NOMURA

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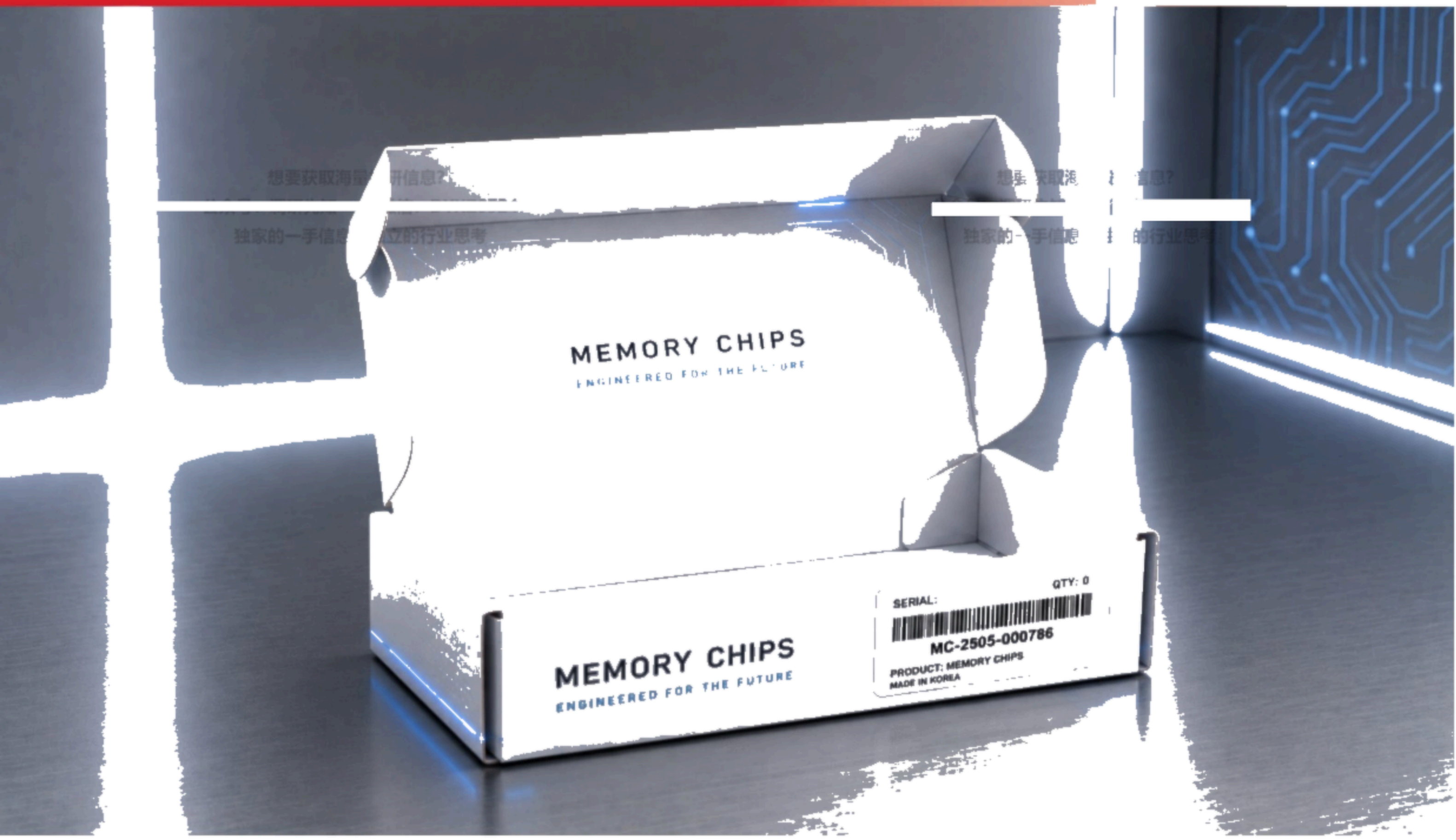

Chipnomics: Introducing Nomura's Chip Shortage Index

Our framework for tracking the AI-era business cycle points to deep shortages and helps explain why the current cycle can sustain beyond 2027

- Chip availability has emerged as a macro driver, increasingly setting the pace of investment and the business cycle in economies such as Korea and Taiwan.
- In this report, we introduce Nomura's Chip Shortage Index (Nomura CSI), which measures the balance between chip demand and deliverable supply each month. Readings above 100 signal chip shortages; readings below 100 signal supply slack.
- The latest Nomura CSI reading stands at 103.8 in July, close to its highest reading in the sample, which suggests the chip market remains in deep shortage territory.
- Our analysis suggests that the shortage-led upcycle can sustain higher chip prices for longer than in past cycles. With the current upturn having begun in H2 2025, our model points to gains through 2027 and beyond, consistent with our tech team's bottom-up view.

Research Analysts

Asia Economics

Jeong Woo Park - NSL
jeongwoo.park@nomura.com
+65 6433 6197

Si Ying Toh, CFA - NSL
siying.toh@nomura.com
+65 6433 6666

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Executive summary

Chip availability has emerged as a macro driver in Korea, Taiwan and even other economies. AI capital spending is now large enough for physical chip supply to limit how much planned investment can be executed. Changes in scarcity increasingly set the pace of the business cycle in both Korea and Taiwan, as the semiconductor industry is in the midst of its most severe supply shortage in decades.

In this report, we introduce Nomura's Chip Shortage Index (Nomura CSI), which aims to measure chip scarcity. The index nowcasts the balance between chip demand and deliverable supply each month. Readings above 100 signal shortage; readings below 100 signal supply slack. Changes in the index show whether the demand-supply imbalance is intensifying or easing.

The methodology behind Nomura CSI mirrors a standard financial conditions index. Separate panels of roughly 20-25 macroeconomic and industry series identify the demand and supply factors. Using vector autoregression (VAR), we derive the weightings from the response of semiconductor export prices to each factor.

