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KOREAN AMERICAN SEMICONDUCTOR ASSOCIATION IN SILICON VALLEY

March 2025

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농구에서 골을 넣으려면 열 개의 손가락이 필요하다. 어느 조직에나 중요한 역할을 하는 사람이 있기 마련이다. 하지만, 실제로는 각 개인이 팀 전체의 성공에 이바지하고 있어야 한다. 무엇보다도 중요한 것은 자신의 성과가 어떻게 팀의 이익과 생존에 영향을 끼치는지 이해하고 있는 것이다. - 존 우든

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ASML: The Bear Case People Don't Talk

Feb 09, 2025 MMTT Wealth

Summary

- ASML's strong moat in EUV lithography is undeniable, but potential competition and geopolitical risks could challenge its dominance and valuation.
- Alternatives like NIL, DSA, and Electron Beam Lithography could threaten ASML's market share if they become more efficient and cost-effective.
- Geopolitical tensions, particularly U.S. export restrictions to China, pose significant risks to ASML's revenue and market position.
- ASML's premium valuation compared to Nvidia is hard to justify given its slower revenue and EBITDA growth, raising concerns about future stock performance.



Sundry Photography

A Summary of the Bull Case

I'll bullet point a very basic bull case here, but the focus of this article is on the bear case as discussed:

ASML has developed a technology beyond imagination that had billions of dollars in sunk costs and decades of R&D. This task they set out to achieve was so difficult that there's barely any company close to them in terms of tech, particularly in the EUV lithography segment where they have more or less a 100% monopoly.

However, the main part of the bull case is how ASML has made the barriers to entry almost impossible to pass. ASML essentially owns the entire EUV ecosystem because of their partnerships with key suppliers like Zeiss, Trumpf, and Cymer which supply the mirrors, light source technology, and plasma technology for ASML. This technology to create these key parts of the ASML involved huge capital investment, huge technological milestones, and decades of R&D. It's no easy feat to just copy. And anyone trying to compete with ASML cannot simply use these suppliers because these suppliers are contractually bound (or owned by ASML) to only sell these key parts to ASML directly.

This means any new competitor to ASML would have to invest huge capital, and spend years on R&D. This is all ok but by the time this has been achieved, ASML will be a few years ahead again, making the process almost impossible, but also not worth it.

Bear Case

Competition

There's numerous alternatives to DUV and EUV lithography that are either not quite efficient enough yet to be fully commercial, or just not as high quality as ASML's machines. This is one of the main reasons the bull case for ASML is currently so strong.

However, it's quite rare to have companies hold a complete monopoly for extended periods of time because that's simply not efficient for markets. Markets need competition and there's numerous alternatives to lithography machines that may create some competition in the future.

Nano-imprint lithography (NIL): NIL does not require a light source like EUV does, making it considerably more simple and cost-effective. However, the downsides of this are less throughput and less precision. If LLM's can start to be built with considerably less chips and less complex chips like DeepSeek showed, there may be cost benefits of using technologies like NIL if the end performance isn't significantly worse.

Direct Self-Assembly Lithography (DSA): DSA is promising in that it can achieve sub 10nm and even sub 2nm in early study research. However, currently there's far more defects compared to the EUV process.

Electron Beam Lithography: Very precise but not commercially efficient at all yet.

Here's a quote from ASML's biggest customer, TSM (CEO):

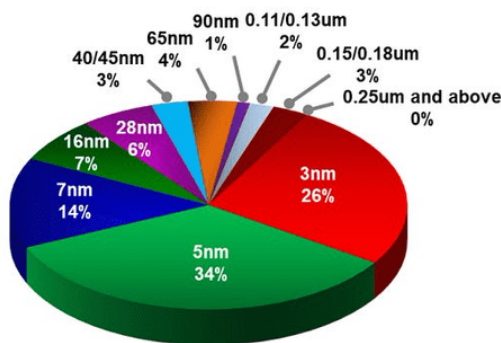
For the coming 20 years, I see ways of improving the energy efficient performance of chips 3x every two years.

Currently, ASML is the only company that can consistently produce chips complex enough for the innovations we are currently in, but there's still an incredible amount of potential for innovation in lithography techniques or alternatives because of the above quote. As with most markets, performance is the key area at the start and customers are willing to pay the higher prices for the best innovation to win market share. The next stage is efficiency, and we are slowly entering that stage, which is where the danger for ASML may come from, particularly in their DUV sales which make up the vast majority of their revenue.

There will get to a point where the power consumption needed for ASML's machines just isn't cost-effective enough unless ASML can find a way to significantly decrease the power consumption.



4Q24 Revenue by Technology



TSM Revenue by technology (TSM Investor Slides)

Geopolitics

The US has imposed export restrictions on Chinese enterprises, meaning ASML cannot sell their EUV machines to China. This has a few downsides for ASML.

1. In 2025 China have really put themselves on the map in the AI race with DeepSeek which led to huge market swings in a single day, and also Alibaba (BABA) release of their high quality LLM which beats DeepSeek and Open AI in numerous areas. This suggests that China's AI expertise is far ahead of what we originally thought it to be and to do this to the next level they're going to need complex chips, and therefore EUV lithography or alternatives.

Currently, we know of no serious Chinese technology that can complete or replace ASML's EUV lithography, but I think it may be naive to completely rule this out. China won't just sit back and take this EUV ban. They'll be figuring out ways to domestically manufacture alternatives, and they would have been doing this for a while. Any inroads here will obviously be detrimental to the ASML moat.

2. Perhaps even more obviously, 27% of ASML's revenue currently comes from China, with most of this being DUV sales. The current ban only prevents EUV machines and the most advanced DUV machines. We don't have specific information on how much this will affect ASML's revenue from China, but management have suggested this quarter's 27% number is more normal compared to what we have got used to in previous quarters with +40%. Management therefore doesn't seem too concerned with this ban, but if tensions rise more, it could be likely more DUV machines be banned in China and that will start to have material impacts on the revenue. The big risk here is that even though ASML is a quality business, a lot of these risks are more or less out of ASML's control.

3. The ASML business is extremely tied up between Chinese demand, US control, and European trade interests. That's not a nice place to be in, in the current geopolitical environment.

Valuation

When you consider the above risks I outlined, and then combine this with a P/E multiple similar to Nvidia (NVDA), I think it becomes very difficult to justify such a premium valuation of 29.3x NTM P/E vs NVDA at 31.5x NTM P/E.

Looking purely at the numbers you have:

ASML Revenue Growth: 2.56%

NVDA Revenue Growth: 125%

ASML Net Income Margin: 29%

NVDA Net Income Margin: 55%

Should these stocks be trading at a similar earnings multiple based on this information? Probably not.

Now looking at EBITDA growth:

ASML currently trades at 27.1x LTM EBITDA multiple and 38.3% EBITDA margin. If ASML can hit the upper end of management's 2030 guidance of \$44B - \$60B, whilst also growing EBITDA 100bps per annum, \$26B in EBITDA could be possible in 2030, which would equate to 16.7% CAGR. To reiterate, this is assuming management hit the upper end of their guidance and EBITDA margins expand every year. If I had to guess, I'd say this is unlikely as EUV machines have lower margins and ASML's big opportunities are with EUV and High-NA EUV over the next 5 years.

Anyway, is a 27.1x EBITDA multiple worth it for (at maximum) a 16.7% EBITDA growth CAGR?

Conclusion

In my view, ASML is quite a rare company who has complete control over the entire EUV ecosystem and this makes up the vast majority of the ASML bull case. However, the downsides are that because they have such a large moat, there will be lots of investment going on to find alternatives and win a portion of this market.

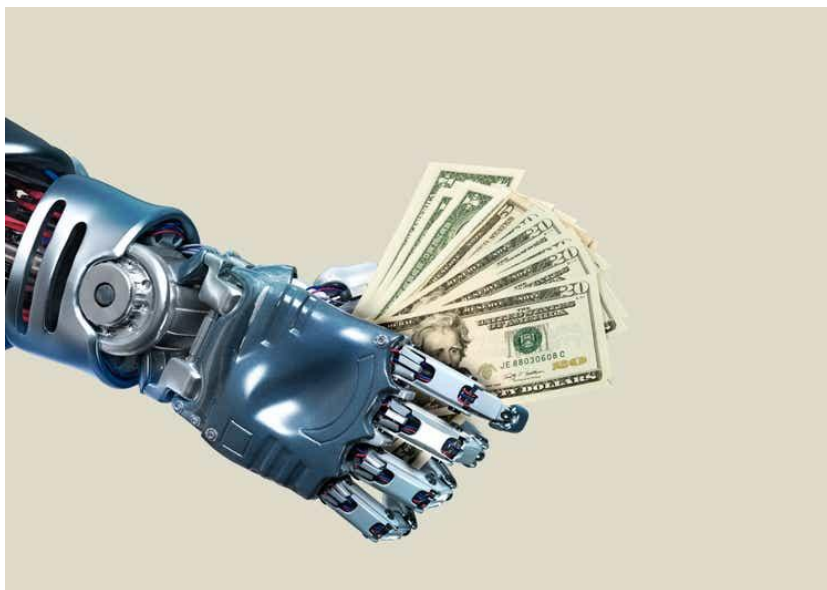
With ASML trading at a similar P/E to NVDA, a company with far better fundamentals, any inroads here will be very bad for the ASML stock price. The valuation today relies on high chip demand, and a complete monopoly where ASML can keep winning. In my view, this is the most likely scenario to happen, but I think we also need to be very aware that at these valuations, there's lots of risks and a lot of multiple contractions that can happen with any positive news outside of China, or any slowdown in demand for machines.

AMD: Show Me The (AI) Money

Feb 07, 2025 Joe Albano

Summary

- Advanced Micro Devices, Inc.'s earnings report met expectations, but management's silence on AI revenue for Q1 2025 disappointed investors, impacting stock sentiment.
- AMD's projected AI revenue growth for 2025 is vague, suggesting 20%-60% growth, which is unimpressive compared to competitors' strong AI growth.
- There are two reasons for AMD's unenthusiastic AI guidance, including poor software and a competitive inferencing market.
- However, the stock may be ready for a bounce as it hangs out in my support zone. The question is, how much of a bounce?



Paper Boat Creative

Coming into Advanced Micro Devices, Inc.'s (NASDAQ:AMD) Q4 earnings report, I told my subscribers I was looking for a bottom to begin forming, potentially between \$110 and \$100. I said even a mediocre earnings report should keep the stock within that range. And the report did just that. However, AMD's management didn't help its stock by being mum on AI revenue during the earnings call. All of 2024 was guided quarterly with AI accelerator revenue, but the first earnings call discussing 2025 goes without financial color on the topic. While I expect AMD to bounce in the coming weeks due to bearish sentiment bottoming at least temporarily, the company fundamentally isn't driving home its AI involvement in the industry.

Many analysts will tell you AMD's AI offerings are very competitive, and all the benchmarks allegedly prove it outperforms Nvidia's (NVDA) products. If this were the case, I'd expect the massive CapEx increases guided across the hyperscalers such as Meta Platforms (META) and Alphabet (GOOG, GOOGL) to flow toward AMD's Instinct AI GPUs — the better product.

I'll return to this, but for now, let's dig into the meat of the report.

Show Me The (AI) Money

Moving into the report, the company will see a 7% decline in revenue from Q4 to Q1. Management blames seasonality. However, Nvidia seems to have no issue with continual quarter-over-quarter increases.

We expect revenue to be down sequentially by approximately 7%, driven primarily by seasonality across our businesses.

