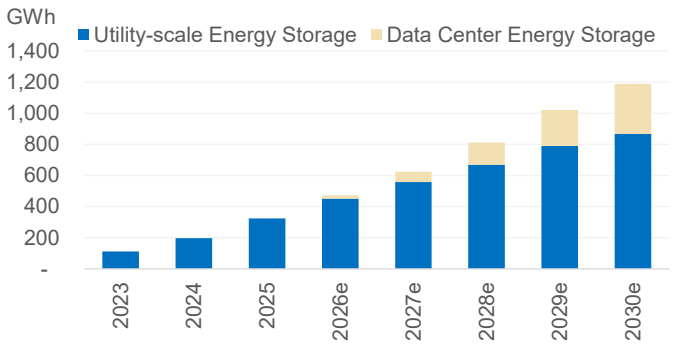
Multiple demand drivers to 2030. We estimate global battery demand will reach 4.4TWh in 2030, up from 1.7TWh in 2025, which implies a 21% demand CAGR. We see demand mainly supported by robust growth in ESS, partially driven by Artificial Intelligence Data Centers (AIDC), as well as further penetration of batteries into trucks and other transport modes. We believe batteries will see new and fast applications in end-demand sectors including eVTOLs and electric vessels as battery technology continues to develop.

Exhibit 200: Battery energy solution forecasts for 2030

Battery energy solution forecast			
2030	Penetration	Deployment (GWh)	TAM (bn US$)
Electric car	45%	2,660	199
ESS	N/A	867	65
Electric LDV	50%	464	37
Electric HDV	55%	215	19
Electric machinery	40%	107	9
eVTOL	N/A	19	1.9
Humanoid	N/A	1.2	0.1
Electric vessel	7%	31	3
Sum		4,365	334

Source: Morgan Stanley Research estimates

Exhibit 201: Energy Storage Solutions (ESS) will be the major driver of growth in battery demand from 2025-30

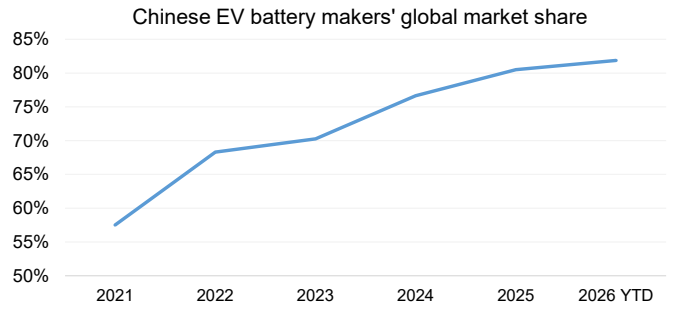


Source: Company data, Rystad, Morgan Stanley Research estimates

Market-share gains for Chinese battery producers. We believe Chinese battery producers can maintain and achieve a small increase in global EV batteries from an already high base, while continuing to dominate the global ESS market. Chinese EV battery makers' global market share went up steadily from 58% in 2021 to 81% in 2025; in 2026, it has continued to inch up from an already high level. We think with a strong EV export trend, market share can see further upside. As for ESS batteries, we may see a slight decline in Chinese battery makers' global market share in the coming years as Korean battery makers are also adding capacity and acquiring orders with the help of policy advantages in the overseas market.

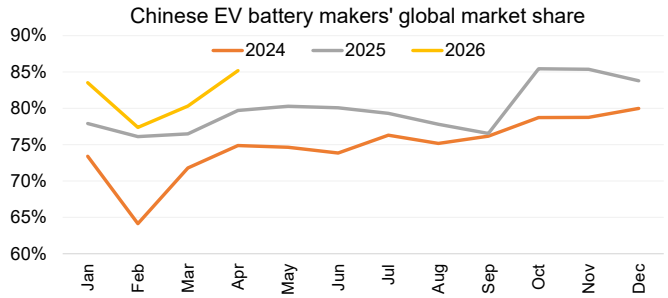


Exhibit 202: Chinese EV battery makers' global market share rose from 58% in 2021 to 81% in 2025



Source: SNE, Morgan Stanley Research estimates

Exhibit 203: In 2026, market share has continued to inch up from an already high level

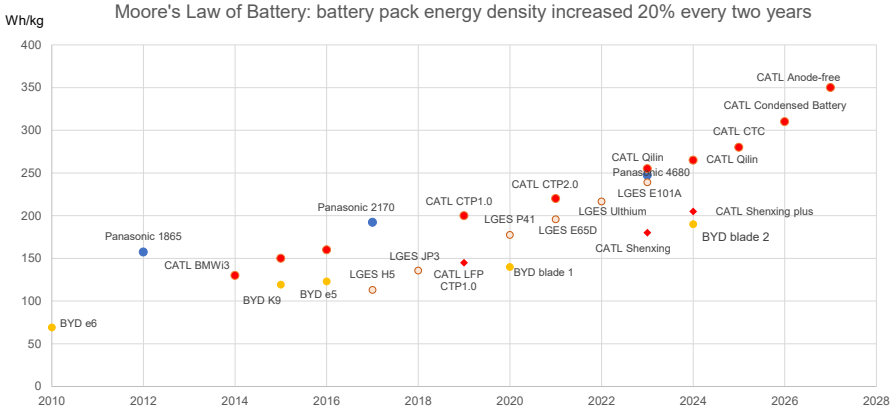


Source: SNE, Morgan Stanley Research estimates

Global innovation leadership and global footprint. Chinese battery makers, represented by CATL, have been leading in battery technology innovation. Battery pack energy density has increased by roughly 20% every two years along with new product launches. Apart from lithium-ion batteries, CATL is developing sodium-ion batteries and solid state batteries to lead the next generation of battery technology.

To commercialize technology innovation and achieve rapid penetration of batteries, Chinese battery makers have been investing in plants in different regions. We now see that all major battery makers in China have plans to build or have built factories in overseas markets, particularly Europe and Southeast Asia.

Exhibit 204: Moore's Law of Batteries



Source: Company data, Morgan Stanley Research

Stock ideas: CATL continues to be our Top Pick in this sector, as the high-point of battery technology iteration and overseas market acquisition. We believe the company will continue to deliver robust earnings growth, while the stock's valuation is still appealing. In the battery value chain, we also like Yunnan Energy (Overweight) as we're optimistic on the sustainability of wet separator price hikes and better-than-industry volume growth thanks to the switch from dry to wet separators.

Capital Goods

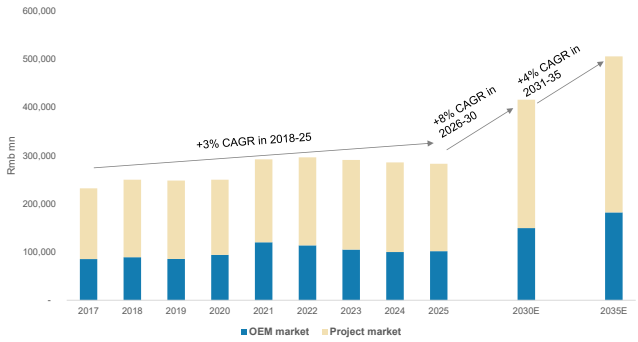
Sheng Zhong, Chelsea Wang

Capital goods are one of the clearest beneficiaries of China's Industry 5.0 capex supercycle, as this cycle will be increasingly equipment-led, automation-led and intelligence-led, combined with equipment companies' global market-share gains from enhanced competitiveness. We see two megatrends here:

1. Factory upgrades

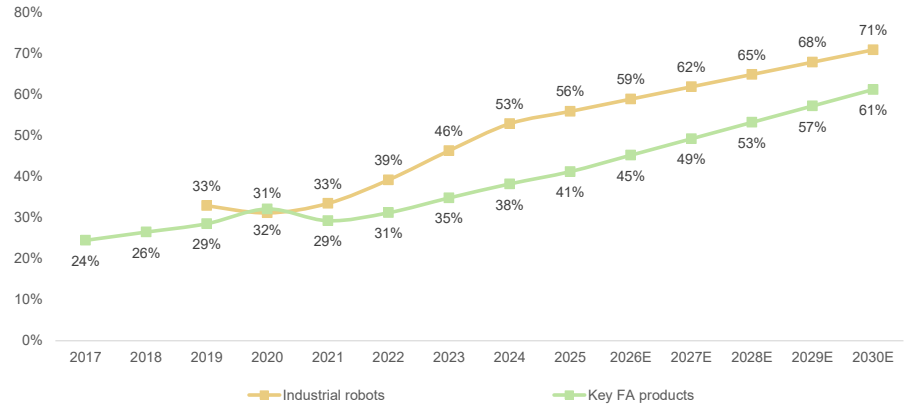
Industry 5.0 most directly benefits automation, intelligent equipment and robotics. China's automation market grew at a 3% CAGR in 2018-25, reaching Rmb283bn in 2025 – we anticipate it to accelerate to 6% in 2026-35 on the back of continual automation penetration and accelerated equipment upgrades. Chinese brands have already made much progress on import substitution with half of products made domestically without use of imports, as of 2025. We believe this trend will continue and evolve, from general equipment to more advanced equipment/precision components, such as in 5-axis CNC machine tools, screws, linear guides, and others.

Exhibit 205: We estimate China's automation TAM to grow at a 6% CAGR in 2025-35, up from 3% in 2018-25



Source: MIR, Morgan Stanley Research (E) estimates

Exhibit 206: China automation brands' localization rate has increased quickly and we estimate it will grow to >70% in 2030



Source: MIR, Morgan Stanley Research (E) estimates. Note: The key FA products include low-voltage AC drives, servos, and PLC.

Exhibit 207: Leading players will likely continue to gain market share, with higher value for price vs. global brands

	China TAM (Rmb bn)		Localization rate	
	TAM in 2023, 2017-23 CAGR	TAM in 2030e, 2024-30 CAGR	2025	2030e
Automation*	Rmb182bn, 5% CAGR	Rmb260bn, 4% CAGR	40%	60-70%
Industrial robotics	Rmb55bn, 14% CAGR	Rmb75bn, 6% CAGR	55%	70-80%
RV reducers	Rmb3.2bn, 27% CAGR	Rmb5.0bn, 9% CAGR	40%	60%
Harmonic reducers	Rmb1.7bn, 22% CAGR	Rmb4.3bn, 8% CAGR	55%	70-80%
Hydraulics**	Rmb43bn, 5% CAGR	Rmb71bn, 7% CAGR	35%	50-60%
Construction machinery	Rmb470bn, 3% CAGR	Rmb860bn, 10% CAGR	90%	90-95%
LiB equipment	Rmb62bn, 23% CAGR	Rmb93bn, 6% CAGR	97%	Close to 100%
Solar equipment	Rmb110bn, 30% CAGR	Rmb165bn, 6% CAGR	97%	Close to 100%

Source: CCMA, CAAM, MIR, GGII, NBS, CPIA, China Laser Development Report 2022. Morgan Stanley Research (e) estimates. *Automation excludes industrial software; **High-end hydraulics only, which represents 50% of the total hydraulics market based on our checks with Hengli.

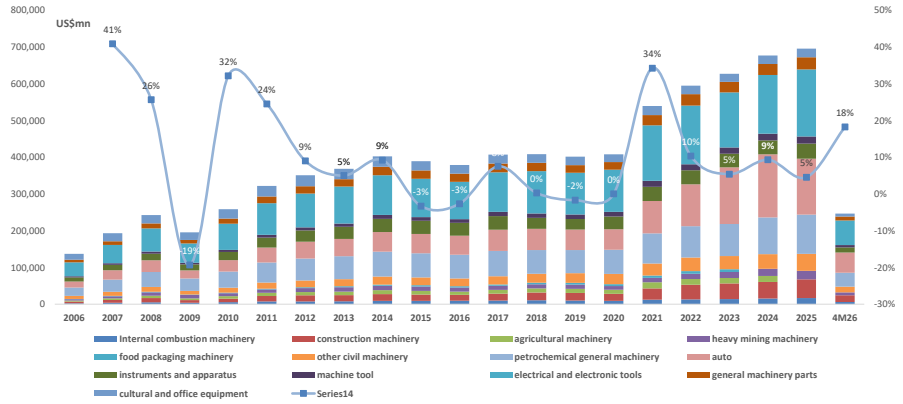
2. Equipment companies' overseas growth potential

China's machinery exports stayed resilient in 2020-25, growing at a 12% CAGR, and further accelerated to 18% y-y in 4M26. Key general equipment, such as forklifts, robots, PIMMs, machining centres, and laser machine tools, have seen a 16-40% CAGR over 1996-2024, and now account for 10-44% of global exports. We expect the penetration to continue its steep upward trajectory supported by technology improvement, cost advantages, and superior services.

1) The competitive edge of Chinese equipment makers is shifting from pure cost advantage to product capability, differentiation and customization. In many categories, Chinese suppliers are no longer simply exporting "cheaper equipment"; they are exporting solutions that are better adapted to new operating requirements. For example, Chinese players have a dominant position in new energy equipment (e.g., solar, wind power, energy storage); in construction machinery and heavy trucks, electrification is becoming an important differentiator, especially in use cases such as mining, ports, logistics parks and urban construction, where customers value lower energy cost, lower maintenance cost and easier fleet management. In laser equipment, Chinese players have an edge in higher-power, higher-precision use cases, supported by better control systems, automation integration and improving reliability. This product upgrade means Chinese equipment can address a broader set of overseas demand, including customers that require customized configurations, faster delivery and more application-specific engineering support.

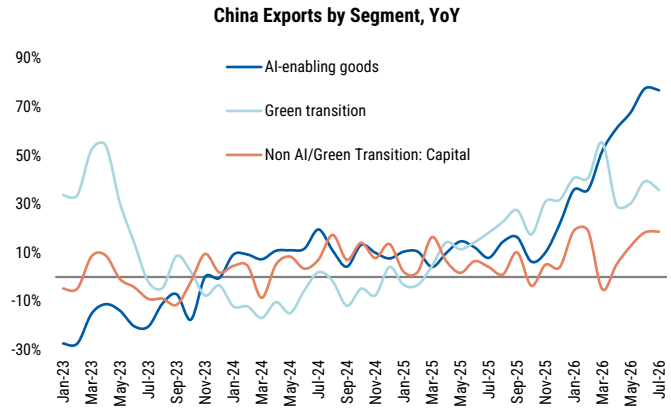
2) Overseas expansion of Chinese downstream customers. In a more multipolar global manufacturing environment, many Chinese companies in batteries, EVs, solar, electronics, chemicals, machinery and industrial components are adopting a "technology export + localized production + integrated services" model. They building new capacity overseas to serve local markets, reduce trade friction and improve supply-chain resilience. When these Chinese manufacturers build plants abroad, they often bring along familiar Chinese equipment suppliers because those suppliers already understand their process requirements, factory standards, automation systems and cost targets. This creates a natural export channel for Chinese equipment makers: follow domestic customers overseas first, then build local references, service networks and credibility with non-Chinese customers.

Exhibit 208: China's machinery exports sustained solid momentum into 2026, mainly driven by food & packaging, autos, heavy industries & mining, and petrochemical general industries



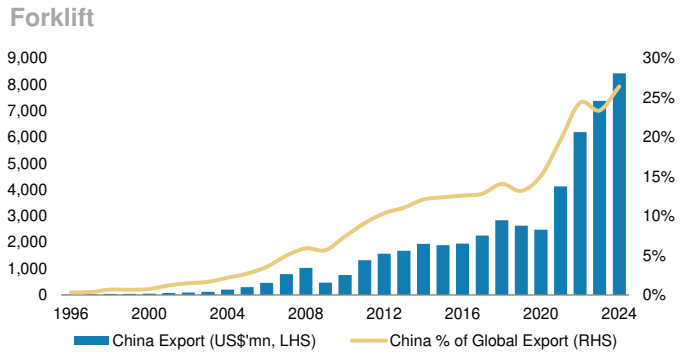
Source: CEIC, Morgan Stanley Research

Exhibit 209: Capital goods could support exports with demand created by global supply chain de-risking and China's own outbound capex in other EMs



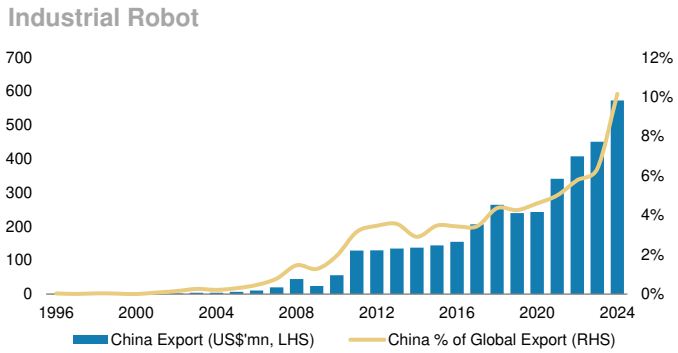
Source: China Customs, CEIC, Morgan Stanley Research. Note: export segments are classified by Morgan Stanley Research, data is adjusted for LNY seasonality.

Exhibit 210: China's forklift exports grew at a CAGR of 25% over 1996-2024, to account for 26% of global exports in 2024



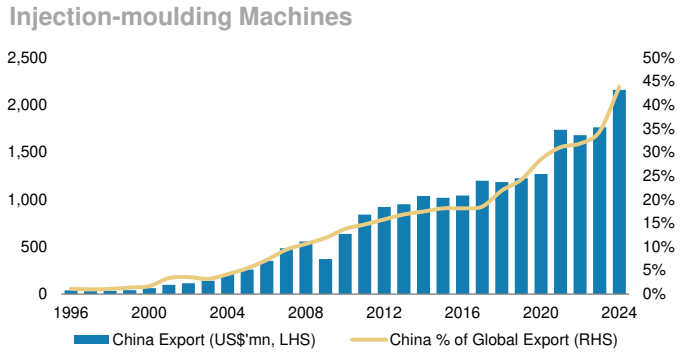
Source: World Integrated Trade Solution, Morgan Stanley Research.

Exhibit 211: China's industrial robot exports were growing at a CAGR of 31% over 1996-2024, to account for 10% of global exports in 2024



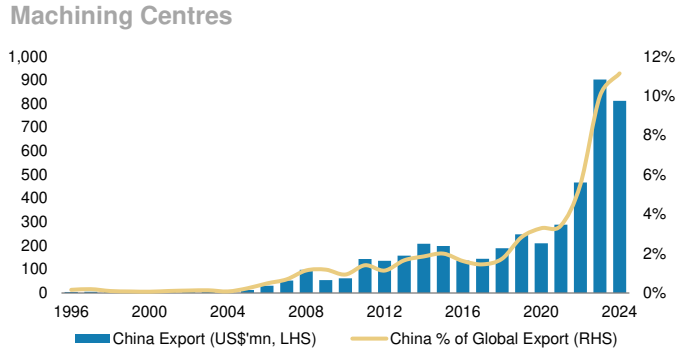
Source: World Integrated Trade Solution, Morgan Stanley Research.

Exhibit 212: China's injection-moulding machine exports grew at a CAGR of 16% over 1996-2024, accounting for 44% of global exports in 2024



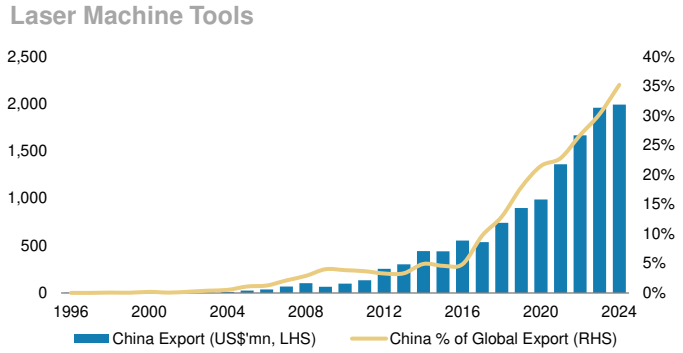
Source: World Integrated Trade Solution, Morgan Stanley Research.

Exhibit 213: China's machining centre exports grew at a CAGR of 21% over 1996-2024, to account for 11% of global exports in 2024



Source: World Integrated Trade Solution, Morgan Stanley Research.

Exhibit 214: China's laser machine tool exports grew at a CAGR of 40% over 1996-2024, to account for 35% of global exports in 2024



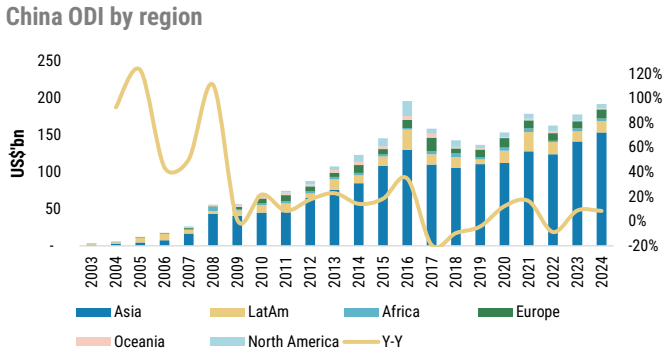
Source: World Integrated Trade Solution, Morgan Stanley Research.

Benefit from downstream 'going global' initiative in multipolar world

1) China's outward direct investment (ODI) has experienced sustainable growth in recent years. According to the Ministry of Commerce, China's ODI grew at a 7% CAGR in 2020-2024, suggesting a proactive shift by Chinese companies towards 'going global' as they are actively seeking growth opportunities against the backdrop of a domestic economic growth slowdown, increasing global economic volatility, and rising trade tensions and protectionism. In particular, manufacturing ODI saw steady growth – at a CAGR of 13% over 2020-2024 and accounting for 19% of total ODI in 2024, driven by autos, electronics, batteries, critical metals, etc.

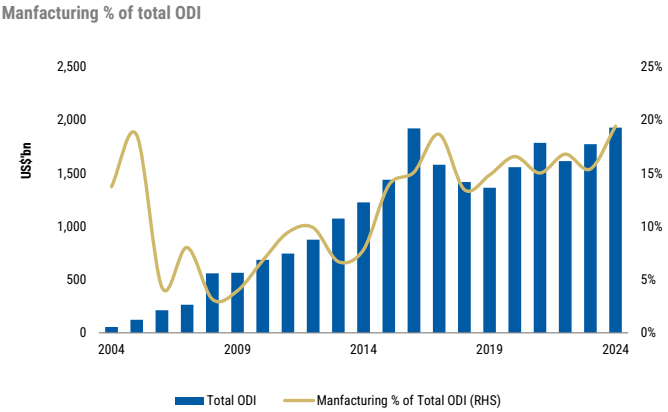
- **By region**, China's ODI has seen rapid growth in ASEAN, driven by the near-shoring supply chain strategy. ODI in Europe remains resilient overall. ODI in the US has shown a weak recovery, while ODI in Mexico is growing rapidly, implying China is actively seeking alternative pathways to mitigate US-China trade uncertainty.
- **By industry**: With >60% of total manufacturing ODI in the last three years, autos have held a dominant position, particularly in Europe to mitigate trade barriers and AD/CVD investigations by strengthening local production. The second-largest manufacturing industry is metal products, driven by China's investment in mining resource countries such as Indonesia and South Africa. The third-largest manufacturing industry is transportation, led by infrastructure investment, e.g., in Belt and Road countries.

Exhibit 215: Chinese companies have been more proactive toward 'going global', with ODI numbers picking up…



Source: Ministry of Commerce, State Administration of Foreign Exchange, Morgan Stanley Research.
*2017 fall due to China government setting restrictions on certain categories of capital outflow.

Exhibit 216: …with a rising manufacturing ODI mix



Source: Ministry of Commerce, Morgan Stanley Research

2) Major downstream overseas capacity expansion is accelerating. In particular, we are seeing global capacity expansion by Chinese companies in industries such as automotive, lithium batteries and electronics amid geopolitical tensions.

- **Autos:** As domestic competition has become more fierce, Chinese OEMs like BYD, Chery and GAC are actively seeking global opportunities. They are rapidly expanding their global manufacturing footprint to overcome trade barriers and establish a stronger international presence. Their capacity expansion plan has reached 530k units and 460k units in 2025 and 2026, respectively.
- **Batteries:** Chinese battery manufacturers are aggressively expanding their production capacity globally to maintain market dominance and secure access to key markets. Battery makers have announced plans to expand capacity by >300GWh in the next 5 years, with the majority in Europe.
- **Electronics:** Facing mounting and ongoing tariff uncertainties, supply chains have been accelerating non-China production capacity. For example, whereas Apple products were fully made in China before 2020, Apple and its suppliers currently have 10% of iPhone capacity in India and 70% of Apple Watch capacity in Vietnam. Our Tech Hardware Team's supply chain checks show that Hon Hai, as the major iPhone assembly partner, has a long-term target to cover at least 25% of iPhone shipments in India. Other Chinese 3C players (such as Xiaomi, Oppo, Vivo) are also expanding their global footprints.

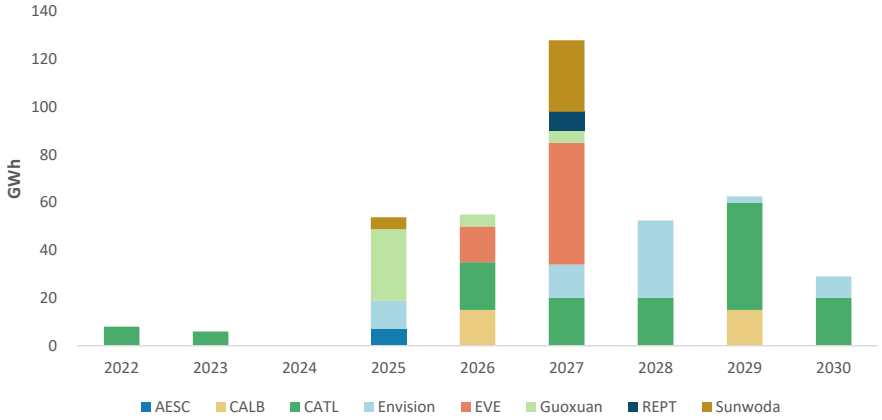
Exhibit 217: Chinese automakers are accelerating offshore expansion



OEM	Location	Launch	Planned Capacity (k units)
BYD	Thailand	2024	150
	Uzbekistan	2024	50
	Brazil	2025	150
	Hungary	2026	150
	Indonesia	2026	150
	Turkey	2026	150
	Cambodia	2026	10
BYD total			**810**
GWM	Russia	2019	150
	Thailand	2021	80-120
	Brazil	2024	100
GWM total			**350**
Geely	Egypt	2012	30
	Belarus	2017	60
	Malaysia	2017	250
Geely total			**340**
SAIC	Indonesia	2017	150
	India	2019	80
	Pakistan	2021	100
	Vietnam	2023	60
	Thailand	2023	50
SAIC total			**440**
Chery	Brazil	2014	150
	Indonesia	2023	200
	Malaysia	2024	30
	Argentina	2025	100
	Thailand	2025	80
Chery total			**560**
GAC	Thailand	2024	50
	Indonesia	2024	100
GAC total			**150**
Chang'an	Thailand	2025	200
Chang'an total			**200**

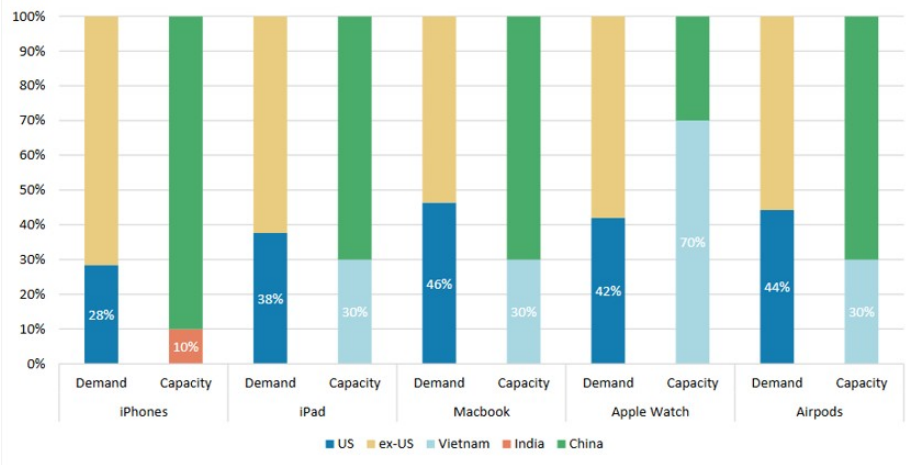
Source: Morgan Stanley Research

Exhibit 218: China battery companies have aggressive overseas capacity expansion plans into 2030



Source: Morgan Stanley Research estimates. Note: EVE capacity included its JV for commercial vehicles (10%).

Exhibit 219: Apple products – production and demand gap by region



Source: Morgan Stanley Research.

Stock Implications

We prefer: 1) companies with high/increasing overseas exposure with global recognition, competitive product lineups, and expanding global market share potential. We like **Weichai Power** for its large-bore engine global market share gain, especially in the US market, and transition into a broader power and energy equipment platform. We like **Sany Heavy Industry** for its leading position in the construction machinery market with comprehensive product matrix and broad sales network. We like **Sinotruk** for its HDT global market share gain and electric HDT expansion; and 2) companies benefitting from AI upgrades and ongoing equipment/factory intelligence. We like **Han's Laser** for its edge in PCB drilling equipment and ultrafast laser equipment, and broader laser penetration in precise processing. We like **Bochu** for its dominant position in laser cutting machine motion control systems, and its expansion into other industrial applications for advanced manufacturing.

Healthcare

Alexis Yan, Laurence Tam, Clinton Ng, Marco Wong

Non-linear globalization trajectory underpinned by industrial innovation and resilience

The healthcare sector is both an enabler and a key beneficiary of China's Industry 5.0. In ***medical devices***, we see an opportunity for China players to gain global market share in a non-linear trajectory. While the Industry 3.0/4.0 rounds of globalization were mainly driven by cost leadership and a focus on low/mid-end markets, we are entering a new globalization era underpinned more by technology breakthroughs and supply chain resilience, and tapping into major western markets. In particular, we see early evidence of China's competitiveness in high-end medical imaging, treatment equipment, surgical robotics, and high-value medical consumables. Accordingly, we expect overseas revenue to make up 50%+ of total revenue for many China medtech companies in the next 3-5 years, if not earlier. Key stock calls include **United Imaging, Mindray, Edge Medical, MicroPort** and **Angelalign**.

