Not for redistribution without written consent of Morgan Stanley

Morgan Stanley | RESEARCH

IDEA

September 7, 2026 09:32 PM GMT

Tech Bytes | Asia Pacific

Which AI Bottleneck To Invest In?

Astra GPT-6 strengthens the AI bottleneck narrative. The risk of under-investing now outweighs the risk of over-investing given investors' reduced positioning, macro ambiguity and a wall of worry following recent draw-downs. Ambiguity has value and we update our best global opportunities.

Which AI bucket to invest in? We want to stay where the AI money is being spent and believe tech investing can be divided into three primary verticals: (1) AI computing – most preferred; (2) memory – Astra GPT-6 provides a near-term narrative boost; and (3) networking is second best. These sub-groups of AI are all recipients of AI capex spending and substantially growing TAM but at different stages of respective cycles.

We believe the market is under-appreciating three dynamics: (1) the impact from the recently launched GPT-6 Astra and its global tech beneficiaries; (2) tighter supply duration caused by lack of material capacity growth (ABF substrates) or challenging manufacturing complexity (Back-End of Line (BEOL) complexity of HBM4E); and (3) stocks that can do well outside of AI and can quietly keep working.

In the latter stages, the higher the expectations, the easier it is to disappoint. Investors don't expect good earnings for AI names anymore – they expect perfect. With valuations approaching normality, Tech is likely to become a pure earnings momentum sector – we buy it when earnings momentum is improving and not because it becomes 'cheap'.

We prefer companies positioned where a broader inference cycle meets limited physical capacity, rising content intensity or increasing manufacturing complexity. Our preferred expressions are AI compute: GPU (NVDA); ASICs (MediaTek, GUC); ABF (Unimicron, Ibiden); MLCC (Murata, SEMCO); back-end semicap/OSAT (Advantest, Tokyo Electron, Chroma, Hon Precision, ASE, KYEC); and power (Delta). In networking: GLW, LITE, COHR, KEYS, Furukawa, Fujikura and Soitec. In memory, we prefer structural share gain and localization: CXMT, while SK hynix, Samsung and Kioxia offer tactical upside (i.e. Astra GPT-6) if tight supply persists, given the later stage of the commodity cycle. Outside AI, analog (STM, NXP, Renesas) offers the most attractive early-cycle diversification.

MORGAN STANLEY & CO. INTERNATIONAL PLC+
Shawn Kim
Equity Analyst
Shawn.Kim@morganstanley.com +44 20 7677 7018

MORGAN STANLEY ASIA LIMITED+
Duan Liu
Equity Analyst
Duan.Liu@morganstanley.com +852 2239 7367

MORGAN STANLEY & CO. INTERNATIONAL PLC+
Cindy Huang
Equity Analyst
Cindy.Huang@morganstanley.com +44 20 7425 2415

MORGAN STANLEY & CO. INTERNATIONAL PLC, SEOUL BRANCH+
Ryan Kim
Equity Analyst
Ryan.G.Kim@morganstanley.com +82 2 399 4939

MORGAN STANLEY & CO. INTERNATIONAL PLC+
Lee Simpson
Equity Analyst
lee.simpson@morganstanley.com +44 20 7425 3378

Nigel van Putten
Equity Analyst
Nigel.Putten@morganstanley.com +44 20 7425 2803

Amelia M Scicluna
Research Associate
Amelia.Scicluna@morganstanley.com +44 20 7425 6694

S. KOREA TECHNOLOGY

Asia Pacific Industry View	**Attractive**

Morgan Stanley does and seeks to do business with companies covered in Morgan Stanley Research. As a result, investors should be aware that the firm may have a conflict of interest that could affect the objectivity of Morgan Stanley Research. Investors should consider Morgan Stanley Research as only a single factor in making their investment decision.

For analyst certification and other important disclosures, refer to the Disclosure Section, located at the end of this report.

+= Analysts employed by non-U.S. affiliates are not registered with FINRA, may not be associated persons of the member and may not be subject to FINRA restrictions on communications with a subject company, public appearances and trading securities held by a research analyst account.

Investment Summary

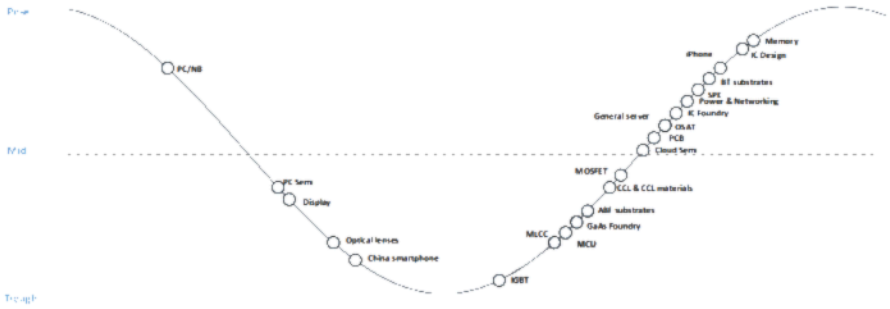
We continue to favor a barbell between structural AI growth and early-cycle non-AI recovery.

- **Within AI, compute remains our highest-conviction bucket**, given the combination of strong unit growth and continued earnings upside across the computing stack in semiconductors GPU/CPU/ASIC, TSMC, and downstream hardware in high-end substrates (ABF) and capacitors (MLCC).
- **Networking is our preferred second leg.** The scale-up networking opportunity is expanding materially as accelerator domains grow, although the transition toward optics is likely to be more evolutionary than previously assumed. We prefer exposure across optical, electrical and architecture-enabling technologies rather than relying exclusively on an aggressive near-term CPO ramp.
- **We remain constructive on the structural memory story but are more selective** as the commodity cycle approaches late-cycle, pricing power is moderating and driving fewer surprises to earnings growth. We prefer legacy memory (DDR4, SLC NAND, NOR), China localization within semicap and prefer packaging and test parts of WFE driven by AI computing over incremental generic front-end exposure.