-Jean Hu, CFO, AMD's Q4 '24 Earnings Call.

Seasonality has not taken a break for Nvidia nor much of the AI world, like Palantir (PLTR) and Broadcom (AVGO), who are seeing continued strength quarter-to-quarter. However, AMD, seeing the largest growth in the company in its Data Center segment, can't seem to find enough there to overcome weaknesses in other areas like the Gaming or Embedded segments. Everyone else in the AI industry, especially in semiconductors, is not seeing this type of weakness, not Broadcom, not Micron (MU), not Nvidia, and not Taiwan Semiconductor (TSM).

But lest you think it's everything but the Data Center segment that'll be weak, management was clear it'll also be down sequentially at that same 7%

So Q1 guide was down 7% sequentially, as Jean mentioned. And the way that breaks out in each of the segments assume that data center would be down just about that average, so the corporate average. We would expect the client business and the embedded business to be down more than that.

- Lisa Su, CEO, AMD's Q4 '24 Earnings Call Q&A.

Moreover, AMD's management had nothing to provide regarding AI revenue except it was pulling in its MI350X launch from 2H '25 to mid-2025.

So as it relates to how data center -- so the overall data center business will grow strong double digits certainly, both the server product line as well as the data center GPU product line will grow strong double digits. And from the shape of the revenue you would expect that the second half would be stronger than the first half, just given MI350 will be a catalyst for the data center GPU business. But overall, I think we are very pleased with the trajectory of the data center business in both 2024 and then going into full year 2025.

- Lisa Su, CEO, AMD's Q4 '24 Earnings Call Q&A.

After a year of closely guiding AI GPU revenue, with each quarter upping its guidance (after starting from below analyst expectations), there's no indication of 2025's expectations except for "strong double-digit" growth. This could mean anything from 20% to 60% (higher, I'd start to use other descriptors). In other words, 2025 could see AI revenue of \$6B or \$8B. That's not exactly impressive growth amid strong AI growth from other competitors and downstream AI plays.

Why The Unenthusiastic 2025 For AI?

Why is this outlook so low? There are two main reasons.

Software Matters More

The first main reason why AMD is unwilling to share 2025 AI's growth numbers is while its hardware may be competitive on paper and in controlled testing, its software is far from it. Many think because AMD went the open-source route, there's much less AMD has to worry about; let the open-source community improve it, right? But, no hardware manufacturer can escape tying a high-level software stack back to its hardware for instructional execution.

This is something I've long known about with AMD and haven't been shy about sharing. Its software engineering culture is not just lacking; it's fairly unproductive. But a team with far more resources and time than me dedicated to understanding just how far off it is from Nvidia captured the exact essence of this software struggle.

SemiAnalysis is not known for being an Nvidia champion; it has had more than its fair share of criticisms over the years, to the point where I got the idea it most likely isn't a fan of the company's products. But when that team put together a head-to-head look at just how competitive each company's products were, it realized one thing: it's just not possible to do AI training workloads on AMD hardware, out of the box or otherwise.

In short, when comparing Nvidia's GPUs to AMD's MI300X, we found that the potential on paper advantage of the MI300X was not realized due to a lack within AMD public release software stack and the lack of testing from AMD.

AMD's software experience is riddled with bugs rendering out of the box training with AMD is [sic] impossible.

- SemiAnalysis, December 22nd, 2024 (emphasis added).

The team at SemiAnalysis worked with AMD for months, directly with principal software engineers, and could barely get some training executions to run. Even then, all the bugs were not handled, and it was still not an out-of-the-box experience, even with the fixes. Each hurdle crossed was met with further bugs, even after personalized attention to the issues. The SemiAnalysis team's conclusion was what I had been telling others for years:

We were hopeful that AMD could emerge as a strong competitor to NVIDIA in training workloads, but, as of today, this is unfortunately not the case. The CUDA moat has yet to be crossed by AMD due to AMD's weaker-than-expected software Quality Assurance (QA) culture and its challenging out of the box experience. As fast as AMD tries to fill in the CUDA moat, NVIDIA engineers are working overtime to deepen said moat with new features, libraries, and performance updates.

- SemiAnalysis, December 22nd, 2024 (emphasis added).

Over the years, some have not taken me seriously when I say software is more important than hardware. But the truth remains: without software — good, working software — hardware is just a paperweight.

A Highly Competitive Landscape In Inferencing

This relegates AMD's usefulness to inferencing, which brings me to my second point.

The competition on the inferencing side is much more fierce and wide-ranging. There are three main competitors on this end. The first is, of course, Nvidia, which claims 40% of its business is inferencing. Then there are the specialty startups with specialized hardware, like Cerebras (CBRS), that focus specifically on inferencing with dedicated higher-performance hardware. This is more niche and not a significant threat, but it's one to keep an eye on. Finally, there's the custom silicon hyperscalers are going to Broadcom for to offload company-specific AI workloads. All three threaten AMD's inroads into inferencing, where it, so far, has competed effectively to a certain level.

The third one is the most concerning, as inferencing, being the easiest of the two modes, means hyperscalers have the money, resources, and software development skills to provide their inferencing workload silicon, infrastructure, and software stack. With hyperscalers continuing to buy Nvidia Hopper and now Blackwell for training and less specific workloads, they can also use those for inferencing and offload some of that inferencing to their silicon. Why buy another company's different hardware and software stack when the first option is the default and the third option is viable and more productive over the long run?

AMD is not the AI giant all have come to hope for, and it's why the stock is down over 47% since its massive run into its peak last March.

Not All Bad, But It Ain't Too Good, Either

Overall, AMD hasn't shown us the AI money, not when it is compared across the industry. This is why sentiment has been bearish for the last 11 months. But because of the drawn-out bearish sentiment, well ahead of the rest of the industry's stocks, the stock didn't drop much further on the lack of guidance.

Trump Tariffs: What's Next For Top Semiconductor Stocks?

Feb 17, 2025 Steven Cress

Summary

- The launch of Chinese AI model DeepSeek erased nearly \$1T from the stock market, impacting AI and semiconductor stocks.
- Tariffs on Chinese imports and the Trump administration's tougher line on semiconductor exports have ignited trade tensions between the two nations, increasing risks for semiconductor stocks with China exposure.
- However, super-charged growth in the AI sector has led some analysts to remain bullish on U.S. chipmakers.
- Using Seeking Alpha's Quant System, this piece will outline the pros and cons of three major semiconductor companies doing business between the U.S. and China: TSM, NVDA, and CRDO.



Olemedia

DeepSeek and Trump Tariffs Shake the Semiconductor Market

“Let the chips fall where they may,” the adage goes. But many investors are walking away from the table altogether when it comes to the chips powering the latest advancements in artificial intelligence.

In what President Donald Trump declared as a “wake-up call” for U.S. tech companies, the launch of Chinese AI model DeepSeek wiped nearly \$1T from the stock market and sent shockwaves through Silicon Valley in late January. DeepSeek’s powerful large language models (LLMs) purport to perform the same tasks as Big Tech-backed heavyweights like OpenAI’s ChatGPT at a fraction of the cost. It has also challenged the status quo that advanced hardware and substantial capital expenditures are necessary for advancing AI technology. Meta (META), Amazon (AMZN), Alphabet (GOOG) (GOOGL), and Microsoft (MSFT) plan to collectively spend more than \$300B on AI in 2025, costs that have come into question since the Chinese disruptor arrived on the scene. Nvidia (NVDA) was among the hardest hit by the DeepSeek sell-off. Its shares tumbled more than 17% and erased over \$590B from its market value—the single-largest daily market

cap decline in U.S. stock market history—as investors fretted over demand for its expensive graphics processing units (GPUs) and other chipmaking technologies.

The DeepSeek debacle has prompted Trump's administration to consider tightening restrictions on NVDA's sales of H20 chips designed for the Chinese market. According to media reports, this ignited concerns over how the U.S. tech behemoth will fare in a burgeoning trade war between Washington and Beijing. And if that wasn't enough to rattle Wall Street's confidence in America's AI prowess, China hit back at Trump's 10% levies with retaliatory tariffs the first week of February, which will impact about \$14bn worth of exports, including oil and gas, farm equipment, and automotive parts. Trump responded on Thursday by unveiling a sweeping reciprocal tariff plan.

Will Semiconductor Stocks be Impacted?

As tensions continue to boil between Beijing and Washington, you may wonder how some of the top U.S. semiconductor stocks are faring and whether they're still worth the investment. Both the Trump and Biden administrations have favored a harder line against exports of AI chips to China, plunging some of the market's most popular AI stocks into uncertain territory. For this piece, I've run three of the most buzzed-about semiconductor stocks with exposure to China—Taiwan Semiconductor Manufacturing Company (TSM), NVDA, and Credo Technology Group (CRDO)—through Seeking Alpha's Quant System to explore how the recent volatility has impacted performance.

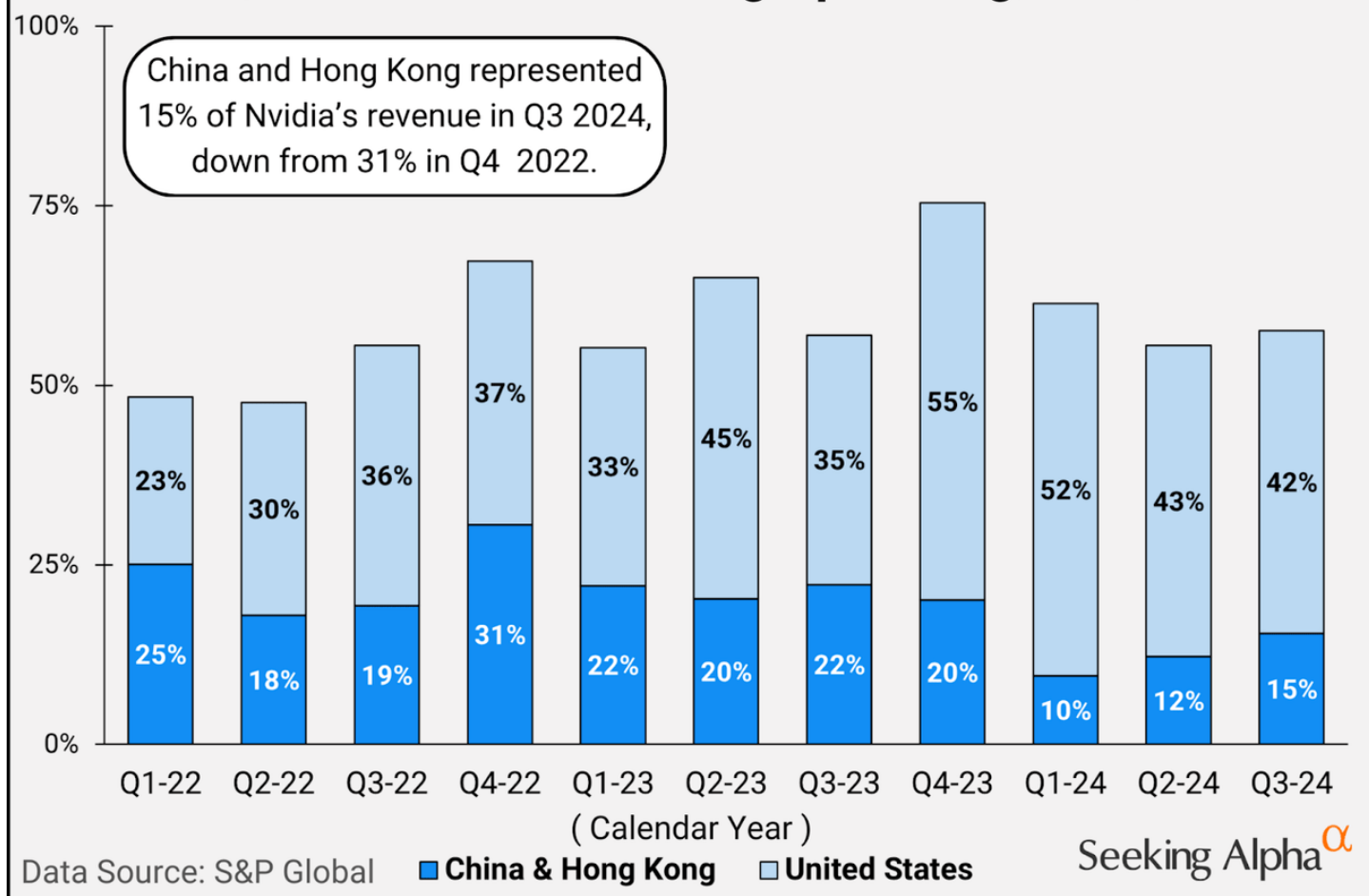
But first, let's look at some of their exposures to China.

