



# Semiconductors: 2025 Q4

AI accelerators should continue their meteoric revenue growth into 2026.



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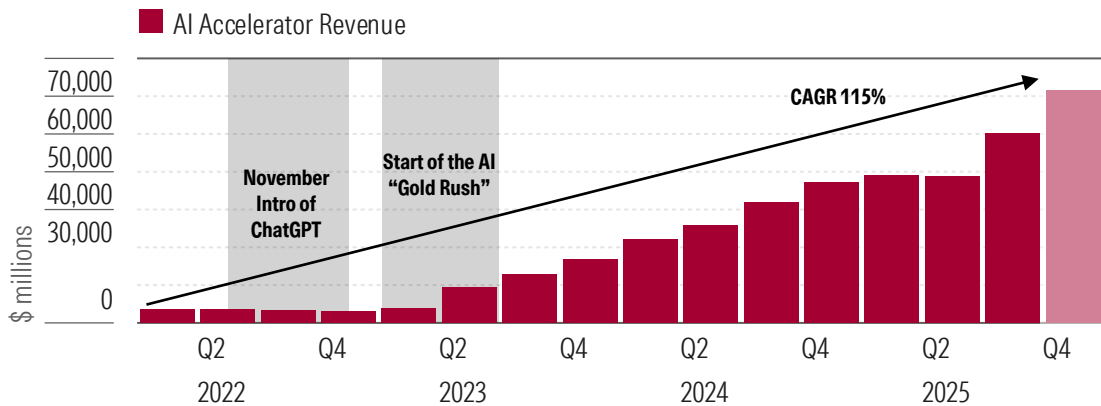
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# Executive Summary

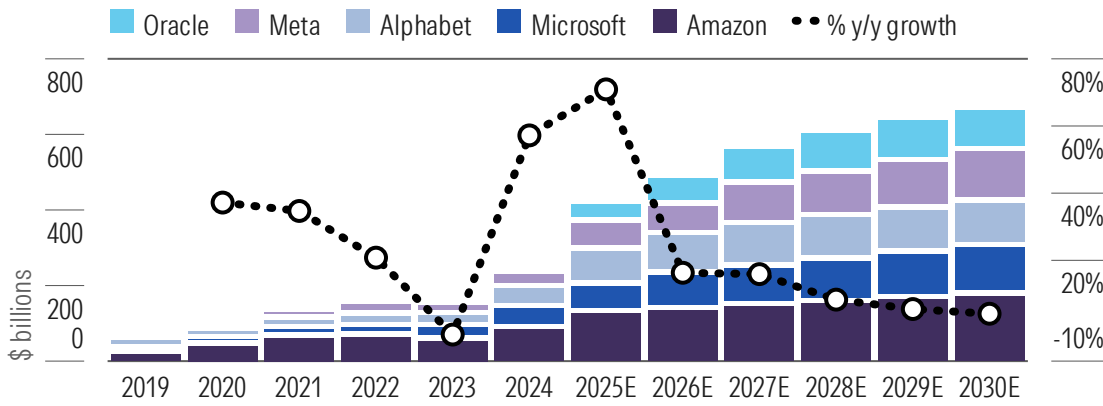
AI chip stocks have pulled back out of unfounded bubble concerns. As of Jan. 13, the median semiconductor stock is 6% undervalued.

# Semiconductors Are Still the Key Force Behind the Artificial Intelligence Buildout

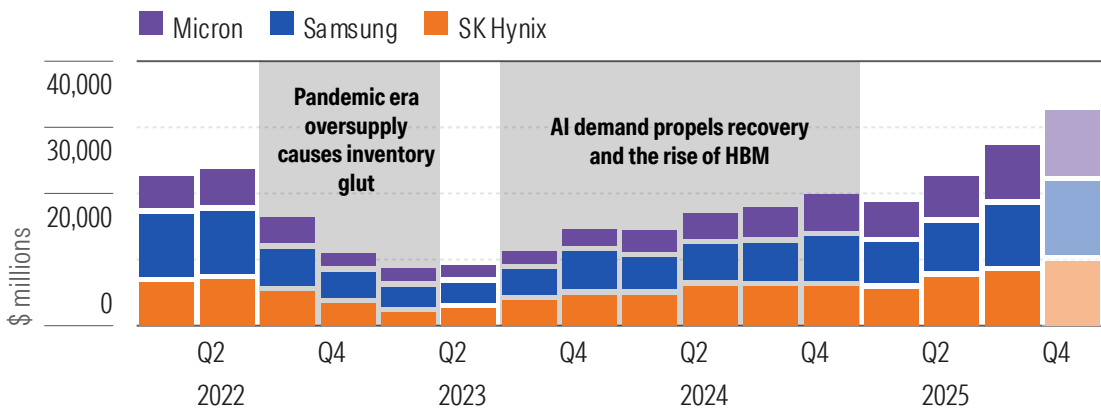
## AI Accelerator Growth, Led by Nvidia, Should Continue to Blaze Ahead



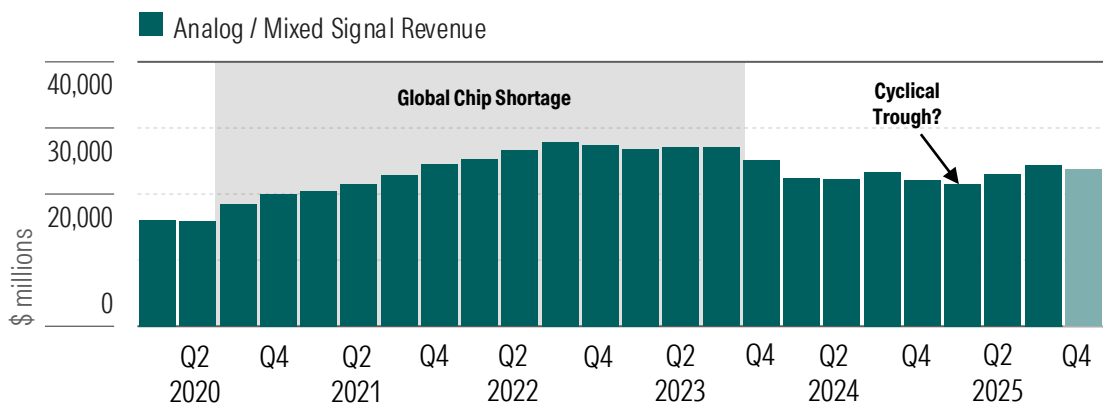
## Annual Hyperscaler Capital Expenditure Should Rise Nicely From Here



## Growing Demand for Advanced DRAM Is Driving Robust Revenue Growth



## Outside of AI, Analog/Mixed-Signal Chip Demand Is Recovering



Source: Morningstar, PitchBook, company documents. Data as of Jan. 15, 2026.

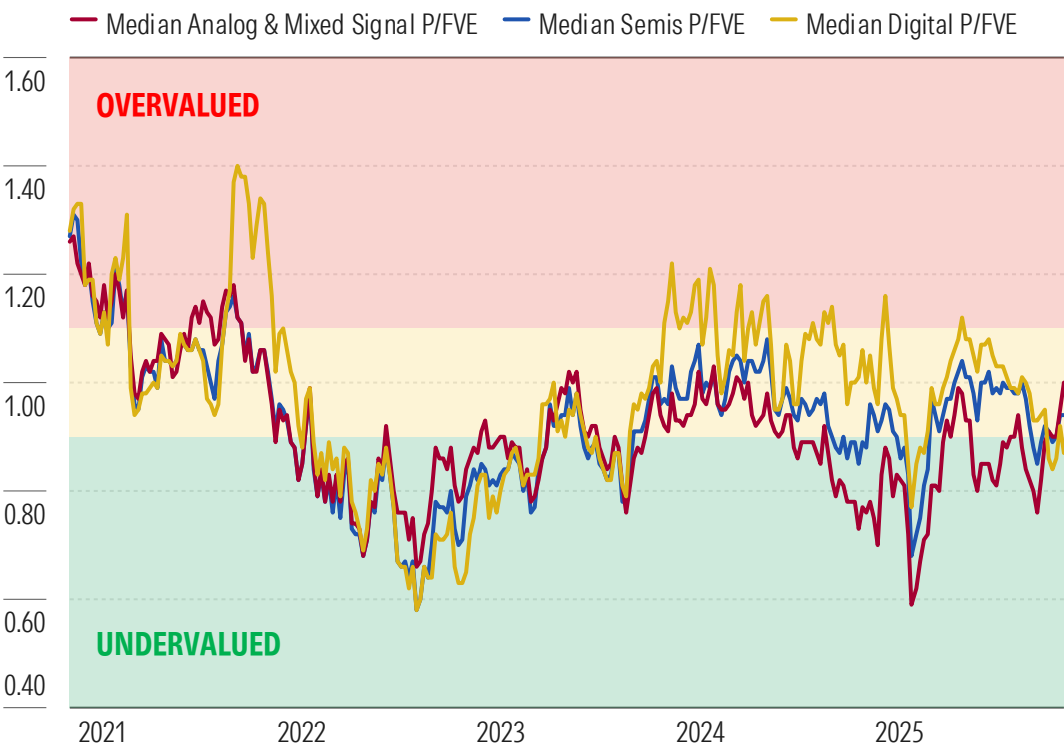
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# Digital Chipmakers Now Appear Undervalued to Us, Thanks to Overblown Near-Term AI Bubble Concerns

- We view the semiconductor industry as 6% undervalued on a median price/fair value estimate basis as of Jan. 13. This compares with the sector being fairly valued a quarter ago.
- Certain AI names sold off due to bubble concerns and the rise of vertically integrated Google. We instead foresee outstanding demand for AI in the near and medium term.
- The median digital chip stock is 11% undervalued, while the median analog/mixed-signal chip stock is fairly valued.
- We now see attractive margins of safety in leading AI chip names, such as Nvidia, AMD, Broadcom, and Marvell.

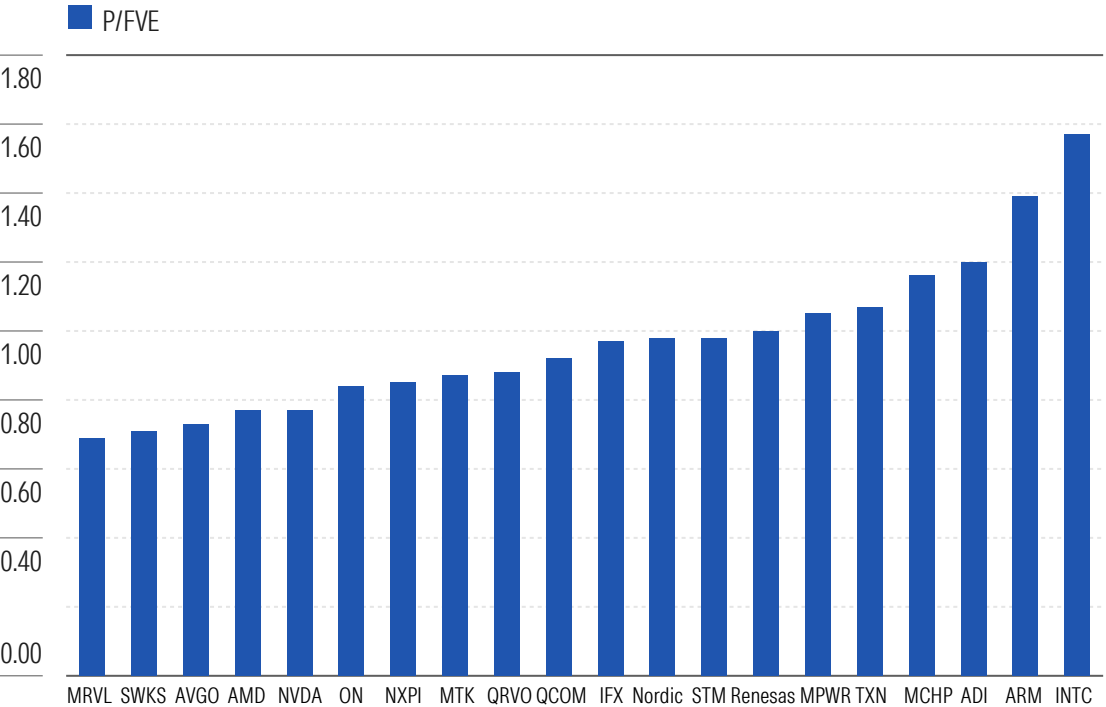
## The Median Digital Stock Is 11% Undervalued While Analog Is Fairly Valued

Several leading AI chipmakers appear cheap to us.



## We Now See Some Buying Opportunities Among AI Chipmakers

Sorted on a price/fair value estimate basis; 1.00 is fairly valued.

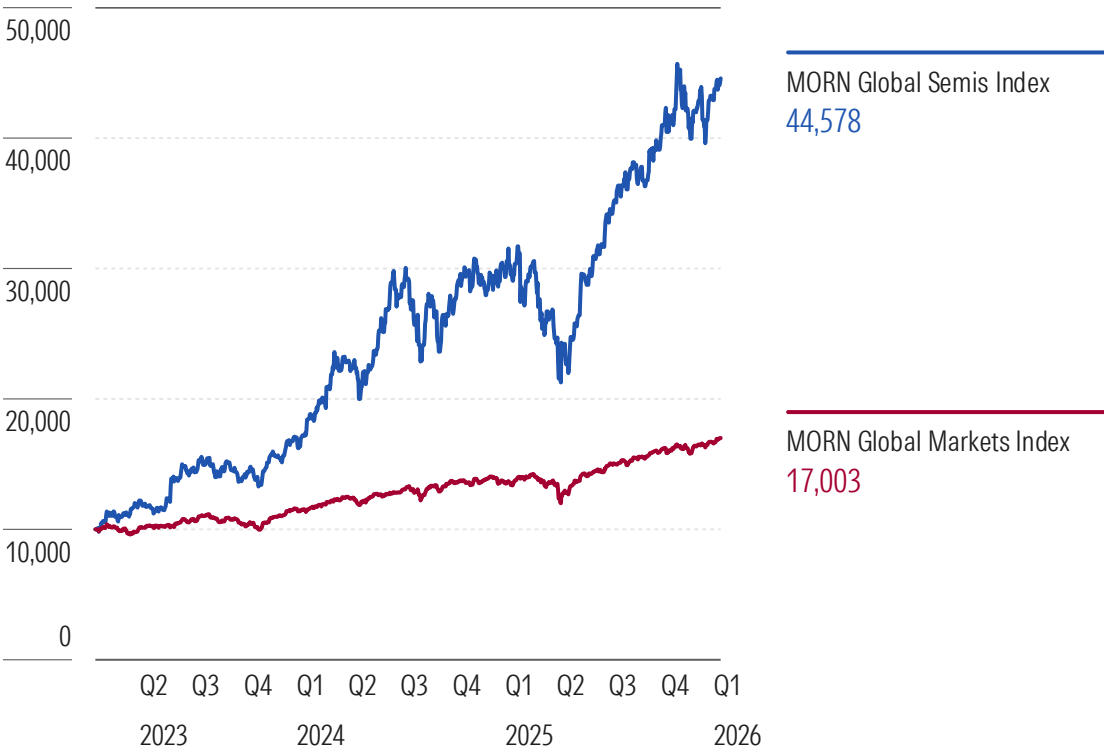


# Global Semis Continue to Outperform the Broader Market; Forward P/E Multiples Are Becoming Reasonable

- A \$10,000 investment at the start of 2023 would have grown to \$44,578, bringing investors a 65% annual return through Jan. 14, 2026.
- P/E multiples in semis have increased with AI, and with Nvidia becoming a much larger portion of the overall semiconductor industry.
- We believe earnings will be strong in the months ahead, given healthy AI demand and strong pricing, especially in memory.

## The MORN Global Semis Index Has Meaningfully Outperformed the Global Market

Growth of 10,000 as of Jan. 1, 2023.



## Forward P/E Multiples in Global Semis Have Pulled Back in Recent Weeks

Multiples calculated on a market-cap-weighted average of forward P/E.



# Semiconductor Overview

AI remains on track to be the core driver of semiconductor industry growth. Memory semis are in focus given booming demand and higher prices.

# Semiconductor Product Types and Heat Map

**Digital Semiconductors:** [Page 11](#)

Digital chips include several product types, but in simple terms, these are processors (at various speeds and complexity) that are the “brains” behind a host of devices. Some examples include CPUs in PCs and smartphones (Intel, Apple), GPUs for AI and graphics (Nvidia), and microcontrollers for a wide range of gadgets.

**Memory:** [Page 27](#)

Memory stores information rather than processing it. The most common memory products are NAND (flash memory for long-term storage), DRAM (for short-term storage), and, increasingly, High Bandwidth Memory, a type of DRAM used in AI.

**Analog Semis:** [Page 32](#)

Analog is a broad category, typically defined by its ability to process real-world/wave signals.

**Optoelectronics/Discretes/Sensors:** *Not addressed in this Pulse.* These include image sensors, laser diodes, LEDs, different sensors (pressure/temperature, and so on), and singular components such as diodes or unintegrated transistors.

**2024 Global Semiconductor Billings by Type (Heat Map Based on Near-Term Growth Prospects)**

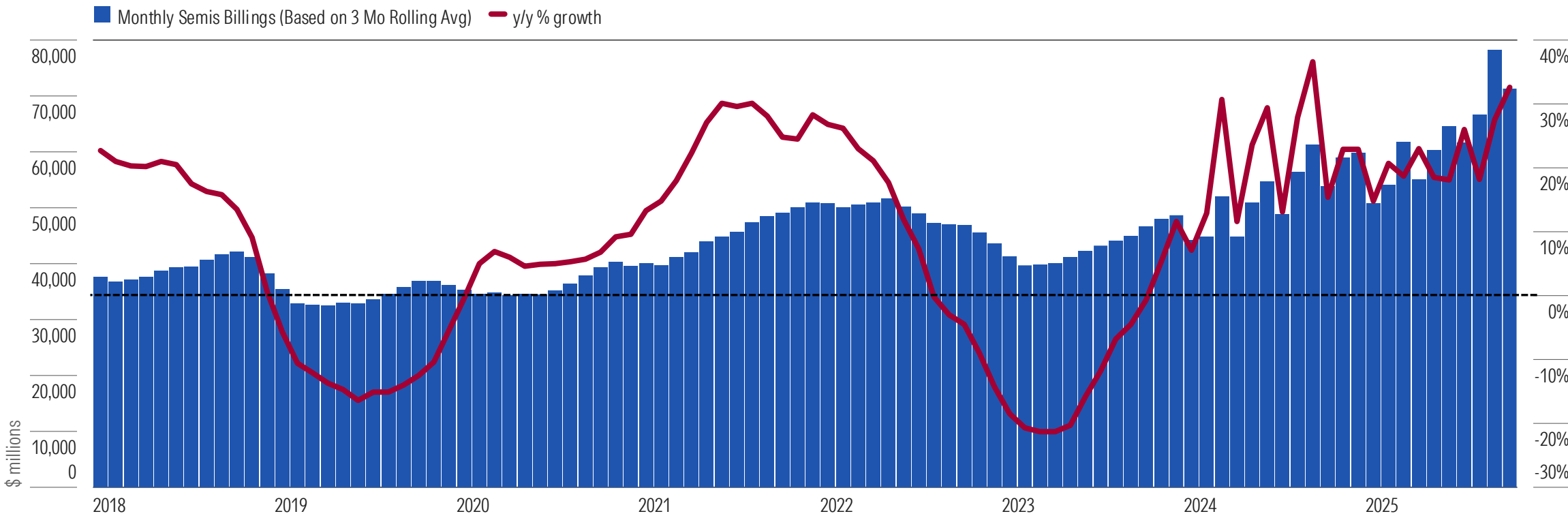
>= midcycle growth;  <= midcycle;  none or negative growth;  unaddressed in this Pulse



# World Semiconductor Trade Data Shows Strong Revenue Growth, Led by AI

Looking at World Semiconductor Trade Statistics published by the US Semiconductor Industry Association, the chip industry (including digital, analog/mixed-signal, memory, and other types of semis) has reported strong growth in 2025. Chip industry billings (akin to revenue) rose 33% in October 2025, thanks to the AI boom for both memory and processors. Overall, AI remains a growth driver, while PC and smartphone demand are modestly stronger than this time a year ago.

## Semiconductor Revenue Continues to Recover Thanks to AI, Higher Memory Spending, and a Bounce Back in PC and Smartphone Demand

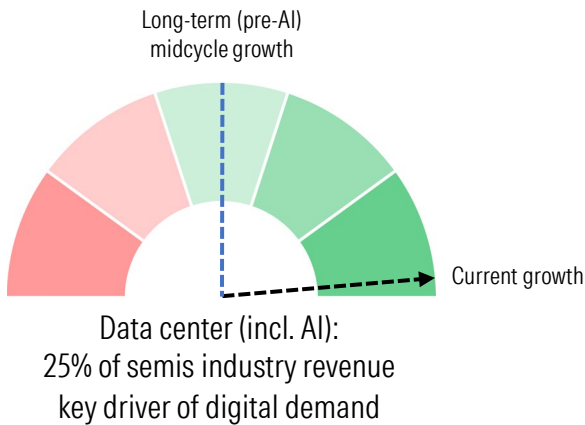


Source: WSTS, Gartner, Morningstar. Data through October 2025. Exhibit as of Jan. 5, 2026.  
WSTS data includes memory and other subsegments of semis that are not addressed in this pulse.