GPT-6 Astra could drive higher demand for compute and inference. The importance of Astra is not simply another model upgrade trained on 100,000 GPUs, where scaling continues and the running costs go up as more chips are needed. Rather, it is more about the breadth of capabilities and interoperability where frontier AI is moving materially higher – across reasoning, engineering, computer use and physical-world tasks. If these capabilities translate into commercially useful applications, the addressable AI revenue pool can broaden well beyond today's dominant use cases. While the market has spent much of the recent drawdown debating how much infrastructure is required to serve known AI demand, Astra potentially changes the question toward how many new workloads become economically viable as model intelligence improves. Better models can create an elasticity effect: as AI becomes more capable and useful per dollar spent, the number, duration and complexity of inference workloads can increase. **In our view, that shifts the bottleneck narrative away from demand formation and back toward the physical constraints required to deliver that intelligence at scale.**

Outside AI, we like cyclically depressed areas of the market (so this is consumer end markets). Once demand normalizes, these companies will have a strong rebound. Global analog offers the most attractive early-cycle diversification, while smartphones, PCs and broader consumer electronics move past trough cycle despite remaining challenged.

Exhibit 1: Sequencing the cycle

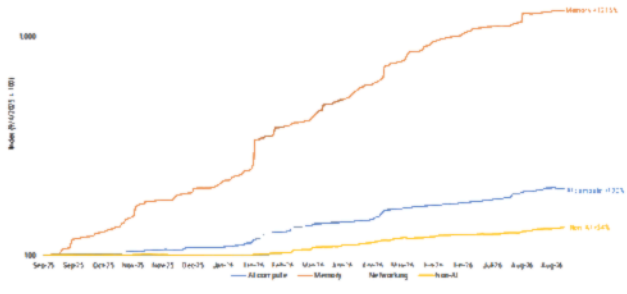


Source: Morgan Stanley Research estimates

Earnings still matter a lot – are the best days behind us? We cannot see Tech beginning to outperform until relative earnings momentum starts to improve. We have had an earnings period confirming the 'AI party' is still going on but stocks did not react positively and not all companies delivered against high market expectations. Traditionally, when relative earnings revision momentum is positive, valuations lose some importance and the sector can outperform. However, when relative earnings momentum is negative, any valuation overhang reinforces earnings drags and the sector tends to significantly underperform.

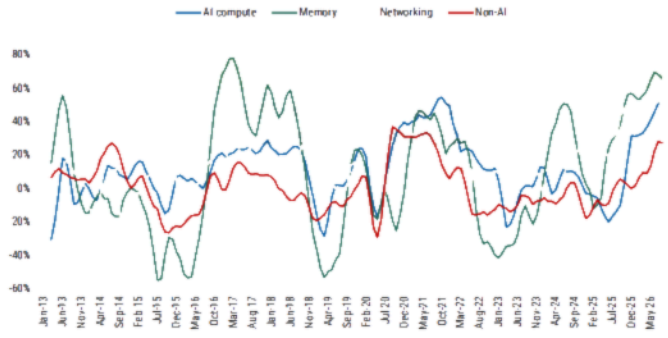
- We believe earnings deliverability and the ability to tolerate estimate downgrades will be the most important driver of near-term stock performance.
- AI beneficiaries are no longer outpacing earnings revision relative to non-AI segments of tech. In Exhibit 3 earnings revision breadth suggests forward earnings momentum may be best for AI compute, networking, non-AI and least for memory stocks, which appear to be past their peak.
- Bottom up, there is 56% consensus earnings growth for AI beneficiaries in 2027 and consensus bakes in margin expansion in an environment where revenue growth is decelerating in 2026. This is an improbable outcome, and we think 53% is more likely.

Exhibit 2: FY27e EPS index trend by bucket



Source: Factset, Morgan Stanley Research

Exhibit 3: Earnings revision breadth by bucket – 3M moving average



Source: Factset, Morgan Stanley Research

Key risks. For AI names, it is a relative term because on an absolute basis, these companies are growing far faster than the market, but from a 'what's priced in' on the stocks perspective, recent results did not provide sufficient upside surprise, helping

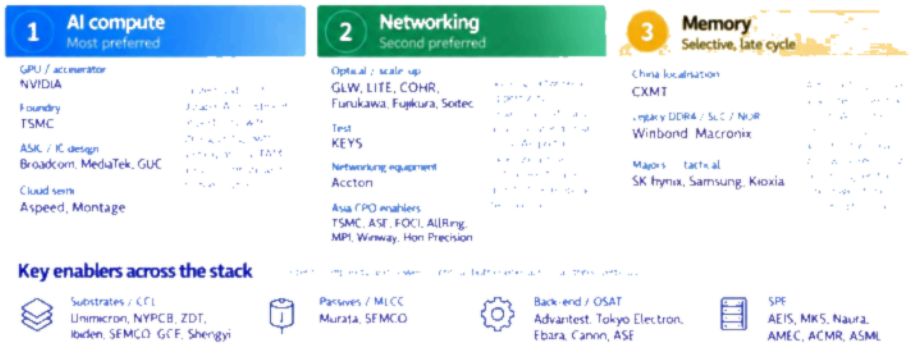
explain the stocks' weak performance since late June.

- There is also an AI capex deceleration likely from 2027 (not negative growth) but stocks live at the margin, at the second derivative and that is what could continue to weigh on the space.
- **Don't fight the Fed.** Macro, oil, inflation, Fed rates and US elections are headwinds ahead.

The investment implication is not simply "buy more AI." We prefer companies positioned where a broader inference cycle meets limited physical capacity, rising content intensity or increasing manufacturing complexity. Our preferred expressions are AI compute: GPU (NVDA); ASICs (MediaTek, GUC); ABF (Unimicron, Ibiden); MLCC (Murata, SEMCO); back-end semicap/OSAT (Advantest, Tokyo Electron, Chroma, Hon Precision, ASE, KYEC); and power (Delta). In networking: GLW, LITE, COHR, KEYS, Furukawa and Fujikura. In memory, we prefer structural share gain and localization: CXMT, while SK hynix, Samsung and Kioxia offer tactical upside (i.e. Astra GPT-6) if tight supply persists, given the later stage of the commodity cycle.

Outside AI, we are increasingly constructive on analog names (STM, NXP, Renesas) given early cycle recovery. 1H26 confirmed that we are at the start of an upcycle. We expect this to continue for at least the latter half of this year, with likely continued price improvements, steps towards inventory replenishment and constructive book-to-bills. Most of our global coverage have guided to above seasonal end-market growth with channel conditions uniformly healthier vs a year ago (see our Global Analog Takeaways from the last quarter here).

