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## Semiconductors | North America

# 2026 Semiconductor Outlook: AI semi strength pushing the ecosystem to the limits

While we understand longer term skepticism on AI, we believe that 2026 will remain strong maintaining good visibility in 2027. That's good for AI semis stocks, but the next leg of growth is more positive for memory and fab utilization, leading to a broader group of outperformers.

**For the third consecutive year, the biggest debate is AI semis**, where the index weighting is dominated by the processor names, and the (so far) insatiable appetite for compute is the most important variable to consider.

We have some skepticism on the 5-year views that make 2025 strength look like a rounding error, where industry participants plan to spend multiples of their private market value on data center compute. We might not be right, as the market cap is evolving, but we do expect there to be digestion cycles on the way even if the longer term outlook is the correct one.

With that said, the picture for CY26 appears very strong, as the resurgence in the market has been driven by the scaling up of token growth for complex inference, around usage of the models, not training. There are still monetization questions around that, and we will need ongoing robust capital markets to fund the spending, but with several frontier model developers fresh off of capital raises, we continue to see a strong year of AI spending, and at least for now we expect visibility to remain strong as good numbers come through.

**In the processor market, we remain OW NVDA and AVGO, maintaining a preference for NVDA.** As we write this, there is growing enthusiasm for ASIC, where growth will be strong, but as various bottlenecks emerge we continue to think that NVIDIA will be the highest ROI solution in cloud, particularly as Vera Rubin ramps in 2H26. While there is limited leverage, we continue to think the market is underestimating NVIDIA's position. We are EW AMD and MRVL, seeing some uncertainty for both but also material upside potential, while our EW on INTC is more cautious given ongoing enthusiasm for foundry where we remain cynical. ALAB is our favorite small cap pick in the data center space.

**The next leg of AI growth will likely be a bigger positive for memory, foundry, and semiconductor capital equipment.** The first \$50 bn of growth in quarterly processor revenue ramped during a downturn, as AI offset lower utilization elsewhere, and DRAM started the ramp at negative gross margins. It's increasingly clear that maintaining the same CAGR on the higher base is starting to strain the overall ecosystem, with unprecedented improvement in memory prices in just a few weeks, and growing concerns that growth constraints are shifting from specialty

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## North America

## Industry View

In-Line

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back end processes (CoWoS and high bandwidth memory) to front end wafer capacity and mainstream DDR5 DRAM. We see the biggest beneficiaries in memory (MU, currently our Top Pick, and SNDK), semiconductor capital equipment (favoring MKSI and AMAT), and foundry (TSMC).

Away from AI, the broad based semis recovery has had some ups and downs, but with lean inventories and steady state end demand we see analog growth accelerating moderately from here. To some degree analog will act as a counterweight to AI, with analog stocks outperforming during periods where investors are trying to maintain semiconductor market weight without being overly levered to the AI names.

### **What would we be doing?**

**1. Maintain high exposure to AI and data center names.** That's a consensus view, and at some point the value in major tech markets shifts from semiconductors to the hardware, software, and service companies that they enable. But 2026 still looks like a very strong growth year with several enduring growth drivers that will stay intact for years to come, with bullish sentiment, but also a wall of worry that stocks can climb as that strength plays out. Worries that certain frontier model makers cannot do 100% of what they aspire to do are reasonable concerns, but it's important to note that those aspirations are not in consensus numbers either.

- Names we like most: NVDA, ALAB, AVGO in the US; Mediatek, GUC, and Alchip in Taiwan
- Our watchlist: We are excited to see what AMD can do with its rack scale products and are watching SMTC's emerging data center connectivity business

**2. Buy memory & semicap. More so than in prior years, we believe that continued AI strength is going to exacerbate shortages of memory and logic wafers, rather than just pressuring advanced packaging.**

- MU is currently our Top Pick, and we remain OW SNDK, in the early stages of the most dramatic memory inflection that we have ever seen
- Our constructive view on AMAT and TSMC is in part driven by positive supply/demand for 3 nm wafers

**3. In analog/MCU, we maintain an optimistic but defensive posture,** looking for opportunities to play higher leverage names.

- Names we like most: NXP is the best combination of growth and value in the broad markets space, while Analog Devices (ADI) is more expensive but with strong growth potential.

### **SEMICONDUCTORS**

North America  
Industry View

Attractive

# Our 2026 Key Stock Calls

## Key Stock Calls

### Top Pick Micron (MU) - Overweight, \$338 PT

- **Thesis:** We are seeing an unprecedented rate of change in DRAM supply/demand, as the thesis shifts away from HBM towards overall DRAM shortages. As AI CAGRs persist from a higher base, we are seeing the AI buildout create the most sudden shift in supply/demand balance that we have seen in 30 years. Capital spending remains high for trend line demand in PCs/phones/servers, but the AI buildout is now creating structural shortages impacting every DRAM consuming market.
- **Valuation:** 25x our through-cycle earnings estimate of US\$13.00 is a premium to average earnings over the last 8 years due mostly to the AI buildout. Our 25x multiple reflects the near term exceptional environment driving \$30+ in near term earnings power.

### Nvidia (NVDA) - Overweight, \$250 PT

- **Thesis:** Still the nucleus for the AI trade, and at an undemanding multiple we think it's hard to look elsewhere in AI. Nvidia continues to execute at a very high level, growing revenues sequentially by \$10bn (\$3bn above guidance) in October, and guiding for another \$8bn in January. With hundreds of billions of demand (and climbing) still yet to be served, we expect the stock to go higher as AI sentiment stabilizes. Rubin will be the most important product cycle of the year in semiconductors, and we expect it to extend Nvidia's leadership technology position and give investors confidence in ongoing pricing power. With Nvidia at a high teens multiple on 2027 numbers that continue to move higher, we think valuation can be the starting point for Nvidia to make up some of the lost ground vs large cap AI semis peers AMD and AVGO. Both of these have been building enthusiasm for 2027 ramps, now mostly reflected in their premium multiples, but when it's all said and done, we think Nvidia is seeing all the same tailwinds.
- **Valuation:** Our \$250 PT is based on ~26x our MW EPS of \$9.57, still a discount to large cap AI peer AVGO and a premium to the broader semi group, albeit a narrowing one as the absolute level of margins and revenue make multiple expansion more challenging.

### Sandisk (SNDK) - Overweight, \$273 PT

- **Thesis:** Ongoing supply discipline and continued demand means the upcycle may last longer than people think. NAND is evolving into a material shortage for hyperscalers which is moving bit demand growth persistently into the mid-20s percentage range versus an industry still investing for low to mid teens levels of growth. With no WFE pick-up in evidence we still see an early cycle NAND setup with significant upside to earnings over the course of 2026.

- **Valuation:** Our base case of \$273 is based on 21x through-cycle EPS of \$13.00 (vs our estimate of the trailing 9-year average of \$6.33). As improving industry dynamics as well as eSSD demand lead to higher levels of profitability than we have seen over the last few years, 21x is a discount to our through-cycle multiple target for MU (25x) as the lack of direct AI is offset by historically higher FCF conversion.

#### Broadcom (AVGO) - Overweight, \$462 PT

- **Thesis:** On the GPU alternatives debate, we prefer AVGO as the proven and enduring accelerator story beyond CY2026. We really like the growth story here, and while we tend to be vocal on GPUs maintaining market share leadership, we still see very strong growth potential for both custom silicon and networking at Broadcom. Numbers still feel conservative at least in the context of ongoing AI strength, and they are among the most credible management teams when it comes to hitting numbers.
- **Valuation:** Our \$462 price target reflects 35x CY27 MW EPS (includes stock based compensation) of \$13.19 (this is ~31x Non-GAAP EPS) and reflects a premium to the direct peer group. The bull case is going to drive more potential upside given share gain potential, though in our view the bear case is also somewhat lower given the lack of architectural control.

#### Astera Labs (ALAB) - Overweight, \$210 PT

- **Thesis:** Astera offers one of the best growth rates in our coverage, with multiple product cycles and a very strong position in key AI technology, with visibility into multiple product cycles that have yet to even start ramping. We still expect strong potential for upside to ALAB numbers for the next few quarters, especially as they have more content on ASICs, which will be ramping over CY26. Cynics have been noisy since the IPO, but the company has maintained triple digit growth rates and has significant growth still to come. We remain convinced that there is a large and durable growth opportunity as scale up revenue per processor continues to improve.
- **Valuation:** Valuation is high and does reflect very strong growth potential, and the scarcity factors around small cap AI plays with this type of growth potential can push the limits of shorter term rationalization. The stock remains expensive; we are now valuing ALAB on 0.95x CY27 EV/S/G, assuming 25% 2026-2028 CAGR. This is roughly 24x CY27 sales, which brings up our PT to \$210.

#### Ambarella (AMBA) - Overweight, \$96 PT

- **Thesis:** The importance of Ambarella technology - AI inference at the edge with low power - is going up, and we continue to be impressed by their technology. AMBA is benefiting from an IoT product cycle with CV5/CV7, and our hope is that this will handoff to other pipeline elements moving forward. We see the potential for their long-term autos story; in the meantime, edge AI diversification is proving the more powerful near-term growth driver.
- **Valuation:** For our PT, we use 8.5x CY27 EV/Sales. This multiple sits at the high

end of the peer range, but we believe it is justified by AMBA's strong edge-AI growth drivers and long-term automotive potential.

#### Analog Devices (ADI) - Overweight, \$293 PT

- **Thesis:** Momentum across end markets and stable through-cycle strength in profitability and cash flow. ADI is benefitting from its positioning in markets with secular tailwinds (ATE, DC, A&D) while offering one of the strongest operational profiles in our analog coverage. We expect the company to maintain design-win momentum, supported by its relatively premium ASP products and favorable China positioning as we model for ADI to surpass prior peak earnings in CY26.
- **Valuation:** For our PT, we use 27x CY27 P/E. This 27x multiple remains a premium to ADI's long-term average of ~21x and a modest premium to large-cap analog peers, reflecting higher GPM% and OPM% levels.

#### NXP (NXPI) - Overweight, \$293 PT

- **Thesis:** We remain OW NXP on the back of: **1) NXP should outperform Auto semis in 2026 as auto joins other end markets in a recovery.** **2) Structural improvements to the business:** NXP has multiple levers to improve gross margin from here (channel shipments, internal utilization, and overall revenue growth); and **3) Favorable MCU set up into 2026** as momentum acceleration appears likely to inflect.
- **Valuation:** We roll forward our PT to CY27, using an 17.5x CY27 P/E multiple, an early-cycle premium to the company's historical average of 16x which we think is justified given the company's downcycle management and set up to outperform auto semi peers in 2026.

#### Other Changes:

- **Increasing SMTC (EW) PT TO \$75:** The data center opportunity remains the key source of near-term growth. We typically take a measured view on emerging opportunities, but the more confident tone from management on ACCs in the latest quarter was encouraging. With the balance sheet no longer an overhang, we expect the company to concentrate on scaling its core assets, led by data center as AI spending continues to grow. Their AI data center opportunity is meaningful and still early, though expectations are rising, and execution will ultimately determine how much of this potential is realized. We are raising our price target to \$75 from \$67, based on 29x CY27 non-GAAP EPS of \$2.59. This is a slight premium to networking and analog peers vs. prior in-line multiple, but reflects their content opportunity with active copper.

# WFE Outlook

**Sub-Industry View:** We recently revised up our 2026/27 WFE market forecast from +11%/+7% to +11%/+13% driven by DRAM and TSMC. We see two very strong years of growth.

**Stock Calls:** Globally our preferred equipment stocks are AMAT, ASML, ASMI, Naura, and Disco

*We previously published our WFE outlook earlier this December, for complete thoughts see that note below: [4Q'25 WFE update, New DRAM WFE Paradigm](#)*

**Two very strong years of growth.** We revise up our WFE forecast to now model two years of double digit growth led by continued strength in DRAM, continued recovery in NAND, and strong leading edge logic growth offsetting weakness in trailing edge logic.

## What does the bull case look like?

**DRAM:** 2026 growth getting above MSe (up 17%) will require Micron/Samsung/Hynix's greenfield projects in 2027 to get pulled into 2026, which is largely out of the equipment makers' control.

**NAND:** 2026 growth getting above MSe (up 28%) will require NAND makers to receive commitments from hyperscalers for 2027 that require additional capacity.

**Foundry Logic:** We're conservative with our TSMC equipment demand forecast, given our assumption for 75% equipment mix vs 85% historically. We see \$2.5bn upside to WFE if we assume equipment mix of 80% (\$39bn/+30% y/y).

For 2026 we think we may be conservative on foundry logic while the upside for 2027 is likely to be in memory.

Exhibit 1: WFE Forecast table

(\$mn)	2020	2021	2022	2023	2024	2025e	2026e	2027e
WFE Revenue	63,539	91,092	96,222	96,008	102,816	116,374	128,946	145,073
Semi Revenue	440,389	553,540	573,978	526,820	630,549	787,706	948,986	1,058,531
Semi Capex	118,477	157,788	187,982	176,924	195,236	205,701	230,483	231,346
<b>Y/Y Change %</b>								
WFE Revenue	12%	43%	6%	0%	7%	13%	11%	13%
Semi Revenue	7%	26%	4%	-8%	20%	25%	20%	12%
Semi Capex	9%	33%	19%	-6%	10%	5%	12%	0%
<b>Metrics</b>								
WFE Intensity	14%	16%	17%	18%	16%	15%	14%	14%
WFE% of Total Capex	54%	58%	51%	54%	53%	57%	56%	63%
Semi Capital Intensity	27%	29%	33%	34%	31%	26%	24%	22%
<b>3rd Party Sources</b>								
Semi	61,171	87,499	94,100	95,610	104,270	110,770	122,100	
Gartner	64,905	92,843	101,101	102,820	111,636	120,789	129,530	136,170
<b>WFE by segment</b>								
Foundry/Logic	34,591	50,265	59,180	70,023	67,615	75,271	79,847	88,515
Memory	28,109	39,828	35,854	24,794	34,523	40,490	48,603	56,057
DRAM	13,526	20,664	18,256	19,579	29,315	30,577	35,905	40,112
NAND	14,583	19,164	17,598	5,215	5,207	9,913	12,699	15,945
Other	839	999	1,188	1,192	677	613	495	501
<b>Y/Y Change %</b>								
Foundry/Logic	21%	45%	18%	18%	-3%	11%	6%	11%
Memory	5%	42%	-10%	-31%	39%	17%	20%	15%
DRAM	-2%	53%	-12%	7%	50%	4%	17%	12%
NAND	12%	31%	-8%	-70%	0%	90%	28%	26%
Other	-30%	19%	19%	0%	-43%	-9%	-19%	1%
<b>% of Total</b>								
Foundry/Logic	54%	55%	62%	73%	66%	65%	62%	61%
Memory	44%	44%	37%	26%	34%	35%	38%	39%
DRAM	21%	23%	19%	20%	29%	26%	28%	28%
NAND	23%	21%	18%	5%	5%	9%	10%	11%
Other	1%	1%	1%	1%	1%	1%	0%	0%
<b>WFE Intensity</b>								
Semi ex-Memory revenue	322,907	399,706	444,153	434,511	465,032	566,688	653,491	729,894
Memory revenue	117,482	153,834	129,825	92,309	165,516	221,018	295,495	328,637
DRAM	64,324	92,960	77,769	51,945	94,860	147,871	181,224	169,793
NAND	49,390	55,953	47,109	36,104	66,427	68,917	110,042	154,614
<b>WFE Intensity</b>								
Foundry Logic	11%	13%	13%	16%	15%	13%	12%	12%
Memory	24%	26%	28%	27%	21%	18%	16%	17%
DRAM	21%	22%	23%	38%	31%	21%	20%	24%
NAND	30%	34%	37%	14%	8%	14%	12%	10%
<b>% of Memory WFE</b>								
DRAM	48%	52%	51%	79%	85%	76%	74%	72%
NAND	52%	48%	49%	21%	15%	24%	26%	28%

Source: Gartner, SEMI, Company data, Morgan Stanley Research estimates. e = Morgan Stanley Research estimates

Exhibit 2: WFE by Region

(\$mn)	2020	2021	2022	2023	2024	2025e	2026e	2027e
<b>WFE by Region</b>								
Total	63,539	91,092	96,222	96,008	102,816	116,374	128,946	145,073
North America	6,053	7,755	10,239	11,346	13,366	10,474	11,605	13,782
Europe	2,664	2,879	5,982	5,741	4,113	2,327	2,579	2,901
Japan	6,049	6,879	7,244	6,438	7,197	9,310	10,316	11,606
Korea	15,038	22,757	19,655	18,965	18,507	23,275	28,368	34,092
Taiwan	15,276	23,566	26,566	19,501	14,908	27,930	34,171	37,719
China	16,634	24,695	22,105	31,682	41,640	41,313	39,328	42,797
Other	1,826	2,561	4,431	2,334	3,084	1,746	2,579	2,176
<b>WFE by Region (Y/Y)</b>								
North America	-22%	28%	32%	11%	18%	-22%	11%	19%
Europe	15%	8%	108%	-4%	-28%	-43%	11%	13%
Japan	5%	14%	5%	-11%	12%	29%	11%	13%
Korea	65%	51%	-14%	-4%	-2%	26%	22%	20%
Taiwan	-13%	54%	13%	-27%	-24%	87%	22%	10%
China	35%	48%	-10%	43%	31%	-1%	-5%	9%
Other	4%	40%	73%	-47%	32%	-43%	48%	-16%
<b>WFE by Region (% of Total)</b>								
North America	10%	9%	11%	12%	13%	9%	9%	10%
Europe	4%	3%	6%	6%	4%	2%	2%	2%
Japan	10%	8%	8%	7%	7%	8%	8%	8%
Korea	24%	25%	20%	20%	18%	20%	22%	24%
Taiwan	24%	26%	28%	20%	15%	24%	27%	26%
China	26%	27%	23%	33%	41%	36%	31%	30%
Other	3%	3%	5%	2%	3%	2%	2%	2%

Source: Gartner, SEMI, Company data, Morgan Stanley Research estimates. e = Morgan Stanley Research estimates

# Greater China Semiconductors 2026 Outlook

**Sub-Industry View:** AI demand dominates the Greater China semi supply chain in 2026. We still hold our Attractive Industry View on Greater China Semiconductors, as the 80% Y/Y industry growth of cloud AI semi in 2026 suggests the valuations remain compelling for key AI semi stocks (eg. TSMC) that trade at 20x -25x at our 2026 EPS.

However, we also think AI semi would consume most of the resources in the Asia semi supply chain, including TSMC's foundry, memory supply, even the chip substrate materials (eg. T-Glass). That would translate into downside to non-AI segment (mainly smartphone and PC)

Our niche memory calls are consistent with our global memory positive view, but we would watch carefully of the potential smartphone/consumer/PC demand shrink in 2Q25 for niche memory sub-sector.

## **Stock Call (Key OW):**

- AI Semi foundry and equipment : TSMC (Top Pick), ASE, KYEC, ASM Pacific, AllRing, FOCI
- AI ASIC: MediaTek, GUC, Alchip
- General sever: Aspeed
- China Semi: SMIC, Naura, Espressif
- Niche Memory: Nanya Tech, Phsion, Winbond, GigaDevice

## **Maintain our Attractive industry view: AI demand dominates the Greater China semi supply chain in 2026**

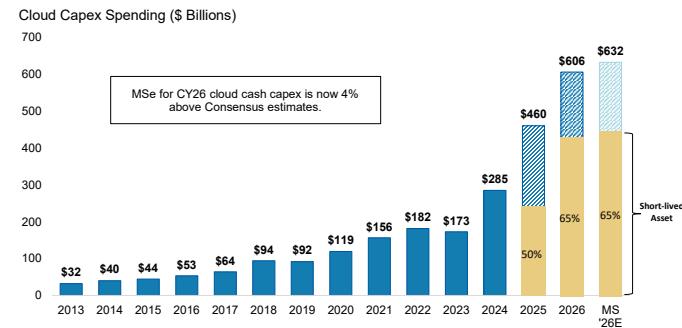
Over the past two years, TSMC's CoWoS capacity expansion and allocation has been a key leading indicator to the global AI GPU and AI ASIC revenue. Although the real leading indicator should be Nvidia customers' demand, we see the global cloud AI semi revenue forecast catching up TSMC's CoWoS implied chip shipment. The risk to AI semi foundry demand should be low in 2026, given TSMC's foundry capacity (in particular 3nm) remains constrained. The chip supply constraint may prevent an oversupply and hence mitigate the "AI bubble" burst concern. We still hold our Attractive Industry View on Greater China Semiconductors. However, for 2027 and onwards, we see some uncertainties on both demand and supply:

- **Supply side - fab clean room space:** TSMC is running out of its fab clean rooms in Taiwan, and hence it needs to speed up overseas fab construction, in particular the US.
- **Demand side - power infrastructure:** Even if TSMC can produce sufficient chips based on customers' strong AI demand, it is still unsure whether power shortage in the US could be resolved.

However, in 2026, we also think AI semi would consume most of the resources in the Asia semi supply chain, including TSMC's foundry, memory supply, even the chip substrate materials (eg. T-Glass). That would translate into downside to non-AI segment (mainly smartphone and PC) cost increase, given the price hike of TSMC's wafers, global memory price, and chip substrate price. We expect the de-spec and capacity supply shortage to dampen the growth of smartphone and PC semis in Greater China semis. We are watching closely whether "Edge AI" can be a savior to the smartphone and PC semis, for example, if the agentic AI feature (eg. the Dobou smartphone from ByteDance) can trigger Android smartphone replacement cycle in China, it would be possible for China smartphone OEMs to pass through the memory costs and maintain the sell-through in the high-end segment. Within the Edge AI, the AI Glasses is probably the segment we see the best growth potential.

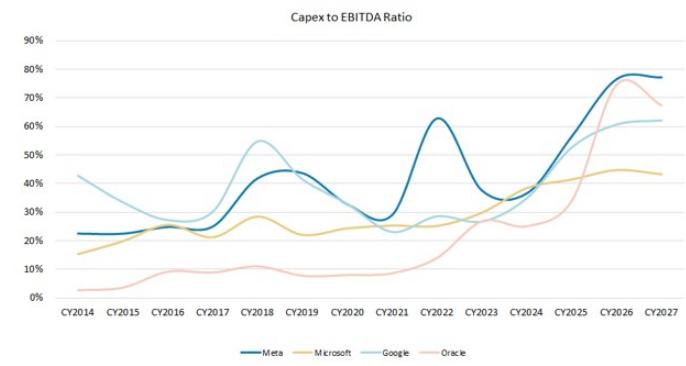
"General purpose computing" is classified as non-AI, but its demand seems to start to correlate with AI demand. The general server and storage sever can be used to process the data for AI's usage and restore the generated data from AI. Of note, the general server CPU has been the bright spot in Greater China semis since [our upgrade of industry view to Attractive this July](#). Back then we saw the general server shipment to be 8% y/y for 2025. And now into 2026, based on Daniel's Cloud Semi update, strong demand from general purpose computing could drive LTA discussions between CSPs and cloud semis providers. Aspeed raised its server TAM growth projection to 6-8% over the next few years ([link](#)).

**Exhibit 3:** Morgan Stanley cloud capex tracker estimates nearly US\$632bn of cloud capex spending in 2026 (Purely Top 10 listed global CSPs; no sovereign AI)



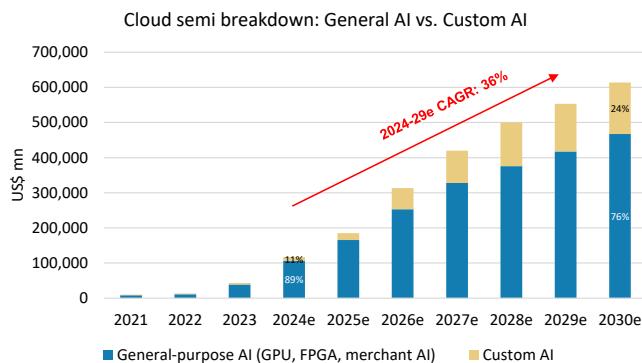
Source: Company data, FactSet, Morgan Stanley Research estimates

**Exhibit 4:** But the Capex/EBITDA of major CSP is also rising, and hence more funding is needed with proper credit risks to be assigned



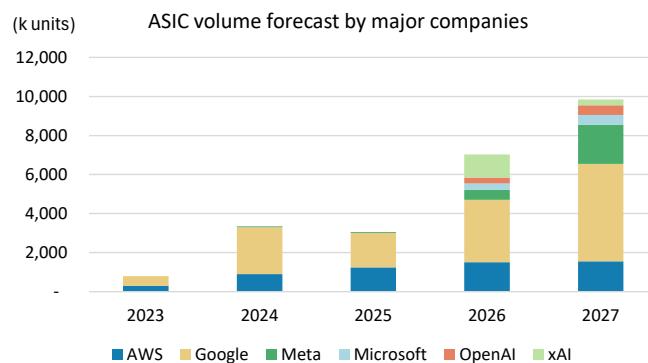
Source: Company data, FactSet, Morgan Stanley Research estimates

**Exhibit 5:** Cloud semi TAM could reach nearly US\$550bn by 2029



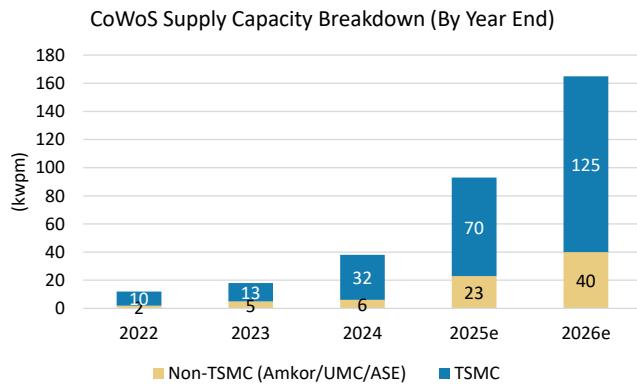
Source: Morgan Stanley research Estimates

**Exhibit 6:** ASIC volume forecast by major companies

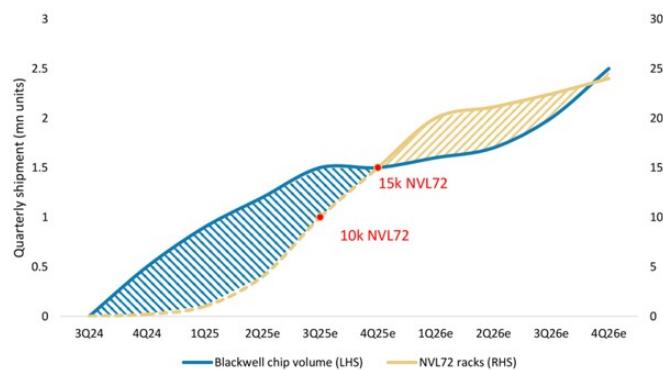


## AI semi supply chain outlook into 2026 – wafer capacity expanded, server racks ramp is the key

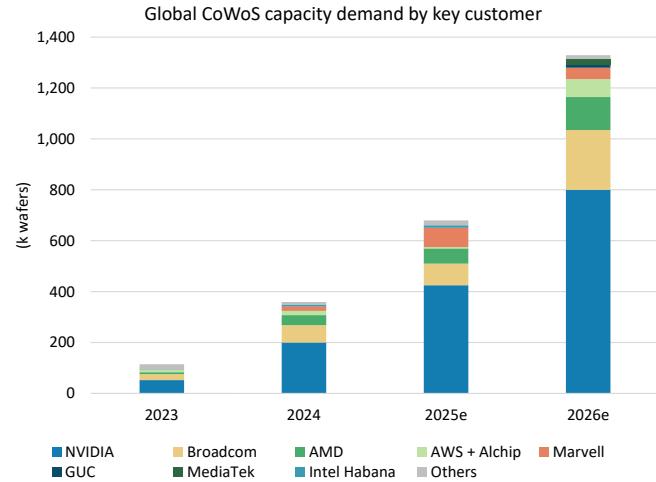
- 2026 should be another strong year of TSMC's AI semi foundry revenue growth. The company shall expand its CoWoS capacity by another 80% Y/Y, to around 125kwpm by 2026. Our US semi team also revised up our new global AI semi TAM forecasts. Globally, we estimate cloud AI accelerators (GPU and ASIC) to reach US \$550 bn in 2029. We estimate TSMC's AI semi foundry revenue in 2029 to be US \$107 bn, including but not limited to the AI GPU and ASIC, but also the CPU and networking chips attached to the AI servers.
- Accordingly, in the coming 4Q25 earning call on January 15th , 2026, we expect TSMC to revise up its 2024-2029 5 year CAGR for AI semi foundry TAM to a 60% CAGR (up from original 45% CAGR).
- Another key trend to watch in 2026 is the downstream server rack's production ramp. According to Nvidia CEO's comment two months, downstream seems to a bigger bottleneck than upstream. Our "chip vs. rack" chart that shows TSMC's chip outputs vs. the Blackwell sever rack shipment also shows the quarterly fluctuation of TSMC's chip production plan. Currently, the monthly server rack output already reached 5.5k per month this November based on our Asia Tech Hardware analyst's update. If the monthly server rack output can increase to 7k-8k in 2026, the annual run rate should be 80k-90k NVL72 racks, and then most of TSMC produced Blackwell chips would be consumed.

**Exhibit 7:** CoWoS Supply Capacity Breakdown (By Year End)

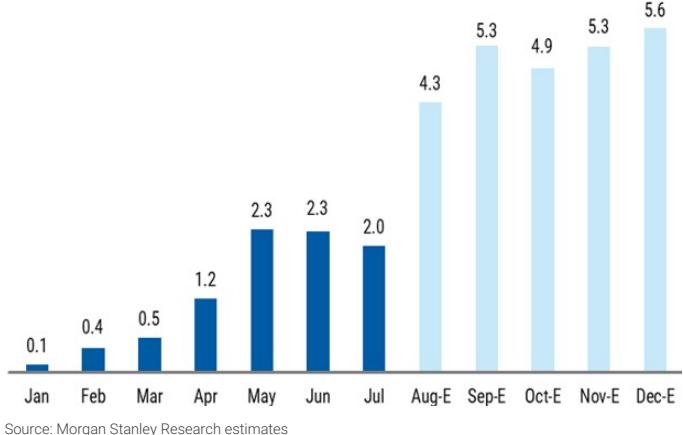
Source: Morgan Stanley Research estimates

**Exhibit 9:** TSMC expected to produce 5.1mn chips in 2025, with full-year GB200 NVL72 shipments expected to reach 30k

Source: Morgan Stanley Research estimates

**Exhibit 8:** Global CoWoS capacity demand by key customer

Source: Morgan Stanley Research estimates

**Exhibit 10:** Industry-wide GB200 NVL72 Rack Monthly Output  
**GB200/300 NVL72 racks (Monthly)**

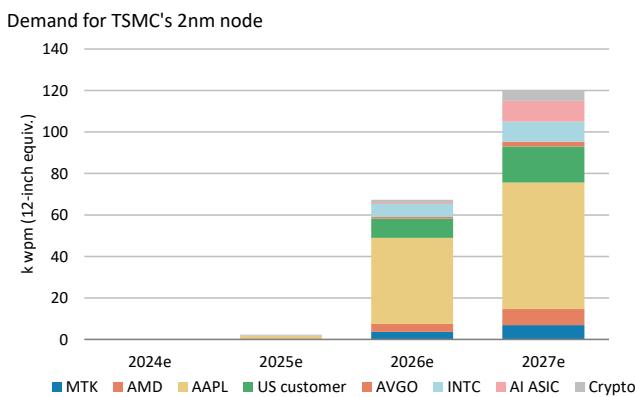
Source: Morgan Stanley Research estimates

## How about the non-AI demand? General server may offset smartphone/PC semi weakness

- China Android smartphone is the major end market for Greater China semis, eg. MediaTek, Omnivision, Novatek. Based our recent industry survey, it is possible China Android smartphone SoC shipment could be down 5%-10% Y/Y.
- PC semi shipment could be down more than 10% in 2026, given the capacity shortage and/or memory cost increase.
- "General purpose computing" is classified as non-AI, but its demand seems to start to correlate with AI demand. The general server and storage server can be used to process the data for AI's usage and then restore the generated data from AI. Of note, the general server CPU has been the bright spot in Greater China semis since [our upgrade of industry view to Attractive this July](#). Back then we saw the general server shipment to be 8% y/y for 2025. And now into 2026, based on Daniel's Cloud Semi update, strong demand from general purpose computing could drive LTA discussions between CSPs and cloud semis providers. Aspeed also raised its server TAM growth projection to 6-8% over the next few years ([link](#)).