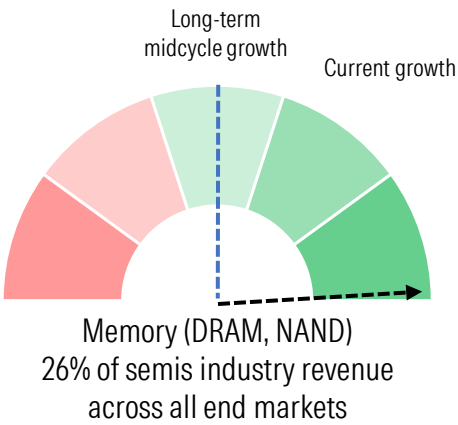
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# End Markets: AI Chip Demand Is Unparalleled, While Other Sectors Are Faring Reasonably Well

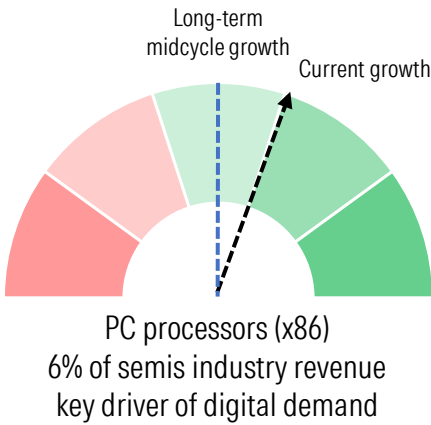
## Data Center (incl. AI) Chip Demand Still Booming



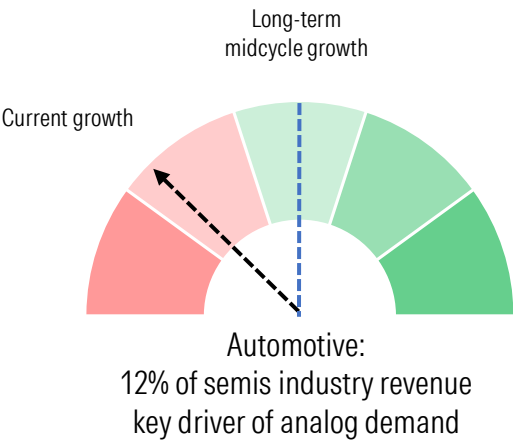
## Memory Is in a Clear Upcycle With Strong Pricing



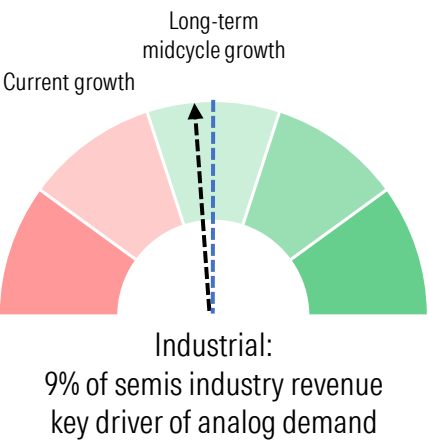
## PC Processor Demand Is Bouncing Back



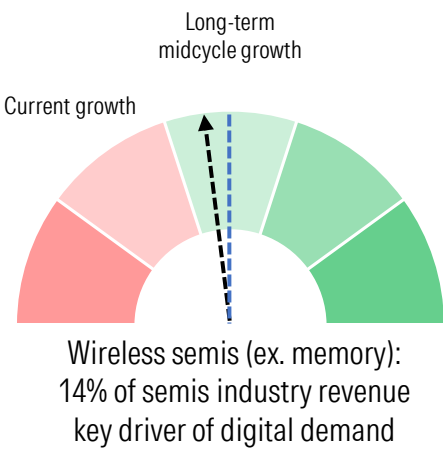
## Automotive Is the Last Subsector in a Downturn



## Industrial Chip Orders Are Beginning to Normalize



## Wireless Chip Revenue Is Recovering



Source: Morningstar, Gartner, WSTS, company documents. % calculations based on 2024 annual estimates. Data as of Jan. 5, 2026.

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# Data Center & AI Semiconductors

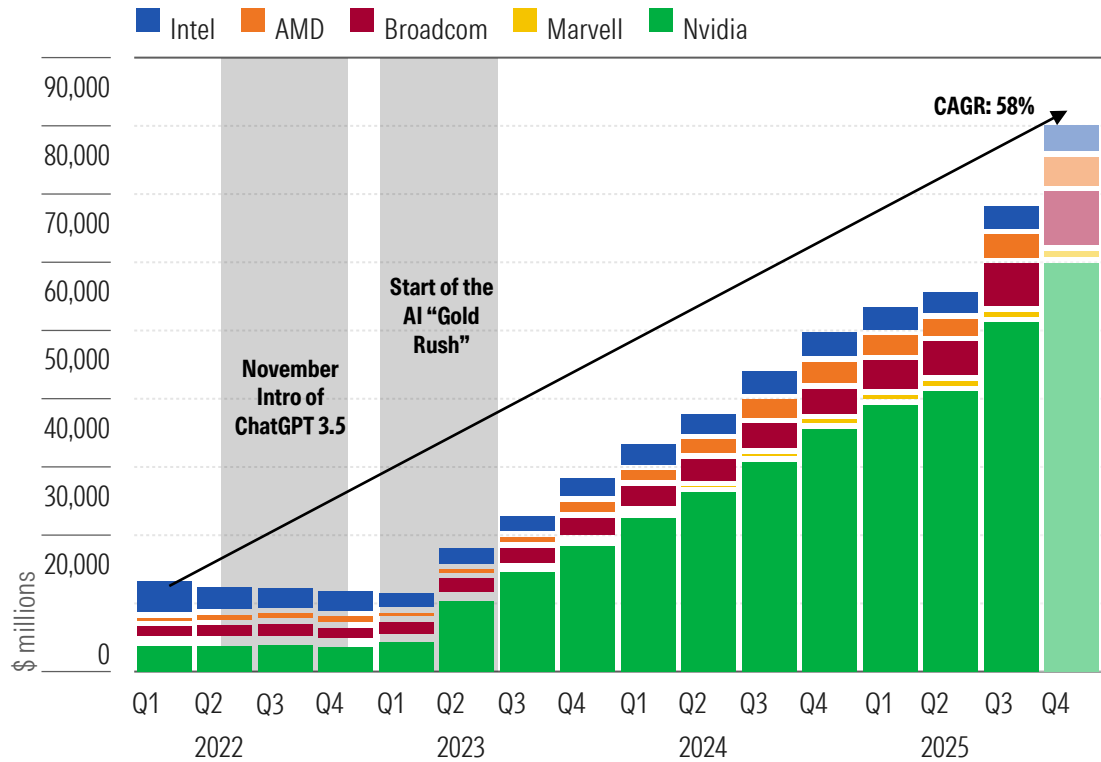
Demand for AI semis has not only not peaked but appears poised to accelerate in 2026.

# Data Center Spending Is Still Booming With Few Signs of a Near-Term Slowdown

- In DCs, Nvidia remains dominant with traction in its next-gen Blackwell Ultra rack-scale solutions for AI training and inference workloads.
- Capital expenditure at large cloud customers (hyperscalers) shows no signs of slowing down. Meta and Oracle have among the highest aspirations.
- Nvidia’s quasi-acquisition of Groq is a longer-term play, in our view, as inference workloads disaggregate between prefill and decode.
- Broadcom should emerge as the AI ASIC leader with strong near-term growth. AMD is carving out a piece of the AI pie.

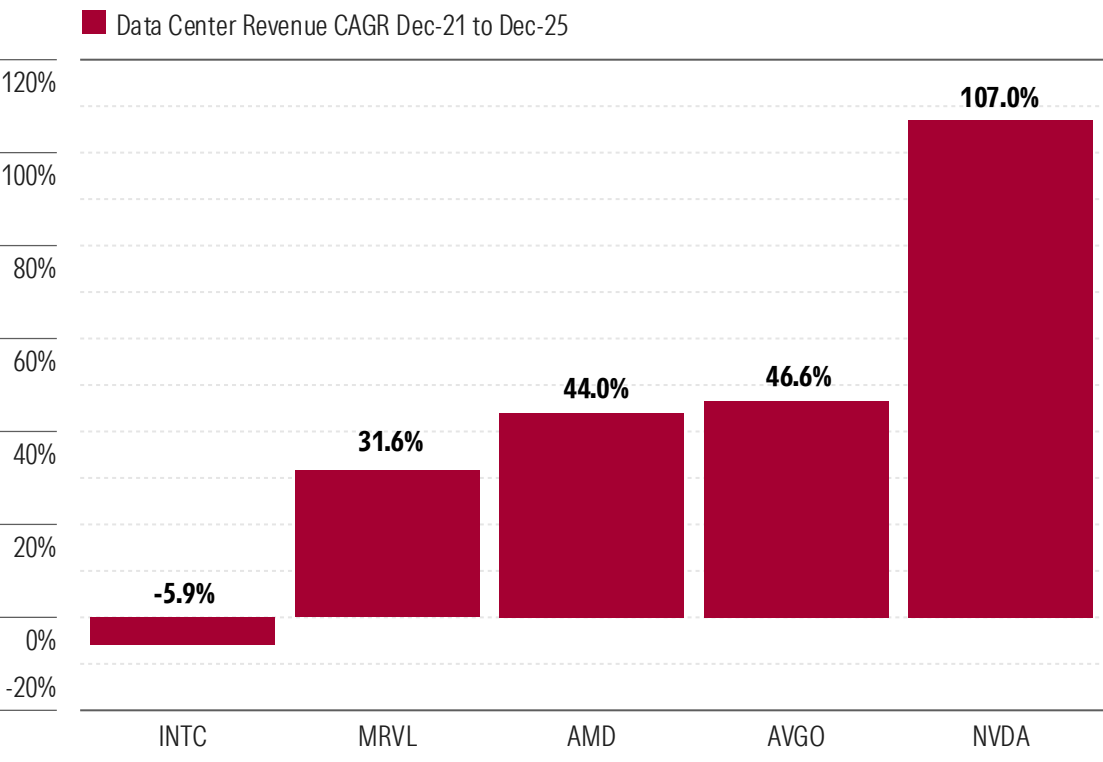
## Nvidia’s Dominance in Data Center Sales Is Unprecedented

The unyielding demand for AI dwarfs that of CPUs and non-AI gear.



## Data Center Growth Has Been Exceptional for All but Intel

The transition to AI has been a boon for most DC chipmakers.

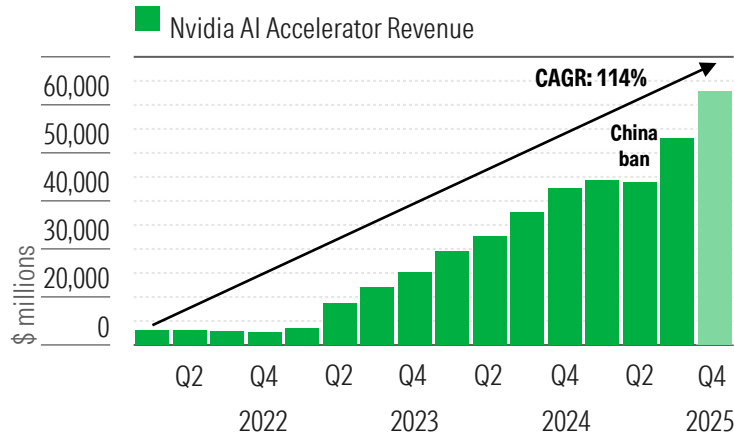


Source: Morningstar, PitchBook, company documents. Data as of Jan. 5, 2026.

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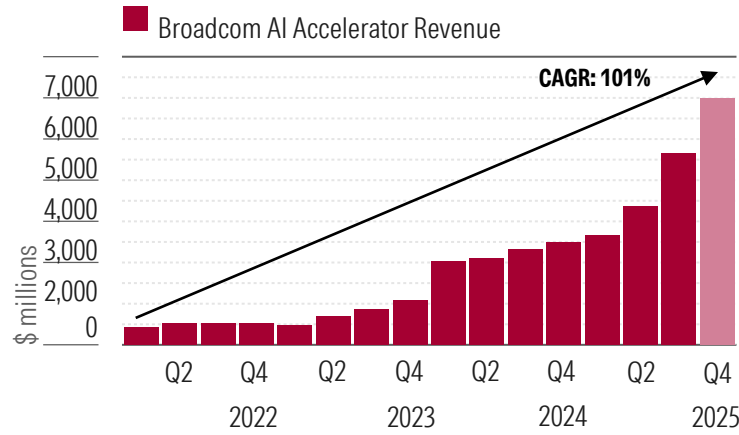
# Nvidia, Broadcom, and AMD Are All Prospering From Unprecedented Growth in AI Accelerators

## Nvidia's Growth Is Nearly Unprecedented



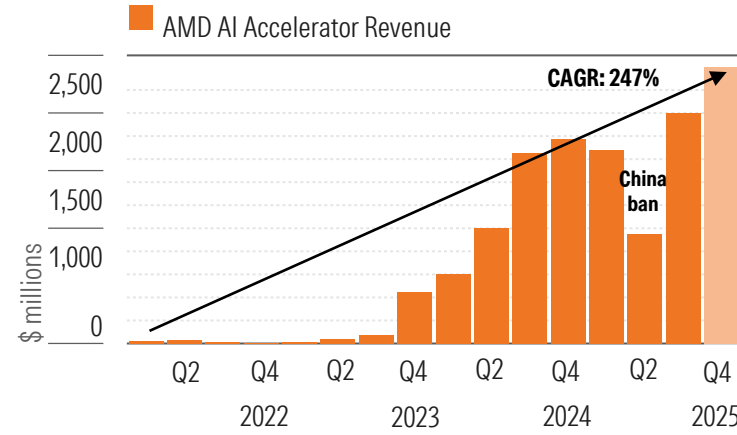
Nvidia remains at the center of the AI industry. Looking at Nvidia's data center compute business (excluding networking), we're still seeing a once-in-a-generation rise in demand and we think Nvidia will sell everything it can build in 2026, just as it has over the prior three years. The only hiccup was in second quarter 2025 with the ban on sales into China, but this ban has been reversed, and the company might see even more upside in 2026 if it can build enough H200s to satisfy a new wave of Chinese AI demand.

## Broadcom's Business With Google's TPUs Is Booming



Broadcom is the leading AI ASIC vendor, most notably via its work with Google on Tensor Processor development, which Google uses primarily to train and run its Gemini LLM today. Google may begin to sell TPUs directly to other AI vendors, such as Anthropic (in which Google is an investor) and Meta is reportedly looking into licensing TPUs via Google's Cloud business. This could lead to even stronger growth to Broadcom, but perhaps some risk is emerging that Google may seek to reduce its reliance on Broadcom as an ASIC partner over time.

## AMD Is Making Admirable Progress in AI



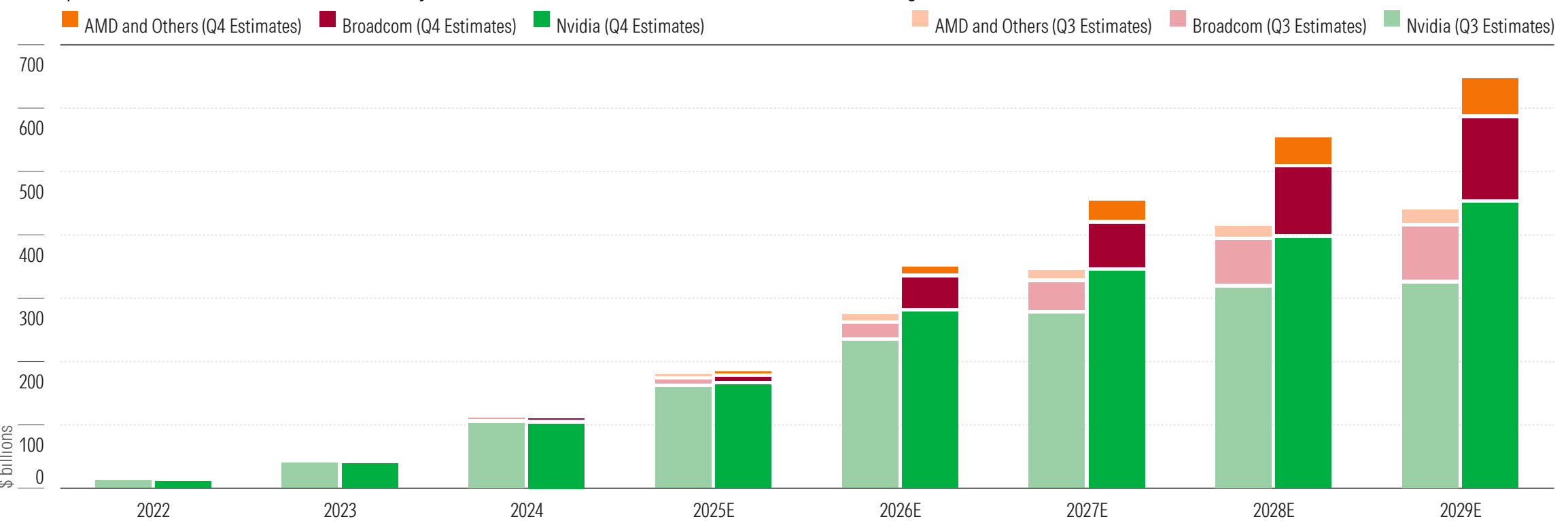
AMD's emergence as an AI GPU leader has been impressive, in our opinion, but overshadowed by Nvidia's massive growth and equally impressive (and aggressive) product roadmap and innovation. We still believe AMD will fill the need for the industry to have a second, independent GPU vendor, given the flexibility and programmability offered by AI GPUs versus custom ASICs. AMD's work with OpenAI will serve as a meaningful "test case" for vendors in 2026 and beyond. Like Nvidia, AMD's second quarter 2025 was hampered by the ban on AI chip sales into China.

# Our Annual AI Accelerator Forecast Has Drifted Higher and Shows No Signs of a Slowdown

- Nvidia effectively guided to \$300 billion of AI revenue (mostly in “compute”, shown below) in October and this may rise even higher with new orders and H200 sales into China.
- Broadcom has emerged as the AI custom ASIC leader, mainly through its work with Google, and we think custom ASICs will take a piece of the market long-term.
- We’re confident in such growth as our estimates are conservative versus comments from Nvidia and AMD; AMD foresees \$1 trillion of industrywide AI chip revenue by 2030.
- Risks to our forecasts center around AI energy, supply chain, and financing concerns. There could be upside beyond our estimates if these turn out to be non-issues.

## We Don’t Expect a Slowdown in AI Accelerator Demand, Although Our Forecasts Are Not as Bullish as Those Provided by Leading Companies

AMD expects custom ASICs, such as those built by Broadcom, to be 20%-25% of the market over time; we agree with this forecast.



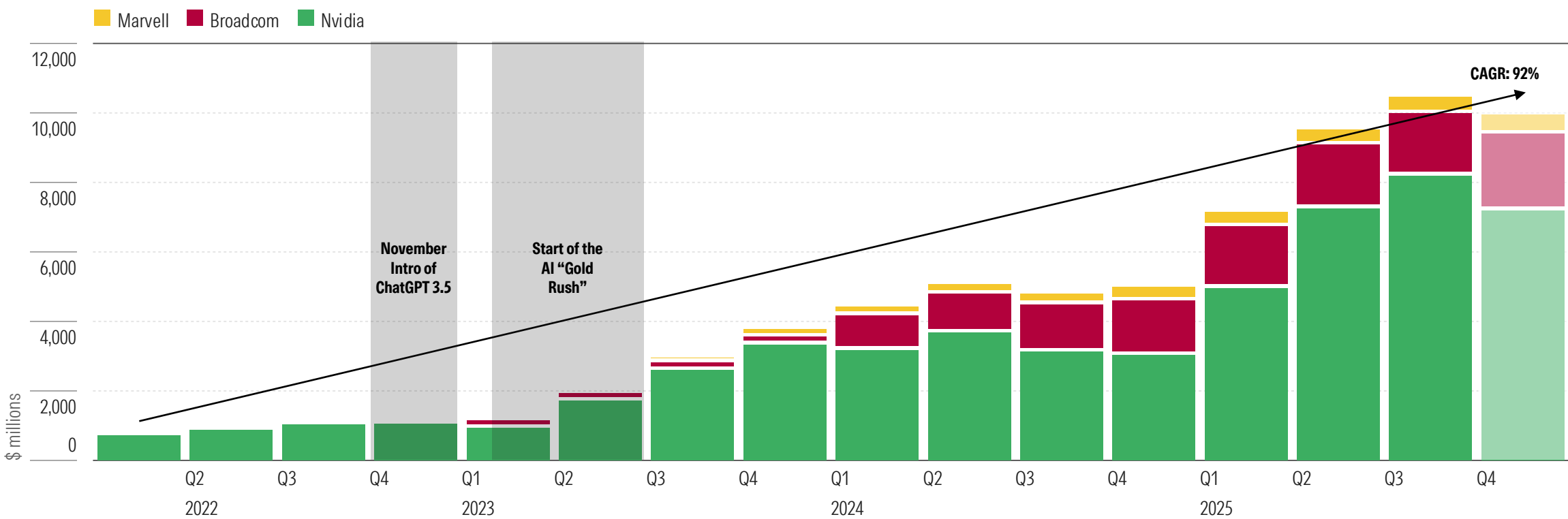
Source: Morningstar, PitchBook, company documents. Data as of Jan. 5, 2026. Others includes US-based companies but does not include Huawei or other Chinese AI processor vendors.

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# Networking Semis Used in AI Are Also in High Demand

- Networking semis are critical components in enabling AI workloads. No surprise that the AI boom has lifted demand for networking semis too.
- Nvidia’s networking business has piggybacked its tremendous AI accelerator demand. We’re impressed with Nvidia’s networking product roadmap.
- Broadcom has excellent expertise in networking semis, including those used in AI, and this expertise may keep it entrenched with Google over time.

## Nvidia Has Emerged as a Prominent AI Networking Vendor – First With InfiniBand and Now With Ethernet



Source: Morningstar, PitchBook, company documents. Data as of Jan. 5, 2026.

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# Taiwan Semi Is a Leading Indicator of AI Wafer Production and Building Ahead for Tremendous Growth

Taiwan Semiconductor Manufacturing is the world’s leading outsourced semiconductor manufacturer, or foundry. Key customers include digital chip design behemoths such as Apple, AMD, Nvidia, and Qualcomm.

We look at TSMC’s monthly revenue (both on a one-month basis and a three-month moving average) to gauge whether front-end manufacturing at the foundry may bode well for near-term revenue among the digital chip giants.