Exhibit 4: GPT-6 Astra: Expanding the AI Opportunity



Source: Morgan Stanley Research

Exhibit 5: Stock Picks - Good Things Come in Pairs

Sector	Current Industry View	Most Favored	Least Favored
China smartphone	Smartphone industry has already suffered from component cost increase in 1H26, we expect the headwinds to continue in 2H26. However, as most negatives have been well known, we believe the smartphone industry has moved close to the cyclical trough.	Xiaomi	NA
Optical lenses	Due to memory cost increase, optical lens' spec upgrade is likely to face BOM pressure. We expect mid-to-low-end products to face headwinds while high-end products to be better positioned. Besides this, leading optical lens companies are developing CPO/NPO related new businesses, which is likely to become a strong new growth driver.	Largan	Ofilm, Lianchuang
PC Semi	Revenue and GM are under pressure from component price hikes (CPU, memory). 1H shipments helped by pre-stocking. 2H could be weaker or below seasonality	Elan	Asmedia
IGBT	Pricing recovered due to cost increase and industry wide price hike, however margin remains low due to depreciation and some customer pushback	Infineon Technologies, STMicroelectronics	Silan Micro
GaAs Foundry	The overall demand is improving from market share gain and new optical/aerospace business. However, investors expectation is high and valuation is stretched	WIN Semi	AWSC
MCU	Data center related demand is strong, while consumer demand has been weak in the MCU market. We expect pricing to increase reflecting foundry and backend price hike	Espressif, STMicroelectronics, Infineon Technologies	Nuvoton
MOSFET	Favorable pricing environment and high utilization of industry players we prefer quality companies with increasing auto exposure	Yangjie	CR Micro
OSAT	OSAT pricing remains favorable and overall utilization at high level. we prefer companies with strong AI revenue growth	ASE	JCET
Cloud Semi	We expect cloud semi players to continue to benefit from the strong cloud capex cycle, helped by the expanded TAM from agentic AI demand	Aspeed, Montage	NA
IC Foundry	The industry sees strong AI demand for leading-edge and 12-inch wafer while 8-inch matured node demand also see some recovery	TSMC	Vanguard
SPE	Accelerated investment in both leading-edge DRAM and Logic is driving strong WFE growth into 2026-2027, while we are seeing momentum getting even stronger for advanced packaging/testing as well	Tokyo Electron, ASML, ASM	Lasertec
Memory	We distinguish between still-strong memory fundamentals and increasingly less attractive relative risk/reward as the cycle matures. We prefer structural share gain, localization and downstream AI exposure to generic commodity pricing exposure.	CXMT, Winbond, Macronix	NA
IC Design	The industry continues to see strong CSP demand for both AI ASIC and CPU, of which the revenue growth for these companies in the following years should all be very strong	MediaTek	Alchip
Display	Overall TV order momentum to stay lukewarm into 2H26 post the restocking in 1H26, while seasonal panel demand should start picking up toward late 3Q in preparation for year-end promotions. Supply-side should stay disciplined and could help prevent significant price declines. IT panel prices are likely to stay flat in coming quarters. Incremental contributions from advanced packaging will likely take longer to materialize and competition could intensify as the industry moves toward mass production.	BOE	NA
Power & Networking	Increasing power consumption for AI servers sets the stage for secular power supply demand. Moreover, the complementary business of thermal solutions and BBU/CBU, and emerging configuration of HVDC all presents opportunities for power supply vendors. Surging data traffic continues to drive the secular demand and spec upgrade for network switches along with the AI capex cycle.	Delta, Accton, Infineon Technologies, STMicroelectronics, Soitec	NA
iPhone	We expect iPhone to gain share in the smartphone market this year against weaker Android phone demand, despite likely price hikes	Apple and the Apple supply chain	NA
ABF substrates	We expect ABF substrate to see undersupply from 2027 onwards, driving price hikes and margin expansion. New capacity takes at least 2 years to come online, which furthers add to the undersupply	SEMCO, Unimicron, NYPCB	NA
BT substrates	On the demand side, we expect memory to continue driving BT substrate demand. On the supply side, major substrate suppliers are converting BT substrate lines to ABF, which reduces available BT capacity.	Unimicron, NYPCB	NA
General server	We expect hyperscalers' capex growth and agentic AI workloads to continue driving demand for general servers.	Wiwynn	NA
AI server	We expect demand from both hyperscalers and neoclouds for AI servers to be well-sustained in CY27.	Wistron, Infineon Technologies	Compal
PC/NB	We expect PC volumes to decline 15-20% in 2H26 and demand to remain subdued in 2027. However, we believe OEMs have stronger pricing power that enables them to fully pass through higher component costs amid Chipflation.	Lenovo	Acer
MLCC	We expect contract pricing with direct customers to continue to go up in 2H26, supported by a tight supply environment driven by AI demand. Customers are seeking LTAs, which reaffirms stronger and longer demand visibility	SEMCO, Murata	Yageo
PCB	We expect higher layer counts and more complex designs of AI server boards to consume substantial PCB capacity, which strengthens suppliers' pricing power.	GCE	NA
CCL & CCL materials	We expect higher layer counts and more complex designs of AI server boards to consume substantial CCL capacity. Additionally, capacity expansion is capped by key equipment supply. Both add to the undersupply and strengthen suppliers' pricing power	Shengyi Tech	NA

Source: Morgan Stanley Research

Exhibit 6: MS Tech coverage performance tracker – iPhone supply chain, PC Hardware and substrate outperforming in the past one month

	1W %	1M %	3M %	YTD %
iPhone supply chain	(4%)	10%	7%	63%
PC/NB Hardware	4%	11%	15%	86%
Substrates	(3%)	0%	(3%)	458%
Server Hardware	2%	8%	10%	152%
Could Semis	1%	2%	(2%)	125%
Smartphone Hardware	(1%)	4%	(7%)	(12%)
Smartphone Semis	6%	4%	(5%)	68%
Memory	1%	5%	(9%)	508%
MCU	(5%)	(8%)	(15%)	24%
Foundry	3%	3%	(8%)	120%
EDA	(10%)	(7%)	(16%)	(15%)
Passive Component	2%	4%	(20%)	355%
Consumer Electronics and Others	(2%)	(3%)	(1%)	35%
Panel	(4%)	(10%)	(16%)	(3%)
SPE	(1%)	(2%)	3%	143%
Networking	(1%)	(3%)	(5%)	226%
PC/NB Semis	3%	(5%)	(2%)	130%
OSAT	4%	(4%)	(10%)	199%
Analog/Auto Semis	2%	(8%)	(19%)	64%
Average	**(0%)**	**0%**	**(5%)**	**143%**