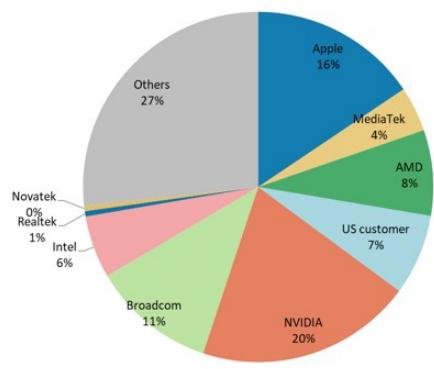
- We expect the general server CPU strength to offset the PC CPU and smartphone SoC foundry demand downside, and hence TSMC may maintain its 2024-2029 CAGR for non-AI segment. With the maintenance of non-AI assumption and the upward revision of AI semis, we expect TSMC to revise up its 2024-2029 full company CAGR to 20%-25% (originally 15%-20%).

**Exhibit 11:** Wafer demand for TSMC 2nm – Apple the major customer



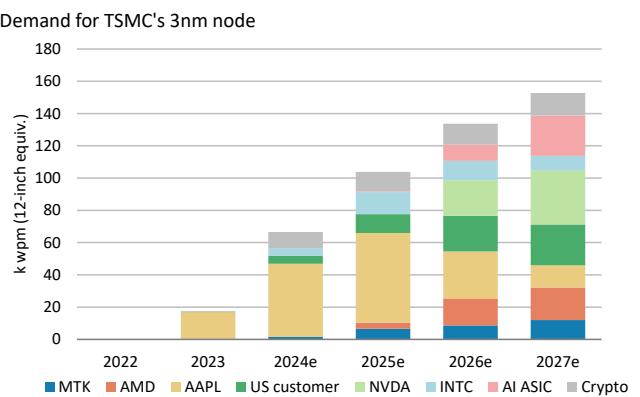
Source: Morgan Stanley Research estimates

**Exhibit 13:** TSMC 2026e customer breakdown - US customers already account for 65% of sales



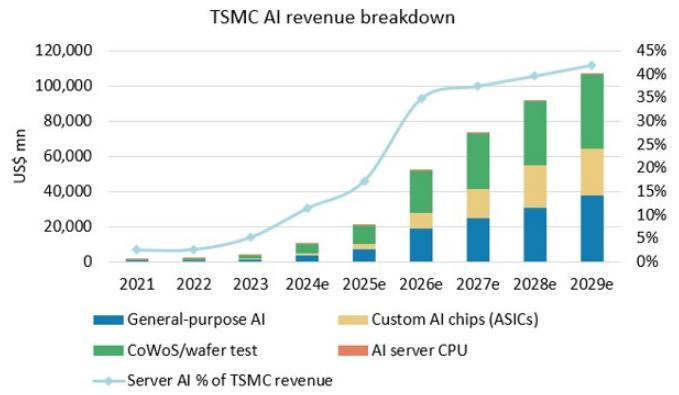
Source: Nvidia, Morgan Stanley Research estimates

**Exhibit 12:** Wafer demand for TSMC 3nm – Nvidia Rubin to ramp in 2026



Source: Morgan Stanley Research estimates

**Exhibit 14:** TSMC AI revenue could reach 40% of total revenue by 2029e



Source: Company Data, Morgan Stanley research Estimates

## Expecting a strong guide of TSMC 2026 capex and revenue growth

- Into 2026, given the robust AI demand is expected to continue, and TSMC's decision to expand its 3nm capacity, we had revised up our 2026 capex to US \$49bn, and expect the company to guide capex to be around US\$48-50bn. Given this additional capacity should start to contribute revenue in 2H26, we revise up our original 2026 revenue growth from 25% Y/Y, to now 30% Y/Y growth (vs.

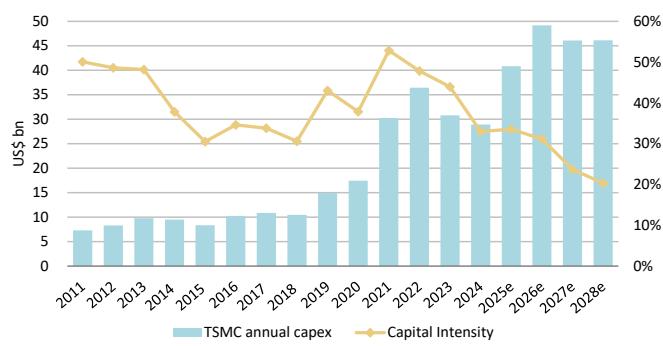
Street's consensus of 22%). We expect TSMC on its January 15th, 2026 analyst meeting to guide to mid-20% growth, and then over achieve it. Please see our wafer revenue and CoWoS breakdown by customers in this report.

- We expect TSMC to provide an ex-memory semi industry growth rate of 10%-15% in 2026, while it should outgrow the industry.

### TSMC vs. Intel: Competition or Collaboration?

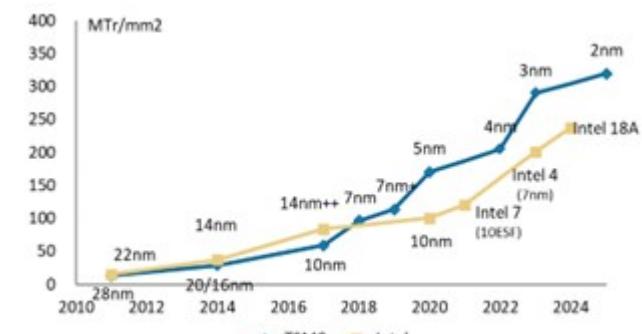
- Although we see that TSMC's customers are qualifying 2nd sources, eg. Apple at Intel's 14A, and Tesla and Samsung's 2nm, we think this reflects customers' need for second source and more production in the US, and not a market share loss due to the technology competition. Regardless of Intel 18A yield improvement, we still assume Intel would continue to outsource part to its client PC CPU to TSMC's 3nm and 2nm. In fact, our foundry industry check suggests TSMC had agreed to let Intel to use its 14A (1.4nm) process for future CPU production. We also don't rule out Intel to outsource its server CPU to TSMC in 2027 given the very strong general server CPU demand. We hence assume Intel's revenue at TSMC should be flat in 2026, and show small growth in 2027.
- Intel's EMIB and Amkor's CoWoS-S are an important second source 2.5D advanced packaging for AI customers. We don't expect TSMC to maintain very high market share in CoWoS, given its limited resources (clean room, engineering), but only focus on strategic and high value business. At the end of the day, TSMC still produces majority of the compute die of AI chips, and hence we believe its relationship with other backend foundry suppliers should be more of a collaboration/partnership than a competition.

**Exhibit 15:** TSMC capex intensity should drop dramatically from huge revenue ramp



Source: Company Data, Morgan Stanley Research estimates

**Exhibit 16:** Logic density comparison: TSMC vs. Intel



Source: Company Data, Morgan Stanley Research estimates

### China's semi localization efforts, in particular in AI GPU

- From Taiwan's AI semi supply chain, we do see ongoing production of H200 chips into 2026 – as we wrote in our [recent AI supply chain field trip report](#), China's AI inference computing still depends largely on 5090 gaming graphics chips,

previously improved Hopper chips, and some local chips. In particular the H200 ecosystem in China is more mature with lots of open-source code.

- It remains to be seen whether the H200 chip and its 25% tax will be accepted by China customers. We therefore think that if TSMC can serve more China AI semi demand, there could be additional upside to our TSMC forecasts. We estimate every 1mn units of the H200 chip could contribute around US\$1.3bn (per chip US \$1300 cost ex-HBM) of foundry revenue to TSMC, or 1% of its total revenue.
- We believe TSMC will comply with export control rules and only produce China chips that are "within spec", ie. the performance criteria in [ECCN code 3A090](#). See [Asia Technology: AI Supply Chain Tracker – Post US export controls impact \(23 Oct 2023\)](#) for the Total Processing Performance (TPP) and Performance Density (PD) calculations. It would be worth following up with TSMC whether it would count the China AI GPU opportunity in its new AI semi CAGR assumption in the coming earnings call.
- We don't rule out that other China CSPs and design houses (eg. ByteDance, Alibaba/T-Head) to design "within spec" chips and produce at TSMC. But for aggressive or "over-spec" AI accelerators, we believe China design houses will try to use local foundries such as SMIC's 7nm to produce. But the new debate is whether local designs can compete with H200 once it is imported.
- On the other hand, for the China semi capex, we do see strong spending in 2026, driven by leading-edge and memory, but there are two major bottlenecks:
  - For SMIC's 7nm capacity expansion, it still lacks a reliable SiGe epi tool provider (originally supplied by AMAT). The local equipment vendor AMEC's qualification will be critical.
  - China DRAM fab CXMT is also migrating its DRAM process from Gen 4 ( mix with US tool production ) to Gen 4B (excluding US tools). Once the yield for its G4B and G5 improve, we expect aggressive expansion.
  - China HBM progress is behind schedule. CXMT's HBM DRAM die is still being affected by the thermal issue, and thus we expect a small production of HBM3e chips by 2026 from CXMT.

### Key OW stock ideas into 2026:

- AI Semi fab : TSMC (Top Pick), ASE, KYEC, ASM Pacific, AllRing, FOCI
- ASIC: MediaTek, GUC, Alchip
- General sever: Aspeed
- China semi: SMIC, Naura, Espressif
- Niche Memory: Nanya Tech, Phsion, Winbond, GigaDevice

# AI Compute: Demand still robust, market share and supply chains the question in 2026

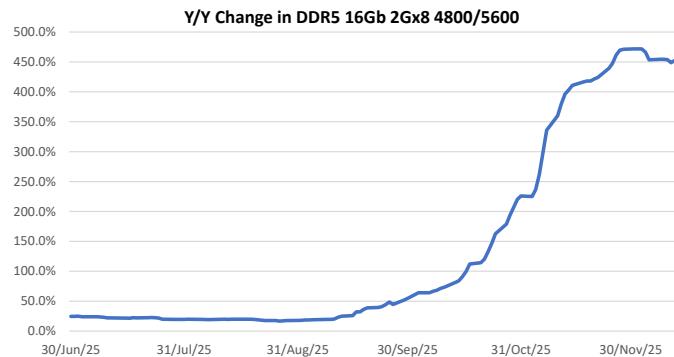
**Sub-industry View:** Continue to maintain a preference for AI exposed names as overwhelming demand for compute looks to continue. Bubble concerns seem overdone near term, as demand indicators are still flashing green (rental pricing, token growth, scaling laws). But we stay mindful of risks to those inputs.

**Stock Calls:** While AI capex is still a rising tide lifts all boats market environment our preferences have skewed more to LLM winner agnostic beneficiaries as share debates take center stage in processors. This is as demand for compute of all forms stretches the supply chain that's shifting value add to hard to replicate physical assets and semicap. TSMC/MU/ASML are out Top Picks globally. We are also OW Nvidia and AVGO.

**AI is the driving force in semis, but that growth going forward is going to bring more challenges and is becoming our focus for stock selection in 2026.** When Nvidia's growth first inflected in 2023 there was latent capacity throughout the semis supply chain, and 5nm utilization at TSMC was 60-70%. Micron's gross margins were negative. Now the supply chain is in a different place – memory fabs are full, and TSMC advanced node utilization is 100%. With our numbers now pointing to an acceleration in XPU revenue in 2026 after growing to \$185bn this year, supply chains are not fully equipped for that level of growth.

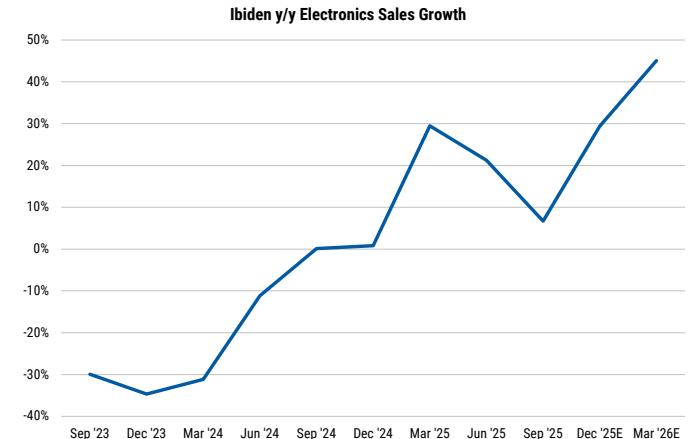
As evidence of that strain, more commodity products close to the AI supply have seen prices skyrocket in recent months. DRAM spot DDR5 pricing is up 460% ytd, and manufacturers of substrates have seen their revenues accelerate due to higher pricing. All that points to a new paradigm in AI growth, where existing scale and capacity becomes bigger source of value creation. We've seen TSMC move from 22nm/28nm tools out of Fab15 to migrate towards 3nm ([AI Supply Chain: TSMC to expand 3nm capacity for major AI customer's growth? \(12 Nov 2025\)](#)), an acceleration in WFE spending in DRAM, as well as hyperscalers looking to use scale from AVGO/MRVL to get additional CoWoS wafer capacity.

**Exhibit 17:** Commodity products close to AI are evidence of ongoing supply chain stress



Source: DRAMeXchange, Morgan Stanley

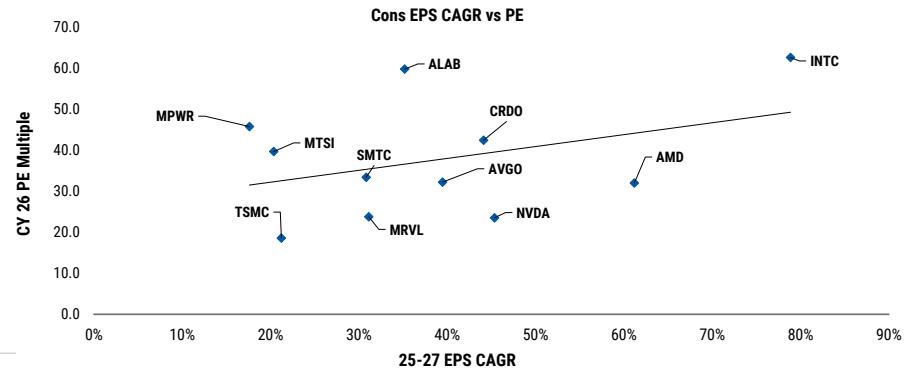
**Exhibit 18:** Including Key ABF supplier Ibiden (4062-JP) who is seeing revenue growth accelerate to new highs



Source: Factset, Morgan Stanley Research

**What does all that mean for AI processors?** The accelerator market will be about \$185bn in 2025, and we estimate an acceleration in 2026 to \$312bn. Demand for AI compute anywhere it's available is what's setting the stage for share debates – Nvidia continues to be sold out, but it looks like secondary and tertiary products as well, including TPU and trainium. We model for AVGO and AMD to grow their AI processor revenues slightly faster than NVDA in CY26, but that mostly just reflects supply chain limitations of a \$205 bn run rate revenue stream – all key products are supply constrained through 2026. We were recently in Asia ([Asia trip takeaways highlight AI strength testing the limits of semiconductor ecosystem](#)) and had a number of meetings that informed this viewpoint. When it comes to stocks our bias is to look to own names where expectations are low relative to the ongoing strength in demand, as current CoWoS numbers still point to significant upside vs consensus and our estimates across the AI value chain.

**On the processor side our favorite source of value remains Nvidia,** as the stock has derated significantly as a result of strong upward revisions against a falling share price. At sub ~20x 2027 EPS further multiple compression should be limited to fundamental downside – as it will be difficult for a 55% topline growth, 68% operating margin income statement business to see the P/E compress that much further below a broader market where aggregate EPS growth expectations are significantly lower. At present the S&P trades at 23x earnings assuming roughly low double digit EPS growth. Relative to peers, Nvidia also has the a compelling combination of growth and multiple, and on a consolidated basis Nvidia trades at a 20% discount to AVGO, valuing AVGO's software assets at closer to that 23x market multiple implies an even wider discount for the AI portions of the businesses.

**Exhibit 19:** AI Semis PE Comparison

Source: Factset, Morgan Stanley

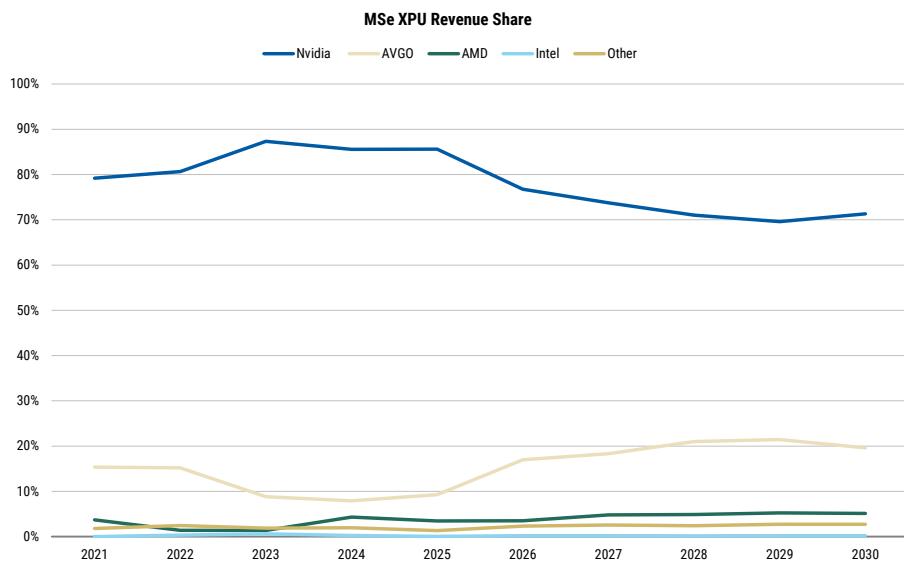
There are reasons to think Nvidia's discount is warranted, and more skeptical investors will point to their high margins and market share as things that can only create risk to the downside. Especially if Open AI, whose growth is the engine behind much of overall cloud spending, is ceding share to Google. For example the biggest spender in AI, Microsoft, through their revenue sharing agreement, API revenue, and OpenAI inference COGS, may have 80% of their Azure AI business coming from just OpenAI. ([Revisiting Microsoft + OpenAI: Base Case Capex Supports Bull Case Azure AI Revenue](#)).

Our view is that much of those fears are priced in on a relative basis and to believe in overall growth in XPU and a continued bid for AI stocks in general, it's difficult for Nvidia not to participate. Further much of the Nvidia alternatives have existential debates of their own, with Marvell's custom ASIC business potentially losing its second customer to AVGO ([link](#)), and AVGO potentially losing share of future TPU generations of MediaTek. And despite TPU becoming a bigger alternative to Nvidia outside Google, we do think much of that growth is coming at the expense of either other projects (Anthropic and Trainium, Meta and MTIA/MI450) vs direct wins versus Nvidia. We are constructive on Nvidia's ROI position relative to alternatives despite the increased competition, and the launch of Rubin becomes a key catalyst to cement that spending.

**We like AVGO as well, as the broadening out of TPU outside of Google has created a basis for growth outside of higher execution risk new ASIC products.** But there are caveats – specifically, we believe that MTIA builds for customer Meta - still volume expected 2H26 - have been deferred somewhat, and replaced by Meta's expected use of TPU. We have heard multiple explanations of this, but it seems that Meta has made some architectural changes. Unconfirmed press reports have Meta, as well as Open AI, using TPU, at least in part to gain familiarity with ASIC usage for eventual migration to internal ASIC. Another important note is that Google continues to work on its own variant of the TPU, with partner MediaTek, that could be a longer term risk. Our MediaTek analyst Charlie Chan and his team raised estimates on this and upgraded MediaTek on this basis. We did hear several important inputs on this and we do consider it a risk to AVGO. Specifically, we believe that Google is going forward with volume production for next year on a chip that still has some functional issues to be resolved, i.e., there will be production volume on silicon that still has some risks. That shows the urgency that Google is bringing to the desire to have an alternative. We continue to believe that barriers to replacement of working solutions are high, and we don't budget for much share loss in CY27/28, but it

remains a risk.

**Exhibit 20:** We continue to see Nvidia maintaining high XPU share, including rack sales from AVGO

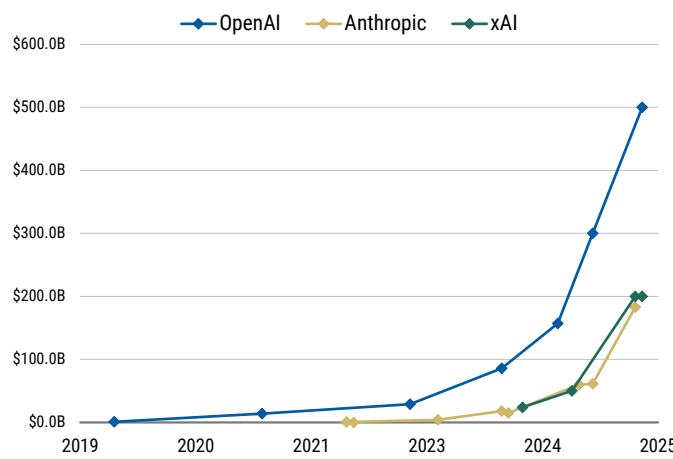


Source: Company Data, Morgan Stanley Research estimates

## What are we watching when it comes to overall growth in XPU's next year?

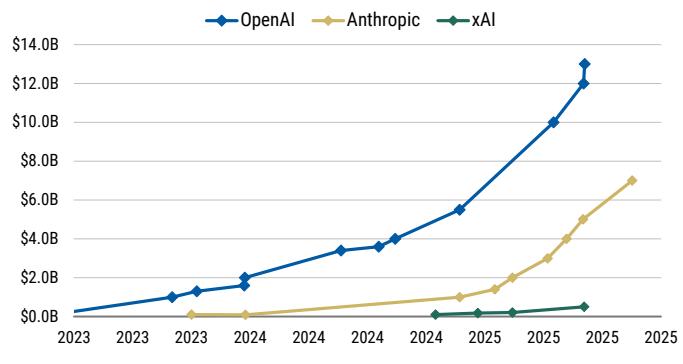
**No matter the vehicle, positive returns still rest on ongoing cloud capex growth that's responding to a series of exponential growth factors.** As models are trained using exponentially more compute, and reason with exponential growth in tokens, they see exponentially higher capabilities. That growth in capabilities respond to value add for applications those models are able to address. As long as each link that chain holds, monetization should follow, and up to this point it has. OpenAI and Anthropic revenue is now at over a combined \$20bn revenue run rate, up 3x in the last year.

**Exhibit 21:** Large AI lab valuations...



Source: voronoi, Sacra, Morgan Stanley

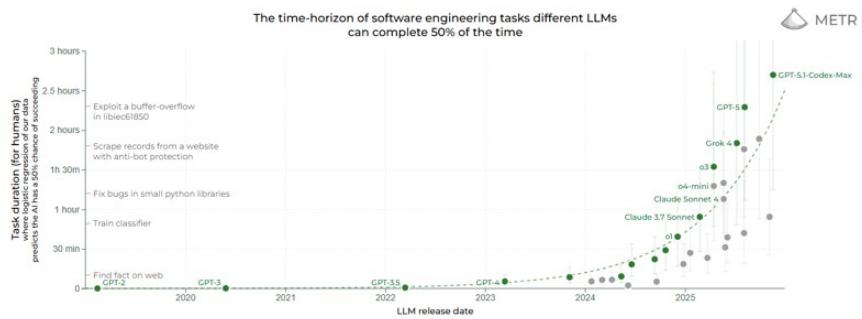
**Exhibit 22:** ...and revenues



Source: EpochAI, Morgan Stanley

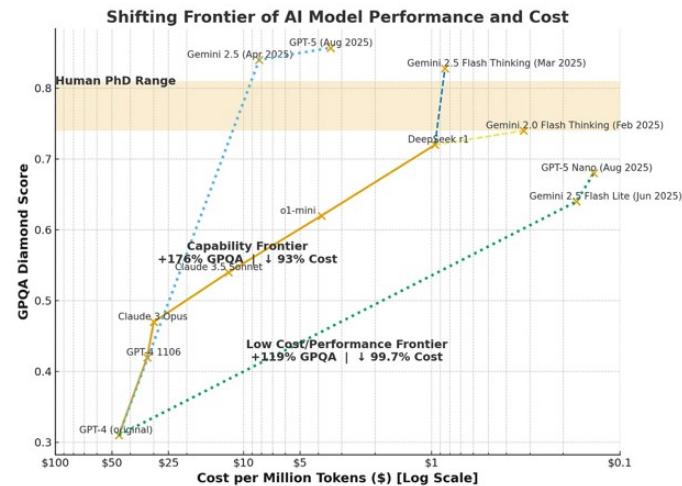
**At this point we see no reason to think these relationships won't continue to hold as we build for an agentic future.** The latest leadership LLM Gemini 3 confirms that the scaling laws which have been the driving force for AI progress since the invention of self learning compute systems are continuing. And we are seeing that translate to demand for compute that's outpacing the growth processor companies are able to provide.

**Exhibit 23:** LLMs are becoming exponentially more capable at agentic asks



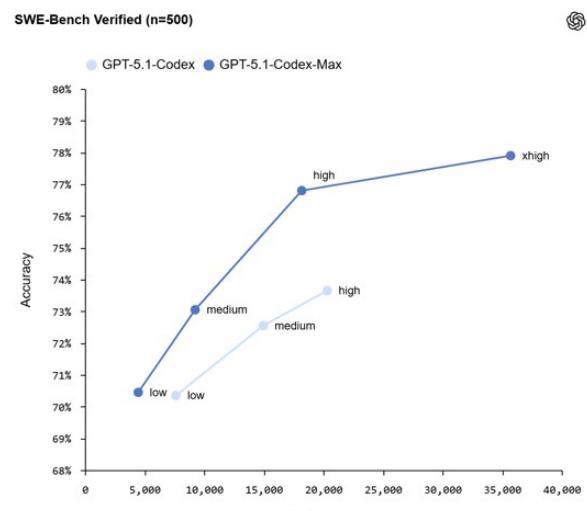
Source: METR, Morgan Stanley

**Exhibit 24:** With those capabilities coming at exponentially lower prices



Source: Ethan Mollick [<https://www.oneusefulthing.org/>], Morgan Stanley

**Exhibit 25:** and requiring exponentially more tokens to achieve



Source: OpenAI, Morgan Stanley

## How could we be wrong? A refresh on risks to the AI trade in 2026.

We do have optimism for AI spending across the board, but given that is a relatively consensus view, we think it's worth considering what risks may derail our base case for higher spending. We outlined three areas in our outlook last year - spender consolidation, shifting scaling laws, and rental market returns. We take a look again at all three of those factors, and come away constructive on all three. That said, there are more risks now on the customer side than a year ago.

**(1) Large Customer Consolidation:** This remains our principal concern for the AI trade, as large model building is a capital-intensive and competitive market. Open source models continue to offer near state-of-the-art performance at incredibly low prices, and closed models are still very competitive relative to each other. For the companies making those

investments, it has been a challenge to differentiate and charge prices high enough to recoup the high cost of inference and training. Salesforce's CEO recently called LLMs "commodity infrastructure" and that sentiment could make it difficult for startups innovating in this area to continue to raise the money needed to keep investing. When dealing with TAM that's as large and as critical as AI we've seen a prisoners' dilemma emerge around AI capex, where a company that might want to slow investment doesn't due to the risk of falling behind. Meta has been the biggest example of this in 2025; in the summer of 2024 Meta briefly had the #1 LLM and, as of yet, has not shown any reduction in their willingness to spend on AI despite falling out of the top five. For a company like OpenAI that does not have the benefit of a cash-generative business to back their investments, it is required to continue raising outside funding. The increasingly expensive means they've taken to unlock some of that funding has been cause for concern among investors. So while we do not doubt the appetite to spend on AI for OpenAI or elsewhere, investors' continued sponsorship of that spending is required, and is the biggest risk to stocks looking out to the second half of 2026 as funding is required to support ambitions into 2027.

**Exhibit 26:** The LLM race remains highly competitive



Source: ArtificialAnalysis, Morgan Stanley

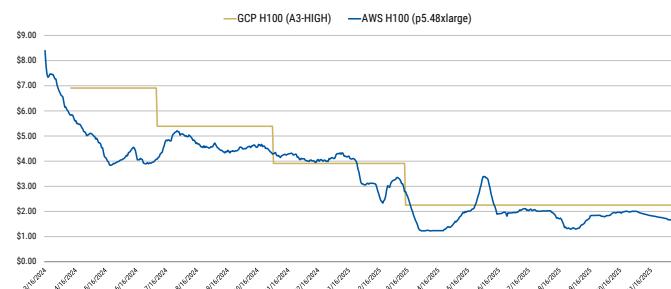
**(2) A slowing of AI scaling laws limits large cluster investments:** We wrote in depth about the importance of scaling laws in our outlook a year ago ([Semiconductors: 2025 Semiconductor Outlook: AI continues to lead the way \(20 Dec 2024\)](#)). And we think one quote from researchers at Anthropic almost four years ago is worth repeating, "It shifts development of this type of model from a process of artisanal trial-and-error to more of a predictable engineering process, where the resources needed to achieve a particular result can be precisely calculated...In this sense, **scaling laws de-risk investments in large models** [emphasis the authors]". ([Predictability and Surprise in Large Generative Models](#)).

The latest proofpoint that scaling laws are continuing is the release of the current #1 ranked LLM Gemini 3, where researchers at Deepmind said that the source of their improvements was per and post training scaling. With "**No walls in sight!**" we expect cluster sizes to continue to track to the one million XPU mark (from low hundreds of

thousands today) and will support robust training demand in 2026 and beyond. Blackwell trained models should enter the landscape in 2026, and will be the next signpost that this pill of demand remains solid.

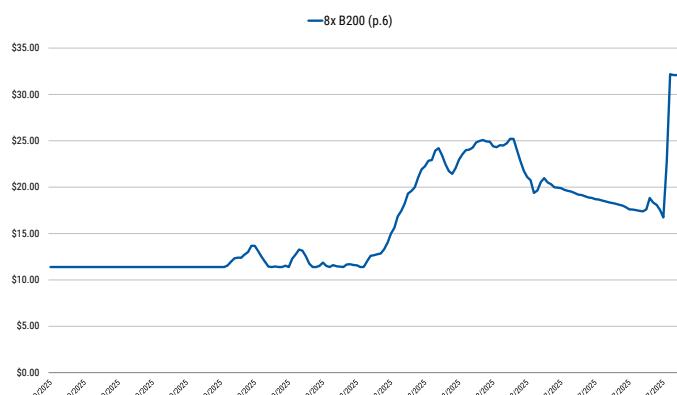
**(3) Rental returns begins to fall:** The health of the GPU cloud market is a key indicator for us on the continued appetite for hyperscalers to invest in GPUs. While the right depreciable life for GPU accounting will remain a topical debate, to us the most important thing is that exhausting GPU fleets continue to see robust cash margins on the rental side. If it continues to be the case that the more GPUs I buy, the more money I make, we think investment will continue. And based on the datapoints we are tracking, returns continue to look strong even for prior generation hopper and ampere products despite falling prices for those instances. Our starting point is always the lowest dominator of pricing, for Hopper that's about \$1 per GPU/hr and for B200 it's about \$4 per GPU/hr (compared to current AWS spot instances at \$1.70, \$4.00). At those prices payback periods are 188 weeks and 66 weeks. For hopper product to have a less than 3.5yr payback period 3.5 years after launch and with incremental Blackwell on the market at the *lowest* prices (most advertised pricing is 2-3x higher) is a positive signal that demand for compute remains higher than overall supply.