In drug development and manufacturing, China ***CDMO*** and ***API*** companies are already playing the role of global manufacturing powerhouse. For major CDMO and API names, overseas revenue contribution has well surpassed that of China already. Similar to medical devices, the competitiveness of Chinese companies' is no longer defined solely by cost advantages, but value generated through efficiency and innovation. This trend is apparent in particular in the CDMO space where leading players are supporting the entire drug development cycle from discovery to commercial-scale manufacturing for innovative drugs developed by MNCs. We expect by 2030, over 30% of US FDA approved, on-patent novel drugs will be manufactured in China. On the generic side, China already supplies 30% of the world's APIs by volume. Key stock calls include **WuXi AppTec**, **Huahai** and **King-friend**.

Medical devices

From net exporter to high-end challenger: China is moving up the value chain from manufacturing hub to global innovation competitor. China has evolved into one of the world's largest medical device manufacturing and export bases, with overall sector exports now exceeding imports and the country generating a net trade surplus in medical devices. However, this aggregate picture masks a more nuanced reality: historically, the global medical device industry has been dominated by US and European players, and China continues to run trade deficits in several high-end medical technology segments, including high-end imaging systems, advanced IVD platforms, surgical equipment and certain implantable devices.

Exhibit 220: China medical device trade balance, 2021-25

Year	Imports (USD bn)	Exports (USD bn)	Trade Balance (USD bn)
2025	48.0	52.4	-4.4
2024	49.1	49.9	-0.8
2023	49.1	46.0	3.1
2022	49.8	60.0	-10.2
2021	45.3	61.3	-16.0

Source: Customs data, High-end Medical Devices Research Institute

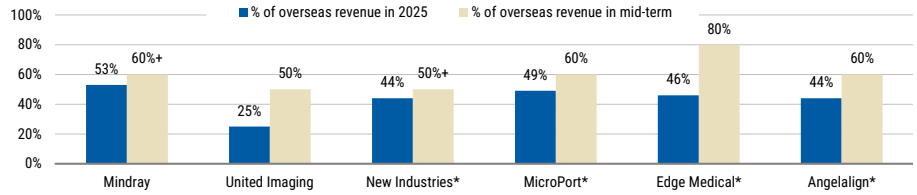
Exhibit 221: Breakdown of export categories, 2021-25

Category	2025	2024	2023	2022	2021
Diagnostic Equipment	22.3%	22.0%	25.2%	25.1%	25.4%
Medical Consumables	29.7%	29.7%	29.2%	29.4%	34.1%
Other Devices	2.9%	2.8%	3.2%	3.1%	2.9%
In Vitro Diagnostic Reagents	36.6%	36.4%	32.1%	32.5%	26.3%
IVD Analyzers	8.5%	9.0%	10.4%	10.0%	11.4%

Source: Customs data, High-end Medical Devices Research Institute

High-end segments narrowing the gap: These gaps have narrowed meaningfully over the past decade as Chinese manufacturers have expanded beyond low-value consumables into increasingly sophisticated product categories. China's medical device market has grown to become the world's second-largest, exceeding Rmb1.3tn in 2024, while exports have continued to gain global market share. Notably, Chinese companies have established competitive positions in high-end imaging equipment, such as CT, MRI and ultrasound, as well as IVD platforms, surgical robotics and clear aligners, supported by continuous investment in R&D, engineering talent and manufacturing scale. Leading domestic players such as **United Imaging**, **Mindray**, **New Industries**, **MicroPort MedBot** and **Angelalign** are increasingly competing against established multinational incumbents both domestically and overseas, reflecting China's growing role in global medical technology innovation.

Exhibit 222: Percentage of overseas revenue in 2025 vs. medium term, per company target or MSe



Source: Company data. "*" denotes MSe.

Industry 5.0 and localized supply chains as the next catalyst: Industry 5.0 is likely to accelerate this transition through the integration of AI, advanced automation and increasingly localized supply chains. Over the past decade, MNC leaders such as GE HealthCare (GEHC.O), Philips (PHIA.O) and Siemens Healthineers (SHL.O) have expanded manufacturing footprints and supplier ecosystems in China under "China-for-China" strategies, fostering the development of a comprehensive domestic supply chain spanning precision components, imaging detectors, sensors, automation systems and advanced materials. As more core technologies and components become locally produced, Chinese manufacturers are increasingly internalizing critical parts and production processes, improving quality control, shortening development cycles and enhancing cost competitiveness.

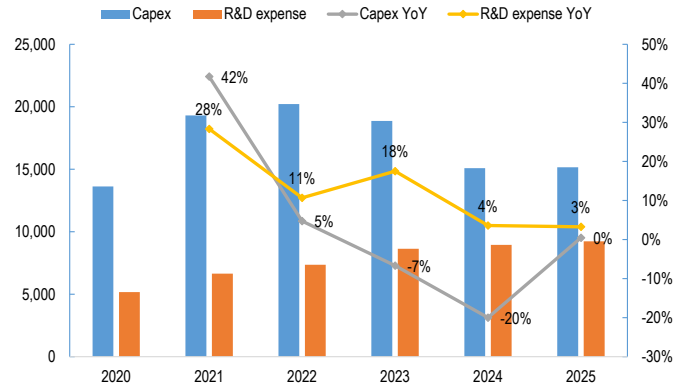
AI adoption to reinforce global competitiveness: This strengthening domestic ecosystem has helped narrow historical technology gaps and supported export growth in higher-end segments where China has traditionally relied on imports, including imaging equipment, IVD platforms, surgical robotics and clear aligners. At the same time, AI is becoming increasingly embedded across the medical device value chain, from product design and image reconstruction to clinical decision support, robotic-assisted surgery and smart diagnostics (see our China Healthcare: CMEF 2026 – Highlights and Takeaways [14 Apr

2026]). Leveraging large domestic datasets, vertically integrated manufacturing capabilities and growing engineering expertise, Chinese device companies are increasingly positioned to capture a larger share of global high-end medical technology markets over the coming decade.

API

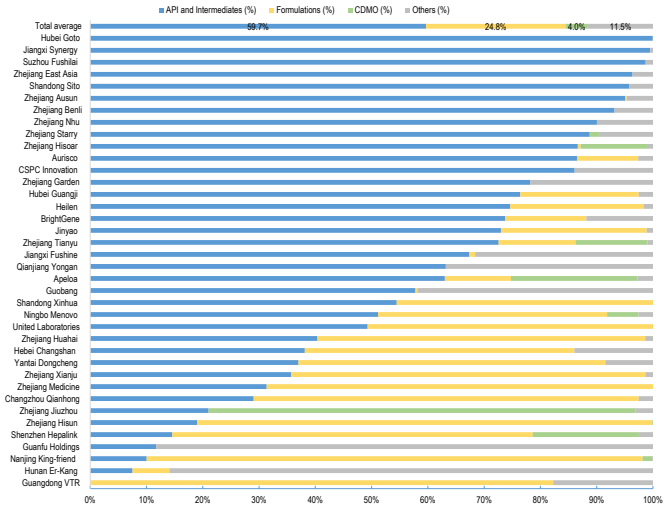
China's API competitiveness is evolving from scale efficiencies to innovation-driven value creation: China has long been a cornerstone of the global API industry, in particular the commoditized APIs such as antibiotics, vitamins and heparins. The country accounted for 30% of global API production volume (note), supported by its cost advantages, comprehensive supply chain and historical outsourcing of API production by foreign drug makers to lower-income countries. We expect market share to increase in the next phase of development, driven by vertical integration into higher-value segments, including specialty APIs, formulations, CDMO services and innovative drug development. These businesses require deeper R&D capabilities across drug discovery, complex chemical synthesis, and process development. Sector-level data suggests this transition is underway, with formulation revenue mix rising from 26.5% in 2023 to 29.3% in 2025 (note), while capex in 2025 was broadly flat vs. 2024 after two years of contraction post-Covid, suggesting peers are moving away from lower-value API manufacturing. Meanwhile, R&D spending has increased over the past five years, underscoring continued investment in manufacturing technology and product upgrading. Looking forward, commoditized APIs should remain the core base, while leading players will move up the value chain and capture incremental global share in higher-value segments.

Exhibit 223: Chinese API capex and R&D expense (2020-2025)



Source: Company data, Morgan Stanley Research.

Exhibit 224: Forward integration level and CDMO involvement for Chinese API (% of revenue base, 2025)



Note: Our basket consists of 38 constituents. Source: Company data, Morgan Stanley Research.

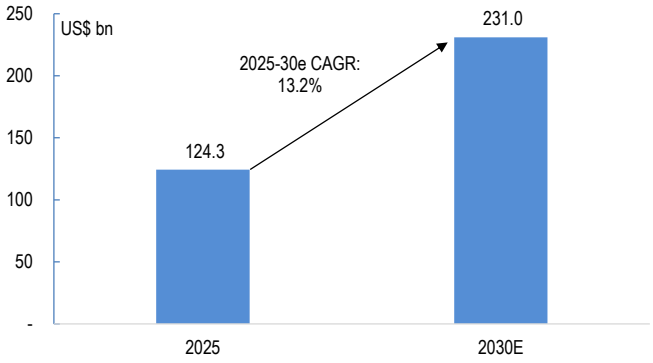
CDMO

China has become a core engine for global innovative drug development: Amid rising global R&D spending and increasing complexity in drug development, we see the outsourcing market expanding at a faster pace, with China among the largest beneficiaries. MNCs/biopharmas are more inclined in selecting Chinese CDMOs such as the WuXi family,

Asymchem and Pharmaron as preferred partners, supported by their proven execution track record, expertise in novel modalities, cost efficiency, quality and capacity. In 2025, these players generated at least two-thirds of their revenue from overseas markets. This trend is particularly evident in innovative small molecules, where drug design and manufacturing have become increasingly complex over the past five years, reflected in heavier molecular weights, larger compounds and longer synthesis routes (note). Over the past seven years, WuXi AppTec achieved an average win rate of ~30% in small-molecule commercial manufacturing contracts for recently approved drugs, underscoring the rising relevance of Chinese CDMOs in global innovative competition. We expect over 30% of US FDA approved, on-patent novel drugs will be manufactured in China by 2030.

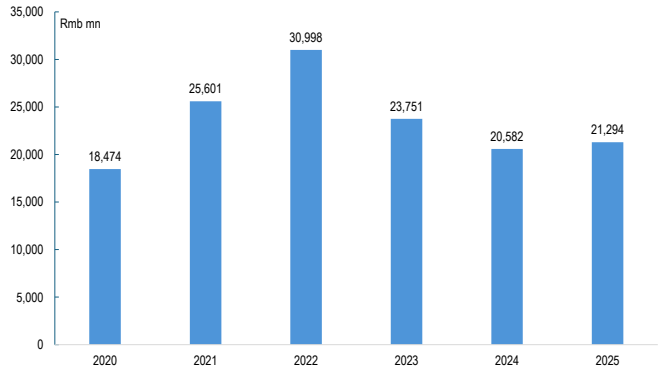
Capacity and supply chain diversification matter in the next phase of development: When drug projects progress into late-stage and commercial manufacturing, capacity needs can rise exponentially (from μg to kg), making scalable and GMP compliant supply a key criterion for MNC outsourcing decisions. Currently, we see particular tightness in global small molecule capacity, while demand for biologics continues to ramp. On a sector level, capex spending has begun to recover in 2025 after the post-Covid pullback, with leading Chinese CDMOs guiding for faster capex deployment in 2026. This is a sign of stronger MNC outsourcing propensity and staying ahead of the next wave of new drug launches and potential blockbusters. Meanwhile, AI has been an enabler across the drug development cycle and manufacturing process. For example, WuXi Apptec is leveraging AI on top of its automated HTS, virtual screening, CADD and DMPK platforms to accelerate hit identification, lead optimization, and early screening of weaker candidates. On manufacturing, it is using both AI and automation to improve route design, process control, impurity prediction, deviation detection and batch consistency, supporting higher manufacturing quality and faster CMC execution (note). Lastly, a majority of capex is now going to overseas markets as customer preferences shift towards a more regionalized model amid geopolitical instability.

Exhibit 225: Global CDMO market size (2025-2030e)



Source: Frost & Sullivan, Morgan Stanley Research (E) estimates.

Exhibit 226: Chinese CDMO capex (2025)



Note: Our group consists of 22 constituents. Source: FactSet, company data, Morgan Stanley Research.

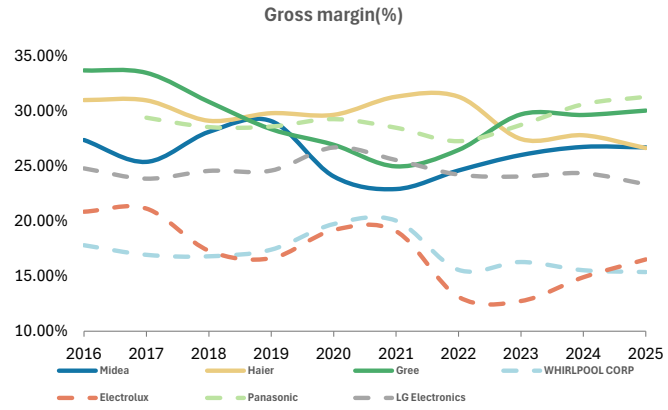
Home Appliances

Lillian Lou, Hildy Ling, Carlos Liu

Leadership in cost and production efficiency: Scale manufacturing, product reliability and cost efficiency are key elements in home appliance companies' core competencies. China's home appliance manufacturers have demonstrated their strong cost control and operating efficiency advantages vs. global peers in terms of margin performance. We believe continued AI development and application across the industry could lead to further productivity gains and eventually support capital returns. We see three areas where AI can drive efficiency improvements:

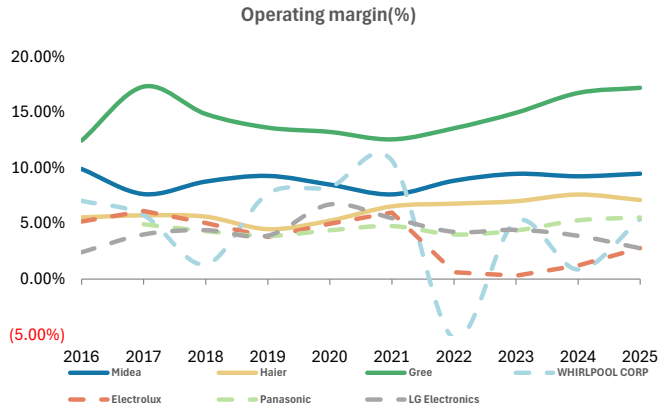
- **Manufacturing:** Adoption of robotics and AI automation manufacturing processes will shorten lead times and improve quality consistency, leading to: 1) lower unit labor costs; 2) lower defect rates; and 3) higher throughput. Midea targets 0.3ppt savings from its manufacturing expenses ratio in 2026 by leveraging its new tech adopted in the manufacturing process.
- **Supply chain:** AI- and data-driven supply chain management with more accurate and real-time forecasting and procurement leads to: 1) lower inventory levels; 2) lower procurement costs; and 3) improving working capital efficiency.
- **Operating expenses:** Corporate integrated digitalization systems contribute to resource allocation and management efficiency, leading to lower selling and marketing inefficiency. We have seen signs of operating efficiency improvements from Haier and Midea in 1Q26.

Exhibit 227: GPM comparison



Source: Visible Alpha, Morgan Stanley Research

Exhibit 228: OPM comparison

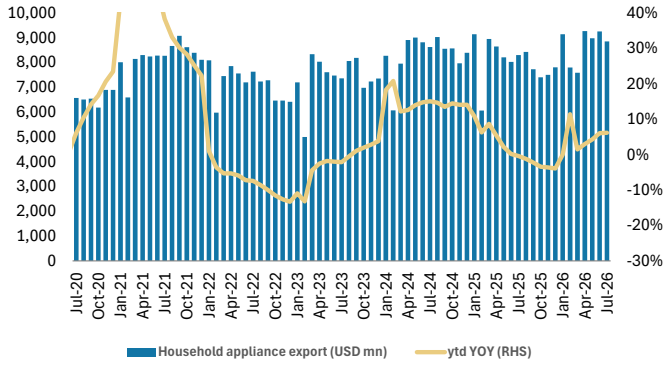


Source: Visible Alpha, Morgan Stanley Research

Overseas expansion – from cost-led exporters to tech-led global operators: In the past, cost advantage and operating efficiency were major factors that contributed to home appliance exports from China, and overseas businesses were mainly started from OEM (Original Equipment Manufacturer) models. Now, companies are establishing global production/service networks to expand their business scope globally (i.e., local-for-local). For example, Midea targets >50% overseas revenue contribution by 2028 for its smart home solutions, with its OBM (Original Brand Manufacturer) business to exceed OEM (achieved in 1H26), and expects OBM's profitability to improve as scale drives pricing

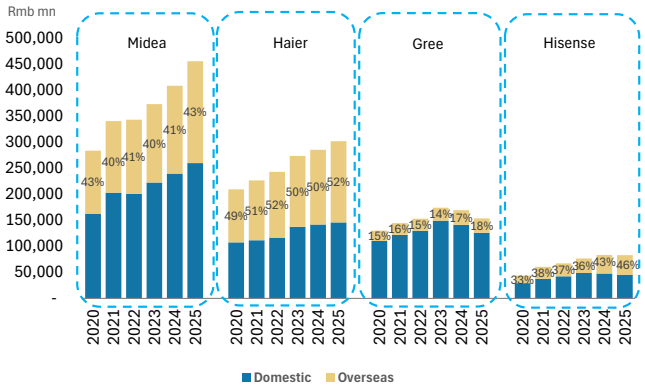
power and cost efficiencies (read more details in Midea's 2026 Investor Day).

Exhibit 229: China's home appliance exports



Source: General Administration of Customs, Morgan Stanley Research

Exhibit 230: Revenue breakdown by domestic and overseas for major players

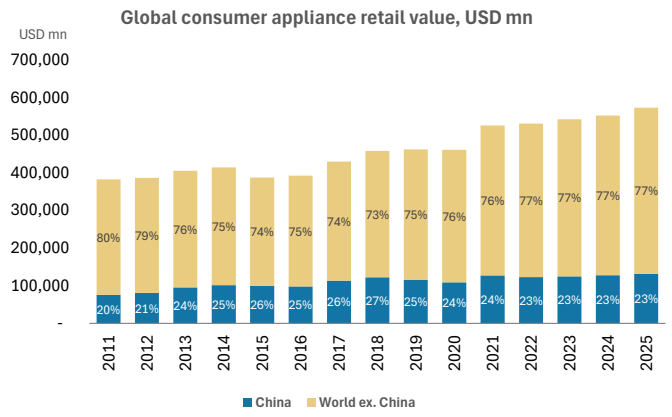


Source: Company data, Morgan Stanley Research

We have seen Chinese brands' market share in overseas markets steadily increase to over 10% in 2025 vs. 6% in 2016, and we see opportunities where AI and tech breakthroughs can further support rapid overseas expansion for key players (on top of the existing cost and efficiency advantages), by increasing the acceleration to OBM models and strengthening brand image, thus bringing profitability upside.

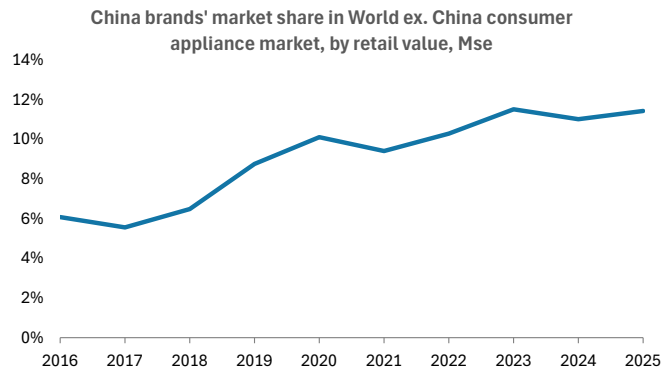
- **Fast localized product adaptation:** Data-driven consumer insight analysis enables region-specific product design and innovation.
- **Mass customization + flexible production:** IoT and AI-driven manufacturing processes support customization of production lines and resources allocation to fit specific needs in different scenario/regions (i.e., Haier COSMOPlat).
- **Smooth and quick after-sale services to enhance global customer stickiness:** Online platforms with Agency Models support seamless one-stop services, improving the local customer experience.

Exhibit 231: China accounted for 23% of the global consumer appliance market in 2025



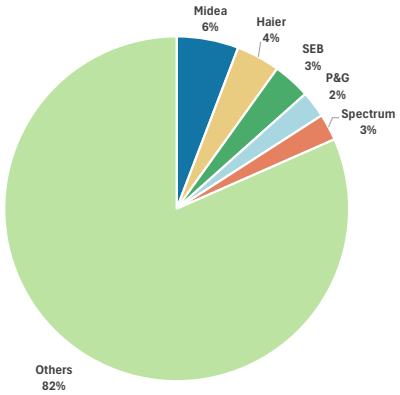
Source: Euromonitor, Morgan Stanley Research

Exhibit 232: Chinese brands are gaining share in overseas markets



Source: Euromonitor, Morgan Stanley Research estimates

Exhibit 233: Consumer appliances global market share by volume, 2025

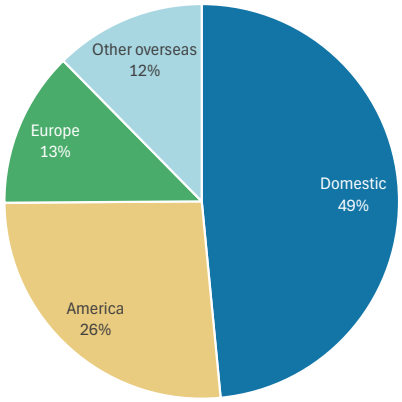


Source: Euromonitor, Morgan Stanley Research

Local-for-local: Instead of exporting Chinese-made products, Midea and Haier are shifting to a local-for-local strategy, where products are designed, manufactured, and sold within the same regional market. For example: Haier's GE Appliances in the US designs refrigerators specifically for American kitchens rather than importing Chinese models. Midea's factories in India manufacture air conditioners designed for India's climate and price points.

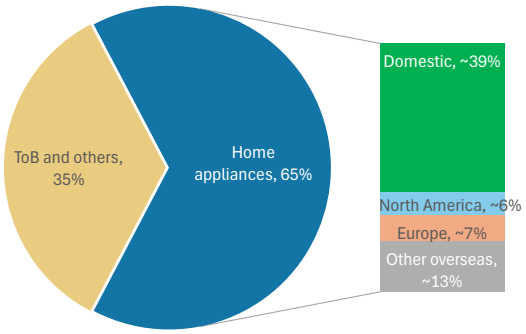
Haier has adopted a "global 3-in-1" (R&D + manufacturing + marketing) integrated localization model with distributed local centers across regions, and owns over 60 overseas factories by 2025. For Midea, it has built "2+4+N" globalized R&D networks, namely two Global Innovation Centers in Shanghai and Foshan, four key global R&D centers in the US, Germany, Italy, and Japan, along with other overseas local R&D centers. Midea held 29 overseas R&D centers and 43 overseas production centers as of 2025.

Exhibit 234: Haier total revenue breakdown by region (2025)



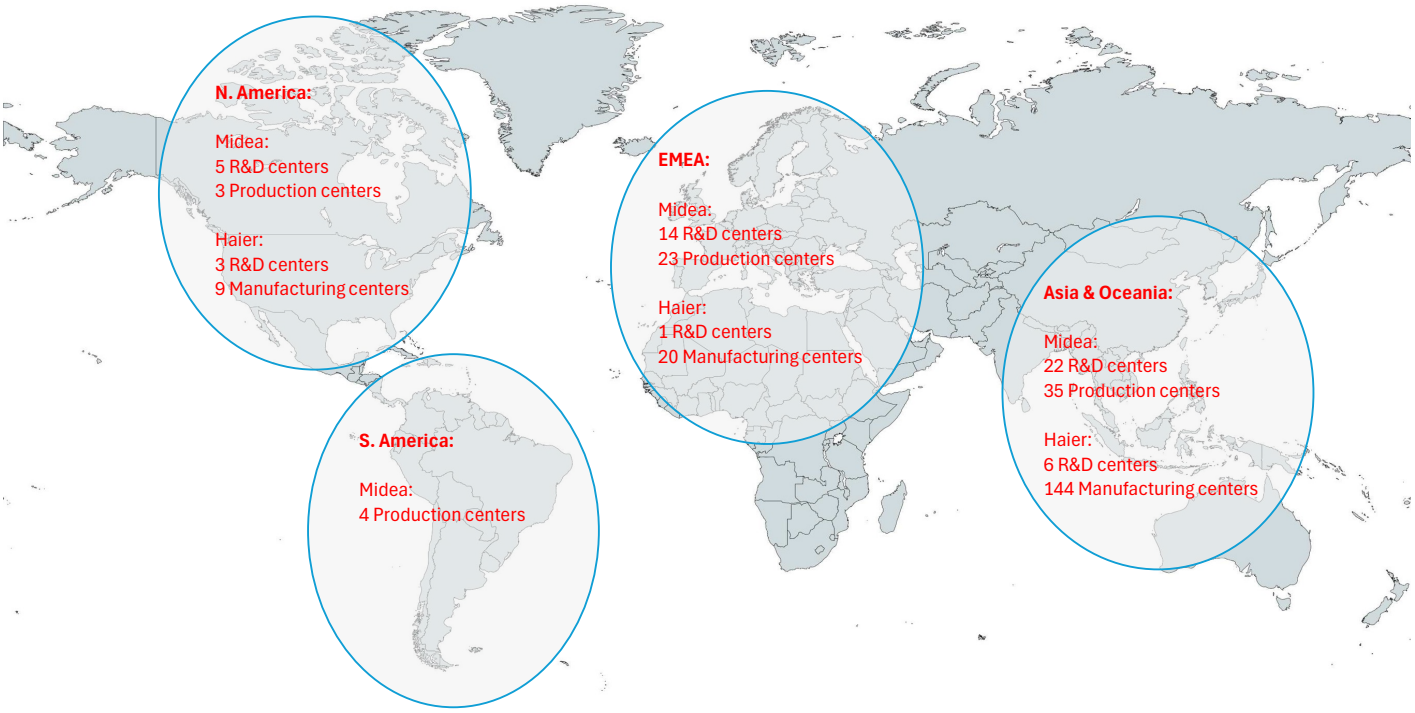
Source: Company data, Morgan Stanley Research

Exhibit 235: Midea total revenue breakdown by region (MSe, 2025)



Source: Company data, Morgan Stanley Research estimates

Exhibit 236:
Global footprint of Midea and Haier



Source: MapChart.com, official website of Haier and Midea, Morgan Stanley Research. Note: Gree did not disclose R&D and production sites details.

By category, global expansion and penetration is most visible for emerging categories/ verticals where local brands are not that established, while Chinese brands are competitive for product quality and value proposition (i.e., robot vacuum cleaners [RVC]) with early adoption of AI.

For the traditional white goods category, companies are expanding overseas from market-share gains by leveraging their Chinese experience (e.g., product design, sales strategy, etc.) and M&A. We see continued overseas penetration potential for their own brands on the back of enhanced global networks, powered by AI-driven flexible production and distribution abilities.

Exhibit 237: Key overseas home appliance brands operated/ acquired by Haier and Midea

	Haier	Midea
North America	GE APPLIANCES	eureka PELONIS
Europe	CANDY Hoover	comfee Master Kitchen
APAC / Oceania	AQUA	TOSHIBA

Source: Midea, Haier, Morgan Stanley Research

Exhibit 238: Recent major overseas M&A activities by Haier and Midea

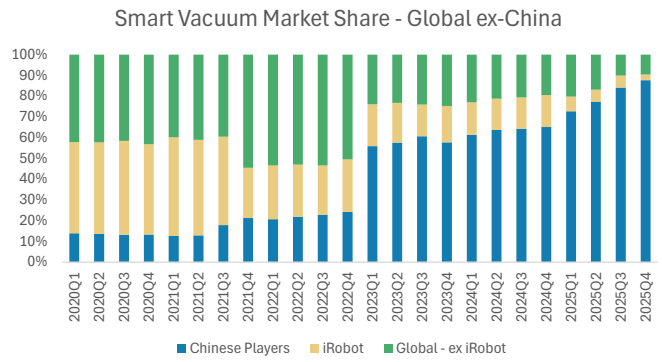
	Haier		Midea	
Target company	Carrier Commercial Refrigeration	Kwikot	Arbonia Climate	Teka Industrial, S.A.
Completion date	2024.10	2024.12	2025.2	2025.4
Region	EU/APAC	Africa	EU	EU
Main business	Commercial refrigeration	Water heater manufacturing	HVAC	Kitchen appliances

Source: Midea, Haier, Morgan Stanley Research

For the quick evolving RVCs category, we believe global expansion has been, and will

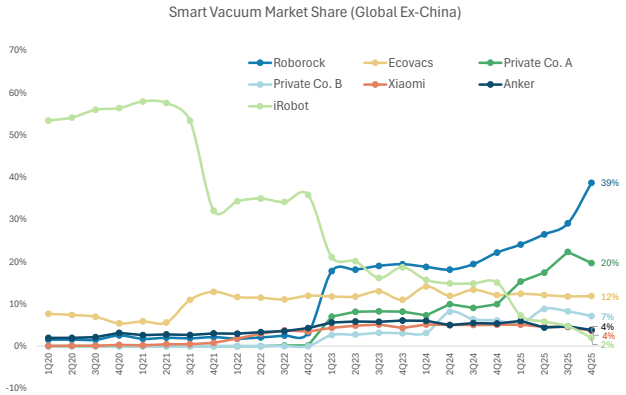
remain, the key growth driver for Chinese cleaning-appliance companies. We expect the global ex-China RVC market to grow at a 20% CAGR over 2025-28, outpacing China's 10% given low ownership rates. Outside of North America and Western Europe, household ownership of RVCs is still estimated at below 2.5% in 2025. The ex-China RVC market is estimated at US$8.9bn in 2025, equivalent to 3x the size of China. By 2028, we expect it to reach US$15.6bn, or 4x China's market size. Chinese companies are leading the RVC market because **they have turned the category from a basic vacuuming device into a smart home-service robot**. Product innovation has accelerated from suction power and LiDAR navigation to AI obstacle avoidance, robotic arms, edge mopping, hot-water mop washing, self-cleaning docks and multi-surface automation.

Exhibit 239: Global ex-China smart vacuum market share since 1Q20



Source: IDC, Morgan Stanley Research

Exhibit 240: Global ex-China smart vacuum market share since 1Q20 – key players



Source: IDC, Morgan Stanley Research

Stock implications: We prefer **Midea (OW, 000333.SZ/0300.HK)** the most as the key beneficiary of AI breakthroughs and one of the pioneers in terms of China home appliance manufacturers expanding into the global market, supported by its appliance scale, industrial automation, smart-home ecosystem development and manufacturing AI capabilities. Overseas markets are Midea's strategic long-term growth driver for its home appliance segment, with the majority of capex in the home appliance segment being allocated to overseas capacity, we estimate. Its trading multiple of 12.9x 2027e P/E is lower than its average of 13.6x since 2017 (A share), and also lower than the global home appliances peer average of 14x, which looks attractive given an 8% 2025-28 earnings CAGR and 5-6% dividend yield during 2027-28.