Source: Factset, Morgan Stanley Research estimates

Exhibit 7: MS Tech coverage EPS revision tracker - PC Hardware, networking and server hardware see the largest upward revision in the past one month

	Last 12M %	1M %	3M%
PC/NB Hardware	61%	20%	28%
Networking	110%	17%	29%
Server Hardware	99%	10%	17%
Substrates	215%	6%	28%
Could Semis	118%	5%	16%
Foundry	82%	5%	19%
EDA	7%	4%	2%
SPE	75%	4%	19%
Memory	1205%	3%	37%
Passive Component	135%	2%	27%
iPhone supply chain	23%	2%	4%
Analog/Auto Semis	44%	2%	8%
PC/NB Semis	65%	1%	17%
MCU	52%	1%	12%
OSAT	111%	0%	19%
Consumer Electronics and Others	26%	0%	1%
Smartphone Semis	14%	-2%	3%
Smartphone Hardware	-9%	-5%	-10%
Panel	6%	-5%	-4%
Average	**128%**	**4%**	**14%**
AI Beneficiaries	108.5%	6.3%	15.9%

Source: Factset, Morgan Stanley Research estimates

Prefer AI Compute, Networking, Analog; More Selective on Memory

We would frame the semiconductor opportunity across three AI buckets – compute, memory and networking – with global analog providing an increasingly attractive non-AI diversification opportunity.

1) AI compute remains best positioned on both unit growth and earnings upside

AI compute remains our highest-conviction bucket, with demand continuing to run ahead of prior expectations across GPUs, CPUs/ASICs, leading-edge logic and the supporting component ecosystem.

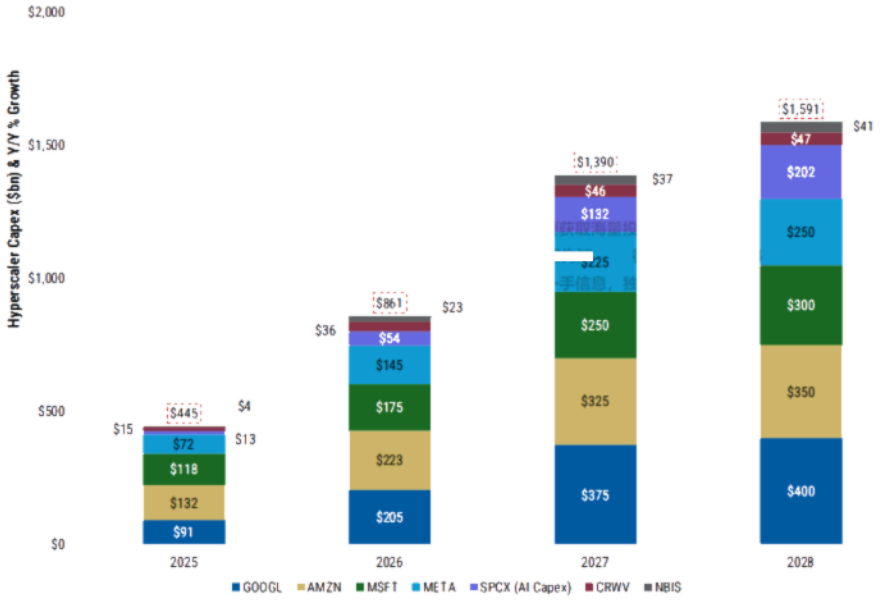
Our Greater China semiconductor team continues to see particularly strong demand at TSMC. The company raised 2026 revenue growth guidance to >40% Y/Y, driven by stronger AI demand, while our team believes 70-80% CAGR for TSMC's AI semiconductor business is reasonable. AI semis could already account for >30% of TSMC revenue in 2026e. TSMC's increase in 2026 capex to US$60-64bn provides another indication that AI demand remains stronger than previously anticipated. (*TSMC: Aggressive capex to address stronger AI demand*)

Importantly, we see the compute opportunity extending beyond GPU/CPU/ASIC and TSMC into components where AI-driven unit growth is increasingly translating into pricing and margin upside.

- **ABF substrates:** The demand mix has structurally shifted away from PCs toward servers, AI GPUs/ASICs and networking. Our Greater China hardware team sees the ABF pricing upcycle as stronger and earlier than previously expected, with Unimicron the preferred play, alongside NYPCB and ZDT. (*ABF Substrates: Pricing Upcycle Is Accelerating*)
- **MLCC:** AI servers require substantially higher-value MLCC content as power density and performance requirements increase. Our Japan components team highlights Murata as a Top Pick, while our Korea team sees Samsung Electro-Mechanics benefiting from a dual AI opportunity across ABF and MLCC, supporting a 29% earnings CAGR in 2026-28e. (*MLCC – Pricing Power Is Coming, New Top Pick*)

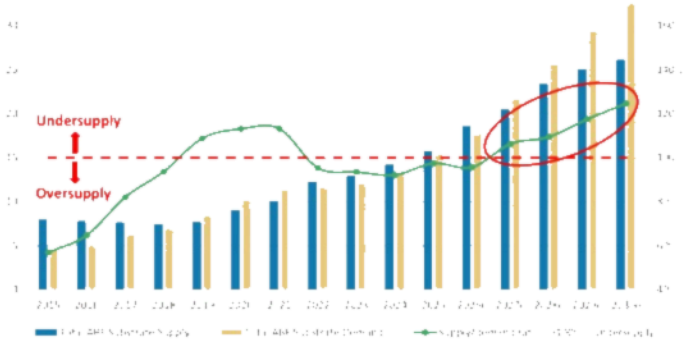
Overall, compute offers the best combination of structural unit growth and continued earnings upside, and remains our preferred AI hardware exposure.

Exhibit 8: Growth continues to remain strong on hyperscaler/neocloud capex



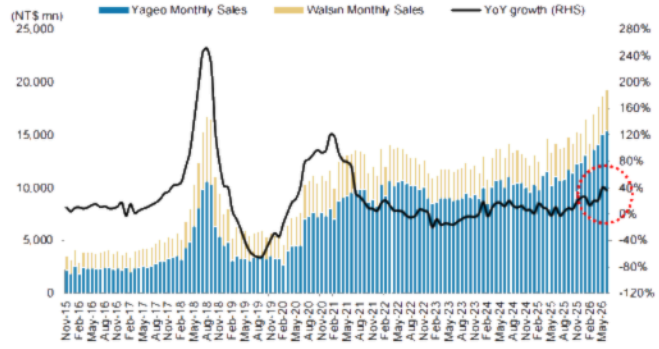
Source: Company data, Morgan Stanley Research estimates

Exhibit 9: Expecting ABF substrate under-supply gap to widen by 2030



Source: Morgan Stanley Research (e) estimates.