**Exhibit 27:** H100 Spot Pricing



Source: Company Data for US east 2b, and US central 1, Morgan Stanley Research

**Exhibit 28:** B200 Spot Pricing



Source: Company Data for US east 2b, Morgan Stanley Research

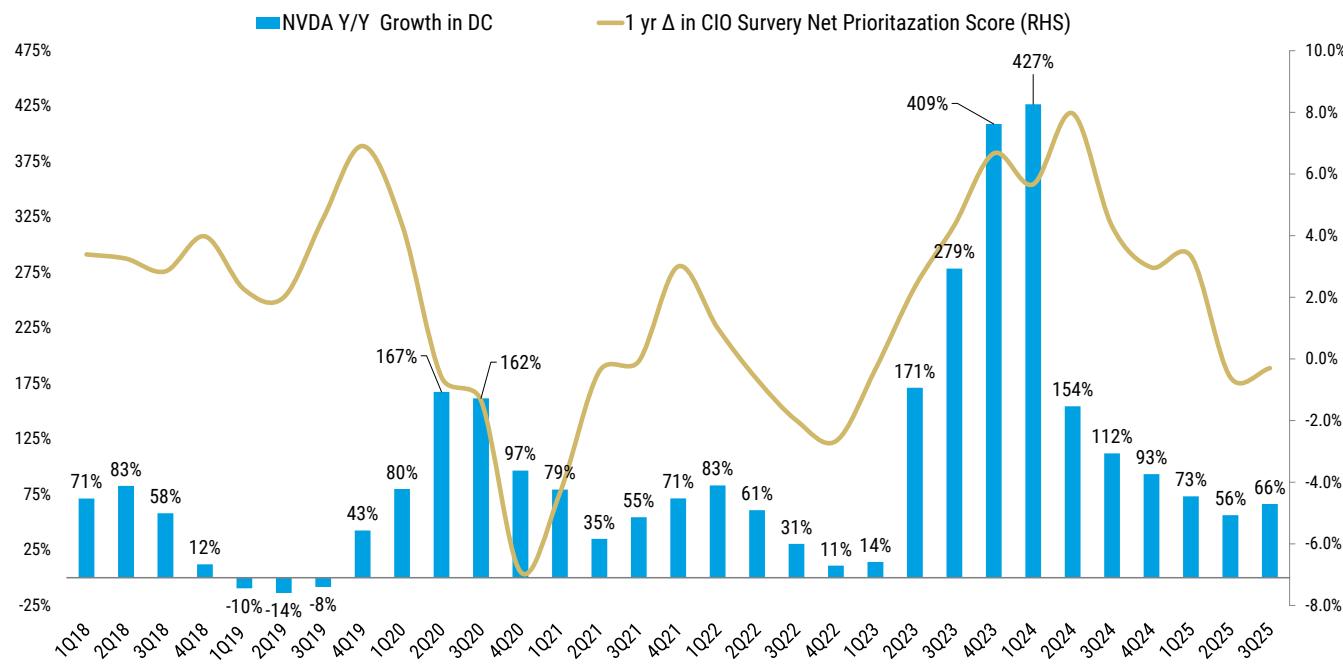
## Thoughts on bubble concerns and fiber comparisons

**Despite the consistent march of progress under Moore's law and the more recent rise of accelerated computing, AI investment has been cyclical over time and we expect it will continue to be.** In fact disillusionment with the progress of AI and a subsequent slowdown in its investment is so prevalent there is a name for it that dates back to the 1980s - *AI winter*.

We don't know when winter is coming for this AI cycle, but while we see recent circular funding deals and the interdependence of the AI supply chain as something that creates the risk of a bubble, we aren't seeing one so clearly today. Debt financing remains minimal, and with recent issuances by Oracle quickly succeeded by a selloff in their CDS and 40% drawdown in their stock. The biggest stewards of the AI trade have seen little to no multiple expansion over the last year. OpenAI's deals with AMD and Nvidia don't start until the second half of 2026 and both deals come with important caveats. For OpenAI to get an equity investment from Nvidia they must first build each GW of compute, meaning

that Open AI still needs to find the other \$30-40bn a GW to unlock the investment. So while none of that means current valuations are sustainable, we do think we're lacking some of the fuel that fired historic bubbles like we saw during the dot com period.

**Exhibit 29:** AI spending prioritization versus Nvidia datacenter growth



Source: AlphaWise, Company Data, Morgan Stanley Research. n=100 (US and EU data)

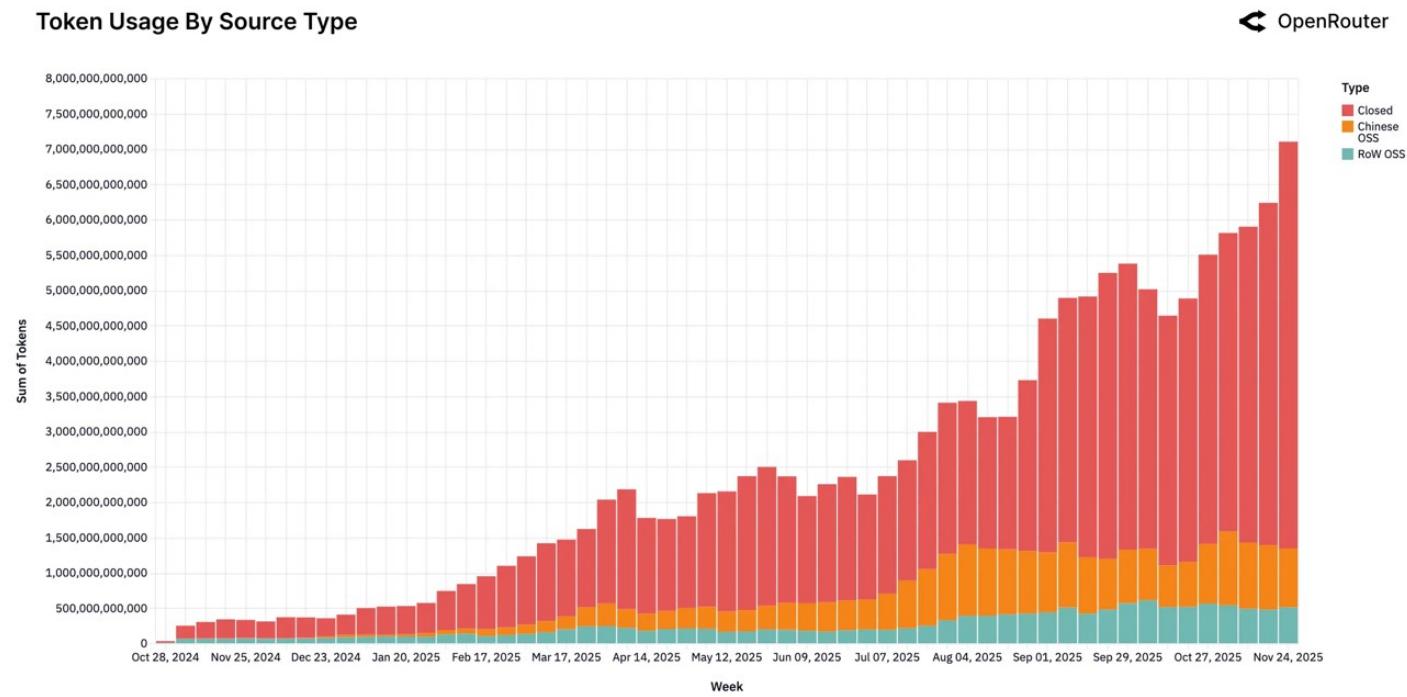
#### Fiber spend was perpetuated by myths about TAM growth, vs estimates for LLM model compute needs that appear to be based on more reasonable world views.

During the fiber bubble the CEO of AT&T, executives at WorldCom, the media, and even the commerce department all repeated versions of the statement that internet traffic was doubling every 100 days - the problem was that it wasn't growing anywhere close to that. While internet traffic was certainly growing at a high rate of about 100% annually, ([Internet traffic growth: Sources and implications](#)) it was growing nowhere close to the 16x annual growth a doubling every three months would imply. In retrospect those statements seem to have underpinned much of the spending, and shaped investor attitudes toward bigger and bigger investments. In AI we are seeing continued usage growth that continues to surpass the expectations of even the more skeptical corporate AI investors.

[A] massive crunch [in compute] is probably an understatement...I think we have been in a mode where it's been almost impossible to build capacity fast enough since ChatGPT ... launched."

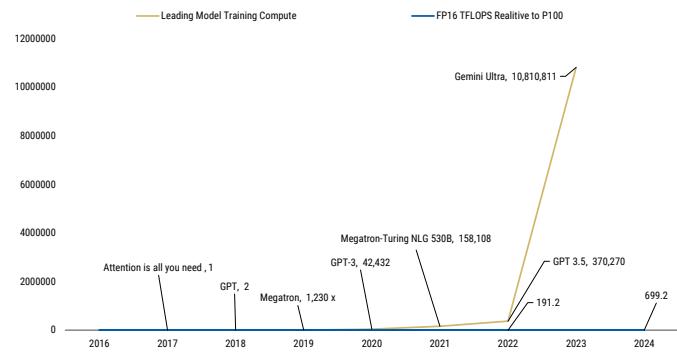
"Even our most ambitious forecasts are just turning out to be insufficient on a regular basis"

- Microsoft CTO Kevin Scott (Oct 2025)

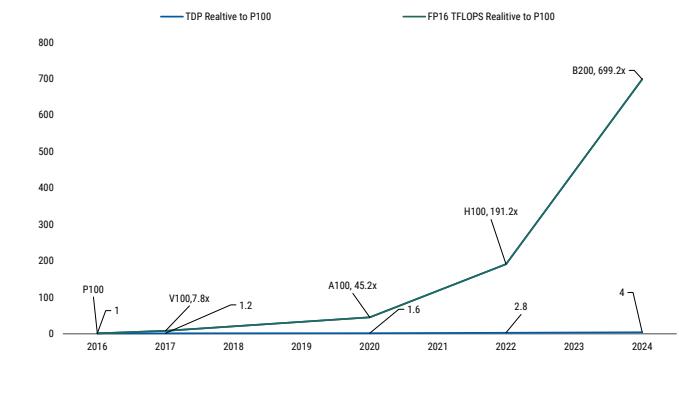
**Exhibit 30:** Token demand continues to be strong

Source: OpenRouter, Morgan Stanley

We don't think a misnomer like that exists in the AI space today, the closest being OpenAI's 2018 analysis suggesting frontier AI model training compute usage doubles 3.4 months or about every 103 days ([here](#)). But in the years since that statement has held, with estimates for GPT-4 training using over 1,000,000x more compute than the original GPT model from 2018, this equates to a doubling roughly every 90 days. That compares to FP16 performance from NVDA that's up only 15x (V100 vs H100) over that time frame. Comparing FP16 performance from product spec sheets does understate the performance improvements Nvidia has been able to drive over time, and chip reuse does play a big part in overall training hardware demand. But comparing the underlying TAM growth to what fiber spenders were contemplating does not seem to tell the full story.

**Exhibit 31:** Hardware performance gains barely register vs training compute intensity growth

Source: epochai, Morgan Stanley Research

**Exhibit 32:** Although hardware performance has grown rapidly

Source: epochai, Morgan Stanley Research

**The bubble in fiber was also massively exacerbated by fiber companies' use of IRUs**

(indefeasible rights of use), which allowed them to sell the right to use their capacity to other carriers - sometimes even selling the same capacity multiple times over. That meant that the effective capacity in 2001 was 2x what was physically built, allowing much greater levels of competition than we would otherwise expect in a network effect driven capital intensive industry, with these "virtual" miles making up about half of total industry capacity in 2000 and 2001. When adjusting for IRUs the decline in industry revenue per mile of fiber between 1990 and 2001 was actually double what it would have been otherwise, suggesting the actual physical infrastructure built (while certainly "excessive") was much more reasonable.

**Exhibit 33:** Double counted capacity was responsible for the majority of fiber network growth after 1996

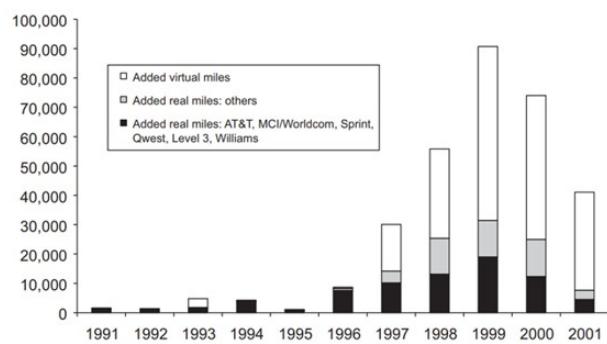
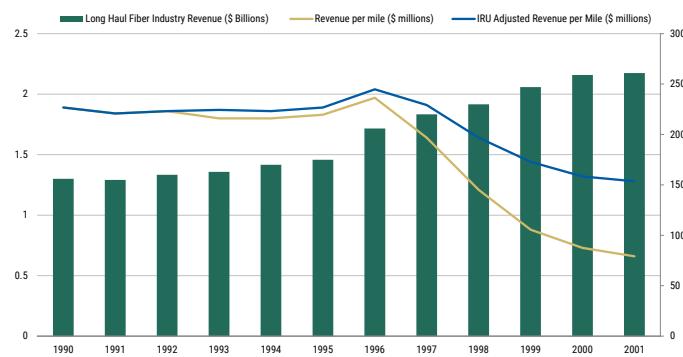


Fig. 1. Yearly additions to total route miles, 1990–2001.

Source: Excessive(?) entry of national telecom networks, Morgan Stanley

**Exhibit 34:** Resulting in a higher degree of pricing pressure

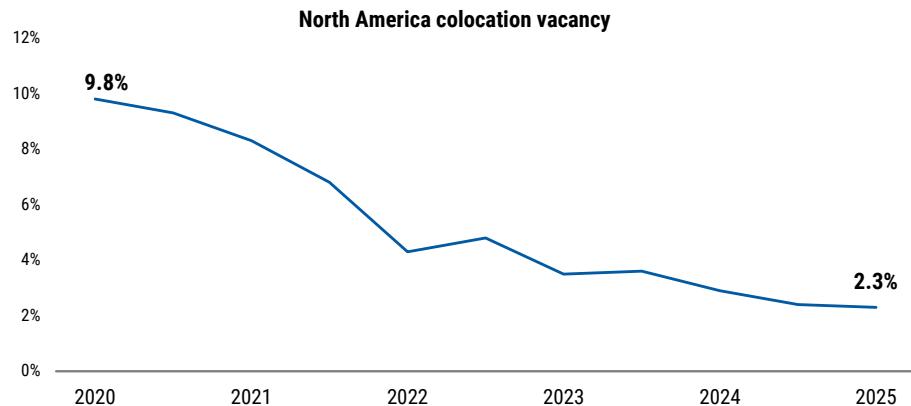


Source: Excessive(?) entry of national telecom networks, Morgan Stanley

**That all occurred despite utilizations along these networks that were persistently very low**, with internet backbones in the range of the 10% to 15%, and corporate long-haul links (the bulk of data transport capacity) between 3-5% ([Data Networks are Lightly Utilized, and will Stay that Way](#)). Although there were some good reasons for this, carriers were certainly not capacity constrained and believed that endless demand for presumably long lived capacity would be enough to bail them out of any slowdown. According to data from Sprint, in 2001 over than 90% of the links in their backbone had utilization of less than 50% for every 5 minute period in the sample ([Packet-Level Traffic Measurements from the Sprint IP Backbone](#)).

**That raises the question of just how similar this is to current cloud investment.** We think the similarities for GPUs are minimal, as utilization is by all accounts quite high. However, there are very valid concerns that companies are doing too much training or offering models at prices that are too low and effectively subsidizing demand that way.

**Exhibit 35:** Datacenter utilization is high today, and will likely continue to be

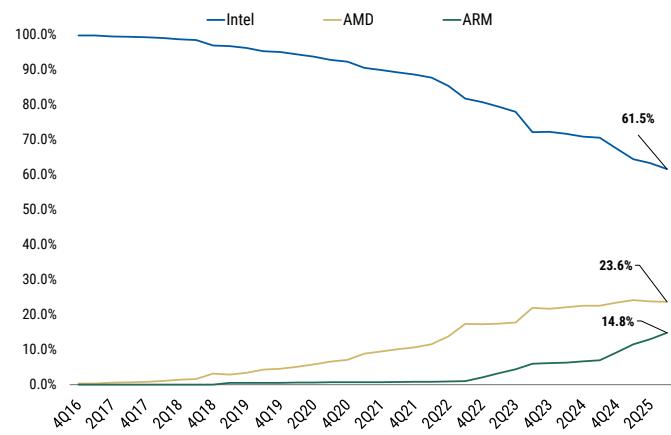


Source: JLL Research

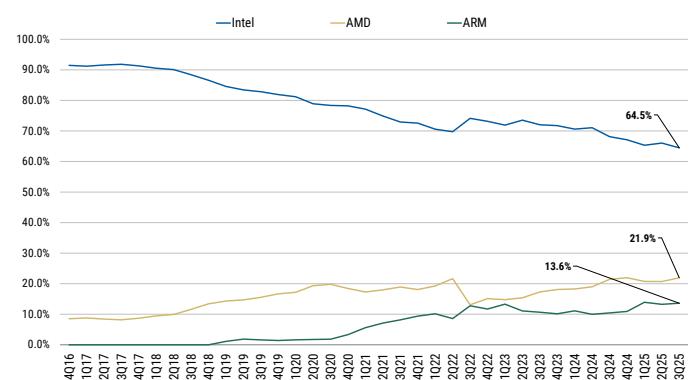
## What about x86?

**The general purpose server market is very strong.** We see AMD with robust share gains for the foreseeable future, and see Intel as likely to struggle, albeit with strong near term conditions mitigating market share concerns. Perhaps one of the under reported elements of the current environment is that general purpose server CPUs are in short supply - not the outright crisis level of hard drives or memory but still leaving unfulfilled demand. At least part of this is the lack of supply growth from Intel, but demand is clearly good, and the tightening availability of 3/4/5 nm wafers is also contributing. AMD Turin remains solidly in the lead, and Intel's 18A process does not appear to be enough to close the gap in 2026, with 18A products not actually utilizing the full backside power capability - Clearwater Forest vs. Venice looks like a clear win for AMD at this point.

**In client conditions are still solid, but memory pricing could create some demand pressure next year.** In PC semis we saw 2025 solidly above seasonal in 1H following what were believed to be tariff pull-ins, and in the second half demand has been bolstered by the continued windows refresh. But both those tailwinds should mitigate beginning next year, and on top of that the spike in DRAM pricing seems likely to cause some amount of incremental demand pressure. PC's don't particularly matter for either of Intel or AMD stocks, but it's an area we are cautious into next year.

**Exhibit 36:** Server CPU Unit Share

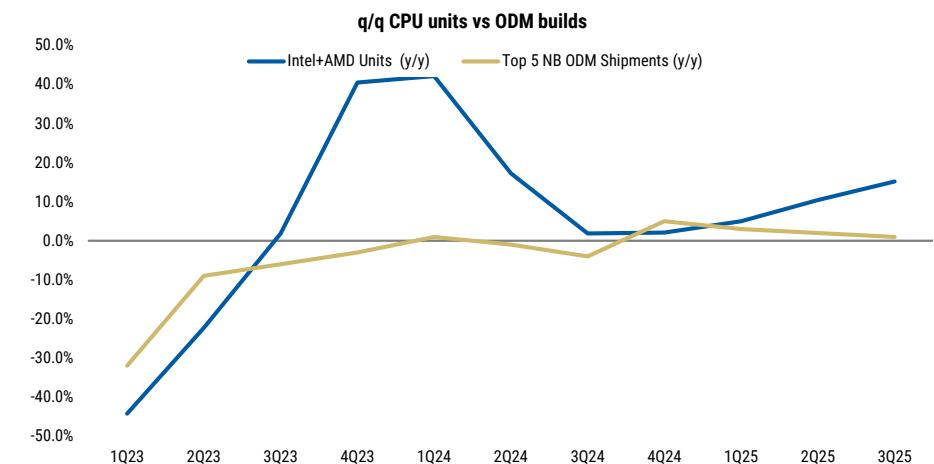
Source: Mercury Research, Morgan Stanley Research

**Exhibit 37:** Client CPU Unit Share

Source: Mercury Research, Morgan Stanley Research

**Exhibit 38:**

CPUs look due for a small correction relative to PCs



Source: Company data, Mercury Research, Morgan Stanley Research

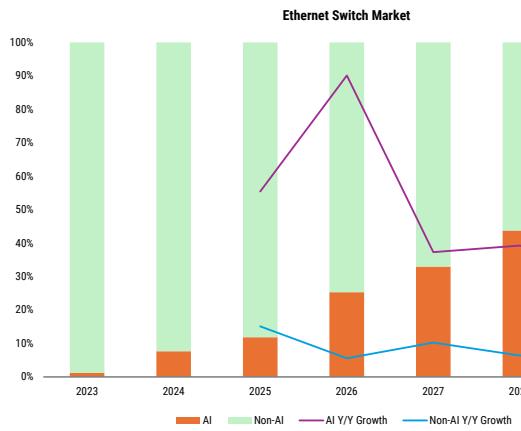
# Networking Semis: AI Architectures Enter The Next Phase

**Our View:** AI drove networking growth in 2025, which we expect to continue into 2026 as AI investments continue. Looking ahead, continued Ethernet adoption, new scale-up protocols, 800G/1.6T optics, and next-gen technologies like active copper, linear optics, and CPO will propel the next phase of AI networking growth.

**Stock Calls:** We are OW on ALAB - benefiting from its Amazon Scorpio ramp and expanding ASIC content - and on AVGO, driven by its ASIC design wins and broad Ethernet-aligned portfolio. We remain Equal-weight on SMT and MRVL: SMT offers upside in ACCs and LPO but has optionality, while MRVL's optical business should outperform even as we stay cautious on its ASIC narrative.

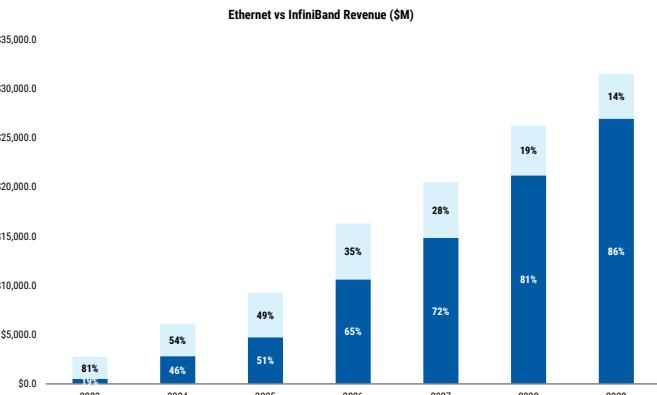
In 2025, AI surged to the forefront of networking technology investment and innovation, pushing traditional enterprise networking into the background as priorities shifted toward building infrastructure optimized for massive AI workloads. Ethernet overtook Infiniband as the preferred protocol for scale-out architectures, as Spectrum-X and vanilla Ethernet gained share. AI also opened the door for new networking vendors, with emerging players including Astera and Semtech to address the unique needs of AI connectivity.

**Exhibit 39:** AI Investments expected to continue to drive growth



Source: Dell'Oro, Morgan Stanley Research

**Exhibit 40:** Ethernet will be the main protocol for AI Back-End networks



Source: Dell'Oro, Morgan Stanley Research

Looking ahead to 2026, we anticipate continued momentum in AI networking. Hyperscalers are set to increase capex by roughly 33% next year, with Network Infrastructure representing about 20% of total data-center IT spending. We expect:

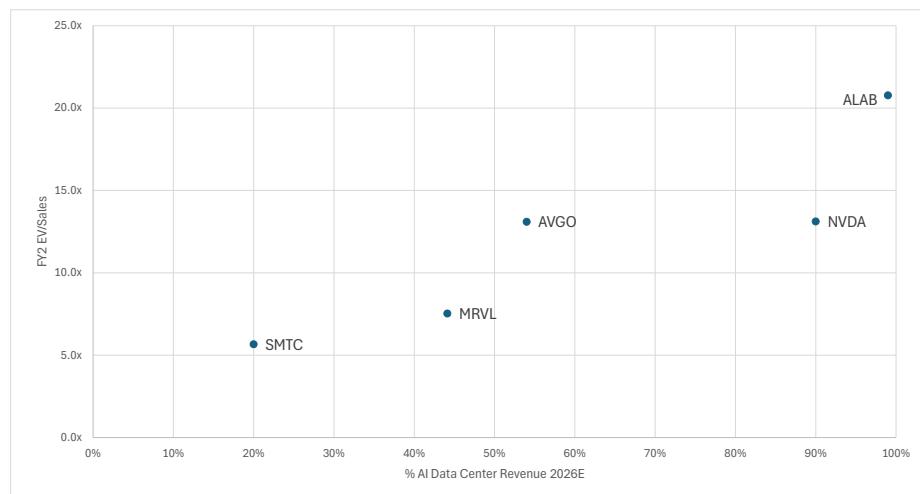
1. Ethernet to keep gaining share as customers prioritize greater standardization across networks.
2. Adoption of new scale-up protocols driven by the diversification of Xpus and the shift toward rack-scale connectivity.
3. 800G to remain a key growth driver, alongside the first wave of 1.6T optical deployments.
4. Further advancements in next-generation networking technologies, including

active copper, linear optics, and co-packaged optics (CPO).

**Stock Views:** We expect all of our AI-networking exposed companies to have strong tailwinds in 2026, supported by sustained AI investment. We are **Overweight ALAB**, given the significant ramp of its new Scorpio scale-up switch with Amazon in 2026. ALAB also benefits from higher ASIC content, which should scale meaningfully over CY26. We are also **Overweight AVGO**, primarily on its ASIC design business, but its broader networking portfolio should benefit from the continued adoption of Ethernet and its strong positioning across key AI technologies.

We are **Equal-weight SMT**C, a newer entrant in AI networking. While the company has long had exposure to optics through its TIA products, it has promising ramps next year in newer technologies such as ACCs and LPO. The ACC opportunity in particular offers substantial optionality, though we remain conservative given the rapid pace of design changes; nonetheless, the upside potential is meaningful. We are **Equal-weight MRVL**, as we remain more cautious on the ASIC business that drives much of the narrative. However, we expect the optical segment to be a bright spot. We believe management's guidance for optical growth to track capex may prove conservative, and we anticipate the company will maintain its leadership in optical DSPs. Overall, we view optics as one of the most durable and attractive parts of MRVL's portfolio.

**Exhibit 41:** AI Semis: Ev/Sales vs. AI Exposure



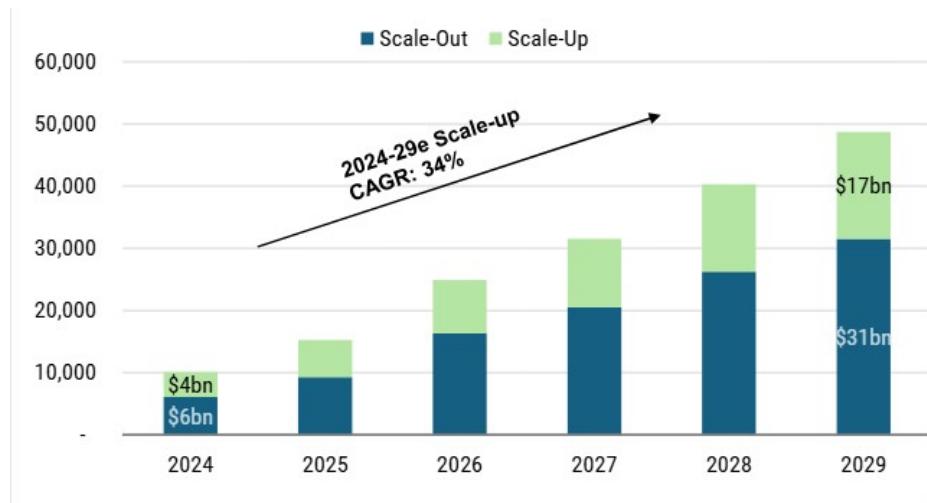
Source: FactSet, Morgan Stanley Research  
As of 12/15/25

## Scale-up: What will be the alternative to NVLink?

The rapid rise of rack-scale AI systems has created a huge greenfield market in scale-up networking, reshaping how accelerators communicate within a server rack. Unlike scale-out networking, which links servers across a data center, scale-up networking provides high-speed, low-latency connections among GPUs/XPUs inside a single rack, enabling them to work as one unified computational system. This architecture has become essential as AI models grow in size and complexity. NVIDIA's NVL72 rack, where all 72 GPUs communicate directly via NVLink, has set a new benchmark and accelerated industry wide efforts to develop competitive scale-up fabrics.

Today NVIDIA dominates scale-up networking through NVLink, but the emergence of alternative accelerators is opening substantial new opportunities. Vendors and hyperscalers are exploring multiple approaches, including UALink, Scale-Up Ethernet (SUE), and PCIe-based or custom fabrics, each with distinct performance and ecosystem advantages. We project the scale-up market to grow from \$4 billion in 2024 to \$17 billion by 2029, with copper interconnects remaining dominant in the near term and optics expected to appear once racks scale beyond ~150 accelerators. While the landscape is nascent, we expect to see numerous NVLink alternatives come to market in 2026 and 2027, including Scale-up Etehrnet (SUE), UALink (UAL), and NVLink Fusion.

**Exhibit 42:** Scale-up TAM estimate (\$mn)



Source: Morgan Stanley Research, Gartner, Dell'Oro

Several companies are well positioned to benefit from this expansion. Astra Labs is gaining traction with its Scorpio family of scale-up switches and stands to benefit further as UALink matures. Broadcom is advocating Ethernet-based scale-up, leveraging its Tomahawk 6 switches and strong hyperscaler relationships, and Marvell plans to bring in optics with their recently announced Celestial AI acquisition and plans to participate in UALink and Ethernet ecosystems.

Overall, while NVIDIA is expected to retain the majority share near-term, the rise of alternative Xpus and open networking standards is creating a broad and rapidly expanding opportunity for the rest of the networking ecosystem. Going into 2026, we expect to see:

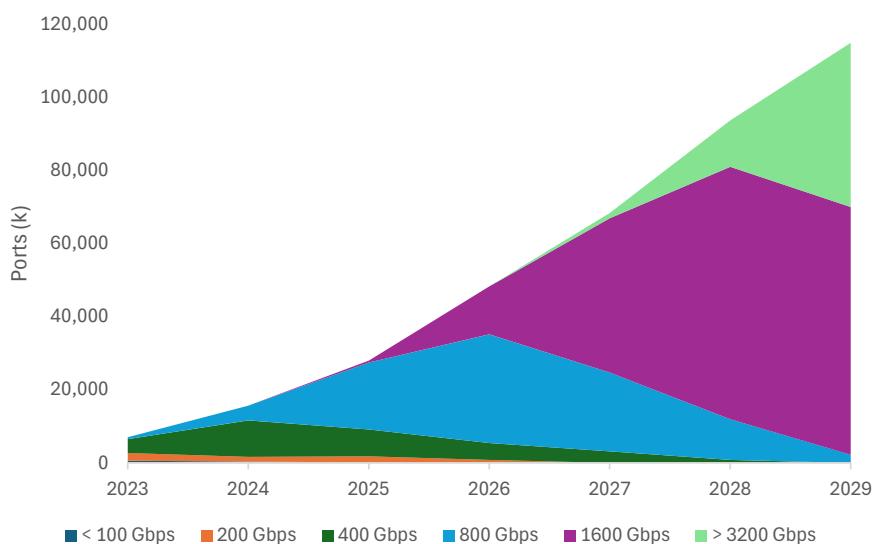
- NVIDIA GPUs: Continue to use NVLink over copper.
- Google TPU: Continue to use OCS/ICI.
- AMD: MI400 will use UAL over Ethernet. This is a modified version of UAL where UALink is tunneled over Ethernet and relies on Broadcom's Tomahawk switches.
- Trainium3: Will scale using PCIe-based scale-up that uses ALAB's Scorpio switches. Trainium4 was announced to use UAL for Trainium clusters and NVLink Fusion for hybrid GPU+Trainium racks.
- Meta MTIA & OpenAI: TBD - consensus is that they will use SUE given relationship with AVGO for ASIC design.