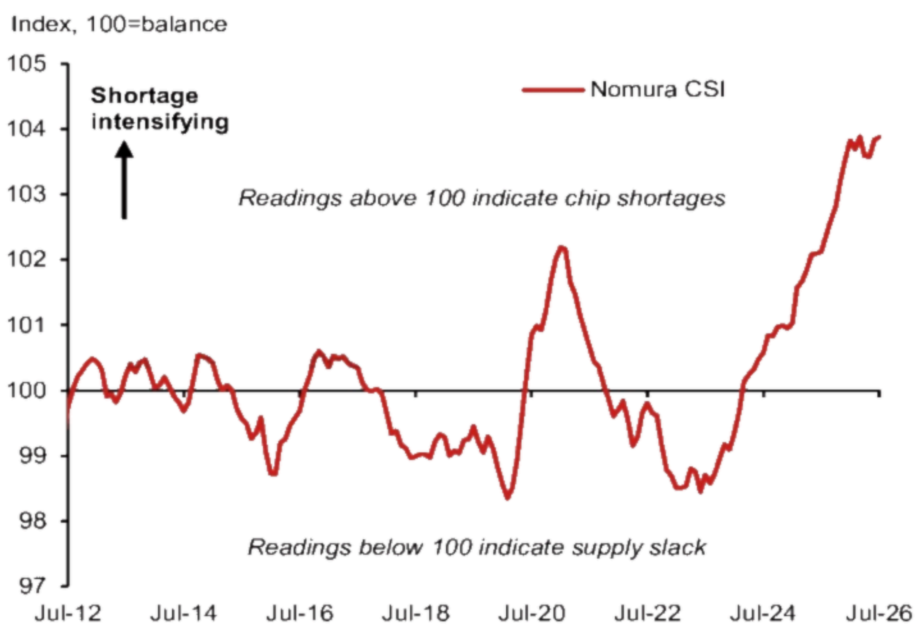
The latest Nomura CSI reading, for July, is close to a record high at 103.8 Recent monthly movements have been small, which indicates there has been no confirmed turn in the shortage cycle (Figure 1). Shortage pressure may fluctuate or ease at the margin, but a near-term shift into supply slack territory appears unlikely.

The historical decomposition identifies three distinct patterns. Industry momentum drove most of the 2012-14 and 2016-18 upturns. A shortage shock drove the 2020-21 increase, partly offset by negative industry momentum. The 2024-25 price recovery was again led by industry momentum, while the CSI continued to signal slack across the broader market.

The current cycle combines an exceptionally large shortage shock with positive industry momentum. Since late 2025, the CSI contribution has risen more sharply and become the dominant driver. The 2021 cycle also had a material shortage contribution; what distinguishes the current episode is its scale and the reinforcing contribution from the industry's own dynamics.

A shortage-led cycle has a much longer price impulse. The VAR indicates that a shortage shock can maintain the chip upcycle for a sustained period. With the current upturn having begun in H2 2025, the model points to gains through 2027 and beyond, which is consistent with our tech team's bottom-up view.

Fig. 1: Nomura CSI remains deep in chip shortage territory



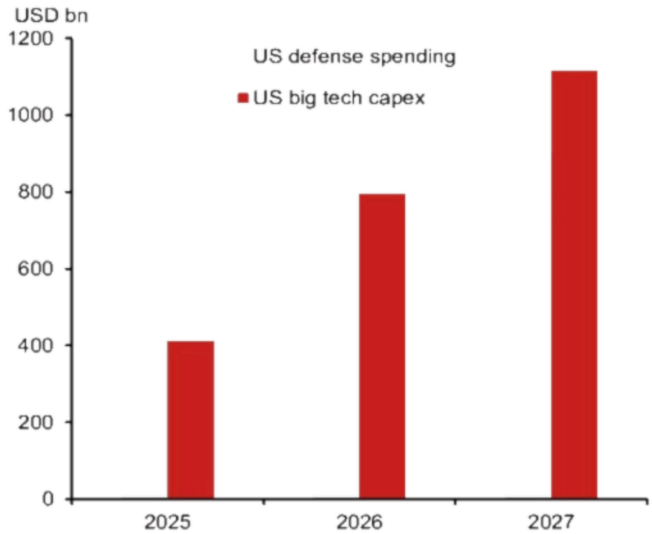
Source: CEIC, Bloomberg and Nomura Global Economics.

Why chip scarcity now drives the macro cycle

For most of the past four decades, the semiconductor cycle has followed the global economy. Chip demand rose during expansions and collapsed during downturns. The swings were large, with global economic activity setting their timing.

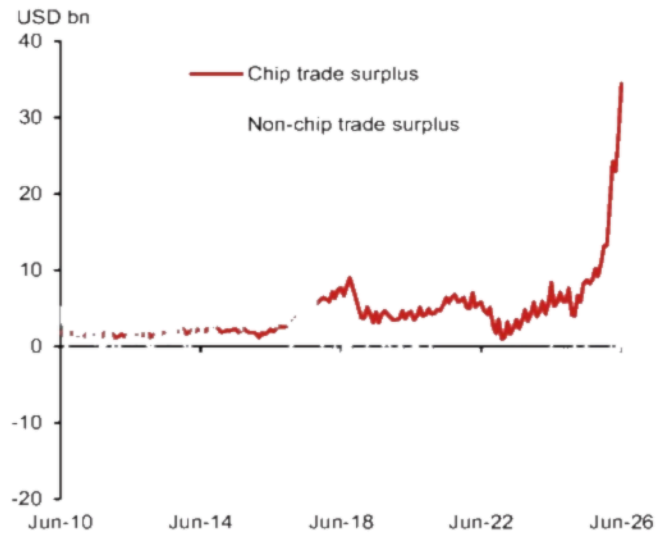
That relationship is now changing. With four big-tech firms' capital spending (*Bloomberg* estimates: USD1.1trn in 2027) likely to exceed US defense spending of USD901bn (CBO estimates) next year (Figure 2), physical chip availability increasingly determines how much planned investment can be executed. Korea supplies the constrained chip input, so changes in chip scarcity now feed directly into exports, income and liquidity via chip price surges and the trade surplus (Figure 3). The semiconductor cycle has become a source of macro momentum in its own right.

Fig. 2: Government defense and big tech spending in the US



Note: We use CBO's projections of government defense spending; US big tech includes Google, Amazon, Microsoft, and Meta. We use Bloomberg estimates of capex for these four companies.
Source: CBO, Bloomberg and Nomura Global Economics.

Fig. 3: Korea: Chip versus non-chip trade surplus



Source: CEIC and Nomura Global Economics.

Last year, we published a special report about *the twin supercycles*, positing that the strong chip cycle will reshape the macro landscape via strong liquidity, which would in turn drive the housing market. Since then, chip export growth has surged by triple digits, and housing prices are soaring again. The memory chip supercycle has become a key driver of Korea's macro story.