Semiconductor Industry in China

China is the largest global consumer of semiconductors, purchasing more chips than any other market. Thus, its reliance on imported chips, the challenges faced by geopolitical tensions, and the ability to produce its own chips have prompted the nation to close the tech gap in chip production. While China's "Made in China 2025" initiative aims to develop and advance its high-tech industries rapidly, companies like NVDA and Credo Technology Group have been gradually winding down exposure to China over the past few calendar years.

In the third quarter of 2024, China and Hong Kong revenue represented 15% of the pie, down from 31% in Q4 2022. Meanwhile, its exposure to the United States increased to 42% from 37% over the same period.

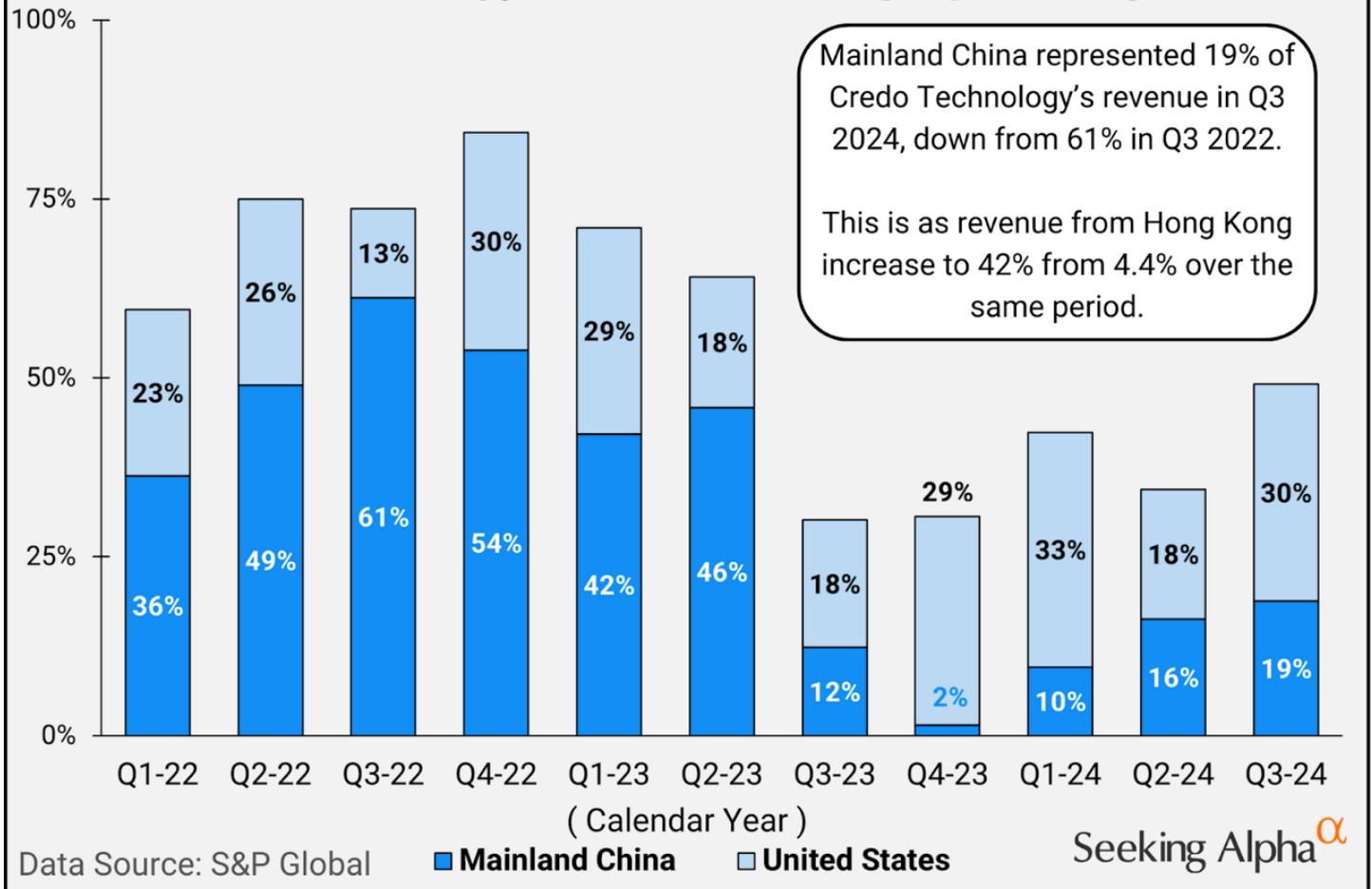
Nvidia Revenue - Geographic Region %



Seeking Alpha Premium

CRDO has also seen its exposure to mainland China deteriorate. As a share of its total revenue, China was 19% in Q3 2024, down from 61% in Q3 2022.

Credo Technology Revenue - Geographic Region %



Unlike NVDA, United States revenue has remained somewhat consistent—around 30% over the same period. More revenue has been sourced from Hong Kong instead, rising to 42% in Q3 2024 from 4.4% in Q3 2022. So, let's dive into the Quant metrics of a few stocks.

1. Taiwan Semiconductor Manufacturing Company Limited (TSM)

- Market Capitalization: \$868.53B
- Quant Rating: Strong Buy
- Quant Sector Ranking (as of 2/14/25): 11 out of 549
- Quant Industry Ranking (as of 2/14/25): 4 out of 67

Taiwan Semiconductor Manufacturing Company Limited (TSM), the world's largest chipmaker that manufactures chips for tech giants including NVDA and Apple (AAPL), has been firmly in Trump's crosshairs since before he re-entered the White House. Since accusing Taiwan of stealing American semiconductor business on the campaign trail, the president has floated the idea of placing tariffs on importing chips and dismantling legislation by the Biden administration, which offers incentives for chipmakers including TSM to set up manufacturing plants in the U.S. "In the very near future, we're going to be placing tariffs on foreign production of computer chips . . . to return production of these essential goods to the [US]," he told House Republicans at the end of last month.

Nonetheless, Wall Street remains bullish on the Taiwanese chipmaking giant, in part due to a deal struck on Monday to produce OpenAI’s first in-house AI chips. As SA analyst Oakoff Investments notes, “TSMC remains a top AI investment due to its dominant market position, strategic alliances, and cutting-edge technologies, despite geopolitical risks.” The game-changing partnership follows strong Q4’24 results by TSM, including year-over-year net income growth of 57% to NT\$374.68B (\$11.38B) and a 33.9% Y/Y rise in total revenue to NT\$2.89T (\$87.79B).



Balance Sheets & Key Indices

Selected Items from Balance Sheets <i>(In NTS billions)</i>	4Q24		3Q24		4Q23	
	Amount	%	Amount	%	Amount	%
Cash & Marketable Securities	2,422.02	36.2%	2,167.60	35.2%	1,687.65	30.5%
Accounts Receivable	272.09	4.1%	249.97	4.1%	201.94	3.7%
Inventories	287.86	4.3%	292.88	4.7%	250.99	4.5%
Long-term Investments	149.04	2.2%	127.33	2.1%	129.44	2.3%
Net PP&E	3,234.98	48.3%	3,071.60	49.8%	3,064.48	55.4%
Total Assets	6,691.94	100.0%	6,165.66	100.0%	5,532.37	100.0%
Current Liabilities	1,264.53	18.9%	1,080.40	17.5%	913.58	16.5%
Long-term Interest-bearing Debts	958.43	14.3%	936.16	15.2%	918.28	16.6%
Total Liabilities	2,368.36	35.4%	2,143.74	34.8%	2,049.11	37.0%
Total Shareholders' Equity	4,323.58	64.6%	4,021.92	65.2%	3,483.26	63.0%
Key Indices						
A/R Turnover Days	27		28		31	
Inventory Turnover Days	80		87		85	
Current Ratio (x)	2.4		2.6		2.4	
Asset Productivity (x)	1.1		1.0		0.8	

* Total outstanding shares were 25,933mn units at 12/31/24
** Asset productivity = Annualized net revenue / Average net PP&E

Like many of its other semiconductor peers, the DeepSeek saga took a toll on TSM, with shares sliding more than 13% between January 24 and January 27. However, shares in the Taiwanese chipmaker have begun to recover on optimism that DeepSeek’s new model could boost demand for AI chips overall, prompting many Wall Street analysts to buy the dip.

TSM 1M Performance (1/13/2025-2/14/2025)



s SA analyst Yiannis Zourmpanos argued following the sell-off:

While DeepSeek's innovations highlight efficiency gains, they do not replace the growing demand for cutting-edge chips needed for AI training and inference workloads. The market's response misprices TSMC's robust fundamentals and its pivotal role in AI hardware.

TSM Valuation, Momentum, Growth, Profitability and EPS Revisions

Despite the geopolitical risks posed by escalating Chinese tariffs, TSM's valuation remains attractive, with an 'A'-rated forward price-to-earnings-growth (PEG) ratio of 0.7, a -63.3% difference from the 1.8 sector median. A PEG of below 1 typically suggests that a stock comes at an attractive discount to its peers. A forward price-to-earnings ratio (P/E) of 22.2, a 25% discount to the sector, and enterprise value to EBITDA ratio of 10.75, a 34.5% difference, also reflect an attractive opportunity to buy the dip. TSM has begun inching closer to its former stock price following the deal with OpenAI among other momentum-boosting developments. The DeepSeek sell-off has brought TSM's 3M price performance down to 8.1%, bringing its previous 'A-' Momentum Grade to a 'B', but its strong growth profile reflects an opportunity for a comeback in performance. Growth highlights include forward revenue growth of 25%, a 291.6% difference, and 'A+' dividend per share growth of 19.4%, a 240.8% difference—all anchored by an A+ Profitability Grade.

Growth Grade and Underlying Metrics ?