**What are we watching next year?** We think the scale-up domain will move to an open networking standard - with the frontrunners being UALink and SUE. While sentiment

currently favors AVGO's SUE following this year's OCP, we wouldn't count UAL out yet. We expect to see first specs of UAL in 2026, and a larger ramp with Trainium4 in 2027. If UAL technology is good, we could see AMD (whose IP from Infinity Fabric is used for UAL) and others deploy it.

**Optics in scale-up?** We think it's coming, just not next year. We believe that AI scale-up, where power efficiency and bandwidth density are critical will be the main application for CPO. AI scale-up networks are the most bandwidth-intensive environments in modern infrastructure, making them the primary driver behind CPO interest. NVIDIA's GB200 architecture requires roughly 7.2 Tb/s of bandwidth per GPU, and the upcoming Rubin platform is expected to double this to 14 Tb/s. NVIDIA and others have been vocal that they will remain on copper for as long as they can, but eventually copper will struggle to extend beyond 2–3 meters, even with active copper solutions. As hyperscalers aim to build increasingly large GPU clusters, optical technologies become essential. We believe that we will see CPO implemented most widely in the scale-up XPU clusters, and will be more relevant as >3.2tbps switch speeds are prevalent.

**Exhibit 43:** AI back-end network switch speed forecast



Source: Morgan Stanley Research, Dell'Oro

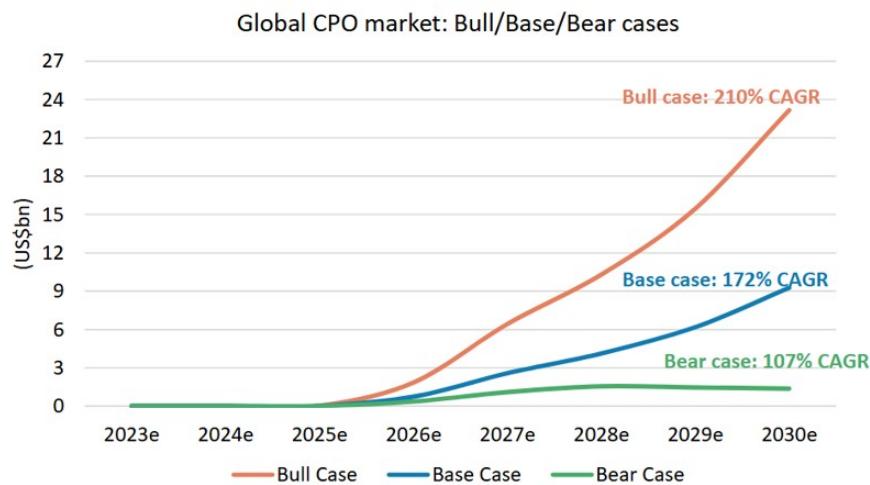
### Quick takes on next gen networking tech: Co-Packaged optics (CPO), Linear Pluggable Optics (LPO), Active Copper (ACC & AEC)

The needs of AI are driving innovations in networking. Below are some of the trends we expect to see develop in 2026 and beyond:

**Photonics/CPO:** Photonics replaces traditional copper-based electrical connections with optical signals, enabling far higher bandwidth, lower latency, and better energy efficiency - capabilities that are increasingly critical as AI models grow and data movement between compute and memory becomes a major bottleneck. Co-Packaged Optics (CPO) uses this technology to embed optical engines directly within the package of switch or compute ASIC, dramatically shortening electrical paths, boosting data transmission speeds, lowering power consumption, and reducing latency. Delivering CPO requires deep

expertise across silicon photonics, fiber-optic components, DSP, high-performance ASIC design, and advanced packaging and test technologies, making it a complex but powerful architectural approach for next-generation AI and data-center infrastructure.

**Exhibit 44:** Optical transceiver vs CPO



Source: Yole, Morgan Stanley Research estimates; see [New Page for Networking Market; Initiate FOCI at OW](#)

We see the shift from pluggables to CPO as a matter of when, not if, and expect meaningful adoption to begin in 2027–2028. Supply chain partners like GlobalFoundries are planning capacity increases that align with the 2027-2028 timeline, and comments from AMD and others expect a major transition in the 2027-2029 timeframe. Broadcom has been developing CPO solutions for years and was first to introduce switches with an integrated CPO. In addition, NVIDIA is incorporating silicon photonics into its Spectrum-X Ethernet and Quantum-X InfiniBand platform for scale-out next year. That being said, we don't expect significant customer adoption next year. There are still various technical challenges, and we don't think network speeds in 2026 will necessitate customers to switch to a costlier and more technically complex technology with a limited vendor ecosystem. In the interim, pluggable optics continue to advance, with 1.6T transceivers expected to arrive next year, providing a bridge before a broader shift to CPO architectures. We think 3.2T and beyond is when we will start to see the initial crossover to CPO solutions. By 2027, we expect both NVIDIA and AVGO to have CPO switches in greater production.

- Stock views: While we don't expect to see an impact in 2026, eventual CPO adoption should benefit Broadcom, now on its fourth-generation platform, and Nvidia/Mellanox, which has introduced CPO across Spectrum-X Ethernet and Quantum-X InfiniBand. Astera Labs will need to move beyond its copper-centric portfolio, though its aiXscale Photonics acquisition shows intent to compete in optics. Semtech faces mixed effects - CPO reduces standalone TIA demand, but pluggables and active copper should remain resilient. For Marvell, CPO is cannibalistic to its DSP-based pluggables, but its Celestial AI investment provides a viable path into photonic architectures.

**Active Copper:** Active copper (including AECs and ACCs) are a way to stretch traditional copper connectivity. Active copper cables (ACCs) include redrivers to amplify electrical

signals and can transmit ~3-5m, far more than the distance of passive copper at high speeds. Active electrical cables (AECs) uses a retimer chip to amplify and reduce jitter and can transmit farther than ACCs (up to 7m). Active cables are frequently found in NiC-to-ToR and ToR-to-ToR connections.

As data-center link speeds continue to rise and architectures expand, we should expect broader adoption of active copper solutions. Higher signaling rates dramatically shrink the loss budgets that passive copper can support, making even short connections challenging without some form of signal conditioning. At the same time, operators are increasing NiC-to-ToR and inter-rack distances to accommodate denser racks, evolving AI/ML fabrics, and more flexible network layouts. In this context, ACCs and AECs provide a practical middle ground, extending reach, improving signal integrity, and delaying the need for more expensive optical links. As the industry moves toward 200G/lane and beyond, active copper is positioned to play an even larger role in short- and mid-reach connectivity.

- Stock views: Growing adoption of active copper should serve as a meaningful tailwind for both ALAB and Semtech, given their exposure to re-driver and retimer solutions. ALAB isn't the incumbent in AEC market, but its traction at Amazon positions it well to participate in upcoming deployments. SMTC expects to ramp their ACCs with a hyperscaler in mid-2026, and predicts active copper will take significant share from DACs as speeds increase.

**Linear Optics:** Linear optics moves the DSP functionality out of a pluggable module and places it into a top of rack (ToR) switch. The number of DSPs is reduced from two to one, as the one ASIC switch is powerful enough to handle both functionalities. This allows electrical signals to drive directly into the transceiver, which offers better thermal protection for the signal and reduces overall power. DSPs are very energy intensive, making it an obvious place for power savings. There is still a transceiver, but it is mostly analog based components (like TIAs, laser drivers, etc.)

We think that LPO solutions are an easier near-term choice because they resemble traditional architectures, benefit from a broader provider ecosystem, and do not require a full architectural overhaul. However, we think hyperscalers will want more permanent solutions, and LPO is generally viewed as a transitional step toward more advanced technologies.

- Stock views: SMTC has design wins with several hyperscalers that are expected to contribute mid-single-digit revenue starting in Q4, with a gradual ramp over the course of next year.

# Analog/MCU: Capturing cyclical momentum

**Sub-Industry View:** Analog and MCU momentum continues to build, supported by improving shipments, accelerating ASP/unit trends, and slowing destocking. We expect auto to join industrial in the recovery, with rising odds of a replenishment cycle. Each company is positioned to benefit differently across these key themes as we look toward 2026.

**Stock Call:** We favor ADI (OW) and NXPI (OW), where strong execution and exposure to industrial/auto position them best for the next leg of the cycle. We remain UW TXN due to persistent capex pressure and ongoing fundamental deterioration YTD pressuring results in 2026.

**2025 Review: Entering the year, consensus expectations centered on an acceleration in the cyclical upturn.** Looking back, however, the recovery has been more muted, taking the shape of a prolonged "U" rather than the sharper "V" seen in prior cycles. Throughout the year, we saw several false starts in what appeared to be a sustainable pickup in momentum, reflected in the way stocks have traded YTD. That said, recent cyclical optimism from analog management teams suggests the data is now pointing to a broad-based acceleration in recovery heading into 1H26, driven largely by inventory replenishment — particularly in autos.

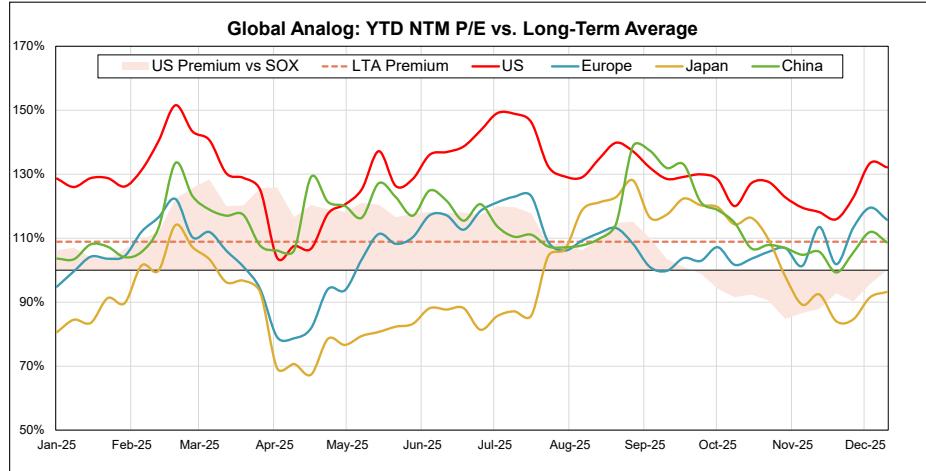
While this dynamic has led to meaningful multiple compression for U.S. analog stocks relative to the SOX, all relevant indicators point to the sector having moved through the trough, even though multiples have yet to fully re-rate. Throughout the year, the industry remained largely in an undershipping posture, though we began to see shipments better align with end demand in industrial markets. Autos, however, continued to stand out as a clear laggard.

**Key Themes into 2026:** **1) Recovery inflection:** the rate of change should improve meaningfully as customer inventories approach stabilization and shipments begin to align more directly with end demand; **2) Broad-based end market recovery:** we expect autos to finally join the recovery, with industrial markets showing accelerating momentum, and **3) AI Data Center opportunity:** growing exposure to data center applications support an emerging secular growth vector for the sector.

**While visibility remains limited, our outlook into 2026 points to a meaningful recovery pickup.** We expect the entire group to benefit to some degree from this acceleration; however, we continue to favor our **OWs: NXPI** and **ADI** given their strong positioning in end markets with clear tailwinds and already solid fundamental profiles. Our **EWs: ON, MCHP, and ALGM** stand to benefit most from a relatively faster rate of change toward peak levels, supported by select exposure to attractive end markets and their current positioning well below normalized run-rates. Meanwhile, we remain **UW** on **TXN** as we view the stock to be range-bound, weighed down by elevated capex's impact on free cash flow and the broader downward revisions implied by management's decision to guide toward the low end of its initial 2026 outlook. Our other **UW NVTS** reflects duration risk on a valuation pricing in significant allocation for the Nvidia 800V

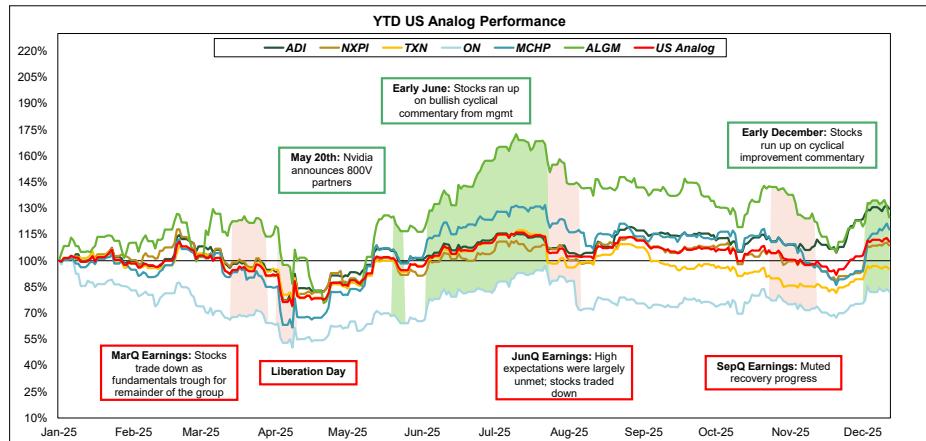
opportunity, where company does not expect to see meaningful revenue until CY27.

**Exhibit 45:** Globally, most analog stocks remain trading above the LTA P/E multiple with the exception of Japan



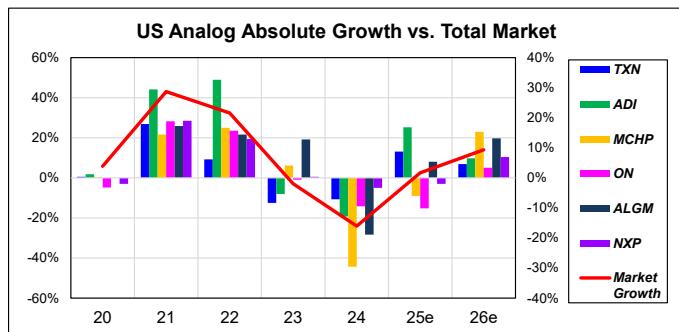
Note: US includes ADI, TXN, MCHP, ON, ALGM, MPWR, and NXPI; Europe includes: Infineon, STMicro, Melexis; Japan includes: Rohm, Renesas; China includes: Silergy, SGMicro. Source: Factset, Morgan Stanley Research.

**Exhibit 46:** Within the last week, US analog stocks climbed to net positive YTD



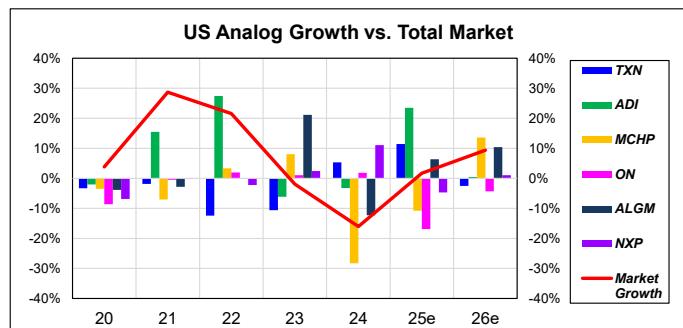
Note: US Analog also includes MPWR. Source: Factset, Morgan Stanley Research.

**Exhibit 47:** We expect HSD-LDD growth across our US analog coverage in CY26...



Note: Total Market Growth includes: TXN, Renesas, STMicro, Infineon, NXP, Rohm, ADI, MCHP, ON, ALGM. Source: Company Data, Morgan Stanley Research estimates.

**Exhibit 48:** ...mostly outperforming the market



Note: Total Market Growth includes: TXN, Renesas, STMicro, Infineon, NXP, Rohm, ADI, MCHP, ON, ALGM; bars represent relative outperformance/underperformance vs the market. Source: Company Data, Morgan Stanley Research estimates.

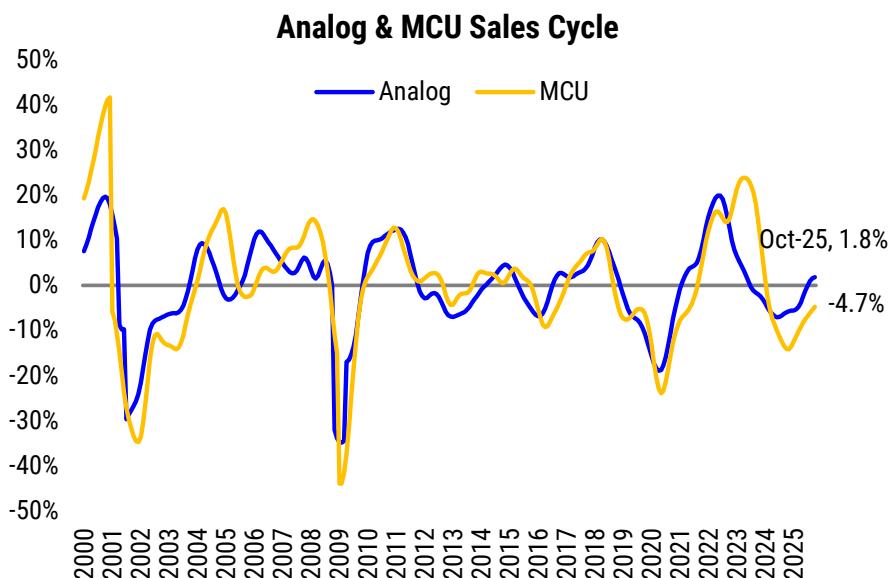
**Where Are We in the Cycle? Hint: It's Still Early**

## Analog & MCU

**Analog and MCU segments continue to show upward momentum.** According to quantitative analysis from our AlphaWise team, analog is now shipping in line with demand, while MCU shipments remain below demand after bottoming a few months later than analog. Both ASP and unit trends, based on SIA data, indicate sustained acceleration over the past several quarters. Inventory destocking has also slowed recently, and we view the rising likelihood of a replenishment cycle as an additional support for continued momentum in the broader cycle.

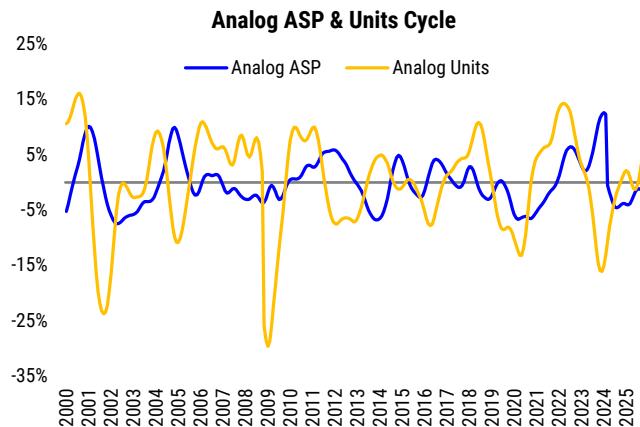
- **Analog:** bottomed in July 2024 when we were shipping 7.9% below trend. As of October we are overshipping by 1.8% and 15 months into a recovery.
- **MCU:** bottomed in November 2024 when we were shipping 18.3% below trend. As of October we are undershipping by 4.7%. and 11 months into a recovery.

**Exhibit 49:** Analog / MCU sales cycle



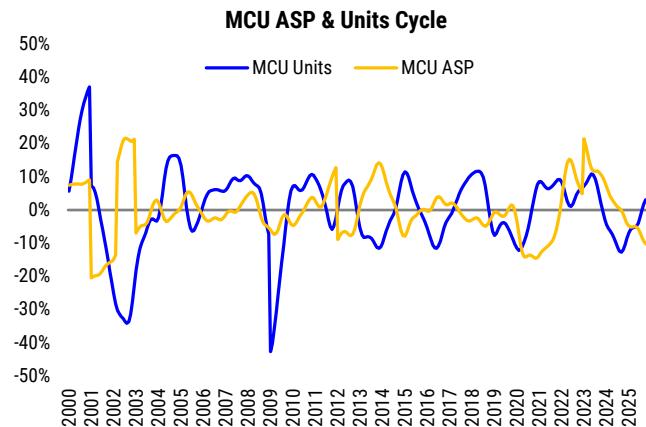
Source: AlphaWise, SIA, Morgan Stanley Research.

**Exhibit 50:** Analog unit & ASPs have continued to climb up since early 2024...



Source: AlphaWise, SIA, Morgan Stanley Research.

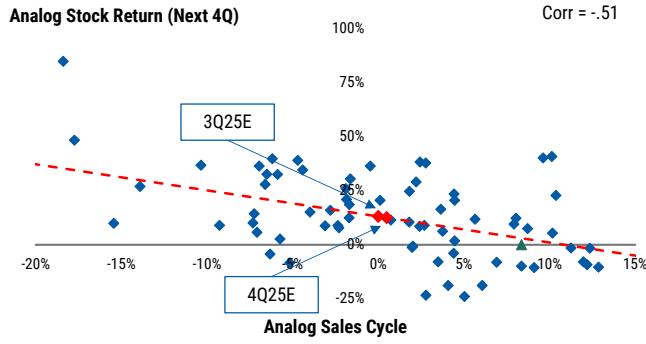
**Exhibit 51:** ...similar with MCU units, while ASPs continue to decline.



Source: AlphaWise, SIA, Morgan Stanley Research.

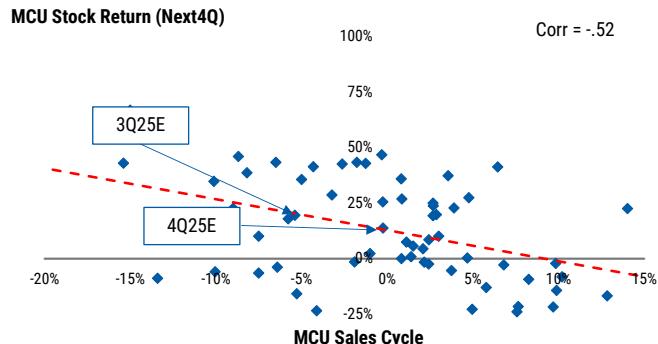
**We see further opportunity for alpha generation as the cycle improves.** Our AlphaWise sector quant team finds a clear negative correlation between 12-month stock returns for our analog and MCU baskets and the position in the sales cycle - meaning the further the industry is undershipping demand, the stronger the forward 12-month returns. This relationship, along with statistically significant p-values, holds consistently across both the analog basket (ADI, TXN) and the MCU basket (STMicro, Infineon, NXPI, MCHP, TXN, Renesas). With analog shipments only now returning to in-line levels and MCU shipments still running below demand as of October, the historical data continues to signal attractive 12-month return potential. Combined with the cohort trading below its average premium to the SOX, we see broad-based upside across the group, though we remain selective on a relative basis.

**Exhibit 52:** Analog returns remain attractive as companies are early in shipping in-line with demand...



Source: SIA, AlphaWise, Morgan Stanley Research.

**Exhibit 53:** ...while MCU's relative undershipping implies slightly higher alpha generation



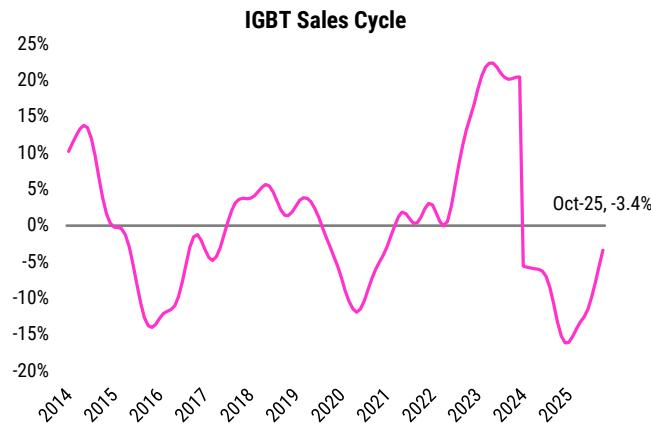
Source: SIA, AlphaWise, Morgan Stanley Research

## IGBTs

**IGBTs past the trough.** The IGBT trough trailed analog and MCU, bottoming in December 2024 when we were shipping 16.1% below trend. As of October, we are undershipping by 3.4% and now 10 months into a recovery. Recall that last Summer, we wrote about leaning toward constructiveness on IGBT's if ASPs showed signs of an inflection, which have faced

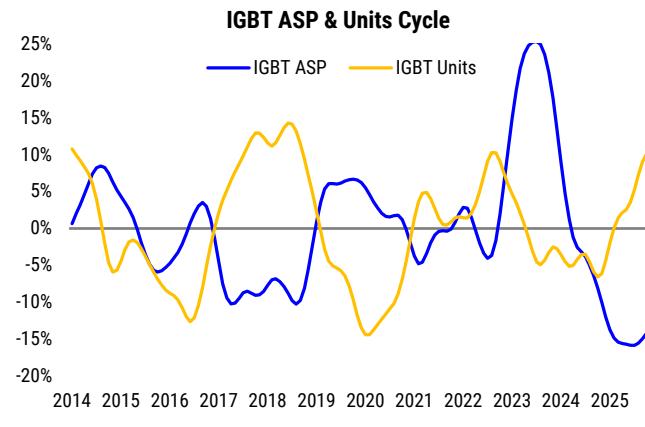
significant pressure from local Chinese suppliers. We are finally seeing an uptick on the ASP side, while units already inflected in early 2025.

**Exhibit 54:** IGBT undershipping accelerated sharply toward in-line with demand ...



Source: AlphaWise, SIA, Morgan Stanley Research.

**Exhibit 55:** ...with unit momentum increasing significantly, and ASP beginning to inflect



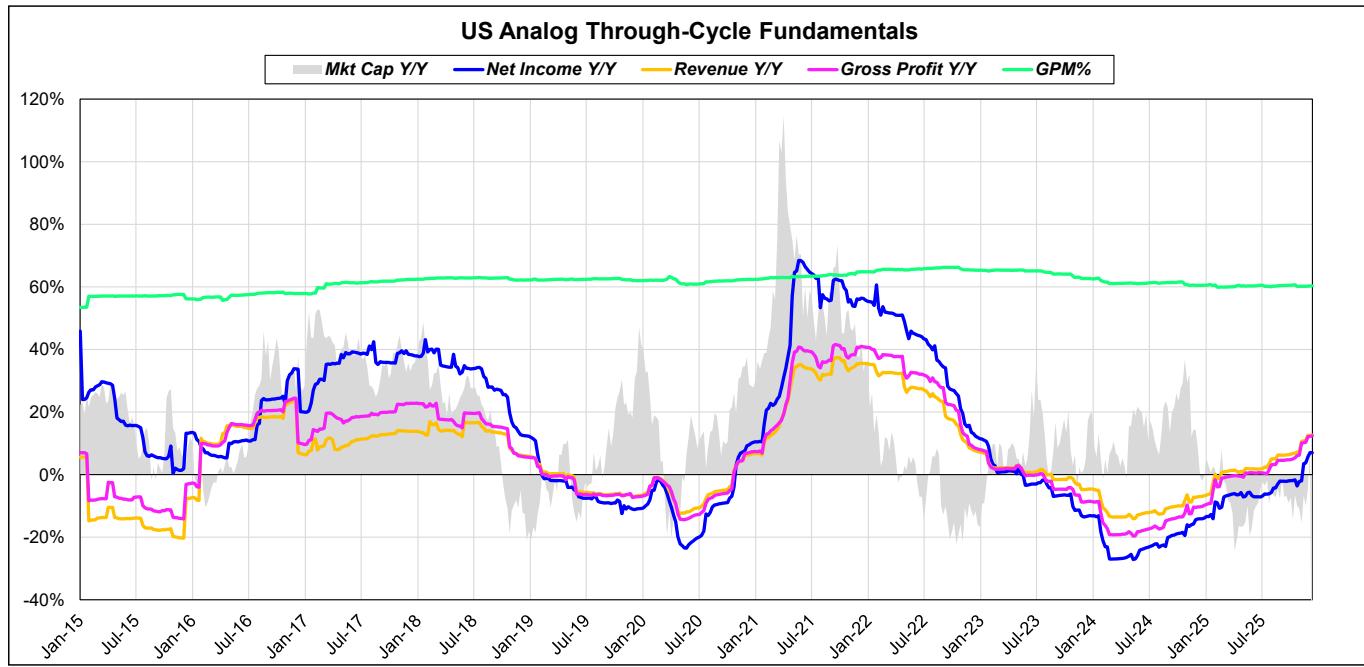
Source: AlphaWise, SIA, Morgan Stanley Research.

## Debates/Key Themes Into 2026

### #1: Momentum Acceleration

**We believe fundamentals for the remaining analog companies bottomed in 1Q25.** In terms of sequencing, ADI and TXN troughed first in late 2023 to early 2024, followed by ALGM in late 2024. MCHP, ON, and NXP subsequently reached their lows in 1Q25. Estimate revisions for the group have begun to move higher, though stock performance has lagged somewhat as investors have prioritized greater direct AI exposure over the broader semi landscape. As autos joins the other end markets in a recovery, industrial inventory stabilizes, and data center demand increases, we see a clearer path to further improvement in fundamentals in early 2026.

**Exhibit 56:** As a group, meaningful upside for US analog stocks has largely been driven by estimate revisions

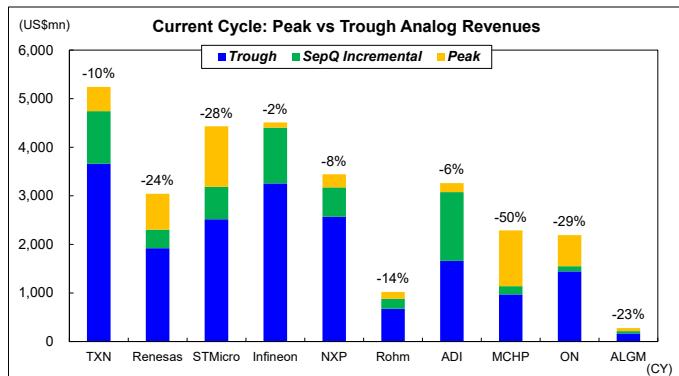


Source: Factset, Morgan Stanley Research.

**The range of gaps between prior peaks remains wide across global analog semis.** This cycle, both peaks and troughs have shifted higher, driven by structural tailwinds (content gains from secular trends) and macro factors (shortages, pricing power, and Fed QE) that helped push revenues to elevated highs. Conversely, many global analog peers experienced deeper troughs as the inventory correction overshot and destocking persisted longer than anticipated. Even so, fundamentals have been improving for several quarters, with the remaining companies having bottomed in 1Q25.

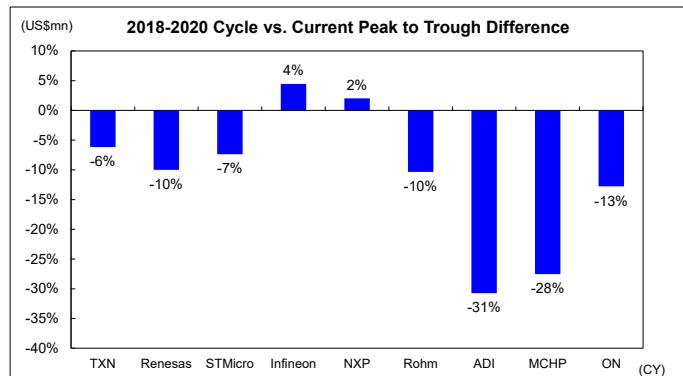
**Relative to prior peaks, MCHP and ON offer the greatest torque to the model.** With revenues still ~50% and ~30% below their respective peaks, their potential rates of change are higher. However, we continue to favor companies that are closer to prior peak levels, given (1) better visibility into surpassing those peaks and (2) valuations that remain undemanding even at prior-peak performance.