We also like **Roborock (OW, 688169.SH)**, the leading smart cleaning appliances company in China and globally, with 30% market share in the global RVC market in 2025. Roborock's R&D and focus on tech-product innovation should ensure it remains a leading RVC brand globally. It was the first company to launch an RVC with a mechanical arm to the mass market, showcasing its R&D and manufacturing capability. Its strong brand power supports expansion in its product categories and ecosystem building. We view the current valuation of 17x 2026 P/E and 12.5x 2027E P/E, and an EPS CAGR of 43% over 2025-27, as compelling.

Financials

Key enabler and beneficiary of Industry 5.0

Richard *Xu, CFA, Chiyao Huang, Beryl Yang*

China's financial system has undergone continued reform, reshaping the system to provide sustained support for China's unique decentralized industrial supply chains. Long investment horizons, more visible cycles, the wide divergence between company and sector ROEs, and the large numbers of SMEs needed to support industrial supply chains that cover all industrial categories are key challenges in funding their sustainable development. Through balancing the financing need between the service and industrial sectors, deflating the housing bubble, establishing a proper mix of government supportive funds, private PE/PCs, an IPO market tilted towards hard tech firms and a more sustainable banking system, China's financial system has resolved many of the challenges of recent years, and is ready to support continued industrial upgrades and expansion for years to come, in our view. In addition, we think enhanced financing models for infrastructure investments will continue to drive a positive loop between infra investments and industrial upgrades.

At the same time, we believe Industry 5.0 and ongoing industrial upgrades and investments will provide healthy and sustainable credit demand for the financial system, and support financial asset yield and healthy returns for financial firms in China. We expect the additional industrial investments under Industry 5.0 to support an additional 1ppt of loan growth in China over the next 10 years, underlining our view that China's financial system has returned to a positive development loop, which could support an 80bps rebound in average financial asset yields in China over the next three years, vs. our current estimate of 50bps.

China's financial system is a key enabler of industrial upgrades

1. China has built a strong mix of various funding channels for sustained industrial upgrades through proper financial regulation and innovation in recent years

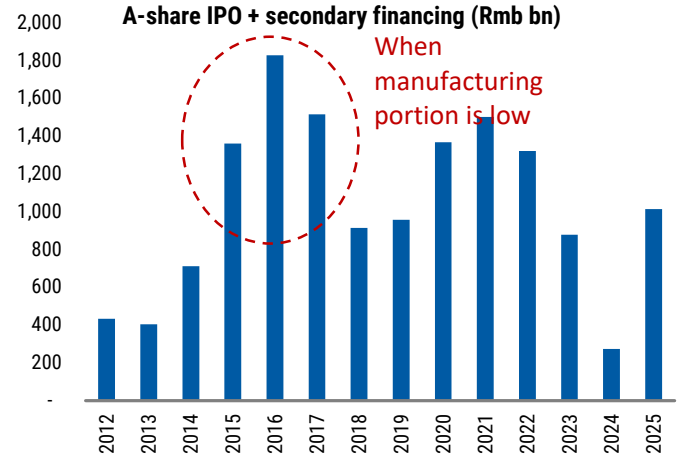
China has developed a comprehensive funding ecosystem for innovation that spans bank credit, capital markets, PE/VC, and government funding. Each plays a distinct role:

Banks are better positioned to service credit demand along the supply chain and scale up verified technologies. High-end manufacturing could be increasingly chased by PE given potentially large upside, and registration-based IPO could also make it easier for market leaders to tap into the secondary equity market. Even so, the majority of industrial firms – many of which are mid-size or small – along various supply chains may still not appear interesting enough to the general equity market. It could therefore make it more costly for investment firms to identify opportunities – whereas banks, thanks to their wide natural reach to companies via bank accounts and settlements, as well as sufficient manpower, are better positioned to source such credit demand.

In addition, the setup of AIC (Asset Investment Company) and improved cooperation among commercial banking, investment banking and asset management units may allow certain leading banks to gain market share in the PE/VC market, given their more comprehensive knowledge of specific supply chains.

Capital market reform channels equity capital to hard tech. We note the trend of increased financing by manufacturing companies in the A-share market in the past three years, up from 45% of total equity market financing (IPOs and follow-on) in 2018 to 64% in 2021, in-line with the general and gradual shift to the manufacturing sector. The launch of a high tech board (STAR Market) and registration-based IPOs have been key to channeling capital to high tech, particularly hard tech sectors.

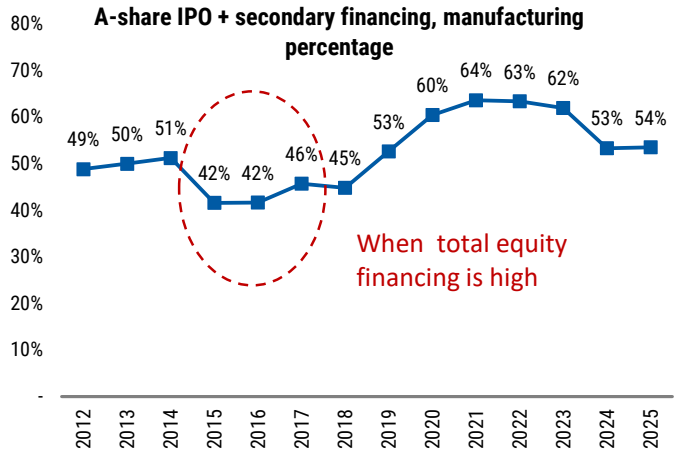
Exhibit 241: A-share equity financing in past years



Source: WIND, Morgan Stanley Research

Note: A notable increase in 2025 was due to capital injection to SOE banks

Exhibit 242: Share of manufacturing in A-share equity financing rose in 2019-2022

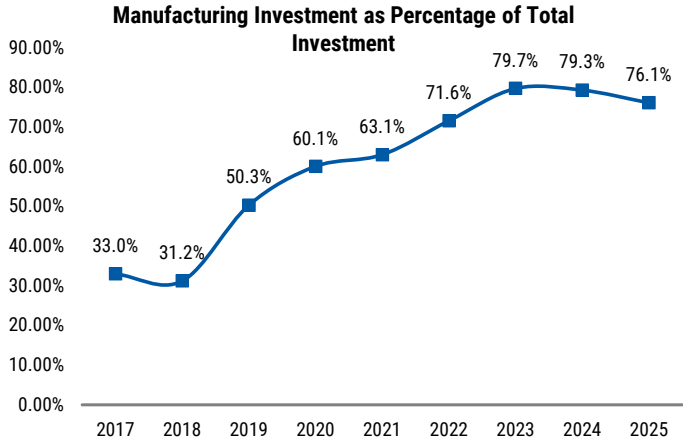


Source: WIND, Morgan Stanley Research

Note: 2025 data excludes capital injection to SOE banks.

PE/VC best at supporting early stage innovation. State-backed funds started playing a bigger role when market-oriented funding took a step back due to cyclicality, because government money has a different risk-reward profile and payback logic.

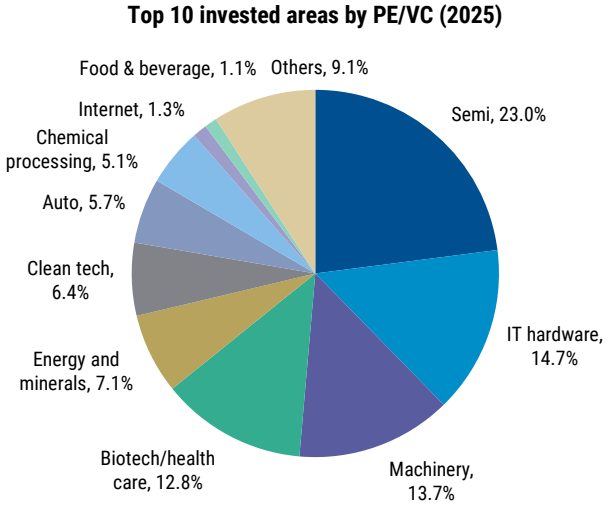
Exhibit 243: PE/VC investment in manufacturing increased from 33% in 2017 to 63% in 2021 by amount, and picked up further to >75%



Source: PEDATA, Morgan Stanley Research

Note: Manufacturing is calculated by combining Biotechnology, Machinery, IT hardware, Semiconductors and Electronic equipment, Chemical, Food and beverage, Automobile and Textile

Exhibit 244: Biotech, semi and IT hardware are among the most invested areas by PE/VC in 2025

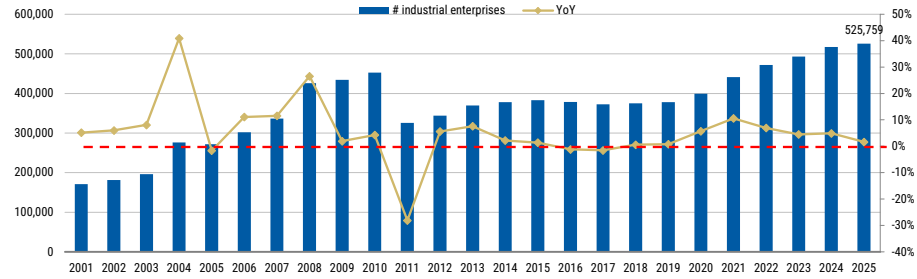


Source: PEDATA, Morgan Stanley Research

2. Funding the capillaries – millions of SMEs on different supply chains

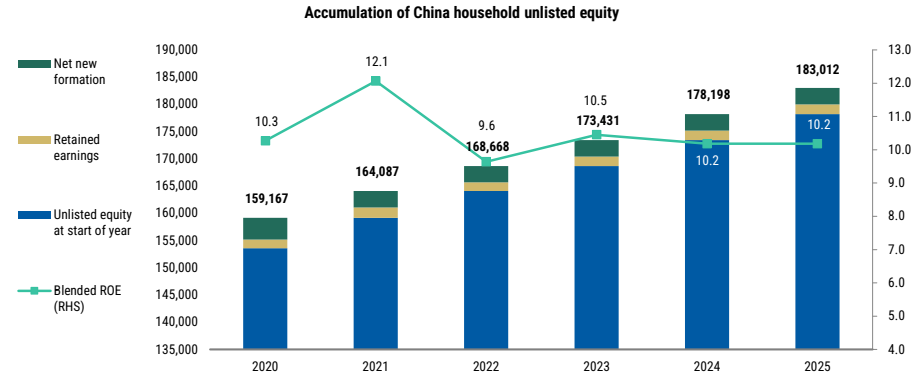
China has unique competitive advantages in its decentralized industrial supply chains that cover all industrial sectors. This allows it to achieve quick product innovation and upgrades, more efficiency gains, and lower costs. We believe China's competitive advantages in industrial sectors have been further strengthened in recent years, aided by a shift in policy and resources to this area.

Exhibit 245: The number of industrial enterprises reached 525,759 as of end 2025, with growth picking up since 2020



Source: NBS, CEIC, Morgan Stanley Research

Exhibit 246: We estimate unlisted equity held by China's households reached Rmb183tn by the end of 2025, driven by rebounding business profitability and new business formation



Source: CEIC, WIND, NBS, National Institution of Finance and Development, Morgan Stanley Research

Banks have an unparalleled reach in the economy, serving a large base of SME customers, and can deal with information asymmetry better than capital markets owing to their day-to-day interactions with SMEs. As a result, banks provide credit to 30mn of the 120mn SMEs in China, with a total balance of over Rmb25tn for SME and small business loans.

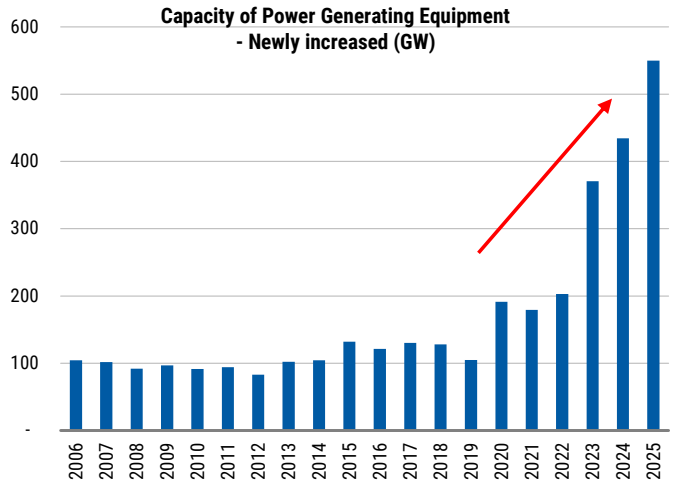
Emerging technologies – such as blockchain, Internet of Things (IoT), and optical character recognition – have in recent years been helping financial institutions to improve efficiency and extend supply chain finance, likely leading to faster growth in such credit. Combined with many government-led public data-sharing programs, this should improve efficiency in serving industrial- and trade-related credit demand.

3. Long-term dedicated support of infrastructure buildout with improved project selection and financing models should create a positive loop between infra investments and industrial upgrades

Infrastructure investment has made up 30-40% of total fixed asset investment in China in recent years, amounting to over Rmb20tn per annum, as China is upgrading infrastructure such as telecom and high-speed railways in preparation for the next phase of growth.

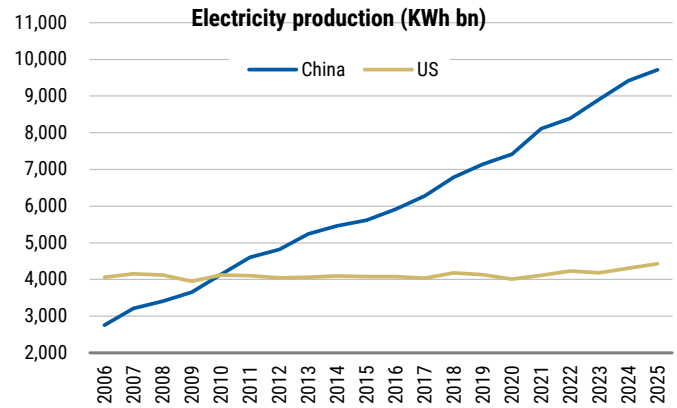
This has not only provided a cushion for job creation, household income and financial asset growth, but also supported revenue and EBIT generation in key industrial sectors, contributing to ongoing industrial upgrades. China's electricity production has expanded rapidly, surpassing the US notably in recent years, reaching close to 10,000bn KWh – a critical enabler for energy-intensive manufacturing and emerging technology sectors.

Exhibit 247: The capacity of power generating equipment has grown rapidly since 2020, especially in 2023



Source: China Electricity Council, Morgan Stanley Research

Exhibit 248: Electricity supply in China has picked up continually, while electricity supply in the US has tended to be stable



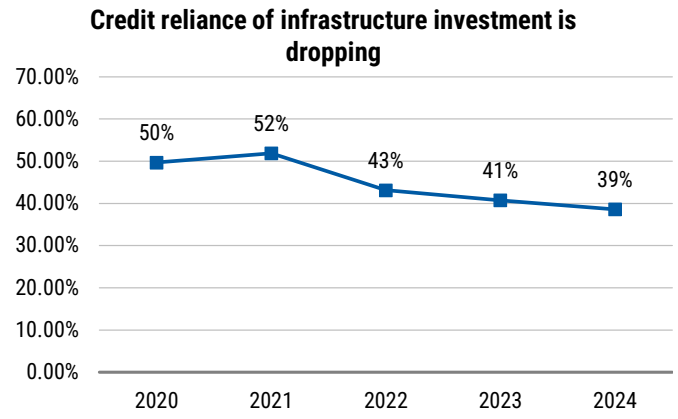
Source: NBS, U.S. Energy Information Administration, Morgan Stanley Research

Policymakers have also shifted infra investment to modern infra projects, such as data centers and smart cities, which could create a positive loop for industrial sectors – creating demand for high-end manufacturing products rather than just cement and steel.

The new regime of infrastructure project selection could help improve credit allocation efficiency. First, our analysis shows that policies introduced to tighten up control over low-quality LGFV debt and low-quality projects financed by special local government bonds have not only led to slower growth in LGFV debt, but also resulted in debt allocation shifting to more productive projects with better cash flows. This has already resulted in a notable reduction in infrastructure projects' reliance on credits. Second, the shift from funding infrastructure via higher cost, less transparent LGFV debt to official local and central government debt has also led to a more efficient centralized project selection process that has eliminated many low-return and no-return projects previously selected by city and county governments, which should improve credit allocation efficiency compared to the previous regime where weaker regions also took on large LGFV debt.

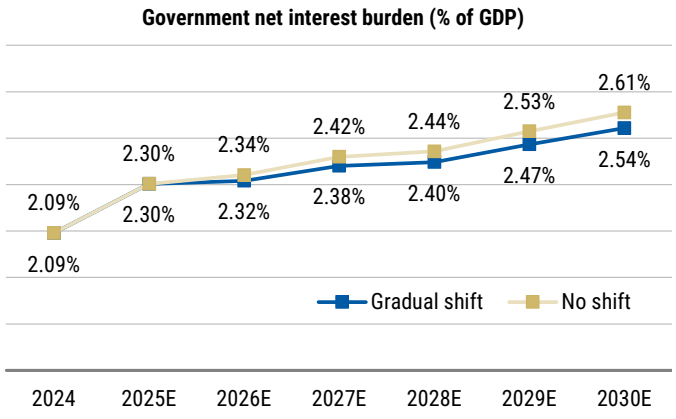
Our analysis shows that the net interest burden should remain manageable despite rising debt to GDP, given the large asset base owned by the various levels of government and stabilization or even rebound in infrastructure investment ROA. We expect the government's net interest burden to rise modestly in our base case of a gradual shift of fiscal resources from infrastructure to consumption, to 2.54% by 2030E from 2.09% in 2024. In addition, the government could choose to gradually privatize and securitize parts of government SOE assets to cover some debt repayments or interest payments, if needed, which would also keep the net interest burden in check.

Exhibit 249: New infrastructure investments have become less credit dependent – a sign of more efficient project selection



Source: CEIC, PBOC, NBS, NAFR, MoF, Morgan Stanley Research

Exhibit 250: Government net interest burden to increase modestly to 2.6% in 2030



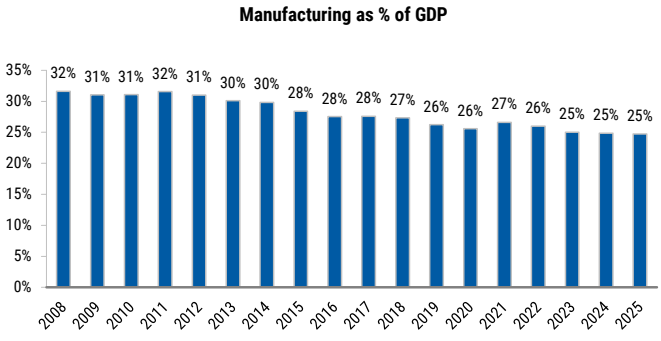
Source: WIND, CEIC, NBS, MoF, PBOC, company data, Morgan Stanley Research (E) estimates

Coordinated policy support is essential for industrial upgrades

1. Policy has directed financial resources to focus back to industrial from service sectors in 2021

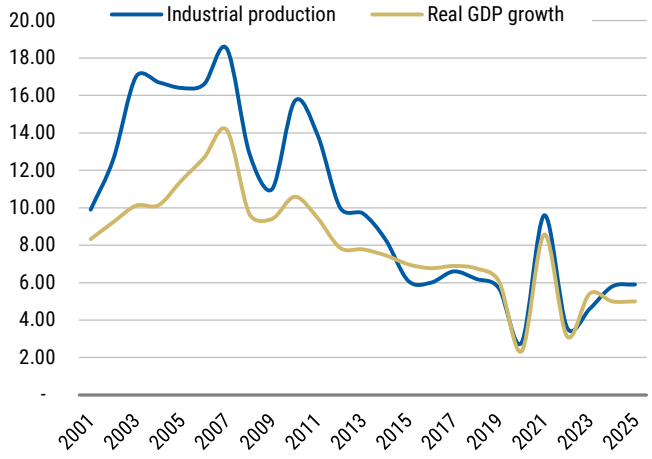
We believe policymakers are trying to maintain a more stable GDP contribution from the industrial sector following a decline from 32% in 2012 to 26% in 2020, because the industrial sector can support quicker productivity gains at this stage of China's economic development. We have seen a coordinated policy direction to shift resources back to manufacturing sectors to preserve and improve China's highly competitive decentralized industrial supply chain that is composed of millions of SMEs.

Exhibit 251: 2021 is the first year when we started to see a rebound in manufacturing's contribution to GDP after more than a decade



Source: NBS, CEIC, Morgan Stanley Research

Exhibit 252: Industrial production growth has lagged real GDP growth since 2015



Source: NBS, CEIC, Morgan Stanley Research

What measures have been taken, and what has been achieved?

Policymakers have launched a series of initiatives to help channel more financial support into the industrial sector and supply chain, including:

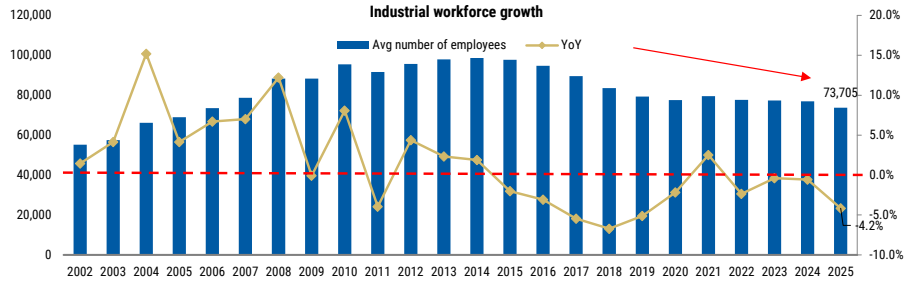
- the launch of a high tech board and registration-based IPO to channel capital to high tech sectors;
- pushing banks to shift lending priority to industrial firms and SMEs;
- heavy IT investment by banks in manufacturing and supply-chain financing;
- a comprehensive database of companies launched by local government to help bridge the information gap between companies and financial firms;
- ongoing improvement in domestic and global payment processing efficiency;
- containment of local SOE and property loans to reduce competition with industrial loans; and
- containing financial activities that are purely for trading/speculation (or financial self-circulation).

Fiscal and tax policies have also favored industrial firms in recent years:

- Almost the entire incremental fiscal support in 2022 has been allocated to local governments for VAT cuts, which will benefit the industrial sector more.
- Changes in the land sales revenue collection process essentially should encourage local government to focus on development of the industrial sector vs. property.
- Further increases in the tax exemption threshold for businesses also favor business formation.

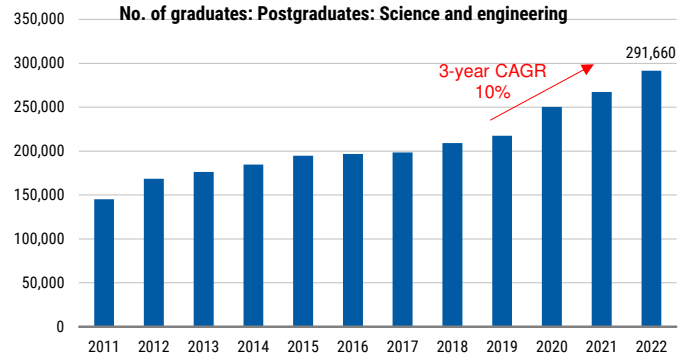
Some of these policies are also designed to address the secular decline in the industrial workforce since 2014. The total industrial sector at its peak employed >100mn people in 2014, after which the workforce started to shrink about 4% per year, falling to 74mn in 2021.

Exhibit 39 The workforce of industrial sectors has been declining since the peak in 2014



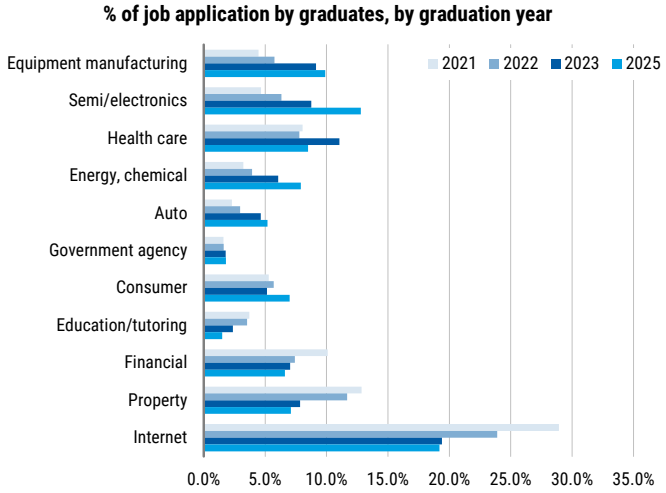
Source: NBS, CEIC, Morgan Stanley Research

Exhibit 253: The number of postgraduates in scientific and engineering fields has continued to rise in recent years



Source: MOE of PRC, WIND, Morgan Stanley Research

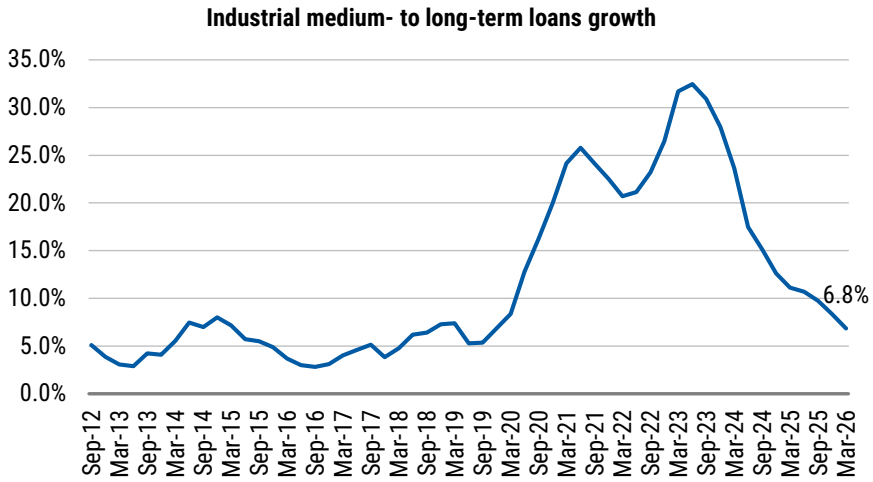
Exhibit 254: China's shift in focus to industrial sectors has been reflected in a notable increase in graduate job applications in manufacturing sectors vs. a sharp drop in the internet, property, and financial sectors



Source: Liepin

The effect is clear: Total Social Financing to industrial and hard tech rebounded to 16% in 2021 from 4% in 2017, and we expect it to reach 24% by 2030. Industrial medium- to long-term loans, which are typically used to support industrial capex, decelerated to 4% annual growth during 2015 and 2017, but rebounded strongly to 20% in both 2020 and 2021, helped by more policy guidance, and started to outpace overall RMB loan growth from 2020. This has supported a rebound in manufacturing FAI since 2020.

Exhibit 255: Industrial medium- to long-term loan growth moderated to 6.8% yoy in 1Q26



Source: PBOC, Morgan Stanley Research

PE/VC investment has pivoted decisively to manufacturing and hard tech. PE/VC investment in manufacturing increased from 33% in 2017 to 63% in 2021 by amount. The

most invested areas by PE/VC in 2021 were biotech/health care (18%), semiconductors (17%), and IT hardware (16%), whereas in 2017, telecoms (16%), Internet (14%), and finance (9%) were more favored.

2. Central and local governments are playing a key role in nurturing innovation

These efforts include:

- Specialized industrial parks: A series of initiatives by various local governments to improve supply chain efficiency via more carefully planned and specialized industrial parks.
- Industrial internet, automation, and R&D investment: Investments in and promotion of industrial internet, automation, and R&D.
- Infrastructure shift to data centers and smart cities: A shift in infrastructure investment to more data centers and smart cities, which would create demand for high-end manufacturing products rather than just cement and steel.
- Setting up national and local level investment funds to invest in innovative companies at different stages.
- Education reform: Education reform to balance future talent supply for both the industrial and service sectors.

Notably, SOE capital investment platforms – essentially PE/VC funds – were formed to meet the financing needs of industrial projects. These platforms were a direct extension of local government policy, designed to fill the equity financing gap for industrial and hard-tech companies that were too small or too early-stage for traditional bank credit, and private P/E and VC funds.

While market-oriented PE/VC activities were cooling down in 2023 and 2024 due to a sharp fall in IPOs, government-led funds partially filled the gap, given they are somewhat different than purely market-oriented funds. The former's objectives usually go beyond purely financial returns, which could also include the need for investees to set up local production or headquarters, which could generate tax revenue as another form of payback.

Example: Beijing E-Town Capital

Beijing E-Town Capital was incorporated in February 2009 as a state-owned investment and financing platform to support the Beijing Economic Technology Development Zone. The company mainly invests in new-generation IT, biotech and health, EV, robotics, and smart manufacturing via private equity funds. By the end of 2023, the company's total assets exceeded Rmb116bn, with 199 investment projects and total investment exceeding Rmb89.5bn. Notable investments included BOE's A-share private placement, the Singularity Power fund (Rmb4bn+) investing in the integrated circuit industry, and the acquisition of Nexteer from General Motors for US$480mn – the biggest overseas acquisition for China's auto parts industry at that time.

Example: Government investment in the creation of China's two biggest memory makers

YMTC and CXMT represent two of China's most consequential semiconductor investments, both founded in 2016 with massive state backing at a time when China had virtually zero domestic capability in memory chips. Government funds entered at inception, with the National IC Industry Investment Fund Phase I co-founding YMTC alongside Tsinghua Unigroup and Hubei provincial capital, while Hefei municipal government funded three-quarters of CXMT's initial investment alongside GigaDevice founder Zhu Yiming.

National IC Industry Investment Fund Phase II subsequently invested a combined Rmb44.5bn across YMTC entities and Rmb32bn across CXMT entities through multiple rounds from 2020 to 2024, joined by an expanding roster of strategic investors including Alibaba, Tencent, Xiaomi, and all five major state bank AICs.