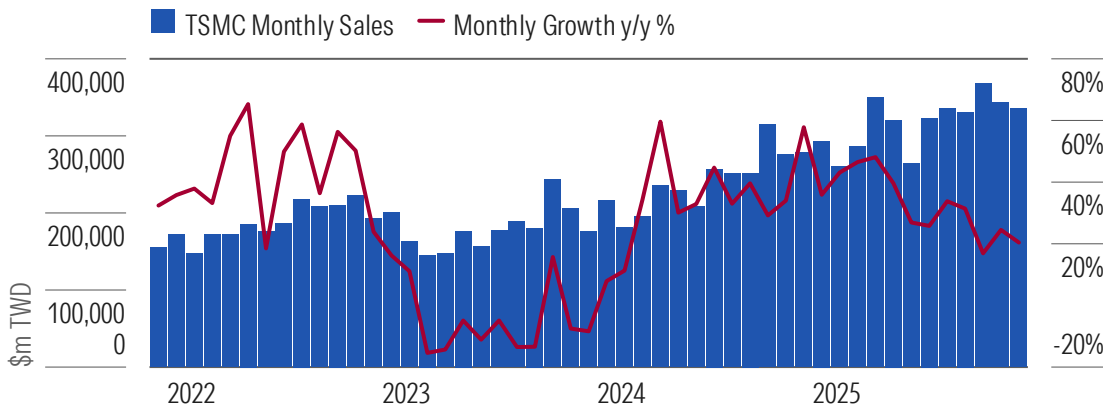
TSMC generated 20% year-over-year revenue growth in the month of December 2025, representing 20.5% growth on a three-month rolling average.

TSMC still sits at the center of the AI boom and is the leading wafer manufacturer for semis going into rack-scale AI solutions. TSMC has enabled Nvidia’s rise and we don’t foresee this relationship meaningfully changing any time soon. Even if Nvidia were to somehow falter, TSMC is relied upon by rivals such as AMD and Broadcom.

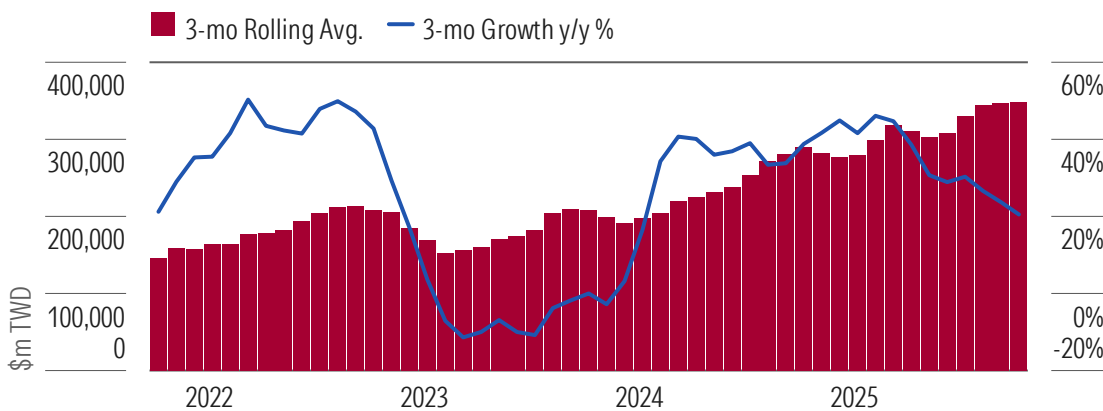
Outside of AI, we see AMD continuing to gain PC processor market share over Intel in both PCs and servers. Intel has also used TSMC for more recent products. Further, x86 server CPU demand is rising, thanks to agentic AI. All of this bodes well for TSMC in the near and medium term.

All of this has likely led TSMC to raise its 2026 capital expenditure forecast as it expands capacity for future AI chip demand.

## Unrelenting AI Demand Continues to Boost TSMC Revenue in 2025



## TSMC Has Been a Key Beneficiary From the Rise of Apple, AMD, and Nvidia



Source: Morningstar, PitchBook, company documents. Data as of Jan. 15, 2026.

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# A Snapshot of Taiwanese ODMs Shows a Healthy Ongoing Buildout for AI Solutions

Taiwanese original device manufacturers are required to report monthly revenue, which can give chip investors an early indication of AI, PC, and mobile device demand. On the right, we look at a three-month moving average of monthly sales from a host of these ODMs.

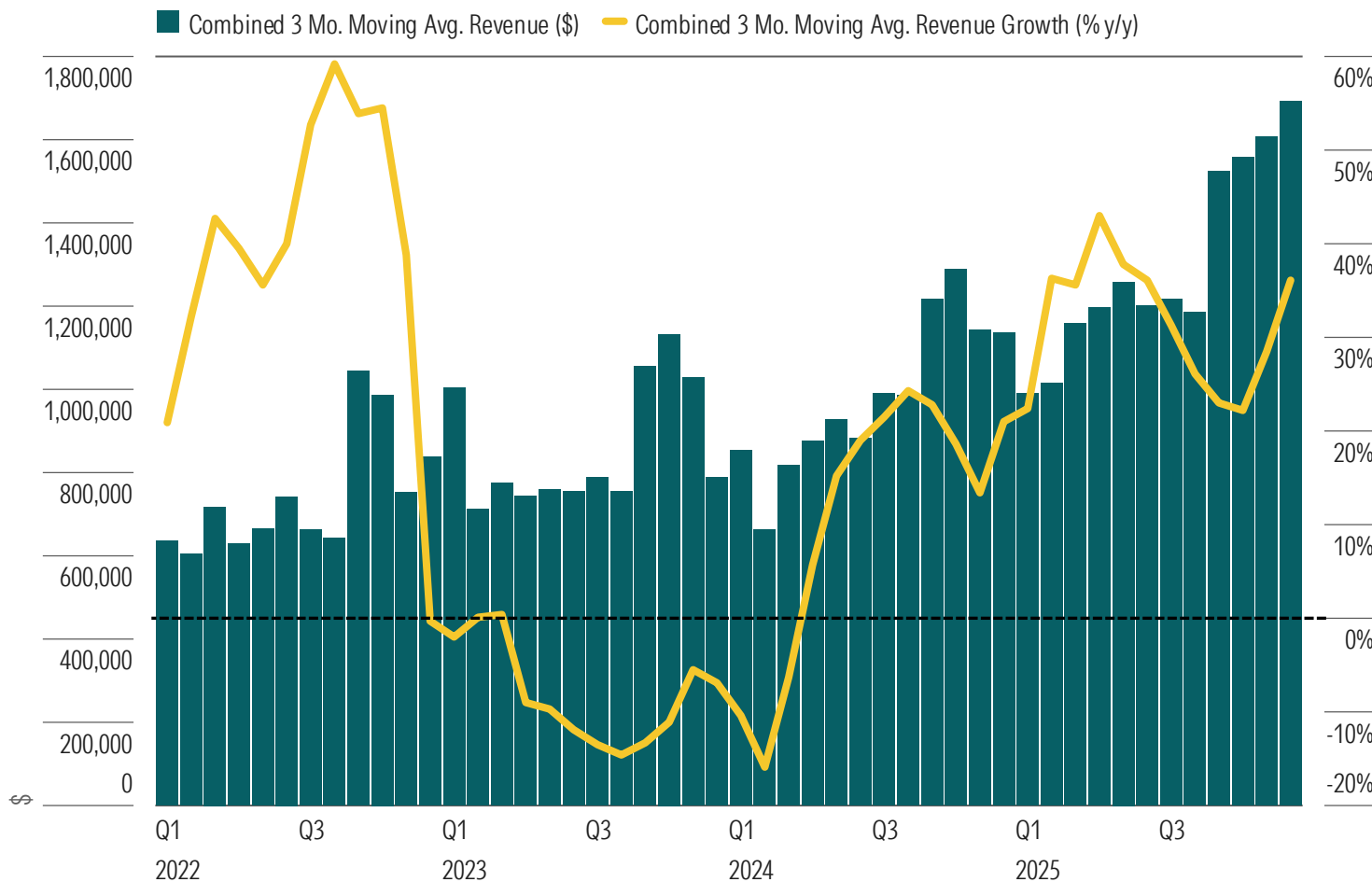
Looking at cumulative revenue from these firms, monthly revenue has been on the rise the past three years due to booming AI demand, in addition to a modest recovery in PC and smartphone sales after the post-covid pause in spending in 2023.

Among the ODMs, WiWynn, which we believe focuses on AI production, has grown the fastest at 156% year over year in the month of November 2025. Revenue at Wistron also nearly doubled in November. Hon Hai, by far the largest Taiwanese ODM, grew 19% year over year in the month of November, thanks to AI.

ODMs shown include: Hon Hai, Pegatron, Wistron, Quanta, WiWynn, Gigabyte, Inventec, and MiTac.

## Electronic Device Production Is Growing With the AI Boom

Hon Hai has high exposure to iPhone production, but AI is leading the way in 2025.



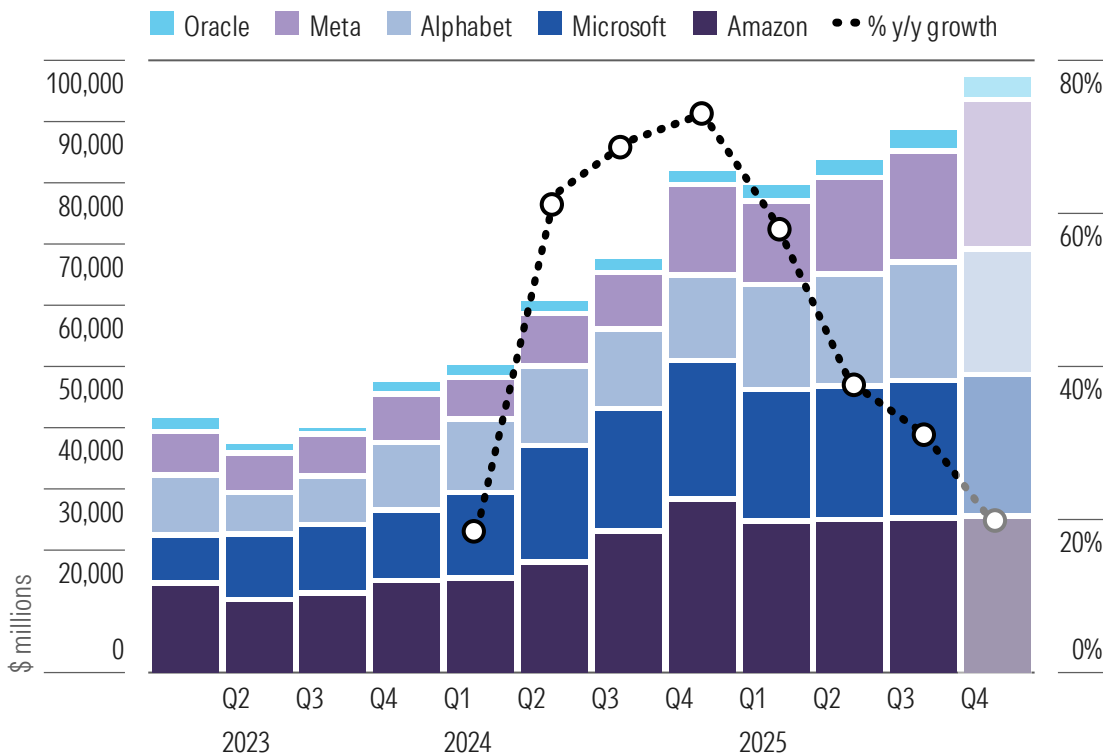
Source: Morningstar, company documents. Data as of Jan. 6, 2026.

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# Quarterly Hyperscaler Capital Expenditure Still Supports Strong AI Chip Revenue Heading Into 2026

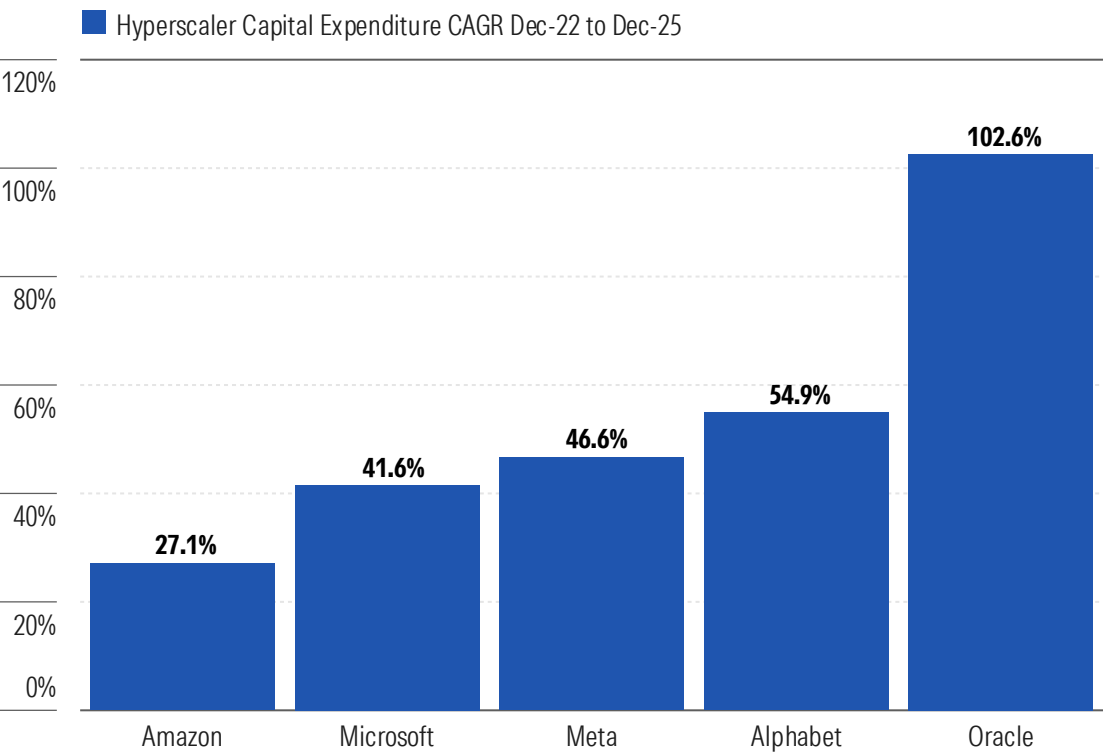
- AI chip revenue has been supported by the hefty spending of some of the largest tech companies in the world. We think this will continue into 2026.
- These hyperscalers remain in a race to build the best AI models, as well as support AI workloads within their cloud businesses.
- Forecasts into 2026 suggest that spending will continue. The longer-term aspirations of Meta and Oracle would be good for AI semis if they come to fruition.

## Quarterly Hyperscaler Capex Is Still Growing Nicely



## Hyperscaler Capex Has Grown at an Impressive CAGR Since 2023

Oracle, most notably, aspires to challenge AWS/Azure/GCP.



Source: Morningstar, PitchBook, company documents. Data as of Jan. 6, 2026. Capex is for each company and may include non-AI spending, such as Amazon ecommerce, Alphabet Waymo, and so on.

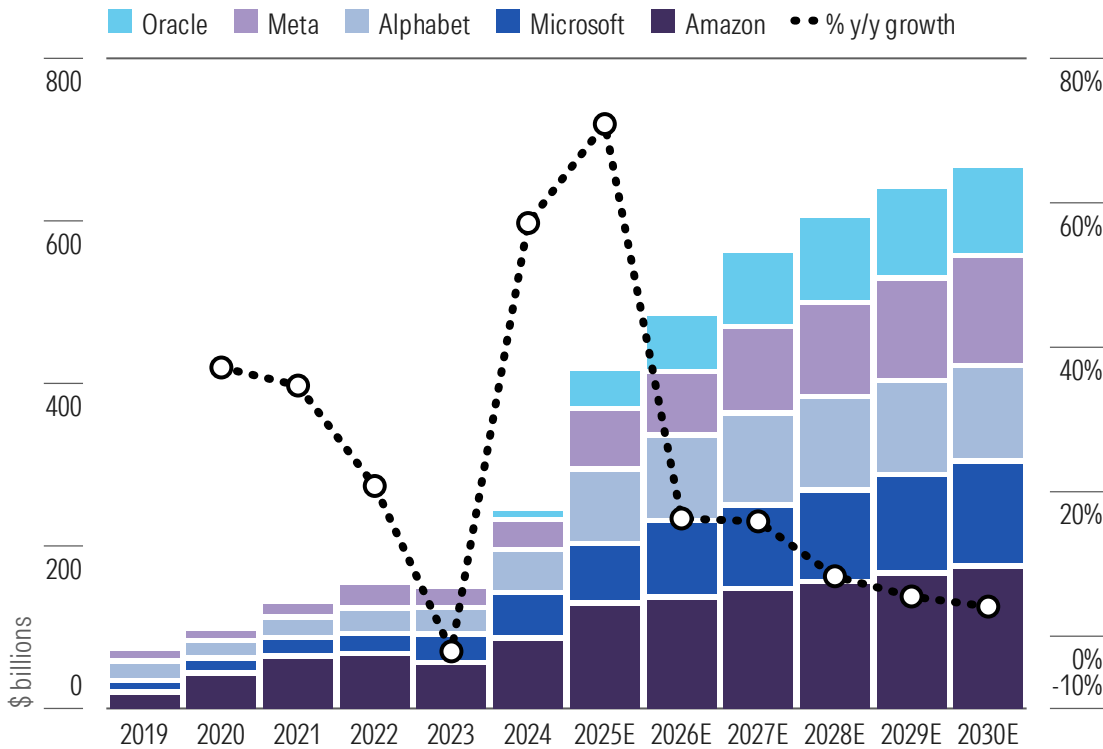
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# Annual Data Center Capex Should Rise Nicely in the Years Ahead

- A look at annual spending shows the massive rise in spending on AI accelerators (namely Nvidia’s GPUs) in the past two years.
- Our cloud and software analyst team expects solid, but not exponential, growth from here. These forecasts appear to be conservative relative to the AI chip and infrastructure forecasts provided by Nvidia and AMD. We still have concerns that financing and energy may mute the most optimistic of AI aspirations and buildouts.
- Nonetheless, hyperscaler revenue (right hand chart) should still grow quite well over the next few years, which should support ongoing spending on AI solutions.

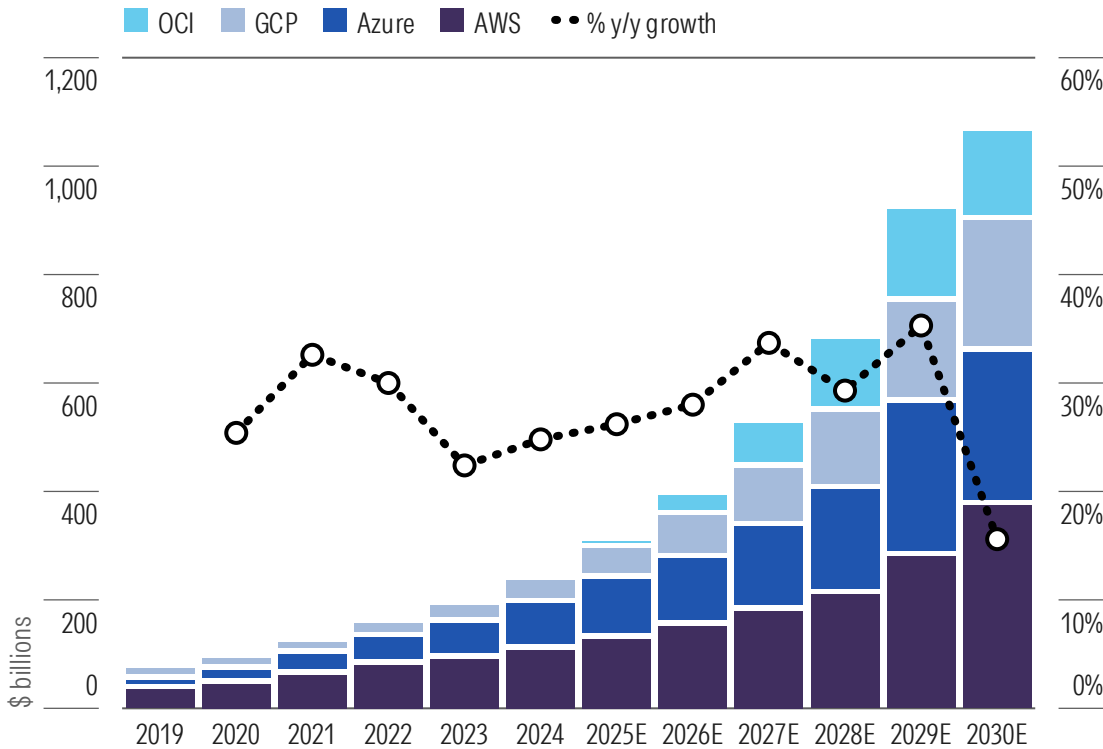
## Annual Hyperscaler Capex Should Rise Nicely from Here

Capex spending should remain strong, but growth rates should decline.



## Cloud Computing Revenue Growth Should Remain Strong Going Forward

We don't anticipate any slowdown in cloud computing demand.