**Exhibit 57:** MCHP and ON are currently the furthest below peak revenues in our US coverage...



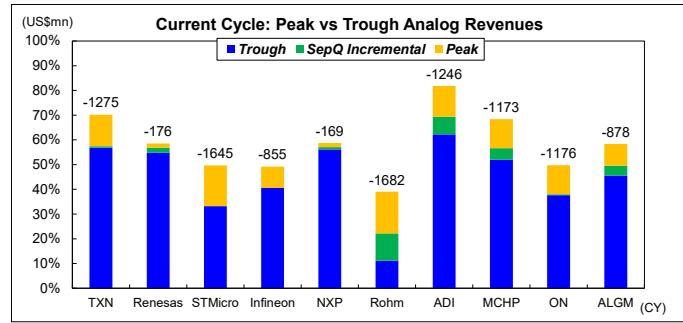
Note: Labels indicate current difference from peak. Source: Company Data, Morgan Stanley Research.

**Exhibit 58:** ...with most companies seeing a deeper trough this cycle



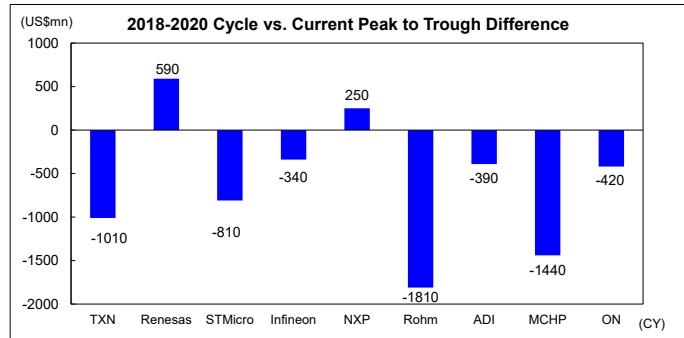
Source: Company Data, Morgan Stanley Research.

**Exhibit 59:** Gross margins have snatched back slower than revenues...



Note: Labels indicate current difference from peak. : Company Data, Morgan Stanley Research.

**Exhibit 60:** ...with most companies seeing deeper troughs this cycle as well



Source: Company Data, Morgan Stanley Research.

## #2: Broad End Market Recovery

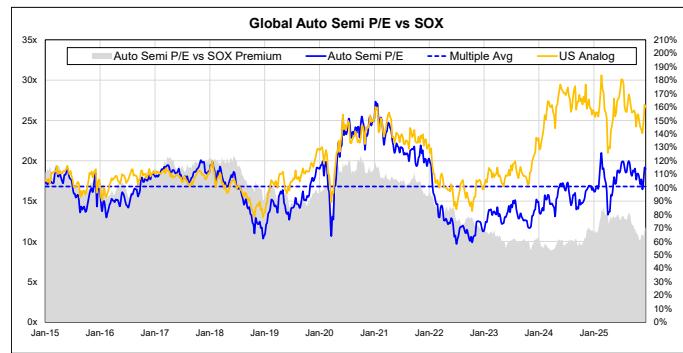
### I. Auto Recovery

**Auto lagged other end-market recoveries in 2025, but we expect a momentum**

**inflection in 2026.** Throughout the year, analog companies consistently cited autos as the clear laggard relative to other end markets. This was not entirely surprising, given that autos bottomed ~5 months after the industrial end market and continued to face added headwinds from pricing pressure driven by local China players.

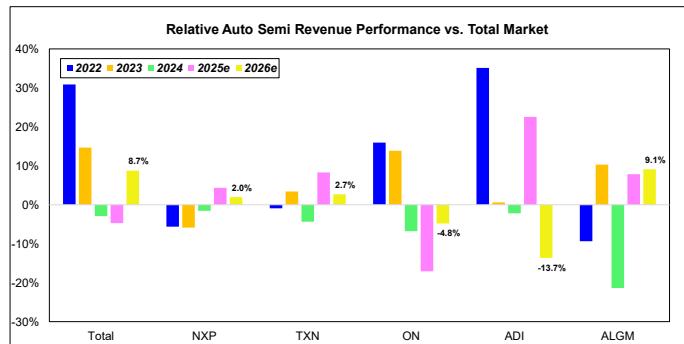
What was unexpected, however, was the behavior of auto customers: despite BS inventories sitting at historically lean levels for several quarters, ordering patterns have remained firmly just-in-time and short-cycle. This dynamic has persisted for the past year and has delayed the typical inventory-driven snapback we would expect at this stage of the cycle.

**Exhibit 61:** Global auto semi relative valuation has lagged overall US analog valuation since 2022...



Source: Factset, Morgan Stanley Research.

**Exhibit 62:** We model for our analog coverage to outgrow the auto semi market in 2026 ex-ON ( remaining pricing headwind) & ADI (tough comps)



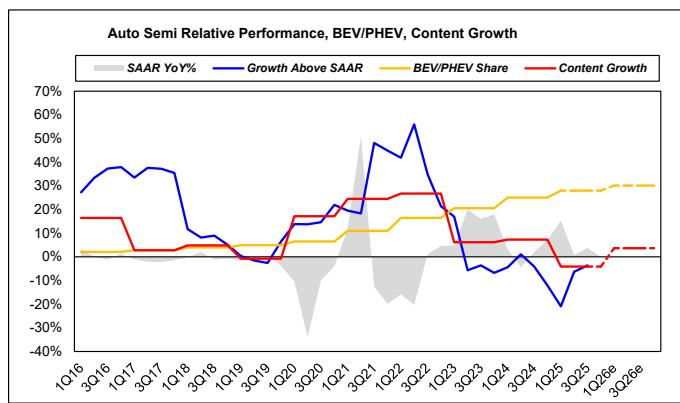
Source: Company Data, Morgan Stanley Research.

**We believe a replenishment cycle is likely to materialize around 1H26, driving upside even in the absence of a simultaneous pickup in end demand.** Given historically low customer inventory levels, such a restocking phase would represent a significant source of outperformance for analog semis. Historically, auto semi demand (or revenue) and customer inventory levels have been inversely correlated; however, this relationship broke

down toward the end of 2021 due to: **1) contractual agreements** (LTAs, PSP programs), **2) initial content uplift from BEV/PHEV** penetration, and **3) pricing power** in part as a function of pass-through of foundry input price hikes.

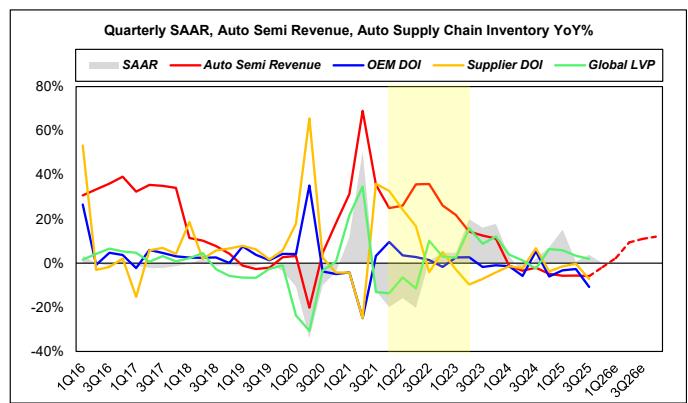
These dynamics postponed the typical reversion to historical trend, where since 2H22, we haven't seen a meaningful rebuild of customer inventories, leading to a continued overcorrection in inventory depletion and reinforcing the prevalence of just-in-time ordering. Additionally, while BEV/PHEV penetration has continued to rise, significant pricing pressure from local China players has remained a headwind to dollar content growth over the past several years. Although we view this pressure as an ongoing challenge, we expect the rate of change to moderate going forward, with room for offsetting as ATP momentum has been building for several months. That said, we are starting to see tailwinds clearer tailwinds toward demand pickup as 1) the **Trump administration lowered fuel economy standards** for ICE vehicles and 2) **extension of Chinese trade-in subsidies** into 2026.

**Exhibit 63:** Although content growth broadly plateaued after late 2022...



Source: BEA, Factset, Company Data, Morgan Stanley Research.

**Exhibit 64:** ...OEM & Supplier DOI hasn't grown meaningfully since 4Q22



Source: BEA, Factset, Company Data, Morgan Stanley Research.

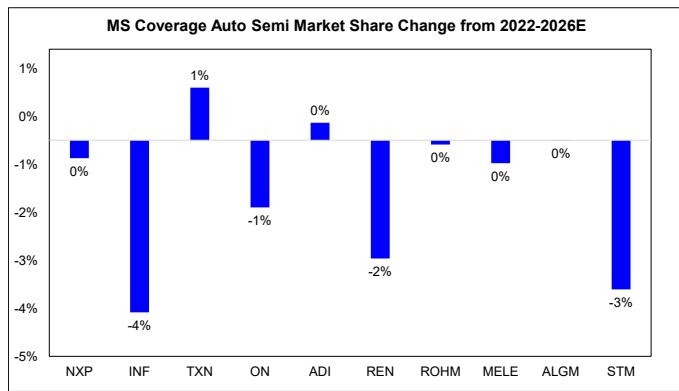
**We prefer NXPI (OW) as the best way to play the auto semiconductor recovery.** NXP is one of only two companies we expect to surpass prior peak revenues next year (the other being ADI). As of the SepQ, NXP's auto revenues sit just 3% below their prior peak and total revenues are 8% below, positioning the company well for new peaks in 2026. NXP's auto exposure has averaged in the high-50% range over the last several years, which we model to slightly increase in CY26 (MSe 58.4%) based on an 11% y/y auto revenue growth rate, contributing ~6-points to total revenue growth of MSe 11% y/y in CY26.

**That said, we expect all US auto semis companies to participate in the upcoming upcycle, including ALGM (EW) and ON (EW).** Relative to NXP, ALGM offers a higher rate-of-change setup, with auto revenues currently 24% below their prior peak in 2Q23 and total revenues also 24% below, creating greater operating leverage to an eventual recovery. Similarly, ON's total revenues are 29% below peak levels and auto revenues are 32% below their prior high, reflecting headwinds from local China competitors in discretes as well as ongoing silicon carbide oversupply.

ALGM's auto exposure has remained in the low- to mid-70% range, while ON's has been in the low-50% range, giving both companies meaningful sensitivity to an improvement in

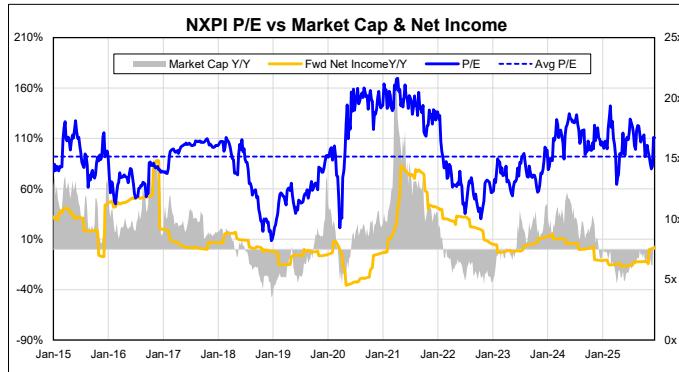
auto demand. From a market-share standpoint, the U.S. group has held share relatively steady since 2022 versus global peers, suggesting further upside potential as design-ins and program wins begin to ramp.

**Exhibit 65:** The US auto semi group has largely held LT market share...



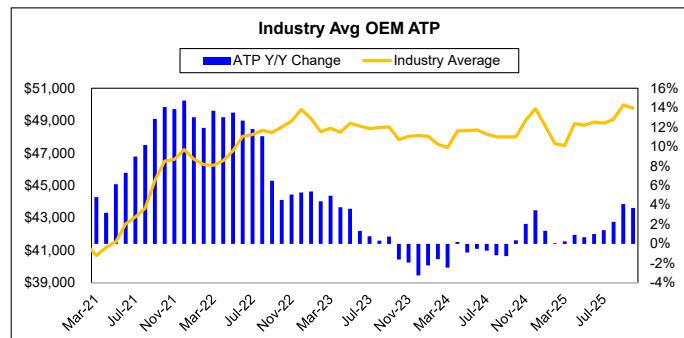
Source: Company Data, Morgan Stanley Research.

**Exhibit 67:** NXP is trading in-line with its historical avg, although revisions have been slow to come up...



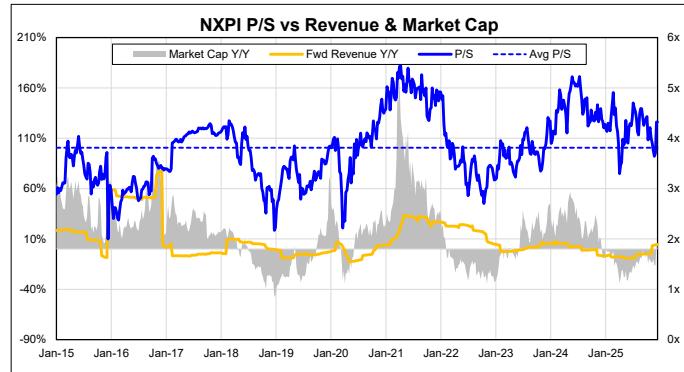
Source: Factset, Morgan Stanley Research.

**Exhibit 66:** ...and average ATP momentum is strong, which should support auto revenue upside across the cohort



Source: Kelley Blue Book, Morgan Stanley Research.

**Exhibit 68:** ...which we view as having further upside, should an auto pickup materialize...



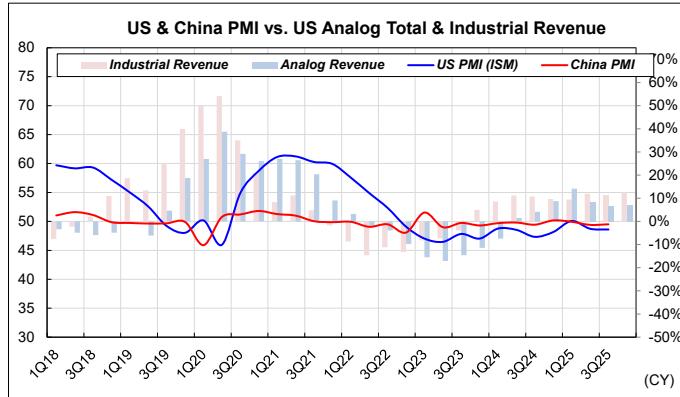
Source: Factset, Morgan Stanley Research.

## II. Industrial Stabilization

**With industrial destocking now largely stable - and supported by both cyclical and secular trends - we see a solid setup for replenishment and demand improvement in 2026.** Industrial revenues peaked and troughed ahead of most other end markets, as PMIs began to roll over in early 2022 alongside rising interest rates. PMIs have remained below 50 since 2023, with the most recent ISM reading at 48.2. That said, mgmt teams across the analog landscape have noted clear stabilization in industrial inventory destocking, where DOI has declined significantly y/y over the past two quarters.

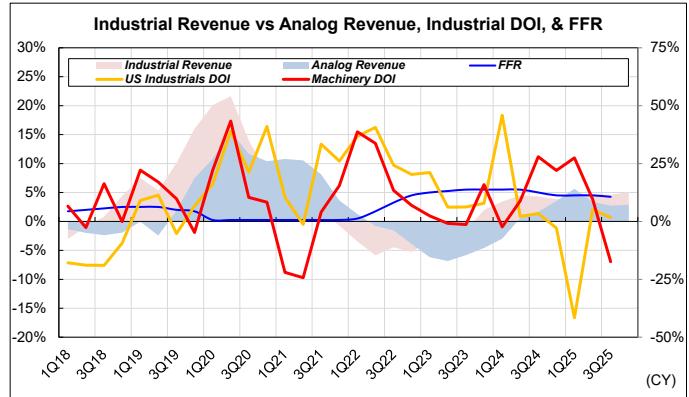
In terms of economic improvement, our **Morgan Stanley US Economics team expects AI to drive growth in non-residential investment** though soften overall relative to 2025 and reaccelerate into 2027. Although that may appear at odds with an industrial recovery, we see the combination of easing interest rates and analog companies' meaningful exposure to AI-enabled industrial applications (e.g., autonomous robotics, test and measurement equipment) as supportive of net positive industrial growth in 2026.

**Exhibit 69:** PMIs have been underwhelming since early 2023, which are closely tied to analog semi industrial revenue...



Source: Factset, Morgan Stanley Research.

**Exhibit 70:** ...similar to interest rates, though interest rates are expected to continue coming down



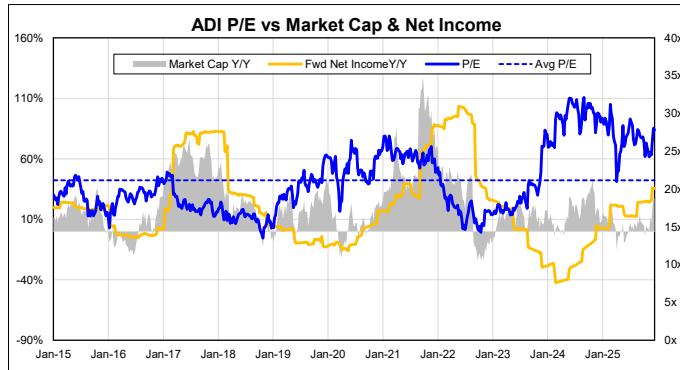
Source: BLS, Factset, Morgan Stanley Research.

#### We favor ADI (OW) as the best play for exposure to the continuing industrial recovery.

ADI has been one of the top performers in our analog coverage this year, building on a call we've been confident in since 2023. The company has maintained stable through-cycle GPMs%, and while CY25 OPM% was pressured largely by higher variable compensation, though we expect this headwind to ease significantly in 2026 with compensation growth running below revenue growth. We also anticipate a lift in industrial mix beginning in CY26, rising to MSe 49% from 46% in CY25 (versus the 56% peak in CY23). Since industrial is ADI's highest margin segment, even a modest recovery in activity should provide further upside to estimates as mix shifts back in its favor.

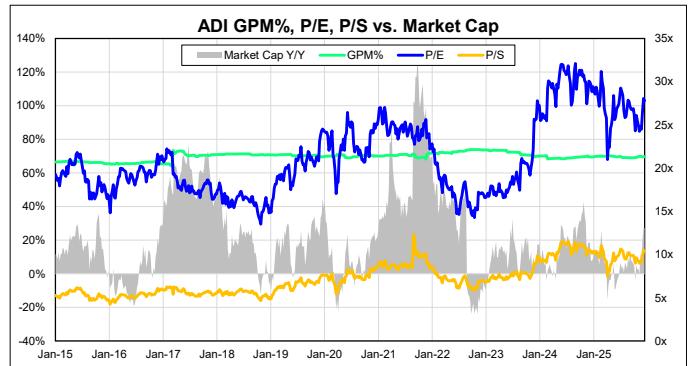
Further supporting upside into 2026 are **1) ongoing channel-refill opportunities** - ADI remains below its new 7-week long-term inventory target - along with **2) strong ASP resilience** against global competition. We also think ADI's track record of **3) expectations management** stands out, highlighted by the company being the first in the group to flag auto pull-ins in the AprQ.

**Exhibit 71:** ADI is trading above its historical avg, but revisions have seen continuing momentum since bottoming in early 2024...



Source: Factset, Morgan Stanley Research.

**Exhibit 72:** ...which we expect to continue increasing, as we model for the company to surpass prior peaks in 2026

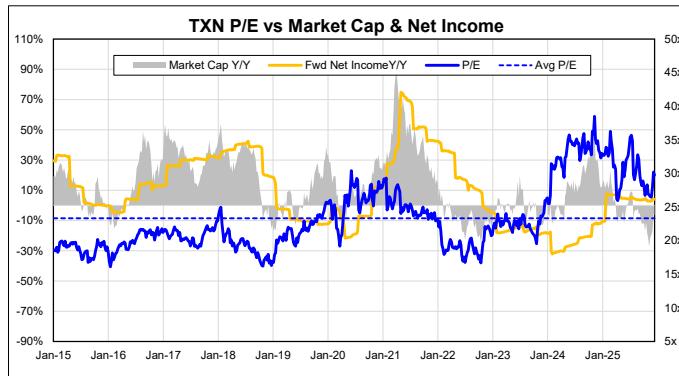


Source: Factset, Morgan Stanley Research.

**We remain UW TXN, as a high capex floor and ongoing fundamental deterioration are likely to continue weighing on FCF into 2026.** While TXN bottomed in early 2024 - similar to ADI - the recovery slope has been far more muted, reflecting heightened pricing

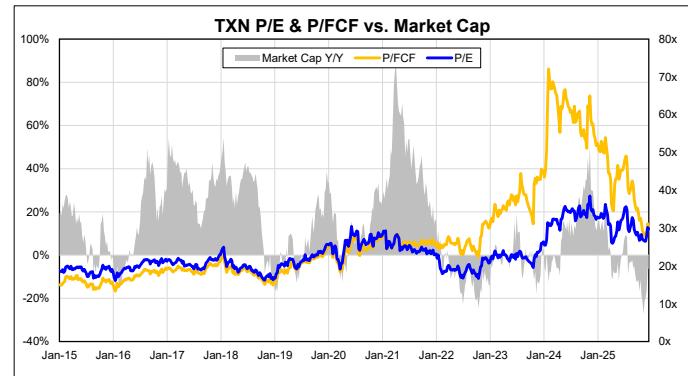
pressure from global competitors and elevated inventory levels. Recent management commentary emphasized disciplined loadings to better manage inventory, and the company now appears likely to land at the low end of its previously outlined \$21–26bn CY26 revenue range. With the \$2bn capex commitment for LFAB2 next year, TXN highlighted that CY26 FCF could reach ~\$8bn; although this would still mark a record, the structural headwinds remain meaningful, including additional depreciation headwinds.

**Exhibit 73:** TXN revisions have plateaued since the beginning of 2025...



Source: Factset, Morgan Stanley Research.

**Exhibit 74:** ...driving the convergence between dislocated P/E and FCF valuation vs fundamental improvements



Source: Factset, Morgan Stanley Research.

### #3: 800V Data Center Opportunity

**Direct AI applications have now firmly entered the analog semiconductor landscape.**

On [May 20th](#), Nvidia announced 10 semiconductor partners for its new 800V DC architecture, significantly expanding the role of wide-bandgap (WBG) technologies such as SiC and GaN. On [October 13th](#), the company added four additional suppliers, bringing the total to 14 public partners.

Although direct AI data-center revenue remains a relatively small portion of overall analog exposure, growth has been exceptionally strong, with many companies reporting AI data-center revenues doubling year over year for multiple quarters. We expect this momentum to continue as Rubin and Rubin Ultra rack deployments ramp through late next year and into 2027, though it remains early to gauge ultimate supplier allocation.

**In the near-term, ON, ALGM, and MCHP appear best positioned for the fastest growth in DC solutions.** The broader 800V opportunity is still early, with design architectures for the Vera Rubin and Rubin Ultra form factors expected in [2H26 ahead of deployments around 1H27](#). Infineon (covered by MS Analyst Lee Simpson) estimates the AI DC semiconductor TAM at roughly €8–12bn (~\$10-\$12bn USD) by 2030, and while new content categories are still emerging, we believe this ultimately opens a meaningful new market for analog semiconductors.

**Exhibit 75:** US Analog Covg AI DC Exposure

Ticker	FY24 % of Total	FY25 % of Total	Within 4-Wall DC Solutions	Reporting Segment	Grid Solutions	Reporting Segment
TXN	4%	6%	Power Management (incl. GaN), Controllers, Connectivity	Enterprise, Comms, Industrial	Grid Mgmt, ESS, Metering	Industrial
ADI*	7%	9%	Optical Connectivity, Power Management	Comms	Grid Mgmt, Protection, ESS	Industrial
NXPI						
MCHP*	18%	19%	Connectivity, Controllers, Power Management	Data Center & Compute	Grid Mgmt, ESS, Metering	Industrial
ON	-	4%	Power Management (incl. SiC & GaN)	Other	Power Management, ESS	Industrial
ALGM	5%	6-7%	Power Management, Thermal Control	Industrial		

Note: Green box indicates presence on Nvidia press release; \*ADI indicates only data center revenue, not including ATE for testers; \*MCHP indicates segments includes both data center and PC compute revenue, though most is data center. Source: Company Data, Morgan Stanley Research.

# Memory: From good to great

**Sub-Industry View:** Memory is in the midst of a generational supply and demand mismatch, and we expect upside to numbers through CY26 throughout the memory ecosystem. If demand stays this robust the upcycle could continue for multiple years.

**Stock Calls:** We are OW both Micron and Sandisk as investor expectations still don't yet match the strength we expect to see in numbers, and the low single digit PE ratios on bull case earnings outcomes still feels overly punitive to us.

**Memory conditions continue to improve, as we hear reports of intensifying shortages across the board.** That's most pronounced in DDR5 DRAM, where there is an active sense of crisis that product is not available at any price, whereas in other areas, such as consumer grade NAND, there is more of a sense that there will be a shortage, but less of a near term crisis. Nevertheless, we are seeing a generational tightness across all areas.

Memory supply has shifted to the highest valued users, in cloud, and we are seeing cloud buyers as well as PC and server OEMs starved of product. For DDR5 mainstream DRAM, there is still some inventory on hand, but once that inventory runs out there is very little visibility on the ability to replace it at any price. In 30 years of covering memory cycles, we haven't seen the situation presented quite so starkly. When the biggest cloud buyers are in the midst of a gold rush purchasing mentality, the rest of the world seems starved of product. Of course, there is always risk that there is double ordering, and we are sure that there is at least the intent of double ordering - but the potential description of line down situations across all markets make it clear that this is an actual supply tightness, not an artificial one.

The severity of the shortage could actually present some risks, that we could see more severe than normal de-spec, and at some point actual demand destruction as end prices rise and volumes are constrained. In our experience, though, this is all good for memory nearer term.

**Exhibit 76:** Memory Comps table

Valuation	MCAP (USD)	EV (USD)	EV / Sales			EV / EBITDA			EV / EBIT			P / E	
			LTM	2025	2026	LTM	2025	2026	LTM	2025	2026	LTM	2025
Sandisk	29,585	29,706	3.82x	4.04x	2.85x	55.5x	35.1x	11.5x	76.4x	43.1x	12.3x	(16.8x)	67.5x
Micron Technology	267,271	272,312	7.29x	7.29x	4.79x	14.8x	15.0x	8.0x	27.1x	25.1x	11.2x	31.3x	28.6x
Kioxia Holdings	32,057	39,466	3.82x	3.21x	2.13x	10.3x	7.8x	4.0x	21.8x	13.0x	5.2x	32.0x	18.2x
SK hynix	274,183	259,151	4.53x	4.08x	2.67x	7.7x	6.7x	4.0x	10.6x	8.8x	4.8x	10.7x	10.1x
Samsung Electronics	466,682	415,181	1.95x	1.87x	1.54x	8.1x	7.3x	4.4x	20.5x	15.6x	6.6x	21.6x	18.2x
Nanya Technology	16,052	15,404	11.23x	7.91x	3.89x	81.0x	33.2x	7.3x	-	(829.8x)	12.4x	(83.2x)	235.5x
													12.7x

Source: Factset, Morgan Stanley

## DRAM Outlook

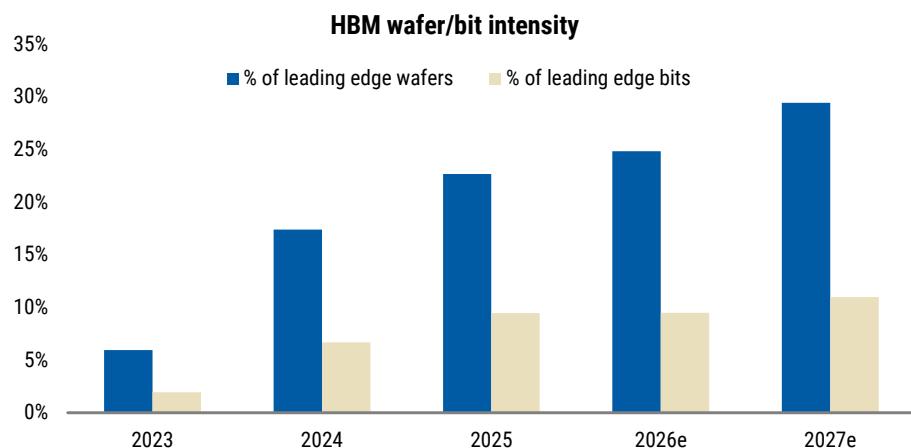
**Demand** - AI has taken the air out of the room when it comes to DRAM demand dynamics. We expect server to be the largest DRAM end market for the first time in 2025, and with further momentum into 2026 as hyperscaler demand continues to outpace other areas, combined with ongoing growth in AI (Nvidia/AMD/AVGO) collectively growing 70% in 2026 vs 60% in 2025. With little inventory across the supply chain there will be

significant restocking demand even as demand and supply normalize.

As for high bandwidth memory, we do continue to see some downward pressure in price in 1Q as longer term contracts are renewed, but profits are still quite high. The dynamic that we see is very much that DDR5 profits are having an upward pull on HBM, rather than the other way around. For HBM4, we see Micron as participating in the NVDA supply chain, albeit with relatively smaller share initially - while success here is important long term, initial market share is a secondary consideration given higher margins for DDR5 currently.

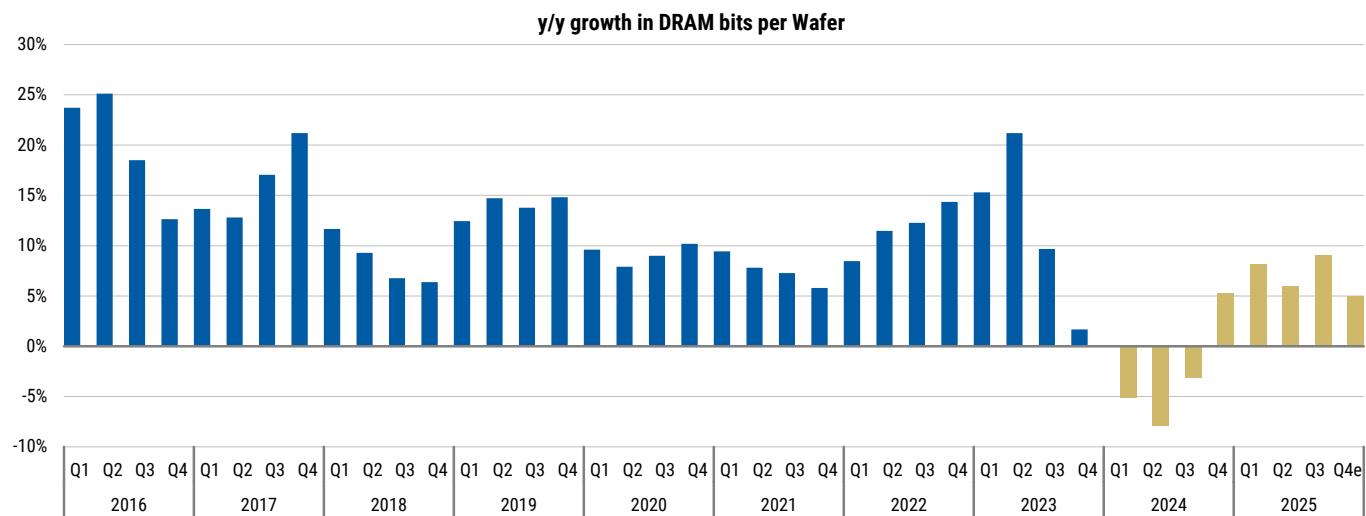
**Supply** - WFE growth is accelerating sharply in DRAM as bit growth moves into the 20%+ range we estimate for 2025-2027, the highest since 2021. Combined with the higher wafer intensity supporting that growth - and you enter a phase where WFE growth and greenfield capacity adds also need to see new highs. We estimate DRAM WFE will increase 42% (annual average) from 2023-2025 to 2026-2027 resulting in a bit output up 23% in 2026 and 24% in 2027 as HBM reduces the impact of added wafers by 3% each of those two years - maintaining supply demand balance.