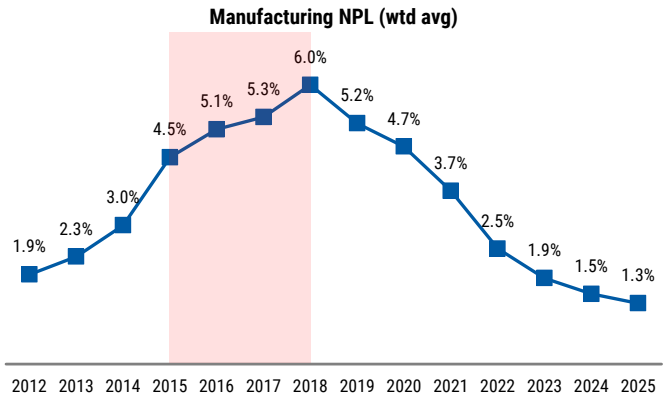
After nearly a decade of cumulative losses totaling tens of billions of RMB, both companies have now reached profitability inflection points amid the AI-driven storage supercycle: CXMT posted Rmb24.8bn in 1Q26 net profit alone, while YMTC's 1Q26 revenue exceeded Rmb20bn with global NAND share surpassing 10%. Today, YMTC is the world's #4–5 NAND flash producer and CXMT is the #4 DRAM maker. This effectively validates the "patient capital" model of Chinese state-led industrial policy, which fundamentally reshaped the global memory chip landscape that was once exclusively dominated by Korean and US players.

3. Interest rates have remained reasonable to enable the financial system to digest risk through the cycle and continue to supply credit to industrial sectors

In recent years, Chinese policymakers have shifted from using window guidance to push down lending rates, toward maintaining lending rates at a reasonable level. Notably, since 2H25, regulators have effectively established a floor for mortgage rates and consumer lending rates at around 3%. In 1H26, they extended this approach to corporate loans, setting a minimum lending rate no lower than the after-tax yield of comparable government bonds.

This shift is important because the credit costs associated with supporting industrial supply chains can be significant. Unlike infrastructure lending, which has maintained relatively stable credit quality despite persistent market concerns, industrial and trade finance lending have experienced notable NPL cycles. The weighted average manufacturing NPL ratio among banks under our coverage increased from 2.0% in 2012 to 6.1% in 2018, with cumulative NPL formation equivalent to 24% of loans between 2016 and 2021. As of 1Q26, we estimate that roughly 7% of outstanding industrial loans remain high risk.

Exhibit 256: Manufacturing NPL ratio picked up notably in 2015-2018



Source: Company data, Morgan Stanley Research

Exhibit 257: Major listed banks have cumulatively digested 26% of manufacturing and trade finance loans as NPLs in 2016-2020

NPL digestion 2016 - 2020	Manufacturing	Trade finance	Manufacturing + Trade finance
ICBC	20%	57%	28%
CCB	26%	20%	24%
BOC	20%	15%	18%
ABC	21%	44%	26%
CMB	29%	30%	29%
Citic	37%	67%	47%
Minsheng	38%	33%	36%
CEB	30%	45%	34%
Aggregate	24%	30%	26%

Source: Company data, Morgan Stanley Research

We expect through-the-cycle NPL formation of manufacturing credit to range between 1.9% and 3.3% annually, according to the analysis above. Considering 50% final loss content (the portion of NPLs that can't be recovered eventually), this results in around 1% to 1.7% of credit cost inherited in loan pricing. Overall, we think manufacturing-related loan rates will probably need to stay no lower than the range between 4.1% and 4.8% to make them economically sustainable for banks through the cycle.

Exhibit 258: We estimate manufacturing loan yields need to stay no lower than between 4.1% and 4.8% to make them economically sustainable for banks

Cost component of loan rate (%)			
Funding cost	1.90		
Credit cost	0.95	to	1.65
Operating cost	0.50		
Bank profit	0.75		
Average loan rate, corp	**4.10**	to	**4.80**

Assumptions		
Slightly lower than 2023 funding cost at 2%, considering deposit rate cut and normalized term/demand mix		
	Lower bound	Upper bound
Through the cycle NPL formation:	1.90	3.30
Final loss content at 50%	0.95	1.65
20% cost income ratio, lower than average due to scalability of corp business		
0.75 ROA to be maintained (2023)		

Source: PBOC, CEIC, Company data, Morgan Stanley Research

Since 2025, the decline of ordinary corporate loan yield has notably slowed and stabilized at 3.5-3.6%, where manufacturing loan yield could be a bit higher. In the presence of rate floors, we think loan pricing will be more rational, offering potential for loan yield to increase based on different risk profiles. This should help banks to rebuild their provision buffer, which they have been using in the past several years to digest property-related risks.

How was industrial capex funded in China historically?

We estimate external funds have consistently accounted for 60-70% of annual industrial capex between 2020 and 2025

Bank loans, in particular mid-to-long term loans lent to industrial sectors, are the single

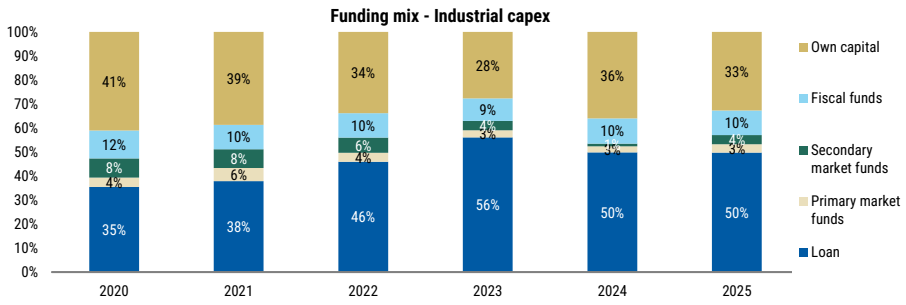
biggest funding source, representing 50% of total funding in 2025. The gross origination each year is based on PBOC's disclosed industrial loan balance and assumes an average 3-year tenor. Notably, mid-to-long term industrial loans origination stayed at around Rmb10tn a year from 2023 to 2025.

The primary and secondary market at their peak in 2021 supplied 13% of industrial capex funding, which subsequently moderated to mid-single digit levels in 2024 and 2025 following a sharp cool down in fundraising in A shares. Looking ahead, as capital intensity rises in the current innovation cycle, we see the capital market's role in funding innovation and industrial capex to rebound steadily, especially in areas like semi, high end manufacturing, robotics, etc., which sit at the forefront of industrial upgrades or have been identified by the government as technology chokepoints.

Fiscal funds made up about 10% industrial capex funding in recent years. These include:

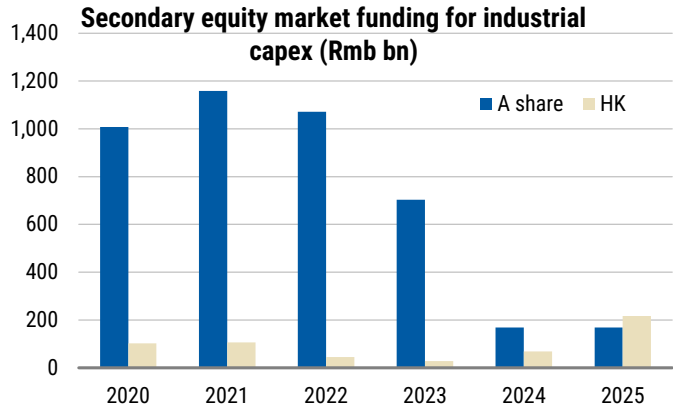
- Fiscal cash subsidies: we estimate a subsidy rate based on reported government subsidies divided by gross profit of listed firms. Then we apply the ratio to industrial value add.
- Land subsidies: this is based on an IMF study where it estimates the land subsidies (measured by the discount when the government grants industrial land compared to market value) to be around 0.5% of annual GDP.
- Fiscal-led investments and others: this includes in-budget fiscal fund investments as well as major national industrial project developments backed by special government bonds in recent years.

Exhibit 259: External funds have consistently accounted for 60-70% of annual industrial capex between 2020 and 2025



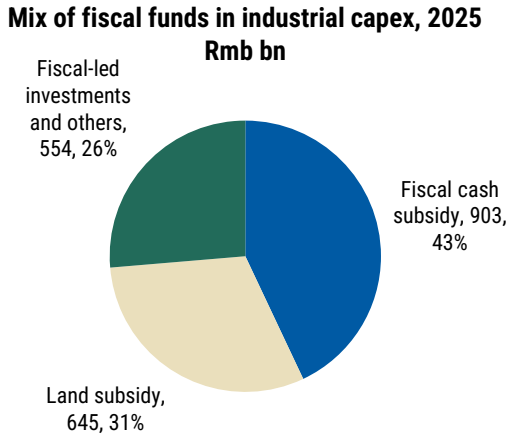
Source: CEIC, WIND, PBOC, NFRA, IMF, PE Data, Company data, Morgan Stanley Research

Exhibit 260: Secondary equity market's role in supplying capex funding has moderated in recent years



Source: CEIC, WIND, IMF, PE Data, Company data, Morgan Stanley Research

Exhibit 261: Fiscal funds made up 10% of industrial capex funding in recent years



Source: CEIC, WIND, IMF, PE Data, Company data, Morgan Stanley Research

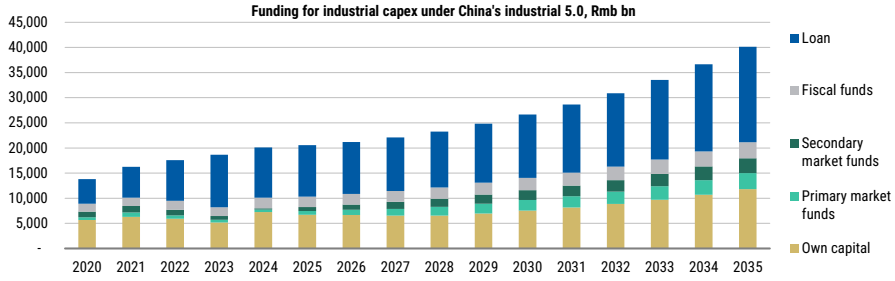
Internal funds account for 30-40% of industrial capex – likely a substantial portion of overall industrial firms' annual profits

In 2025, we estimate industrial firms' own funds contributed to Rmb6.7tn of capex. This is likely a substantial share of overall industrial firms' profits in the year: NBS reported above-scale industrial profits of Rmb7tn not including profits at smaller scale firms (which are not in official statistics) or profits at many smaller firms along supply chains, such as wholesale trade, etc.

Opportunities arise from funding China's Industry 5.0

Driven by China's Industry 5.0, our industrial analysts expect capex to rise at a 6.9% CAGR from 2025 to 2035, reaching Rmb40.1tn by 2035. This will create strong demand for capital in the next 10 years to be served by various financial firms.

Exhibit 262: We expect bank loans will remain the largest capital supply source for industrial capex



Source: CEIC, WIND, PBOC, NFRA, IMF, PE Data, Company data, Morgan Stanley Research

In particular, we expect bank loans will remain the largest capital supply source for industrial capex, due to banks' unique positioning – wide reach and deep penetration – in industrial supply chains. We forecast bank loans to make up 47% of industrial capex in the next 10 years, the same as the average mix of the past 5 years.

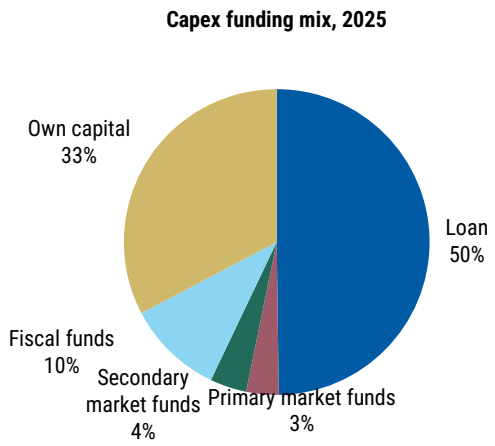
We estimate this will translate into a 6.3% 10-year CAGR for industrial mid-long term

loans. As overall industrial loans make up slightly over 1/5 of total credit, we see loan demand from Industry 5.0 supporting overall credit growth at a level around 4-7% over the next 10 years.

Note that Exhibit 265 is smoothed for illustration purposes only, and in fact we believe growth will most likely be uneven and cyclical, as is typical for industrial loans, with the average annual growth rate staying at 6-7%. An uneven growth curve is also more desirable as it allows periodic recalibrations of credit allocation and risk digestion.

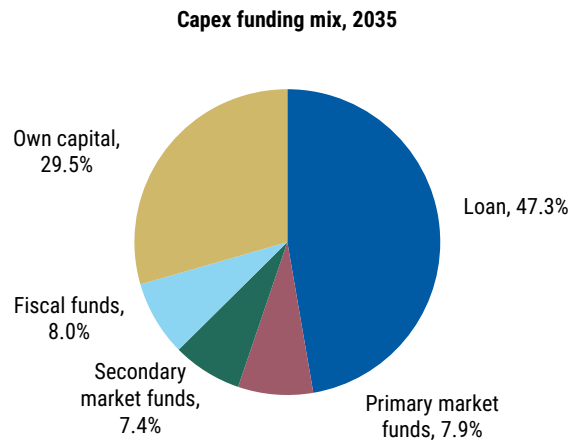
On the other hand, we expect China's capital markets (including HK) could eventually contribute around 15% of industrial capex funding, compared to the previous peak of 13%. This would be roughly evenly split across primary market (PE, VC) and secondary market (IPO, follow-on) fundraising. We expect industrial mix in secondary market fundraising to temporarily rise to 64.5% by 2028, from 47.9% in 2025, before moderating to 57% of total by 2035. This is because we think industrial upgrades should also drive income growth, which could bring more listing opportunities in the service and consumer sectors over time, which typically offer higher ROE and are also appreciated by capital markets.

Exhibit 263: Capex funding mix in 2025



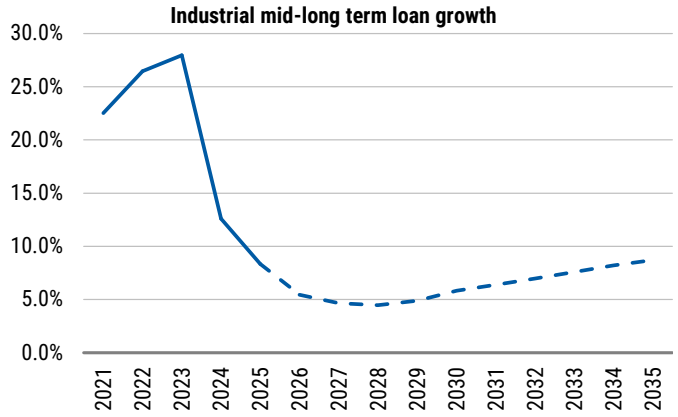
Source: CEIC, WIND, PBOC, NFRA, IMF, PE Data, Company data, Morgan Stanley Research

Exhibit 264: Capex funding mix in 2035



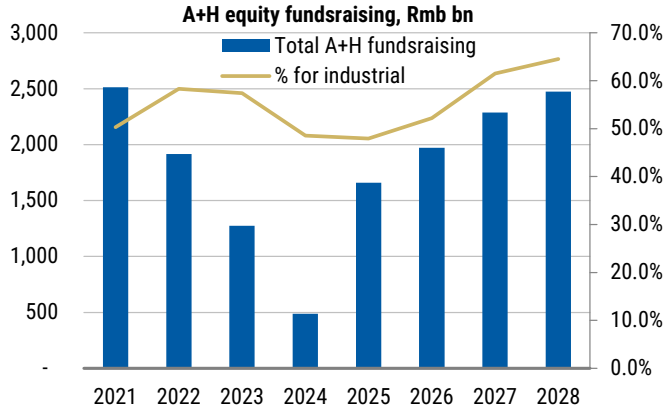
Source: CEIC, WIND, PBOC, NFRA, IMF, PE Data, Company data, Morgan Stanley Research

Exhibit 265: The average annual growth rate of industrial mid-long term loans could stay at 6-7% in the next 10 years



Source: CEIC, WIND, PBOC, NFRA, Company data, Morgan Stanley Research

Exhibit 266: We expect a major recovery in China's equity market fundraising in the next 3 years partly helped by industrial capital demand



Source: CEIC, WIND, PBOC, NFRA, Company data, Morgan Stanley Research

Industry 5.0 to reinforce positive loop of financial system and financial firms' earnings

1. Continued industrial upgrades will support healthy credit demand and interest rate levels. Because of the additional credit demand, we see a potential 80bps rebound in loan yield over time from the current level, up from our original expectation of 50bps. This should comfortably lift industrial loan yield above 4%, which we see as a necessary level to allow for cross-cycle risk digestion in the industrial sector and help banks maintain healthy capital generation to supply credit sustainably. Better loan yield will in turn lead to higher deposit yield because banks need to compete for funding. This will benefit deposit interest income to households where deposits will likely remain the largest financial asset holdings.

2. Industrial upgrades will support income growth and healthy demand for financial products that benefit banks' and brokers' fee business. We continue to believe industrialization will be the most effective way to drive productivity gains for China in the current development stage. We also believe income growth will remain the primary means of wealth accumulation in China. Industry 5.0 developments strengthen our expectation of high-single-digit household financial asset growth in the next decade, driving growing demand for asset allocation in fixed income and equity market products, as well as wealth advisory needs. We see top wealth and asset franchises from banks and brokers taking more market share in this growing TAM.

3. Financial firms can maintain reasonable margins and ROE through the cycle. This is the key to keeping the positive loop running, in our view. With healthy capital demand and reasonable yield, we see banks' ROE stabilizing at around 9% in the next 10 years, which will be sufficient to support 5-7% credit growth while maintaining stable shareholder returns.

Materials

Rachel Zhang

China Materials: The Foundational Layer of Industry 5.0

China's materials sector is a reinforcing ecosystem that amplifies the country's industrial competitiveness. The interconnections are profound: glass fiber feeds AI server PCBs and wind turbine blades; copper and aluminum underpin grid expansion and ESS deployment; lithium batteries power EVs and power storage; rare earth magnets enable EV motors, wind turbines, and humanoid robots; and carbon fiber provides the structural backbone for aerospace, low-altitude economy, and next-generation transportation. These materials are not merely inputs; they are the structural backbone of China's AI-native industrial economy, enabling the country to compress cost curves, scale production, and dominate global supply chains across the most strategically critical sectors.

Our preferred stocks across the materials complex reflect this integrated view: Zijin Mining (copper, gold and lithium), CMOC (copper and cobalt), Chalco and Hongqiao (aluminum), Tianqi Lithium and Ganfeng Lithium (lithium), JL Mag (rare earth magnets), China Jushi (glass fiber), Zhongfu Shenying (carbon fiber), and Huayou Cobalt (battery materials). Together, these companies represent the material foundation upon which China's Industry 5.0 ambition is being built – a scalable and increasingly AI-amplified industrial materials ecosystem with few global parallels.

Copper: Benefiting from power and data center buildout

Copper demand is undergoing a structural shift. In emerging fields, the production of new energy vehicles and supporting charging infrastructure has maintained continued growth. The explosion of AI computing power accelerated the construction of data centers, and copper demand from data centers is expected to rise in the next five years. AI data centers consume approximately 30 tonnes of copper per MW, and our global commodities team estimates AI accounts for 2% of global demand.

Grid investment is a major structural driver. China's 15th Five-Year Plan (2026–2030) has outlined a grid spend target of Rmb4tn (US$600bn), a 40% increase over the prior five years, implying annual spend of Rmb800bn (US$118 billion). State Grid invested Rmb130bn in 1Q26, up 37% YoY, while China Power Grid invested Rmb38.5bn, up 50% YoY. Vehicle and solar cell exports have been particularly strong, rising 62% and 43% YoY in Jan–Apr 2026, providing additional support for domestic copper consumption.

Every 100GWh of energy storage systems (ESS) will consume approximately 60kt of copper and 160kt of aluminum in foil, casings, cold plates, and components. With global ESS production going from 350GWh in 2024 to approximately 600GWh in 2025 and 900GWh in 2026, copper demand will see continued support.

Aluminum: Capacity Cap, Global Deficit, and Emerging Demand Drivers

China is the world's largest aluminum producer. Its domestic output and consumption of primary aluminum were 44.23mn tonnes and 46.29mn tonnes respectively in 2025, accounting for 59.4% and 62.1% of global output and consumption.

The government's 45.4mnt capacity ceiling – set during the first round of supply-side reform in 2017 – remains firmly in place. Capacity constraints have driven a steady rise in industry utilization, which reached 97% by the end of 2025. Each ton of aluminum produced consumes 13,500kWh of power and emits approximately 13 tonnes of carbon during the process, and aluminum accounts for approximately 5% of China's total carbon emissions – a key reason the government is unlikely to remove the capacity ceiling.

Constrained by the capacity cap, Chinese producers are increasingly investing abroad. Indonesia has captured the majority of this investment, with approximately 3mn tonnes of additional Chinese-owned capacity being tracked, while Vietnam is emerging as a potential future growth story.

Demand drivers are shifting toward new energy. The growth drivers for aluminum consumption are shifting towards emerging sectors such as new energy vehicles, power grids, energy storage, and high-end manufacturing. With the copper-aluminum ratio at an all-time high, manufacturers may increasingly favor aluminum, especially in mid-voltage applications. Global aluminum supply is likely to remain in deficit in 2026 due to the Middle East conflict and gradually loosening in 2027, supporting aluminum prices at elevated levels.

Lithium: Rapid Growth from Energy Storage

The lithium market continues to be underpinned by robust growth in battery and energy storage demand. Global lithium-ion battery shipments reached 2,280.5GWh in 2025, representing a 47.6% year-on-year increase. China remained the dominant player, accounting for 1,888.6GWh or 82.8% of global shipments. China's cumulative production of power and energy storage batteries reached 1,755.6GWh, up 60.1% year-on-year, while installed battery capacity represented 64.8% of the global total.

Energy storage has emerged as the key growth driver for lithium demand. China's energy storage lithium battery shipments surged to 630GWh in 2025, an 85% year-on-year increase, significantly exceeding industry expectations. Cumulative installed new energy storage capacity in China reached 136GW by end-2025, up 84% YoY. During the year, China deployed an additional 66.43GW/189.48GWh of energy storage capacity, with power and energy capacity increasing by 52% and 73%, respectively.

On the supply side, recent developments suggest a tightening in near-term lithium chemical availability despite ongoing efforts to bring idled capacity back online. Zimbabwe's temporary ban on lithium concentrate exports, which lasted approximately 2.5 months, disrupted feedstock flows to Chinese converters and highlighted the growing impact of resource nationalism on global supply chains. At the same time, a number of lepidolite operations in Jiangxi have been curtailed or suspended due to weak economics and environmental inspections, reducing domestic lithium feedstock production.

Looking forward, several Australian spodumene operations that were previously placed on care and maintenance are commencing restarts as lithium prices have recovered. However, the pace of supply recovery remains measured. The Manono project in DRC from Zijin will start commercial production around end of June/July 2026, which is the main large new supply that's coming to the market.

Rare Earth Permanent Magnets: EVs and Humanoids are the main

demand drivers

As of late 2025, the PRC controlled approximately 70% of mined rare earth production and nearly 90% of refined output. China has banned exports of technology and equipment used in rare earths separation, metal production, and REPM production since 2023. In April 2025, China imposed export controls on items containing seven rare earth elements.

China's leading magnet producer, JL Mag, ranked first globally in both production and sales volumes in the REPM industry in 2024, and achieved new record highs in 2025 – producing 34.4 thousand tonnes of magnetic materials blanks (up 17.31% YoY) and selling 25.3 thousand tonnes of finished products (up 21.25% YoY). JL Mag's products are widely applied in NEVs, energy-saving VFACs, wind power, robots and industrial servo motors, 3C, low-altitude aircraft, energy-saving elevators, and rail transit.

In the short term, we expect Chinese enterprises to remain the dominant players in the global REPM supply landscape, as Western diversification projects gradually come to production.

Glass Fiber: AI-Driven Upcycle

The industry is now entering a structurally differentiated upcycle driven by AI infrastructure demand. AI-related demand is driving high-end glass fiber and fabric demand and prices, leading to incremental glass fiber capacity shifts toward high-end products. As a result, supply for standard products such as 7628 has tightened, contributing to price hikes of 170% YTD (from Rmb4.4/meter to Rmb12/meter).

China Jushi, the global capacity leader, is aggressively positioning for the AI era. The company announced an additional 50kt electronic yarn and 320mn meter electronic fabric expansion project, with more than 60% of output in thin, ultra-thin, and super-thin products targeting AI-related applications. Jushi's Huai'an plant started production in March 2026 with 100kt electronic yarn capacity (~380mn meters of fabric), with a further 200kt yarn to start production around mid-2026. Jushi currently operates more than 5,000 weaving machines and has placed orders for another 3,900 units, partially mitigating the industry-wide bottleneck from limited availability of imported weaving machines.

The high-end electronic fabric supply tightness is expected to persist for the next 1–2 years. Total electronic yarn capacity stands at approximately 1.13mnt currently, and supply tightness for high-end Low-DK products is expected to remain given long product certification periods (at least 6 months) and long delivery periods for imported weaving machines. China National Building Material (CNBM) has also completed the world's first zero-carbon intelligent manufacturing base in the fiberglass industry, and its carbon fiber production capacity ranked among the global top three.

Carbon Fiber: Rapid Ascent, Breakthrough in Ultra-High-Strength Grades

China has become the fastest-growing carbon fiber market globally and has rapidly expanded its global market share. Chinese companies' share of the global carbon fiber market rose to 37% in 2024 from just 10% in 2016, while Japanese producers including Toray, Teijin, and Mitsubishi Chemical held approximately 40%. The global carbon fiber market is mainly concentrated in the United States, Japan, and China, accounting for more than 70% of total production capacity, with China now leading in production scale.

Zhongfu Shenying, China's leading carbon fiber producer, is currently the sole domestic producer of T1200 products. The company achieved revenue of Rmb2.194bn in 2025, a year-on-year increase of 40.87%, returning to profitability. Carbon fiber is classified as a strategic material under China's 14th Five-Year Plan, and the "Made in China 2025" initiative identified high-performance fiber and composite materials as key strategic materials.

Carbon fiber applications are extensive, growing at a rate of 10% to 15% every year, spanning aerospace, low-altitude economy, automotive, wind turbine blades, pressure vessels, hydrogen storage, and robotics. China's localization rate for high-performance carbon fiber is projected to exceed 70% by 2025, reducing reliance on imports.

Robotics & Humanoids

Sheng Zhong, Carlos Chai

A key enabler of industrial intelligence

Unmatched foundation, moving towards industrial intelligence. China is the world's largest robotics demand and installed-base market, accounting for 54% of global industrial robot installations in 2024, according to IFR (latest data). We believe the next stage is not simply more automation, but the integration of robotics, embodied AI and data loops. In humanoids, China's capabilities, particularly in locomotion, improved meaningfully in 2025, as highlighted by the 2026 Spring Festival Gala performance. Meanwhile, the focus is no longer demonstration capability, but reliability, task generalization and ROI in real industrial settings. We expect 2026 to mark an early transition from government/R&D-led procurement toward more business-led pilots, with recent use-case exploration being widely diversified across industrials, commercial services and household/healthcare.

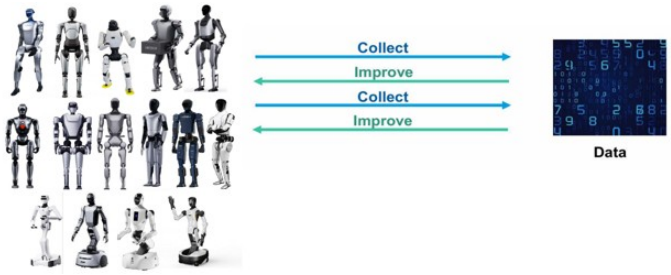
Embodied intelligence is the enabler of China's industrial intelligence. Robots will become the physical execution layer of industrial AI. Humanoids add general-purpose manipulation and embodied AI capabilities. The key difference from traditional industrial robots is generalization. Instead of relying only on pre-programmed motions, embodied robots can learn and adapt to different tasks, objects and environments. Data is the critical input, especially real-world robot data, which is far scarcer than internet data used for LLM training. China has a unique advantage here, the world's largest and most diverse manufacturing base, combined with a large engineering workforce, creates an ideal deployment ground. This can form a data flywheel – more robots generate more real-world data; better models unlock more applications; broader applications drive more deployment. Over time, embodied intelligence should enable more flexible, faster and lower-cost manufacturing.

Exhibit 267: The data pyramid: Higher quality data is more scarce, scale will be the advantage...



Source: Morgan Stanley Research

Exhibit 268: ...with larger fleets to drive the data flywheel, collecting more data for capability improvement



Source: Morgan Stanley Research

China positioned for a dominant market share in robotics globally

A 97% share in 1H26: Global shipments reached 19k units in 1H26, up 272% YoY, with Chinese players accounting for 97%. Although 65% of shipments remained in entertainment, education/R&D and data collection, use cases are broadening into industrial and commercial applications. We expect China's dominant market position to persist and strengthen over the next decade, driven by economies of scale and a powerful data flywheel that enhances product competitiveness. For humanoid robots, we forecast global shipments to rise from 35k units in 2025 to 7.3mn by 2035, implying a 76% CAGR. Despite the industry's early stage, Chinese humanoid players are already expanding overseas and building ecosystems for long-term growth. We believe robotics and humanoids will further strengthen China's export leadership.

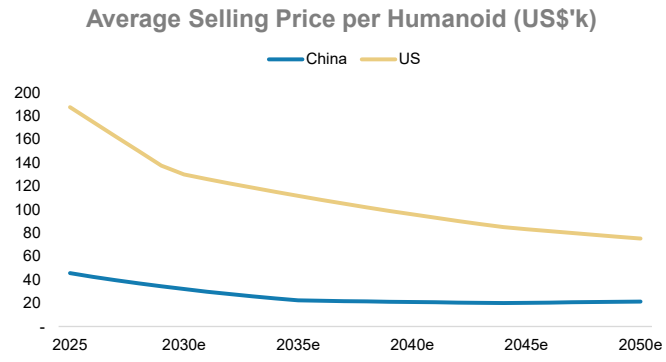
Strong robotics supply chain supports faster cost deflation and resilience. China's large and diverse industrial base supports localized production of robots and components such as screws, sensors, and batteries, as well as assembly. The localized supply chain creates a virtuous cycle: lower costs accelerate adoption, adoption drives scale, and scale further reinforces China's supply-chain depth and manufacturing dominance. In the next 10 years, we expect humanoid robot prices to be half of today's level, even though they will be more advanced, intelligent and dexterous by then.

Significant capex for robot production

The robotics value chain is long and spans semiconductors, mechanical and electrical components, electronics, and final robot assembly. Based on our estimate that China will account for 43% of the projected 7.3mn humanoid shipments in 2035, we forecast China's humanoid robot production value will reach US$70bn by 2035. Total manufacturing capacity could exceed US$100bn, depending on capacity utilization and production-to-sales ratios.