However, it is not just Korea. The global economy is in the midst of the largest technology investment boom since the late 1990s. Hyperscaler capital spending should exceed USD700bn this year (Figure 2), and the AI capex boom is becoming a new growth driver for *global trade* and *the US economy*.

Whether the boom is eventually validated by returns or corrected by them is a debate well covered elsewhere. What we are observing is that the AI boom is creating an unprecedented chip shortage, which is reshaping the dynamics of the business cycle and policy reaction function. Thus, we narrowly focus on the dynamics of the chip shortage and its macro implications, as the boom is colliding with a supply curve that has become structurally inelastic.

The physics of bottlenecks and the economics of supply

The physical bottleneck: The end of free supply growth

Current dynamics reflect an unusual combination of multi-year AI demand and a supply base that is adjusting only slowly.

On the demand side, AI spending no longer follows the replacement cycle for consumer electronics. Inference usage grows with the utilisation of infrastructure being built under multi-year plans, and those commitments change little within the year, even when chip prices rise.

Supply is responding even more slowly. For roughly fifty years, semiconductor supply expanded automatically according to *Moore's law*; transistor density doubled every two years or so, and each generation of miniaturization yielded chips that were faster, more numerous and cheaper per unit of computing. This is why semiconductor prices trended down for decades and why the industry functioned as a persistent source of deflation.

Some semiconductor experts have warned[1] that this mechanism has largely run its course.

- Circuit features are now a few nanometers wide, and producing them requires extreme ultraviolet lithography and tools costing upwards of USD200mn each, shipped in limited numbers by a single supplier (ASML).
- Equally important, each new manufacturing process begins with a low yield (i.e., the share of usable chips per wafer), and raising that yield takes longer with every generation. Technology that once expanded supply at lower cost is now absorbing significant amounts of capital and time.

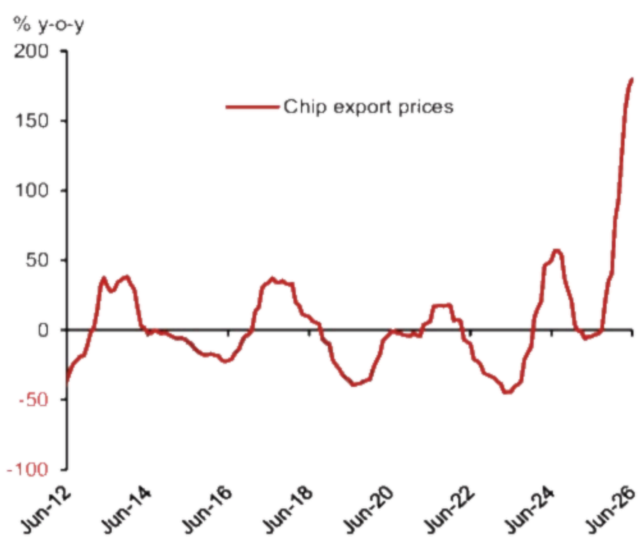
From Moore's law to the memory wall

The bottleneck is most severe precisely where AI demand is concentrated (i.e., the AI memory wall)[2]. The very technology deployed to breach the performance memory wall is now erecting a supply-side one

- **Memory wall bottleneck**: Wafer allocation within existing fabs is the immediate constraint. HBM requires several times as much silicon area per functional bit as commodity DRAM, while stacking and through-silicon-via processes have materially lower yields. Consequently, every line converted to HBM removes conventional memory capacity from the market, and the price impact was observable in the first half of the year: memory chip export prices surged by 135% y-o-y on average in H1 2026 (Figure 4).
- **Adding capacity takes longer still**: Construction and the subsequent yield ramp require two to three years from commitment and longer in the EUV era, while new capacity arrives in large, discrete increments rather than smoothly, amplifying the supply cycle (Figure 5).

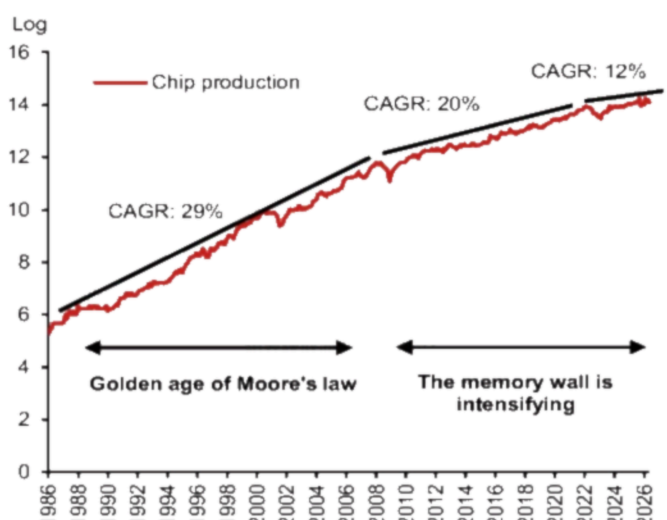
The result is a demand base that remains firm against a supply response that is both slow and lumpy, making the current shortage more persistent than a standard consumer-electronics inventory cycle.

Fig. 4: Chip export price surge



Source: CEIC and Nomura Global Economics.

Fig. 5: From Moore's law to the memory wall



Note: The memory wall is the growing gap between how fast computer processors can calculate data and how fast memory systems can deliver that data.
Source: CEIC and Nomura Global Economics.

1. Micron CEO Forecasts Production Spend Increase to Meet 'Insane' Demand for Memory, TechRadar, 20 March 2026 and Memory Wall Gets Higher, Semiconductor Engineering, 26 March 2026.
2. Bottlenecks to Breakthroughs: The Future of Memory and Storage, Micron Blog, 1

September 2025.

A structural shortage does not prevent cycles

A persistent bottleneck can lift the average price level and amplify the cycle, but it does not prevent the eventual downturn. Major technology build-outs have always moved from boom to bust, including the railway mania in the 1840s and the dot-com bubble of the 1990s.

High prices eventually justify new capacity, and that capacity can create excess supply and force retrenchment. The 2016-18 supercycle gave way to a downturn in 2019; the 2020-21 shortage ended in an inventory recession.

The physics of the bottleneck do not prevent the cycle, they raise both the mean around which prices oscillate and the amplitude of the oscillation. For investors and policymakers, the distinction between the structural trend and the current phase of the cycle is critical.

Chip shortage dynamics define business cycles

This is where the economics of supply takes over from the physics.