Exhibit 10: Taiwan, monthly MLCC sales – cycle edging up with June +36% YoY



Source: Company data, Morgan Stanley Research

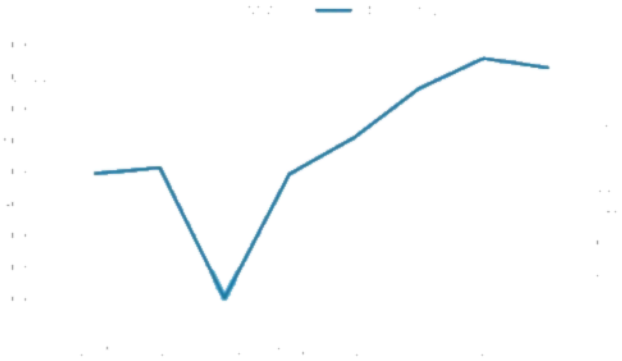
2) Memory remains fundamentally strong but late cycle – more selective

We distinguish between still-strong memory fundamentals and increasingly less attractive relative risk/reward as the cycle matures. We expect the cycle to transition into late cycle by 4Q26 with YoY DRAM monthly pricing peaking. Pricing remains strong but sequential price increases should moderate and the rate of earnings revisions has begun to decelerate. 3Q26 DRAM contract pricing was tracking approximately +20% Q/Q, slightly above our previous estimates of +15-20% for both DRAM and NAND, mainly due to strong server demand while the consumer/non-AI side remain muted. 4Q26 is still tracking about 5-10% Q/Q with limited visibility beyond.

Memory is still very much impacted by supply growth. DRAM bits have grown 36% YTD (based on the latest June SIA data) and now tracking 31% growth in 2026 (vs. previous

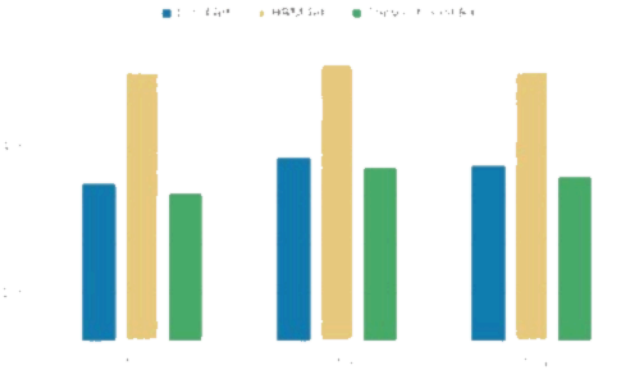
25%). Our 2026 DRAM WFE has been revised up by 47% in the last 9-months as DRAM producers have continued to pull-in tool capacity. To put in context, the 2019 memory downturn was much worse than 2008 with memory sales down -39% YoY. If the risk of peak cycle and demand destruction has been a primary driver of recent price declines, than equally we must see such pricing fears allayed if stocks are to recover.

Exhibit 11: We model 32-38% bit supply growth in 2026-27e



Source: TrendForce, Company Data, Morgan Stanley Research. e = Morgan Stanley Research estimates

Exhibit 12: We model HBM bit supply growth of 50%+ in 2027-28e



Source: TrendForce, Company Data, Morgan Stanley Research. e = Morgan Stanley Research estimate

This is not a bearish call on memory fundamentals. These late cycle concerns have now been at least partially acknowledged by the markets as DRAM stocks are more than 30% off their June highs, and bullish expectations for earnings growth have been reduced. AI is extending the duration and changing the economics of the memory cycle: DRAM content per AI compute unit is up materially but has come off recently due to high costs – SOCAMM is down 67% from 192GB initially to 64GB in 2027, HBM GB density de-spec will absorb less advanced DRAM wafer capacity from late 2027, but LTAs should reduce some of the historical volatility of industry earnings.

What can surprise on the upside? A shortage in both DRAM and NAND to continue for the foreseeable future due to a change in memory assembly into a tri-party co-design environment between IC designers (NVIDIA/AMD), memory makers (SK hynix/Micron/Samsung), and foundational logic foundries. BEOL (Back-End of Line complexity of HBM4E represents a massive paradigm shift in semiconductor manufacturing, moving HBM from a specialized 3D-memory stack to an advanced, highly integrated custom Chiplet logic system.

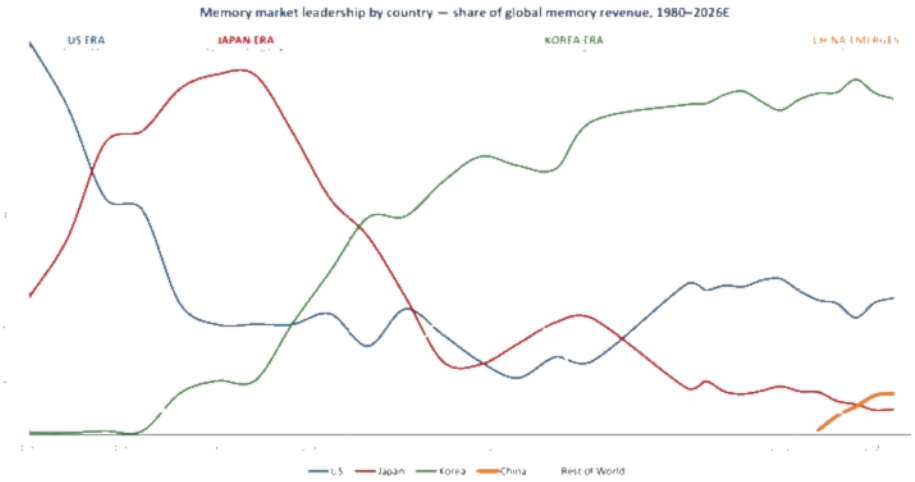
- The increasing BEOL complexity of HBM4E can delay DRAM supply growth, which in turn will delay NAND supply growth.
- Due to an increase of interconnect layer counts of HBM4E – such as SK hynix's introduction of dummy bump, a significant portion of DRAM capex will have to be spent for BEOL capacity expansion in 2026-27e.
- As a result, a meaningful increase of FEOL (Front-End of Line) process migration capex and acceleration in DRAM GB shipment growth are likely to occur only from 2H27.
- As DRAM makers (who are tier-1 customers for equipment makers) will receive priority for equipment manufacturing/delivery slots, NAND capacity expansion could likely be delayed. KrF (krypton-fluoride) lithography tools are particularly important for 3D NAND.