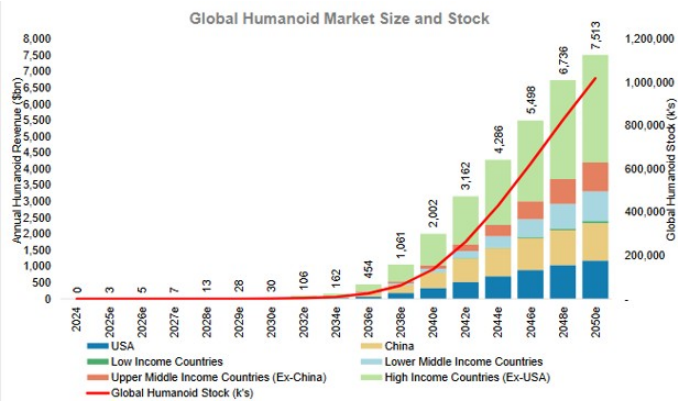
Assuming a manufacturing capex-to-output ratio of over 50%, we estimate humanoid-related manufacturing capex will exceed US$50bn by 2035, excluding investment in adoption infrastructure such as workplace upgrades, networking, and charging systems. As deployment scales, growing demand for maintenance and aftermarket services should drive additional investment, making total humanoid-related capex significantly larger than US$50bn.

Exhibit 269: We expect Chinese humanoids to have a significant price advantage



Source: Morgan Stanley Research (e) estimates.

Exhibit 270: We estimate China's humanoid market presents a US$1trn opportunity and a global market of US$7trn



Source: Morgan Stanley Research (e) estimates.

Stock implications

We prefer leading component players, which will increasingly realize revenues from humanoids regardless of early end-use cases.

Leaderdrive (688017.SS): Leaderdrive is a leading harmonic reducer supplier, with a dominant share in collaborative robots and mass supplying three of the top four industrial robot makers. Embodied AI is becoming a fast-growing incremental driver. Currently, it is supplying leading domestic humanoid integrators, contributing 20% of revenue in 2025 and expected to expand further. Capacity utilization is likely to remain tight through 3Q26. Leaderdrive is also developing other transmission parts, including bearings, planetary roller screws, and new reducer products. The JV with Minth in US is expected to establish initial capacity by 3Q26 to capture US demand. We are positive on Leaderdrive's ability to capture the rapid scaling of industrial cobots and the early-stage ramp of embodied AI/ humanoid robots.

Hengli Hydraulic (601100.SS): Hengli is China's leading manufacturer of hydraulic cylinders, pumps, and valves. We are positive on three compelling catalysts: (1) a global construction machinery upcycle driving core business growth; (2) aggressive overseas market-share gains with key clients like Caterpillar, and product piloting at Hitachi, Volvo, Doosan, and other top-tier OEMs; and (3) a humanoid robot components business, which is a core supplier to a key US humanoid integrator, holding a leading share in planetary roller screws. Hengli also sees the potential to supply motors to this client in the near term.

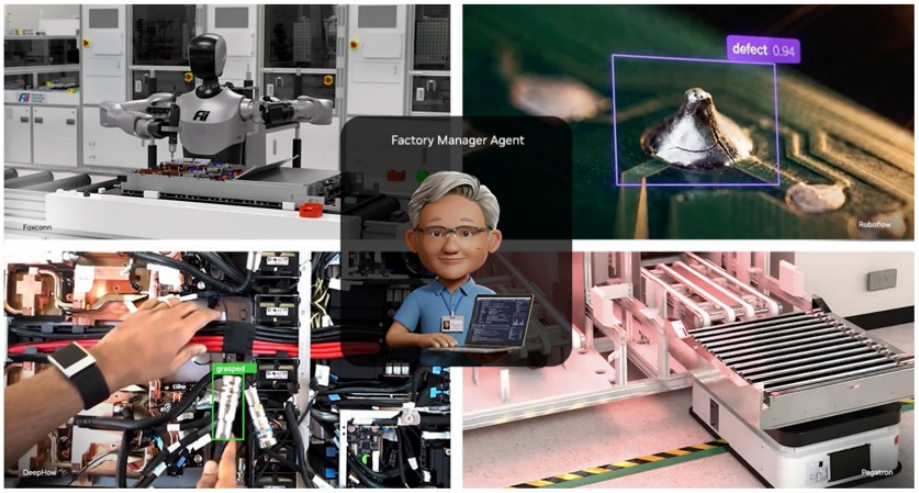
Semiconductors

Charlie Chan, Daniel Yen, Daisy Dai, Henry Zhao

Semiconductors as enablers of plant-wide intelligent manufacturing

The future smart factory is a highly autonomous, "lights out" environment where machines, robots, and supply chain systems are interconnected through IIoT, AI and real time data loops. Production is no longer linear but adaptive – equipment health is continually monitored, defects are detected in-line, and workflows are dynamically optimized by AI models and digital twins. Human intervention is minimized to oversight, while robots and intelligent systems collaborate seamlessly, enabling predictive maintenance, real time scheduling, and mass customization.

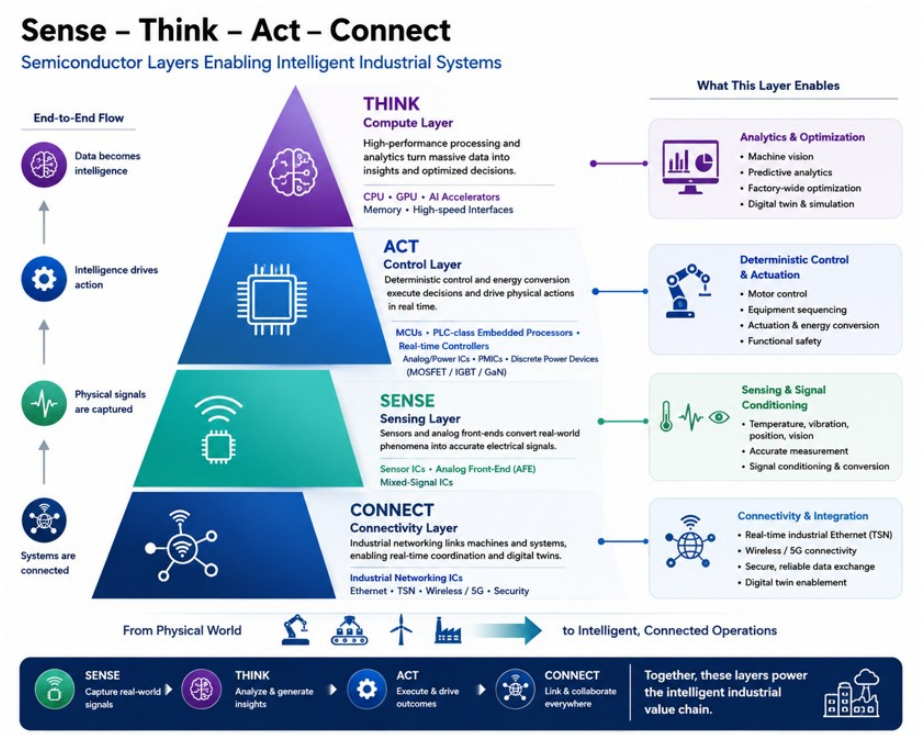
Exhibit 271: NVIDIA Factory Operations Blueprint (FOX) – a reference design for building an autonomous factory manager agent



Source: Nvidia

At the sense–think–act–connect level, semiconductor demand spans multiple layers. In the sensing layer, sensor ICs, analog front-end and mixed-signal chips convert physical data (temperature, vibration, position, vision) into electrical signals; this is the foundation of real-world interaction. In the control layer, MCUs, embedded processors, and real-time controllers handle deterministic tasks (motor control, equipment sequencing), while analog/power ICs, PMICs, and discrete devices (MOSFET/IGBT/GaN) enable actuation and energy conversion. In the compute layer, CPU/GPU/AI accelerators support high-level analytics, machine vision and factory-wide optimization, aggregating massive amount of data from IIoT systems. Finally, in connectivity, industrial networking ICs (Ethernet, TSN, wireless/5G) link machines, enabling real-time coordination and digital twin systems.

Exhibit 272: Sense–think–act–connect: semiconductor demand spans multiple layers



Source: Morgan Stanley Research

Barbell investment opportunity in Greater China Semis

For Greater China semis, smart manufacturing drives a structurally broader demand profile, spanning both high-volume industrial chips and high-value compute. While the control and actuation layers (analog, power, MCU/mixed-signal) capture the majority of incremental silicon content due to their high unit intensity across sensors, motor drives and distributed control nodes, the "think" layer (CPU/GPU/AI accelerators) remains critical as the central brain of the factory – enabling machine vision, predictive maintenance, and factory-wide optimization. Although compute demand is lower in unit terms versus edge control chips, it carries disproportionate value and is indispensable to achieving full Industry 5.0 autonomy.

From an investment perspective, this implies a barbell opportunity in Greater China: (1) analog/power/MCU players (e.g., industrial & power discretes, signal chain) benefit from scale, localization, and broad deployment across equipment, while (2) domestic CPU/GPU/AI companies gain strategic importance in edge AI and industrial inference as factories upgrade toward higher autonomy. Net-net, we see smart factory capex as a multi-year tailwind for China's semiconductor ecosystem, with volume led by industrial semis but value increasingly shaped by compute penetration and AI enabling.

Stock implications: Yangjie, GigaDevice, Cambricon, Innoscience, OmniVision

Yangjie Technology (OW): Yangjie plays a key role in enabling smart manufacturing through its broad portfolio of discrete power semiconductors – including MOSFETs,

diodes, rectifiers and protection devices – which are essential for power conversion, motor control and circuit protection in industrial equipment. Yangjie's power discrete modules are widely used across industrial and AI-related applications, where they ensure stable power delivery, improve energy efficiency, and protect sensitive systems. By supporting more precise control of electrical systems and enhancing reliability in applications such as robotics, power supplies and automated production lines, Yangjie's devices help manufacturers build smarter, more responsive and energy-efficient equipment – thereby underpinning the transition toward intelligent manufacturing.

GigaDevice (OW): GigaDevice is positioned as a core beneficiary of the "sense + control" layer in smart manufacturing, with its portfolio spanning NOR Flash, MCU and analog. In smart factories, its MCUs act as the distributed "nervous system" embedded across PLCs (Programmable Logic Controllers), robotics controllers and industrial IoT nodes, while memory (NOR/NAND) supports code storage and local data buffering. As factories scale toward higher automation with thousands of edge nodes, GigaDevice's value lies in its high-volume, broad-based exposure to industrial control and edge intelligence, benefiting from both localization tailwinds and increasing semiconductor content per machine.

Cambricon (OW): Cambricon fits into the "think layer" of smart manufacturing as a domestic AI compute provider, focused on AI accelerators for inference and training. In the factory context, its chips enable machine vision inspection, predictive maintenance, and real-time optimization at both edge servers and centralized computing hubs. While unit demand is relatively limited compared to MCUs or power devices, Cambricon captures disproportionate value in enabling AI-driven automation, and its strategic positioning improves as factories migrate from basic automation toward AI-native, data-driven operations consistent with Industry 4.0/5.0 architectures.

Innoscience (EW): Innoscience, as a leading GaN (gallium nitride) power semiconductor supplier, supports smart manufacturing by enabling higher-efficiency, higher-frequency and more compact power conversion systems compared with traditional silicon-based devices. Its GaN devices and modules improve energy efficiency, reduce heat generation, and allow more precise control in industrial power supplies, motor drives and automation equipment – key requirements for intelligent, highly automated production lines. For instance, GaN modules can help battery manufacturers, such as CATL, reduce power consumption on production lines by improving conversion efficiency and system-level energy management, while emerging use cases, such as humanoid robots, benefit from GaN's high power density and fast switching to enable lighter, more efficient actuation systems. This positions GaN as a critical enabler for 'physical AI', where robots and smart machines operate with higher efficiency, responsiveness and autonomy in intelligent factories.

OmniVision (EW): OmniVison (OV) is a leading fabless semiconductor company supplying CMOS image sensors (CIS) across automotive, smartphone, professional imaging, robotics, and edge AI. OV's CIS business is capturing a rapidly expanding opportunity in robotics, driven by explosive demand for data collection devices used in LLM training and the accelerating transition of humanoid robots from prototype to engineering mass production. In 1H26, OV's machine vision and robotics segment generated Rmb210mn in revenue, up >70% YoY. The per-robot CIS content ranges from US$20–30 for entry-level units to US$200–300 for high-end data collection systems, notably higher per-unit content than automotive CIS given multiple camera positions (head, chest, waist, hands)

per robot. OV's flagship products (OX09C, OX05B, OX05C) have become the de facto standard across major global robotics customers, underpinned by industry-leading HDR performance and data collection efficiency, resulting in severe supply tightness as demand outpaces capacity.

Power

Eva Hou, Tom Li

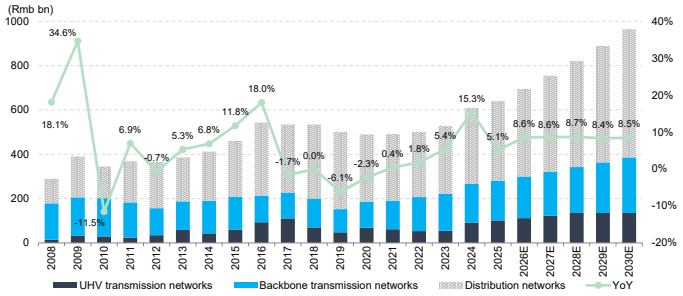
Industry 5.0 will be accompanied by massive AI deployment, driving sustained demand for power and grid infrastructure. We remain positive on China's power equipment sector, as AI-related power demand and energy security needs support growth globally. Chinese suppliers are particularly well positioned as they continue to gain global market share.

Stock picks: Our preferred names are **Sieyuan** (high-voltage transformers and switchgears), **Yingliu** (gas turbine blades), **Sungrow** (AIDC ESS and SST), and **Jiangsu Zhongtian** (ZTT, optical fiber and offshore wind cables). All are leveraged to the AI power infrastructure buildout and should benefit from a combination of stronger demand, new product cycles, improving pricing and margins, and market-share gains.

Grid and renewable investments in China

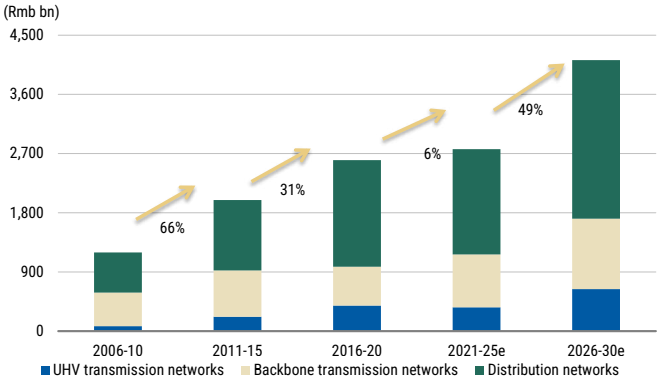
We foresee a total grid investment of Rmb4.1tn during 2026-2030, or 49% growth compared to the 14th FYP. This represents an 8.6% CAGR for grid capex, outpacing the 5.4% power demand CAGR over the period, per our estimates.

Exhibit 273: China's power grid investment, 2008-2030



Source: National Energy Administration. Morgan Stanley Research (E) estimates.

Exhibit 274: China's power grid investment to accelerate during the 15th Five-Year Plan



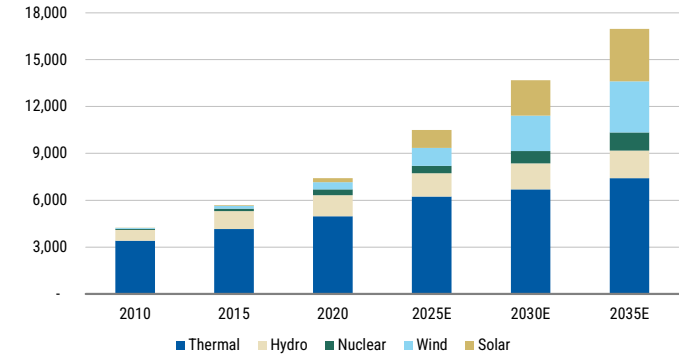
Source: Source: National Energy Administration, China Electricity Council. Morgan Stanley Research (e) estimates.

Strong grid capex in China can support rising power demand due to electrification and AIDC installation, and also support the acceleration of renewables adoption. In a previous report, we wrote that DC would contribute material power demand growth over the next 5-10 years, to account for 4% of total power demand by 2030 and 10% by 2035 (vs. 2% in 2025). We forecast China's DC power capacity to grow at a 19% CAGR from 2025 to 2030, followed by a 22% CAGR, as chip efficiency reaches its potential physical limits while computing power keeps growing notably.

In terms of renewables adoption, as implicitly outlined at the national strategic level, China targets 3,600GW of wind and solar installations by 2035 – double the 2025 level of 1,842GW. This implies that China will add 176GW of wind and solar capacity annually during 2026-35. Accordingly, we expect wind and solar generation together to make up 25% of the total mix in 2030 and 29% in 2035, compared to 17% in 2025. By 2026, we

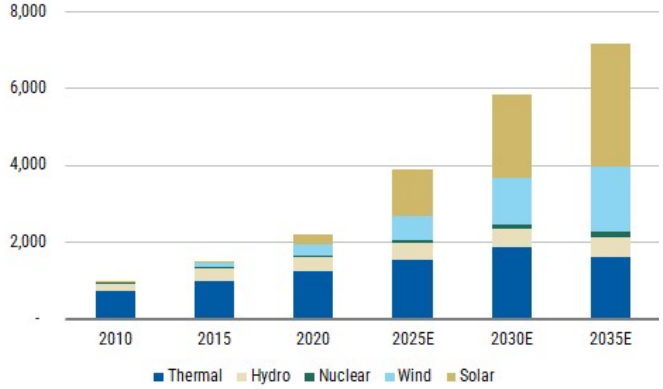
expect solar and wind together to account for 50% of total power generation capacity.

Exhibit 275: China – Power generation breakdown: wind and solar to pick up quickly



Source: NEA, Morgan Stanley Research (E) estimates

Exhibit 276: China – Cumulative capacity breakdown: wind and solar to surge in the mix

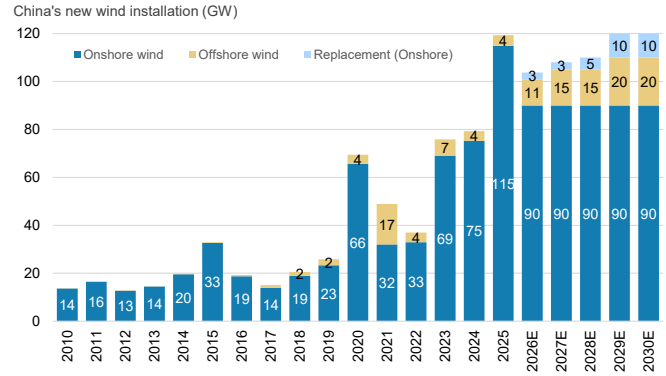


Source: NEA, Morgan Stanley Research (E) estimates

Within this, we remain positive on wind installation growth during the 15th FYP, and project an average of 110-120GW wind installation p.a., including over 15GW p.a. of offshore wind underpinned by smoother approvals, and incremental contributions from deep-sea offshore development.

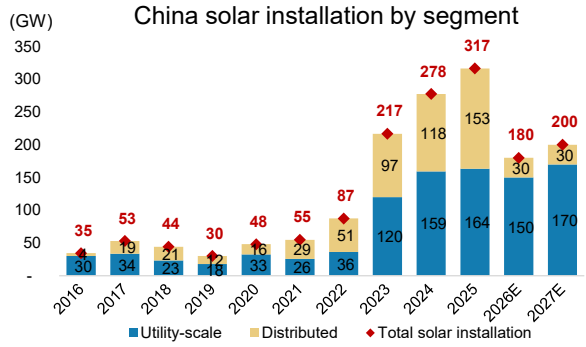
In addition, we still expect substantial solar additions of 180-200GW p.a. in the long term, though 2025 marked a peak year with 315GW in view of rush installations before the policy deadline (May 31, 2025).

Exhibit 277: We project an average of 110-120GW wind installations p.a. during the 15th FYP



Source: NEA, Chinese Wind Energy Association (CWEA), Morgan Stanley Research (E) estimates

Exhibit 278: China – solar installation (AC) forecasts by segment



Source: NEA, Morgan Stanley Research (E) estimates

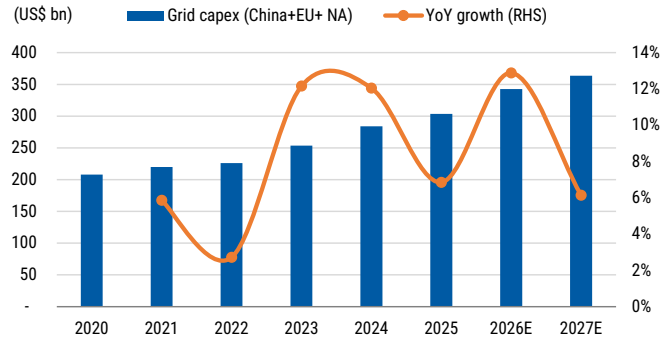
Power and grid equipment exports

As we mentioned in a report in April, besides the accelerating grid capex in China, we see similar trends happening globally due to: 1) strong power demand triggered by AI data centers (AIDC); and 2) the need for energy security, which is leading to more grid enhancement capex. With the AIDC boom, the global electricity system is shifting from stagnation to expansion amid inadequate infrastructure, leading to a multi-year export upcycle for China. We believe global gas turbine demand is likely to increase from 80GW in 2025 to >100GW in the next 10 years, with higher ASPs. In addition, on the grid side, we

foresee grid capex CAGRs of 12%/8.5% for Europe/US in 2025-27, respectively, compared with a global grid capex CAGR of 6-7% in 2020-25, driving the demand for large power transformers.

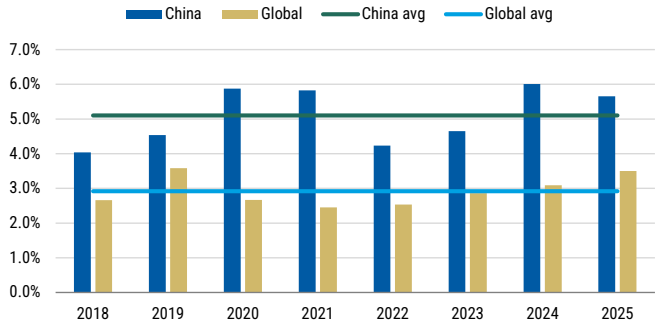
On the supply side, we view equipment makers' capex plans as still disciplined, as the capex-to-sales ratio remains largely stable. This should continue to foster a sustainable uptrend in lead time (2-3x vs. the normal level) and pricing (up 30-50% in 2025).

Exhibit 279: Grid capex in North America, Europe, and China in 2020-27



Source: IEA, S&P Global Market Intelligence, CEC, Morgan Stanley Research (E) estimates

Exhibit 280: Capex-to-sales ratio around historical average implies disciplined expansion

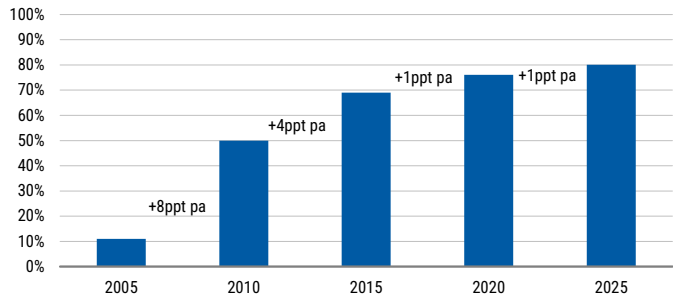


Source: FactSet, Company data, Morgan Stanley Research. Note: "China" includes Sieyuan, Huaming, and Sanxing. "Global" includes GEV, Siemens Energy, HDHE, Eaton, ABB, Schneider, Siemens.

Global market-share gains. We believe China's power equipment suppliers are still at an early stage of going global and should have strong upside given supply chain tightness and relatively more sufficient production capacity vs. global peers. This should lead to more competitive ASP and much shorter lead times. According to our analysis, the global market share for China's transformers, HV switchgears, and gas turbine vanes & blades ranges between 2-11%. Our sensitivity analysis shows that every 1ppt of global market share gain will lead to the following additional revenue in 2027e – transformers US $824mn, HV switchgears US$824mn, and gas turbine vanes & blades of US$119mn. On a company level, the 1ppt global market-share gain would lead to as much as around 40% EPS upside in 2027e across the companies we cover.

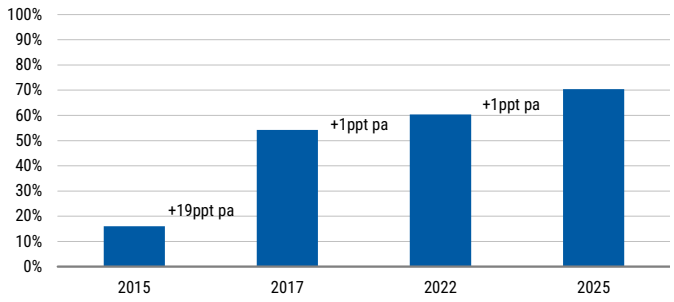
We believe the market tends to underestimate the global penetration development of Chinese power and grid equipment, and thus likely under-appreciates the growth and margin improvement potential. Global market-share gains may be non-linear, as seen from the examples of solar panels and EV batteries, bringing in stronger-than-expected revenue growth profiles and margin improvement at the early-to-medium stages of penetration. We believe continued shortages would be the strongest catalyst for such non-linear growth.

Exhibit 281: Global market share of China's solar panels



Source: China Photovoltaic Industry Association (CPIA), Morgan Stanley Research

Exhibit 282: Global market share of China's EV batteries



Source: SNE Research, Morgan Stanley Research

Exhibit 283:

Earnings sensitivity on every 1ppt global market-share gain

Investment in US$ bn	2020	2021	2022	2023	2024	2025
Grid						
China	70	70	72	75	87	93
Overseas	224	239	246	280	305	325
Power generation						
China	219	213	295	402	429	416
Overseas	378	422	485	540	576	598
Power overall (Overseas)	**602**	**661**	**731**	**819**	**881**	**922**

Gas plants						
	2020	2021	2022	2023	2024	2025
Global annual addition (GW)	42	37	61	50	69	85
CCGT power plant EPC cost (US$ mn/GW)						2,000
% from gas turbine						35%
% of costs from vanes and blades in GT						20%

Assumed contribution	**Grid**	**Power generation**
Transformer	10%	4%
HV switchgear	10%	4%

Global TAM (US$ bn)						
Transformer	53	56	63	73	79	82
Transformer tap changer	1	1	1	1	1	2
HV switchgear	53	56	63	73	79	82
Gas turbine vanes and blades						12

China's export value (US$ bn)						
Transformer	3.3	3.7	4.4	5.3	6.7	9.0
HV switchgear	2.0	2.2	2.6	3.3	4.1	5.4
Yingliu's gas turbine vanes and blades revenue				0.07	0.09	0.13

China's global market share						
Transformer	6.1%	6.5%	7.1%	7.2%	8.4%	11.0%
HV switchgear	3.7%	4.0%	4.2%	4.5%	5.2%	6.5%
Gas turbine vanes and blades						2.2%
Yingliu						1.1%

Sensitivity analysis	
Additional revenue on every 1ppt market share gain (US$ mn)	
Transformer	824
Transformer tap changer	15
HV switchgear	824
Gas turbine vanes and blades	119
Assumed Global NPM	
Transformer	17%
Transformer tap changer	40%
HV switchgear	20%
Gas turbine vanes and blades	25%
Additional NP on every 1ppt market share gain (US$ mn)	
Transformer	140
Transformer tap changer	6
HV switchgear	165
Gas turbine vanes and blades	30
2027E NP (Rmb mn)	
Sieyuan	5,794
Huaming	940
Yingliu	864
2027E NP upside	
Sieyuan	37%
Huaming	5%
Yingliu	24%

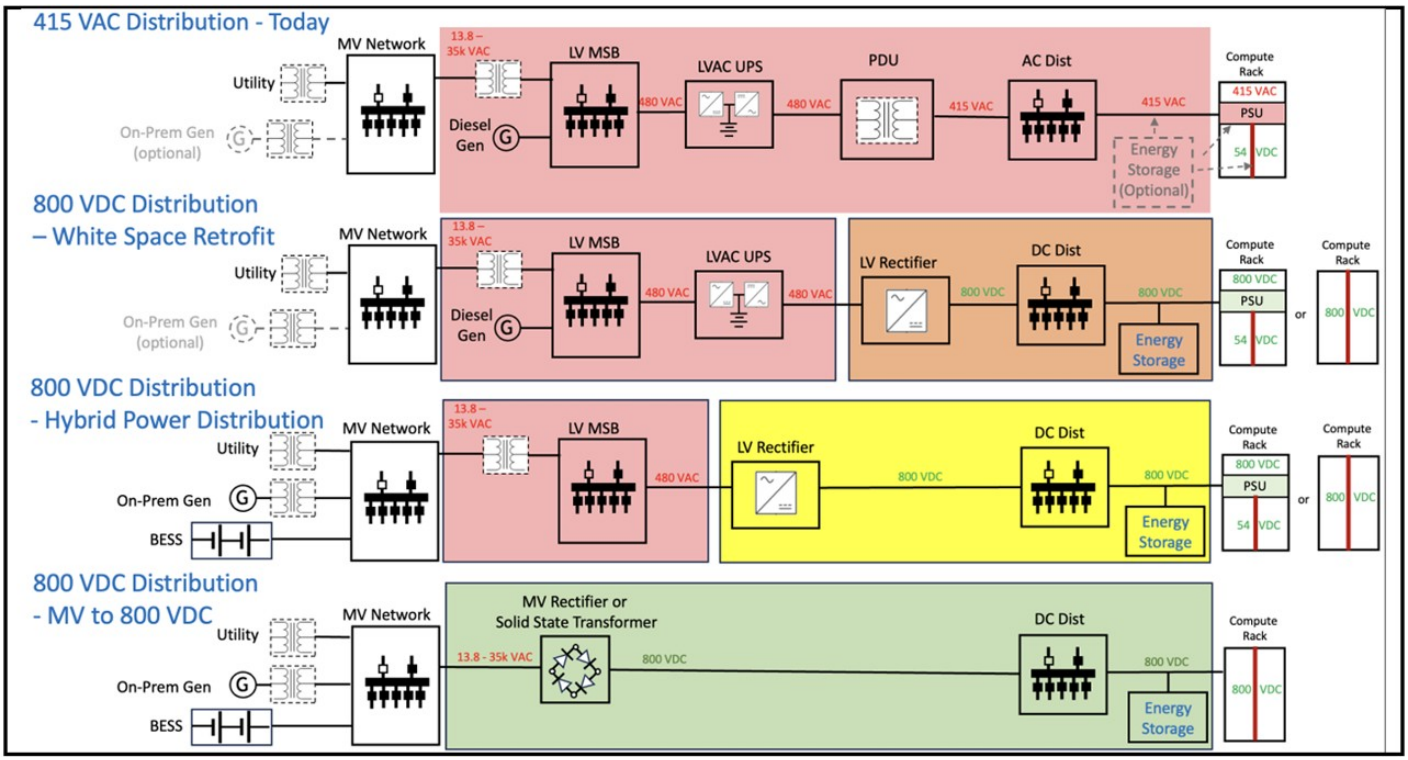
Source: IEA, company data, Morgan Stanley Research estimates

AIDC power solutions – ESS and SST

Sungrow, on which we recently initiated coverage, is one of the best proxies to play the global artificial intelligence data center (AIDC) power solution upgrade theme in the A-share market, in our view. Global AIDC power infrastructure will upgrade in the following years, as AI workloads push rack power requirements from sub-10kW toward 100kW+ and eventually MW-class levels, making traditional power architecture a bottleneck. We see the industry transition from traditional UPS-based AC power chains towards higher-efficiency solutions, starting with energy storage system (ESS) deployment, followed by HVDC adoption and ultimately solid state transformer (SST)-based -"grid-to-chip" AI energy campus power delivery. In particular, SST represents a step-change in data center power architecture, enabling direct conversion from medium-voltage AC to low-voltage DC (e.g., 800VDC), reducing conversion stages, improving efficiency and enabling tighter integration of renewables and storage. This effectively shortens the power chain from grid to GPU and supports higher rack density and faster load response.