**Exhibit 77:** HBM not consuming a material portion of industry capacity, a trend that requires incremental WFE



Source: TrendForce, Morgan Stanley Research

**Exhibit 78:** Overall DRAM bits per wafer starts has moved persistently lower in recent years

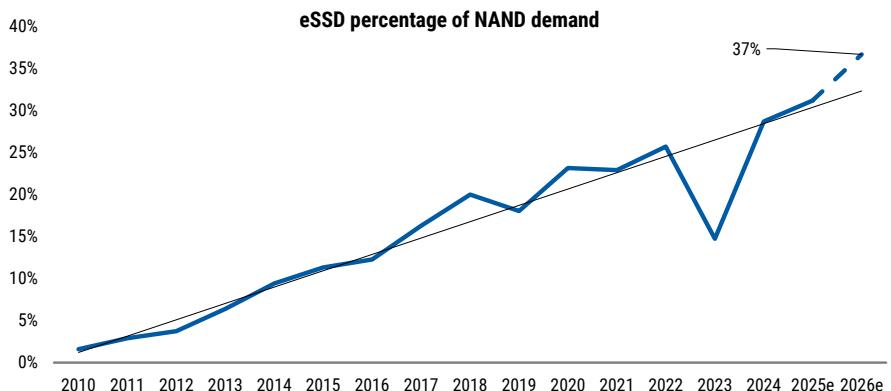


Source: TrendForce, Morgan Stanley Research

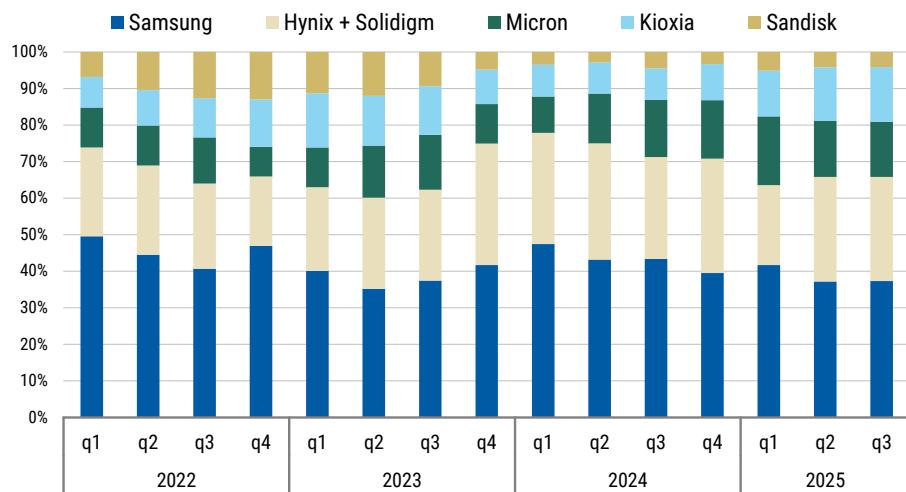
## NAND Outlook

**Demand** - We think bit growth next year can reach 20-25%, the industry's highest in years. In the base case Sandisk participates, but in the bull case Sandisk could outperform on the back of new QLC product and more flexible supply growth.

At this point we're comfortable penciling in something like 40-50% y/y growth for eSSD in 2026. Forecasts and estimates for the size of the eSSD market vary, but given the size of hyperscaler orders (40 EBs or so for each of the major buyers), which we now understand to be mostly incremental demand, the market adding 120+ EBs in eSSD bits y/y seems very achievable to us. Based on estimates of the market size in 2025 from Gartner and Trendforce, 120EBs alone would be enough to see eSSD growth of 43% and 37%, respectively, in 2026 with that translating to overall NAND bit demand of 10-12% without any contribution from other markets. If other markets grow 10-15% y/y in 2026, the overall market should grow high teens to low 20s y/y in 2026. With eSSD over half of demand growth, a similar ratio to 2025. Based on our conversations, our sense is that ratio in 2026 should be above that of 2025, which gives us confidence that some estimates are still too conservative.

**Exhibit 79:** We look for eSSD as a % of NAND demand to move above trend next year

Source: Gartner, Morgan Stanley Research

**Exhibit 80:** Sandisk still underrepresented in eSSD

Source: TrendForce, Morgan Stanley Research

**Supply-** We think NAND supply growth will be limited in 2026, with the Sandisk Kioxia JV one of the lone sources of potential new wafer capacity. And equipment company commentary confirms limited investment through at least the first half of next year.

Ultimately, increasing bit output requires new spending, and companies in the semicap supply chain are just not seeing a near-term inflection in NAND activity, that's expected to take place more in the second half of 2026 (which should translate to supply growth closer to 2027). Key NAND supplier Lam saw NAND systems revenues down something like 30% q/q in September, and while that number should continue to trend higher, we don't model a bigger acceleration until the second half of next year.

NAND capacity expansion is generally shorter lead time than DRAM/logic given less need for long lead time EUV/process control. So not seeing an order pickup is a good indication that new capacity will be limited, for next few quarters or so.

DRAM investment also remains the priority for Hynix/Micron/Samsung, which have shifted their capex budgets towards DRAM in response to HBM demand and lower NAND bit

growth vs pre-2022. Even as NAND pricing has improved, DRAM margins are still much higher, and with HBM's extra demands on wafer starts, we think investment will continue to go where perceived returns will be higher - which continues to be in DRAM.

## Risk Reward – NVIDIA Corp. (NVDA.O)

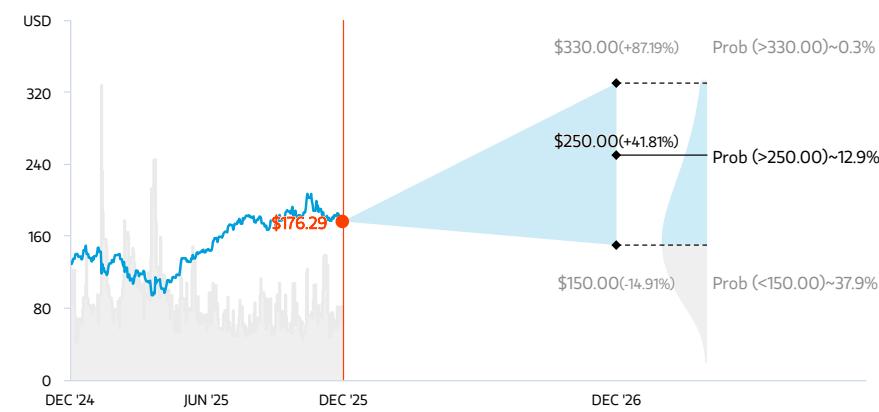
OW as large language model enthusiasm is transforming cloud capex

### PRICE TARGET \$250.00

~26x our MW CY27 EPS estimate of \$9.57, a discount to large cap AI peer AVGO, and a premium to semis overall. Reflecting our higher conviction in upward revisions to estimates, and premium margin/ growth profile within the space



### RISK REWARD CHART AND OPTIONS IMPLIED PROBABILITIES (12M)



#### BULL CASE

~30x bull case MW CY27 EPS of \$11

**Bull case** has DC revenues continuing to grow through 2027. Upside from networking, GB300 based systems, networking, and software create potential for a full stack AI computing company worthy of an even greater valuation premium

- Higher margin data center and AI-focused software and services growth accelerates
- GPU based AI PC gains traction, widely increasing the client TAM
- Automotive opportunity takes off, allowing the company to earn recurring, per-car licensing revenue

#### \$330.00

#### BASE CASE

~26x our MW CY27 EPS of \$9.57

**~26x valuation is a premium to the semis group, but a discount to large cap AI peer AVGO.** reflecting the expansion in all AI names as well as our higher conviction in estimates given NVIDIA's higher AI exposure. We believe that NVIDIA should trade at a premium given its higher probability of upward revisions in the near term.

- Revenue grows by 63.4% in 2025 and 54.7% in 2026
- Datacenter continues to grow significantly in 2026 as supply remains constrained

#### \$250.00

#### BEAR CASE

~20x bear case MW CY26 EPS of \$8.25

**Two key debates both go the wrong direction, causing investors to question future prospects for growth**

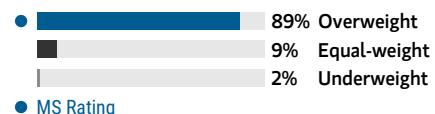
- Growth in DC slows substantially as supply catches up to demand faster than anticipated
- AI development costs come down materially, a strong competitor enters the market to take market share, or customers begin insourcing custom hardware solutions
- Greater than expected impact from tariff headwinds and export controls

#### \$150.00

### OVERWEIGHT THESIS

- Blackwell remains the premiere solution for gen-AI workloads, where compute demand continues to outstrip supply
- We see continued upward pressure to estimates as demand strength continues, with Rubin expected to maintain Nvidia's performance leadership position

### Consensus Rating Distribution



Source: Refinitiv, Morgan Stanley Research

### Risk Reward Themes

New Data Era:	Positive
Pricing Power:	Positive
Secular Growth:	Positive
View descriptions of Risk Rewards Themes <a href="#">here</a>	

## Risk Reward – NVIDIA Corp. (NVDA.O)

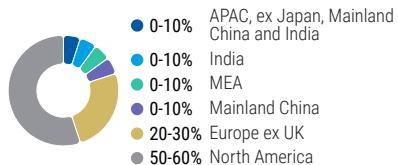
### KEY EARNINGS INPUTS

Drivers	2025	2026e	2027e	2028e
GAAP Revenue (\$, mm)	130,497	213,214	329,829	429,406
MW Gross Margin (%)	75.4	71.2	74.5	73.7
MW EPS (\$)	2.92	4.50	7.56	9.57
Inventory (\$, mm)	10,080	20,144	31,021	34,300
DOI	111.2	117.1	132.1	108.8

### INVESTMENT DRIVERS

- Growth in AI capex from customers
- Next gen GPUs continue to outpace the competition
- Systems approach allows for higher monetization over time
- New drivers emerge for Nvidia such as AI PCs, autonomous vehicles, robotics, and software

### GLOBAL REVENUE EXPOSURE



Source: Morgan Stanley Research Estimate  
View explanation of regional hierarchies [here](#)

### MS ALPHA MODELS

5/5 BEST	24 Month Horizon	4/5 MOST	3 Month Horizon
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Source: Refinitiv, FactSet, Morgan Stanley Research; 1 is the highest favored Quintile and 5 is the least favored Quintile

### RISKS TO PT/RATING

#### RISKS TO UPSIDE

- Growth in training and inference propel data center revenue
- Gaming sales accelerate as GPU based AI PCs gain traction
- Nvidia can recapture lost revenue in China

#### RISKS TO DOWNSIDE

- AI end markets don't materialize as expected, customers sharply reduce GPU purchases
- AMD reemerges as a viable GPU competitor
- Cloud customers outside of Google are able to develop competitive custom hardware

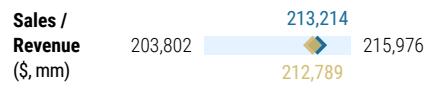
### OWNERSHIP POSITIONING

Inst. Owners, % Active	51.1%	
HF Sector Long/Short Ratio	2x	
HF Sector Net Exposure	26.9%	

Refinitiv; MSPB Content. Includes certain hedge fund exposures held with MSPB. Information may be inconsistent with or may not reflect broader market trends. Long/Short Ratio = Long Exposure / Short exposure. Sector % of Total Net Exposure = (For a particular sector: Long Exposure - Short Exposure) / (Across all sectors: Long Exposure - Short Exposure).

### MS ESTIMATES VS. CONSENSUS

FY Jan 2026e



♦ Mean   ◆ Morgan Stanley Estimates  
Source: Refinitiv, Morgan Stanley Research

## Risk Reward – Ambarella Inc (AMBA.O)

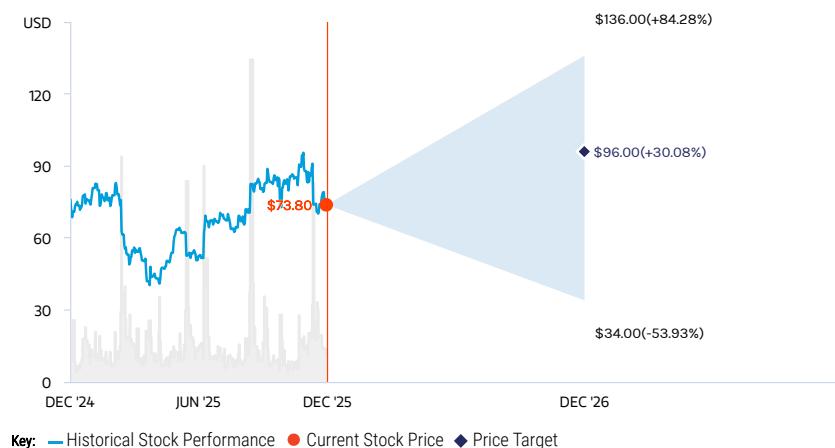
Long term prospects with CV3 are exciting, but L2+ autonomy development is slow.

### PRICE TARGET \$96.00

EV/sales of 8.5x CY27, 8.5x sales is a slight premium to small cap semiconductors



### RISK REWARD CHART

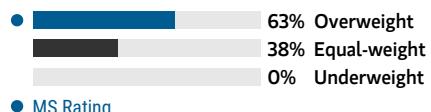


BULL CASE	\$136.00	BASE CASE	\$96.00	BEAR CASE	\$34.00
9.5X CY27e Revenue of \$614mm  CV products take auto market share, consumer grows more than expected, and sensor fusion business materializes  - CV solution begins to overcome auto incumbents; further relationships with tier one suppliers, surveillance growth continues  - Design win momentum accelerates, including some in sensor fusion products, and later robotics  - Core business grows more meaningfully, as adoption of CV drives strong growth across all segments		~8.5X CY27e Revenue of \$472mm  Incremental growth in security camera opportunities combines with a burgeoning automotive segment  - Increasing CV penetration leads to improved ASPs and larger SAM  - Current pace of EV and AV adoption drives automotive revenue  - Design win momentum continues		3X CY27e Revenue of \$401mm  Automotive revenue takes longer than expected to ramp; Security camera growth stalls  - AMBA design wins and market share gains in the automotive segment result in smaller revenue opportunities than expected, leading to slower growth and lower multiple  - CV penetration rate decelerates in security camera market  - Computer vision products fail to make any real impact beyond initial surveillance wins.	

### OVERWEIGHT THESIS

- We like Ambarella's fundamental position and think that bears generally underestimate the company's technology leadership. We think that the company's computer vision (CV) products are unique and expect CV to drive transformative growth
- Home security and automotive applications will add growth on top of existing core market growth (core markets include surveillance, dash mounted autos and OEM auto surround view/digital rear view mirrors)
- Sensor fusion beginning with radar and camera begins to materialize, though we do not yet base material revenue growth on this market

### Consensus Rating Distribution



Source: Refinitiv, Morgan Stanley Research

### Risk Reward Themes

Electric Vehicles: Positive  
Secular Growth: Positive

View descriptions of Risk Rewards Themes [here](#)

## Risk Reward – Ambarella Inc (AMBA.O)

### KEY EARNINGS INPUTS

Drivers	2025	2026e	2027e	2028e
GAAP Revenue (\$, mm)	285	390	427	472
MW Gross Margin (%)	61.6	60.0	59.4	60.2
MW EPS (\$)	(2.77)	(1.79)	(2.31)	(2.50)
Inventory (\$, mm)	34	35	39	42
DOI	93.4	78.5	78.5	78.5

### INVESTMENT DRIVERS

- Automotive customer relationships announced throughout 2022
- IP Security systems adopt computer vision more quickly, driving 2x increase to average selling price
- Sensor fusion solutions find definitive market fit, take market share from incumbents

### GLOBAL REVENUE EXPOSURE



- 0-10% Europe ex UK
- 0-10% Japan
- 0-10% Latin America
- 0-10% Mainland China
- 0-10% UK
- 10-20% APAC, ex Japan, Mainland China and India
- 50-60% North America

Source: Morgan Stanley Research Estimate  
View explanation of regional hierarchies [here](#)

### MS ALPHA MODELS

4/5 BEST	24 Month Horizon	4/5 MOST	3 Month Horizon
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Source: Refinitiv, FactSet, Morgan Stanley Research; 1 is the highest favored Quintile and 5 is the least favored Quintile

### CATALYST CALENDAR

Date	Event	Source: Refinitiv, Morgan Stanley
04 Jun 2026 - 08 Jun 2026	Ambarella Inc Annual Shareholders Meeting	

### RISKS TO PT/RATING

#### RISKS TO UPSIDE

- AMBA becomes the CV solution of choice over incumbent auto players
- Design wins continue in the automotive and surveillance markets, but also consumer
- CV penetration accelerates

#### RISKS TO DOWNSIDE

- Legacy pressures could spread to surveillance and auto, with most of the R&D now going to computer vision
- Auto SAM does not grow as quickly as expected
- Security camera CV replacement rate does not materialize

### OWNERSHIP POSITIONING

Inst. Owners, % Active	46.4%	
HF Sector Long/Short Ratio	2x	
HF Sector Net Exposure	26.9%	

Refinitiv; MSPB Content. Includes certain hedge fund exposures held with MSPB. Information may be inconsistent with or may not reflect broader market trends. Long/Short Ratio = Long Exposure / Short exposure. Sector % of Total Net Exposure = (For a particular sector: Long Exposure - Short Exposure) / (Across all sectors: Long Exposure - Short Exposure).

### MS ESTIMATES VS. CONSENSUS

FY Jan 2026e

Sales / Revenue (\$, mm)	390		392
	390		390

◆ (53)

Note: There are not sufficient brokers supplying consensus data for this metric

EBITDA (\$, mm)

Net income (\$, mm)	(78) ◆		27
	(78)		26

EPS (\$)

EPS (\$)	0.59		0.63
	0.57		0.60

◆ Mean ◆ Morgan Stanley Estimates

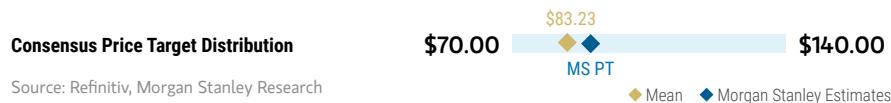
Source: Refinitiv, Morgan Stanley Research

## Risk Reward – Skyworks Solutions Inc (SWKS.O)

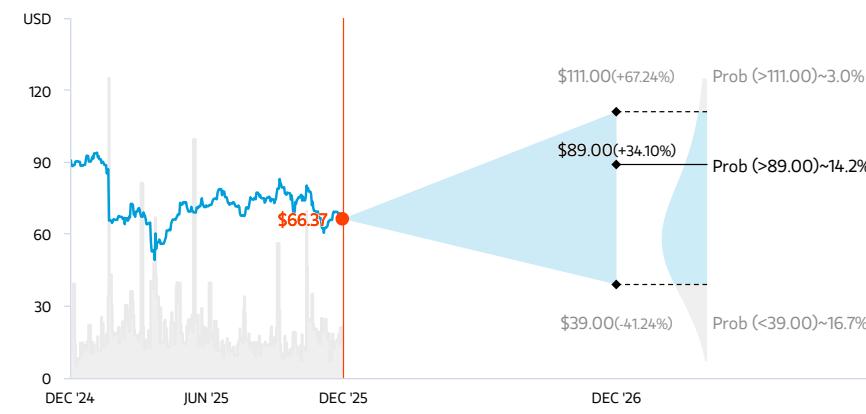
Content growth opportunities long term, but EW on customer concentration

### PRICE TARGET \$89.00

With the deal synergies, we believe that combined CY27 EPS would be about \$7, vs. our standalone \$5.20, so this would be about 13x the combined entity. Given some deal risk and synergy uncertainties, we would prefer to value on standalone EPS with a 17x multiple.



### RISK REWARD CHART AND OPTIONS IMPLIED PROBABILITIES (12M)



Source: Refinitiv, Morgan Stanley Research, Morgan Stanley Institutional Equities Division. The probabilities of our Bull, Base, and Bear case scenarios playing out were estimated with implied volatility data from the options market as of 15 Dec 2025. All figures are approximate risk-neutral probabilities of the stock reaching beyond the scenario price in either three-months' or one-years' time. View explanation of Options Probabilities methodology [here](#)

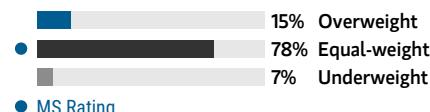
BULL CASE	\$111.00	BASE CASE	\$89.00	BEAR CASE	\$39.00
18X CY27 Non-GAAP EPS of \$6.17 The SWKS/QRVO acquisition occurs. Revenue growth comes in above our expectations as a broader smartphone recovery leads to greater \$ content and smartphone unit growth. Gross margins improve towards SWKS' target model, WiFi 6/7 upgrades benefit Broad Markets, and cash returns to shareholders boost the multiple.		17x CY27 EPS of \$5.20 Skyworks posts 2% revenue decline in CY25 and 12% decline in CY26. Broad markets rebound offsets some content loss at Apple. - GM 46.7% in CY25 and 45.9% in CY26 - CY25 Non-GAAP EPS of \$5.33 and CY26 Non-GAAP EPS of \$4.04		8X CY27 Non-GAAP EPS of \$4.92 The acquisition deal is canceled. Skyworks loses significant share at Apple, and the company fails to diversify. The stock's valuation multiple de-rates further.	

### EQUAL-WEIGHT THESIS

■ SWKS announced an acquisition of RF Peer QRVO, expected to close in CY27. The deal is expected to be accretive and help strengthen mobile technologies and expand scale.

- We like the long term growth story at Skyworks, encouraged by WiFi 7 IoT upgrade cycles and emerging auto business. Near term the company is seeing share loss with its top customer Apple, and we think it will also be important to broaden its exposure. The broad markets business is seeing a recovery from inventory imbalance and reduced end demand
- We see valuation upside if the broad markets business were to make up a larger proportion of the business, or if the company's mobile business is able to capture demand in China.

### Consensus Rating Distribution



Source: Refinitiv, Morgan Stanley Research

## Risk Reward – Skyworks Solutions Inc (SWKS.O)

### KEY EARNINGS INPUTS

Drivers	2025	2026e	2027e	2028e
GAAP Revenue (\$, mm)	4,087	3,598	3,738	4,108
MW Gross Margin (%)	45.9	45.5	46.3	46.6
MW EPS (\$)	4.51	2.54	2.97	4.02
Inventory (\$, mm)	755	699	731	823
DOI	114.5	130.1	133.1	137.0

### CATALYST CALENDAR

Date: 14 May 2026 - 18 May 2026 Event: Skyworks Solutions Inc Annual Shareholders Meeting Source: Refinitiv, Morgan Stanley

### INVESTMENT DRIVERS

- Faster than expected growth in broad markets, including contribution from the SLAB I&A acquisition.
- Increasing cash returns to shareholder, including buybacks and dividend growth
- Continued content gains at Apple

### GLOBAL REVENUE EXPOSURE



- 0-10% Europe ex UK
- 0-10% Japan
- 10-20% APAC, ex Japan, Mainland China and India
- 10-20% Mainland China
- 60-70% North America

Source: Morgan Stanley Research Estimate  
View explanation of regional hierarchies [here](#)

### MS ALPHA MODELS

2/5 BEST	24 Month Horizon	4/5 MOST	3 Month Horizon
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Source: Refinitiv, FactSet, Morgan Stanley Research; 1 is the highest favored Quintile and 5 is the least favored Quintile

### RISKS TO PT/RATING

#### RISKS TO UPSIDE

- SWKS/QRVO acquisition approved
- Captures greater \$ content in 5G smartphones
- Potential to regain share in China after a weak period
- Increased expansion of Broad Markets portfolio

#### RISKS TO DOWNSIDE

- SWKS/QRVO acquisition canceled
- Increasing competition and China localization efforts in RF
- Customer concentration and potential pricing pressure from Apple (~60% of total sales)
- If GM fails to recover to near-term target

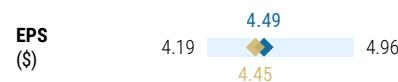
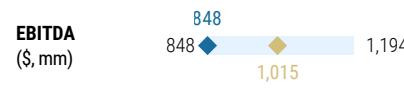
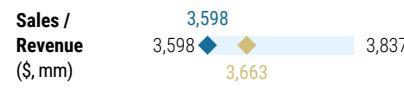
### OWNERSHIP POSITIONING

Inst. Owners, % Active	39.7%	
HF Sector Long/Short Ratio	2x	
HF Sector Net Exposure	26.9%	

Refinitiv; MSPB Content. Includes certain hedge fund exposures held with MSPB. Information may be inconsistent with or may not reflect broader market trends. Long/Short Ratio = Long Exposure / Short exposure. Sector % of Total Net Exposure = (For a particular sector: Long Exposure - Short Exposure) / (Across all sectors: Long Exposure - Short Exposure).

### MS ESTIMATES VS. CONSENSUS

FY Sep 2026e



◆ Mean ◆ Morgan Stanley Estimates

Source: Refinitiv, Morgan Stanley Research

## Risk Reward – Marvell Technology Group Ltd (MRVL.O)

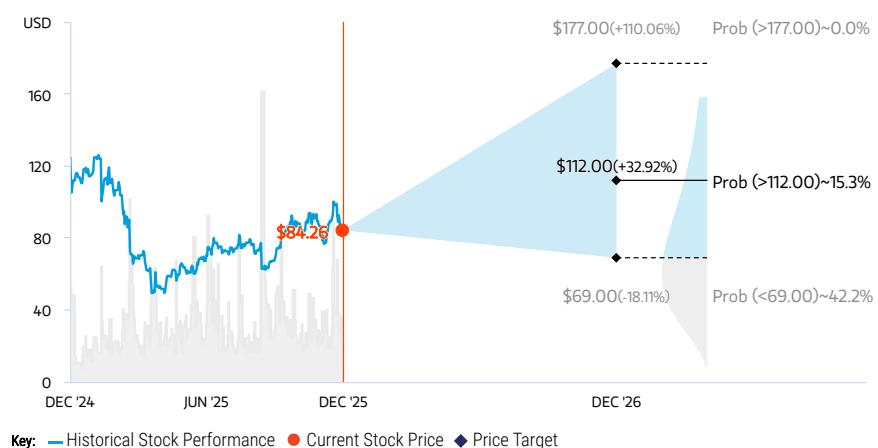
Attractive growth capability but valuation leaves us EW

### PRICE TARGET \$112.00

31X CY27e Base Case MW EPS \$3.63, in-line with high growth AI semis



### RISK REWARD CHART AND OPTIONS IMPLIED PROBABILITIES (12M)



Key: — Historical Stock Performance ● Current Stock Price ◆ Price Target

Source: Refinitiv, Morgan Stanley Research, Morgan Stanley Institutional Equities Division. The probabilities of our Bull, Base, and Bear case scenarios playing out were estimated with implied volatility data from the options market as of 15 Dec 2025. All figures are approximate risk-neutral probabilities of the stock reaching beyond the scenario price in either three-months' or one-years' time. View explanation of Options Probabilities methodology [here](#)

#### BULL CASE \$177.00

##### 42X Bull Case CY27e MW EPS of \$4.20

- CY26 Revenue comes in at \$10.6bn and CY27 at \$13bn

- Marvell's AI opportunity comes in larger than expected, helping drive upside to revenue estimates as well as drive multiple expansion

- The company hits on a number of cloud growth opportunities that drive the multiple higher

#### BASE CASE \$112.00

##### 31X Base Case CY27e MW EPS of \$3.63

- We expect CY26 revenue to come in at \$10bn and CY27 revenue of \$12bn

- MW GM of 57.8% in 2026 (includes SBC)

#### BEAR CASE \$69.00

##### 22X Bear Case CY27e MW EPS of \$3.14

- Storage and enterprise data center remain weak, with little line of sight for a recovery

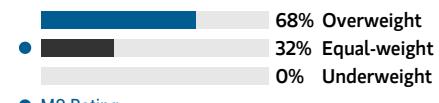
- Networking continues to be a headwind, as inventory both at customers and in the channel continue to offset tailwinds in the custom ASIC business

- Stock overshoots to the downside closer to its tangible book value

### EQUAL-WEIGHT THESIS

The company has AI related opportunity, primarily the higher speed elements of the Inphi optical businesses (PAM4 and 400ZR), and longer term cloud custom silicon. We do expect this growth to play out, in particular on the optical side, and we expect MRVL to outgrow data center spending overall. We remain EW given valuation as well as high stock compensation expense that weighs on enthusiasm.

### Consensus Rating Distribution



Source: Refinitiv, Morgan Stanley Research

## Risk Reward – Marvell Technology Group Ltd (MRVL.O)

### KEY EARNINGS INPUTS

Drivers	2025	2026e	2027e	2028e
GAAP Revenue (\$, mm)	5,767	8,183	9,989	12,120
MW Gross Margin (%)	60.2	58.8	57.8	57.0
MW EPS (\$)	0.49	2.13	2.71	3.63
Inventory (\$, mm)	1,030	1,115	1,364	1,590
DOI	111.0	100.5	100.2	97.4

### INVESTMENT DRIVERS

- Company sees revenue growth in Storage and Networking resuming driven by the enterprise and storage markets
- Accretion from the Aquantia and Avera acquisitions come in above expectations

### GLOBAL REVENUE EXPOSURE



- 0-10% North America
- 20-30% APAC, ex Japan, Mainland China and India
- 20-30% Europe ex UK
- 40-50% Mainland China

Source: Morgan Stanley Research Estimate  
View explanation of regional hierarchies [here](#)

### MS ALPHA MODELS

<b>4/5</b> <b>BEST</b>	24 Month Horizon	<b>5/5</b> <b>MOST</b>	3 Month Horizon
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Source: Refinitiv, FactSet, Morgan Stanley Research; 1 is the highest favored Quintile and 5 is the least favored Quintile

### RISKS TO PT/RATING

#### RISKS TO UPSIDE

- AI opportunities (Inphi optical businesses) realize earlier than expected
- Cloud custom silicon projects are larger than expected
- The storage market recovers

#### RISKS TO DOWNSIDE

- AI opportunities are smaller than expected
- The strength we estimate for Storage and Networking surprise to the downside
- Enterprise DC and Networking continue to weigh on results

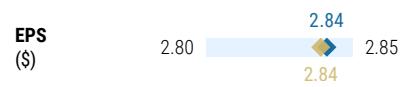
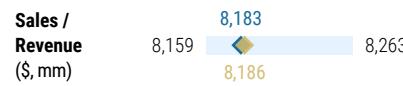
### OWNERSHIP POSITIONING

Inst. Owners, % Active	57.9%	
HF Sector Long/Short Ratio	2x	
HF Sector Net Exposure	26.9%	

Refinitiv; MSPB Content. Includes certain hedge fund exposures held with MSPB. Information may be inconsistent with or may not reflect broader market trends. Long/Short Ratio = Long Exposure / Short exposure. Sector % of Total Net Exposure = (For a particular sector: Long Exposure - Short Exposure) / (Across all sectors: Long Exposure - Short Exposure).

### MS ESTIMATES VS. CONSENSUS

FY Jan 2026e



♦ Mean   ◆ Morgan Stanley Estimates

Source: Refinitiv, Morgan Stanley Research

## Risk Reward – Micron Technology Inc. (MU.O) Top Pick

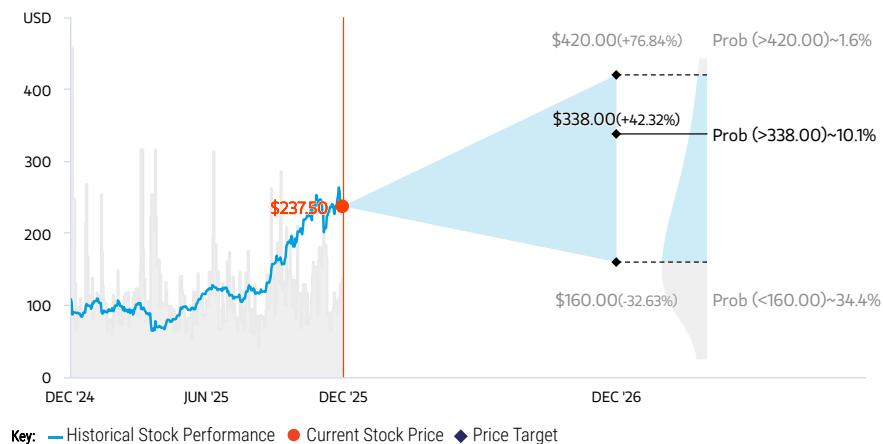
See multiple quarters of upward revisions, with AI driving a higher multiple

### PRICE TARGET \$338.00

25x through-cycle earnings of US \$13.50, a premium to history reflecting new opportunities in AI, at the high end of broader semis.