TSM Growth Grade

A-

	Sector Relative Grade	TSM	Sector Median	% Diff. to Sector	TSM 5Y Avg.	% Diff. to 5Y Avg.
Revenue Growth (YoY)	A	33.89%	5.28%	541.30%	19.56%	73.22%
Revenue Growth (FWD)	A	25.07%	6.40%	291.64%	16.24%	54.35%
EBITDA Growth (YoY)	A-	37.37%	6.54%	471.82%	21.09%	77.23%
EBITDA Growth (FWD)	B+	25.94%	7.97%	225.53%	17.81%	45.68%
EBIT Growth (YoY)	B+	43.47%	6.83%	536.73%	26.33%	65.09%
EBIT Growth (FWD)	A-	30.30%	10.49%	188.84%	18.14%	67.06%
EPS Diluted Growth (YoY)	B+	39.92%	11.47%	248.13%	26.09%	53.00%
EPS Diluted Growth (FWD)	A-	27.12%	9.89%	174.04%	16.25%	66.87%
EPS GAAP Growth (YoY)	B+	35.91%	4.48%	701.57%	-	-
EPS GAAP Growth (FWD)	A-	28.65%	11.28%	154.01%	-	-
EPS FWD Long Term Growth (3-5Y CAGR)	A	33.09%	14.84%	123.00%	18.38%	80.00%
Levered FCF Growth (YoY)	A+	751.06%	17.46%	4,202.26%	NM	NM
Free Cash Flow Per Share Growth Rate (FWD)	A-	62.43%	15.87%	293.42%	16.93%	268.74%
Operating Cash Flow Growth (YoY)	B+	47.04%	15.25%	208.49%	22.57%	108.40%
Operating Cash Flow Growth (FWD)	B	26.95%	14.43%	86.74%	16.03%	68.16%
ROE Growth (YoY)	B+	15.51%	-3.26%	NM	7.85%	97.57%
ROE Growth (FWD)	B	4.89%	-1.62%	NM	0.30%	1,551.74%
Working Capital Growth (YoY)	A-	42.44%	-0.58%	NM	40.98%	3.56%
CAPEX Growth (YoY)	C+	0.65%	-2.30%	NM	22.68%	-97.13%
Dividend Per Share Growth (FWD)	A+	19.43%	5.70%	240.87%	12.12%	60.39%

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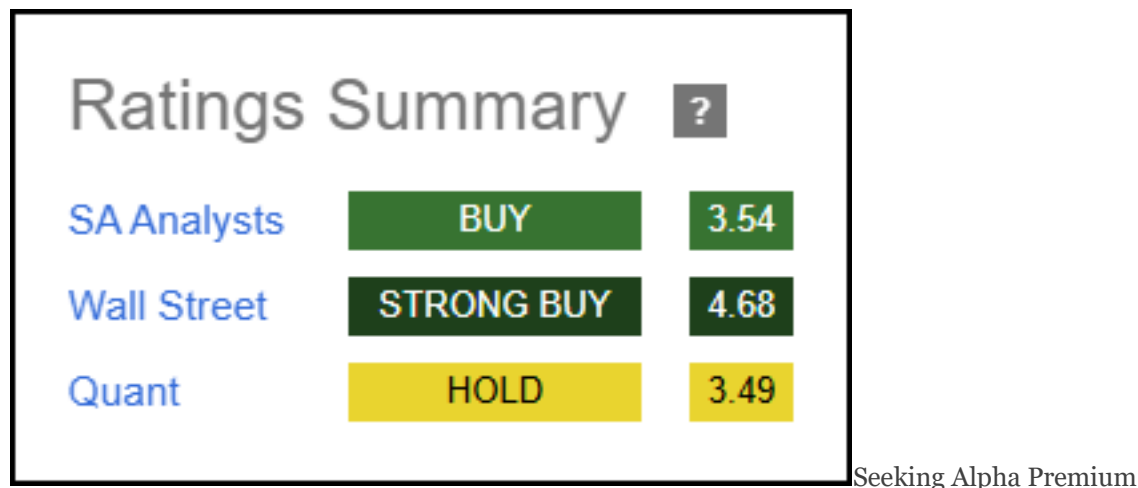
TSM has also received 29 positive revenue revisions from analysts over the past 90 days, compared to 4 negative ones, and 6 positive EPS revisions compared to one negative. Similar to TSM, the following stock has encountered obstacles

due to the DeepSeek shake-up and looming tariff war, but its fundamentals may not be as attractive from a Quantitative perspective.

2. NVIDIA Corporation (NVDA)

- Market Capitalization: \$3.3T
- Quant Rating: Hold
- Quant Sector Ranking (as of 2/14/25): 92 out of 549
- Quant Industry Ranking (as of 2/14/25): 9 out of 67

It's hardly a surprise that analysts are in disagreement over whether NVDA is a Hold, Buy, or Strong Buy. Our Quant system registers it as a Hold given its expensive valuation, among other factors.



Like TSM, however, many analysts seem to believe that DeepSeek's turbo-charging of the AI race could ultimately benefit NVDA and its peers in the long run. The California chipmaker's chief executive Jensen Huang attended a closed-door meeting with Trump last week, that was scheduled before DeepSeek's unwelcome arrival wiped nearly \$600B from NVDA's market value. Since the Biden administration restricted what American chipmakers could sell in China in 2022, NVDA has continued to sell certain AI chips and GPUs in the region. Convincing the Trump administration to preserve that balance could be key to NVDA's continued regional dominance, especially with new overseas adversaries like DeepSeek.

So far, DeepSeek has had little impact on NVDA's earnings outlook, with analysts maintaining stable predictions for FY25-FY27 despite the sweeping sell-off. From an individual investment perspective, the semiconductor leader's elongated rally—having returned nearly more than 1,882% over the past five years—means that it requires ironclad fundamentals to justify its permanently high valuation. Some analysts, however, interpret the DeepSeek dip as a rare chance to capitalize on a lower valuation. As SA's Finance Flash argues:

With anticipating ambitious but realistic growth rates of 32.3% p.a. for the next eight years, we get a potential undervaluation of almost 40%. With this in mind, and considering the very prosperous growth prospects of the company, I currently rate the company a Strong Buy.

NVDA Valuation, Growth, Profitability, Momentum, and EPS Revisions

NVDA stock's 'F' Valuation Grade is weighed down by a forward P/E of 47.6 (a 61% difference from the sector median) and an 'F'-rated price-to-book ratio (FWD) of 37 (a 726.9% difference) among other low-rated metrics. However, a 'B+'-rated PEG of 1.2 (FWD) and 'A'-rated PEG (TTM) of 0.23, 34.8%, and 76.96% below the sector median, respectively, suggests there could still be a value play to unlock. SA analyst Millennial Dividends lays out a scenario in which this could take place:

With a 2-year (only 1 quarter left to be reported from FY25) average growth expectation of 33% in EPS, the fair value of Nvidia could be around 40x its earnings, pretty much at the valuation the stock is currently trading. That means that the stock is not a bargain, but simply if the forward growth materializes, investors will be rewarded handsomely, but of course, everyone should be aware of Nvidia's volatility with a beta of 1.66. Even if we were more skeptical and used the 15Y Valuation average of 35.8x its earnings, investors could still see around 26% total annual ROR over the course of the next 2 years.

Valuation Grade and Underlying Metrics

NVDA Valuation Grade

F

	Sector Relative Grade	NVDA	Sector Median	% Diff. to Sector	NVDA 5Y Avg.	% Diff. to 5Y Avg.
P/E Non-GAAP (TTM)	D	51.68	25.52	102.46%	63.61	-18.76%
P/E Non-GAAP (FWD)	D	45.81	25.64	78.69%	47.87	-4.30%
P/E GAAP (TTM)	C-	53.42	33.03	61.75%	84.82	-37.01%
P/E GAAP (FWD)	C-	47.65	29.58	61.05%	63.00	-24.37%
PEG GAAP (TTM)	A-	0.23	0.99	-76.96%	-	NM
PEG Non-GAAP (FWD)	B+	1.20	1.84	-34.80%	1.88	-36.23%
EV / Sales (TTM)	F	29.00	3.56	713.73%	25.27	14.75%
EV / Sales (FWD)	F	25.42	3.38	651.86%	19.58	29.82%
EV / EBITDA (TTM)	D+	45.16	20.04	125.34%	65.35	-30.90%
EV / EBITDA (FWD)	D	39.08	16.43	137.91%	48.95	-20.16%
EV / EBIT (TTM)	C-	46.25	25.53	81.16%	76.63	-39.65%
EV / EBIT (FWD)	D+	38.61	21.24	81.72%	40.97	-5.77%
Price / Sales (TTM)	F	29.38	3.36	774.39%	25.50	15.19%
Price / Sales (FWD)	F	25.64	3.32	671.90%	19.97	28.36%
Price / Book (TTM)	F	50.31	3.66	1,275.12%	31.08	61.87%
Price / Book (FWD)	F	37.07	4.48	726.93%	23.05	60.81%
Price / Cash Flow (TTM)	D-	56.20	20.13	179.21%	71.83	-21.76%
Price / Cash Flow (FWD)	D	48.00	21.88	119.40%	49.40	-2.83%
Dividend Yield (TTM)	F	0.03%	1.43%	-98.25%	0.08%	-68.68%

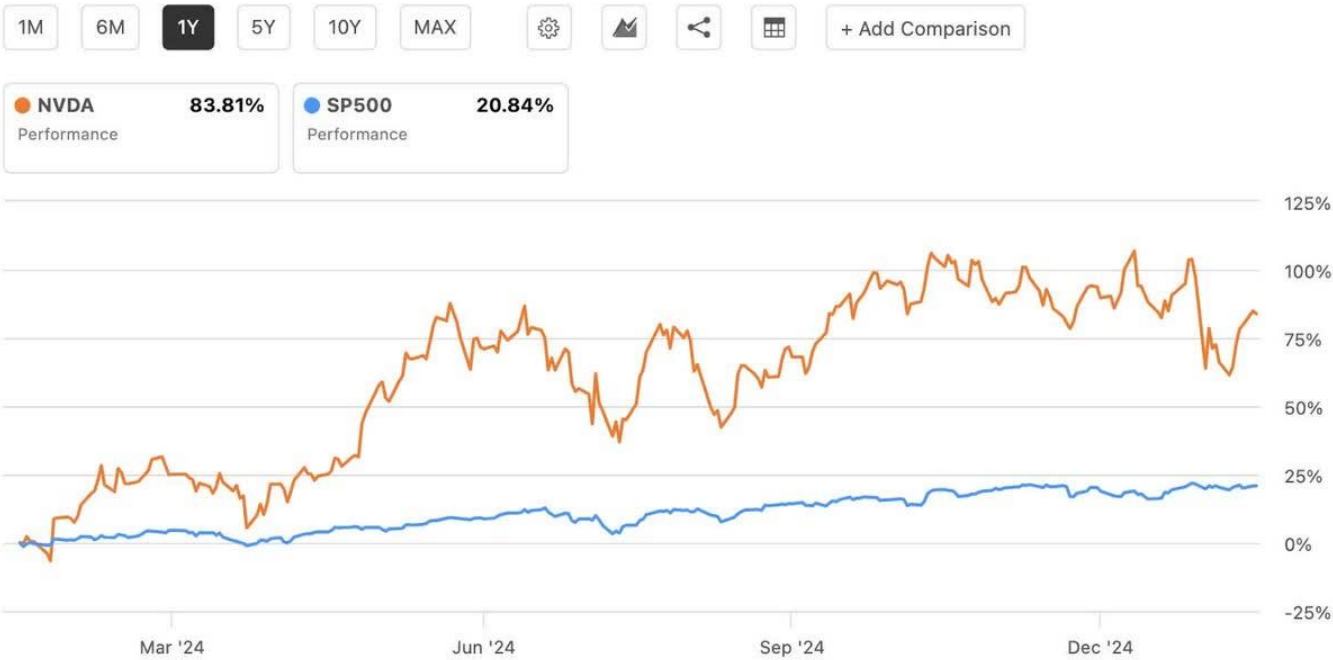
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NVDA boasts 'A+ Growth and Profitability scores, with highlights including 'A+ forward revenue growth of 93.7%, a 1,363.8% difference from the sector median, forward EBITDA growth of 181.3%, a 2,174.8% difference, and 58.96B in cash from operations, a 58,911% difference. NVDA continues to outpace the S&P 500 by more than 4x over the past

year but has struggled to keep up the last month following DeepSeek’s debut, as illustrated by its ‘B’ Momentum Grade.