We expect this transition to support strong multi-year demand for advanced power solutions, with increasing integration of storage, power conversion and energy management. Sungrow's early access to US cloud service providers, combined with its full-stack energy-service capability, provides a strategic foothold to expand from ESS into higher-value segments, including SST and integrated power infrastructure. We estimate that AIDC-related ESS and SST will contribute Rmb19.6bn in revenue and Rmb3.9bn in net profit (14% and 18% mix, respectively) by 2028, making this a meaningful new earnings engine beyond its traditional inverter and storage businesses.

Exhibit 284: Data Center architecture upgrade path over time



Source: NVIDIA. Note: The chart illustrates the migration from today's AC/UPS architecture to 800VDC retrofit, hybrid 800VDC distribution with onsite generation/BESS, and ultimately medium-voltage-to-800VDC conversion using an SST.

Exhibit 285: We expect SST and AIDC ESS to collectively contribute 18% of Sungrow's net profit by 2028

TAM Forecast	Unit	2026E	2027E	2028E
Solid-state Transformer (SST)				
U.S. AIDC Annual Addition	GW	15.5	21.9	25.9
SST Adoption	*%*	*0%*	*5%*	*15%*
SST TAM	**GW**	***0.0***	***1.1***	***3.9***
ASP	*Rmb/W*		*1.30*	*1.30*
SST TAM	**Rmb mn**		**1,424**	**5,052**
Sungrow Market Share	***%***		*20%*	*20%*
Sungrow - SST Revenue	**Rmb mn**		**285**	**1,010**
NPM	*%*		*50%*	*50%*
Sungrow - SST Net Profit	**Rmb mn**		**142**	**505**
AIDC ESS				
U.S. Data Center ESS Annual Addition	GW	14.3	30.8	62.3
ASP	*Rmb/W*	*1.20*	*1.20*	*1.20*
AIDC ESS TAM	Rmb mn	17,148	36,845	74,564
Sungrow Market Share	*%*	*25%*	*25%*	*25%*
Sungrow - AIDC ESS Revenue	**Rmb mn**	**4,287**	**9,211**	**18,641**
NPM	*%*	*18%*	*18%*	*18%*
Sungrow - AIDC ESS Net Profit	**Rmb mn**	**772**	**1,658**	**3,355**
Contribution to Sungrow				
Revenue - Segment	Rmb mn	4,287	9,496	19,651
Revenue - Sungrow	Rmb mn	100,673	119,648	144,738
Revenue Mix	***%***	***4%***	***8%***	***14%***
Net Profit - Segment	Rmb mn	772	1,800	3,861
Net Profit - Sungrow	Rmb mn	15,490	17,879	21,611
Net Profit Mix	***%***	***5%***	***10%***	***18%***

Source: Morgan Stanley Research (E) estimates

TMT (LLM & CSP Hyperscalers)

Gary Yu, Lydia Lin, Joanne Lau

Industrial 5.0 to reveal a new scaling dimension for AI LLMs and CSPs

We view Industry 5.0 as the shift from connected factories to adaptive, AI-native production systems, where workflows move from "data → dashboard → human decision" toward "multi-source data → AI reasoning → governed execution → continuous learning". Under this architecture, LLMs, AI agents and CSP hyperscalers can increasingly become the reasoning, orchestration and infrastructure layers across planning, quality control, maintenance, procurement, engineering and supplier coordination. LLMs can sit inside the industrial operating system, combining machine data with unstructured information such as engineering documents, maintenance logs and operating procedures, while CSPs including **Alibaba, Baidu and Tencent** provide the compute, model platforms, data infrastructure and cloud-edge deployment needed to translate intelligence into actions through MES/ERP, industrial software and smart equipment. This shifts AI from assisting workers to coordinating workflows end-to-end.

Industry 5.0 will also expand LLMs and CSPs into Physical AI. As robots, autonomous vehicles and other embodied systems become software-upgradable, foundation models can provide the perception, reasoning and task-planning layer, while cloud platforms support training, simulation, data management and fleet learning. Every deployed intelligent machine becomes a new inference endpoint and source of proprietary operational data, broadening AI monetization from digital knowledge work into factories, warehouses and other physical environments.

Open weights could be the bridge from LLMs to Physical AI. China's strong open-weight models are particularly relevant for factories and robots, where enterprises need low-latency inference, on-premise deployment, proprietary data fine-tuning and deep integration with industrial software and hardware. Combined with China's large manufacturing base and fast robotics deployment, this can create a self-reinforcing loop: better models → broader factory/robot deployment → more proprietary operational data → stronger domain models → more use cases. In parallel, CSPs can reinforce this loop by providing the cloud, model-development and deployment infrastructure required to scale industrial AI across customers. In our view, this could help Chinese LLMs and CSP platforms evolve from general-purpose software intelligence into industrial agents and "robot brains", lowering adoption barriers and accelerating the shift from connected factories to adaptive Industry 5.0 systems.

Exhibit 286: Open-weight models power a virtuous cycle of physical AI



Source: Morgan Stanley Research

Stock implications

Alibaba (BABA, OW, Top Pick): We see Alibaba as the clearest Chinese CSP exposure to the convergence of open-weight models, cloud and Physical AI. Qwen is expanding into robotics through the Qwen-Robot Suite, covering manipulation, autonomous navigation and world-model simulation, with enterprise customer pilots underway; Amap has also demonstrated an autonomous quadruped guide robot. Together with Alibaba's full-stack AI infrastructure, this creates a potential model–robot–cloud flywheel as physical deployments drive inference and real-world data generation. We forecast AliCloud revenue growth of 50% in F27E, supported by surging AI training/inference demand, reinforcing cloud as a key monetization channel for Alibaba's expanding AI ecosystem.

Tencent (0700.HK, OW): Tencent's Physical AI exposure is earlier-stage but increasingly tangible. Its embodied-AI stack now spans VLM/VLA/reasoning models, TairosAgent and Embodied-AI-as-a-Service; Hy-Embodied-0.5-VLA was trained on >10,000 hours of manipulation data and has been validated on a cosmetics production line at >95% accuracy with a six-second cycle time, while Tencent has also deployed a Unitree G1-based AI tour-guide robot. We see these deployments as early evidence that Tencent is extending its cloud and model capabilities into an enabling platform for industrial and embodied AI.

MiniMax (0100.HK, OW): We see MiniMax as a differentiated global open-weight and omni-model play, with accelerating commercialization providing increasing validation of its model capabilities. ARR surpassed US$800mn in August, ahead of expectations, supported by M3 adoption, H3 video monetization and improving platform scalability. M3.1, M3 Pro and H3.1 should provide the next catalysts, while the planned 10T-parameter model highlights continued commitment to frontier scaling. We forecast revenue to rise from ~US$500mn in 2026 to US$1.5bn in 2027, alongside improving inference efficiency

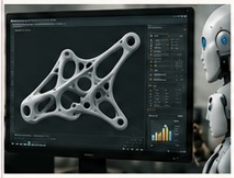
and GPM normalization. MiniMax currently trades at ~9x 2027e P/S, versus our DCF-based HK$900 PT implying 25x, offering meaningful re-rating potential if the next-generation model reaches global state-of-the-art (SOTA) level.

Z.ai (2513.HK, OW): We see Z.ai as China's scaled frontier-model and agent platform, with coding increasingly becoming the foundation for broader coworker agents across professional workflows. Commercial momentum remains strong: August monthly ARR reached US$1.6bn and weekly ARR surpassed US$2bn, while token consumption grew >40x YTD despite API pricing rising 101%. At the same time, an 80% decline in unit inference costs and infrastructure optimization provide a credible path toward margin expansion. We forecast revenue increasing from Rmb6.3bn in 2026 to Rmb19.3bn in 2027, with break-even expected in 2028. Z.ai currently trades at ~25x 2027e P/S, versus our DCF-based HK$1,800 PT implying 35x, with further upside dependent on sustained SOTA model performance, ARR growth and improving compute economics.

Appendix I – Evolving Through Industry 1.0 to 5.0

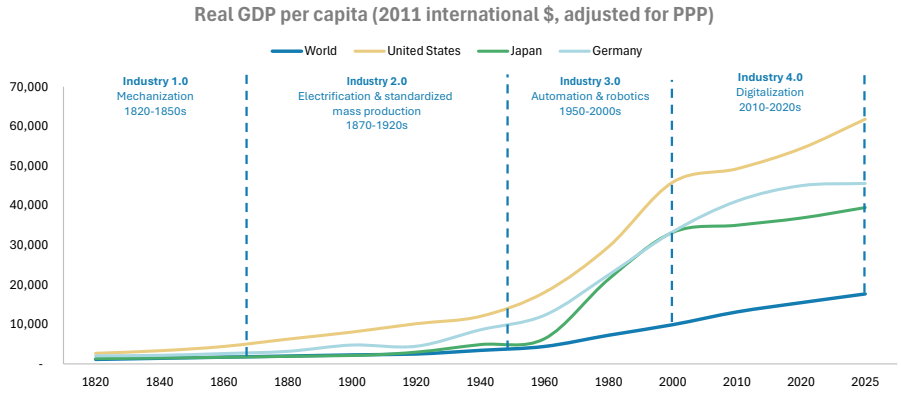
Industrial and manufacturing processes are not fixed and static, but a continuous process of reinvention. Here, we frame the progression of earlier industrial eras and their impact on productivity, cost structures, and labor, prior to Industry 5.0.

Exhibit 287: Industry 1.0 - 5.0: From steam engine to physical AI

	Industry 1.0 – Mechanization	Industry 2.0 – Electrification & Standardized Mass Production	Industry 3.0 – Automation and robotics	Industry 4.0 – Digitalization	Industry 5.0 – Physical AI
Design Process	Unstandardized, craft-based, trial-and-error engineering 	Standardized design and components facilitated mass assembly 	CAD enabled modeling/testing before prototyping 	Digital twin and simulation linked design with production data 	AI-assisted and generative design; testing, production, and after-sales data feed back into development 
Manufacturing Process	Steam-powered machines replaced manual tools, but still operated by labor 	Shift to mass assembly-line. Workers executed repetitive tasks at fixed nodes of assembly line 	Programmable machines, industrial robots and software (CAE, CAPP, CAM, etc.) automated production line 	Connected machines generated real-time data; enabling real-time monitoring and optimization of production 	Closed-loop adaptation 
Role of Human	Machine operators 	Assembly line workers 	Technician & engineers 	Supervisor & data analyst 	Intent governor & boundary setter 

Source: Morgan Stanley Research

Exhibit 288: Industrial Revolution driving global GDP growth



Source: Maddison Project, Morgan Stanley Research. Note: There is no consensus on the exact year of each industrial evolution, for further detail of each evolution, please see the detail in later section. Industrial 1.0 happened as early as mid-18th century, the above chart shows 1820-1850 only due to data availability.

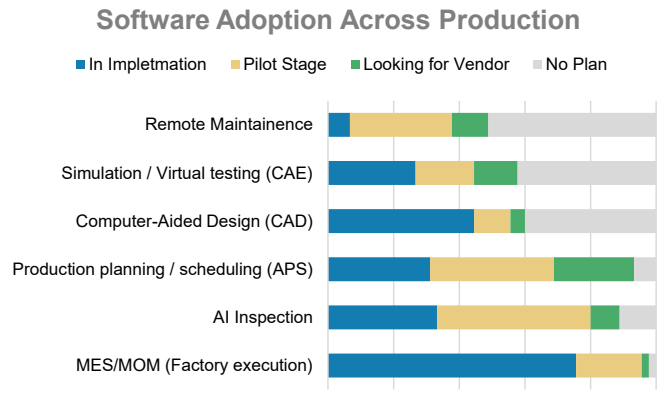
From Industry 1.0 to 3.0, the central objectives were efficiency maximization: Firstly, mechanization replaced manual effort, then electrification and assembly-line production standardized output at scale, and later automation and robotics improved speed, precision, and repeatability. Each wave pushed production toward higher throughput and lower unit cost. With the improving economies of scale, each industrial evolution drove faster growth with world's real GDP per capita CAGR +0.5%, +1.0% and +2.2% for Industry 1.0, 2.0 and 3.0, respectively. But it also progressively narrowed the role of labor from craftsmanship towards supervision, operation, and maintenance.

Industry 4.0 marked the shift toward connectivity and established the foundation for Industry 5.0: This phase transformed purely physical automation to the software layer, as IoT, sensors, cloud platforms, and real-time data visibility enabled factories to monitor and optimize production. In our view, its key contribution was not simply more automation, but the digitalization of the industrial environment itself, creating the data architecture, system interoperability, and process transparency that now form the foundation for the next phase. In short, Industry 4.0 built the connectivity and visibility layer. **That said, the intelligence adoption in Industry 4.0 focused more on the manufacturing process** (execution and operational software), and the adoption rate of dynamics planning, design, simulation and remote maintenance lagged behind (see Exhibit 289). Even with the latest GenAI, the main adoptions are in knowledge and analytics, but the adoption rate for management, control and maintenance remain low (Exhibit 290). Moreover, these capabilities remain fragmented and tool-based rather than closed-loop and self-adaptive. Only 5% of respondents in a survey this year by Manufacturing Leadership Council's Smart Factories and Digital Production indicated they had achieved an end-to-end digitalization today (Exhibit 291).

The breakthrough of Industry 5.0 lies in 'cognitive physicalization' – where AI transitions from the digital realm into physical work to take over complex decision-making and adaptive execution. Industry 5.0 factories combine the digital foundation of 4.0 with AI and robotics advancements to create self-optimizing systems. More than the existing factory automation, the software can coordinate among various applications and processes within the factories to dynamically optimize scheduling, quality control,

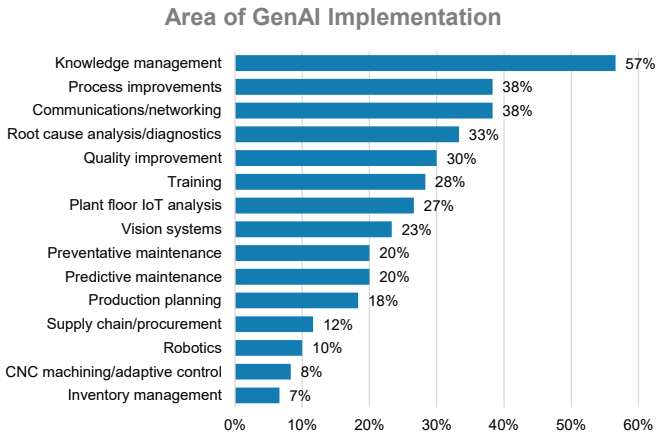
material flow, maintenance timing, and even engineering change responses in real time. **Put differently, Industry 4.0 connected the factory; Industry 5.0 allows it to think, adapt, and respond.**

Exhibit 289: Current focus areas are on manufacturing execution, but adoption in other stages is still low



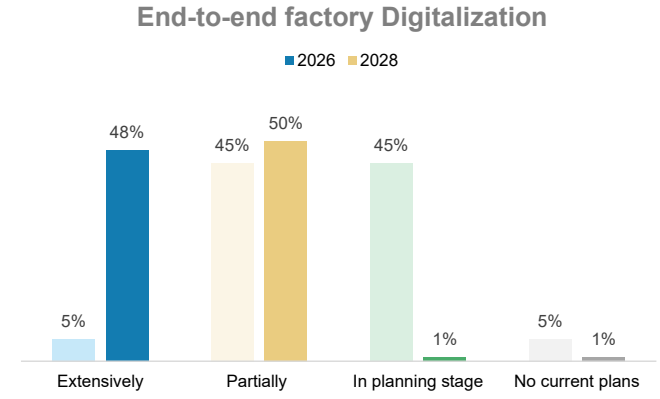
Source: iResearch Survey (n=45), Morgan Stanley Research. Note: MES - Manufacturing Execution System, MOM - Manufacturing Operations Management, APS - Advanced Planning and Scheduling, CAD - Computer-Aided Design, CAE - Computer-Aided Engineering.

Exhibit 290: Even for GenAI, the high adoption areas are focused on knowledge, analysis, but the adoption rate for management, control and maintenance remain low



Source: Manufacturing Leadership Council's Industrial AI Survey of April 1, 2026, Morgan Stanley Research

Exhibit 291: End-to-end factory digitalization is expected to accelerate by 2028



Source: Manufacturing Leadership Council's Smart Factories and Digital Production Survey 2026, Morgan Stanley Research

Exhibit 292: Workflow comparison for Industry 4.0 and 5.0.

Dimension	Industry 4.0	Industrial 5.0
Decision-making	Human-led, data-assisted	AI-assisted or AI-led within guardrails
Changeovers	Require re-program, time-consuming and high cost	Algorithmically optimized, increasingly low-friction
Quality control	Sampling + rule-based vision	Continuous, model-updating inspection and root-cause learning
Scheduling	Periodic replanning	Real-time dynamic sequencing
Labor role	Operator and line monitor	Supervisor
Inventory posture	Buffers to absorb forecast error	Dynamically adjusted for the optimal level
Engineering cycle	Linear, phased approach	Continuous digital loop from design to production feedback
Economics	Scale benefits strongest in stable volume	Scale plus adaptability benefits strongest under volatility

Source: Morgan Stanley Research

What is Industry 1.0 - 4.0?

Industry 1.0 - Mechanization (mid-18th Century to mid-19th Century)

- **The emergence of the factory:** The advent of steam power and mechanized production marked the birth of the factory system. Productivity grew slowly but steadily as mechanization spread over decades. Costs per unit gradually fell from artisanal levels, though output volume remained low initially.
- **And factory workers:** Labor moved from farms and craft guilds to urban factories; work became more standardized and supervised, but skilled

mechanics and machinists were in high demand.

- **Data usage was nonexistent in this era:** feedback was limited to a foreman's eye and a craftsman's intuition. Decision-making was entirely human, via trial and error.

Industry 2.0 - Electrification (mid-19th century to the early 20th century)

- **Mass production as a norm:** Electrification, internal combustion engines, telegraph/telephone networks, and the assembly line enabled mass production and a sharp break in cost and scale. This process divided production into smaller sub-tasks, improving productivity and unit economies. Companies like Ford achieved order-of-magnitude improvements in output and huge reductions in unit cost by producing standardized products at scale.
- **Specialized but repetitive labor:** Labor became more specialized but also more repetitive: semi-skilled operators each performed one task, while new layers of managers and engineers designed workflows.
- **Data usage was minimal:** Decision-making was still human (factory managers and industrial engineers), using basic statistics and line charts at best.

Industry 3.0 - Automation (mid-20th century to 2000s)

- **Computer control and software drove efficiency:** The introduction of computers, programmable logic controllers (PLC), and industrial robots brought automation and precision. Factories could run faster and with greater repeatability. Automation reduced labor costs per unit and cut variable costs, but required significant capital investment, tilting cost structures toward high fixed costs and large production runs.
- **Job polarization:** Many routine manufacturing and clerical jobs disappeared, while demand grew for high-skill roles (managers, engineers, programmers) and very low-skill service jobs, squeezing the middle.
- **Data in Industry 3.0 was largely operational records:** Machines generated logs and measurements used for offline analysis, but real-time data feedback was limited. Decision-making was rule-based: machines executed tasks, and humans still made adjustments when conditions changed.

Industry 4.0 - Digitalization (2010s to Present)

- **Factories began to digitalize and connect.** The Industrial Internet of Things (IIoT) outfitted equipment with sensors; cloud computing and advanced analytics enabled real-time monitoring of production. By collecting data from machines, processes, and supply chains, companies unlocked new optimization opportunities.
- **Labor's role shifted to monitoring these systems:** Shifting from repetitive execution, workers became 'pilots' watching screens and handling exceptions, rather than physically on the line, raising demand for digital and interdisciplinary skills.

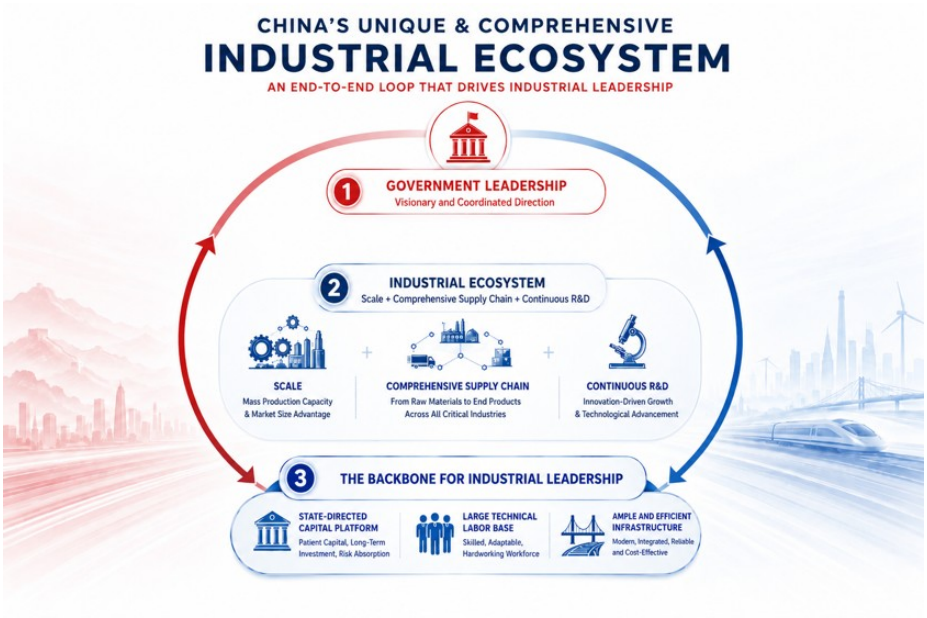
- **Data in Industry 4.0 was mostly descriptive and diagnostic:** It told humans what was happening (or even why), but systems rarely acted on their own. Decision-making was data-informed but not yet data-driven; humans in the loop were still deciding how to adjust the factory based on dashboards and analysis.

Appendix II – China's Unique Industrial Ecosystem

In the past decades, China has built the most comprehensive industrial ecosystem in the world – **A uniquely integrated system of forward-looking government leadership (central + local government), efficient industry execution along the whole value chain, and vast supporting systems including financial, education, and infrastructure.**

These have resulted in China's industrial ecosystem, which is now the world's largest with a rising mix of green and high value-added sectors. The supply chain is comprehensive, decentralized and highly efficient. Continuous R&D efforts have propelled China to global leadership in various fields, instead of just a follower. All these elements reinforced each other, improving China's competitiveness in the global market.

Exhibit 293: China's Industrial Ecosystem



Source: Morgan Stanley Research

Case study #1 - NEV industry: the journey to becoming a mass-market product with government support

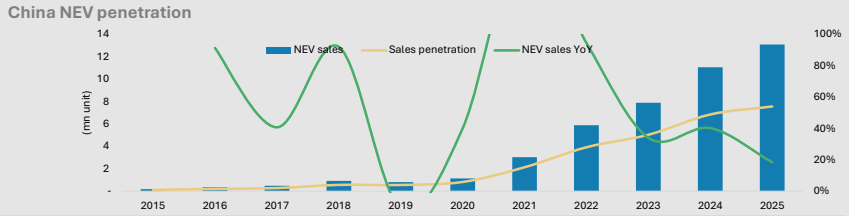
China is now the world's largest NEV market, accounting for 51% of global sales in 2025. The rate of development has outpaced other developed markets where companies entered the NEV market much earlier than in China (e.g., Tesla launched in 2008, Mitsubishi i-MiEV launched in 2009). When reviewing China's NEV evolution, we note multiple factors supporting the rapid EV industrialization: central-government policy direction, local-government execution/inter-competition, strong manufacturing depth, infrastructure construction capacity, abundant engineering talent and capital, and fast product iteration.

- **Central government policy set the long-term direction and provided**

confidence for companies. In the early/mid-2010s, the central government issued a series of high-level guidance/policies, including the five-year-plan (FYP) where it gave the value chain a clear long-term signal that EV would be a national strategic priority.

- **China's policy support was effective because it evolved with the industry.** Early subsidies boosted demand for early stage products; infrastructure policy reduced adoption friction; and the dual-credit system later stimulated OEMs' new product development and production. This policy evolution prevented NEVs from remaining a subsidy-dependent niche, and pushed them into being a mainstream commercially viable product.
- **Local governments competed to create localized EV clusters rather than isolated factories**, attracting OEMs and component suppliers, for example the Yangtze River Delta's "4 hour industrial circle", (i.e., a NEV factory is able to obtain all necessary component supplies within a 4-hour drive).
- **China's existing manufacturing base provided the industrial foundation required for EV scaling.** While China was lagging behind in internal-combustion engines (ICE), since the 2000s China has developed huge scale and capability in electronics, raw materials, machinery, and power equipment, allowing China to transfer into the emerging NEV industry.
- **Huge capital and engineering base created a multitude of startups, and competition turned into product competitiveness.** China's domestic market became extremely competitive. Once subsidies and infrastructure created the early market, private enterprises competed aggressively on range, battery cost, design, intelligent cockpits, assisted driving, charging speeds, manufacturing processes and price. This competition forced rapid iterations in a much shorter timeframe compared to traditional ICE vehicles.

Exhibit 294: EV evolution through government subsidies to meet customer demand



Period	Government-led development	Decline	Inflection point: becoming a booming market
Demand driver	Significant growth driven by subsidies Most demands were from to-B market, not widely accepted by public customer due to higher price and lower range	Subsidies faded out resulting in sales decline	Opening low-end market thanks to cost-parity (Wuling MiniEV, BYD) Penetrating high-end (>Rmb300k) market with luxurious amenities (i.e. Li Auto), advanced tech (i.e. XPENG)
Supply driver	NEV capacity developing thanks to government initiative	Pure NEV players launched 1st model (i.e. Nio, XPENG, Li Auto)	Domestic supply chain becoming more mature with a significant cost advantage More big name players joining (Huawei, Xiaomi)
Technology driver	Most models were converted from ICE foundation with low range, mainly small-size NEV	Dedicated NEV platform	Significant improvement in range, interior, riding quality PHEV/EREV rising to address range anxiety More emphasis on autonomous driving technology

Source: Wind, Morgan Stanley Research. Note: NEV includes BEV and PHEV.

Case study #2 – How China's closed-loop industrial ecosystem response is mitigating the US technology ban

The US's semiconductor products ban began in the 2020s, and it has continued to escalate through 2025 and into 2026, mainly via expanding its Entity List (including major Chinese wafer fab equipment [WFE], EDA, and foundries companies), tightening advanced AI chip bans and EDA software restrictions, while seeking key strategic allies to jointly restrict key semi products to China.

This materially raised the difficulty for China's semiconductor development, especially in advanced logic, AI chips, HBM, EDA and wafer-fab equipment. However, the restrictions also accelerated China's localization cycle by forcing policy, capital, customers and supply-chain players to align around domestic substitution.

China has converted that external shock into a domestic substitution flywheel:

- **External shock raises the need for industrial resilience.** Before the restrictions, Chinese customers were generally optimized for the best global components available. After the restrictions, the optimization function changed: security of supply, regulatory certainty and domestic controllability became as important as peak performance. This lowered the adoption barrier for domestic alternatives, even when they initially lagged global leaders on performance, yield, software ecosystem or cost.
- **Government policies support the domestic value chain: from financing to demand allocation:** The semiconductor sector, along with AI and aerospace, has been among the most frequently mentioned industries in government guidelines over the past decade. China set up its third state-backed semi 'Big Fund' in May 2024, with registered capital of Rmb344bn, up from Rmb99bn in the first, and Rmb204bn in the second 'Big Fund'. More importantly, the government created protected demand for Huawei, Cambricon and other domestic AI-chip vendors. China has reportedly guided state-funded data center projects to use domestically made AI chips. This effectively creates:

  1. End-to-end supply chain localization and vertical coordination: With the new demand and funding, not only do chips/foundries benefit, but the whole value-chain. China's semi supply chain localization has improved meaningfully from basically none in 2018, to meet >50% sufficiency in fields like image sensoring and display drivers, and other segments are also growing quickly. Our Greater China Semis team expects China AI chip self-sufficiency to reach 70% in 2030 (see their latest report here).

  2. Stimulation of semi demand by promoting growth in multiple end-markets: China has huge semiconductor/AI demand. Our China Internet team estimates China hyperscaler capex to reach US$101bn in 2027e,

providing the necessary demand for the domestic semis sector. In addition, China has been actively promoting domestic semis in other end-markets, such as EVs, both to-business and to-consumer electronics.

3. Infrastructure to support AI commercial viability. Our colleagues' analysis suggests China's AI data center total cost of ownership (TCO) can be competitive, supported by lower chip prices, cheaper power, and improving infrastructure. For inference workloads, cost per token matters more than peak performance, reinforcing the competitiveness of domestic solutions.