### RISK REWARD CHART AND OPTIONS IMPLIED PROBABILITIES (12M)



#### BULL CASE

28x through-cycle earnings of US\$15.00

Gross margin improvement continues, driven by scale, AI mix, and cost improvements in new products. Pricing pressure alleviates as demand sustainably moves above supply driven by HBM's wafer intensity, a product category where MU cements performance leadership on future products.

#### \$420.00

#### BASE CASE

25x through-cycle earnings of US\$13.50

Our through-cycle earnings estimate of US\$13.00 is a premium to average earnings over the last 8 years due mostly to HBM. Our 25x multiple reflects the market's enthusiasm for the HBM opportunity, and at the high end of the broader semi group.

#### \$338.00

#### BEAR CASE

#### \$160.00

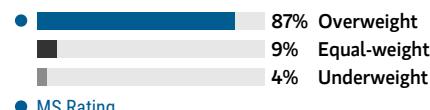
16x through-cycle earnings of US\$10.00

Memory begins to enter a downturn in late 2026. As the strength attributed to demand in the early part of the year ended up being inventory build at customers. Multiple compresses severely after an underwhelming peak

### OVERWEIGHT THESIS

- DRAM fundamentals should continue to improve as datacenter/AI continue their upward trajectory, and other markets continue steady
- Execution on AI is underappreciated, and we expect Micron to maintain share in CY26 vs the competition. Supporting margins and driving a higher multiple than prior cycles
- FCF metrics give us pause, but earnings upside justifies continued rerating

### Consensus Rating Distribution



Source: Refinitiv, Morgan Stanley Research

### Risk Reward Themes

New Data Era: *Positive*  
Secular Growth: *Positive*

View descriptions of Risk Rewards Themes [here](#)

## Risk Reward – Micron Technology Inc. (MU.O)

### KEY EARNINGS INPUTS

Drivers	2025	2026e	2027e	2028e
GAAP Revenue (\$, mm)	37,378	62,758	80,004	79,895
Non Gaap Gross Margin (%)	40.9	60.3	65.1	59.8
Non-GAAP EPS (\$)	8.29	23.79	33.00	30.54
Inventory (\$, mm)	8,355	8,226	9,635	11,255
DOI	133.7	116.6	122.2	124.3

### INVESTMENT DRIVERS

- Improved pricing and demand strength drive earnings growth

### GLOBAL REVENUE EXPOSURE



- 0-10% APAC, ex Japan, Mainland China and India
- 0-10% India
- 0-10% Japan
- 0-10% MEA
- 0-10% Mainland China
- 0-10% UK
- 10-20% Europe ex UK
- 40-50% North America

Source: Morgan Stanley Research Estimate  
View explanation of regional hierarchies [here](#)

### MS ALPHA MODELS



Source: Refinitiv, FactSet, Morgan Stanley Research; 1 is the highest favored Quintile and 5 is the least favored Quintile

### RISKS TO PT/RATING

#### RISKS TO UPSIDE

- Customers continue to demonstrate an appetite to take on inventory around macroeconomic uncertainty
- Additional wafer intensity of HBM further improves overall supply and demand
- Micron's HBM share surpasses expectations

#### RISKS TO DOWNSIDE

- Pricing can turn quickly; a falter in end demand with inventories elevated could lead to a swift price reduction
- HBM demand falters and competition intensifies, pressuring pricing

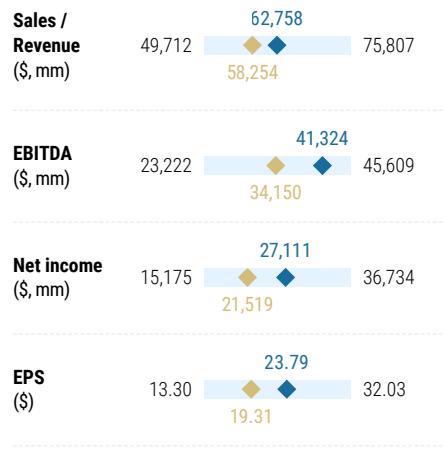
### OWNERSHIP POSITIONING

Inst. Owners, % Active	50.4%	
HF Sector Long/Short Ratio	2x	
HF Sector Net Exposure	26.9%	

Refinitiv; MSPB Content. Includes certain hedge fund exposures held with MSPB. Information may be inconsistent with or may not reflect broader market trends. Long/Short Ratio = Long Exposure / Short exposure. Sector % of Total Net Exposure = (For a particular sector: Long Exposure - Short Exposure) / (Across all sectors: Long Exposure - Short Exposure).

### MS ESTIMATES VS. CONSENSUS

FY Oct 2026e



Source: Refinitiv, Morgan Stanley Research

## Risk Reward – ON Semiconductor Corp. (ON.O)

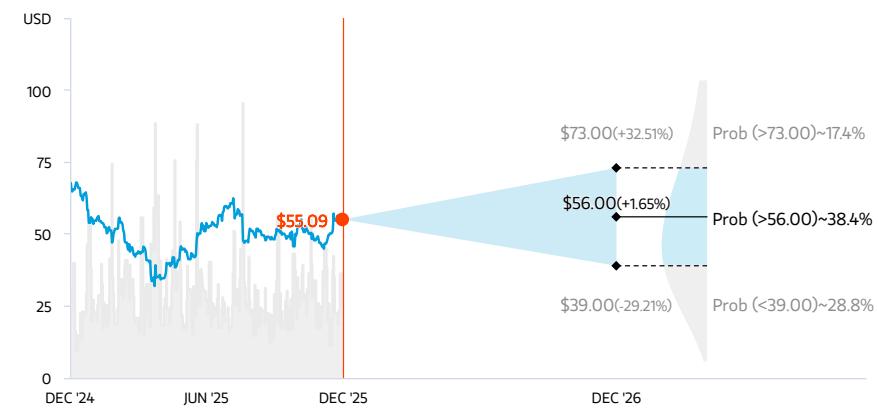
Negativity somewhat priced in, EW

### PRICE TARGET \$56.00

We value ON at 18x P/E on our 2026 EPS estimate of \$3.13, an early-cycle premium to the average PE multiple during 2016-2020 when the company's gross margin tracked between 30-40%.



### RISK REWARD CHART AND OPTIONS IMPLIED PROBABILITIES (12M)



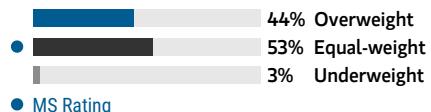
Source: Refinitiv, Morgan Stanley Research, Morgan Stanley Institutional Equities Division. The probabilities of our Bull, Base, and Bear case scenarios playing out were estimated with implied volatility data from the options market as of 15 Dec 2025. All figures are approximate risk-neutral probabilities of the stock reaching beyond the scenario price in either three-months' or one-years' time. View explanation of Options Probabilities methodology [here](#)

BULL CASE	\$73.00	BASE CASE	\$56.00	BEAR CASE	\$39.00
20x 2026 EPS of \$3.63		18x 2026e EPS of \$3.13		15x 2026e EPS of \$2.58	
Automotive recovery, fueled by greater-than-expected SiC, drives revenue growth in 2026.		The company sees revenue headwinds that weigh on gross margin.		Sales growth remains subdued, pressured by a weaker macro and slowing end markets.	
- Revenue grows 12.4% in 2026		- Revenue grows 5.1% in 2026		- Revenue declines 5.4% in 2026	
- GM recovers to 41.2% in 2026		- GM recovers to 40% in 2026		- GM recovers to 39% in 2026	

### EQUAL-WEIGHT THESIS

- We aren't as bullish as the street is on ON's gross margin improvement, and we find difficulty in modelling for material revenue outperformance vs the auto semi market in the absence of a growth driver.
- However, we believe with the shares trading at near 17x our FY26 estimates, the downside is largely priced in. Company last traded in the 10-15x range during 2016-2020 when gross margin was in the 30-40% range.

### Consensus Rating Distribution



Source: Refinitiv, Morgan Stanley Research

### Risk Reward Themes

Electric Vehicles:	Positive
Pricing Power:	Negative

View descriptions of Risk Rewards Themes [here](#)

## Risk Reward – ON Semiconductor Corp. (ON.O)

### KEY EARNINGS INPUTS

Drivers	2024	2025e	2026e	2027e
GAAP Revenue (\$, mm)	7,082	6,005	6,309	6,793
MW Gross Margin (%)	45.5	38.4	40.1	44.6
MW EPS (\$)	3.98	2.33	3.13	4.51
Inventory (\$, mm)	2,242	2,010	1,831	1,771
DOI	209.1	195.7	174.4	169.4

### INVESTMENT DRIVERS

- Top-line growth driven by increased ADAS & EV penetration as well as continued growth in SiC
- Gross Margin expansion as the company executes on its strategic initiatives.

### GLOBAL REVENUE EXPOSURE



Source: Morgan Stanley Research Estimate  
View explanation of regional hierarchies [here](#)

### MS ALPHA MODELS

5/5 BEST	24 Month Horizon	5/5 MOST	3 Month Horizon
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Source: Refinitiv, FactSet, Morgan Stanley Research; 1 is the highest favored Quintile and 5 is the least favored Quintile

### CATALYST CALENDAR

Date	Event	Source: Refinitiv, Morgan Stanley
15 May 2026 - 19 May 2026	ON Semiconductor Corp Annual Shareholders Meeting	

### RISKS TO PT/RATING

#### RISKS TO UPSIDE

- Company tracks ahead of SiC targets
- Gross margin improvement measures bear fruit earlier than anticipated

#### RISKS TO DOWNSIDE

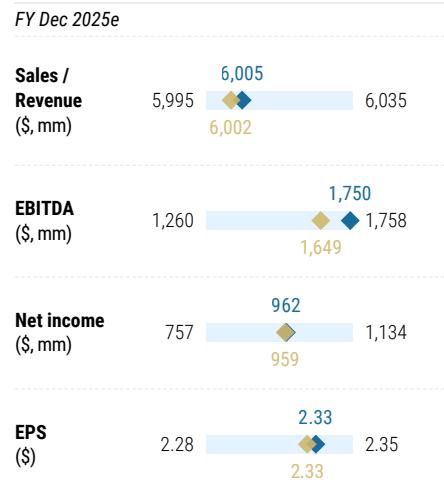
- Company loses market share in SiC and auto image sensors
- Company's self-help initiatives stall and margins decline
- Automotive business enters a prolonged correction

### OWNERSHIP POSITIONING

Inst. Owners, % Active	51%
HF Sector Long/Short Ratio	2x
HF Sector Net Exposure	26.9%

Refinitiv; MSPB Content. Includes certain hedge fund exposures held with MSPB. Information may be inconsistent with or may not reflect broader market trends. Long/Short Ratio = Long Exposure / Short exposure. Sector % of Total Net Exposure = (For a particular sector: Long Exposure - Short Exposure) / (Across all sectors: Long Exposure - Short Exposure).

### MS ESTIMATES VS. CONSENSUS



♦ Mean   ◆ Morgan Stanley Estimates

Source: Refinitiv, Morgan Stanley Research

## Risk Reward – SanDisk Corporation. (SNDK.O)

NAND improving quickly on the back of accelerating cloud demand

### PRICE TARGET \$273.00

We assume 21x through-cycle EPS of \$13.00 (vs. our estimate of the trailing 9-year average of \$6.33). As improving industry dynamics as well as eSSD demand lead to higher levels of profitability than we have seen over the last few years, 21x is a discount to our through-cycle multiple target for MU (22x) as the lower AI exposure is offset by historically higher FCF conversion



### RISK REWARD CHART



### BULL CASE \$320.00 BASE CASE \$273.00 BEAR CASE \$145.00

#### 22x through-cycle EPS of ~\$14.50

Our bull case of \$320 per share represents 22x a higher through-cycle EPS of \$14.50. Here earnings sustain closer to prior peak cycles (\$20+ per share) with more mild downturns, and with higher levels of profitability supporting a higher multiple. \$320 per share is a reasonable multiple our estimate of replacement cost (\$114-\$142).

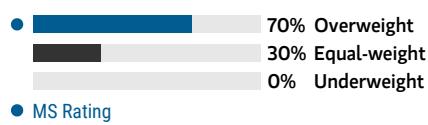
#### 21x through-cycle EPS of \$13.00

Our base case of \$263 is based on 21x through-cycle EPS of \$12.50 (vs our estimate of the trailing 9-year average of \$6.33). As improving industry dynamics as well as eSSD demand lead to higher levels of profitability than we have seen over the last few years, 21x is a discount to our through-cycle multiple target for MU (22x) as the lack of direct AI is offset by historically higher FCF conversion.

### OVERWEIGHT THESIS

Following two years of minimal NAND capex and an absence of prior cycle headwinds (aggressive new entrants INTC/YMTC) industry returns should improve over the coming years. As NAND pricing continues to improve we see a path to significantly higher earnings power than past cycles

### Consensus Rating Distribution



### Risk Reward Themes

Secular Growth: Positive

View descriptions of Risk Rewards Themes [here](#)

## Risk Reward – SanDisk Corporation. (SNDK.O)

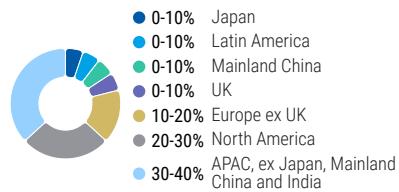
### KEY EARNINGS INPUTS

Drivers	2025	2026e	2027e	2028e
GAAP Revenue (\$, mm)	7,355	10,622	13,190	12,817
Non-GAAP Gross Margin (%)	30.3	44.0	54.6	48.3
Non-GAAP EPS (\$)	2.74	14.86	26.38	20.65
Inventory (\$, mm)	2,079	1,691	1,984	2,123
DOI	145.5	102.1	119.1	115.1

### INVESTMENT DRIVERS

- Improved pricing and demand strength drive earnings growth
- Position in DC SSD market improves

### GLOBAL REVENUE EXPOSURE



Source: Morgan Stanley Research Estimate  
View explanation of regional hierarchies [here](#)

### MS ALPHA MODELS

5/5 <b>BEST</b>	24 Month Horizon	4/5 <b>MOST</b>	3 Month Horizon
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Source: Refinitiv, FactSet, Morgan Stanley Research; 1 is the highest favored Quintile and 5 is the least favored Quintile

### RISKS TO PT/RATING

#### RISKS TO UPSIDE

- Higher NAND content growth from edge AI applications
- Quicker eSSD penetration in the datacenter
- Sandisk's investments in advanced memory technologies such as HBF (high Bandwidth Flash) pay dividends

#### RISKS TO DOWNSIDE

- NAND industry growth disappoints
- Capex growth returns as industry participants invest to gain share
- Sandisk loses market share as they fail to gain traction in datacenter
- China continues to gain share

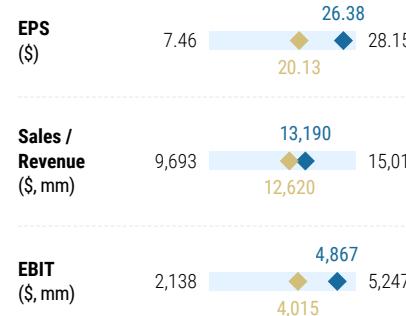
### OWNERSHIP POSITIONING

Inst. Owners, % Active	53.7%	
HF Sector Long/Short Ratio	2x	
HF Sector Net Exposure	26.9%	

Refinitiv; MSPB Content. Includes certain hedge fund exposures held with MSPB. Information may be inconsistent with or may not reflect broader market trends. Long/Short Ratio = Long Exposure / Short exposure. Sector % of Total Net Exposure = (For a particular sector: Long Exposure - Short Exposure) / (Across all sectors: Long Exposure - Short Exposure).

### MS ESTIMATES VS. CONSENSUS

FY Jun 2027e



Source: Refinitiv, Morgan Stanley Research  
♦ Mean   ◆ Morgan Stanley Estimates

## Risk Reward – ASE Technology Holding Co. Ltd. (3711.TW)

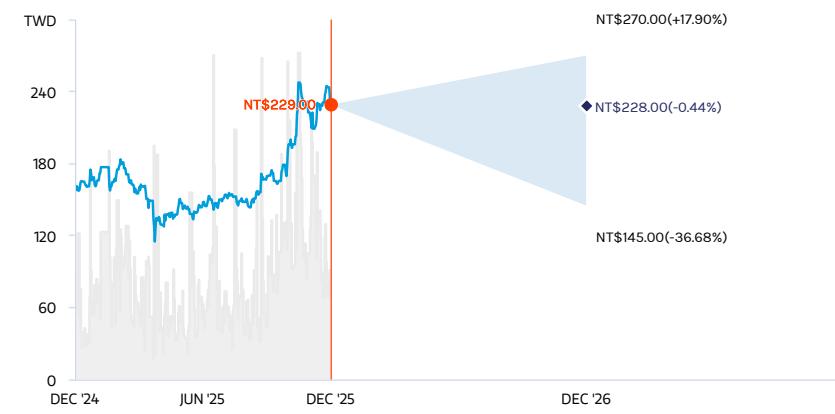
AI contributes to strong revenue growth; OW

### PRICE TARGET NT\$228.00

Base case, residual income model. Key assumptions: cost of equity of 9.8%, intermediate growth rate of 6.5%, terminal growth rate of 3.0% and cash dividend payout ratio of 60%.



### RISK REWARD CHART



**Key:** — Historical Stock Performance ● Current Stock Price ◆ Price Target

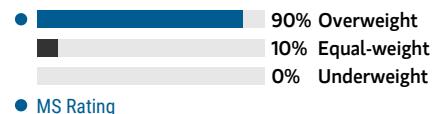
Source: Refinitiv, Morgan Stanley Research

BULL CASE	NT\$270.00	BASE CASE	NT\$228.00	BEAR CASE	NT\$145.00
<b>19x 2026e EPS</b>  Strong semi growth; competition becomes rational thanks to merger; upside for SiP penetration rate with mainstream products: Competition becomes rational with sustained gross margin. Stronger price bargaining power and technology advancement thanks to smooth consolidation between ASE and SPIL. SiP shipments accelerate among mmWave AiP, camera modules, acoustic modules, 3D sensing and wearables. ASEH develops comprehensive advanced packaging technology with high traction among customers.		<b>16x 2026e EPS</b>  Cycle bottoming with AI/advanced packaging acting as the new driving force: Demand for wire-bonding and flip-chip from consumer tech demand remains weak, and we only see a weak recovery approaching. However, the advanced packaging business should be the major source of margin accretion in the coming years. Pricing for ATM businesses remains more defensive than peers. CoWoS outsourcing from TSMC may aid its top line and margin profile as well as the CPO opportunity in 2026.		<b>10x 2026e EPS</b>  Semis enter down-cycle, with less back-end outsourcing and big customers searching for more cost-effective alternatives: The macro situation weakens, impairing semi demand. The need for second sources causes big customers to shift back-end orders away from ASE, along with pricing erosion given competition. SiP adoption remains limited outside of wearables. Gross margins keep deteriorating given competition from Chinese peers.	

### OVERWEIGHT THESIS

- Our checks show ASE is receiving strong packaging overflow demand from TSMC, which could see strong momentum in 2026 and after.
- AI semi demand is still on track. We bake in some impact from tariffs on consumer tech demand but stay OW.
- Valuation remains attractive.
- Our price target implies 16x our 2026e EPS, slightly higher than ASE's 10-year average P/E multiple of 12x.

### Consensus Rating Distribution



Source: Refinitiv, Morgan Stanley Research

### Risk Reward Themes

Secular Growth: *Positive*  
Technology Diffusion: *Positive*

View descriptions of Risk Rewards Themes [here](#)

## Risk Reward – ASE Technology Holding Co. Ltd. (3711.TW)

### KEY EARNINGS INPUTS

Drivers	2024	2025e	2026e	2027e
Revenue from IC packaging Segment (NT\$, mn)	265,858	311,874	410,730	535,266
Revenue from Testing Segment (NT\$, mn)	54,562	68,274	86,785	119,049
Revenue from Direct Material Segment (NT\$, mn)	5,130	5,569	6,532	7,648
Revenue from SiP (NT\$, mn)	98,143	104,044	112,587	123,652

### INVESTMENT DRIVERS

- Global semi growth
- New applications for SiP
- Synergies from merger with SPIL

### GLOBAL REVENUE EXPOSURE



- 0-10% Europe ex UK
- 0-10% Japan
- 10-20% APAC, ex Japan, Mainland China and India
- 10-20% Mainland China
- 60-70% North America

Source: Morgan Stanley Research Estimate  
View explanation of regional hierarchies [here](#)

### MS ALPHA MODELS



Source: Refinitiv, FactSet, Morgan Stanley Research; 1 is the highest favored Quintile and 5 is the least favored Quintile

### RISKS TO PT/RATING

#### RISKS TO UPSIDE

- Stronger-than-expected global economic and semiconductor growth.
- Margin expansion through merger consolidation.
- New wearables project wins with higher margins.

#### RISKS TO DOWNSIDE

- Slower-than-expected global economic and semiconductor growth.
- Further margin erosion amid price competition.
- Lack of new features in wearables, causing consumers to lose interest.

### OWNERSHIP POSITIONING

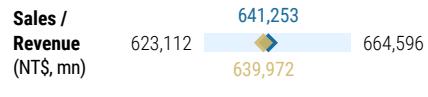
#### Inst. Owners, % Active

67.8% 

Source: Refinitiv, Morgan Stanley Research

### MS ESTIMATES VS. CONSENSUS

FY Dec 2025e



◆ Mean ◆ Morgan Stanley Estimates

Source: Refinitiv, Morgan Stanley Research

## Risk Reward – King Yuan Electronics Co Ltd (2449.TW)

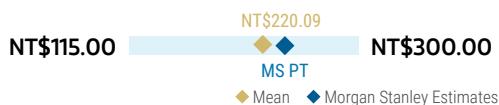
AI testing business upside still underappreciated

### PRICE TARGET NT\$238.00

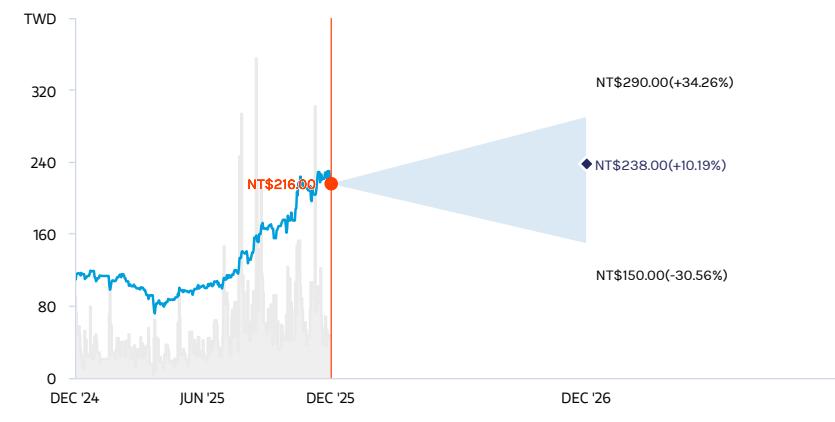
Base case, residual income model. Key assumptions: cost of equity of 9.8%, intermediate-term growth rate of 9.0%, terminal growth rate of 3.0% and cash dividend payout ratio of 65%.

#### Consensus Price Target Distribution

Source: Refinitiv, Morgan Stanley Research



### RISK REWARD CHART



#### BULL CASE

30x 2026e EPS

**Strong semiconductor cycle after macro uncertainties have eased:** 1) AI testing demand continues to surprise to the upside, with AI GPU testing market share remaining stable before 2H26. 2) 5G progress is faster than in our base case, leading to higher mmWave testing demand. 3) IDM outsourcing to OSAT is faster than expected, notably in 5G and AI-related testing demand. 4) US/China tensions ease. 5) Consumer/smartphone testing demand is stronger than expected.

#### NT\$290.00

#### BASE CASE

25x 2026e EPS

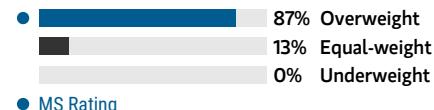
**Strong HPC and auto demand offset by weak consumer semi testing demand:** 1) AI GPU testing market share remains stable before 2H25. 2) Longer testing time of 5G SoC and increasing penetration of 5G smartphone help KYEC's smartphone SoC testing business stay healthy in 2025 and onward. 3) HPC and automotive customers testing demand stays healthy in 2025, thanks to longer testing times for GPUs and FPGAs. 4) More normalized non-AI testing demand in 2025.

#### NT\$238.00

### OVERWEIGHT THESIS

- KYEC is a key supplier for AI GPU and ASIC final testing, which should benefit from ongoing AI demand strength.
- Our supply chain checks suggest notably elongated testing time for NVIDIA's new AI GPUs.
- KYEC could attain the second-highest 2025 revenue and earnings exposure to AI GPU and ASIC within our Greater China semi coverage.
- We expect stable market share for KYEC's AI GPU testing business and some share gains in the AI ASIC testing business.
- Our price target implies 23x 2026e EPS, well justified by our 2024-27e revenue CAGR of >30%. We see re-rating potential given a structurally improved gross margin profile and continued acceleration in AI revenue and earnings growth.

#### Consensus Rating Distribution



Source: Refinitiv, Morgan Stanley Research

#### Risk Reward Themes

Pricing Power: Positive  
Secular Growth: Positive

View descriptions of Risk Rewards Themes [here](#).

#### BEAR CASE

15x 2026e EPS

**US-China trade tensions linger, coupled with inventory correction:** 1) A sluggish 5G smartphone penetration rate negatively affects 5G smartphone demand. 2) Logic semi inventory correction persists longer than expected. 3) Testers are severely underutilized, leading to significant margin contraction. 4) Meaningful AI GPU testing market share loss before 2H25.

#### NT\$150.00

## Risk Reward – King Yuan Electronics Co Ltd (2449.TW)

### KEY EARNINGS INPUTS

Drivers	2024	2025e	2026e	2027e
Wafer Sort revenue (NT\$, mn)	3,301	2,624	2,793	2,393
Final Test revenue (NT\$, mn)	3,991	3,781	3,757	3,294
Burn-In revenue (NT\$, mn)	212	171	180	479

### INVESTMENT DRIVERS

- 5G smartphone shipment/penetration rate
- Gross margin improvement/erosion
- China's semiconductor localization demand

### GLOBAL REVENUE EXPOSURE



- 10-20% North America
- 30-40% Mainland China
- 40-50% APAC, ex Japan, Mainland China and India

Source: Morgan Stanley Research Estimate  
View explanation of regional hierarchies [here](#)

### MS ALPHA MODELS



Source: Refinitiv, FactSet, Morgan Stanley Research; 1 is the highest favored Quintile and 5 is the least favored Quintile

### RISKS TO PT/RATING

#### RISKS TO UPSIDE

- Shipments rise for core customers such as MediaTek.
- Strong AI demand from both GPU and ASIC.
- Penetrate wafer sorting business.
- IDM outsourcing to OSAT rises.

#### RISKS TO DOWNSIDE

- Overall non-AI demand remains weak.
- Significant testing market share loss.
- Shipments drop for core customers such as MediaTek.

### OWNERSHIP POSITIONING

#### Inst. Owners, % Active

71.7% 

Source: Refinitiv, Morgan Stanley Research

### MS ESTIMATES VS. CONSENSUS

FY Dec 2025e



 Mean  Morgan Stanley Estimates

Source: Refinitiv, Morgan Stanley Research



## Risk Reward – MediaTek (2454.TW)

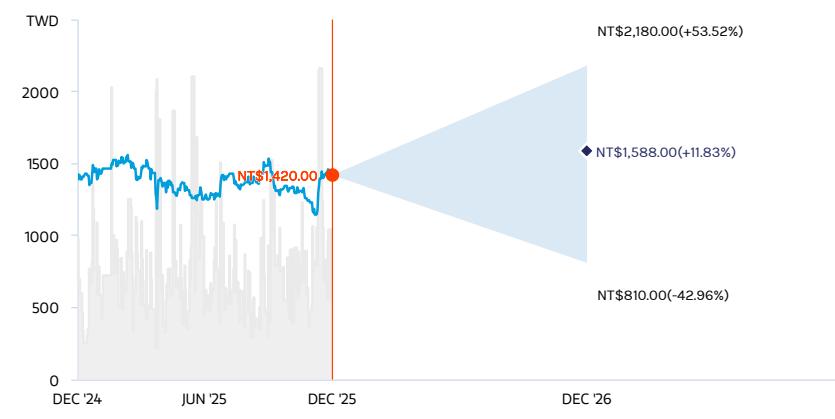
AI ASIC demand should offset smartphone headwind; Raise to OW

### PRICE TARGET NT\$1,588.00

Base case, residual income model. Key assumptions: cost of equity 9.2%, intermediate growth rate 9.0%, terminal growth rate 3.0%.



### RISK REWARD CHART



### BULL CASE NT\$2,180.00

#### 33x 2026e EPS

MediaTek receives US licenses for shipments to all Chinese smartphone brands. Emerging market demand recovers to trend-line growth. MediaTek reaches 90% of an enlarged addressable market for 5G Android smartphones in 2026, including share gains in premium smartphone models. Blended ASP rises in 2025. Better business development in IoT, autos, enterprise networking chips, edge AI projects and AI ASIC business, especially on Google TPU demand.

### BASE CASE NT\$1,588.00

#### 24x 2026e EPS

MediaTek maintains around 35-40% overall share in the Chinese smartphone market, with a share of 30-40% in 5G SoC for 2025 (ex-Apple). Besides of smartphone, AI ASIC should be the largest focus for the company now. We expect a 15-20% revenue CAGR during 2024-27. Non-smartphone business development stays on track, including IoT, autos, enterprise networking chips, edge AI projects and AI ASIC business.

### BEAR CASE NT\$810.00

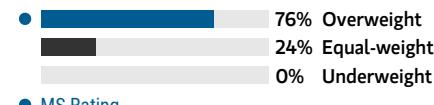
#### 12x 2026e EPS

Competitive pressures are worse than expected, with some market share loss, which hurts gross margin. Emerging market smartphone growth stalls. Chinese smartphone chipset vendors show breakthrough in 5G technologies or foundry supply and start to take more market share in midrange 5G smartphone SoCs. Slow new business development in ASIC, IoT and automotive, edge AI projects and AI ASIC business.

### OVERWEIGHT THESIS

- We think the gross margin will decline in both 2026 and 2027 given smartphone headwinds and TPU margin dilution, but the strong demand from TPU should be able to cover the earnings growth.
- Overall AI ASIC demand seems very strong, especially on Google TPU, which should benefit MediaTek in the following years.
- The AI smartphone replacement cycle is the key wild card. AI smartphone replacement could be too mild to pass through additional costs in Chinese smartphones.
- Risk-reward is attractive at the current level given strong TPU demand. We believe the share price deserves to trade at at least +1SD of its historical average since 2006, which is 22x.