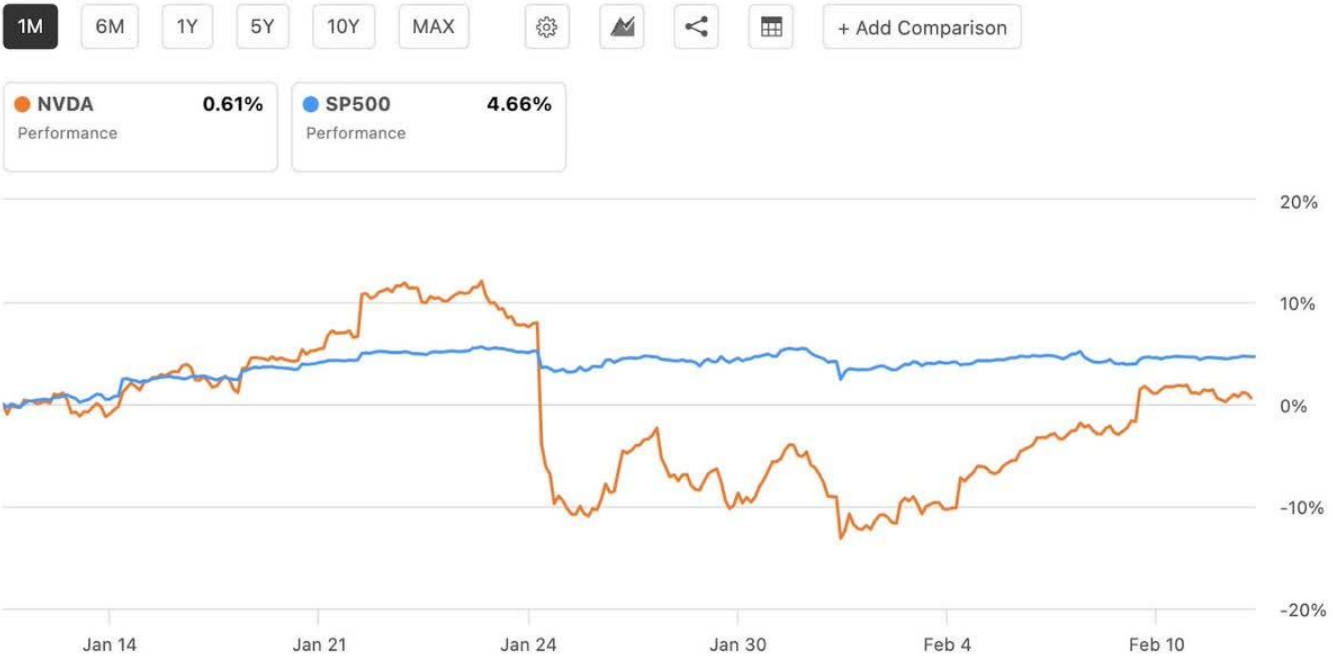
NVDA 1Y Performance v. S&P 500 (1/14/2025-2/14/2025)

Price Return vs S&P 500



Seeking Alpha Premium

Price Return vs S&P 500



The chipmaker has also received 43 positive EPS revisions over the past 90 days compared to two downward EPS revisions and 48 positive revenue revisions, indicating widespread confidence in its recovery following DeepSeek. Also making an impressive DeepSeek recovery and, better yet, finds itself in a unique niche in the semiconductor market that has been less impacted by trade tensions thus far is Credo Technology Group.

3. Credo Technology Group Holding Ltd. (CRDO)

- Market Capitalization: \$11.8B
- Quant Rating: Strong Buy
- Quant Sector Ranking (as of 2/14/25): 3 out of 549
- Quant Industry Ranking (as of 2/14/25): 2 out of 67

AI has transformed the data center industry, and no company has benefitted from this quite like Credo Technology Group (CRDO). Included within my top 10 stocks for 2025 and ranked in the top three among its fellow Technology Stocks and Semiconductor Stocks, CRDO has ridden the wave of supercharged demand for AI-driven data centers, which utilize its specialized high-speed connectivity products, including integrated circuits and active electrical cables (AECs). With offices in California, Taiwan, Hong Kong, Shanghai, and Tokyo, the company's high-speed semiconductor solutions for electrical and optical ethernet applications have significant exposure to potential trade tensions between the U.S. and China. Similar to TSM and NVDA, CRDO lost 17% on January 27 following the DeepSeek launch.

Nonetheless, investors are bullish that CRDO's valuable niche in the semiconductor connectivity market will allow it to benefit from DeepSeek-powered AI advancements in the long term, thus restoring its valuation to a more sustainable level. By positioning itself as an integral supplier to AI hyperscalers—large data centers that provide the computing power and infrastructure to scale AI technologies—CRDO has attached itself to one of the fastest-growing areas of the AI revolution.

The strategy continues to pay off: impressive Q2 results released in December reflect a strong growth trajectory, with a 21% Y/Y increase in revenue to \$72M and a non-GAAP gross margin of 63.6%, suggesting that it is achieving high sales growth without a knock to profitability.

CRDO Valuation, Growth, Momentum, Profitability, and EPS Revisions

CRDO trades at a slight discount, with a forward PEG of 1.5, a -20.3% difference from the broader technology sector median. Yet, other valuation metrics, including an 'F'-rated forward GAAP P/E of 397.9—a 1,244.9% difference from the 29.6 sector median—suggest that its surging shares have inflated its overall valuation.

CRDO's 'A+' Growth Grade is promising, with forward revenue growth of 50.5% (a 689.4% difference), forward EBITDA growth of 129.4% (a 1,523.8% difference), and forward earnings per share (EPS) diluted growth of 174% (a 1,659.5% difference)—all of which reinforce its 'A+' Momentum Grade. Profitability is more questionable, with an overall 'D' rating as a result of a -16.9% levered free cash flow margin (TTM) and -7.96% EBITDA margin (TTM) among other metrics. An 'A'-rated capital expenditure-to-sales ratio of 14.7%, however, suggests that CRDO is reinvesting significant cash to back its future growth.

Price Return vs S&P 500



Seeking Alpha Premium

Looking forward, the company has received 11 positive EPS revisions and 10 positive revenue revisions from analysts over the past 90 days with zero negative ones in either category. With consensus optimism around the company, analysts are projecting an astounding 467.8% Y/Y EPS growth for the next quarter, making this stock a Strong Buy for 2025 and potential option for investors considering chip stocks with exposure in China.

Conclusion: The Semiconductor Market Shows Resistance to Trump Tariffs and AI Competition

The rise of new AI technologies such as DeepSeek and a brewing trade war between the U.S. and China will pose major challenges for some of the market's largest semiconductor players. However, the initial market shock following DeepSeek's launch has already begun to correct. Many analysts foresee the introduction of faster, cheaper technologies as a net positive for the sector. Separately, investors may be wise to evaluate their portfolios for semiconductor stocks with exposure to China as the Trump administration ramps up its scrutiny over cross-border sales and China hits back with restrictions and tariffs of its own. TSM and NVDA may be more exposed to future trade tensions, whereas CRDO's position as a leader in the high-growth semiconductor connectivity space may leave it out of the political crosshairs for now.

Applied Materials, Inc. (AMAT) Q1 2025 Earnings Call Transcript

Feb 13, 2025 SA Transcripts

Company Participants

Liz Morali - Vice President, Investor Relations

Gary Dickerson - President and Chief Executive Officer

Brice Hill - Senior Vice President and Chief Financial Officer

Conference Call Participants

Toshiya Hari - Goldman Sachs

Atif Malik - Citigroup

Stacy Rasgon - Bernstein Research

CJ Muse - Cantor Fitzgerald

Vivek Arya - Bank of America

Timothy Arcuri - UBS Securities

Harlan Sur - JPMorgan

Krish Sankar - TD Cowen

Srini Pajjuri - Raymond James

Brian Chin - Stifel

Joe Quatrochi - Wells Fargo

Charles Shi - Needham & Company

Chris Caso - Wolfe Research

Vijay Rakesh - Mizuho

Mehdi Hosseini - Susquehanna

Timm Schulze-Melander - Redburn Atlantic

Operator

Welcome to the Applied Materials First Quarter Fiscal 2025 Earnings Conference Call. During the prepared remarks, all participants will be in a listen-only mode. Afterwards, there will be a question-and-answer session.

I would now like to turn the call over to Liz Morali, Vice President of Investor Relations. Liz, you may begin.

Liz Morali

Thank you. Good afternoon and thank you for joining us for today's call. With me today are Gary Dickerson, President and CEO; and Brice Hill, CFO.

Before we continue, let me remind you that today's discussion contains forward-looking statements within the meaning of the Federal Securities Laws, including predictions, estimates, projections or other statements about future events. Actual results may differ materially from those mentioned in these forward-looking statements, as a result of risks and uncertainties. Information concerning these risks and uncertainties is discussed in our most recent Form 10-K and 8-K filings with the SEC. We do not intend to update any forward-looking statements.

During today's call, we will also reference non-GAAP financial measures. Reconciliations of GAAP to non-GAAP results can be found in today's earnings press release and in our quarterly earnings materials, which are available on our Investor Relations website at ir.appliedmaterials.com.

I will now turn the call over to Gary.

Gary Dickerson

Thanks, Liz. In our first fiscal quarter of 2025 Applied Materials delivered record revenues surpassing the prior high we set last quarter. The major technology trends that are shaping the global economy are made possible by advanced semiconductors underpinning long-term secular growth for the industry and especially Applied Materials.

We are providing our customers a unique and connected portfolio of solutions to accelerate the technology roadmap, positioning us for continued growth and outperformance in the years to come. In my prepared remarks I'll share our latest market insight, I'll describe how our innovations are enabling the major device architecture inflections that are critical to advancing energy efficient AI and I'll talk about why high-velocity co-innovation is more important than ever as the industry races to bring next generation technology to consumers faster and at lower cost.

Starting with the market, AI remains central to our outlook. With almost infinite possible uses, AI is the most transformative technology change of our lifetimes and a major catalyst for innovation and growth across the technology sector. Early deployment of AI supported approximately 20% year-on-year growth of global semiconductor sales in 2024 and the market remains on track to exceed \$1 trillion of annual revenues by 2030.

We are only at the beginning of what's possible and as we look ahead we expect disruptive innovations to significantly improve the energy efficiency and cost of AI, opening up new applications and growing the overall market opportunity. To unlock this potential innovation is required across the technology stack from the models and software as we've seen in recent weeks with DeepSeek to data center architecture, chip design and how those chips are made.

Advancements in foundational semiconductor technologies will have a dramatic impact on system level energy and cost reduction in the AI data center. I've previously described four critical areas the industry is currently focusing on; leading edge logic, high performance DRAM, DRAM stacking referred to as High Bandwidth Memory or HBM and advanced packaging to connect the logic and memory chips together in an integrated package.

There's also a fifth theme emerging as we are seeing major innovations in power electronics. These innovations can address data transfer energy consumption within the data center as well as significantly reduce grid to data center power losses. Applied has strong leadership in all these areas and we're best positioned at future device architecture inflections including next generation gate-all-around transistors, backside power delivery, 4F squared and 3D DRAM, advanced packaging, compound semiconductors for power electronics and silicon photonics.