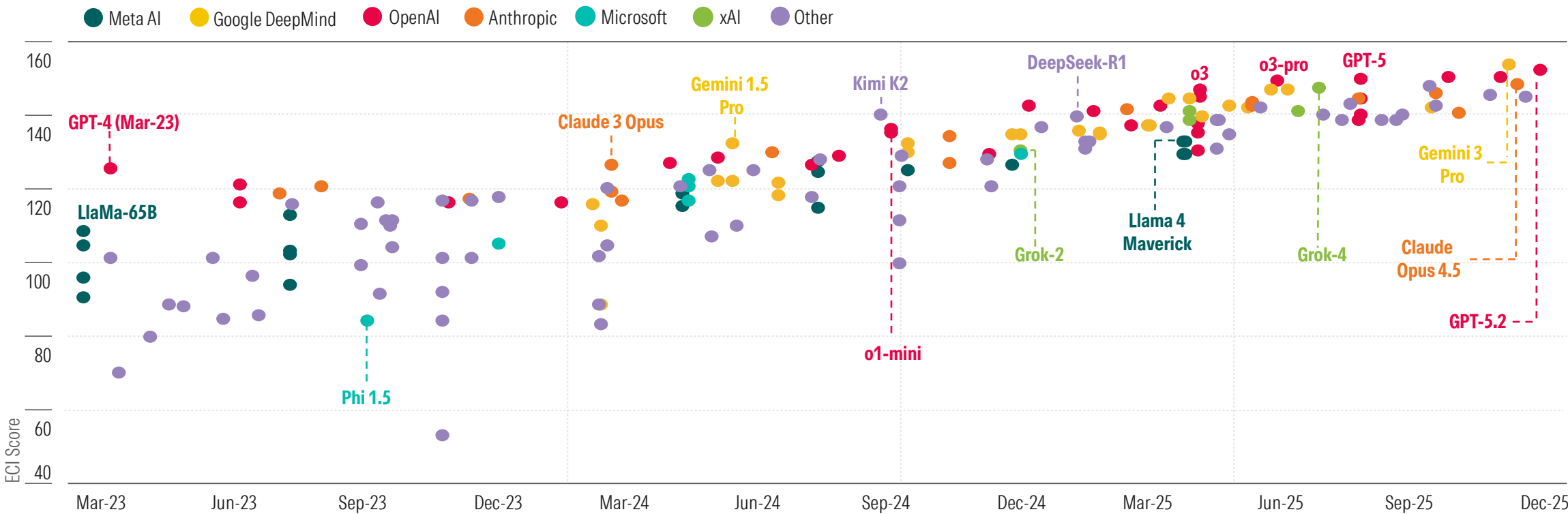


# AI Models Continue to Improve, Which Supports the Need for the Latest and Greatest AI Components

- We look at Epoch.AI's Capabilities Index as a data point to understand the relative improvement of AI LLMs over time.
- AI LLMs improvement suggests that scaling laws are holding, which means that chip demand should remain exceptional as firms add more processing power.
- As model builders compete, we believe they'll seek larger AI clusters for AI training, plus inference enhancements. Both support future investments in AI semis.
- We are not significantly concerned with AI depreciation debates because we believe hyperscalers will still buy the latest and greatest gear regardless.

## Large Language Models Are Still Advancing, Which Should Support Investments and Spending on the Latest AI Gear From Nvidia and Others

We doubt any LLM builder will be content with pausing their investments just to leverage prior capex.



Source: Epoch.AI. Data as of Jan. 5, 2026.

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# Digital Semiconductors

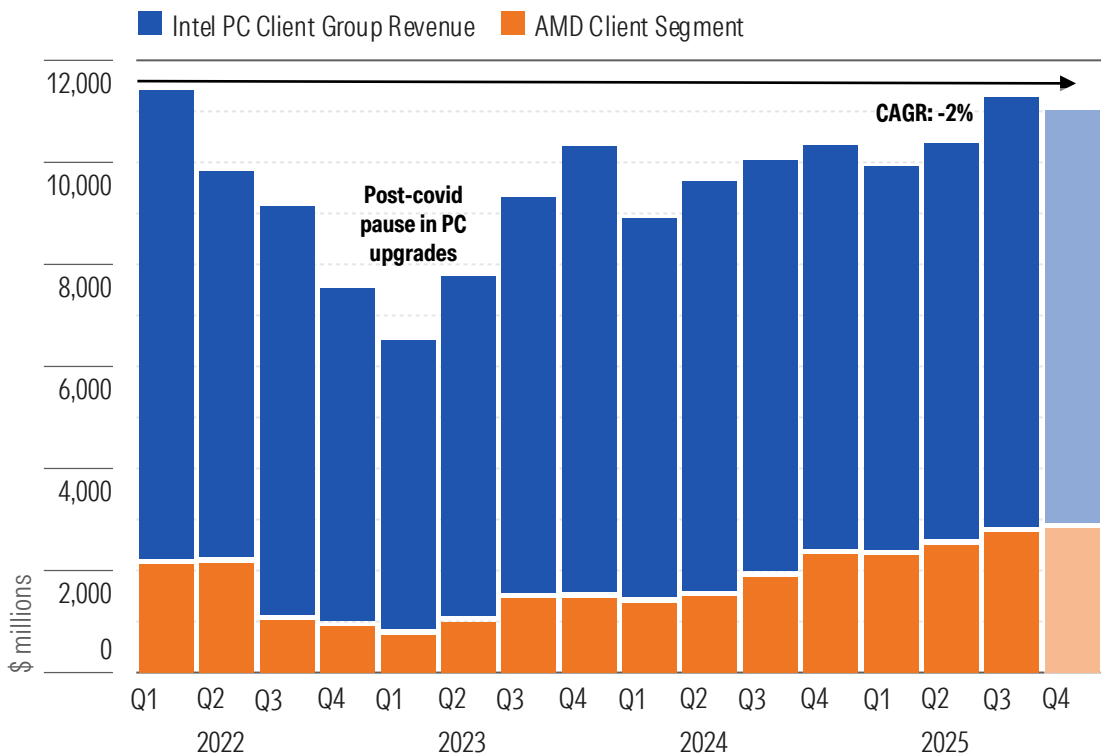
AMD continues to gain share in PC processors. Wireless semis are bouncing back a bit at the end of 2025.

# In PC Processors, AMD Is Clearly Gaining Market Share at the High End

- PC processors have shown some modest growth in 2025.
- Intel's customer mix has shifted toward lower-priced, non-AI PC chipsets. Intel is now allocating internal capacity to server CPUs and away from PC CPUs.
- In contrast, rival AMD saw strong client segment growth driven by sales of higher-priced desktop and notebook CPUs. ASPs are driving most of the revenue increase.
- We expect AMD to continue to capture processor share gains from Intel as production of its latest AI CPUs ramps up over the year.

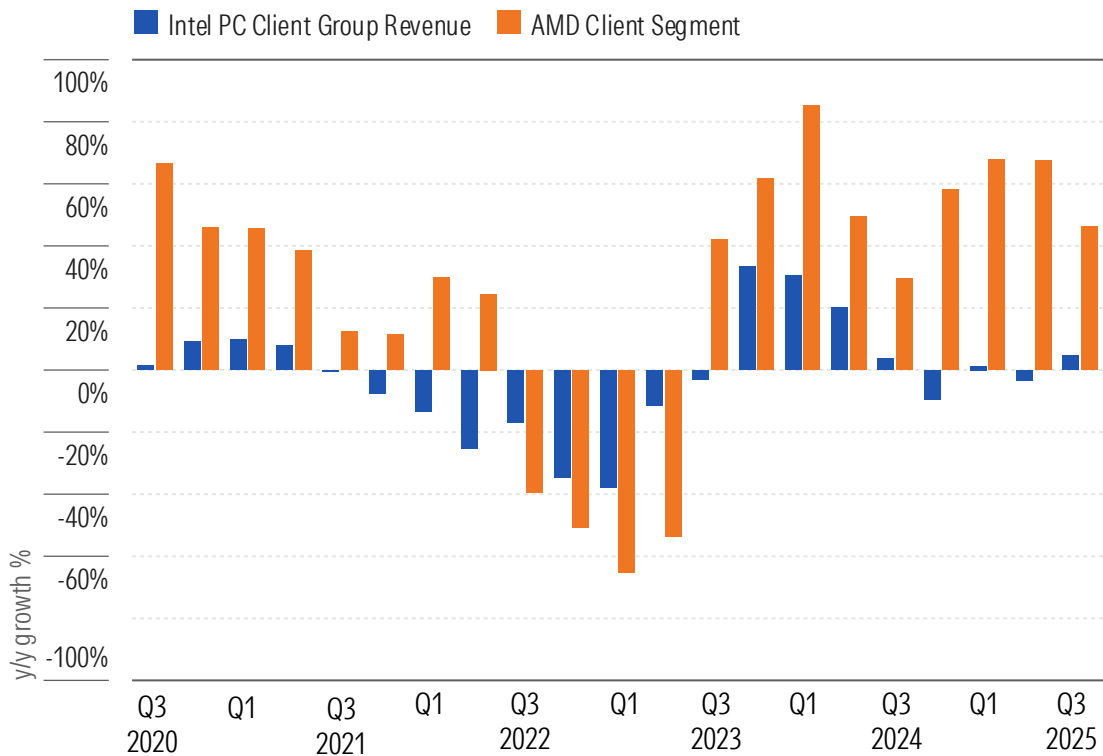
## PC CPU Revenue Is on the Rebound but Not to the Peak Levels During Covid

The AI PC will likely be a sales catalyst over 2025, with AMD capturing share from Intel.



## AMD's CPU Share Gains Are Here to Stay

AMD's growth has eclipsed Intel's over the past few years.



Source: Morningstar, PitchBook, company documents. Data as of Jan. 7, 2026.

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# PC Processor Revenue, in Total, Has Largely Grown in Line With the PC Market

The PC market has been ex-growth for several years, essentially since the rise of the smartphone. Overall, PC CPU makers have failed to increase dollar content per unit and have grown at a pace like that of the overall market, for better or worse.

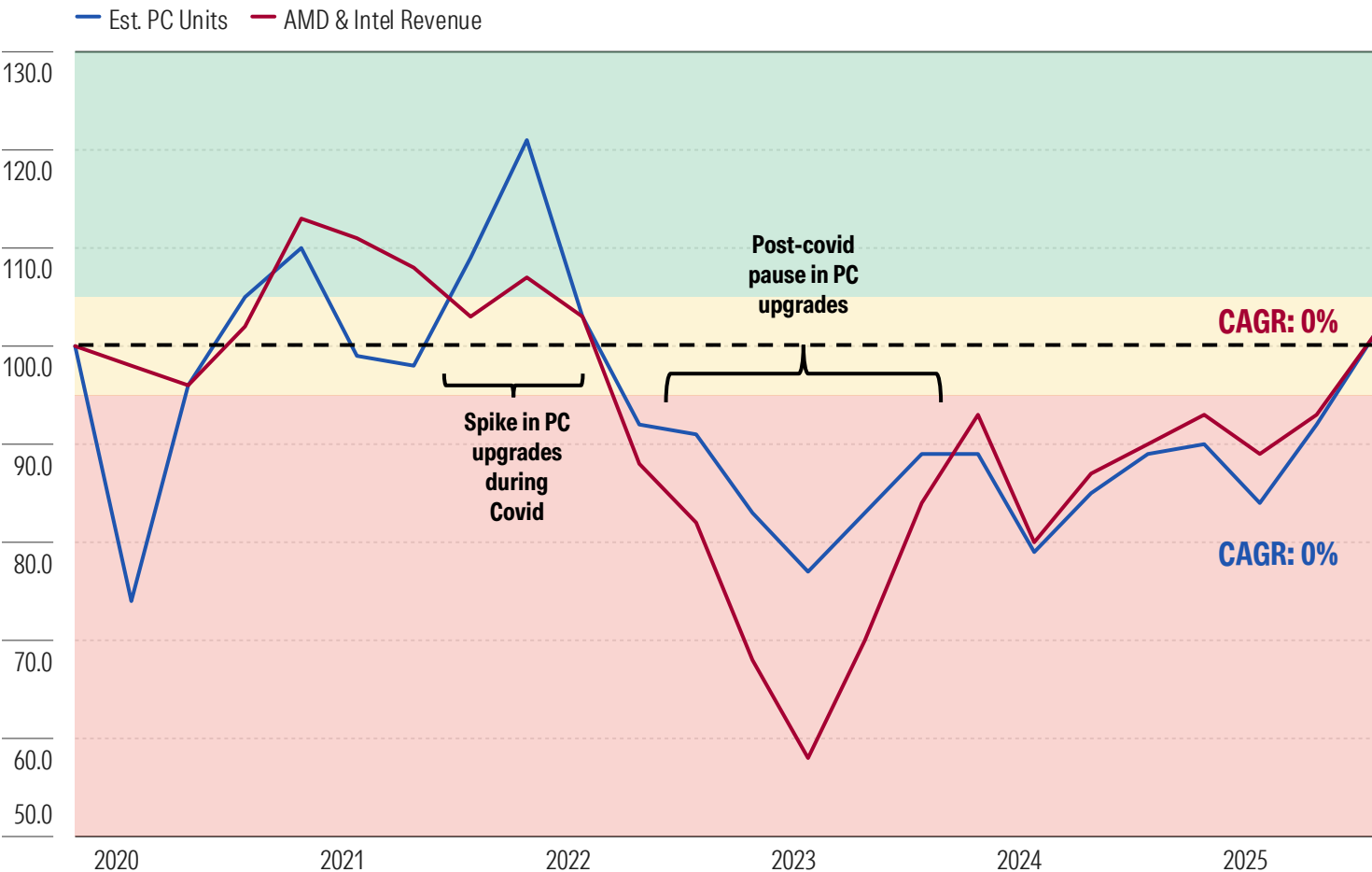
Although AMD and Intel dominate the processor market for Windows PCs with its x86 architecture, CPUs based on ARM’s architecture have emerged to challenge Intel and AMD, offering speedy and efficient processing that allow for longer PC battery lives.

We expect ARM-based vendors to gradually erode the PC CPU market over time, although perhaps less than previously expected if Nvidia’s route into PCs is via its new GPU chiplet partnership with Intel.

Nevertheless, we view AMD as the prime beneficiary of the PC market for the foreseeable future as it gains further share from Intel. That said, it’s plausible that the new Nvidia-Intel partnership may allow Intel to stop the bleeding a bit in PC share losses.

## PC CPU Vendors, in Aggregate, Have Been Unsuccessful in Driving Content Gains in Recent Years

The PC market is not only ex-growth, but Intel and AMD haven’t gained pricing power over PC makers either.



Source: Gartner, Morningstar, company documents. Revenue and unit sales as of September 2025. Exhibit as of Jan. 7, 2026.

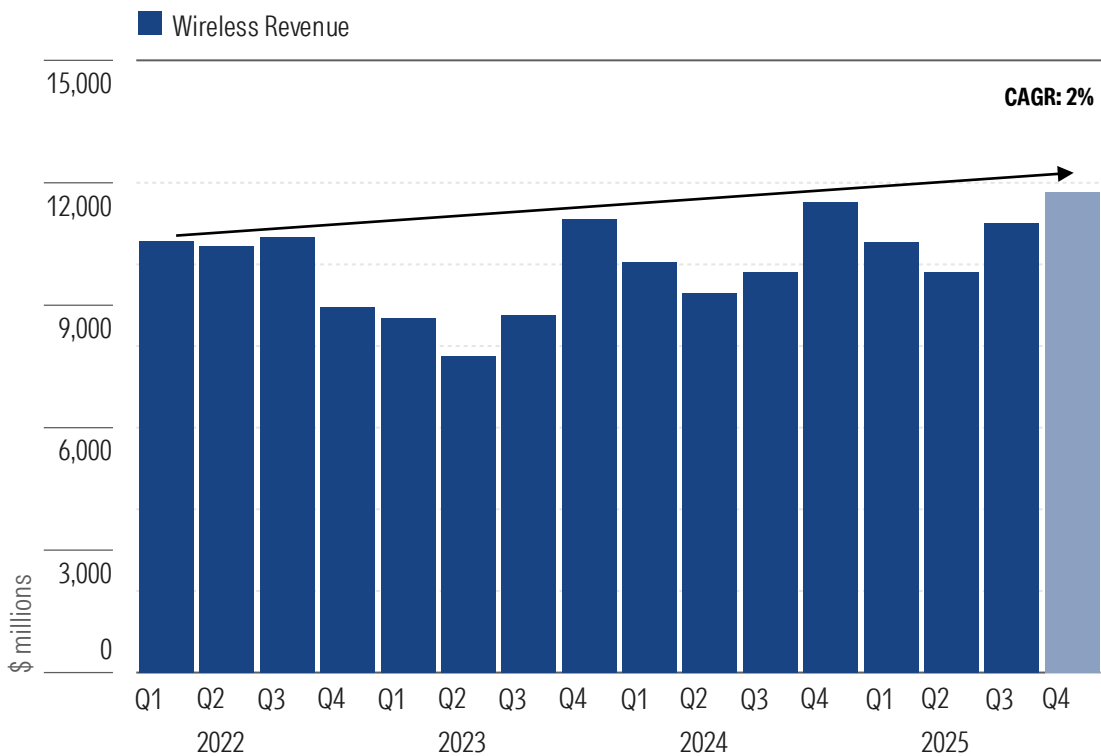
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# Wireless Semiconductor Growth Has Been Modest in Recent Years

- Wireless semis\* include processors, baseband, and radio frequency semis used predominantly in smartphones.
- Wireless semis revenue was sluggish in early 2025 due to normal seasonality and a negative mix shift toward higher demand for lower-priced phones with less chip content.
- Revenue should recover in the back half of 2025, as Qualcomm commanded higher pricing on its processors, while Apple iPhone 17 series unit sales should be solid.
- Skyworks' pending merger with Qorvo is a reasonable and beneficial one, in our view. We see some risk of failure to get regulatory approval, however.

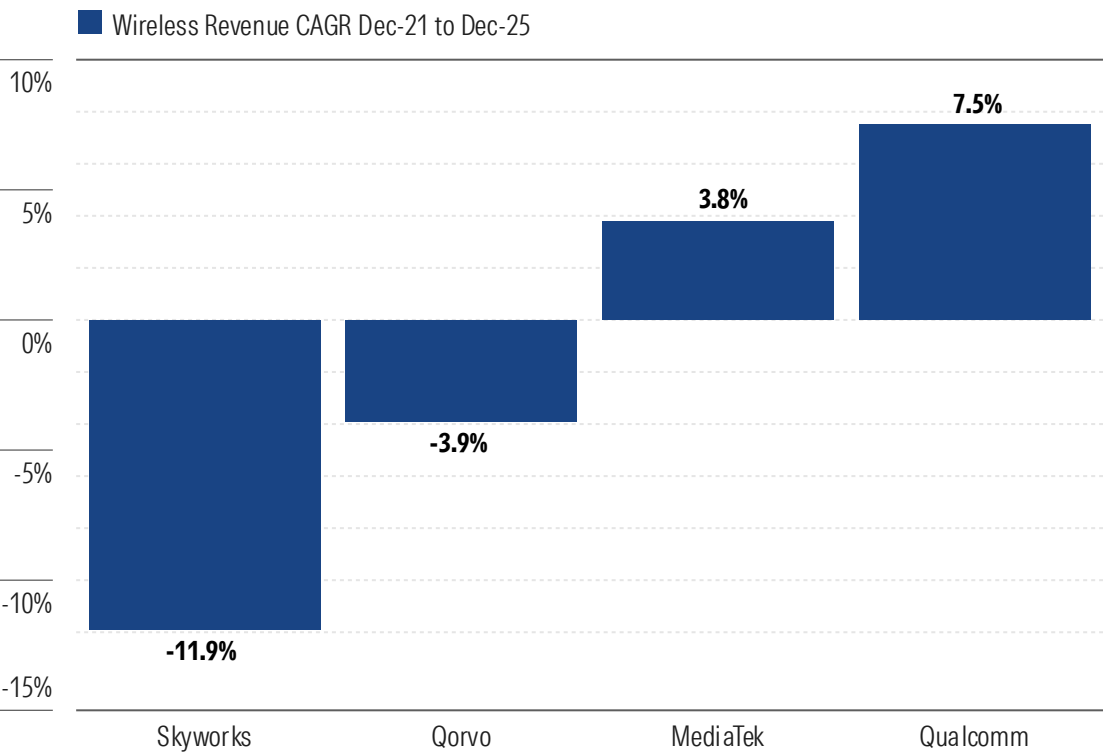
## Wireless Chip Revenue Will Likely See Only Modest Growth in 2025

Qualcomm remains the industry leader while RF pure-plays haven't grown much.



## RF Growth Has Been Soft Since 2019, but Processors Made Some Leaps

Skyworks revenue peaked with the dawn of 5G, but recently lost Apple iPhone content.



Source: Morningstar, PitchBook, company documents. Data as of Jan. 7, 2026.

\*Wireless revenue includes handset revenue of Qualcomm and MediaTek plus mobile revenue (RF) of Skyworks and Qorvo.

See Important Disclosures at the end of this report.

# 5G Led to a Terrific Boost in Chip Content per Smartphone Earlier This Decade, but Gains Have Since Stalled

Here, we examine revenue growth in the wireless chip industry relative to smartphone unit sales growth. Unsurprisingly, we see the smartphone unit sales market as ex-growth, as longer replacement cycles have largely offset the benefits of population growth and further device adoption.