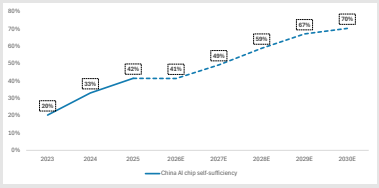
4. An education system supplying the human-capital layer: The Ministry of Education upgraded integrated circuit science and engineering to a first-level discipline in 2021. Since it founded in 1956, Tsinghua School of Integrated Circuits alone has trained more than 4,000 undergraduates, 3,000 postgraduates and 500 PhDs.

Exhibit 295: China's semiconductor self-sufficiency rate, by segment

	Upstream		Memory		Logic Semi						Power Semi	
	Equipment	EDA	DRAM	NAND	CPU	GPU	Display Driver	RF	Image Sensor	MCU	Analog	Power discrete
2018	4%	6%	0%	0%	0%	0%	0%	0%	5%	6%	0%	4%
2019	5%	8%	0%	1%	0%	0%	26%	15%	6%	13%	6%	14%
2020	6%	11%	2%	4%	1%	0%	31%	23%	11%	12%	8%	16%
2021	8%	14%	4%	12%	4%	11%	34%	27%	56%	21%	18%	28%
2022	12%	15%	5%	22%	6%	20%	37%	23%	65%	19%	18%	29%
2023	13%	14%	8%	19%	7%	20%	84%	33%	55%	19%	23%	28%
2024	16%	15%	18%	28%	10%	33%	80%	31%	79%	24%	26%	39%
2025	21%	16%	35%	43%	18%	42%	91%	32%	89%	25%	26%	45%
2026e	32%	17%	38%	54%	20%	41%	91%	35%	95%	26%	28%	48%
2027e	38%	17%	41%	65%	21%	49%	92%	38%	101%	29%	31%	52%
2028e	50%	18%	44%	75%	23%	59%	92%	38%	106%	30%	34%	56%

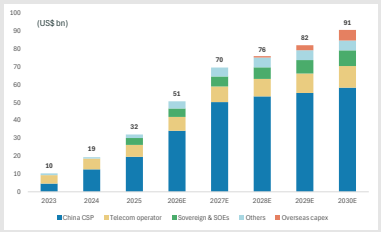
Source: Gartner, WSTS, Morgan Stanley Research (e) estimates.

Exhibit 296: Our Greater China Semis team expects China AI chip self-sufficiency to reach 70% in 2030



Source: Morgan Stanley Research estimates

Exhibit 297: Our Greater China Semis team expects China's AI chip TAM to grow to US$91bn by 2030, initially driven by sovereign/SOEs, but with commercial usage key to long-term growth



Source: Company data, e = Morgan Stanley Research estimates.

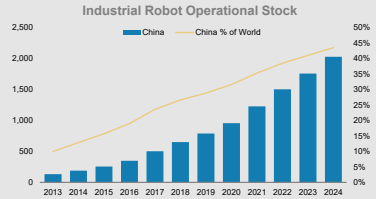
Case study #3 – The era of Chinese robots

China has built a self-reinforcing robotics system: Previously the industrial robot space was dominated by the foreign "Big 4" of industrial robotics, i.e. FANUC, ABB, KUKA, and Yaskawa. China is now the largest industrial robotics market, with

domestic mix exceeding 50%. We see this as a result of an integrated effort of government direction, domestic market, industry know-how, local component supply chain, engineering and system integrators, and more importantly, the success of each element reinforcing other Chinese players and strengthening China's robot's competitiveness in the global market.

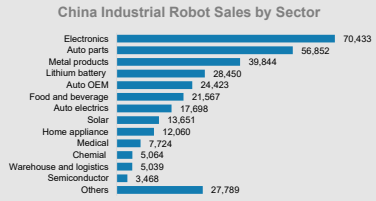
- **Policy creates initial direction and funding:** China's robotics policy became a full industrial strategy after 'Made in China 2025' released in 2015 and the 'Robotics Industry Development Plan, 2016–2020' in 2016. The policy explicitly connected robot makers, component localization, downstream adoption, industrial clusters, standards, finance, and talent. In 2025, China's NDRC set up a state-backed VC fund focused on robotics, AI and cutting-edge innovation, expected to raise ~Rmb1trn over 20 years, according to NDRC.
- **Manufacturing scale creates the adoption base for robots:** Thanks to its strong manufacturing demand, China is the world largest industrial market with over 2mn industrial robots operating, accounting for 43% of global industrial operational stock in 2024, with wide adoption across diverse sectors. The strong demand has attracted more new players, pushing supply chain demand, and more innovation/technology advancements.
- **Downstream localization accelerates component localization**, albeit penetration diverges across components. Basically all the key components have reached a relatively high localization rate, for example, both harmonic and RV reducers have gained market share from foreign players. The wide adoption of local supply chains has lowered component/robot prices, supported adoption willingness, and also driven a fast iteration of new products.
- **Continuous R&D:** As well as catching up with foreign players on traditional industrial robots, domestic players are front-runners in new collaborative robots, now accounting for 64% of global robot sales in 2025.

Exhibit 298: China has the world's largest industrial robot fleet



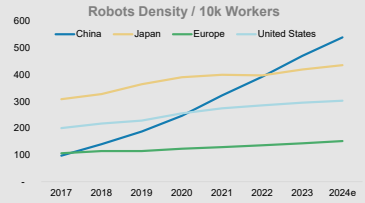
Source: IFR, Morgan Stanley Research

Exhibit 299: With diverse adoption across sectors



Source: MIR, Morgan Stanley Research.

Exhibit 300: China has widely adopted robots, its robot density far exceeds Japan, Europe, and the US



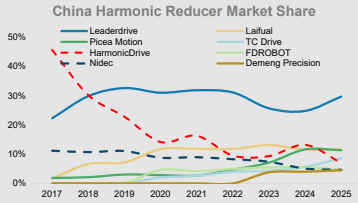
Source: IFR, e = Morgan Stanley Research estimates.

Exhibit 301: China's industrial robot domestic mix exceeded 50% in 2024 (latest data)



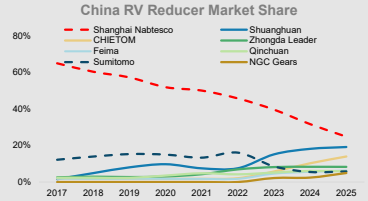
Source: IFR, Morgan Stanley Research

Exhibit 302: China's domestic harmonic reducer suppliers are gaining from foreign players (dotted lines)



Source: MIR, Morgan Stanley Research.

Exhibit 303: Domestic suppliers are also gaining share in RV reducers as well



Source: MIR, Morgan Stanley Research.

Government Leadership – Visionary and Coordinated Direction

Government policy has served as high level guidance for industrial development, often acting as both a growth accelerator and a risk mitigator. Government policy is constantly evolving, pushing the industrial sectors to develop. For example, China established itself as the 'world's factory' after joining the WTO in early 2000s. Then in 2006, the State Council issued its "National Medium- and Long-term Plan for Science and Technology (2006-2020)", shifting the focus from labor-intensive to technology-intensive industries, such as electronics, autos, semis and renewable energies. "Made in China 2025" in 2015 further clarified the country's long-term strategic goals, including increasing domestic value-add, pursuing a green transition, and the fusion of information technology and manufacturing.

China has a holistic approach to support its targeted industries. The favorable incentives lower entry barriers, and the stable and long-term vision also de-risks capital allocation for private stakeholders. Such interventionist measures have helped to create visible pipelines of shovel-ready projects, enhance supply chain resilience, and ultimately reshape industry ROI profiles – particularly vital for capital-intensive sectors.

Today, China has created an increasing number of strategic emerging sectors. New ones in the latest 15th FYP include embodied intelligence, brain-computer interfaces, nuclear fusion energy, and bio manufacturing. This top-down playbook is critical for China to catch up to, if not overtake, developed markets in key industries, such as new energy and robotics. We see the government is applying a similar playbook to the next frontier of

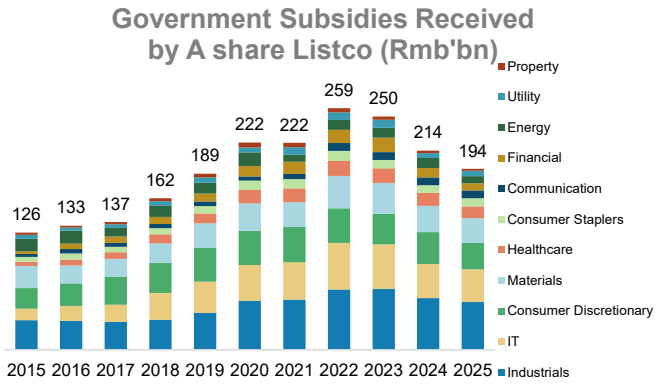
products, such as humanoids (see the policy list for humanoids here) and electric vertical take-off and landing (eVOTL) aircraft.

Exhibit 304: China's industrial policy covers an increasing number of emerging sectors

Sector	10th FYP	11th FYP	12th FYP	13th FYP	14th FYP	15th FYP
Robotics	X	X	X	X	X	X
Hydrogen energy				X	X	X
Next-generation IT	X	X	X	X	X	X
New energy	X	X	X	X	X	X
New materials	X	X	X	X	X	X
Connected NEVs				X	X	X
Biomedicine / biotech	X	X	X	X	X	X
Aerospace equipment	X	X	X	X	X	X
Marine equipment		X	X	X	X	X
Energy storage				X	X	X
Quantum technology				X	X	X
Integrated circuits	X	X	X	X	X	X
Medical devices			X	X	X	X
CNC machine tools	X	X		X	X	X
Shipbuilding	X	X	X	X	X	X
Rail equipment	X		X	X	X	
NEVs	X	X	X	X	X	
New batteries and storage				X	X	X
6G					X	X
Low-altitude economy						X
Intelligent driving						X
New solar cells						X
Biomanufacturing						X
Nuclear fusion energy						X
Brain-computer interfaces						X
Embodied intelligence						X

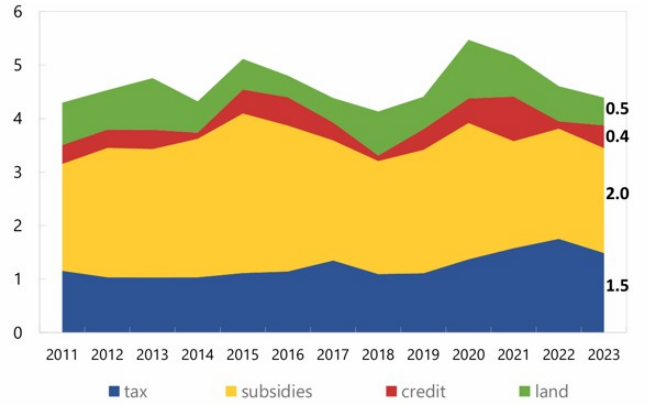
Source: Rhodium Group compilation based on official documents and literature review. Morgan Stanley Research.

Exhibit 305: The government has provided over Rmb2trn subsidies to listcos, particularly in the capital-intensive industrials sector



Source: Wind, Morgan Stanley Research.

Exhibit 306: Per IMF, China's Industrial policy (including tax, cash, credit, and land subsidies) accounted for ~4% of GDP over time.



Source: IMF estimate/data, Baidu Maps, Ministry of Natural Resources, Wind, and Staff calculations.

Note: Results for listed firms are extrapolated to all firms, correcting for the disproportionate share of CIT revenue contributed by listed firms. Financial firms are excluded. Labor costs (to calculate value added) are inferred from employee counts. Land subsidies and subsidized credit are based on advantages for the manufacturing sector relative to other sectors, excluding the real estate sector. The numbers on the right indicate the GDP shares of each category in 2023.

Exhibit 307: National Technical Standards in China

	2005	2010	2015	2020	2021	2022	2023
DOMESTIC STANDARDS							
Total in Effect	1,320	2,860	1,931	2,252	2,815	2,266	2,902
Formulated	690	2,123	1,330	2,584	1,900	1,382	1,708
Revised	630	737	601	668	915	884	1,194
ADOPTED INTERNATIONAL STANDARDS							
Total	711	n/a	500	568	876	792	999
Identical	417	n/a	283	245	521	379	543
Modified	220	n/a	171	323	355	413	456
Non-equipment	74	-	46	-	-	-	-

Source: National Bureau of Statistics, China Statistical Yearbook on Science and Technology 2024 (Beijing: China Statistics Press, November 2024), 216, https://www.stats.gov.cn/sj/ndsj/2024/indexeh.htm.

'AI+' the Centerpiece of Government Policy

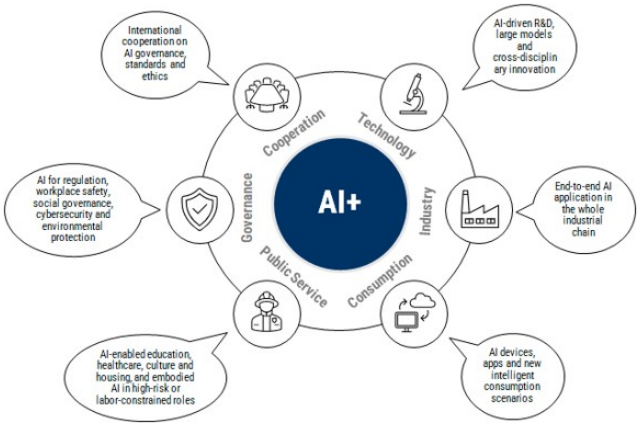
China has set AI+ as the centerpiece in China's 2026-30 Five Year Plan to drive productivity gains, explicitly linking digital and intelligent upgrading to sustained productivity gains, and targeting labor productivity growth that outpaces GDP growth. AI+ is integrated throughout the planning framework – from computing infrastructure and data governance to large scale adoption across industry, services, and public administration – signaling a clear shift from frontier breakthroughs toward deployment at

scale. The government has set explicit targets, as below (see Exhibit 308), and in a series of policies:

- The latest MIIT's 2026–2028 industrial internet platform plan targets more than 450 influential platforms, over 120 million connected industrial devices, and platform penetration above 55% by 2028.
- MIIT and seven other agencies issued the "AI + Manufacturing" action plan, targeting by 2027, to achieve 3-5 general-purpose large models deeply applied in manufacturing, 1,000 high-level industrial intelligent agents, 100 high-quality industrial datasets, 500 typical application scenarios, two to three globally influential ecosystem-leading companies, and 1,000 benchmark enterprises.
- The "AI+" initiative stated that the penetration rate of new-generation intelligent terminals and AI agents is expected to surpass 70% by 2027 and 90% by 2030.
- In April 2025, MIIT and the National Standardization Administration issued the National Intelligent Manufacturing Standard System Construction Guide, aiming to strengthen top-level standard design for smart manufacturing.

Industrial AI benefits from coordination because value often sits across firms, supply chains, and infrastructure layers, not only within one company.

Exhibit 308: The 15th FYP elevated "AI+" as a cross-cutting productivity strategy



Source: Government website, Morgan Stanley Research.

Exhibit 309: China's industrial AI targets by 2027



Source: MIIT, Morgan Stanley Research

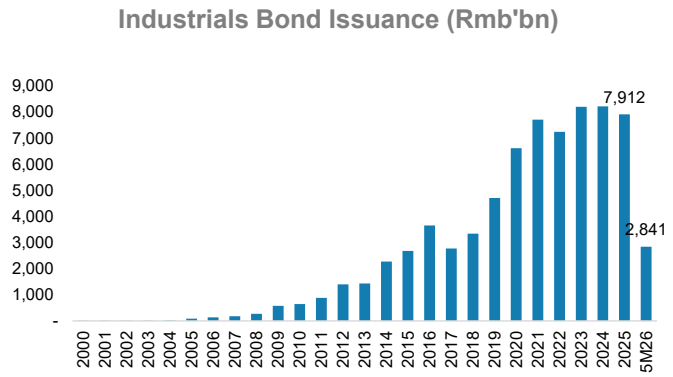
Industry 5.0 is the next step of the government's ongoing endeavor to digitalize and innovate. The government started the digital manufacturing initiative years before the current AI cycle, e.g., it introduced "5G + Industrial Internet" in 2019, the 14th Five-Year Plan for Intelligent Manufacturing in 2021, and the Manufacturing Digital Transformation Action Plan in 2024. The systematic plans for industrial IoT, 5G factories, industrial software, and manufacturing standards, have now become the backbone for Industrial AI adoption.

The Backbone for Industrial Leadership – Capital+Talent +Infra

Capital – A state-directed platform to support industry

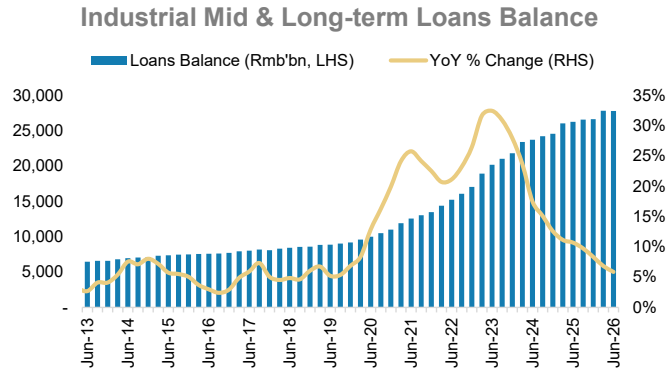
China's financial system is not just a funding channel; it is an industrial-policy tool. Through bank credit guidance, policy-bank lending, PBOC structural tools, government-guided funds, bond financing, and SOE capital, the government lowers funding costs and extends capital duration for sectors aligned with national priorities, including semiconductors, high-end equipment, industrial software, new materials, commercial aerospace, robotics, and advanced manufacturing SMEs. For example, on August 2025, PBOC and six departments issued Guidelines on More Financial Support for Advanced Manufacturing. Financial institutions (FIs) are required to fulfill effective manufacturing credit demand and provide diversified financing support to advanced industries.

Exhibit 310: Industrial bond issuance has surged over the past two decades, reaching Rmb8trn in 2025, with a stock balance of Rmb21trn as of May 2026, per Wind data



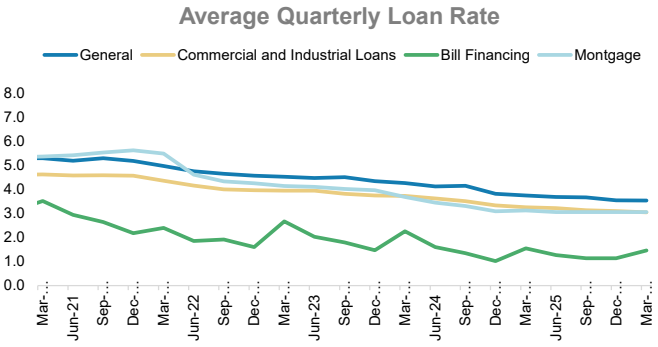
Source: Wind as of May 19, 2026, Morgan Stanley Research.

Exhibit 311: Loan balances are also close to Rmb28trn, although loan growth has continued to moderate since end-2023



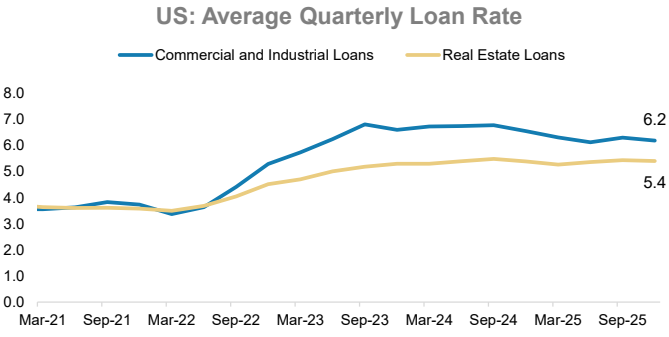
Source: PBOC, Wind, Morgan Stanley Research.

Exhibit 312: China loan yields have stabilized at a low level...



Source: PBOC, Morgan Stanley Research.

Exhibit 313: ...compared to the US



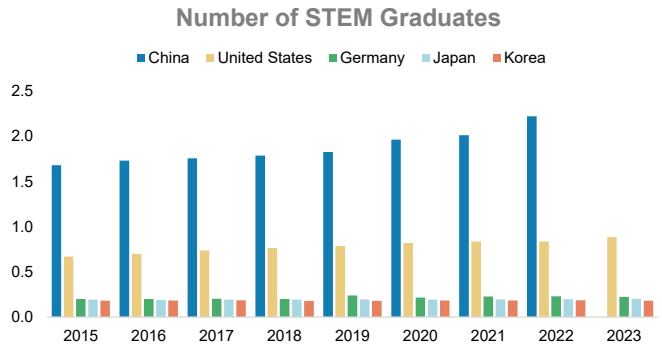
Source: FDIC, Morgan Stanley Research. Note: this is the average rate of all institutions insured by the FDIC.

Talent – China has a large technical labor base

China has the world's largest STEM graduates base with new majors being offered at an accelerated rate. China has consistently produced more science, technology, engineering and mathematics (STEM) PhDs than the US since the mid-2000s. Now, China has over 2mn graduates in STEM majors each year. In addition, universities are now offering strategic emerging majors that align with government policy direction, with most emerging majors in AI, digital economy and smart manufacturing in 2020-24. In the 2025 China Undergraduate Career Destination Survey, run by higher education consulting firm, Mycos, the percentage of graduates that chose electronics & electrical and machinery as their ultimate career destination rose the most over 2020-24.

China's talent advantage is a critical element for Industry 5.0. Industrial intelligence requires not only software engineers, but front-end engineers with specific industry know-how, and interdisciplinary knowledge across industrial production, robotics, automation, and machinery. China's large engineering base gives it advantages in industrial deployment, process optimization, robotics integration, factory transformation, and scaling operational AI systems, rather than frontier research alone. In addition, with the huge engineering base, China can pursue multiple technological pathways simultaneously, fostering a dynamic and competitive industrial landscape.

Exhibit 314: A huge STEM graduate base in China to support the adoption and deployment of industrial AI



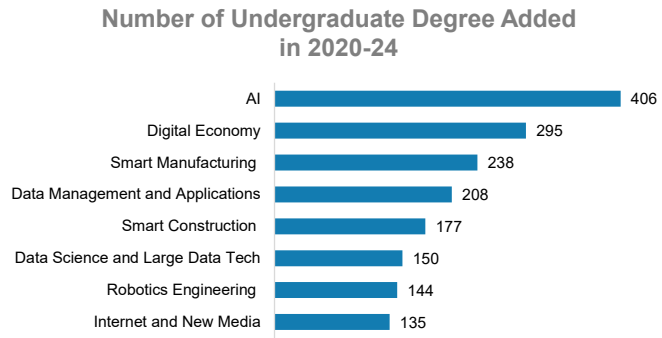
Source: OECD, Ministry of Education, Morgan Stanley Research.

Exhibit 315: The number of researchers per million tripled in the past two decades to support domestic technology development



Source: World Bank, Morgan Stanley Research.

Exhibit 316: China's incremental undergraduate majors in 2020-24 – focus is now on AI, digital economy, and smart manufacturing



Source: Mycos, Morgan Stanley Research.

Exhibit 317: Key career destinations for China's undergraduates – the number of those choosing electronics & electrical and machinery is rising

	2020	2021	2022	2023	2024	2023 vs. 2018 y-y
Education	17.0%	14.0%	13.0%	13.6%	13.9%	-3.1%
ICT	9.0%	9.2%	8.7%	7.6%	8.3%	-0.7%
Finance	7.5%	7.2%	7.3%	7.4%	7.6%	0.1%
Construction	9.0%	8.6%	7.7%	7.0%	6.7%	-2.3%
Electronics&Electrical equipment mfg	5.7%	6.2%	6.8%	6.4%	6.6%	0.9%
Government and public service	6.2%	6.4%	6.8%	6.7%	6.3%	0.1%
Healthcare	5.9%	6.0%	6.0%	6.0%	6.0%	0.1%
Culture, sports and entertainment	4.2%	4.6%	4.5%	4.7%	5.1%	0.9%
Retail	3.5%	3.8%	3.6%	3.8%	4.1%	0.6%
Machinery equipment mfg	2.5%	2.6%	2.9%	3.1%	3.6%	1.1%
Medicine equipment mfg	2.1%	2.4%	2.7%	2.4%	2.4%	0.3%
Transportation equipment mfg	1.3%	1.8%	1.7%	1.9%	1.7%	0.4%

Source: Mycos, Morgan Stanley Research.

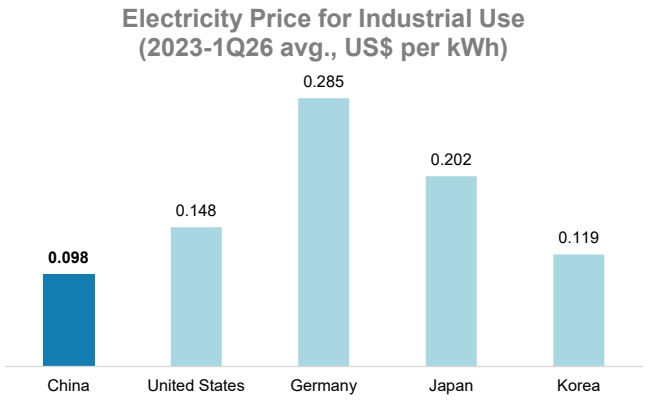
Infra – China's ample and efficient base for industrials

China's power supply is already highly efficient and among the lowest cost across major manufacturing economies. Beyond that, our China utility team expects total grid investment of Rmb4.1tn/US$599bn during 15th FYP (2026-2030e), or 49% growth compared to the 14th FYP, which is set to outpace power growth in the medium term, supported by UHV projects, interregional/provincial interconnected transmission projects, and acceleration of distribution network development, as well as a substantial renewable installations.

Highly connected logistics network. China's robust infrastructure investment over past decades has made a massive road and railway network of 5.5mn km and 162,100 km, respectively, providing an accessible inland freight connectivity. For external connectivity, China owns six of the world's top 10 ports, or 17 of the top 50 ports, according to the World Shipping Council. This opens open the door for China's goods exports to move globally and efficiently. To further improve economic efficiency, the government aims to further cut the logistic costs to GDP to 13.5% by 2027 from 13.9% in 2025 through optimizing infrastructure.

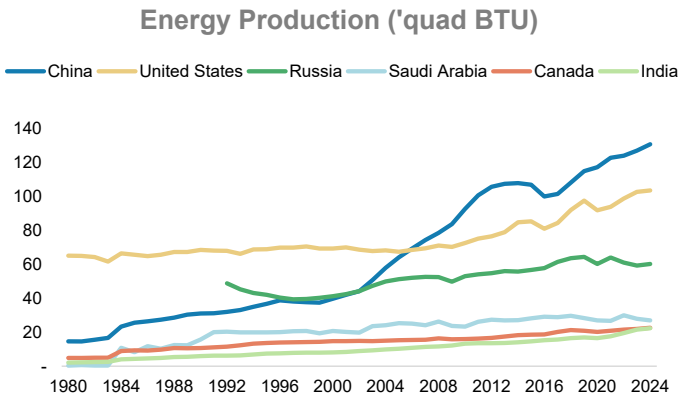
While Industry 5.0 is defined by smarter software, better data and AI-enabled orchestration, competitive advantage still depends on whether goods, components and electricity can move cheaply, reliably and at scale, on which China retains a substantial structural edge.

Exhibit 318: China's industrial electricity prices remain among the lowest across major manufacturing economies.



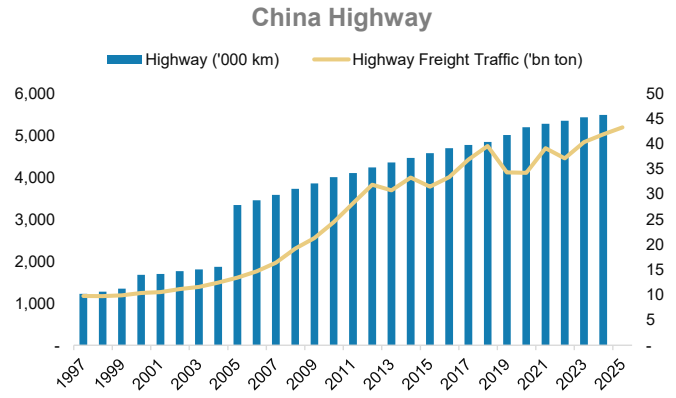
Source: GlobalPetrolPrices, Morgan Stanley Research.

Exhibit 319: China's power system has expanded rapidly to become the world's largest energy producer, with growing diversification across generation sources



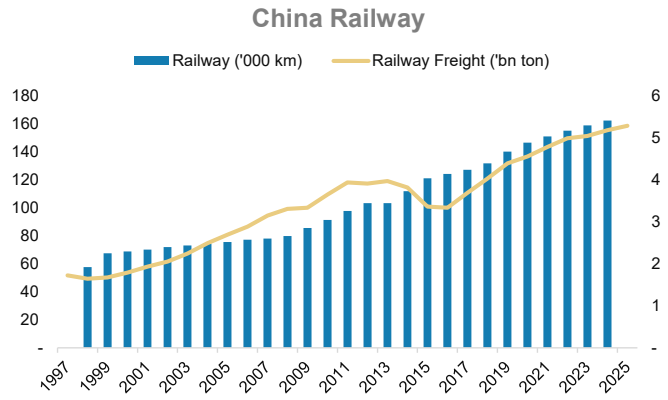
Source: US Energy Information Administration, Morgan Stanley Research. Note: this represents total energy production including coal, natural gas, petroleum & other liquids, nuclear, renewable and other. In quadrillion British Thermal Units (BTU).

Exhibit 320: China's strong logistical infrastructure drives an increasing freight intensity...