### Consensus Rating Distribution



Source: Refinitiv, Morgan Stanley Research

### Risk Reward Themes

New Data Era:	<i>Positive</i>
Technology Diffusion:	<i>Positive</i>
View descriptions of Risk Rewards Themes <a href="#">here</a>	

## Risk Reward – MediaTek (2454.TW)

### KEY EARNINGS INPUTS

Drivers	2024	2025e	2026e	2027e
Revenue from 5G Products (NT\$, mn)	222,937	289,350	296,636	318,155
Revenue from Mid-low-end 4G Products (NT\$, mn)	27,339	4,854	1,364	1,310
Revenue from Growing Products (NT\$, mn)	173,443	193,258	235,272	436,639
Revenue from Mature Products (NT\$, mn)	38,881	34,922	34,955	34,768

### INVESTMENT DRIVERS

- Market share in major smartphone brands
- Overall demand from non-smartphone businesses, such as TVs and set-top boxes
- Introduction of new products, such as SoC, smartphones and tablets

### GLOBAL REVENUE EXPOSURE



- 0-10% APAC, ex Japan, Mainland China and India
- 0-10% Europe ex UK
- 80-90% Mainland China

Source: Morgan Stanley Research Estimate  
View explanation of regional hierarchies [here](#)

### MS ALPHA MODELS



Source: Refinitiv, FactSet, Morgan Stanley Research; 1 is the highest favored Quintile and 5 is the least favored Quintile

### RISKS TO PT/RATING

#### RISKS TO UPSIDE

- Edge AI proliferates smartphone replacement cycle.
- Smartphone demand rises in China and other EMs.
- New products attract high demand, resulting in market share gains.
- Google TPU demand.

#### RISKS TO DOWNSIDE

- Smartphone demand deteriorates in China and other EMs.
- Competition heats up, resulting in pricing competition.
- New products attract low demand, causing market share loss.
- Margin dilution faster.

### OWNERSHIP POSITIONING

Inst. Owners, % Active 72.4%

Source: Refinitiv, Morgan Stanley Research

### MS ESTIMATES VS. CONSENSUS

FY Dec 2025e

Sales / Revenue (NT\$, mn)	574,697		591,602
			591,073
EBITDA (NT\$, mn)	116,316		127,000
			128,012
Net income (NT\$, mn)	103,305		106,542
			106,120
EPS (NT\$)	64.91		66.94
			71.52
			66.50

Mean Morgan Stanley Estimates

Source: Refinitiv, Morgan Stanley Research

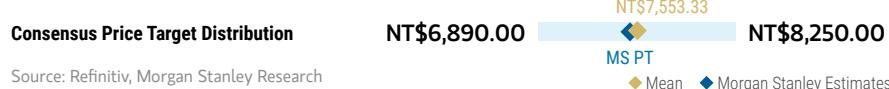
## Risk Reward – Aspeed Technology (5274.TWO)

More substrate supply supports upside for Aspeed in 2026 - OW

### PRICE TARGET NT\$7,500.00

Base case, residual income model. Key assumptions:

- Cost of equity of 9.8% (2.0% risk-free rate, 6% risk premium, 1.3 beta)
- Medium-term growth rate of 18.5%
- Terminal growth rate of 5.2%
- Cash payout ratio of 84%



### RISK REWARD CHART

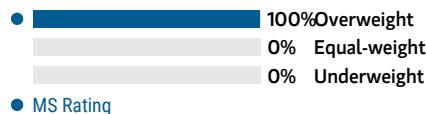


BULL CASE	NT\$8,600.00	BASE CASE	NT\$7,500.00	BEAR CASE	NT\$3,700.00
<b>55x 2026e EPS</b>  Booming data center demand with significant share gains; meaningful OPM expansion; new businesses take off faster than expected: Significant earnings growth from data center demand and market share gains in white brands and US server brands. Margins improve considerably. New business growth accelerates. We also assume AI servers fully ramp up and clients execute new server platform migration faster than expected.		<b>48x 2026e EPS</b>  Cloud/traditional servers bottom out after a year of correction with momentum resuming; remains a beneficiary of GB200; new business bears fruit: 1) Revenue growth of 30% Y/Y in 2025 after strong growth in 2024; 2) gross margin of 67.2% in 2025 vs. 64% in 2024, OPM improves to 51.4% in 2025 vs. 45% in 2024; 3) Vera Rubin gets more demand from BMC.		<b>24x 2026e EPS</b>  Disappointing end demand, with share loss; operating margin pressure; new businesses face challenges: Revenue growth decelerates amid slow data center demand and share loss amid a weakening macro environment. OPM pressure emerges amid intense competition. New businesses stay flattish as end-markets take off more slowly.	

### OVERWEIGHT THESIS

- We view Aspeed as a distinctive NVIDIA-related play, being the major BMC supplier for AI servers and a key supplier to help realize Omniverse adoption by leveraging its Coupola360 products.
- With a potential cloud capex trough in 4Q25/1Q26 and concern of cloud capex decrease eliminated, we have become more positive from a top-down perspective. Rising inference demand could sustain CPU and non-standard AI server demand, on top of AI server rack ramp up.
- Enhancing server security functions (US brands and customers) should boost semi content.
- Our price target implies 48x our 2026 EPS estimate, above the 46x average one-year forward P/E since 2020, which we find justified by improving demand.

### Consensus Rating Distribution



Source: Refinitiv, Morgan Stanley Research

### Risk Reward Themes

Secular Growth: Positive

View descriptions of Risk Rewards Themes [here](#).

## Risk Reward – Aspeed Technology (5274.TWO)

### KEY EARNINGS INPUTS

Drivers	2024	2025e	2026e	2027e
BMC revenue (NT\$, mn)	5,244	7,979	10,930	13,673
360 degree SoC revenue (NT\$, mn)	367	63	122	245
PC/AV extension IC revenue (NT\$, mn)	176	105	96	103

### INVESTMENT DRIVERS

- Expanding share in baseboard management controller (BMC) market
- Cloud spending acceleration from customers
- Margin expansion
- New business progress

### GLOBAL REVENUE EXPOSURE



Source: Morgan Stanley Research Estimate  
View explanation of regional hierarchies [here](#)

### MS ALPHA MODELS

2/5  
MOST      3 Month  
Horizon

Source: Refinitiv, FactSet, Morgan Stanley Research; 1 is the highest favored Quintile and 5 is the least favored Quintile

### RISKS TO PT/RATING

#### RISKS TO UPSIDE

- Stronger cloud demand
- Faster-than-expected spec migration
- Mild competition

#### RISKS TO DOWNSIDE

- Softening cloud demand
- Slower-than-expected spec migration
- Intensified competition
- Further policy tightening in China

### OWNERSHIP POSITIONING

#### Inst. Owners, % Active

72.5% 

Source: Refinitiv, Morgan Stanley Research

### MS ESTIMATES VS. CONSENSUS

FY Dec 2025e



◆ Mean    ◆ Morgan Stanley Estimates

Source: Refinitiv, Morgan Stanley Research



## Risk Reward – NAURA Technology Group Co Ltd (002371.SZ)

3Q25 beat, stay OW on localization story

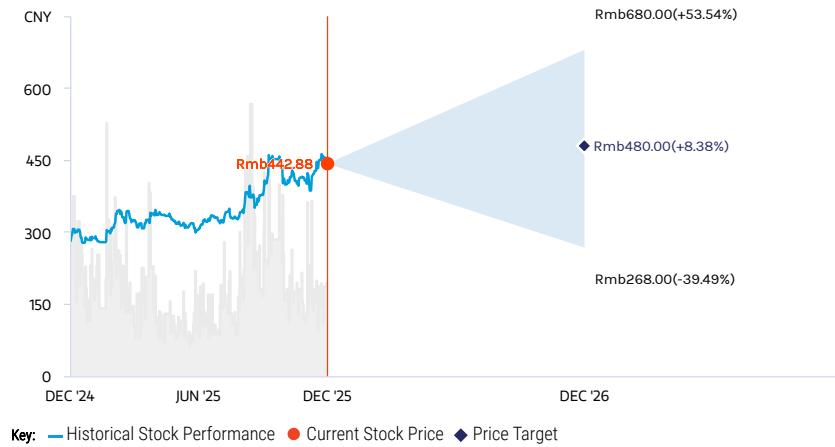
### PRICE TARGET Rmb480.00

We use a residual income model to value NAURA. Our base case assumptions are:

- WACC of 10.1%, derived from a risk-free rate of 2.0%, beta of 1.35 and a market risk premium of 6.0%.
- Intermediate growth rate of 14%.
- Terminal growth rate of 5%.



### RISK REWARD CHART



### BULL CASE

#### 49x 2026e P/E

We assume (1) 45% revenue CAGR in 2024-27e, fueled by stronger-than-expected semi capex; (2) NAURA's domestic market share surges in 2025; and (3) gross margin improves to over 45% in 2025, thanks to scale effects and the company's technology competitiveness. Customers' capex also resumes a bullish trend.

### Rmb680.00

### BASE CASE

#### 35x 2026e P/E

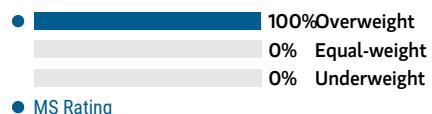
We expect (1) 28% revenue CAGR in 2024-27e thanks to robust capacity expansion plan from downstream fabs; (2) NAURA's domestic market share to increase gradually; and (3) gross margin to grow slightly through 2025-2027e.

### Rmb480.00

### OVERWEIGHT THESIS

- Chinese logic foundries appear likely to maintain high capex spending in 2026, which should help fuel NAURA's revenue growth.
- We view NAURA as a long-term beneficiary of China's semiconductor equipment localization trend. We believe its key customers will continue to expand capacity aggressively over the next few years.
- The company has acquired a 17.9% share in KingSemi, whose track, cleaning and back-end equipment could complement NAURA's product portfolio.
- The stock is trading at 35x our 2026e EPS estimate, less than -1SD of its average P/E since 2016, which we view as appealing.

### Consensus Rating Distribution



Source: Refinitiv, Morgan Stanley Research

### Risk Reward Themes

Secular Growth: Positive

Technology Diffusion: Positive

View descriptions of Risk Rewards Themes [here](#)

## Risk Reward – NAURA Technology Group Co Ltd (002371.SZ)

### KEY EARNINGS INPUTS

Drivers	2024	2025e	2026e	2027e
Sales to Memory Customers (Rmb, mn)	27,707	37,208	49,202	58,077
Sales to Front-end Logic Customers (Rmb, mn)	2,094	1,745	2,083	2,464
Sales to backend and others (Rmb, mn)	37	143	176	208

### INVESTMENT DRIVERS

- Strong demand from China semiconductor localization trend
- Production capacity expansion of domestic fabs

### GLOBAL REVENUE EXPOSURE



● 100% Mainland China

Source: Morgan Stanley Research Estimate  
View explanation of regional hierarchies [here](#)

### MS ALPHA MODELS

4/5  
MOST      3 Month  
Horizon

Source: Refinitiv, FactSet, Morgan Stanley Research; 1 is the highest favored Quintile and 5 is the least favored Quintile

### RISKS TO PT/RATING

#### RISKS TO UPSIDE

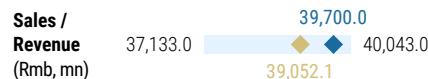
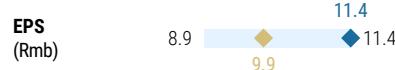
- Stronger-than-expected semi capex cycle in China
- Faster-than-expected R&D, leading to substantial market share increases for NAURA
- Tight production capacity in chips, leading to faster capacity expansion by fabs

#### RISKS TO DOWNSIDE

- Slowdown in China's semi capex cycle
- NAURA's market share declines
- Weakening demand in automotive, factory automation, IoT, etc, resulting in oversupply of chips

### MS ESTIMATES VS. CONSENSUS

FY Dec 2025e



◆ Mean    ◆ Morgan Stanley Estimates

Source: Refinitiv, Morgan Stanley Research

### OWNERSHIP POSITIONING

#### Inst. Owners, % Active

93.9% 

Source: Refinitiv, Morgan Stanley Research



## Risk Reward – GigaDevice Semiconductor Beijing Inc (603986.SS)

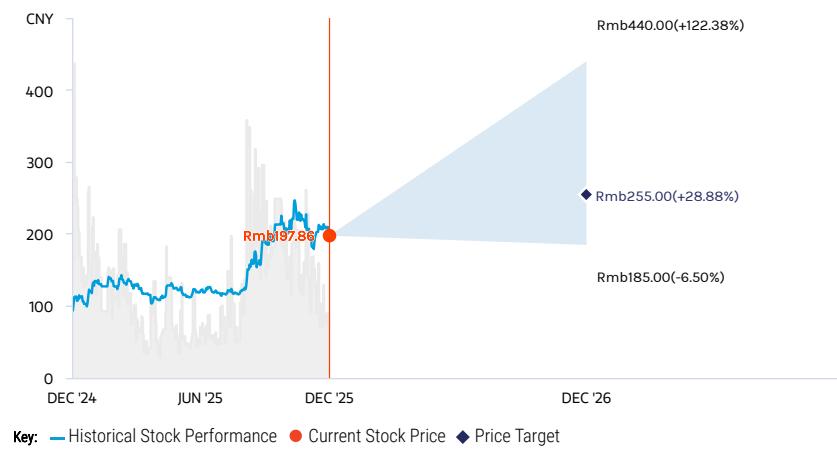
Multiple drivers ahead

### PRICE TARGET Rmb255.00

Our price target of Rmb255 is our base case value, derived from our residual income model. Key assumptions: cost of equity of 8.9% (beta 1.1, risk-free rate 2% and risk premium 6%), a payout ratio of 40%, medium-term growth rate of 18.5%, and a terminal growth rate of 5%.



### RISK REWARD CHART



### BULL CASE Rmb440.00

**86x 2026e EPS**  
NOR flash prices rise more sharply into 1H26, and the company increases production of mid-/high-density NOR; MCU growth accelerates; DRAM business shows significant contribution: 1) NOR flash sales grow 70%+ Y/Y in 2026 via price hikes and exponential growth in AI glasses; 2) MCU sales growth significantly exceeds 40% in 2026; 3) contribution from WoW exceeds expectations in 2026-27e; 4) gross margin above 50% in 2026.

### BASE CASE Rmb255.00

**50x 2026e EPS**  
NOR and DRAM pricing upsides in 2026; moderate WoW contribution: 1) NOR flash sales to rise 56% Y/Y in 2026; 2) MCU grows 24% in 2026; 3) moderate contribution from WoW in 2026-27e; 4) gross margin at 40%+ in 2026.

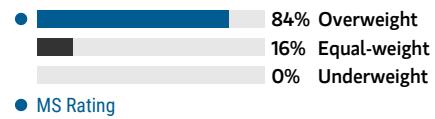
### BEAR CASE Rmb185.00

**36x 2026e EPS**  
NOR Flash price declines sharply into 1H26; MCU faces stronger competition from foreign and local vendors; pause in DRAM business development: 1) NOR flash sales decline in 2026, as ASP starts to decline; 2) MCU sales to decline >10% Y/Y in 2026; 3) contribution from WoW falls below expectations in 2026-27e; 4) gross margin below 35% in 2026.

### OVERWEIGHT THESIS

- We expect GigaDevice to continue to gain share in China's MCU market. Auto MCUs offer bigger opportunities as local self-sufficiency is low.
- We expect further NOR Flash pricing upside, and we expect GigaDevice NOR quality to catch up in the auto segment.
- Specialty DRAM pricing started to rebound in late 1Q25, and there are opportunities such as wafer-on-wafer specialty memory.
- Spot price implies 42x our new 2026 EPS estimate which looks attractive given a strong growth outlook.

### Consensus Rating Distribution



Source: Refinitiv, Morgan Stanley Research

### Risk Reward Themes

Pricing Power: Positive  
Secular Growth: Positive

View descriptions of Risk Rewards Themes [here](#).

## Risk Reward – GigaDevice Semiconductor Beijing Inc (603986.SS)

### KEY EARNINGS INPUTS

Drivers	2024	2025e	2026e	2027e
NOR Flash ASP growth (%)	(10)	6	18	2
MCU ASP growth (%)	(31)	(8)	0	0
Gross margin (%)	38	39	41	42

### INVESTMENT DRIVERS

- Beneficiary of MCU localization
- Decreasing opex burden
- Development of AI glasses market

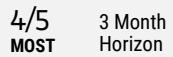
### GLOBAL REVENUE EXPOSURE



- 0-10% Europe ex UK
- 0-10% India
- 0-10% Japan
- 0-10% MEA
- 0-10% North America
- 0-10% UK
- 20-30% APAC, ex Japan, Mainland China and India
- 50-60% Mainland China

Source: Morgan Stanley Research Estimate  
View explanation of regional hierarchies [here](#)

### MS ALPHA MODELS



Source: Refinitiv, FactSet, Morgan Stanley Research; 1 is the highest favored Quintile and 5 is the least favored Quintile

### RISKS TO PT/RATING

#### RISKS TO UPSIDE

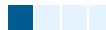
- NOR up-cycle driven by stronger demand
- Superior chip design, leading to increasing exposure to low-density NOR
- Faster-than-expected DRAM development

#### RISKS TO DOWNSIDE

- NOR down-cycle driven by weaker demand
- Inferior chip design, leading to increasing exposure to mid-/high-density NOR
- Slower-than-expected DRAM development

### OWNERSHIP POSITIONING

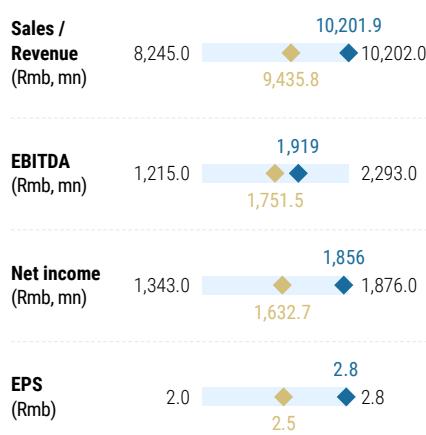
#### Inst. Owners, % Active

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Source: Refinitiv, Morgan Stanley Research

### MS ESTIMATES VS. CONSENSUS

FY Dec 2025e



Source: Refinitiv, Morgan Stanley Research



## Risk Reward Reference links

1. View explanation of Options Probabilities methodology -  
[Options\\_Probabilities\\_Exhibit\\_Link.pdf](#)
2. View descriptions of Risk Rewards Themes - [RR\\_Themes\\_Exhibit\\_Link.pdf](#)
3. View explanation of regional hierarchies - [GEG\\_Exhibit\\_Link.pdf](#)
4. View explanation of Theme/Exposure methodology -  
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(as of November 30, 2025)

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Stock Rating Category	Coverage Universe		Investment Banking Clients (IBC)			Other Material Investment Services Clients (MISC)	
	Count	% of Total	Count	% of Total IBC	% of Rating Category	Count	% of Total Other MISC
Overweight/Buy	1501	41%	389	46%	26%	661	41%
Equal-weight/Hold	1608	44%	379	44%	24%	736	46%
Not-Rated/Hold	4	0%	1	0%	25%	1	0%
Underweight/Sell	567	15%	83	10%	15%	212	13%
Total	3,680		852			1610	

Data include common stock and ADRs currently assigned ratings. Investment Banking Clients are companies from whom Morgan Stanley received investment banking compensation in the last 12 months. Due to rounding off of decimals, the percentages provided in the "% of total" column may not add up to exactly 100 percent.

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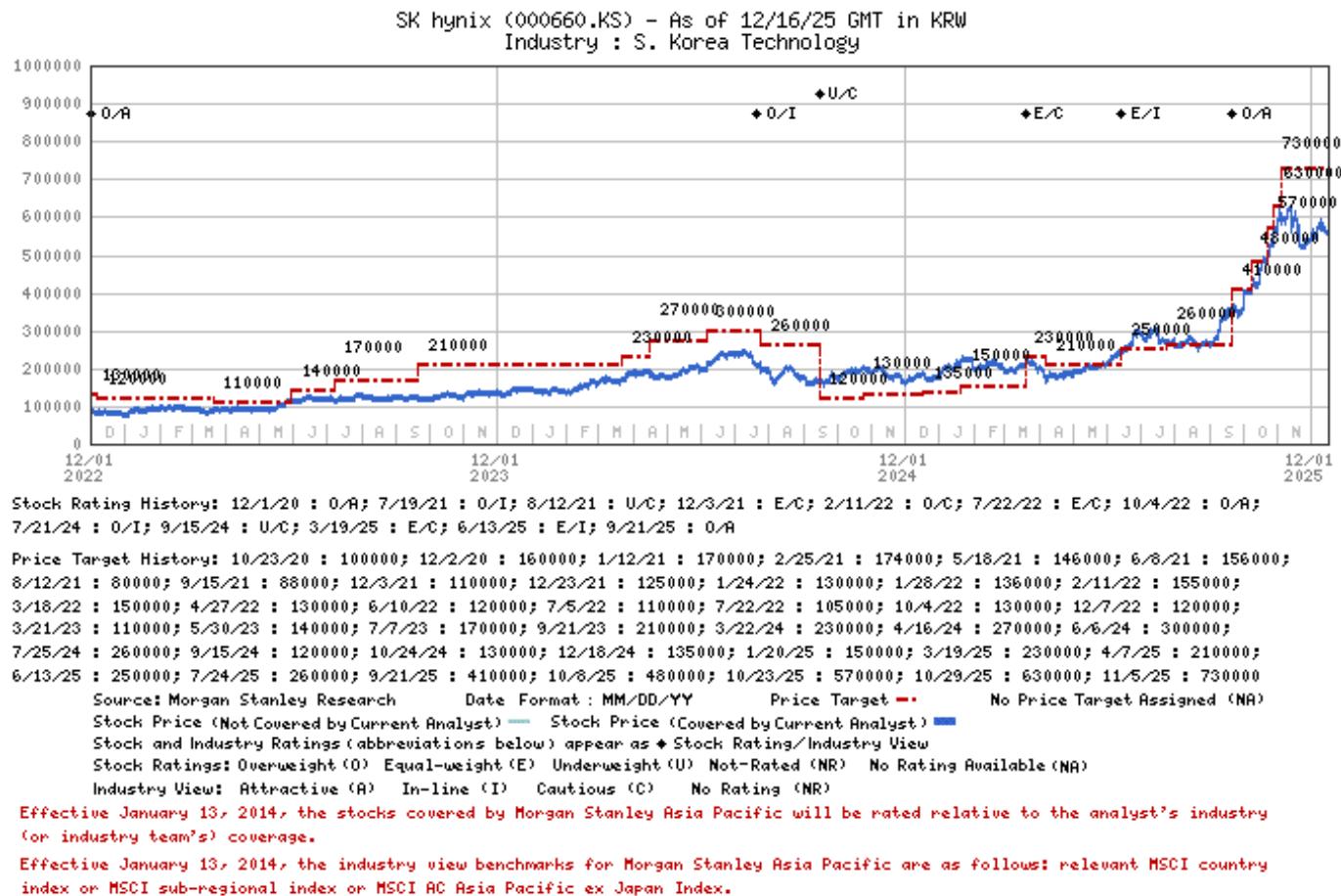
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## INDUSTRY COVERAGE: Semiconductor Capital Equipment

COMPANY (TICKER)	RATING (AS OF)	PRICE* (12/16/2025)
<b>Shane Brett</b>		
Applied Materials Inc. (AMAT.O)	O (09/22/2025)	\$258.84
Camtek (CAMT.O)	E (12/01/2025)	\$111.31
KLA Corp (KLAC.O)	E (09/22/2025)	\$1,223.37
Lam Research Corp (LRCX.O)	E (09/22/2025)	\$163.26
MKS Inc. (MKSI.O)	O (08/04/2024)	\$156.25
Nova Ltd (NVMI.O)	E (12/01/2025)	\$318.21
Teradyne Inc (TER.O)	E (07/30/2025)	\$192.29

Stock Ratings are subject to change. Please see latest research for each company.

\* Historical prices are not split adjusted.

## INDUSTRY COVERAGE: Semiconductors

COMPANY (TICKER)	RATING (AS OF)	PRICE* (12/16/2025)
<b>Joseph Moore</b>		
Advanced Micro Devices (AMD.O)	E (06/09/2024)	\$209.17
Aeva Technologies Inc (AEVA.O)	E (07/19/2021)	\$14.02
Allegro Microsystems Inc (ALGM.O)	E (05/09/2025)	\$26.24
Ambarella Inc (AMBA.O)	O (03/29/2016)	\$71.98
Amkor Technology Inc (AMKR.O)	E (11/08/2023)	\$40.28
Analog Devices Inc. (ADI.O)	O (11/16/2023)	\$278.40
Astera Labs Inc (ALAB.O)	O (05/11/2025)	\$144.94
Broadcom Inc. (AVGO.O)	O (06/09/2024)	\$341.30
GlobalFoundries Inc (GFS.O)	E (10/28/2024)	\$37.08
Intel Corporation (INTC.O)	E (02/22/2023)	\$37.31

IonQ Inc (IONQ.N)	E (04/25/2023)	\$49.67
Marvell Technology Group Ltd (MRVL.O)	E (09/14/2015)	\$84.07
Microchip Technology Inc. (MCHP.O)	E (07/10/2024)	\$65.90
Micron Technology Inc. (MU.O)	O (10/06/2025)	\$232.51
Navitas Semiconductor Corp (NVTS.O)	U (04/06/2025)	\$7.83
NVIDIA Corp. (NVDA.O)	O (03/16/2023)	\$177.72
NXP Semiconductor NV (NXPI.O)	O (02/11/2025)	\$229.75
ON Semiconductor Corp. (ON.O)	E (05/11/2025)	\$54.56
Qorvo Inc (QRVO.O)	E (10/28/2025)	\$86.57
Qualcomm Inc. (QCOM.O)	++	\$176.12
SanDisk Corporation. (SNDK.O)	O (03/03/2025)	\$209.31
Semtech Corp. (SMTC.O)	E (04/06/2025)	\$71.13
Silicon Laboratories Inc. (SLAB.O)	E (01/19/2021)	\$134.34
Skyworks Solutions Inc (SWKS.O)	E (11/28/2018)	\$66.02
Texas Instruments (TXN.O)	U (04/13/2020)	\$177.56
Wolfspeed, INC (WOLF.N)	NR (04/06/2025)	\$17.85
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Lee Simpson		
Arm Holdings plc (ARM.O)	O (07/19/2024)	\$121.10
Cadence Design Systems Inc (CDNS.O)	O (02/14/2024)	\$319.53
Synopsys Inc. (SNPS.O)	O (11/10/2023)	\$463.34

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\* Historical prices are not split adjusted.

## INDUSTRY COVERAGE: Greater China Technology Semiconductors

COMPANY (TICKER)	RATING (AS OF)	PRICE* (12/16/2025)
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Charlie Chan		
ACM Research Inc (ACMR.O)	O (03/07/2023)	\$37.14
Advanced Micro-Fabrication Equipment Inc (688012.SS)	O (11/06/2023)	Rmb272.51
Advanced Wireless Semiconductor Co (8086.TWO)	U (07/14/2025)	NT\$103.50
Alchip Technologies Ltd (3661.TW)	O (05/14/2021)	NT\$3,015.00
Andes Technology Corp (6533.TW)	O (08/04/2022)	NT\$250.00
ASE Technology Holding Co. Ltd. (3711.TW)	O (09/15/2024)	NT\$229.00
Global Unichip Corp (3443.TW)	O (07/27/2024)	NT\$2,020.00
GlobalWafers Co Ltd (6488.TWO)	O (09/19/2025)	NT\$364.50
Gudeng Precision (3680.TWO)	O (11/25/2025)	NT\$334.00
Hua Hong Semiconductor Ltd (1347.HK)	U (10/21/2025)	HK\$66.30
King Yuan Electronics Co Ltd (2449.TW)	O (03/03/2023)	NT\$216.00
Maxscend Microelectronics Co Ltd (300782.SZ)	U (01/11/2021)	Rmb73.42
MediaTek (2454.TW)	O (11/28/2025)	NT\$1,420.00
Nanya Technology Corp. (2408.TW)	O (09/18/2025)	NT\$158.00
NAURA Technology Group Co Ltd (002371.SZ)	O (11/06/2023)	Rmb442.88
OmniVision Integrated Circuits Group Inc (603501.SS)	E (11/17/2025)	Rmb124.80
Phison Electronics Corp (8299.TWO)	O (03/11/2025)	NT\$1,045.00
SG Micro Corp. (300661.SZ)	E (11/03/2025)	Rmb64.36
Silergy Corp. (6415.TW)	O (02/13/2025)	NT\$205.00
SMIC (0981.HK)	O (10/21/2025)	HK\$63.45
TSMC (2330.TW)	O (02/07/2022)	NT\$1,435.00
UMC (2303.TW)	E (10/28/2024)	NT\$49.20
Vanguard International Semiconductor (5347.TWO)	U (08/05/2024)	NT\$92.30
WIN Semiconductors Corp (3105.TWO)	U (07/14/2025)	NT\$167.50
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Daisy Dai, CFA		
ASMPT Ltd (0522.HK)	O (07/24/2025)	HK\$74.75
China Resources Microelectronics Limited (688396.SS)	E (06/19/2025)	Rmb54.30
Elan Microelectronics Corp (2458.TW)	O (10/03/2025)	NT\$122.00

Empyrean Technology Co Ltd (301269.SZ)	E (01/17/2025)	Rmb102.76
Hangzhou Silan Microelectronics Co. Ltd. (600460.SS)	U (08/25/2025)	Rmb27.10
Innoscience (2577.HK)	E (10/13/2025)	HK\$71.20
JCET Group Co Ltd (600584.SS)	U (09/25/2024)	Rmb35.38
Shanghai Anlogic Infotech Co Ltd (688107.SS)	E (05/14/2024)	Rmb25.35
Shanghai Fudan Microelectronics (1385.HK)	O (03/07/2025)	HK\$40.48
SICC Co Ltd (688234.SS)	E (09/03/2025)	Rmb84.85
StarPower Semiconductor Ltd (603290.SS)	O (03/01/2022)	Rmb93.70
Unigroup Guoxin Microelectronics Co Ltd (002049.SZ)	U (01/10/2023)	Rmb73.72
Universal Scientific Ind. (Shanghai) (601231.SS)	O (11/05/2025)	Rmb25.63
Yangjie Technology (300373.SZ)	O (06/10/2022)	Rmb63.21

**Daniel Yen, CFA**

AP Memory Technology Corp (6531.TW)	O (07/11/2025)	NT\$376.50
ASMedia Technology Inc (5269.TW)	U (10/03/2025)	NT\$1,190.00
Aspeed Technology (5274.TWO)	O (06/09/2025)	NT\$6,650.00
Egis Technology Inc (6462.TWO)	O (10/21/2025)	NT\$125.00
Espressif Systems (688018.SS)	O (05/15/2023)	Rmb157.31
GigaDevice Semiconductor Beijing Inc (603986.SS)	O (05/15/2025)	Rmb197.86
Macronix International Co Ltd (2337.TW)	O (09/18/2025)	NT\$37.15
Montage Technology Co Ltd (688008.SS)	++	Rmb113.57
Novatek (3034.TW)	E (11/10/2025)	NT\$374.50
Nuvoton Technology Corporation (4919.TW)	U (11/10/2025)	NT\$51.00
Parade Technologies Ltd (4966.TWO)	O (10/03/2025)	NT\$589.00
Powerchip Semiconductor Manufacturing Co (6770.TW)	O (10/27/2025)	NT\$33.80
Realtek Semiconductor (2379.TW)	O (06/19/2025)	NT\$514.00
Shenzhen Goodix Technology Co Ltd (603160.SS)	U (07/14/2025)	Rmb76.72
Sino Wealth Electronic (300327.SZ)	U (03/31/2025)	Rmb28.13
Winbond Electronics Corp (2344.TW)	O (03/11/2025)	NT\$70.60
WPG Holdings (3702.TW)	U (11/10/2025)	NT\$60.80

**Duan Liu**

Dosilicon Co Ltd (688110.SS)	U (09/06/2024)	Rmb112.00
Shenzhen Longsys Electronics Co Ltd (301308.SZ)	O (03/11/2025)	Rmb240.42

**Tiffany Yeh**

AllRing Tech Co. (6187.TWO)	O (09/23/2025)	NT\$347.00
FOCI Fiber Optic Communications Inc (3363.TWO)	O (01/15/2025)	NT\$411.00
Himax Technologies Inc (HIMX.O)	O (05/09/2025)	\$8.28
Silicon Motion (SIMO.O)	O (05/06/2024)	\$85.50

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