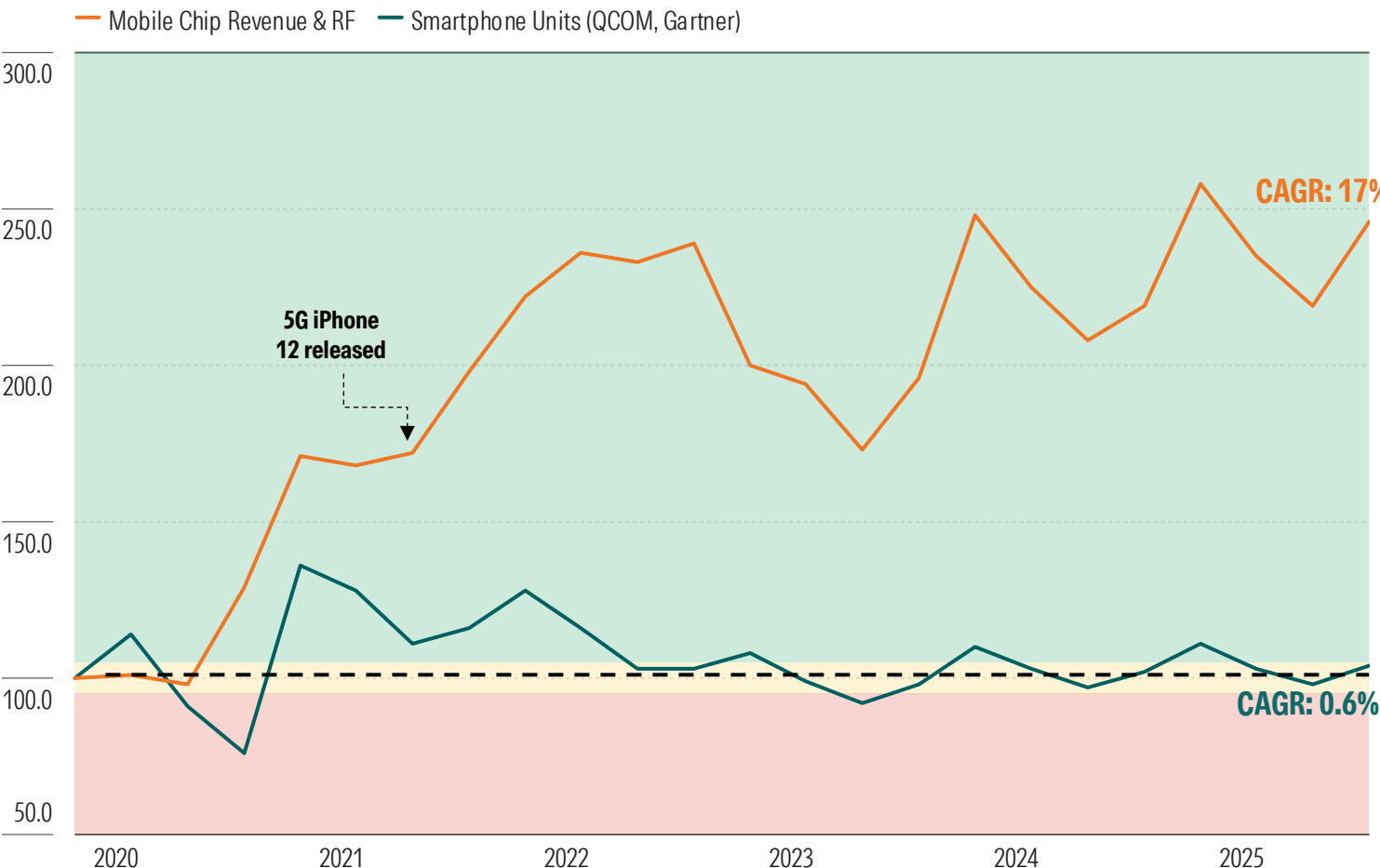
However, wireless chipmakers have still managed to gain market share over the past five years. With the launch of 5G devices like the iPhone 12 in late 2020, radio frequency chipmakers that produce filters and amplifiers, among other parts, gained higher dollar content per device, with Qualcomm a notable beneficiary.

Qualcomm expects about 70% market share in Apple's iPhone 17 launch, while chip content in Samsung phones stays at 75%. MediaTek continues to benefit from sales to Chinese smartphone brands.

It's possible that Apple has a strong year of iPhone sales ahead. In the long term, however, content gains per device will still be the biggest driver of chipmaker revenue growth.

## 5G Content Gains Have Propelled Wireless Chip Revenue Despite a Muted Smartphone Market

Wireless vendors benefited from the wireless signal complexity of 4G and 5G networks.

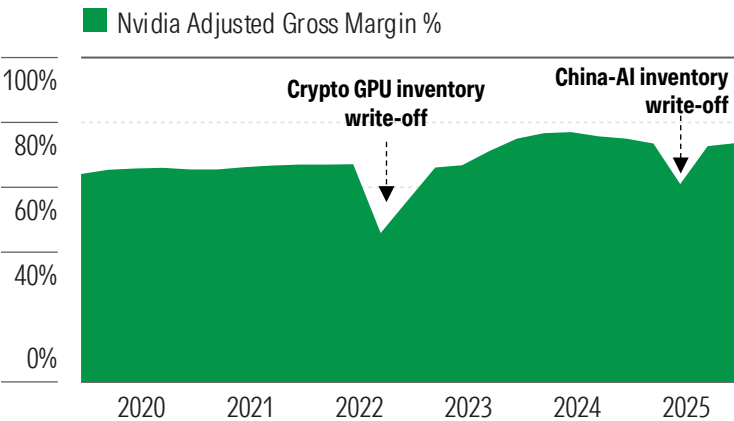


Source: Gartner, Morningstar, company documents. Revenue and unit sales as of September 2025. Exhibit as of Jan. 7, 2026.

See Important Disclosures at the end of this report.

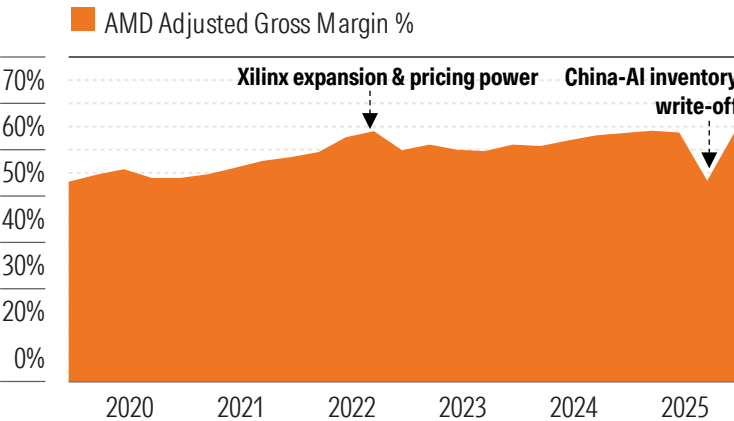
# Gross Margins Tell the Recent History of Digital Semis, as Nvidia and AMD Have Supplanted Intel

## Nvidia's GM Profile Remains Best of Breed



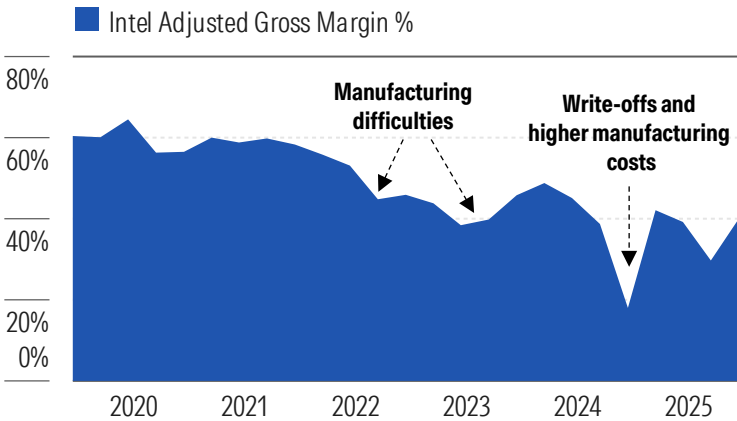
Nvidia's gross margins remain unmatched, reaching a peak of 78%, thanks to its dominance in AI. Gross margin fell to 61% in the April 2025 quarter based on US restrictions that forced the write-off of H20 products aimed at China. Excluding the write-off, adjusted gross margin would have been 71.5%. Gross margin in the July quarter rebounded to 73%. Longer term, we think low-to-mid-70% gross margins are still attainable given Nvidia's robust pricing power.

## AMD's GM Expansion Has Been Impressive



AMD's gross margins expanded in the second half of 2025 due to improving PC demand and strong data center revenue. However, the China restrictions caused the second-quarter gross margin to dip to 43%. Excluding China, AMD would have earned a 54% gross margin. We think AMD's long-term adjusted gross margin target of 55%-58% is achievable as data center becomes a bigger part of AMD's overall revenue mix.

## GMs Tell the Story of Intel's Fall from Grace



Intel's gross margins somewhat recovered in 2025, albeit because of a mix shift toward sales of legacy chipsets. However, gross margins are generally a far cry from the firm's heyday of 60%-plus. We anticipate margins declining below 40% in the fourth quarter and the start of 2026 as Intel ramps up its next generation of products, including Intel 18A.

# Memory

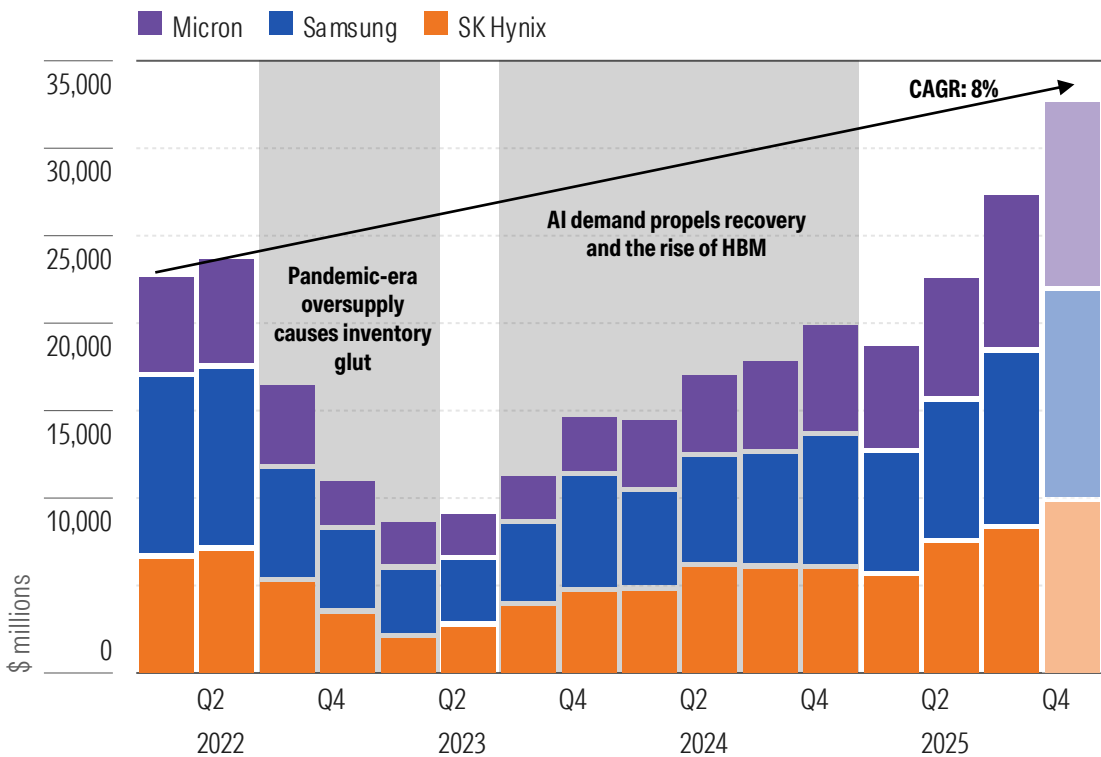
Red-hot AI demand is stretching memory prices to new highs, and supply is several quarters away from catching up.

# Supply-Squeeze Fears Among Electronic Vendors Are Exacerbating the DRAM Shortage

- We estimate traditional dynamic random-access memory will make up 54% of demand in the memory market in fourth quarter 2025.
- Prices of DRAM have been surging due to rising data center infrastructure demand and vendor stockpiling in anticipation of ongoing supply shortages.
- Based on Samsung’s preliminary fourth-quarter results, we may see 70% sequential pricing growth for non-HBM DRAM, underscoring the tight overall market conditions.
- While prices will likely remain elevated in the coming quarters, we expect supply to eventually improve as new fabs come online, causing pricing to normalize long-term.

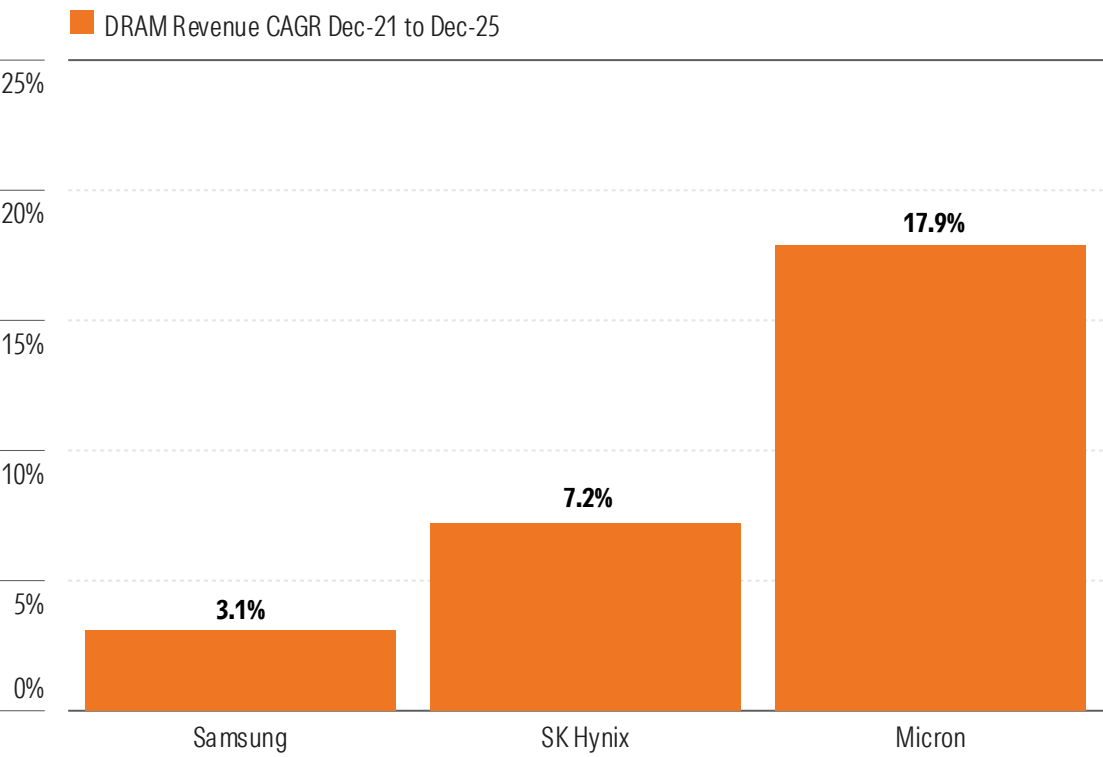
## Growing Demand for Advanced DRAM is Driving Robust Revenue Growth

Micron's larger share of high-priced DDR4 enabled higher growth than SK Hynix in Q3.



## Micron and SK Hynix Remain the Top Beneficiaries of DRAM Demand So Far

Samsung’s HBM push may have come at the expense of traditional DRAM pricing upside.



Source: Morningstar, PitchBook, Gartner, company documents. Data as of Jan. 8, 2026.

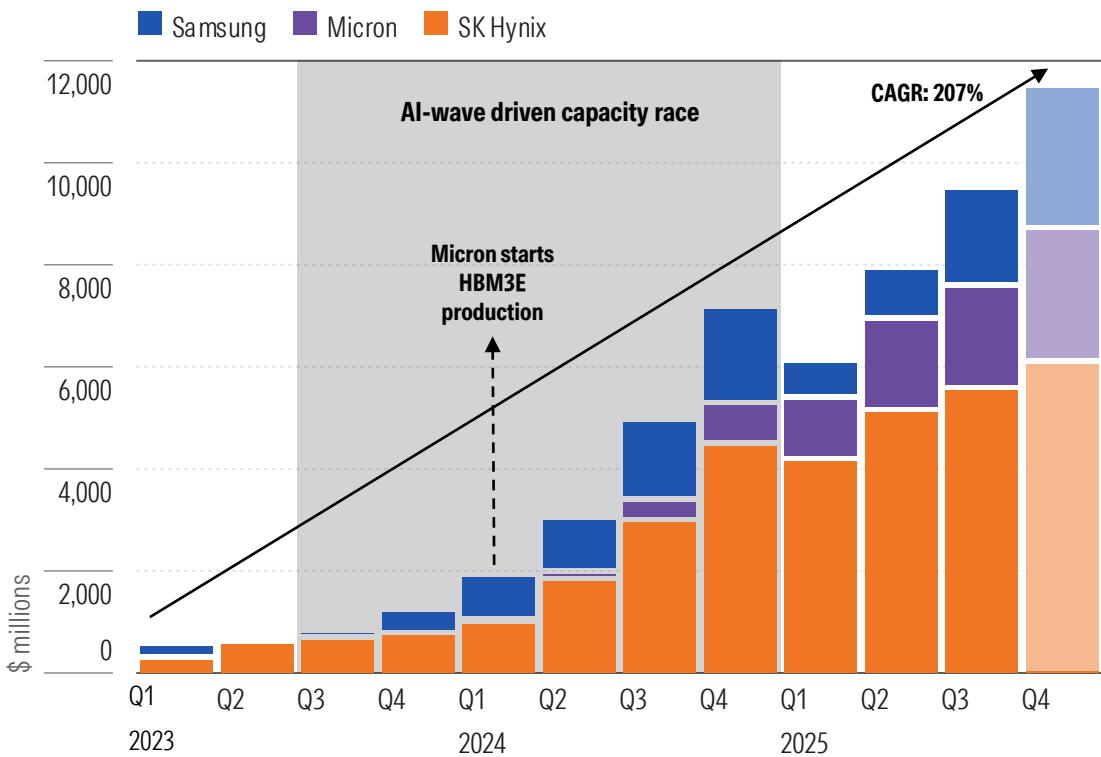
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# Nvidia Remains the HBM Linchpin That Could Reset Competitive Dynamics in Samsung's Favor

- We expect surging demand for AI buildouts to fuel a boom in high bandwidth memory revenue, making up 26% of all DRAM sales by fourth quarter 2025—up from just 6% in 2023.
- Samsung's results from the third quarter appear to reflect Nvidia's HBM3E qualification, buoyed by ramping production following the lift of the ban on AI chip exports to China.
- Despite the green light on its HBM3E, Samsung continues to lag Micron and SK Hynix in the market, given the firm's delayed ramp and Nvidia's pending qualification of its higher-price HBM4 line.

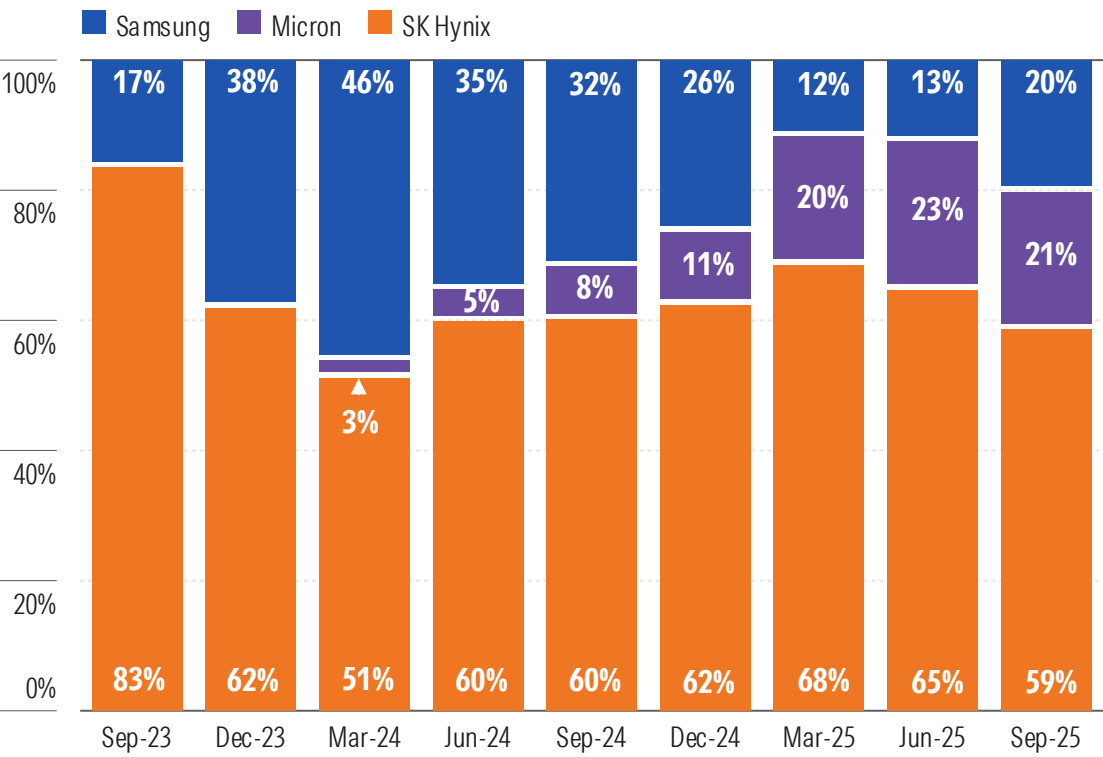
## HBM Remains a Key Winner of the AI Era

Outsize data center demand and constrained supply have kept prices buoyed.



## Nvidia's Qualification of Its Early HBM4 Has Enabled SK Hynix to Maintain Its Lead

Samsung's HBM3E ramp has enabled it to claw back some market share.

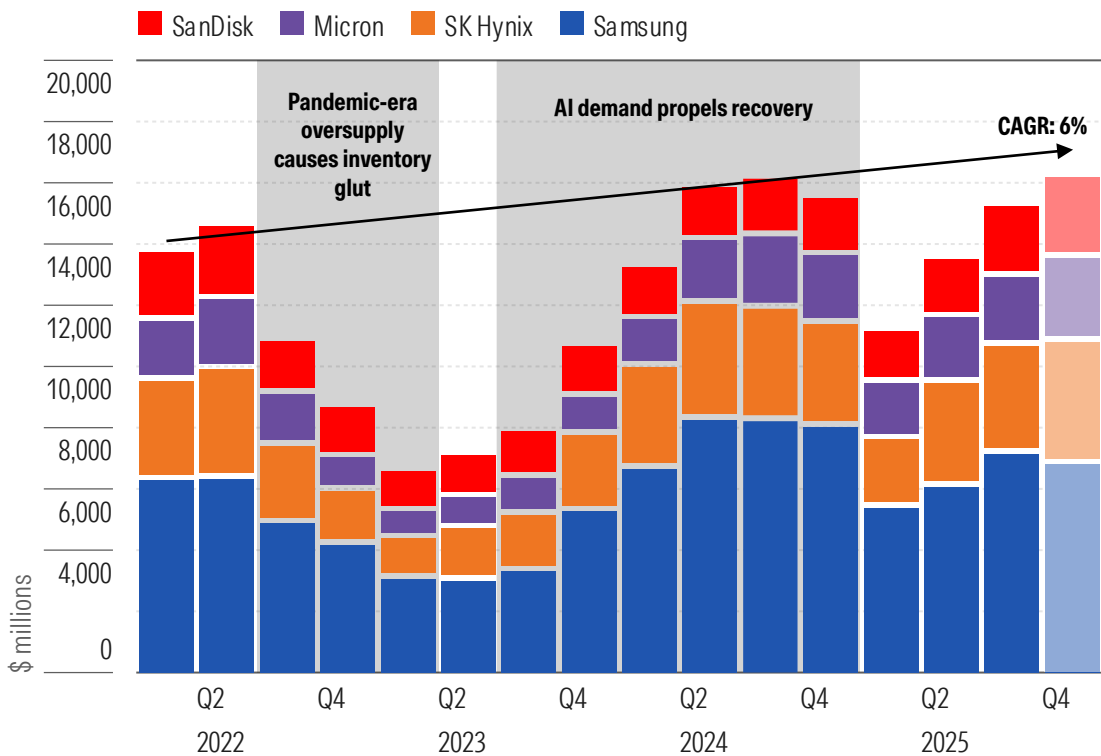


# Prior Production Cuts and Growing Data Center Demand Will Likely Keep NAND Prices Elevated in the Near Term

- As of 2024, we estimate Not-And chips will make up 27% of all memory revenue in fourth quarter 2025.
- The gap between NAND supply and demand continues to widen as torrid data center demand lifts prices, compounded by supplier production cuts earlier in 2025.
- We expect the current supply-constrained environment to persist through calendar 2026 and support further pricing improvements.
- However, the ongoing upcycle doesn't distract us from the commodity-like nature of NAND chips, and we continue to anticipate pricing to normalize over the next few years.