Key beneficiaries of BEOL expansion include **Canon** (trailing-edge KrF lithography), **Tokyo Electron** (lithography track and BEOL etch) and **Ebara** (CMP).

At this stage of the cycle, we prefer structural share gain, localization and downstream AI exposure to generic commodity pricing exposure. China memory is a key exception. Our Greater China Semiconductor team initiated CXMT at OW on August 26, reflecting China's domestic AI/server demand for HBM and DDR5, localization and rapid capacity expansion. The team forecasts 46% bit-shipment CAGR over 2025-28e. HBM3E is also expected to become a major bottleneck for China AI GPUs in 2027, increasing CXMT's strategic importance to the domestic AI supply chain.

- *China Memory – Reshaping Global Competition*
- *China DRAM Going Mainstream; Initiate CXMT at OW*

Exhibit 13: Memory market leadership by country — share of global memory revenue, 1980–2026E



Source: Trendforce, Morgan Stanley Research

For WFE, companies continue to rewrite the bull case and increasingly raise questions around the cycle's peak year. The market is increasingly unwilling to pay for incremental upside without clearer evidence of duration (AI ROIC). At this stage, we prefer downstream packaging/test beneficiaries directly linked to AI compute over front end exposure. By contrast, we are less constructive on incremental front-end memory exposure. Memory WFE remains healthy, but the setup increasingly shifts toward capex following already-strong commodity pricing. Our memory team expects new investment coming online from late 2027 eventually to pressure the pricing cycle.

- **US SPE preference.** Within OWs, our US team has a strong preference for AEIS and MKS over LAM and KLA. While some multiple expansion relative to historical levels is justified for the OEMs (LAM, AMAT, KLA), particularly given GM% expansion, valuations are already reflecting some of this upside. In contrast, AEIS and MKS are trading as though the cycle peaks in CY27. In a scenario where WFE meaningfully overshoots to the upside in CY27 (~$230bn+), the team sees AEIS earning closer to US$20 and MKS closer to US$21, implying both stocks trade at approximately 13x earnings. *Semiconductor Capital Equipment: Thoughts on stocks (25 Aug 2026)*
- **Japan SPE picks.** Increasing HBM stack complexity raises the value of TSV,

advanced packaging and testing; our team highlights **Advantest** as OW / Top Pick in HBM testers.

- **EU SPE preference.** Within Europe SPE we prefer our Top Pick **ASML**. We view ASML as the key beneficiary within our coverage of DRAM and logic demand. ASML is the dominant supplier of critical toolsets for the semi manufacturing process. We anticipate consensus earnings revisions as the debate shifts to 2027 on improving DRAM and logic demand for EUV. We also expect margin expansion over the mid-to-long term as ASML can apply value-based pricing as a medium-term lever.
- **China SPE preference.** Within China SPE OWs, we prefer **Naura**, **AMEC** and **ACMR** as the key beneficiaries of accelerating domestic memory expansion and higher localization. **Naura** remains our broadest platform pick, with exposure across etch, deposition and cleaning, and should benefit most from broader WFE localization. **AMEC** is also transitioning toward a more platform-like equipment supplier, expanding beyond etch into deposition, process control, etc.m which should broaden its wallet-share opportunity over time. **ACMR** provides a differentiated angle through wet cleaning leadership and underappreciated ECP optionality, with potential upside from TSV metallization, advanced packaging and non-mainland backend demand.

Exhibit 14: Key debates on SPE

The WFE Debate

1. Why aren't SPE stocks "working"?

- We think there are 2 camps of thought here
  - SPE is part of the AI ROIC trade
  - WFE expectations (across the buyside) are "full"
- We sympathize with 1. rather than 2. as customers have blown past constraints (cleanroom).

End-Market Debates

2. How does WFE tie into compute?

- How does hyperscaler GW deployment translate to incremental WFE demand?

3. What are the "bull cases" from here

- Intel s capex resurrection, greenfield NAND restart, and DRAM pull-forwards have all realized What s left beyond more capacity expansion?

4. How do we see DRAM supply?

- DRAM bits have grown 36% y/y YTD (Jun , SIA) We model 32%/38% bit supply growth in 2026/27.

Company Debates

5 Market Share at Intel

- The debate is no longer whether Intel spends, but which suppliers capture the spend

6. HBM de-spec

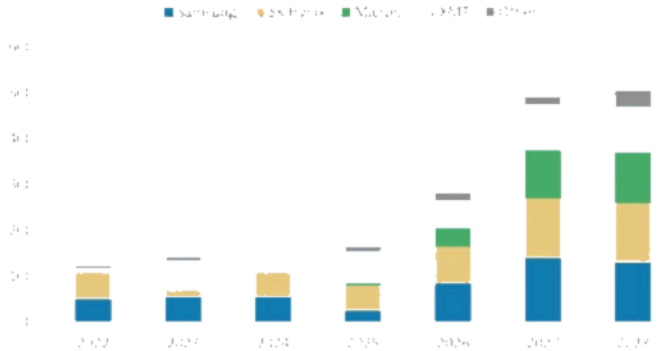
- As we de-spec from HBM 12-high to 8-high, it doesn t mean that all process steps go down proportionately

7. Sub-system vs OEM

- AMAT/LAM/KLA trade at a 64% valuation premium to AEIS/MKS vs 8% historically

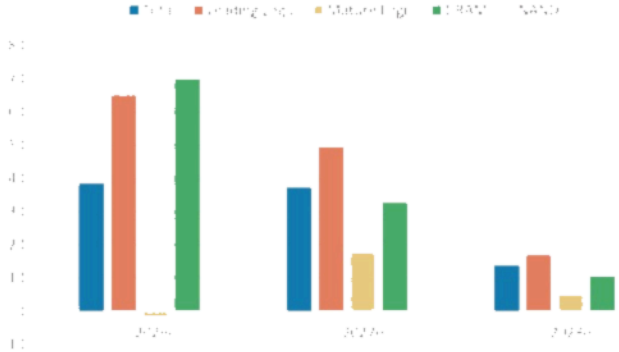
Source: Morgan Stanley Research

Exhibit 15: We see approx. 500kwpm of DRAM greenfield in 2027/28



Source: TrendForce, Company Data, Morgan Stanley Research. e = Morgan Stanley Research estimates