These device architecture inflections in logic, compute, memory, packaging and power devices grow the market for wafer fab equipment, increase the relative mix of materials engineering technologies and provide opportunities for Applied to gain market share. Taking leading edge foundry logic as an example, the transition from the most advanced generation of FinFET to the first nodes with integrated gate-all-around and backside power delivery grows our total available market by more than 15% to around \$14 billion for every 100,000 wafer starts per month of capacity.

At the same time, we expect related Applied revenues to grow in the 30% range for the equivalent wafer fab capacity. While the bulk of spending for these inflections is ahead of us, we are already seeing a positive impact on our business. In 2024 we believe we outperformed the market in aggregate across leading edge foundry logic, DRAM, advanced packaging and the ICAPS markets outside of China.

The ability of U.S. companies to serve the China market is constrained and has been further limited by updated trade rules announced in December and January. We estimate the incremental impact of these new rules will be around

\$400 million of revenue in fiscal 2025, approximately half of which is service revenue. We also see China being a smaller portion of global wafer fab equipment spending in 2025.

At Applied Materials, our strategy is to develop and commercialize the most enabling technologies for the industry across leading edge logic, memory, advanced packaging and ICAPS. We have focused our investments on these high growth inflections that allow us to create and capture more value. One of the ways we are implementing our strategies is to provide our customers unique and connected solutions that take advantage of our broad portfolio of technologies, capabilities and partnerships.

Our co-optimized and integrated solutions address higher value device challenges for customers and are difficult for competitors to replicate. A good example is our Integrated Hybrid Bonding Interconnect solution that combines six technologies including one module from a partner into a single integrated system.

In the past quarter we successfully completed important qualification milestones and received volume orders from multiple leading edge customers. Our Integrated Hybrid Bonding system is one of our next generation solutions that is allowing us to extend our leadership in advanced packaging. In 2024, our packaging business captured more than half of the market we serve and we remain on track to double our revenues over the next several years.

Another key pillar of our strategy is high-velocity co-innovation. We believe this is key for Applied and our customers to bring next generation technology to market faster and at lower cost. By speeding up cycles of learning through tighter ecosystem collaborations, we are accelerating new chip architectures, driving higher mutual success rates and optimizing R&D efficiencies.

Among our accomplishments in the past quarter, we launched our EPIC Advanced Packaging Strategy at a technical summit we hosted in Singapore that brought together R&D leaders representing more than 20 global companies. We were part of two teams that received CHIPS Act grants to develop advanced packaging substrates for 3D integration. We are leading the team for silicon substrates and we have a long-term partnership and investment in the company that won the grant for glass core packaging.

We made significant progress with the construction of the EPIC Center in Silicon Valley which is on track to come online in 2026 and will become the centerpiece of our global EPIC collaboration platform and we partnered with TPG to transition Applied's thin film battery business into an independent company.

We're also evolving our collaborative model and services where we are helping customers manage increasing complexity in their business as they ramp next generation technology into high volume manufacturing. We are deploying our Advanced service products including our Actionable Insight Accelerator Data Platform or AIx to help accelerate customers R&D programs, reduce technology transfer times and optimize device performance yield output and cost in their fabs.

Through these closer working relationships, a high percentage of our service revenues is generated from subscriptions in the form of multiyear agreements. While our near-term service growth is negatively impacted by trade restrictions, we remain confident that we will still grow AGS at a low double digit annualized growth rate over the longer-term.

Before I hand over to Brice, I'll quickly summarize. As major technology trends reshape the global economy and the semiconductor industry, Applied continues to deliver strong financial performance in the near-term. We are best positioned at major device architecture inflections in fast growing areas of the market that are critical to energy efficient AI and we are focused on high-velocity co-innovation with our customers and partners to bring breakthrough technology to market faster than ever before.

Brice?

Brice Hill

Thanks Gary and thank you to everyone joining us for today's call. We had a strong start to the fiscal year with healthy revenue growth and meaningful margin expansion which helped drive a 12% year-over-year increase in non-GAAP earnings per share. In addition, we distributed \$1.6 billion to shareholders with 1.3 billion of share repurchases and \$326 million of dividends. For fiscal Q1 our results were largely in line with our expectations with total net sales of approximately \$7.2 billion up 7% year-over-year with growth in both Semiconductor Systems and Applied Global Services.

Non-GAAP gross margin was 48.9%, up 100 basis points year-over-year and our highest quarterly gross margin since fiscal year 2000. The strong margin performance in Q1 was the result of a very favorable mix and increasing adoption of our leading edge technologies and advanced integrated systems. In addition, we progressed on our value based pricing initiatives and cost reductions. Non-GAAP operating expenses were \$1.31 billion with increased R&D investments to support our technology growth areas. Non-GAAP EPS was a record \$2.38, up 12% year-over-year given the revenue growth, better profitability and share repurchases.

Moving to the segments, Semiconductor System sales were \$5.36 billion for Q1, up 9% year-over-year driven by 20% growth in foundry logic partially offset by an expected decline in DRAM sales as prior year sales to customers in China did not repeat. Non-GAAP operating margin of 37.3% was up 160 basis points year-over-year. Sales for the ICAPS nodes which serve customers across the IoT, communications, automotive, power and sensor markets were down slightly year-over-year and flat quarter-over-quarter.

Moving to Applied Global Services, AGS delivered revenue of \$1.59 billion in Q1, up 8% year-over-year with healthy growth in services partially offset by a decline in sales of 200 millimeter equipment. Non-GAAP operating margin of 28% was down 30 basis points year-over-year. Lastly, our Display business delivered revenue of \$183 million.

Moving to the balance sheet and cash flows, we ended the quarter with cash and cash equivalents of \$6.3 billion and debt of \$6.3 billion. Cash from operations in the quarter was \$925 million, capital expenditures were \$381 million and free cash flow was \$544 million. We distributed \$1.6 billion to shareholders in the quarter, including \$1.3 billion in share repurchases and \$326 million in dividends. As of the end of the quarter, approximately \$7.6 billion remains available under our share repurchase authorization.

Turning to our outlook, we are seeing strong momentum for leading edge foundry logic, where we are particularly well positioned as our customers ramped the most advanced technology nodes with gate-all-around transistors into high volume manufacturing.

Offsetting leading edge is a more measured level of investment in the ICAPS nodes following strong spending in 2023 and 2024. In DRAM, we are seeing healthy demand, but face tough year-over-year compares given the purchases from Chinese customers in 2024 that do not repeat this year.

We are also seeing growth in NAND, albeit from historically low levels. As Gary mentioned, as a result of the expanded export controls announced in December and January, we expect to face a headwind to revenue of approximately \$400 million in fiscal 2025. Nearly half of that impact will be in Q2. The impacts in the second half of the fiscal year will be more weighted to AGS as we are no longer able to service certain customers. And following the step down in revenue in Q2, we would anticipate a return to growth in Q3 for AGS.

Based on these trade restrictions and our view of our business for Q2, we expect that China as a percentage of total revenue will be about 5 percentage points lower than in Q1. This is below the normalized level of approximately 30%. Taking all of these factors into account, for fiscal Q2 we expect total revenue of \$7.1 billion plus or minus \$400 million which represents a 7% increase year-over-year and non-GAAP EPS of \$2.3 plus or minus \$0.18 which represents a 10% increase year-over-year.

We expect Semiconductor Systems revenue of approximately \$5.3 billion up 8% year-over-year, AGS revenue of approximately \$1.55 billion up 1% year-over-year and Display revenue of approximately \$250 million. We expect non-GAAP gross margin of approximately 48.4% and non-GAAP operating expenses to be approximately \$1.3 billion. We are modeling a tax rate of approximately 13%.

In closing, our business is strong and we remain confident in our growth opportunities across all of our business segments. We are making significant investments in R&D to grow our share at the leading edge and we are increasing our capital investments to be the leader in high-velocity co-innovation with our customers. This is an important indicator of the confidence we have in the growth trajectory of our business and with our differentiated technology, unique insights and deep industry relationships, we are poised to benefit from the technology transitions and semiconductor growth that is expected over the coming years.

Liz we're now ready to begin the Q&A.

Liz Morali

Thanks Brice. To help us reach as many people as we can on today's call, please limit yourself to one question. If you have an additional question, please re-queue and we'll do our best to come back to you later in the session.

Question-and-Answer Session

Operator

[Operator Instructions] And our first question comes from the line of Toshiya Hari from Goldman Sachs. Your question please.

Toshiya Hari

Hi, good afternoon. Thank you so much for taking the question. I know you guys aren't or haven't been giving specific WFE numbers, but at a high level, Gary and/or Brice, I was hoping you could provide a little bit of context on how you're thinking about the year. I know you gave a couple of comments, but by application, by geography, how is 2025 likely to shape up in your view? And more importantly your outperformance vis-à-vis the market, what are some of the key drivers that we should be focused on? And if you can speak to the magnitude of outperformance relative to what you achieved in 2024, that would be really helpful? Thank you.

Brice Hill

Okay, thanks Toshiya, nice to hear from you. So first we'd say that our Q2 guide gives a really good indication of how we think the market is evolving. So leading edge, with all the strength that you see in AI and pulling DRAM, Advanced Logic and HBM, that factors into what we see in the market today. So leading edge is growing. We've been thinking it will be accelerating through the course of the year and we do see that growing strongly in Q2.

And we highlighted that we've also been watching the ICAPS market after the significant build out the last couple of years in China and that is lower in Q2. So those things offset, but you see on total that we still have consistent year-over-year growth in the overall market. So that's the big change from a market perspective.

If you look at the memory side, our memory is roughly flat quarter-over-quarter. We do see some additions on the NAND side and that's offset by a slight reduction in DRAM. NAND is growing, but of course that's from a smaller level.

And the last thing I would share is when you think about advanced packaging, we had a significant amount of capacity adds last year in the HBM side for the initial burst of capacity. And we're still selling into HBM, still adding equipment into that market, but it's at a slower rate, so that's part of the outlook also.

So the key thing there is, we've all been waiting to see if Advanced Logic would ramp strongly enough to offset any slower rate of investment in ICAPS and that is what we're seeing in Q2 and that's our best. What we try to do is share what we're seeing today and we think that's our best indication on how you can think about the year at this point.

Gary Dickerson

Yes Tashiya, relative to the outperformance question, over the last four years, including last year, we outperformed in aggregate across leading edge foundry logic, DRAM, High-Bandwidth Memory, Advanced Packaging and ICAPS markets outside of China and we've been talking about this a lot. We're focused on major device architecture inflections critical to AI energy efficient computing.

When we're meeting with all of our customers, that's where they're all focused. So for us, we're on track to capture greater than 50% share of our served market in gate-all-around and backside power and foundry logic. We gained 10 points of DRAM share and we're positioned to gain shareholders as 4F squared and 3D DRAM architectures are adopted.

Packaging was around \$1.7 billion in 2024, up 3x in four years. And as we've said many times, we're positioned to double this business in the coming years. In ICAPS we gained several points of share since we formed the group six years ago. We brought several new products to market. We have a strong pipeline of new products that will grow our available market and position us well in this segment.

And materials engineering intensity, where Applied has clear leadership is increasing in next generation chip architectures. So going forward, I like how we're positioned to win these major inflections. Again, we've been outperforming in all of these segments over the last four years and we're well positioned to continue to outperform going forward.

Operator

Thank you. And our next question comes from the line of Atif Malik from Citi. Your question please.