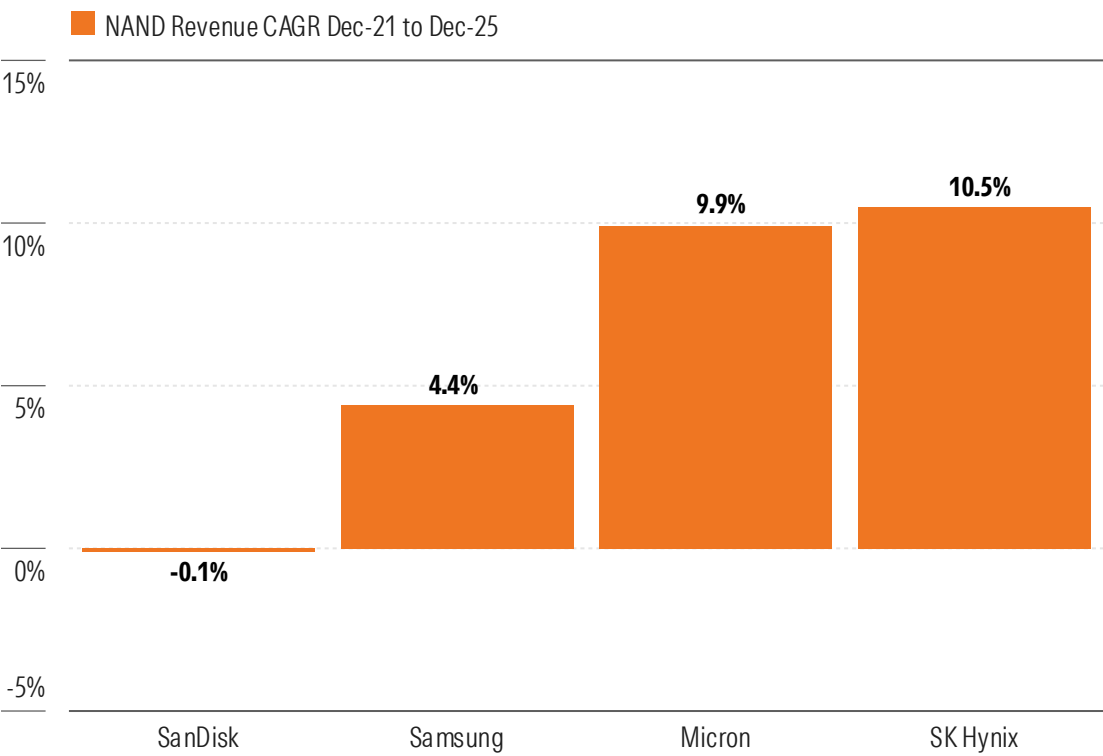
## The Ongoing Supply Squeeze Is Driving Industry-Wide Gains

We expect the current upcycle to stretch deep into 2026.



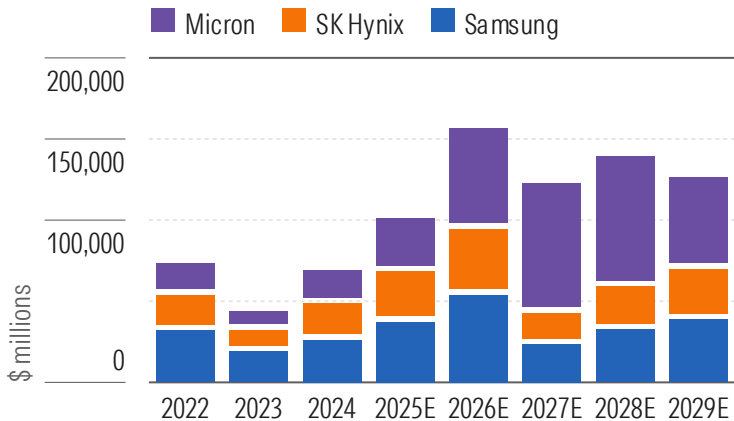
## SanDisk's Results Were Impacted by a Prior Inventory Glut

Shipment execution remains a challenge, but we see signs of improvement.



# Memory Growth Has Been Exceptional Lately, But Longer-Term, Pricing Normalization Seems Inevitable

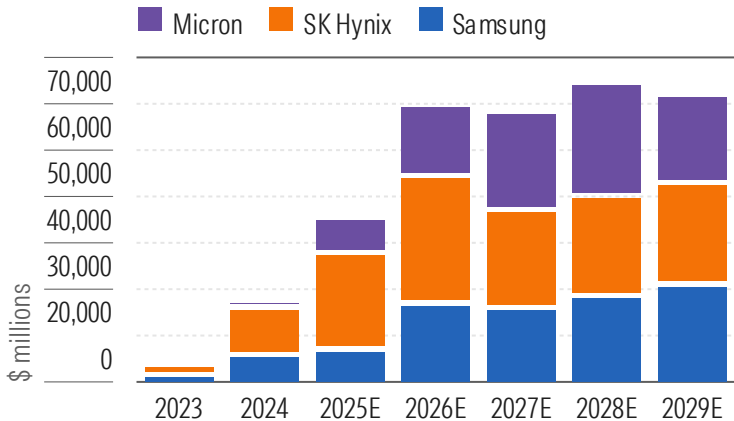
DRAM Pricing Drivers May Lose Steam by 2027



We attribute the ongoing upcycle for traditional DRAM to a combination of vendor stockpiling, the Windows 10 refresh cycle, and conversions of DRAM capacity to HBM. With such near-term drivers largely realized, we expect traditional DRAM prices to taper starting the second half of 2026.

Given the inherently commodity-like nature of DRAM, including HBM, our long-term view remains centered on the industry's cyclical, ultimately transitory pricing strength, with normalization expected over time.

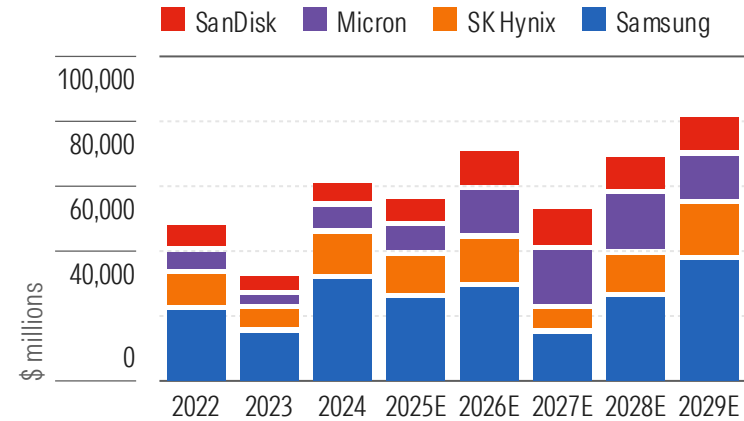
New Fabs May Help Rein in Burgeoning HBM Prices



As a key AI winner, we expect HBM to enjoy pricing growth in the medium term. Current deal visibility points to tight supply through 2027 despite rising production capacity.

Although early qualification results for Samsung's HBM4 appear competitive, its rocky HBM3E ramp tempers our confidence in a near-term catch-up with competitors, despite longer-term upside. As SK Hynix's new Yongin and Samsung's P5 fabs come online, we expect supply growth to accelerate, capping supernormal pricing and pressuring Micron's outsize share gains.

In NAND, China May Cap Korean Supplier Gains



We expect data center investments and HDD replacements with NAND to drive NAND demand over the next few quarters. In the medium term, we expect SK Hynix and Samsung's sales growth to moderate as HDD replacement rates mature, and Chinese competitors gain market share. We currently model supply-demand dynamics for Micron and SanDisk to normalize around 2028, although further visibility into demand may drive estimates higher. We anticipate that new AI architectures, such as Nvidia's newly announced Memory Storage Platform, will use higher-capacity NAND, keeping demand buoyed.

# Analog/Mixed-Signal Semiconductors

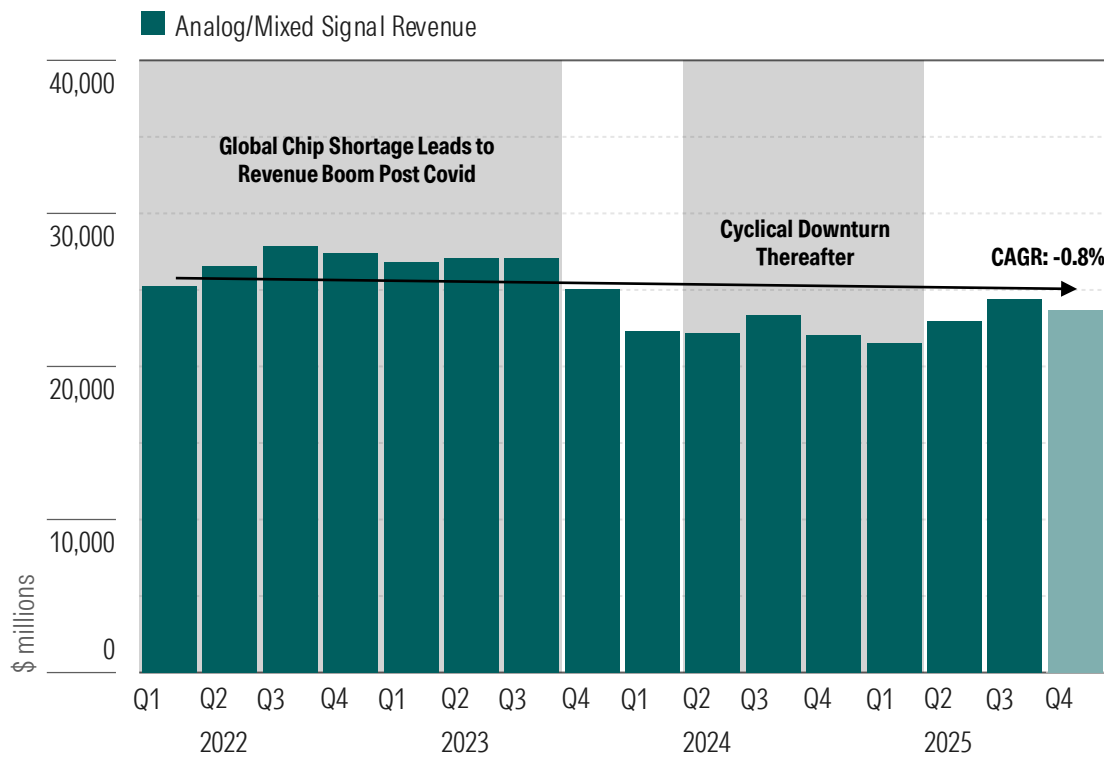
Industrial chip inventory corrections appear to be winding down. Auto is weak, but the cyclical trough appears shallow.

# Analog/Mixed-Signal Chipmakers Are Recovering, Although Macroeconomic Risks Are Possible

- Semis that go into automotive, industrial, and consumer applications made up 30% of industry revenue in 2024, per Gartner. Analog/mixed-signal chips have high exposure here.
- This group of companies experienced a severe cyclical downturn in 2024, particularly in the industrial end-market and, to a lesser extent, in automotive.
- We are now likely approaching normal, midcycle conditions across almost all end-markets. Microchip's higher guidance was a bullish signal in early January.
- In the longer term, we believe that the structural tailwinds of higher chip content per device remain in place.

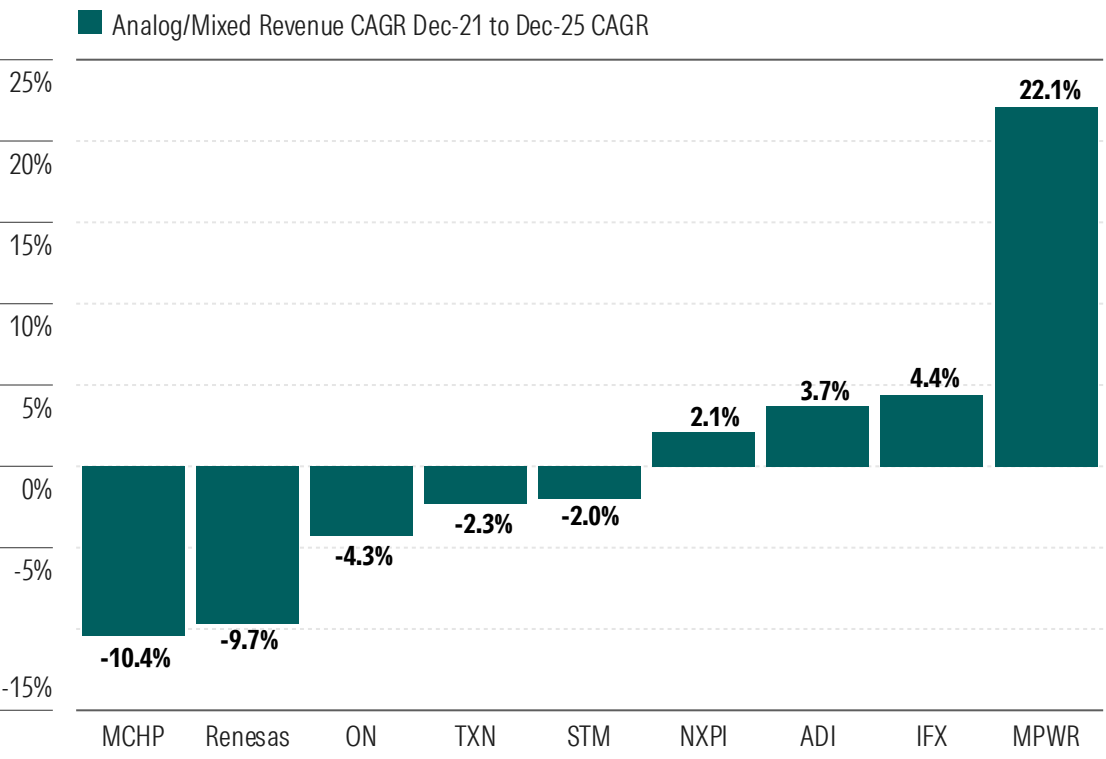
## Analog/Mixed-Signal Revenue Is Still Down From the Post-Covid Revenue Boom

We view the softness in sales as cyclical rather than structural.



## Many Firms Delivered Industry-Like, Mid-Single-Digit Growth in Recent Years

Laggards faced sharper inventory corrections; Monolithic is in a league of its own.



Source: Morningstar, PitchBook, company documents. Data as of Jan. 7, 2026.  
Data for ADI is pro forma, including the acquisition of Maxim Integrated, which was completed in the December 2021 quarter.

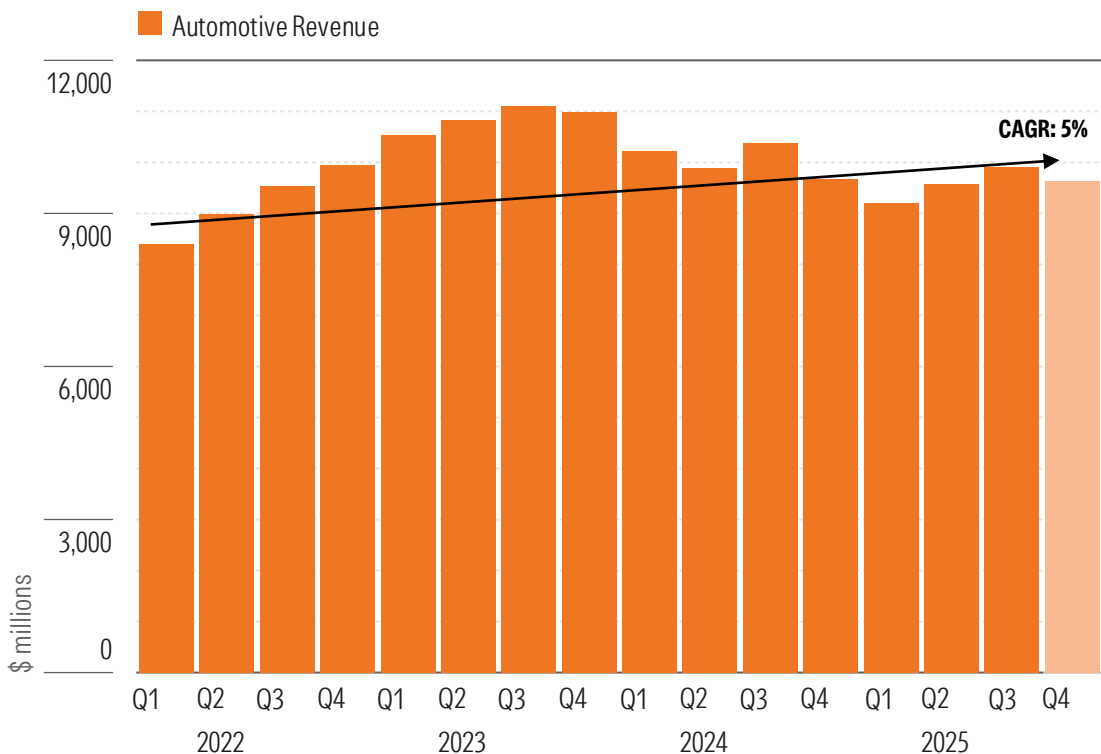
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# Automotive Revenue Is at the Tail End of a Cyclical Downturn, but Long-Term Secular Tailwinds Are Still Intact

- Auto chip revenue suffered at the end of 2024, as inventory exceeded end-market demand after a shortage earlier in the decade, albeit not as severe as in industrial.
- We’re not seeing a broad snapback in auto revenue in 2025; electric vehicle demand didn’t live up to expectations, while tariffs likely weighed on near-term chip orders.
- Still, we expect chipmakers will see content gains per vehicle (especially in EVs and autonomous vehicles).
- If car manufacturers gain greater confidence in future production, we think a rush of chip orders will be placed with leading chipmakers.

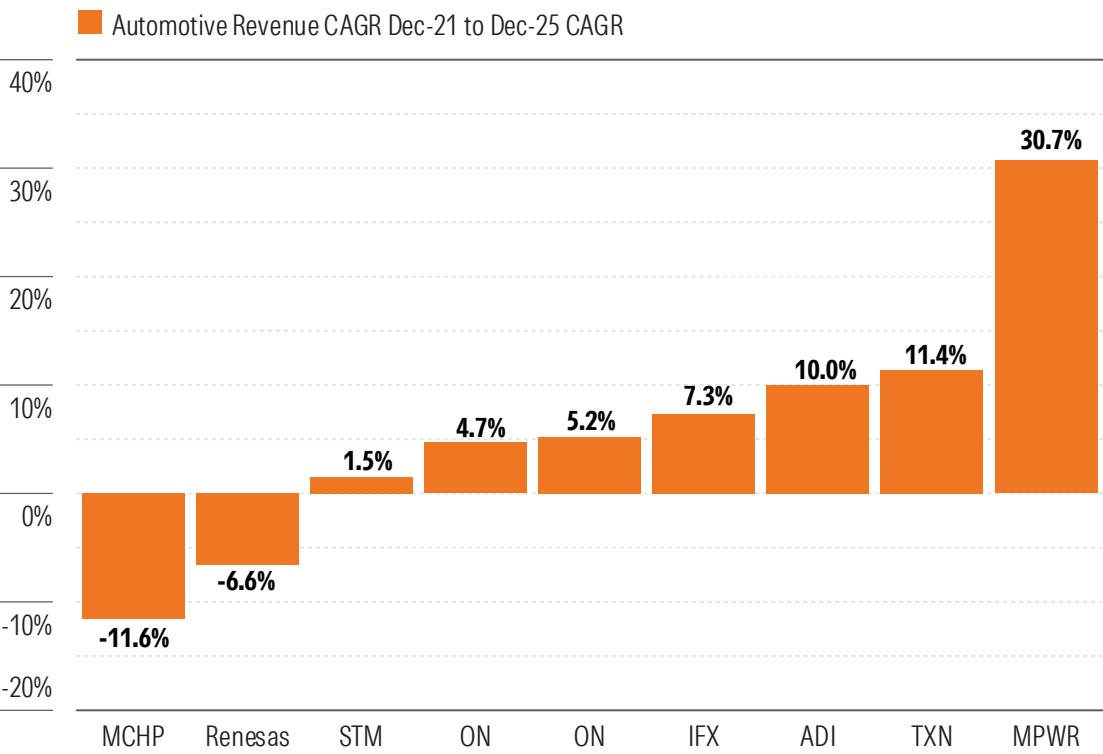
## Higher Content Gains per Vehicle Will Drive a Gradual Recovery Over 2025

Inventory correction woes appear more severe in the industrial end market.



## High-Single-Digit Revenue Growth in Auto Has Been the Norm in Recent Years

Microchip faced a sharper inventory correction, but others have fared much better.



Source: Morningstar, PitchBook, company documents. Data as of Jan. 7, 2026.  
Data for ADI is pro forma, including the acquisition of Maxim Integrated, which was completed in the December 2021 quarter.