- **Investment overshoots and undershoots:** The same long lead times make capital spending inherently pro-cyclical. When prices are high, every producer reads the same signal and commits to expansion at once. However, as the payoff arrives only years later, they are effectively investing against a demand picture that may no longer exist by the time capacity is operational. Waves of simultaneous investment therefore tend to overshoot, converting a shortage into a glut; the subsequent retrenchment is equally synchronized, sowing the seeds of the next shortage. It is this synchronized over- and under-investment that turns a slow supply response into a boom-bust cycle.
- **Customers amplify the swings**: When chips are scarce, buyers overorder to secure allocation; when scarcity eases, the phantom demand is immediately cancelled. The result follows a simple rule: the lower the elasticity of supply, the larger the price fluctuations generated by a given demand shock.

These two forces together are becoming more prevalent in AI capex cycles and in our view are creating new business cycles in the AI era.

Introducing Nomura's Chip Shortage Index

No published series measures the global chip shortage in real time. Even so, shortages leave a clear footprint in macroeconomic data: export values diverge from export volumes (Figure 6), production diverges from shipments, inventories fall as orders rise, and announced capital spending runs ahead of actual spending. Each series is noisy on its own, but their common movements reveal the underlying imbalance. The Nomura Chip Shortage Index (Nomura CSI) is designed to find that signal.

Fig. 6: Chip exports: Volume and prices

Source: CEIC, Nomura Global Economics

Construction

Step 1. Extracting common supply and demand factors

We use a dynamic factor model (DFM) to extract common supply and demand factors from separate panels of roughly 20-25 monthly macroeconomic and industry series (see Figures 15 and 16 for key variables).

For example, our disaggregation into supply and demand factors shows that post-ChatGPT, chip demand is far outstripping supply (Figure 7).

Step 2. Weighting

Once the supply and demand factors have been estimated, we enter these two factors and semiconductor export prices into a three-variable vector autoregression (VAR) model. The estimated price responses become the weightings used to combine supply and demand into the CSI, with a higher reading indicating greater chip scarcity.

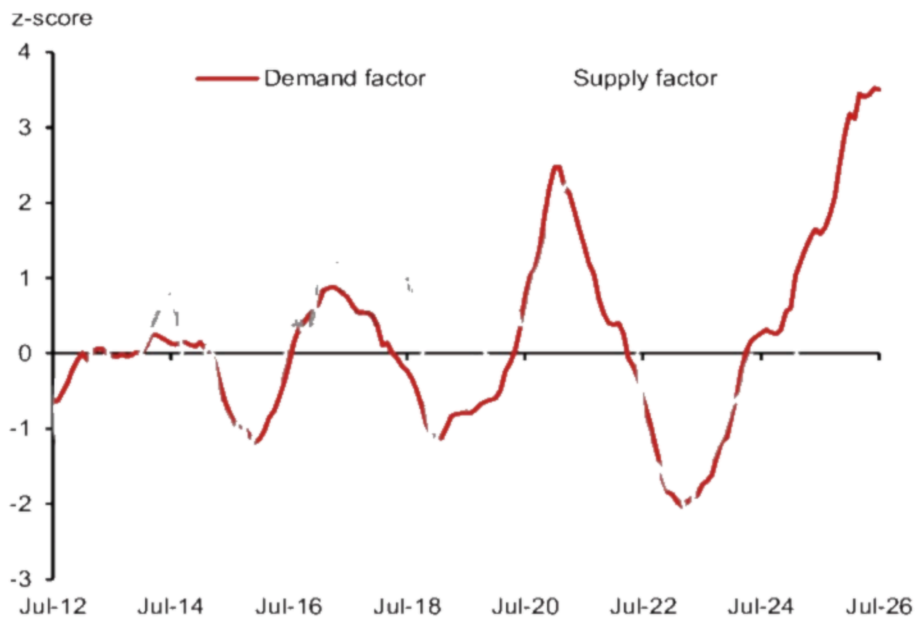
The weighting process follows the standard *financial conditions index* (FCI) approach. An FCI weights each component by its estimated effect on a target macroeconomic variable. The CSI applies the same principle to semiconductor scarcity, using each factor's estimated effect on chip prices. This puts supply and demand on the same economic scale and makes movements in the index comparable across cycles.

Focus on chip export prices:

- Semiconductor export prices provide the economic anchor for our model. This is because they are a key channel through which the chip cycle affects Korea's terms of trade, trade surplus, corporate cash flow and liquidity. At the July policy press conference, BOK Governor Shin explicitly urged observers to closely monitor semiconductor prices, citing their role in the terms of trade, gross domestic income (GDI) and Korea's economic outlook.
- Spot, contract and other market quotations provide useful product-level cross-checks, but their coverage and history vary by product. The semiconductor export price index

– produced by the BOK – offers the most consistent aggregate benchmark across a broad product mix, which makes it the most suitable price measure for the VAR.

Fig. 7: Chip demand and supply factors



Note: We use a dynamic factor model to extract common demand and supply factors from around 25 monthly and quarterly indicators. We then standardized them against the sample period (2012-2026).
Source: CEIC, Bloomberg and Nomura Global Economics.