Exhibit 16: We continue to model NAND to be the fastest grower in 2027, off a slightly lower base



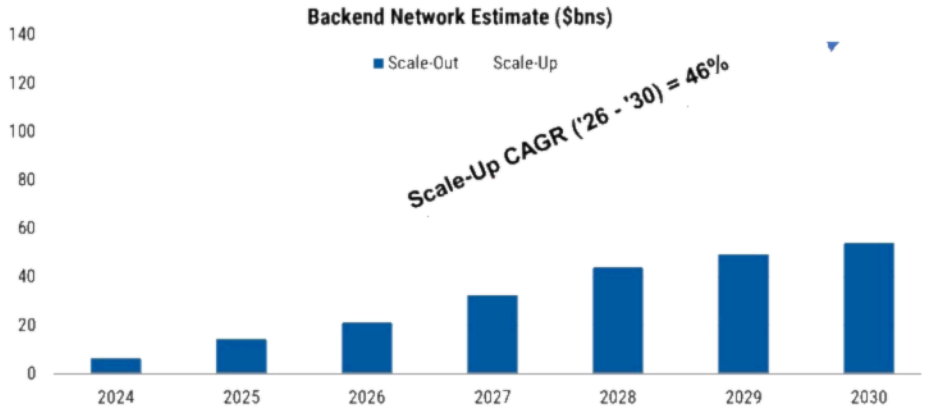
Source: Company Data, Morgan Stanley Research. e = Morgan Stanley Research estimates

3) Networking – the opportunity is much broader than

simple copper replacement

Networking remains an attractive AI infrastructure opportunity as accelerator clusters become larger and increasingly communication-intensive. However, our latest work suggests the opportunity should be framed around the rapid expansion of scale-up networking, rather than assuming an immediate transition from copper to optics. Our networking team now estimates the scale-up networking opportunity at >US$70bn by 2030, more than 4x the opportunity estimated a year ago, reflecting materially larger accelerator domains across NVIDIA, Google, AWS and other architectures. Rubin increases the scale-up domain to 144 GPUs and Rubin Ultra to 576 GPUs, with further expansion possible in subsequent generations. (*Technology: Bringing More Light to Scale-Up Networks: An Updated Scale-Up Primer*)

Exhibit 17: Scale-Up Market Estimate Has 4x'd Y/Y



Source: Dell'Oro Note. Excludes NICs, Pluggables/Optics and Cables

Copper – higher for longer. Importantly, we believes copper is likely to remain viable for longer than the market has assumed. For short-reach intra-rack connectivity, copper continues to offer advantages in latency, power and cost, while improvements in SerDes, retimers, connectors and active copper continue to extend its useful life. Optical becomes increasingly necessary as scale-up domains extend across racks and bandwidth density and electrical I/O power become more challenging. As a result, we see the transition as copper → NPO / hybrid architectures → CPO, rather than a binary copper-to-optics replacement. Our team expects only limited scale-up CPO adoption in 2028, with the strongest adoption likely in 2029 and beyond. NPO provides an intermediate architecture by bringing optics closer to the ASIC while retaining greater serviceability and supplier flexibility than full CPO.

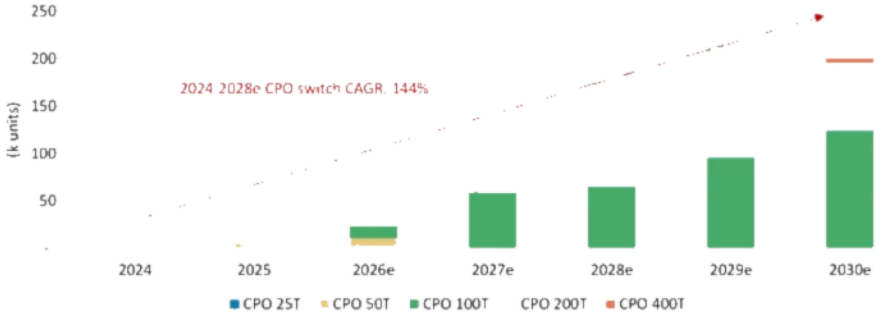
Scale-up key beneficiaries? Our team believes **GLW, LITE, and COHR** are well positioned and **KEYS** was upgraded to OW as an architecture-agnostic beneficiary of increasing test complexity across optical, electrical, scale-up and scale-out networks. Within this group, GLW offers relatively architecture-agnostic optical exposure; LITE is [illegible] optical-engine content as NPO/CPO develops; and COHR has broad [illegible] CPO/NPO component stack.

We also see tangible CPO supply-chain ramps. We forecasts total [illegible] increasing from 23k units in 2026 to 59k in 2027 and ~200k by 203[illegible] to expand PIC capacity materially through 2028. We are OW on key

人在草木间

including TSMC, ASE, FOCI, AllRing, MPI, Winway and Hon Precision. (*CPO Supply Chain Updates; More on GlassBridge*). In Europe, we prefer Soitec, who is leveraged to silicon photonics through its leadership in photonics SOI substrates (see *There's room for plenty more PICs in a POD*).

Exhibit 18: We expect scale-out CPO switch to grow rapidly, from 5k units in 2025 to 200k units in 2030, implying a 144% CAGR over 2023-30



Source: Yole, Morgan Stanley Research (e) estimates

Non-AI opportunity – analog attractive as an early-cycle hedge

4) Analog – an early-cycle hedge

The cyclical positioning is almost the inverse of memory. Following more than three years around an L-shaped bottom, our Europe Technology team sees improvement across three key indicators: lean channel inventories, stabilizing pricing and selective tightness in mature-node/power products. Industrial bookings are improving, while utilization and pricing are recovering from depressed levels. (*Global Analog Semis – Is This Time Different?*)

This makes analog an attractive early-cycle complement and hedge to AI exposure. AI compute continues to offer superior structural growth, while analog provides more conventional cyclical operating leverage from depressed utilization levels and improving industrial demand.

We would remain selective. TXN provides the cleanest read-through on broad-cycle analog demand; **NXP** has reported constructive auto and data-center trends, while **STM** and **Renesas** are also seeing improving industrial demand. The key debate remains whether the improvement reflects sustainable sell-through or primarily distributor restocking. Our Global Semis team think that commentary last quarter points to a demand-led up-cycle rather than a short-lived inventory spike (link).