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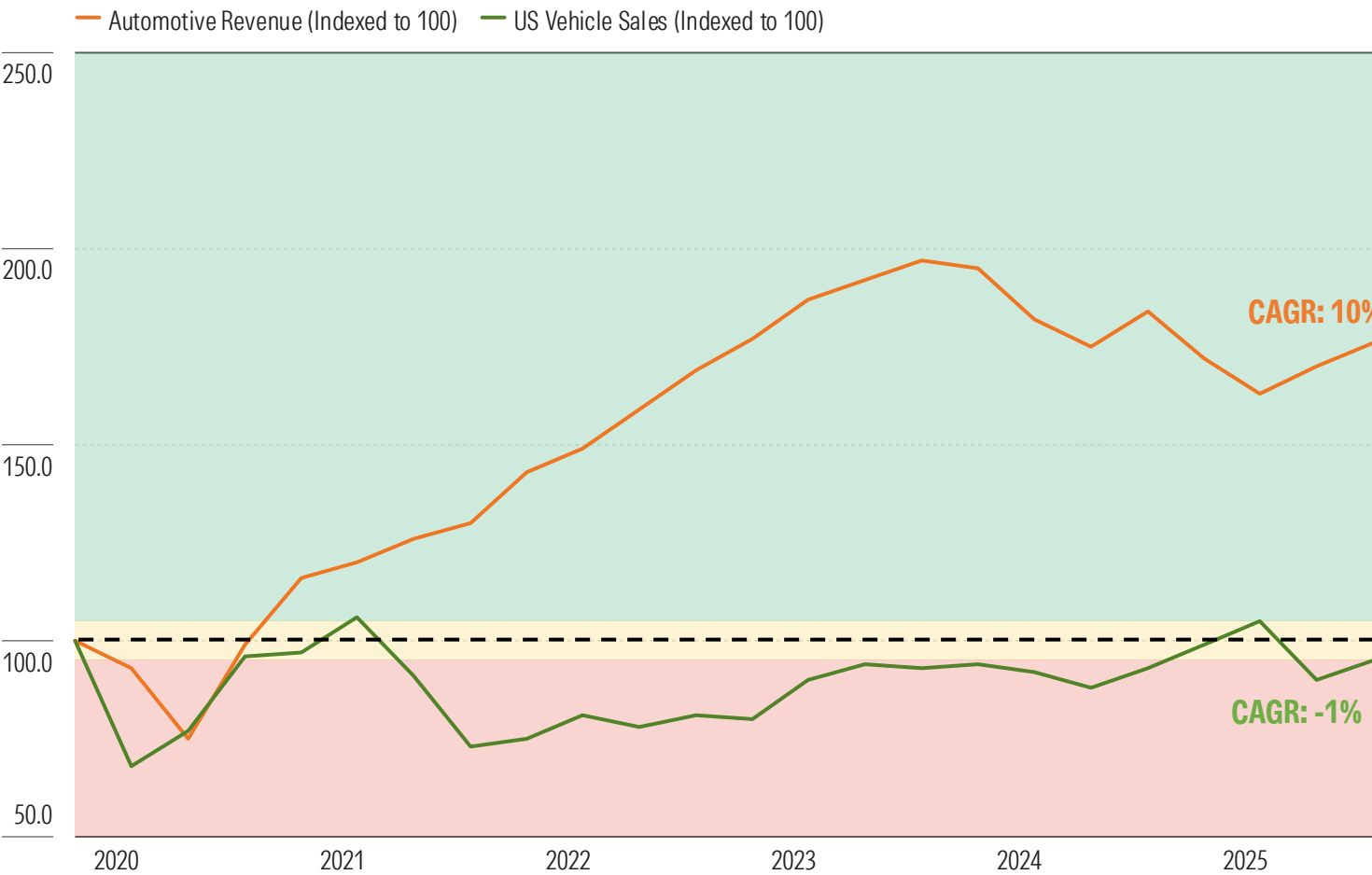
# Chip Content in Automotive Is Rising, Even With Car Sales Being Flattish in the US

Examining the automotive market, global automotive chip revenue has grown notably faster than car unit sales (we look at US car sales as a reasonable proxy for global sales on the right). However, the gap narrowed in recent quarters as the global chip shortage ended, and chipmakers faced inventory replenishment headwinds.

On a long-term basis, chip revenue is expected to outpace vehicle sales for quite some time, thanks to rising chip content per car, especially in EVs. A chip revenue CAGR of 6%-10% above car unit sales is reasonable, in our view. AVs and EVs should support this higher demand for chips going inside cars.

We acknowledge some risk that an emerging Chinese semiconductor industry may take some opportunities away from US and European chipmakers, especially in Chinese EVs. However, we still anticipate that Chinese carmakers will choose reliable, trusted chipmakers for a good portion of their content in exported cars. US and European carmakers are setting up shop in China, using Chinese sales teams and Chinese fabs to build parts for the Chinese market.

**Higher Content per Car Continues to Drive Automotive Chip Revenue Growth Ahead of US Vehicle Sales**  
US quarterly vehicle sales indexed to 100 as of December 2019, compared with indexed semis' automotive revenue.



Source: US Federal Reserve Economic Data. Revenue and unit sales as of September 2025. Exhibit as of Jan. 7, 2026. Vehicle sales are measured on a seasonally adjusted average rate.

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# Chinese Electric Vehicles Are Still a Bright Spot for Automotive Chipmakers

Automotive semiconductor growth has been boosted by the improving mix shift in the vehicle market toward EVs. Firms like Infineon and others have suggested that EVs have at least 2 times the chip dollar content per vehicle compared with gas-powered cars.

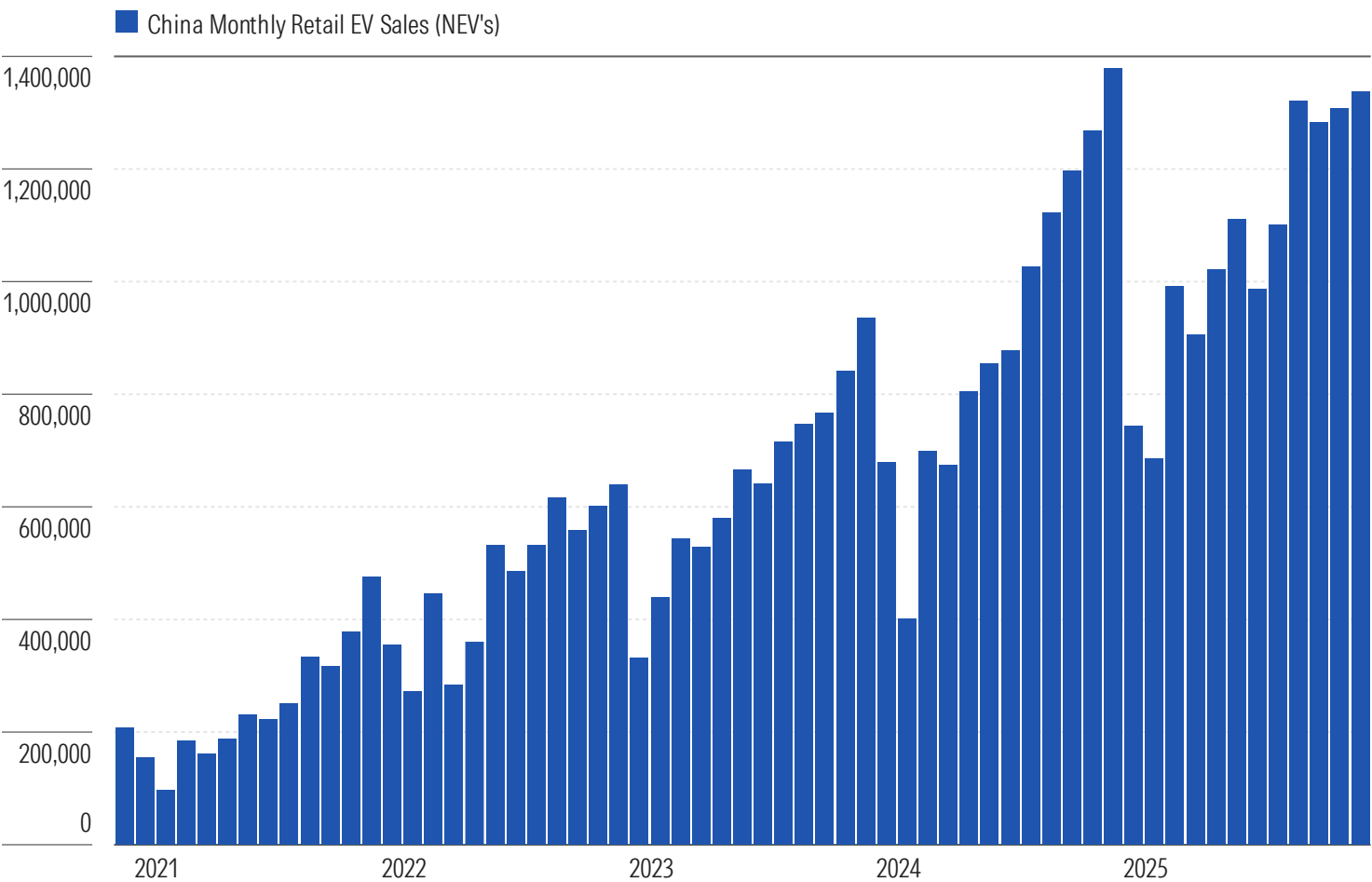
On a unit basis, the Chinese EV market grew nicely in 2024, up 25%. We anticipate further China EV growth in 2025 (Morningstar’s forecast is 15%-20% growth for the full year), with sales both domestically and as these carmakers gain share in other regions of the world.

Sales growth continues to decelerate; however, retail EV sales in China rose only 3% in November 2025. The discontinuation of subsidies has likely weighed on demand.

US chipmakers have even said that automotive innovation now resides in China rather than Western markets, as the country innovates faster. Since this innovation relies on chip content, automotive chipmakers are expected to prosper as EV penetration increases.

## China EV Sales Have Grown Well in Recent Years

China EV growth should reside somewhere between “strong” and “explosive” as these new EV models gain adoption.



Source: China Association of Automobile Manufacturers report, CnEVPost. Unit sales as of November 2025. Exhibit as of Jan. 7, 2026.

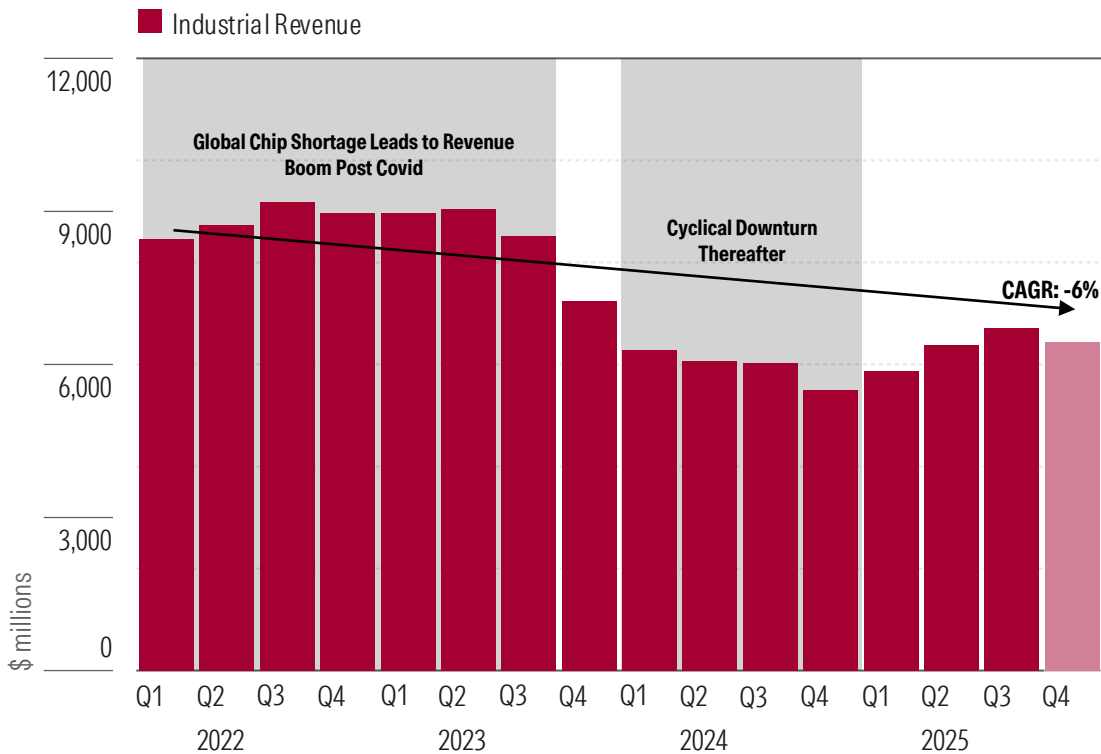
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# Industrial Revenue Is Nearing a Full Recovery Despite Tariff Concerns

- Industrial chip revenue also flipped from a global shortage in 2022 to a severe downturn in 2024. However, we think the worst of the downcycle is behind these chipmakers.
- Firms anticipate a recovery, even as tariffs loom, which we think speaks to the severity of the inventory correction, in our view.
- On a longer-term basis, we still anticipate higher chip content per device within a wide range of industrial, medical, robotics, and Internet of Things products.

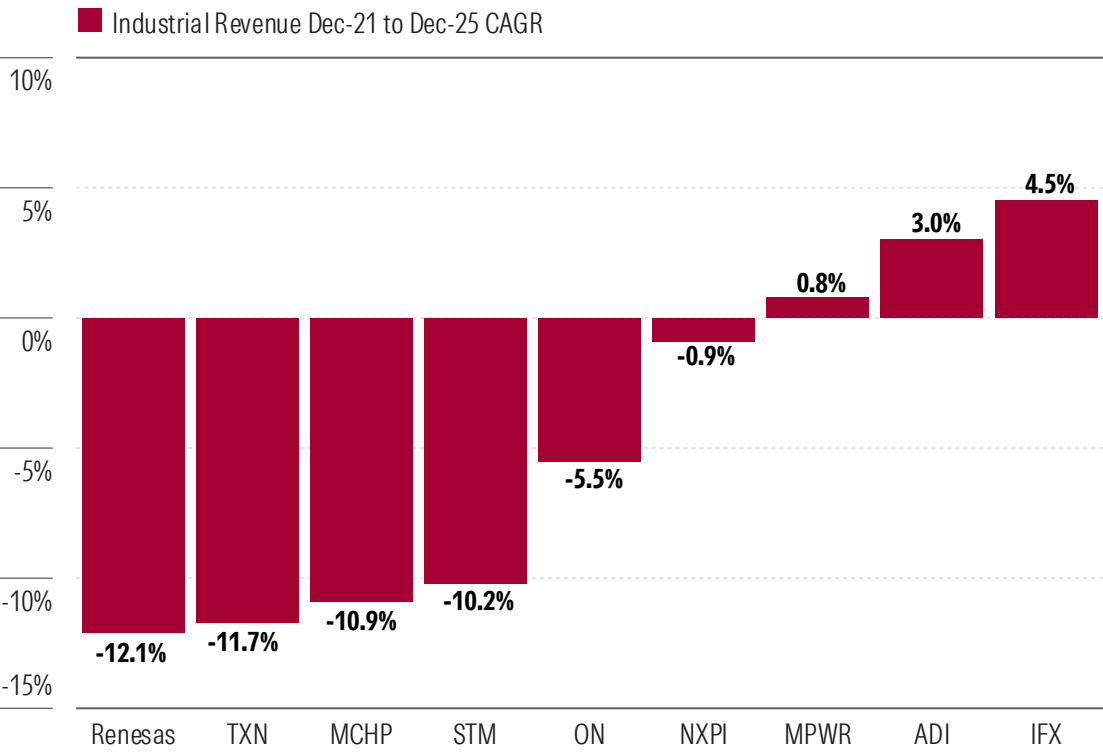
## Industrial Chip Demand Faced a Severe Inventory Correction in 2024

Chipmakers began the recovery in 2025, with hopefully more to go in 2026



## Industrial Semis Typically Grow at a Mid-Single-Digit Pace

The CAGRs from 2022-25 show the severity of the recent inventory correction.



Source: Morningstar, PitchBook, company documents. Data as of Jan. 7, 2026.  
Data for ADI is pro forma, including the acquisition of Maxim Integrated, which was completed in the December 2021 quarter..

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# Industrial Chip Growth Should Outpace U.S. Manufacturing Activity Once Again

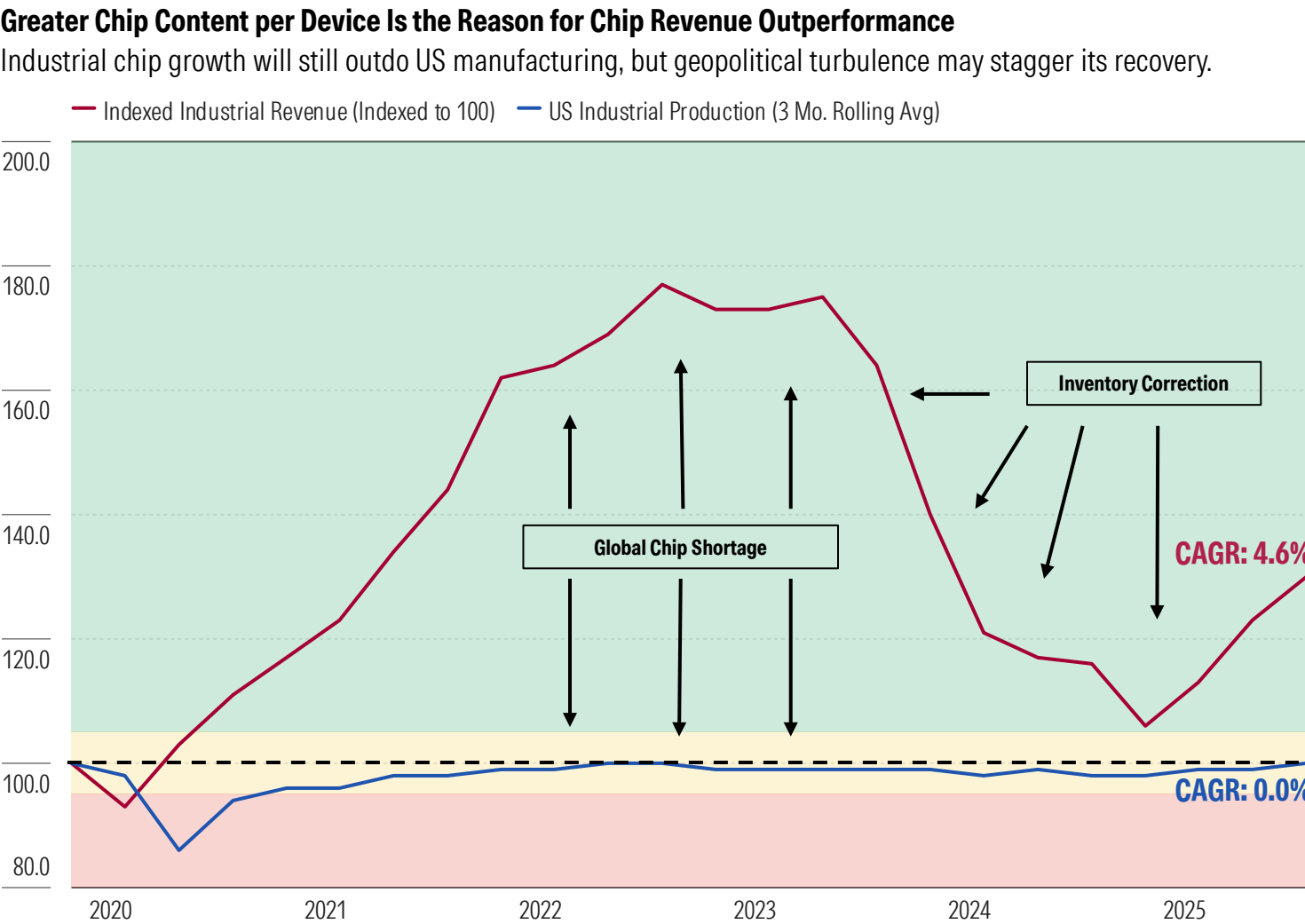
Here, we compare global industrial chip revenue growth (indexed to 100) with a rolling three-month average of US industrial production (also indexed to 100, and again using the US as a proxy for global production).

This exhibit illustrates the significant rise in industrial chip shipments during the global shortage and the subsequent cyclical downturn that led to a decline in industrial chip revenue in 2024.

Industrial chip revenue achieved outsize growth due to content gains, particularly in smart devices and machinery with greater electronics, sensing, and processing.

Looking ahead, we still expect the red line of indexed industrial chip revenue to outpace the blue line of US production, driven by higher chip content per device. Generally, we anticipate chipmaker revenue growth to be 2 times the growth of industrial production. Advancements in robotics may further boost this segment.

While we foresee a cyclical recovery ahead, we acknowledge that geopolitics and macroeconomic factors may stymie it.



# Gross Margins (Non-GAAP Basis) Are Past Their Peak, but Should Recover in 2026 in Line With Revenue

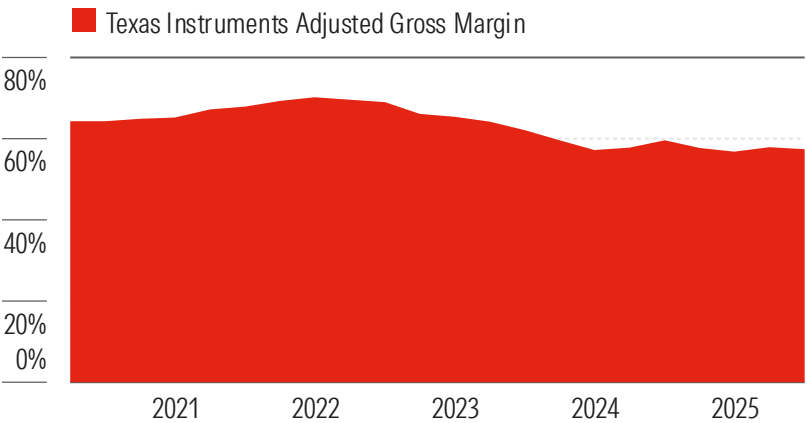
Gross margins are an important barometer in analog/mixed-signal semis based on the high fixed costs associated with internal production. An ability to retain pricing power also matters, and chipmakers often boast intangible assets to support wide and narrow economic moats.