Atif Malik

Hi. Thank you for taking my questions. Brice, I appreciate the color on the April quarter. The silicon system is down a little bit, explained by the China impact and you're talking about the return to growth in AGS. Can you also comment on the silicon systems? Do they return to sequential growth in the July quarter or we'll have to wait and see?

Brice Hill

Yes, thanks Atif. I think we'll have to wait and see on the semiconductor systems. But what we're sharing is, we've been expecting the leading edge to accelerate. When you think about the gate-all-around and backside power nodes in the market and the advantages of those nodes for leading edge architectures, we expect a significant amount of capacity to be put in place in those nodes and that is what you see in Q2 and we expect that that is a good indication of where the market will be going.

And then on the offset for that, we highlighted the ICAPs and we've been watching that, but I'll just say that market continues to evolve. Our forecast for ICAPS and for ICAPS China seems to change every single quarter and so we'll see how that evolves through the rest of the year.

And then on the services business, yes, this will be similar to 2022 when there were new trade rules. We'll have a step back, as you can see in our guide in Q2, but we expect to grow from there at the low double digit rate as we continue to

add customers, add new types of services, and the new customers and new locations will make it more likely the services business is utilized by the customers.

Atif Malik

Thank you.

Operator

Thank you. And our next question comes from the line of Stacy Rasgon from Bernstein Research. Your question please.

Stacy Rasgon

Hi guys, thanks for taking my question. You said that the China impact in the second half will be weighted to AGS, but you also said AGS returns to growth in Q3. So like how do I square that circle? What's offsetting the China impact in the second half? And just like broadly, if I were to add the \$200 million-ish or so that AGS is getting hit by the China sanctions, if you added that \$200 million back in, would it still grow double digits this year?

Brice Hill

Yes, that's a good question. Thank you Stacy for the question. So on the AGS side, the way to think about it is, approximately half of the impact will be taken in Q2 and then it will be a continued impact in the following quarters. But we don't expect it to be a sequential reconciling line item. In other words, whatever business we can't support in Q2, that's the same business or less in Q3 and Q4. So there is an impact in Q3 and Q4, but we think you shouldn't worry about it from a modeling perspective.

We'll just begin to add from there and we'll grow at the rate that we've described, low double digits as we continue to add installed base and tools to support. And then didn't do the calculation. I guess what I would say is from a core AGS perspective, if you take the 200 millimeter out, we're absolutely growing at low double digits or higher.

Operator

Thank you. And our next question comes from the line of CJ Muse from Cantor Fitzgerald. Your question please.

CJ Muse

Yes, thank you for taking the question. I was hoping you could speak a bit to gross margins. You talked about value based pricing starting to come in in the January quarter. I would love to hear more about how you see that flowing through the model throughout all of calendar 2025.

And I guess as part of that, how should we be thinking about kind of evolving mix in terms of modeling gross margin either first half, second half or kind of exit rate for calendar 2025 would be very helpful. Thank you.

Brice Hill

Okay, thank you CJ. Good to hear from you. So, on the gross margin, 48.9 and 48.4 in our guide in Q2, very strong mix in both quarters. Obviously with the China impacts for Q2, it's a little bit lesser mix strength. We're still going to reiterate our 48% underlying rate. So we think when we don't have those quarters with ultra-strong mix, that's still about the ballpark for our normalized rate.

So think in the second half that unless we maintain the exact same mix, which we likely don't expect, we will be closer to that 48% gross margin for the year or not for the year. Sorry, we're not giving a guide for the year, but that is our underlying baseline rate to think of as you think about where the business is normally.

And then if you think about the pricing, I think of two dynamics with pricing; one the solutions that we're developing that Gary has pointed the company toward the inflections, those are increasingly valuable solutions for the customers. And so there's increasing value proposition for the equipment itself.

And then our pricing mechanism is to make sure that we're including that in our thinking with respect to the pricing. And we also have a disciplined infrastructure to have those discussions with customers. So as we allocate our R&D, we're of course allocating to the areas that we think are most valuable in the market. And we think, you know, it's a matter of execution to achieve that value in the marketplace, which is what we're trying to do.

So I said third inning last quarter on those -- on the process for pricing, and I think that's still accurate.

Operator

Thank you. And our next question comes from the line of Vivek Arya from Bank of America Securities. Your question please.

Vivek Arya

Thanks for taking my question. I actually had a longer-term conceptual question for Gary related to litho versus etch and depth intensity. You know, let's say overall WFE intensity stays around mid-teens. It means WFE will grow in line with semiconductor industry sales over the next several years. And if that happens, do you think Gary litho takes more share or do you think etch or depth take more share and hence grow faster or slower than overall semiconductor industry sales? I've heard arguments on both sides, but would appreciate your views.

Gary Dickerson

Oh, hi Vivek, thanks for the question. So if I look at the major inflections that we're focused on going forward, if you look at leading edge, foundry logic, gate-all-around in backside power, our customers have talked about being able to achieve in backside power 30% area scaling benefit beyond power and performance benefits with really no change in feature size. So that's basically what we're seeing in foundry logic and we think that continues going forward.

In DRAM, if you look at what our customers have talked about in 4F squared, they also talk about significant area savings as they implement that new architecture. And of course again for all of these things, we're incredibly well positioned.

And then when you get to 3D DRAM, 3D DRAM is more similar, not the same materials, but a similar impact, where the relative spending for materials engineering goes up significantly versus lithography. And of course another area that we're focused on and the entire industry is focused on is Advanced Packaging. And when we look at what the AI servers look like three or four years from now, the architectures are going to be very different. And the way the data is connected in those architectures, there's just going to be tremendous innovation again around materials innovation.

So, when I look across any of these different markets and of course ICAPS is really all driven through materials innovations. We've talked about this before in our master classes. We see the percentage of materials engineering relative to spending to be increasing going forward around all of these different architecture inflections.

Vivek Arya

Thank you.

Operator

Thank you. And our next question comes from the line of Timothy Arcuri from UBS Securities. Your question, please.

Timothy Arcuri

Thanks a lot. Brice, do you think, as you look at, I know that you're not going to give us a WFE number for last year, but do you think you gained WFE share? That's the first question. And then how do you kind of assess Gary, the headwind from these companies in China? Because I know that they have delayed revrec, so it makes it hard to sort of measure year-to-year, but they're about 5% now of WFE. It's up like 400 basis points over the past four to five years and that's all depth and etch. And you know, you've done a great job holding share and gaining share, but how do you sort of think about that headwind from China, because so much of the incremental spending is from there? Thanks.

Brice Hill

Okay, Tim, nice to hear from you, thank you. On the share in 2024, of course, we don't know yet in terms of the final measures there, but you heard in Gary's script he talked about, we think we've gained share in all the markets except for likely China. So, we'll just have to see what the, what that reading is once all the share numbers are in. So we feel well positioned from that perspective.

And even in China we feel good about the way we compete. It's just yes, the local Chinese vendors have some advantages with the trade rules that have been put in place. And then, on the headwinds for China, I think, we do have lower visibility, but we continue to add customers and we think that's a huge market. It's our largest ICAPS market. And ICAPS is the largest market for Applied. And we expect that to grow over time at the device level, mid-to-high single digits.

As you know, the equipment investments in the last couple of years have been ahead of the market. So we've expected it to moderate for some period of time. So, we'll see how that plays out. But for us, that continues to be one of the most important markets for the company.

Gary Dickerson

Yes, Tim, just I would add again, I talked about this a little bit earlier. Leading-edge foundry logic, we're incredibly well positioned for those inflections. DRAM, we've gained 10 points of share and again, really well positioned for 4F-squared and 3D DRAM, high bandwidth memory. You know, that's another one where we have a very strong leading position. And advanced packaging is another area where it's up 3x in four years and we anticipate that we'll double that business and then that will keep going into the future.

And again, we're just really well positioned for all those inflections, in ICAPS we have room to grow in PDC and etch and we have momentum in those segments. And I talked earlier about the pipeline of ICAPS innovations. Again, we formed this group six years ago. We brought 20 new products to market and we have new products in the pipeline that will expand our total available market. We have new products for cost competitive applications and we have innovations to enable new ICAPS device architectures that we're co-innovating with leading customers. So as Brice said, in the areas where we can compete, I feel really good about our positions and our pipeline going forward.

Timothy Arcuri

Thanks a lot, Gary.

Operator

Thank you. Our next question comes from the line of Harlan Sur from JPMorgan. Your question please.

Harlan Sur

Hi, good afternoon. Thanks for taking my question. We track many of your end customers in the semiconductor industry, both Fabless and IDMs, and we're tracking their design starts, especially at 2 nanometer design starts appear to be accelerating since the second half of last year, especially in areas like AI, accelerated, compute mobile. Is the team in talking with your customers, is the team getting a sense on how big the upcoming 2 nanometer node transition and more importantly volume production potential could be relative to 3 nanometer?

Brice Hill

Hi Harlan. Gary might also add on to this. I've seen various estimates for 2 nanometer based on the performance benefits of 2 nanometer. I think we're expecting that to be a large node. If you look at some of the third party estimates, that should be a good landing spot for designs, just like 7 nanometer in the past was a good landing spot for designs. So we're expecting it to be, on the large side from a node perspective.

Gary Dickerson

Yes, Harlan, I would just add that, everybody's focused on energy efficient computing for AI and if you look at what our customers are saying, they're very bullish about the size of that 2 nanometer node.

Harlan Sur

Thank you.

Operator

Thank you. Our next question comes from the line of Krish Sankar from TD Cowen. Your question please.

Krish Sankar

Yes. Hi, thanks for taking my question. Gary, I had a question on gate-all-around. You have spoken about getting over 50% share of the incremental TAM there, but it seems like the EPI stack is one of the more critical ones and your epitaxy competitor seems to be making some strides. So I'm just kind of curious, can you talk a little bit about your EPI market share and if you still feel confident in the 50% plus share gain of the overall gate-all-around opportunity? Thank you.

Gary Dickerson

Yes, we're in, as I mentioned earlier, we're in deep partnerships with all of our customers focused around this concept of high velocity co-innovation. And we're working with every one of our customers out a decade into the future on multiple technology nodes. For gate-all-around, we still are on track to do what we had talked about earlier with gaining more than 50% of the incremental spending for gate-all-around and Epi is part of that. We're in very strong position. I think 85% of those Epi steps are selective Epi where we have tremendous strength, we have new innovations we're bringing to market in Epi and so we still feel very confident in our outperformance going forward.

Krish Sankar

Thanks, Gary.

Operator

Thank you. And our next question comes from the line of Srini Pajjuri from Raymond James. Your question please.

Srini Pajjuri

Thank you. My question is on China. I think Brice, you said for Q2 Outlook, you used the word China will be below normal in terms of percent of exposure. I would think that the export restrictions, those are permanent. So I'm just curious as to, when you say below normal, are you expecting China to recover to like the 30% level that you previously communicated? And then when do you think we might get to that level? And then maybe for Gary, Gary over the last 90 days excluding the export restrictions, can you talk to, how the demand conditions are within China? Thank you.

Brice Hill

Okay, thanks Srini. So first of all, 30% we still think will be a good long-term rate for us or a good long-term estimate of the share to China. When you think about the market, of course for us now that's an ICAPS market, we can't serve the leading edge, but that will be a growing market over time.

The devices will grow mid to high single digits, if not more, heading to, helping to get to the 1.3 or yeah, \$1 trillion to \$1.3 trillion semiconductor market by 2030. So that market will continue to grow. We may pause a little bit less, we may have a little bit lower rate of investment as we go through the next short period of time. Will that adjust? But that's a very strong market for us. So 26% in Q2 and 30% is a good estimate for the company. And of course that includes all of our businesses, AGS and display also.