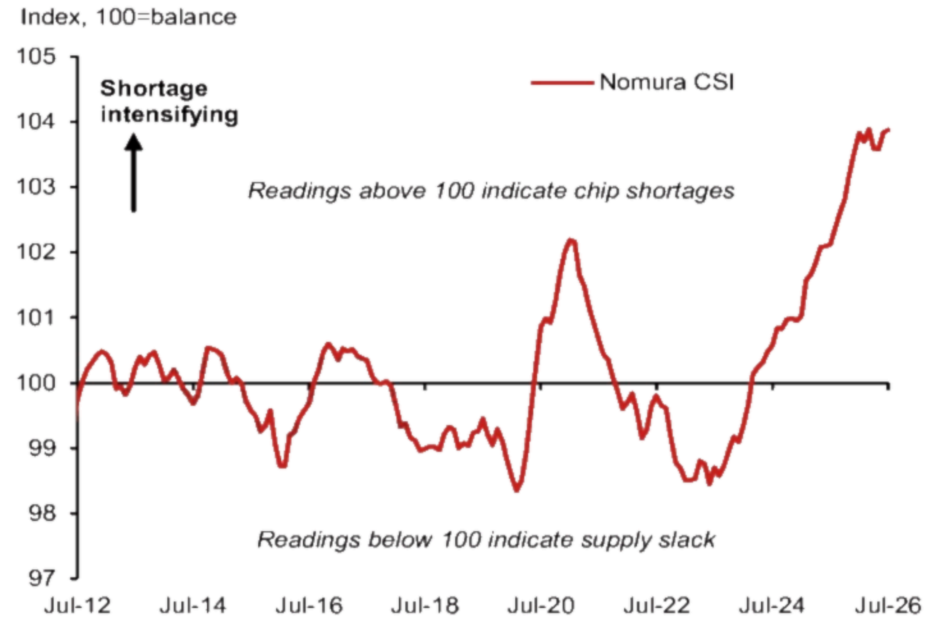
Interpreting Nomura CSI

The resulting Nomura CSI series is centred on 100 (Figure 8), the point at which demand and deliverable supply are in balance. We have calculated it monthly over 2012 to 2026, and its short publication lag makes it a good real-time gauge of market conditions.

The concept of shortage versus slack

While "shortage" is the term used across the industry and the condition the index was designed to measure, the CSI spans the full market cycle. Values above 100 indicate shortage pressure; values below 100 indicate supply slack. The distance from 100 measures the size of the imbalance, and movement in the index shows whether it is intensifying or easing. During the 2022-23 downturn, the CSI fell to 98.45 in June 2023, its lowest reading in the sample and the point of greatest supply slack.

Fig. 8: Nomura CSI remains deep in chip shortage territory



Source: CEIC, Bloomberg and Nomura Global Economics.

Reading Nomura CSI

The CSI should be read in two steps (Figure 9).

- **Level and regimes**: First, the 100 threshold identifies the market regime: readings above 100 indicate a shortage of deliverable supply, while readings below 100 indicate supply slack.
- **Change and direction**: Second, the monthly change shows the direction of the CSI. Above 100, a rise means the shortage is intensifying, while a decline means it is easing. Below 100, a rise means slack is narrowing, while a decline means it is widening.

Together, the level of and change in the Nomura CSI provide an early read on the semiconductor cycle and, increasingly, on the business cycles of Korea and Taiwan.

Fig. 9: Nomura CSI has four stages depending on the regime

Nomura CSI level	Market regime	Rising index	Falling index
Above 100	Supply shortage	Shortage intensifying	Shortage easing
Below 100	Supply slack	Slack narrowing	Slack widening

Source: Nomura Global Economics.

Chip shortage dynamics and a full regime change

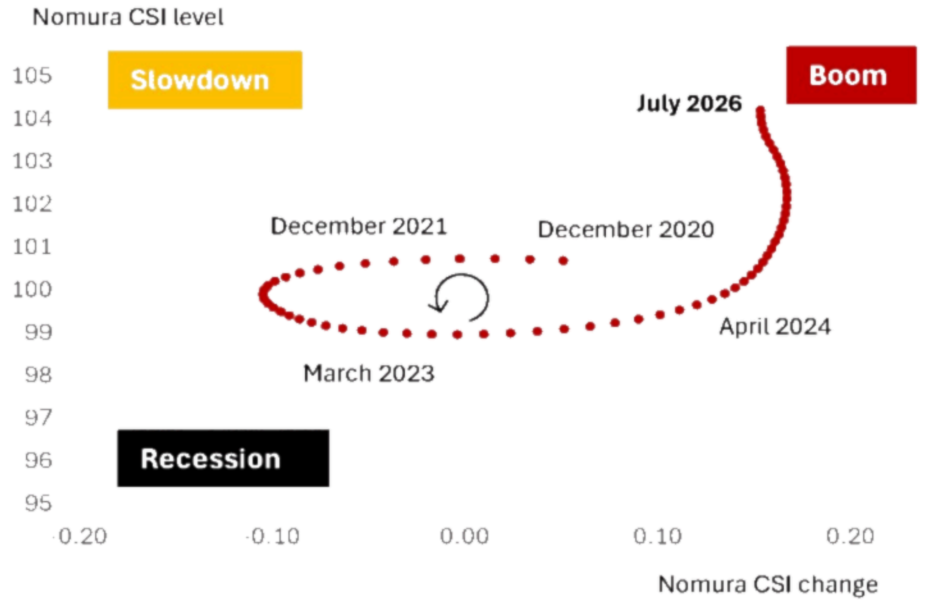
The progression of index movements across successive months matters most around turning points. While a single monthly move could be informative, it is insufficient to confirm a turn in the cycle.

Nomura CSI clock

Using the Nomura CSI, we build a CSI clock that splits the cycle into four stages along two axes (Figure 10). Starting from the bottom-right and moving anticlockwise, the chip cycle rotates from recovery to boom, then enters a slowdown, and finally a recession.

- **Boom and slowdown stages**: Above 100, a rising index signals an intensifying shortage (boom) while a falling index shows shortage pressures easing at the margin (slowdown).
- **Recession and recovery stages**: Below 100, a rising index means slack is narrowing as conditions recover (recovery), while a sustained decline signals widening slack and a cycle that has turned (recession).

Fig. 10: Nomura CSI clock



Note: We apply the Hodrick-Prescott (HP) filter to the original Nomura CSI to extract its underlying trend, then classify the cycle into four regimes based on the trend's level (supply tightness) and its month-on-month change (momentum).
Source: CEIC, Bloomberg, Nomura Global Economics

What does the current reading suggest?

The latest reading of Nomura CSI is around 103.8 in July (Boom stage) and remains close to its highest reading in the sample. Recent month-to-month movements have been small and do not establish a turn in the shortage cycle. In essence, the market remains deep in shortage territory.

Given the long lead time for new capacity and the multi-year nature of AI demand, a move below 100 remains highly unlikely in the near term. Shortage pressure may fluctuate or ease at the margin, but the evidence does not point to an approaching regime change into supply slack.

To assess how long the current shortage could persist, we next compare its drivers with those of the previous semiconductor cycles (see Figure 17 for more details).