Gross margins peaked across the industry in 2022 and 2023. Inventory corrections weighed on gross margins thereafter.

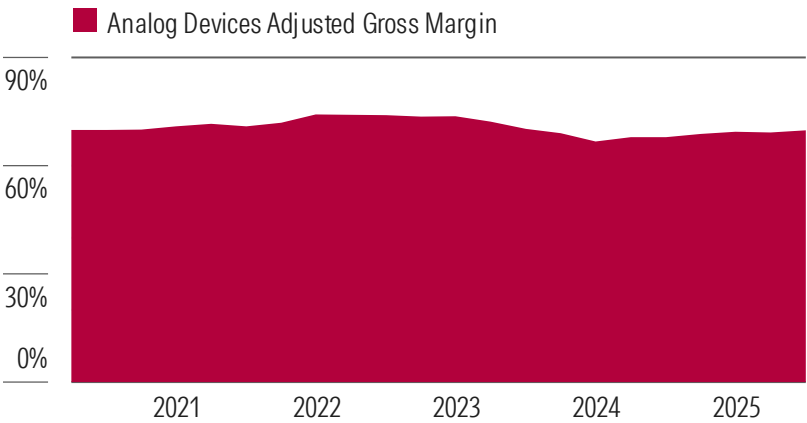
Texas Instruments' gross margins faced excess capacity in the inventory correction, and ongoing expansion should provide modest headwinds. Analog Devices' gross margins should remain best of breed.

Microchip's margins suffered with perhaps the most severe of inventory corrections, but we think they will ultimately rebound. We're less confident of a strong recovery to peak conditions at STMicro.

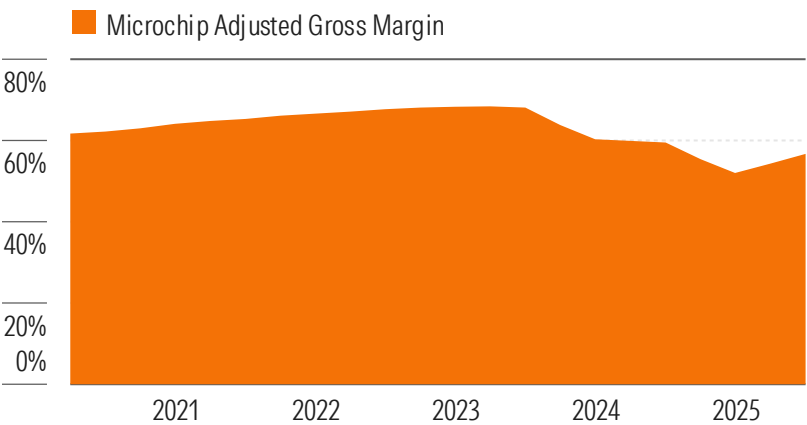
TI's GM% Will Depend Upon Its Expansion Plans



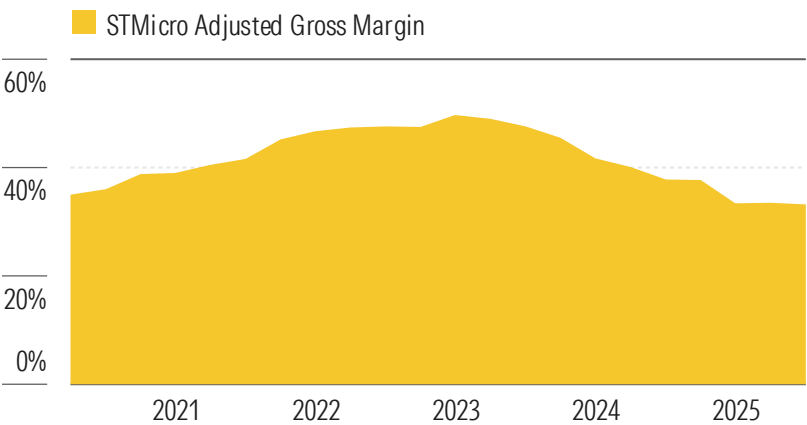
Analog Devices Strives for Gross Margins With a 70% Floor



Microchip's GM% Suffered from the Inventory Correction



STMicro's GM% Boost in '22/'23 Doesn't Appear Sustainable

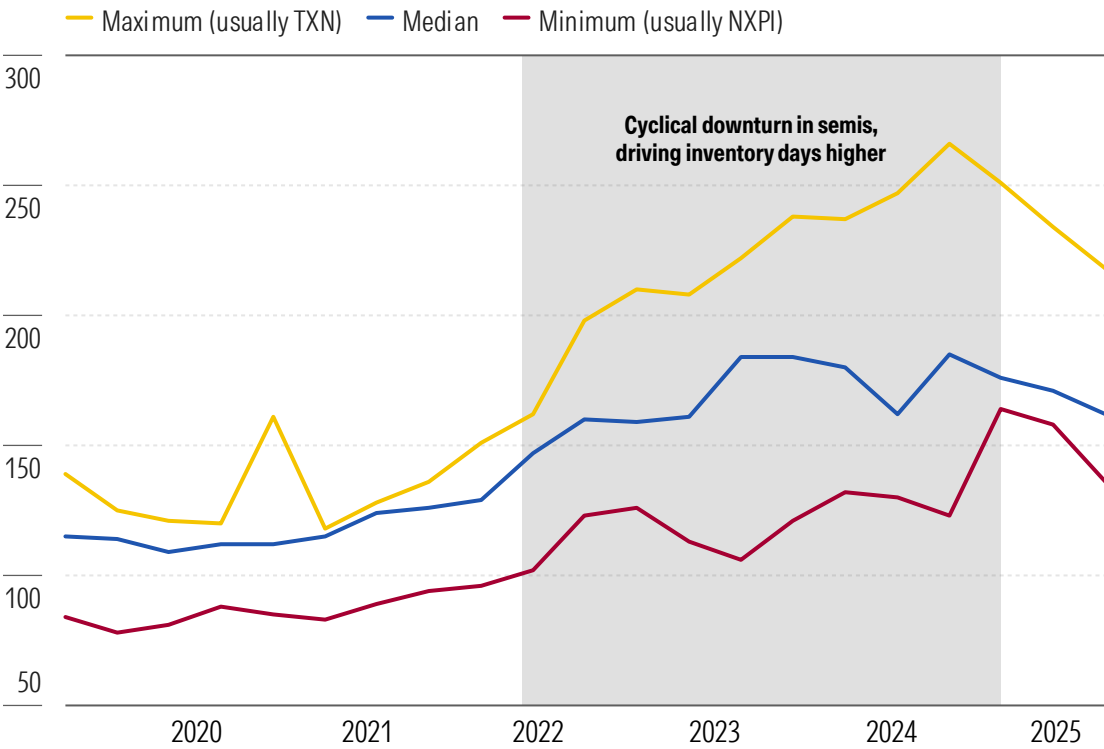


# Chip Inventory Levels Remain Elevated, but Are Poised for Mean Reversion With the Next Upcycle

- The cyclical downturn in analog and mixed-signal semis is most notable when looking at days of chip inventory (left).
- Inventory reached alarming levels during most of 2024, even when acknowledging that these chips have long useful lives and a low risk of obsolescence.
- We're encouraged that the median inventory days outstanding have started to decline since mid-2024, and a reduction is a priority at firms like TI and Microchip.
- Inventory days at key distributors like Arrow and Avnet (right) are still elevated and in modest decline, which again suggests that chipmakers aren't out of the woods yet.

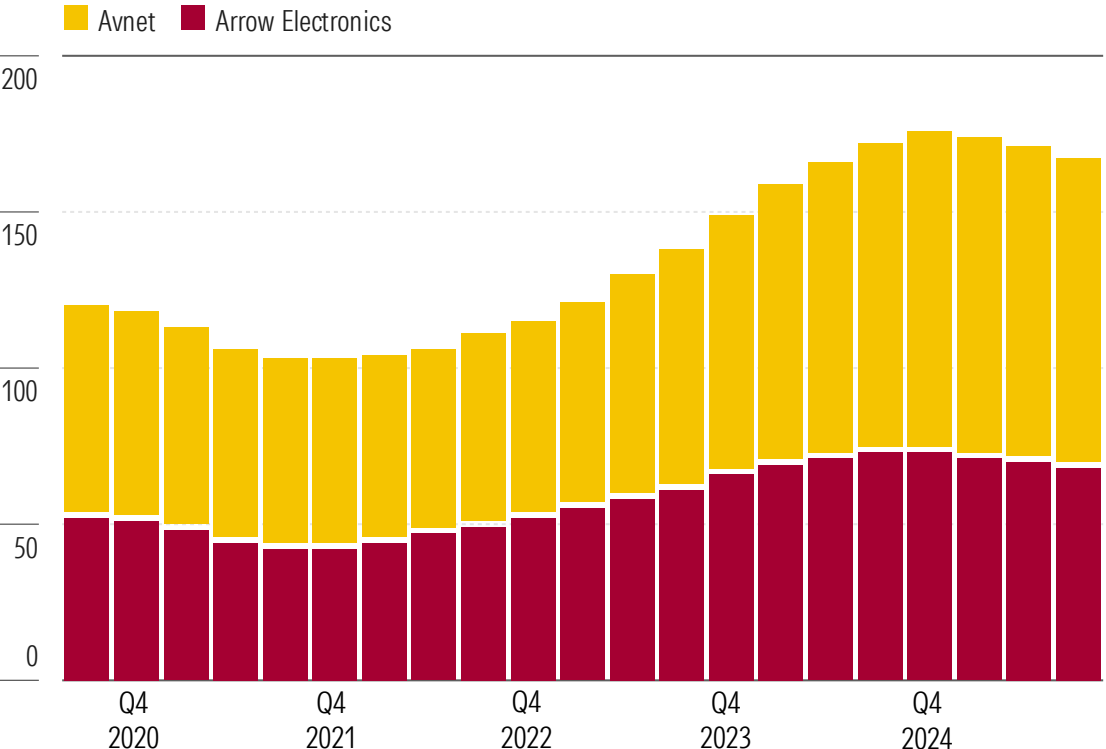
## Inventory Days Are Still High, but Firms Are Striving to Reduce These Balances

TI is comfortable carrying more inventory, while NXP has the leanest turnover.



## Inventory Days at Key Distributors Are Still Higher Than Historical Norms

Inventory has grown since the 2021-22 chip shortage.



# Top Picks and Coverage

Top picks in semis include Nvidia, Broadcom, NXP Semi, and Marvell.

# Our Top Picks in Semis Are Nvidia, Broadcom, NXP Semi, and Marvell

| Nvidia (NVDA) |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |             |            |                 |        | Broadcom (General Purpose Semiconductors) (AVGO) |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |             |            |                 |        |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|------------|-----------------|--------|--------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|------------|-----------------|--------|
| P/FV          | Market Cap                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Moat Rating | Last Close | Fair Value Est. | Rating | P/FV                                             | Market Cap                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Moat Rating | Last Close | Fair Value Est. | Rating |
|               | 4328B USD                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Wide        | 186.23     | 240.00          | ★★★★   |                                                  | 1577B USD                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Wide        | 351.71     | 480.00          | ★★★★   |
| 1.75          | <p>Nvidia has emerged as one of our top picks in semis. Concerns of an AI bubble, and perhaps the progress of vertically integrated Google, have weighed on Nvidia's stock price in recent months. However, we think these fears are overblown. Nvidia will inevitably lose some market share to custom ASICs, such as Google's TPUs, for specific workloads. However, the bulk of AI runs on Nvidia today, and Nvidia still offers best-of-breed performance and flexibility in the fast moving AI space. The firm has effectively guided to \$300 billion-plus of revenue in calendar 2026, which implies no slowdown in AI spending in the quarters ahead.</p> |             |            |                 |        | 1.75                                             | <p>Broadcom is one of our top picks in semiconductors, trading at an attractive discount to our \$480 fair value estimate. Broadcom is a major AI winner, in our view, with second-largest AI processor business trailing only Nvidia. We expect Broadcom to take share as large customers like Google, Meta, and other AI model builders use greater proportions of custom accelerators alongside GPUs. We also continue to see Broadcom's networking chip portfolio as best-of-breed. Broadcom's chip design prowess stems from moaty intangible assets that we see as durable over the long term.</p> <p>Additionally, Broadcom is a shareholder-friendly stock with immense cash flow and good shareholder returns. We have a positive view of management's capital allocation strategies, including good acquisitions and integration as well as robust organic investment. To us, Broadcom has sold off since late 2025 on some fears of overexuberance in AI spending. We believe this represents a good entry point, and expect strong results to be a positive catalyst in 2026 as Broadcom onboards new AI customers.</p> |             |            |                 |        |
| 1.50          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |             |            |                 |        | 1.50                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |             |            |                 |        |
| 1.25          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |             |            |                 |        | 1.25                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |             |            |                 |        |
| 1.00          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |             |            |                 |        | 1.00                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |             |            |                 |        |
| 0.75          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |             |            |                 |        | 0.75                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |             |            |                 |        |
| 0.50          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |             |            |                 |        | 0.50                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |             |            |                 |        |
| 0.25          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |             |            |                 |        | 0.25                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |             |            |                 |        |

# Our Top Picks in Semis Are Nvidia, Broadcom, NXP Semi, and Marvell

| NXP Semiconductors (NXPI)                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |             |            |                 |        | Marvell Technology (MRVL)                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |             |            |                 |        |
|------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|------------|-----------------|--------|------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|------------|-----------------|--------|
| P/FV                                                 | Market Cap                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Moat Rating | Last Close | Fair Value Est. | Rating | P/FV                                                 | Market Cap                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Moat Rating | Last Close | Fair Value Est. | Rating |
|                                                      | 58B EUR                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Wide        | 237.11     | 280.00          | ★★★★   |                                                      | 68B USD                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Narrow      | 79.80      | 120.00          | ★★★★   |
| 1.75<br>1.50<br>1.25<br>1.00<br>0.75<br>0.50<br>0.25 | NXP Semiconductors is one of our top picks in the analog and mixed-signal chip space. We're especially fond of the company's outsize exposure to the automotive end market, where it obtains nearly 50% of revenue. NXP is well diversified in automotive with a nice product portfolio of processors, microcontrollers, and analog parts. We think the firm will gain its fair share in electrification and safety automotive products too, such as radar and battery management systems. Overall, NXP's auto business is well tied to the secular tailwinds around rising chip content per vehicle and we think the market is too focused on a near-term slowdown in demand. |             |            |                 |        | 1.75<br>1.50<br>1.25<br>1.00<br>0.75<br>0.50<br>0.25 | Marvell Technology is one of our top picks in networking semis, trading at an attractive discount to our \$120 fair value estimate. We see Marvell as a long-term winner in artificial intelligence infrastructure, both via its custom accelerator chip designs for customers like Amazon and Microsoft, and via optical connectivity chips, where we see Marvell as best-of-breed. To us, this strong exposure stems from moaty intangible assets in chip design and should fuel strong growth into the long term.<br><br>We believe Marvell's position in Amazon's Trainium chips and Microsoft's Maia chips should endure, and continue to drive strong overall growth for the firm. While we do expect partial multi-sourcing with competitors like Alchip or GUC, we view these firms as design consultancies rather than full-blown chip designers, like Marvell. In our view, Marvell has strong core IP that will keep it as a preferred source in these custom chip customers, even as customers also utilize the likes of Alchip for portions of their total production. |             |            |                 |        |

Source: Morningstar, PitchBook, company documents. Data as of Jan. 20, 2026.

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# AI Has Driven Strong Returns in Digital Semis and Significant Returns in Memory

## Nvidia, Broadcom, and Marvell are Among our Top Picks in Digital Semis

| Company (Ticker)                           | Industry             | Market Cap (Billions) | Moat Rating | Uncertainty Rating | Last Close | Fair Value Estimate | Star Rating | P/FVE | P/E   | Yield | 1-Year Return |
|--------------------------------------------|----------------------|-----------------------|-------------|--------------------|------------|---------------------|-------------|-------|-------|-------|---------------|
| Nvidia (NVDA)                              | Semiconductors       | 4328 USD              | Wide        | Very High          | 186.23     | 240.00              | ★★★★★       | 0.78  | 39.8x | 0.1%  | +35.3%        |
| Intel (INTC)                               | Semiconductors       | 232 USD               | None        | Very High          | 46.96      | 28.00               | ★★          | 1.68  | 77.3x | 1.1%  | +118.5%       |
| Advanced Micro Devices (AMD)               | Semiconductors       | 378 USD               | Narrow      | Very High          | 231.92     | 270.00              | ★★★         | 0.86  | 34.9x | 0.0%  | +90.9%        |
| Broadcom (AVGO)                            | Semiconductors       | 1577 USD              | Wide        | High               | 351.71     | 480.00              | ★★★★★       | 0.73  | 34.5x | 3.2%  | +49.1%        |
| Qualcomm (QCOM)                            | Semiconductors       | 165 USD               | Narrow      | High               | 154.07     | 185.00              | ★★★         | 0.86  | 12.7x | 2.3%  | -4.2%         |
| MediaTek (TAI:2454)                        | Semiconductors       | 2370 TWD              | Narrow      | High               | 1,485.00   | 1,660.00            | ★★★         | 0.89  | 21.3x | 8.2%  | +6.5%         |
| Marvell Technology (MRVL)                  | Semiconductors       | 68 USD                | Narrow      | High               | 79.80      | 120.00              | ★★★★★       | 0.67  | 28.1x | 0.4%  | -35.8%        |
| Arm (ARM)                                  | Semiconductors       | 114 USD               | Wide        | High               | 107.17     | 80.00               | ★★          | 1.32  | 62.2x |       | -28.2%        |
| Skyworks Solutions (SWKS)                  | Semiconductors       | 9 USD                 | None        | High               | 57.77      | 83.00               | ★★★★★       | 0.70  | 13.1x | 2.3%  | -35.3%        |
| Qorvo (QRVO)                               | Semiconductors       | 7 USD                 | None        | Very High          | 80.11      | 91.00               | ★★★         | 0.88  | 12.6x | 0.0%  | -4.9%         |
| Digital and RF Semis; Cap-Weighted Average |                      |                       |             |                    |            |                     |             | 0.81  | 38.9x | 1.0%  | +41.1%        |
| Micron Technology (MU)                     | Semiconductors       | 411 USD               | None        | High               | 365.00     | 225.00              | ★           | 1.61  | 11.3x | 0.7%  | +245.6%       |
| SK Hynix (KRX:000660)                      | Semiconductors       | 513008 KRW            | None        | Very High          | 764,000.00 | 323,000.00          | ★           | 2.37  | 6.9x  | 1.2%  | +257.6%       |
| Samsung Electronics (KRX:005930)           | Consumer Electronics | 939984 KRW            | None        | High               | 145,200.00 | 84,000.00           | ★           | 1.78  | 9.3x  | 2.2%  | +171.0%       |
| Memory Semis; Cap-Weighted Average         |                      |                       |             |                    |            |                     |             | 1.88  | 9.3x  | 1.5%  | +214.6%       |

Source: Morningstar, PitchBook, company documents. Data as of Jan. 20, 2026.

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# Most Analog/Mixed-Signal Semis Have Appreciated Toward our Fair Value Estimates

## NXP Semiconductors Remains our Top Pick in Analog Semis as We Expect a Rebound in Automotive Chip Revenue

| Company (Ticker)                                | Industry       | Market Cap (Billions) | Moat Rating | Uncertainty Rating | Last Close | Fair Value Estimate | Star Rating | P/FVE | P/E    | Yield | 1-Year Return |
|-------------------------------------------------|----------------|-----------------------|-------------|--------------------|------------|---------------------|-------------|-------|--------|-------|---------------|
| Texas Instruments (TXN)                         | Semiconductors | 172 USD               | Wide        | High               | 191.58     | 177.00              | ★★★         | 1.08  | 31.5x  | 2.9%  | +2.4%         |
| Analog Devices (ADI)                            | Semiconductors | 145 USD               | Wide        | High               | 295.67     | 245.00              | ★★          | 1.23  | 29.7x  | 2.1%  | +36.7%        |
| Microchip Technology (MCHP)                     | Semiconductors | 40 USD                | Wide        | High               | 74.70      | 63.00               | ★★          | 1.19  | 50.0x  | 2.2%  | +32.0%        |
| NXP Semiconductors (NXPI)                       | Semiconductors | 58 USD                | Wide        | High               | 237.11     | 280.00              | ★★★★        | 0.85  | 17.2x  | 2.2%  | +12.0%        |
| STMicroelectronics (NYS:STM)                    | Semiconductors | 24 USD                | Narrow      | Very High          | 27.12      | 29.00               | ★★★★        | 0.97  | 24.3x  | 0.6%  | +8.3%         |
| Infineon Technologies (ETR:IFX)                 | Semiconductors | 53 EUR                | Narrow      | High               | 40.64      | 43.00               | ★★★★        | 0.95  | 24.9x  | 1.1%  | +35.7%        |
| OnSemi (ON)                                     | Semiconductors | 24 USD                | Narrow      | High               | 60.33      | 70.00               | ★★★★        | 0.86  | 20.7x  | 0.0%  | +10.4%        |
| Monolithic Power Systems (MPWR)                 | Semiconductors | 50 USD                | Wide        | High               | 1,033.17   | 920.00              | ★★★★        | 1.12  | 49.6x  | 0.8%  | +66.1%        |
| Renesas Electronics (TKS:6723)                  | Semiconductors | 4262 JPY              | Narrow      | High               | 2,322.50   | 2,390.00            | ★★★★        | 0.97  | 13.3x  | 0.0%  | +13.3%        |
| Nordic Semiconductor (OSL:NOD)                  | Semiconductors | 26 NOK                | Narrow      | High               | 131.80     | 140.00              | ★★★★        | 0.94  | 576.1x | 0.0%  | +27.0%        |
| Analog/Mixed-Signal Semis; Cap-Weighted Average |                |                       |             |                    |            |                     |             | 1.07  | 32.9x  | 1.9%  | +23.3%        |

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