5) Traditional end-markets – consumer remains the weak link

AAPL provides a unique opportunity relating to AI. It is the first company that really can take AI and deliver a product that is in the consumers' hands. And we think that advances the story significantly if they are able to successfully do it, because now the consumer can familiarize itself with AI instead of people talking about it all day.

- **Smartphones – cautious China, stay with iPhone supply chains.** Our Greater China hardware team expects global smartphone shipments to decline approximately 13% Y/Y in 2026, including a roughly 15% decline in Android, as higher memory costs drive OEM price increases and demand destruction, particularly in mid-range Android.
- **PCs – cautious, too much builds in the value chain.** Memory inflation is similarly pressuring PC affordability and demand. Our hardware teams continue to characterize the PC market as stagnant/soft, with limited evidence of a meaningful unit recovery despite strong builds in anticipation of component price inflation.
- **Traditional servers – mixed; AI/cloud remains the main source of strength.** Cloud capex remains robust and CPU demand benefits as AI infrastructure expands beyond accelerators. However, we would distinguish hyperscaler/AI server infrastructure from conventional enterprise servers: the former remains strong, while traditional server replacement is not the primary growth driver.
- **Consumer electronics – cautious.** Semiconductor and memory demand continues to migrate from consumer devices toward AI/server infrastructure. Higher

component costs therefore represent an additional headwind to consumer volumes even as they support semiconductor industry revenues.

Monthly Data Tracker: C3Q App Store Weakness; Minor iPad Build Cuts; Incremental Cloud Capex Upside

Exhibit 19: Share price

Company name	Ticker	Share Price (Local Curr)
TSMC	2330.TW	2,460.00
Vanguard International Semiconductor	5347.TWO	156.00
WIN Semiconductors Corp	3105.TWO	450.50
Advanced Wireless Semiconductor Co	8086.TWO	112.50
Samsung Electronics	005930.KS	270,000.00
Samsung Electronics	005935.KS	199,600.00
SK hynix	000660.KS	1,783,000.00
KIOXIA Holdings	285A.T	59,530.00
CXMT Corp	688825.SS	58.47
Macronix International Co Ltd	2337.TW	124.50
Winbond Electronics Corp	2344.TW	180.00
Micron Technology Inc.	MU.O	1,016.59
ASE Technology Holding Co. Ltd.	3711.TW	621.00
JCET Group Co Ltd	600584.SS	69.00
King Yuan Electronics Co Ltd	2449.TW	273.00
WinWay Technology Co Ltd	6515.TW	7,000.00
Hon Precision	7769.TW	6,565.00
MPI Corporation	6223.TWO	5,490.00
NAURA Technology Group Co Ltd	002371.SZ	660.65
Advanced Micro-Fabrication Equipment Inc	688012.SS	344.00
ACM Research Inc	ACMR.O	74.44
Applied Materials Inc.	AMAT.O	454.71
ASML Holding NV	ASML.AS	1,500.40
ASM International NV	ASMI.AS	862.20
Advantest	6857.T	34,480.00
Tokyo Electron	8035.T	55,840.00
Lasertec	6920.T	35,590.00
Lam Research Corp	LRCX.O	307.65
KLA Corp	KLAC.O	185.60
MKS Inc.	MKSI.O	260.31
Advanced Energy Industries Inc.	AEIS.O	280.90
Keysight Technologies Inc	KEYS.N	327.21
Ebara	6361.T	4,598.00
Canon	7751.T	4,502.00
Chroma Ate Inc.	2360.TW	2,230.00
AllRing Tech Co.	6187.TWO	1,370.00
Soitec SA	SOIT.PA	143.35
Corning Inc	GLW.N	154.30
NVIDIA Corp.	NVDA.O	230.36
Broadcom Inc.	AVGO.O	357.90
Advanced Micro Devices	AMD.O	477.57
MediaTek	2454.TW	4,760.00
Alchip Technologies Ltd	3661.TW	4,040.0
Global Unichip Corp	3443.TW	5,935.0
ASMedia Technology Inc	5269.TW	1,440.0
Aspeed Technology	5274.TWO	19,215.0
Elan Microelectronics Corp	2458.TW	131.0
Nuvoton Technology Corporation	4919.TW	122.5
Espressif Systems	688018.SS	113.8
Montage Technology Co Ltd	6809.HK	279.0
Texas Instruments	TXN.O	258.4
NXP Semiconductor NV	NXPI.O	227.8
Infineon Technologies AG	IFXGn.DE	60.8
STMicroelectronics NV	STMPA.PA	46.6
Renesas Electronics	6723.T	3,403.0
Intel Corporation	INTC.O	95.8
China Resources Microelectronics Limited	688396.SS	57.9
Hangzhou Silan Microelectronics Co. Ltd.	600460.SS	31.0
Yangjie Technology	300373.SZ	89.0
Coherent Corp	COHR.N	281.9
Fujikura	5803.T	5,241.0
Furukawa Electric	5801.T	3,840.0
FOCI Fiber Optic Communications Inc	3363.TWO	723.0
LianChuang Electronic Technology Co Ltd	002036.SZ	6.8
Accton Technology Corporation	2345.TW	2,100.0
Wistron Corporation	3231.TW	197.0
Wiwynn Corp	6669.TW	2,490.0
Lite-On Technology	2301.TW	299.0
Lenovo	0992.HK	32.4
Delta Electronics Inc.	2308.TW	1,850.0
Apple, Inc.	AAPL.O	320.0
Xiaomi Corp	1810.HK	27.5
Largan Precision	3008.TW	6,660.0
OFILM Group Co Ltd	002456.SZ	7.5
BOE Technology	000725.SZ	5.7
Zhen Ding	4958.TW	501.0
Samsung Electro-Mechanics	009150.KS	1,454,000.0
Gold Circuit Electronics Ltd.	2368.TW	1,120.0
Unimicron	3037.TW	949.0
Nan Ya PCB	8046.TW	1,050.0
Murata Manufacturing	6981.T	7,620.0
Ibiden	4062.T	22,200.0
Shengyi Technology Co Ltd.	600183.SS	148.2
Alphabet Inc	GOOGL.O	338.5
Amazon.com Inc	AMZN.O	258.5
Microsoft	MSFT.O	499.7
Meta Platforms Inc	META.O	616.8
SpaceX	SPCX.O	148.0
CoreWeave	CRWV.O	89.4
Nebius Group NV	NBIS.O	226.4
NEC	6701.T	4,610.0
Hitachi	6501.T	5,358.0

Source: Morgan Stanley Research