Examining the semiconductor cycle through the lens of Nomura CSI

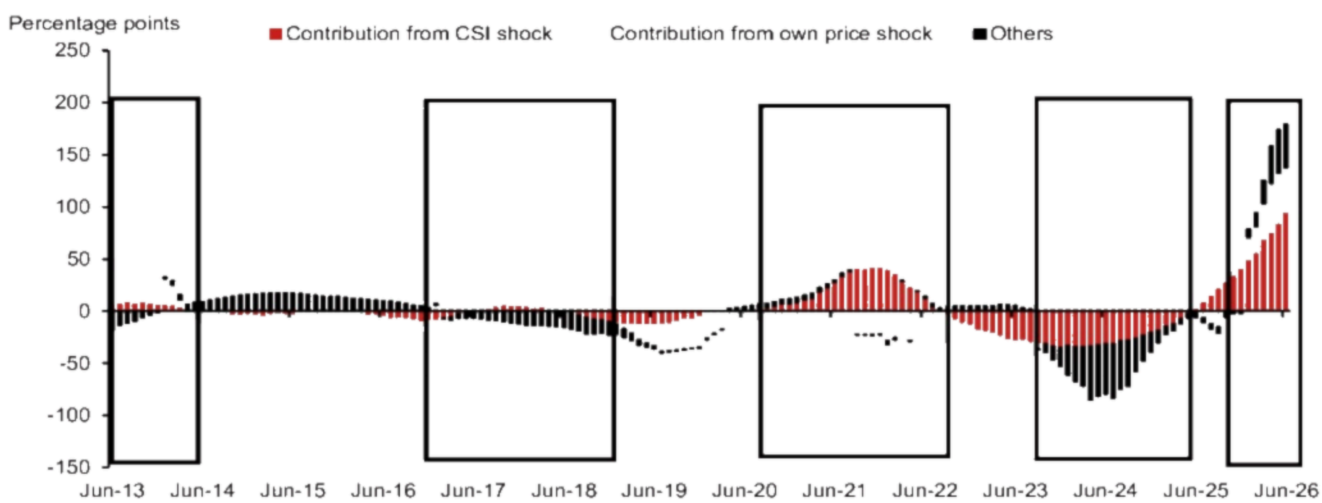
Historical decomposition: Different drivers across episodes

The 2012-26 sample contains four major price upcycles – 2012-14, 2016-18, 2020-2021 and the current cycle – as well as an interim recovery in 2024-25 (Figure 11). To identify the driver of each episode, we estimate a simple two-variable VAR with the Nomura CSI and semiconductor export prices over the full sample.

The historical decomposition separates the shock-driven price path into CSI shocks and own-price shocks.

- **CSI shocks** capture changes in the balance between demand and deliverable supply.
- **Own-price shocks** capture momentum generated within the industry through factors such as inventory adjustment, production cuts, allocation-related double-ordering, producer pricing and product-specific developments that are not fully reflected in the aggregate balance.

Fig. 11: Historical decomposition of chip export prices



Note: We break down chip export prices (% y-o-y) into its own price shock and CSI shock using historical decomposition from a two-variable VAR model. We interpret own price shocks as industry dynamics while CSI shocks are more about the macro balance.
Source: CEIC and Nomura Global Economics.

#1. The 2012-2014 upcycle: Industry-led with a modest supply shortage

The 2012-14 upcycle was driven mainly by the industry's own dynamics, with only a modest positive contribution from the CSI. Elpida's insolvency and acquisition by Micron consolidated DRAM into a three-firm market, while a fab fire in late 2013 (SK Hynix) and stronger capital discipline tightened supply further. These were largely industry-specific developments, and the decomposition assigns most of the resulting price increase to the own-price component. Demand remained subdued: growth in mobile memory demand broadly offset the decline in PC-related demand. Once capacity returned and capital discipline faded, prices fell sharply through 2015-16.

#2. The 2016-2018 upcycle: Industry-led supercycle

The 2016-18 cycle provides the clearest example of an industry-led supercycle. The own-price component closely tracked the price increase, while the CSI contribution remained near zero. Inventory accumulation, allocation-related double-ordering and producer pricing generated strong internal momentum. Prices fell once that momentum reversed, without requiring a large change in the physical capacity base.

#3. The 2020-21 pandemic boom: Led by supply disruption

The 2020-21 cycle exhibits an opposite configuration. The CSI contribution turned materially positive, while the own-price contribution remained negative through much of the upturn. Pandemic-era goods demand and delivery constraints tightened the balance between demand and available supply. The episode nevertheless reversed on a relatively short horizon as logistics normalised, end-demand weakened and inventories accumulated, culminating in the 2022-23 inventory recession.

#4. The 2024-2025 narrow upcycle amid chip production cut

The 2024-25 price recovery was the recovery leg of the post-COVID inventory adjustment. Broad semiconductor demand remained subdued, and producers were still cutting output to work off excess inventories. Prices nevertheless recovered as production discipline, inventory normalisation and producer pricing generated strong industry momentum. HBM demand was beginning to emerge, but its share in the overall memory market was not yet large enough to tighten the aggregate balance. The CSI contribution therefore remained negative through most of the period.

#5. The current supercycle: Structural chip shortage

The current cycle marks the next transition. Since Q4 2025, AI and HBM demand have become large enough – and sufficiently wafer-intensive – to tighten deliverable supply across a much broader share of the market. Both decomposition components are now positive, but the CSI contribution has risen more sharply and become the larger driver. The 2021 episode also had a material shortage component. However, the distinction today lies in the unprecedented scale of that contribution and the reinforcing support from positive industry momentum. Raw inventory data are consistent with the result: inventories across the supply chain remain historically low (Figure 12).

Fig. 12: Chip sector inventory remains near historical lows

Source: CEIC and Nomura Global Economics.

Why the current cycle can sustain

The historical record shows that a large shortage contribution does not, by itself, guarantee persistence. The 2020-21 cycle was shortage-led, but its constraints eased as logistics normalised and pandemic-era goods demand faded. Inventories then amplified the downturn. Duration depends on the source of the constraint, how quickly it can be reversed and whether demand continues to grow while supply is being restored.

However, today's constraint is harder to reverse, because it reflects wafer allocation across products. HBM uses several times as much silicon area per functional bit as conventional DRAM, and relief requires new construction followed by a successful yield ramp. At the same time, multi-year AI build-out programmes and expanding inference usage should keep demand growing during that process. Shortage pressures can therefore moderate without taking the CSI below 100.