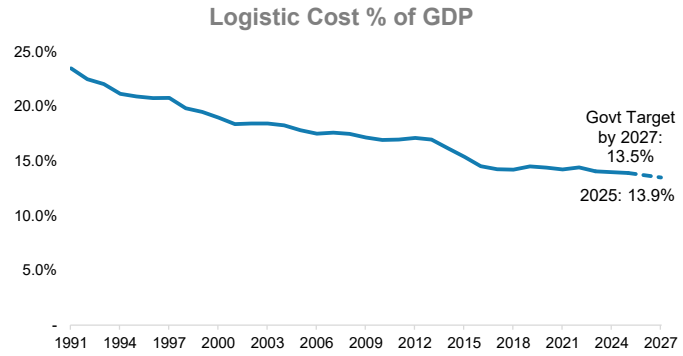
Source: NBS, Morgan Stanley Research

Exhibit 321: ...as well as the world's largest railway infrastructure



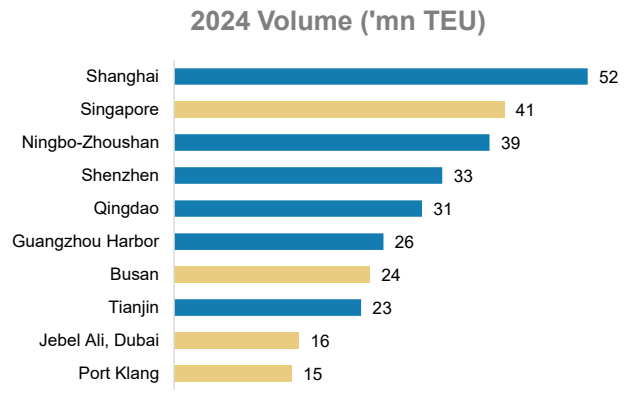
Source: NBS, Morgan Stanley Research

Exhibit 322: China aims to cut the ratio of social logistics costs to GDP to around 13.5% by 2027



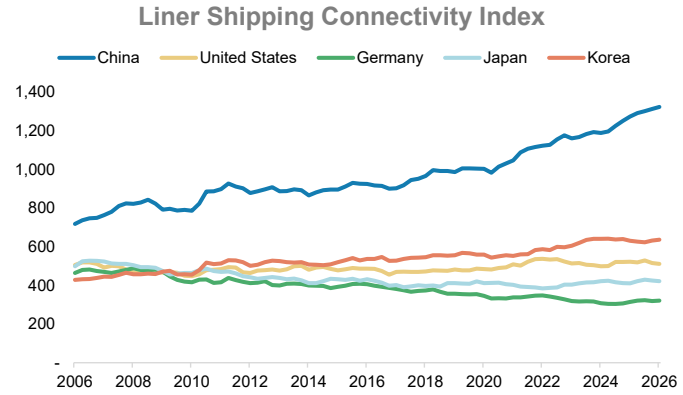
Source: NBS, China Federation of Logistics and Purchasing, Morgan Stanley Research

Exhibit 323: China owns six of the world's top 10 ports, or 17 of the top 50 ports



Source: World Shipping Council, Morgan Stanley Research. Note: Blue represents China's ports, yellow represents foreign ports.

Exhibit 324: China has widened its lead in global liner shipping connectivity, reinforcing export logistics advantages

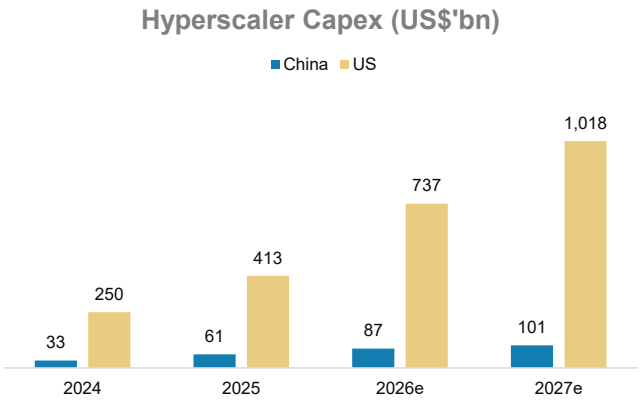


Source: UNCTAD, Morgan Stanley Research

Data infrastructure: China is investing heavily in computer power in the global AI race. Our China internet team expects China hyperscaler capex of US$87bn and US$101bn for

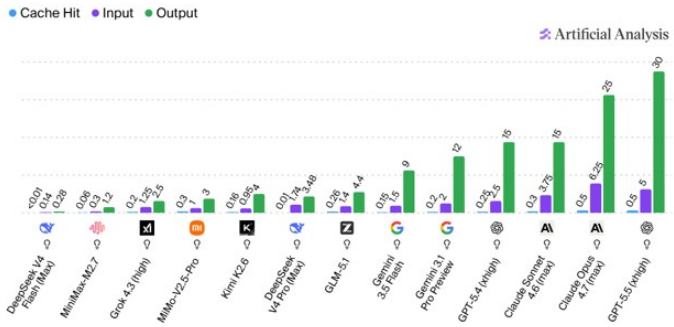
2026 and 2027e, respectively. While it still falls short of US hyperscalers, the computing power provides a base for growing industrial intelligence.

Exhibit 325: China's hyperscalers are set to increase AI-related capex materially despite the level remaining far from US peers.



Source: Company data, e = Morgan Stanley Research estimates. Note: China Capex represents the sum of Alibaba, Tencent, Baidu, Bytedance, Kuaishou, and Kingsoft. US Capex represents the sum of Amazon, Microsoft, Google, and Meta.

Exhibit 326: The China model is following a cost-effective path



Source: Artificial analysis

Appendix III – Long Capex Cycle for Industrial Revolutions Historically

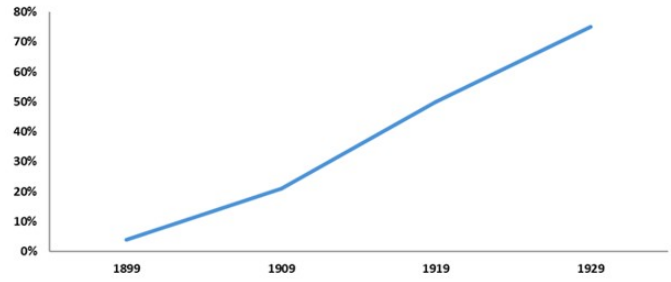
US electrification (1880s-1920s)

US electrification shows that a general-purpose technology can sustain elevated capex intensity for decades, not just years. It was not a one-off equipment replacement cycle – it created a new physical layer for the economy. In current-price terms, US gross capital formation as of GNP picked up from 20.3% in 1869-78, and stayed at high levels: 23.1% in 1889-98, 22.8% in 1899-1908, 22.1% in 1909-18 and 22.4% in 1919-28. That said, during the core electrification phase, capex intensity hovered around 22-23% for multiple decades, before the Great Depression disrupted the cycle.

The physical build-out was significant. US central-station electric power output rose from about 5.97bn kWh in 1902 to 179.91bn kWh in 1940, while electricity's share of primary horsepower in manufacturing increased from 4% in 1899 to 21% in 1909, 50% in 1919 and 75% by 1929. In other words, the capex cycle was not only about building power plants and grids; factories themselves had to be rewired around electric motors, new layouts and new production methods.

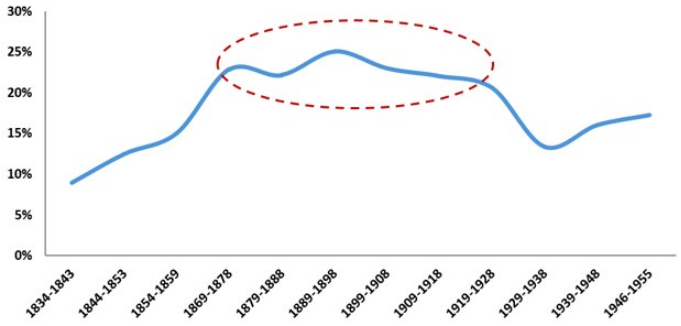
Similarly, for China Industry 5.0 AI-native manufacturing, it also requires both an infrastructure layer and a factory-rebuild layer: compute, grid, storage, cooling, industrial software, robotics, sensors, edge AI and factory automation. The US case supports our argument that once a new general-purpose technology enters the production system, capex intensity can remain structurally high before the full productivity payoff arrives.

Exhibit 327: Electricity's share of primary horsepower in US manufacturing increased from 4% in 1899 to 75% by 1929



Source: National Bureau of Economic Research (NBER), Morgan Stanley Research

Exhibit 328: US gross capital formation as a percentage of GNP – remained at >20% for ~40 years



Source: National Bureau of Economic Research (NBER), Morgan Stanley Research

Japan's heavy industrialization (1960s-1975)

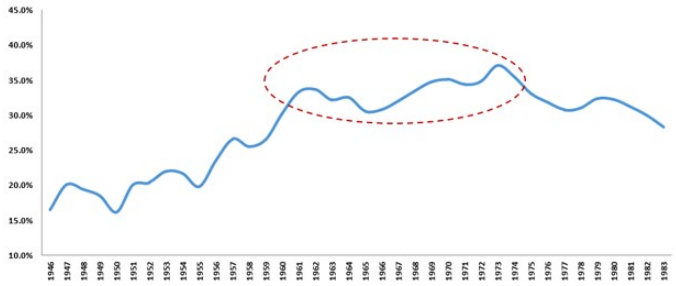
Japan's postwar heavy-industrialization cycle is a useful precedent because it shows that a capex supercycle can last far longer than a normal replacement cycle. Japan's high-growth period ran from the mid-1950s to the early 1970s, with real GDP growth frequently exceeding 10%. More importantly, the cycle was driven by what Japan's Economic White Paper called an "investment-inducing-investment" mechanism: an initial rise in investment created demand for machinery, steel, construction, electricity and other industrial inputs,

which then created the need for another round of investment.

The data support this interpretation. Using GFCF/GDP as the comparable proxy for FAI intensity, Japan's investment intensity rose from 29.6% in 1960 to 36.2% in 1970 and peaked at 37.1% in 1973. It averaged 33.6% during 1961-75 and stayed above 30% for 21 consecutive years from 1961 to 1981. The micro-industrial data also show how fast capacity scaled: Toyota's domestic vehicle production increased from 11,706 units in 1950 to 1.61mn units in 1970, showing how downstream manufacturing scale-up pulled through upstream factory, tooling, component and supplier capex.

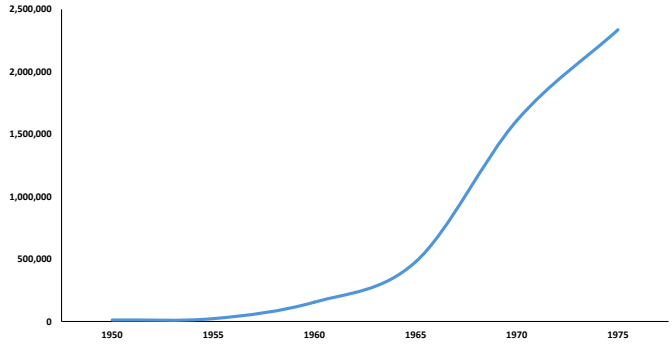
The read-across to China Industry 5.0 is that if AI infrastructure, factory automation, industrial software, power equipment, robotics and physical AI adoption reinforce each other, China's cycle can also become a multi-year, possibly decade-long industrial reinvestment regime. The key lesson from Japan is not sector-for-sector similarity, but the mechanism – when one round of capex raises productivity and output, it creates new bottlenecks in machinery, power, logistics, components and downstream applications – forcing the next round of capex.

Exhibit 329: Japan's gross capital formation as a percentage of GDP – staying at >30% for ~20 years



Source: World Bank, Morgan Stanley Research

Exhibit 330: Toyota passenger car production in Japan – it surged ~55x times in 20 years



Source: Toyota website, Morgan Stanley Research

China's economic boom after joining WTO (2000s-2015)

After China formally entered the WTO in December 2001, China's GFCF/GDP rose from 32.6% in 2000 to 43.4% in 2014; more importantly, it averaged 39.6% across 2000-14 and 42.9% across 2008-14, compared with 32.4% in the six years prior to December 2001.That persistence is the key lesson – once the industrial system is expanding market share and absorbing labor at scale, investment intensity can remain structurally high for more than a decade. China was going through three key structural changes at the time:

1. China was taking global market share. China's exports of goods and services increased from US$253bn in 2000 to US$2.46tn in 2014, lifting its share of world exports from 3.2% to 10.3%. China's share of global manufacturing value-add rose from 8.5% in 2004 to 24.7% in 2014. The global demand and supply-chain relocation created a self-reinforcing need for factories, logistics, power, machinery and urban infrastructure.

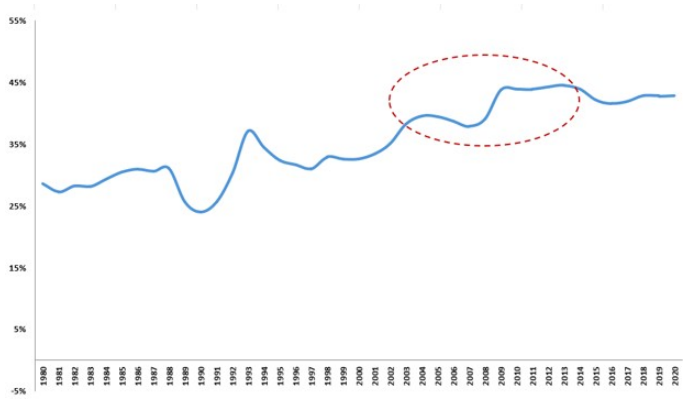
2. Urbanization provided the domestic-demand flywheel. China's urbanization rate rose from 36.4% in 2000 to 55.8% in 2014, a 19.3ppt increase. That migration created housing, transport, utilities, appliance, auto and services demand, while also expanding the urban labor pool for export manufacturing. The result was a rare combination of external share

gain and internal absorption capacity, allowing capex intensity to stay high.

3. Automation was the late-cycle upgrade kicker. China was in industrial upgrade from labor-intensive to capital-intensive and gradually introduced automation into factories very quickly. China became the world's largest industrial-robot market in 2013, when 37k industrial robots were sold/installed and robot density reached 36 units per 10k manufacturing employees.

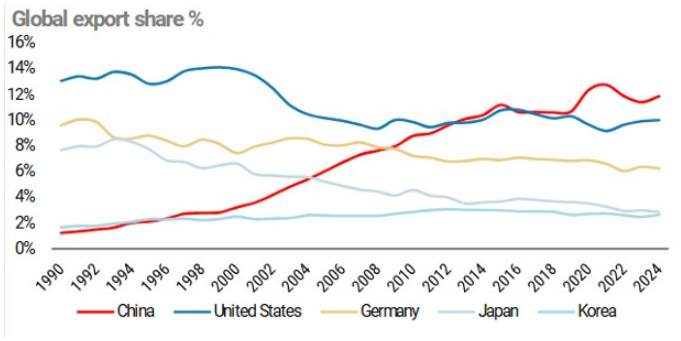
The WTO-era case suggests China's Industry 5.0 capex cycle this time should be analyzed also as a reinforcing system, not a simple equipment replacement cycle. If China can combine global manufacturing share gains with AI-enabled productivity, smart-factory retrofits, power/compute infrastructure, and downstream physical-AI adoption, capex intensity can stay elevated for years even if property capex remains weak.

Exhibit 331: China's gross capital formation as % of GDP rose from 30%+ in 1990s to 40%+ after 2000s – and stayed at high levels for a long period



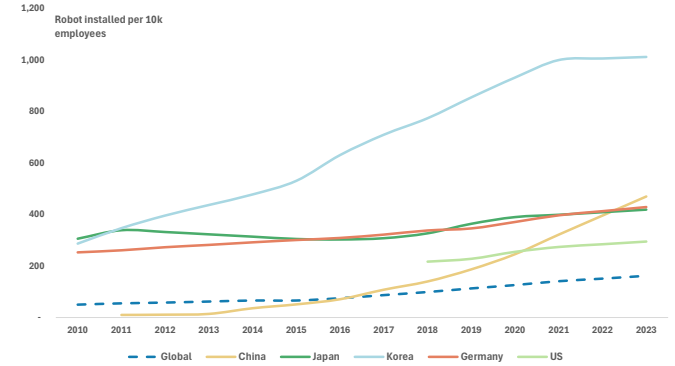
Source: World Bank, Morgan Stanley Research

Exhibit 332: China has largest share of global exports, with fastest share expansion from 2000-2015



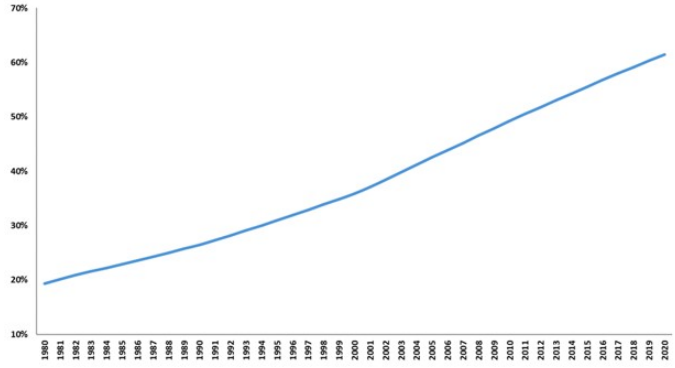
Source: OECD, Morgan Stanley Research

Exhibit 333: China's industrial robot density surged with China becoming 'the world's factory'



Source: OECD, Morgan Stanley Research

Exhibit 334: China's urbanization rate has accelerated this century



Source: OECD, Morgan Stanley Research

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(as of August 31, 2026)

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	Coverage Universe		Investment Banking Clients (IBC)			Other Material Investment Services Clients (MISC)	
Stock Rating Category	Count	% of Total	Count	% of Total IBC	% of Rating Category	Count	% of Total Other MISC
Overweight/Buy	1555	42%	450	48%	29%	767	44%
Equal-weight/Hold	1577	43%	395	42%	25%	770	44%
Not-Rated/Hold	3	0%	1	0%	33%	1	0%
Underweight/Sell	559	15%	93	10%	17%	216	12%
Total	3,694		939			1754	

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INDUSTRY COVERAGE: China Industrials

COMPANY (TICKER)	RATING (AS OF)	PRICE* (09/09/2026)
Chelsea Wang		
China Railway Group (601390.SS)	E (05/12/2022)	Rmb4.44
China Railway Group (0390.HK)	E (08/11/2025)	HK$3.42
China State Construction Engineering (601668.SS)	U (08/11/2025)	Rmb4.39
Han's Laser (002008.SZ)	O (10/02/2025)	Rmb94.85
Hefei Meyer Optoelectronic Technology (002690.SZ)	E (09/08/2025)	Rmb15.84
iRay Technology Company Limited (688301.SS)	O (07/07/2026)	Rmb90.32
Neway Valve (Suzhou) Co., Ltd (603699.SS)	O (09/12/2025)	Rmb44.29
Shanghai BOCHU Electronic Technology (688188.SS)	O (08/22/2024)	Rmb96.18
Shenzhen Envicool Technology Co Ltd (002837.SZ)	O (08/19/2024)	Rmb62.43
Sheng Zhong		
Beijing Geekplus Technology Co., Ltd. (2590.HK)	O (08/07/2025)	HK$9.35
Centre Testing International Group (300012.SZ)	E (11/18/2024)	Rmb14.76
CRRC Corp Ltd (1766.HK)	U (01/22/2026)	HK$5.39
CRRC Corp Ltd (601766.SS)	U (01/22/2026)	Rmb6.16
DR Laser (300776.SZ)	E (12/17/2021)	Rmb113.86
Estun Automation Co Ltd (002747.SZ)	E (08/25/2026)	Rmb30.06
Haitian International Holdings Limited (1882.HK)	E (09/08/2025)	HK$17.97
Hongfa Technology Co Ltd (600885.SS)	O (05/23/2023)	Rmb35.43
Jiangsu Guomao Reducer Co Ltd (603915.SS)	U (01/08/2025)	Rmb13.25
Jiangsu Hengli Hydraulic Co.Ltd (601100.SS)	O (05/23/2023)	Rmb101.63
Jingsheng Mechanical & Electrical Co (300316.SZ)	U (01/08/2025)	Rmb40.33
Leader Harmonious Drive Systems (688017.SS)	O (01/22/2026)	Rmb290.50
Sany Heavy Industry Co., Ltd. (600031.SS)	O (01/08/2025)	Rmb20.22
Shenzhen Inovance Technology (300124.SZ)	++	Rmb55.92
Shenzhen SC New Energy Technology Corp (300724.SZ)	U (09/08/2025)	Rmb53.05
Sinotruk (Hong Kong) Limited (3808.HK)	E (05/19/2025)	HK$44.64
Suzhou Maxwell Technologies Co Ltd (300751.SZ)	U (09/15/2023)	Rmb191.60
Times Electric (3898.HK)	E (01/22/2026)	HK$30.68
WeiChai Power (2338.HK)	O (03/30/2026)	HK$34.02
WeiChai Power (000338.SZ)	O (03/30/2026)	Rmb27.85
Wuxi Autowell Technology Co Ltd (688516.SS)	U (09/08/2025)	Rmb41.48
Wuxi Lead Intelligent (300450.SZ)	O (09/08/2025)	Rmb30.83

Zhejiang Dingli Machinery Co Ltd. (603338.SS)	O (11/05/2025)	Rmb59.56
Zhejiang Hangke Technology (688006.SS)	O (09/08/2025)	Rmb20.54
Zhejiang Shuanghuan Driveline Co. Ltd. (002472.SZ)	O (08/25/2023)	Rmb37.22
Zoomlion Heavy Industry (1157.HK)	O (09/08/2025)	HK$6.15
Zoomlion Heavy Industry (000157.SZ)	O (09/08/2025)	Rmb6.66

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* Historical prices are not split adjusted.

INDUSTRY COVERAGE: Greater China Technology Semiconductors

COMPANY (TICKER)	RATING (AS OF)	PRICE* (09/09/2026)
Charlie Chan		
ACM Research Inc (ACMR.O)	O (03/07/2023)	US$76.91
Advanced Micro-Fabrication Equipment Inc (688012.SS)	O (11/06/2023)	Rmb333.00
Advanced Wireless Semiconductor Co (8086.TWO)	U (07/14/2025)	NT$113.50
Alchip Technologies Ltd (3661.TW)	O (05/14/2021)	NT$3,905.00
ASE Technology Holding Co. Ltd. (3711.TW)	O (09/15/2024)	NT$640.00
Cambricon Technology Corporation (688256.SS)	O (04/27/2026)	Rmb1,054.96
CXMT Corp (688825.SS)	O (08/26/2026)	Rmb56.87
Global Unichip Corp (3443.TW)	O (06/24/2026)	NT$5,925.00
GlobalWafers Co Ltd (6488.TWO)	E (05/19/2026)	NT$955.00
Gudeng Precision (3680.TWO)	O (11/25/2025)	NT$566.00
Hua Hong Semiconductor Ltd (1347.HK)	E (03/12/2026)	HK$111.60
Iluvatar CoreX Semiconductor Co., Ltd. (9903.HK)	O (04/27/2026)	HK$332.60
King Yuan Electronics Co Ltd (2449.TW)	O (03/03/2023)	NT$270.00
MediaTek (2454.TW)	O (11/28/2025)	NT$4,625.00
MetaX Integrated Circuits (688802.SS)	E (04/27/2026)	Rmb532.00
Nanya Technology Corp. (2408.TW)	O (05/28/2026)	NT$523.00
NAURA Technology Group Co Ltd (002371.SZ)	O (11/06/2023)	Rmb646.40
OmniVision Integrated Circuits Group Inc (603501.SS)	E (11/17/2025)	Rmb80.01
Phison Electronics Corp (8299.TWO)	E (02/25/2026)	NT$2,085.00
SG Micro Corp. (300661.SZ)	E (11/03/2025)	Rmb107.75
Silergy Corp. (6415.TW)	U (05/19/2026)	NT$417.00
SMIC (0981.HK)	O (10/21/2025)	HK$65.00
TSMC (2330.TW)	O (02/07/2022)	NT$2,465.00
UMC (2303.TW)	O (05/19/2026)	NT$141.50
Vanguard International Semiconductor (5347.TWO)	E (01/14/2026)	NT$157.00
WIN Semiconductors Corp (3105.TWO)	U (07/14/2025)	NT$464.00
Daisy Dai, CFA		
ASMPT Ltd (0522.HK)	O (07/24/2025)	HK$169.00
China Resources Microelectronics Limited (688396.SS)	U (03/02/2026)	Rmb56.28
Empyrean Technology Co Ltd (301269.SZ)	E (01/17/2025)	Rmb89.50
Hangzhou Silan Microelectronics Co. Ltd. (600460.SS)	U (08/25/2025)	Rmb30.27
Hygon Information Technology Co., Ltd. (688041.SS)	O (07/03/2026)	Rmb235.80
Innoscience (2577.HK)	E (10/13/2025)	HK$44.94
JCET Group Co Ltd (600584.SS)	E (01/16/2026)	Rmb68.64
Shanghai Fudan Microelectronics (1385.HK)	O (03/07/2025)	HK$25.96
SICC Co Ltd (688234.SS)	O (03/20/2026)	Rmb98.05
StarPower Semiconductor Ltd (603290.SS)	E (05/14/2026)	Rmb84.47
Unigroup Guoxin Microelectronics Co Ltd (002049.SZ)	U (01/10/2023)	Rmb61.21
Universal Scientific Ind. (Shanghai) (601231.SS)	O (11/05/2025)	Rmb25.38
Yangjie Technology (300373.SZ)	O (06/10/2022)	Rmb87.01
Daniel Yen, CFA		
AP Memory Technology Corp (6531.TW)	O (07/11/2025)	NT$999.00
ASMedia Technology Inc (5269.TW)	U (10/03/2025)	NT$1,395.00

Aspeed Technology (5274.TWO)	O (06/09/2025)	NT$18,605.00
Egis Technology Inc (6462.TWO)	E (01/28/2026)	NT$100.00
Elan Microelectronics Corp (2458.TW)	O (10/03/2025)	NT$130.00
eMemory Technology Inc (3529.TWO)	O (08/18/2026)	NT$2,780.00
Espressif Systems (688018.SS)	O (05/15/2023)	Rmb108.38
GigaDevice Semiconductor Beijing Inc (603986.SS)	O (05/15/2025)	Rmb381.87
Macronix International Co Ltd (2337.TW)	O (09/18/2025)	NT$126.50
Montage Technology Co Ltd (6809.HK)	O (03/18/2026)	HK$271.40
Montage Technology Co Ltd (688008.SS)	O (03/18/2026)	Rmb195.30
Novatek (3034.TW)	U (02/04/2026)	NT$543.00
Nuvoton Technology Corporation (4919.TW)	U (11/10/2025)	NT$119.00
Parade Technologies Ltd (4966.TWO)	O (05/27/2026)	NT$550.00
Powerchip Semiconductor Manufacturing Co (6770.TW)	O (10/27/2025)	NT$72.40
Realtek Semiconductor (2379.TW)	E (01/30/2026)	NT$705.00
Shenzhen Goodix Technology Co Ltd (603160.SS)	U (07/14/2025)	Rmb51.68
Winbond Electronics Corp (2344.TW)	O (05/28/2026)	NT$183.00
WPG Holdings (3702.TW)	O (03/16/2026)	NT$105.00
WT Microelectronics Co. Ltd. (3036.TW)	O (01/27/2026)	NT$191.50
Duan Liu		
Dosilicon Co Ltd (688110.SS)	U (09/06/2024)	Rmb114.88
Shenzhen Longsys Electronics Co Ltd (301308.SZ)	E (02/25/2026)	Rmb348.03
Henry Zhao		
Maxscend Microelectronics Co Ltd (300782.SZ)	U (01/11/2021)	Rmb73.89
Tiffany Yeh		
AllRing Tech Co. (6187.TWO)	O (09/23/2025)	NT$1,330.00
FOCI Fiber Optic Communications Inc (3363.TWO)	O (01/15/2025)	NT$708.00
Himax Technologies Inc (HIMX.O)	E (02/04/2026)	US$14.12
Hon Precision (7769.TW)	O (04/17/2026)	NT$6,720.00
MPI Corporation (6223.TWO)	O (04/17/2026)	NT$5,615.00
Silicon Motion (SIMO.O)	O (05/06/2024)	US$272.02
WinWay Technology Co Ltd (6515.TW)	O (04/17/2026)	NT$7,280.00

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INDUSTRY COVERAGE: China Utilities

COMPANY (TICKER)	RATING (AS OF)	PRICE* (09/09/2026)
Eva Hou		
CGN Power Co., Ltd (1816.HK)	E (03/21/2026)	HK$3.11
CGN Power Co., Ltd (003816.SZ)	U (03/29/2021)	Rmb4.30
China Longyuan Power Group (0916.HK)	E (01/20/2026)	HK$5.50
China Longyuan Power Group (001289.SZ)	E (08/06/2024)	Rmb15.29
China Resources Power (0836.HK)	E (03/21/2026)	HK$19.16
China Yangtze Power Co. (600900.SS)	O (11/14/2023)	Rmb28.05
Dajin Heavy Industry (002487.SZ)	O (04/18/2026)	Rmb32.57
Goldwind (002202.SZ)	U (01/20/2026)	Rmb17.85
Goldwind (2208.HK)	E (08/17/2022)	HK$9.27
Hangzhou First Applied Material Co. Ltd (603806.SS)	O (01/18/2023)	Rmb14.66
Henan Pinggao Electric (600312.SS)	O (01/18/2024)	Rmb19.73
Huaneng Power International Inc. (0902.HK)	E (06/30/2022)	HK$5.90
Huaneng Power International Inc. (600011.SS)	U (04/07/2021)	Rmb7.04
JA Solar Technology Co Ltd (002459.SZ)	E (09/02/2025)	Rmb6.89
Jiangsu Zhongtian Technology Co. Ltd. (600522.SS)	O (10/12/2020)	Rmb34.12
LONGi Green Energy Technology Co Ltd (601012.SS)	U (09/02/2025)	Rmb11.83
NARI Technology (600406.SS)	O (11/01/2015)	Rmb22.45

Ningbo Orient Wires & Cables Co Ltd (603606.SS)	O (08/17/2022)	Rmb34.10
Riyue Heavy Industry Co., Ltd. (603218.SS)	O (02/11/2025)	Rmb9.28
Shanghai Electric (2727.HK)	U (03/26/2021)	HK$3.10
Shanghai Electric (601727.SS)	U (03/26/2021)	Rmb6.74
Sieyuan Electric Co.Ltd. (002028.SZ)	O (07/01/2025)	Rmb138.58
Sinoma Science & Technology Co. Ltd. (002080.SZ)	O (09/23/2025)	Rmb50.53
Sungrow Power Supply Co. Ltd (300274.SZ)	O (06/09/2026)	Rmb87.00
Tongwei Co. Ltd. (600438.SS)	E (09/02/2025)	Rmb11.71
XJ Electric (000400.SZ)	E (03/21/2026)	Rmb21.60
Hannah Yang, CFA		
Xinyi Solar Holdings Ltd (0968.HK)	O (07/30/2020)	HK$2.17
Tom Li		
Anhui Yingliu Electromechanical Co Ltd (603308.SS)	O (04/08/2026)	Rmb46.30
China Gas Holdings (0384.HK)	E (07/10/2026)	HK$5.61
China Resources Gas (1193.HK)	E (07/10/2026)	HK$17.37
Huaming Power Equipment (002270.SZ)	O (04/08/2026)	Rmb19.70
Ningbo Sanxing Medical Electric Co. Ltd. (601567.SS)	O (04/08/2026)	Rmb13.47

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