And then Gary, on what we're seeing with respect to demand.

Gary Dickerson

Yes, I think I'll just make a comment on that. It's still our largest market, so you see leading edge accelerating, but ICAPS is still our largest market and China is the largest country inside that market. And so when you're thinking about it and you're thinking about what we're describing as a step back in the rate of investment, you should still think about it as just a very large opportunity and growth opportunity going forward.

And so we think the rate slows down a little bit after two huge years of investment. But we expect that market to grow over time. We've continued to add customers. We're tracking a large number of projects that are underway. We expect capacity to be added every single year. And that forms the backbone of our expectations.

Brice Hill

Yes, the one thing I would add is that we believe that the ICAPS market over the longer term will grow kind of mid-to-high single digits. And as I mentioned earlier, we have new products in the pipeline that expand our total available market. New products for cost competitive segments and opportunities to grow in large segments, where we have momentum. So, I think longer-term we're positive on the market and positive on our position in the market.

Operator

Thank you. And our next question comes from the line of Brian Chin from Stifel. Your question please.

Brian Chin

Hi there. Good afternoon. Thanks for letting us ask a few questions, or maybe one question, maybe for Brice. I think you previously disclosed a \$549 million reduction in backup for the fiscal year in a filing. And you're quantifying a \$400 million impact for the year. Did you revise what that actual impact would be or is there some maybe the residual amount of 149 that sits outside of the 12-month horizon?

Brice Hill

You've got it exactly right, Brian. So it's not much of a change. That \$549 was our backlog and it covered more than just a year. And so we shared, I think, what was in the 12 months. And if you did that math, I think it was about \$380. So we're still very close in terms of what we're thinking the impact is for the year.

Brian Chin

Thanks.

Operator

Thank you. And our next question comes from the line of Joe Quatrochi from Wells Fargo. Your question please.

Joe Quatrochi

Thanks for taking the question. I was wondering if you could talk a little bit more about your expectations for DRAM growth. If we were to exclude just the benefit of China DRAM spending in the comparison a year ago, how should we think about the growth in your business this year?

Brice Hill

Yes. Thanks, Joe. I'll start on this one. I think we've seen two record years of DRAM and of course, 2024 was buoyed by the extra China demand that we saw. And I can't call the year here, but we see the rate of investment in DRAM continuing in the rest of the world. So, there's a lot of pull for the HBM solution, and there's a lot of pull in for DRAM in the advanced compute performance systems. So, I would expect continued momentum in DRAM, and that's included in our outlook in Q2.

Gary Dickerson

Yes, Joe, I would just say that, as I mentioned earlier, we're more bullish on compute memory than we are in storage memory. And then what our customers have said is it takes 3x the number of wafers to produce the same number of bits for HBM. So that's going to certainly help the growth rate over the longer-term.

Joe Quatrochi

Thank you.

Operator

Thank you. And our next question comes from the line of Charles Shi from Needham & Company. Your question please.

Charles Shi

Hi. Yes, good afternoon all. I have a question about the revenue, expected revenue from gate-all-around nodes. You previously said more than \$2.5 billion in fiscal, I mean, in probably calendar 2024, and you expect to double, has the 2025 number move up or down or any changes to that number? And maybe the other part of the question, I think that you previously said last year's \$8 on revenue plus this year kind of implies 100,000 global capacity built on 2-nanometer by the end of this year. Do you see potentially that gate-all-around spending can accelerate further into 2026? Because we were trying to think about with the end capacity, it could be in 2026, but do you want to get your early thoughts on 2026, if possible? Thank you.

Brice Hill

Okay, Charles. Thanks for the question. So first thing, yes, we have not changed our expectations for growth looking into 2025 with the gate-all-around related equipment, so \$2.5 in 2024 and then the opportunity to double that in 2025. And if you put those together, that's just over \$7 billion. And when we describe the SAM for us with gate-all-around the backside power, yes, you can back in and say that implies that there's approximately 100,000 wafer starts of pilot and HBM -- HVM, excuse me, high-volume manufacturing capacity being put in place in the beginning. And then, of course, you'll have to do your own research to see what size you think the node would be. I would just suggest that nodes are generally larger than that. So we would expect that to continue and the ramp to continue beyond 2025 for sure.

Gary Dickerson

Yes, I would say the one thing incrementally is that as you go forward, you're going to add in backside power, that also is growing our available market, and we have a very strong share there. So once you have gate-all-around and backside power together, our opportunity grows significantly.

Operator

And our next question comes from the line of Chris Caso from Wolfe Research. Your question please.

Chris Caso

Yes. Thank you. Good evening. I guess the question is regarding sort of where your level of confidence is in your customer forecast right now? And I know you haven't given us guidance for the full year, obviously, but I know the customers generally give you pretty good visibility on the forecast. Maybe you could talk about the different segments and you sound pretty constructive with regard to foundry logic spending for the year. Your comments suggested that ICAP, the forecast has been changing a lot. So I'd imagine that there's some uncertainty there. Perhaps you could speak in those terms for the different segments.

Brice Hill

Sure. Thanks for the question, Chris. So, I think I would put the level of confidence for larger customers as fairly high. So especially since COVID and the inflation events that we saw, we've asked for longer perspectives from all of our customers. So we have more visibility with the larger customers. So if you think about leading logic, more visibility, certainly for DRAM, certainly for NAND. And then I would split up ICAPS, it would be the same sort of observation for the more mature, longer-standing companies in the ICAP space good visibility, same practices.

And then for the long tail in ICAPS, including a lot of the customers in China, there's just more less experience there on both sides. And so the visibility gets lower, and that's where we've seen a lot of volatility in our forecast. So I think in the past couple of years, we've continually increased our China forecast as we've gone through the year. So you have less visibility and the plans change as that goes forward.

And then just a last comment, thinking about foundry logic because there's lots of questions about the various foundries, our perspective there is not only do we have the information from the customers, but we try to also triangulate with our end market expectations. And so we think we're pretty comfortable with our forecast for leading logic being driven by data center, PC, smartphone and understanding what the end demand is for those markets.

Chris Caso

Thank you.

Operator

Thank you. [Operator Instructions] Our next question comes from the line of Vijay Rakesh from Mizuho. Your question please.

Vijay Rakesh

Yes, hi. I just have a question on the packaging side. I know packaging is becoming more and more important and on the memory side. I'm just wondering if there's a way to look at what the mix of just packaging was of total WFE if you had to look at 2025 and how you see that mix of WFE growing as packaging becomes a bigger and bigger chunk of both memory and logic? Thanks.

Brice Hill

I'll try, Vijay. We said last year that in 2024 that our packaging related revenues in Advanced Packaging were \$1.7 billion and so that we have an advantaged share in that space. So you probably have to do some backward math to imply what packaging is. And it's growing at a strong rate. I think just thinking about what's behind that, we all know that there's, Gary calls it a race for performance on these leading-edge systems, getting the highest utilization out of GPUs, CPUs, accelerators, et cetera. And that's really what's driving the increased demand for these packaging technologies, so we expect that to grow significantly over the coming years.

Gary Dickerson

Yes Vijay, we also talked about doubling again our packaging revenue over the next few years. And there's just tremendous innovation happening in this space. We talked about chips grants on new substrate technologies for silicon and glass, how you connect the AI server and that architecture in three or four years is going to be very different than what it looks like today. So I believe this is a great opportunity for Applied. We're the leader in wiring on the front of the wafer, back of the wafer and in Advanced Packaging. And this segment is going to see a significant compound annual growth rate because it's so important for energy-efficient computing.

Operator

Thank you. And our next question comes from the line of Mehdi Hosseini from Susquehanna. Your question please.

Mehdi Hosseini

Yes. Thanks for taking my question. One question, two parts. Based on the last 10-K, the SSE [ph] backlog of \$8.3 billion, down 23% year-over-year, and then AGS and backlog of \$6.8 billion, up 32%, when do you expect backlog for SSE [ph] to show the inflection point and show growth? And on the AGS, the \$200 million that is going to come out because of the restriction in China, that is a very small part of the AGS backlog. Is that a reflection of the AGS backlog in multiyear or any color you can have here would be great?

Brice Hill

Yes Mehdi thanks for the question. You've got it right on the AGS. We've got multiyear contracts in AGS that tends to make that backlog look larger and your book-to-bill look much larger when we signed those contracts. So the average contract life, I think, is in the 2.9-year region, and we're signing some that are longer than that. So that really is what distorts the backlog or makes it larger for AGS.

And then on the equipment side, since the supply chain and issues related to COVID, we've been normalizing on the equipment side. So we stopped reporting that on a quarterly basis because it's not a very good indication of the underlying business changes. We're working to get longer visibility with our customers, and we're working to get

longer commits on the builds. And so there's a lot of movement in that. So, I wouldn't have anything to share other than what you've seen in our 10-K.

Mehdi Hosseini

Got it. Thank you.

Operator

Thank you. And our next question comes from the line of Timm Schulze-Melander from Redburn Atlantic. Your question please.

Timm Schulze-Melander

Yes. Hi, there. Thanks very much for taking my question. Maybe one for Gary and one for Brice, please. Gary, you mentioned Advanced Packaging and you referenced volume orders from multiple leading-edge customers. Maybe could you share a little bit of color in terms of what kind of device applications they are? And when you'd expect volume manufacturing to begin? And then Brice, just a modeling question on that tax asset revaluation. Could you maybe just provide a little more color on that? And is there any real course or implication for the remaining \$2.4 billion of deferred tax assets on the balance sheet? Thank you.

Gary Dickerson

Yes, Tim, relative to packaging revenue, it's really coming from all of the different packaging architectures, we have a very strong position, a broad, unique connected portfolio. So I wouldn't say that, again for us, including an HBM where we were at \$700 million in revenue this last year, we have strength across all of those different architecture types. I don't really want to comment, I'll let customers comment on which architectures they're ramping. I would say, as I mentioned earlier, there's going to be tremendous innovation in this space with very different architectures than what are in the market today. This is going to be very important for energy-efficient computing. Applied has been investing to be positioned to win those architecture inflections.

Brice Hill

Okay. And then Tim, thanks for the tax question. So yes, good to point out that on our GAAP net income, you'll see a significant difference in the growth in our non-GAAP income. And what is happening there? It's one of those situations where good news is bad news. So we've just renewed our incentive rates in Singapore. And so the tax asset that we have in Singapore that was created years and years ago when we moved assets to Singapore. That is essentially a less valuable because it will protect from lower taxes, if that makes sense.

So our tax rate goes down, which is good news. And then the asset that you have to protect from taxes is a little bit less valuable than what it was with higher tax rates. And so that \$674 million, I think that number is a revaluation of that tax asset. And I wouldn't look we're amortizing the benefit of that tax move of years to go. That's always in our reconciliation, but this particular event that we're talking about, I think there's any look forward on that.

Timm Schulze-Melander

Great, thank you.

Brice Hill

Yep.

Operator

Thank you. [Operator Instructions] And this does conclude the question-and-answer session of today's program. I'd like to hand the program back to Brice for any further remarks.

Brice Hill

Thank you. To recap, we believe we're well positioned in both the near term and the longer term as the investments we're making in R&D for leading-edge technology inflections, together with our efforts to accelerate industry collaboration set us up to benefit from the semiconductor growth as expected over the coming years. Thank you for attending today. And Liz, please close the call.