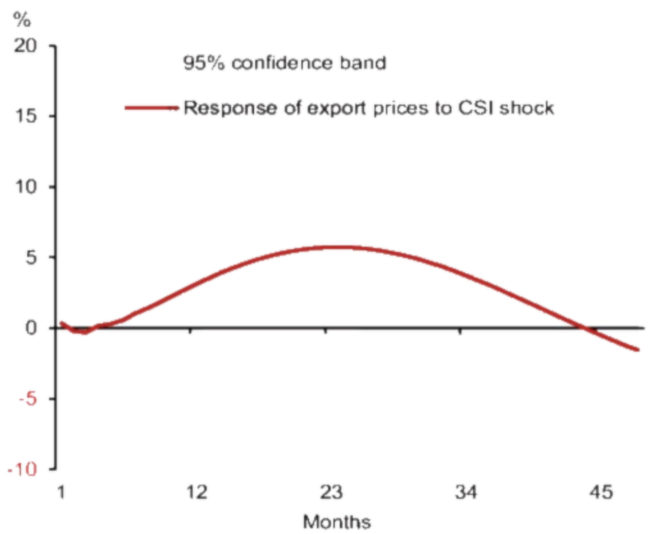
A CSI shock is more persistent and can sustain higher chip prices

Impulse responses from the same VAR quantify the difference in persistence. An own-price shock fades relatively quickly, as orders, inventories, production and producer pricing normalise. However, a CSI shock is more persistent and can sustain higher chip prices for more than the average chip upcycle of 24 months (Figures 13 and 14).

The current price upturn began in Q4 2025. Provided the shortage remains the principal driver, the model points to continued gains through 2027 and beyond. This top-down projection is broadly consistent with our tech team's bottom-up view (see *here* and *here*).

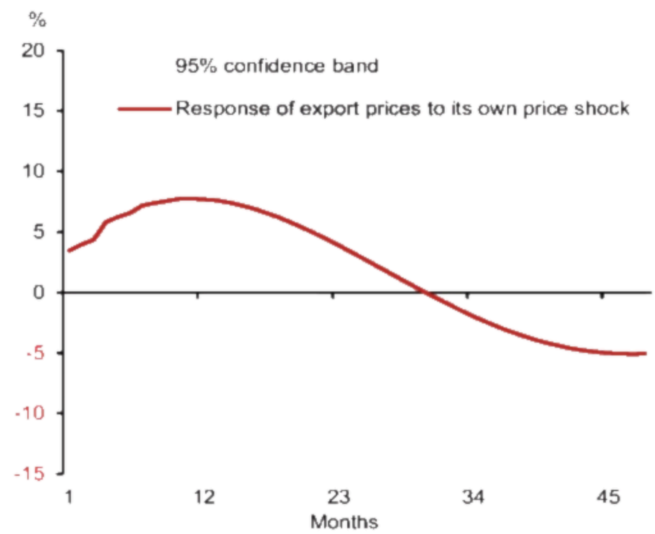
The 2022-23 correction remains relevant, but it is not a direct template for the current cycle. That downturn followed the easing of pandemic-era delivery constraints alongside a rapid inventory build. Lasting relief today depends more heavily on construction and yield. While a brief decline in the CSI above 100 would indicate some moderation in pressure, the market would remain in a shortage regime until the index declines back to the 100 threshold.

Fig. 13: Response of chip export prices to CSI shock



Note: We simulate Impulse Response Function using a two-variable VAR model.
Source: CEIC and Nomura Global Economics.

Fig. 14: Response of chip export prices to its own price shock



Note: We simulate Impulse Response Function using a two-variable VAR model.
Source: CEIC and Nomura Global Economics.

Tracking the AI-era business cycle through Nomura CSI

As we believe the Nomura CSI framework is an effective tool to track a newly emerging business cycle in the AI-era, we plan to update the Nomura CSI and its dashboard each month (Figure 15). These updates will show whether the shortage is intensifying or easing, identify the demand and supply components driving the move and flag potential turning points in the cycle. Together, thematic notes and monthly updates will make the Nomura CSI an ongoing framework for tracking the AI-era business cycle.

Fig. 15: Nomura CSI dashboard

	2023		2024		2025				2026					
	H1	H2	H1	H2	Q1	Q2	Q3	Q4	Q1	Apr	May	Jun	Jul	Aug
Supply														
Chip production, % y-o-y (Korea)	-23.6	24.9	34.2	12.2	13.2	16.5	23.1	0.2	10.3	13.3	1.5	2.2	-	-
Chip inventory to shipment ratio (Korea)	1.75	1.39	0.96	0.93	0.76	0.61	0.48	0.51	0.53	0.52	0.56	0.51	-	-
Electronics production BSI (Korea)	74.3	70.5	77.2	92.8	86.3	96.7	90.0	93.0	95.0	97.0	95.0	103.0	104.0	100.0
Electronics PMI production index (Taiwan)	46.1	46.5	55.4	53.5	54.4	57.9	46.2	54.5	60.8	70.0	69.2	66.7	65.8	-
Electronics inventory to shipment ratio (US)	2.26	2.24	2.25	2.20	2.14	2.13	2.13	2.11	2.04	2.02	2.01	1.97	-	-
Demand														
Big tech capex market estimates, % y-o-y	11.1	6.6	18.9	37.8	56.4	65.4	62.6	78.9	88.5	102.5	105.5	127.4	133.6	-
ICT export orders, % y-o-y (Taiwan)	-12.4	-11.5	-0.5	9.4	15.5	37.4	26.0	61.9	92.7	89.7	67.2	81.9	-	-
Electronics PMI new orders index (Taiwan)	42.6	45.0	56.4	53.2	54.1	55.9	44.1	53.3	65.0	69.5	70.1	66.7	67.3	-
Electronics new orders BSI (Korea)	67.3	63.5	79.8	93.3	88.3	96.7	91.0	96.3	93.3	97.0	95.0	99.0	107.0	107.0
Token expenditure index	-	-	-	-	-	-	-	-	1.5	1.7	1.9	1.8	1.5	1.2
GPU rental index	-	-	-	2.5	2.1	2.3	2.1	2.0	2.4	2.5	2.6	2.7	2.7	2.8
Prices														
DRAM export price, % y-o-y (Korea)	-45.8	-34.3	25.2	46.7	11.7	0.7	5.4	42.3	129.2	223.1	236.6	238.2	240.0	-
NAND export price, % y-o-y (Korea)	-50.0	-18.0	90.0	72.0	-28.6	-29.9	-27.4	41.6	148.2	161.5	202.3	229.5	219.6	-
DDR5 price, USD	-	4.1	4.2	4.4	4.4	4.9	5.3	20.8	33.0	31.4	35.4	42.3	46.8	49.3

Note: For big tech capex market estimates, we use 12-month forward Bloomberg consensus estimates for four big tech companies, namely Microsoft, Amazon, Google and Meta. Green cells denote tighter supply, stronger demand and higher prices. Red cells denote higher supply, weaker demand and lower prices.
Source: Bloomberg, CEIC and Nomura Global Economics.

Fig. 16: Description of variables included in Nomura CSI dashboard

Variables	Data type	Frequency	Explanation
Supply			
Chip production, % y-o-y (Korea)	Hard	Monthly	Measures the growth rate of semiconductor manufacturing output in Korea, a major chip producer. Rising production indicates increased supply capacity.
Chip inventory to shipment ratio (Korea)	Hard	Monthly	Compares stockpiled chips to actual shipments. A rising (falling) ratio suggests excess (tightening) supply or weakening (strong) demand.
Electronics production BSI (Korea)	Soft	Monthly	Business Survey Index capturing Korean electronics manufacturers' assessment of production conditions. Values above (below) 100 indicate expansion (contraction).
Electronics PMI production index (Taiwan)	Soft	Monthly	Measures Taiwan's electronics production sentiment. Above (Below) 50 indicates expansion (contraction). Taiwan is critical for advanced chip manufacturing.
Electronics inventory to shipment ratio (US)	Hard	Monthly	Higher ratios suggest supply buildup or demand weakness; lower ratios indicate supply tightness
Demand			
Big tech capex market estimates, % y-o-y	Soft	Daily	Market expectations of capex for Oracle, Microsoft, Amazon, Google and Meta. Higher capex = Increased investment in data centers, AI infrastructure, and chip purchases.
ICT export orders, % y-o-y (Taiwan)	Hard	Monthly	Growth in tech export orders received by Taiwanese firms. Leading indicator of global tech demand.
Electronics PMI new orders index (Taiwan)	Soft	Monthly	Measures new orders received by Taiwan's electronics sector. Above 50 indicates growing demand; below 50 signals declining orders
Electronics new orders BSI (Korea)	Soft	Monthly	Business Survey Index tracking Korean electronics manufacturers' new order volumes. Reflects demand momentum in the semiconductor supply chain.
Token expenditure index (Silicon Data LLM Token Expenditure Index)	Hard	Daily	Price benchmark measuring market willingness to pay for AI intelligence, using weighted averages from over 400 models from multiple providers (e.g. OpenAI, Anthropic, etc).
GPU rental index (Silicon Data H100 Rental Index)	Hard	Daily	Daily standardized benchmark tracking the hourly cost of renting NVIDIA H100 GPUs in USD per GPU-hour. Higher index value indicates stronger demand for computational resources, particularly for AI/ML workloads.
Prices			
DRAM export price, % y-o-y (Korea)	Hard	Monthly	Rising prices signal supply shortages or strong demand (especially from data centers/AI); falling prices indicate oversupply. DRAM is used for temporary memory in computers and servers.
NAND export price, % y-o-y (Korea)	Hard	Monthly	Price increases suggest tight supply-demand balance; declines indicate excess capacity. NAND provides permanent storage for smartphones, SSDs, and data centers.
DDR5 price, USD	Hard	Daily	DDR5 is the latest memory standard; price movements reflect supply-demand dynamics in cutting-edge memory markets.

Source: Bloomberg, CEIC and Nomura Global Economics.

Fig. 17: Chronology of chip cycles

Chip cycles	Period	Duration (Months)	Main events	Global financial conditions
Upturn	June 1993 - November 1995	29	New economy and PC boom	Tightening (Fed hikes: 3.0% -->6.0%)
Downturn	November 1995 - June 1998	31	Overinvestment and excess supply Asia financial crisis and double-dip	Fed's small cuts (5.5% --> 4.75%) Higher-for-longer strategy
Upturn	June 1998 - September 2000	27	DDR1 and IT bubble (e-commerce, Y2K)	Tightening (Fed hikes)
Downturn	September 2000 - July 2001	10	IT bubble burst	Easing (Fed cuts: 6.5% -->1.75%)
Upturn	July 2001 - May 2004	34	DDR2, NAND driven boom (Apple's iPod and mobile phones)	Easing (Fed cuts: 1.75% -->1.0%)
Downturn	May 2004 - June 2006	25	Global soft landing	Tightening (Fed hikes: 1.0% --> 5.25%)
Upturn	June 2006 - August 2007	14	DDR3, China investment/US housing market boom	Fed rate at 5.25%
Downturn	August 2007 - January 2009	17	US subprime crisis/ DRAM market restructuring	Easing (Fed cuts: 2.0% --> 0.25% and QE)
Upturn	May 2009 - September 2010	20	NAND boom: Smartphones and tablet PC DRAM consolidation	China's fiscal stimulus package
Downturn	September 2010 - July 2012	22	Slowing PC demand (Cannibalization of PC)	Global QE2
Upturn	July 2012 - October 2014	27	Final consolidation in DRAM markets (Elpida's fall) DDR4; Supply-side driven boom	Global QE3
Downturn	October 2014 - February 2016	16	Peak smartphones	Zero interest rate policy (ZIRP)
Upturn	February 2016 - September 2018	31	Data center investment: Server PC boom	Tightening (Fed hikes: 0.25% --> 2.5%)
Downturn	September 2018 - April 2020	19	Excess chip supply (inventory overhang) Trade war and Covid-19	Easing (Fed cuts: 2.5% --> 0.25%)
Upturn	April 2020 - December 2021	20	DDR5, Data center investment: Pandemic boom	Global pandemic stimulus packages
Downturn	December 2021 - April 2023	16	The pandemic chip boom burst Excess inventory	Tightening (Fed hikes: 0.25% --> 5.5%)
Upturn	April 2023 - July 2024	16	AI server boom: Strong demand for high-speed chip Chip production cuts	Fed's 'higher for longer' strategy
Downturn	August 2024 - March 2025	7	NVIDIA Blackwell delay	Tightening to easing
Upturn	April 2025 -		AI server chip + legacy chip shortage	Easing + Insurance cuts
The average upturn cycle: 24 months (the longest was 34 months; the shortest: 14 months) The average downturn cycle: 18 months (the longest was 31 months; the shortest was 7 months)				

Note: We calculate the chip cycle by using the Hamilton-filter method. We use the Fed's monetary policy as a proxy for global financial conditions.
Source: Nomura Global Economics.

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