03 Nov 2026 09:36:16 ET | 13 pages

Global Semiconductors

2027E Global Memory Supply & Demand Projection: DRAM S/D Ratio at -3.8%, NAND S/D Ratio at -3.3%

Peter Lee [AC]

Jayden Oh

CITI'S TAKE

We revise our DRAM and NAND supply & demand outlook to reflect 3Q26 earnings releases and recent market developments. Reflecting increased bit growth guidance of global memory suppliers including Samsung and Hynix, we forecast 2027E DRAM S/D to ease to -3.8% from -8.7% and 2027E NAND S/D at -3.3% (vs. -6.1% before) on higher supply guidance and weak consumer NAND demand. That said, memory demand is still outpacing the incremental supply driven by strong server DRAM/eSSD demand growth of +53%/+52% YoY in 2027E, with memory S/D fulfillment ratio remaining at ~70% currently. We foresee continued memory undersupply in 2027E.

2027E DRAM S/D: Supply +24% vs. Demand +28% (+19% vs. +30% before) — We project 2027E DRAM supply/demand ratio to ease from -8.7% to -3.8%, reflecting the recent guidance provided by global memory suppliers during their earnings calls (Samsung Electronics (005930.KS) - 3Q26 Review: Solid Memory Outlook, but Muted Shareholder Returns, SK Hynix (000660.KS) - 3Q26 Review: Robust Earnings and Attractive Shareholder Returns). In particular, we project Samsung's 2027E bit supply to increase by +22% and Hynix's bit supply to grow +28% driven by 1cnm capacity ramp. On the demand side, we project continued supply shortage supported by robust server DRAM demand growth of +53% YoY, while slightly lowering our 27E demand growth from +30% to +28% as handset DRAM demand is expected to decline -11% YoY. Despite higher-than-expected DRAM bit growth guidance, the current supply/demand fulfillment ratio is ~70%.

2027E NAND S/D: Supply +22% vs. Demand +26% (+21% vs. +29% before) — We project 2027E NAND S/D ratio at -3.3%, as NAND suppliers are pursuing node migration to effectively address the rising eSSD demand. Baking in recent bit growth guidance from NAND suppliers, we slightly revise up our 2027E supply growth estimate to +22% YoY. On the demand side, we lower our 27E NAND demand growth estimates from 29% to 26% due to weaker-than-expected consumer NAND demand. That said, we project eSSD demand to sustain solid growth of +52% YoY in 2027E supported by increased content per box (+38% YoY).

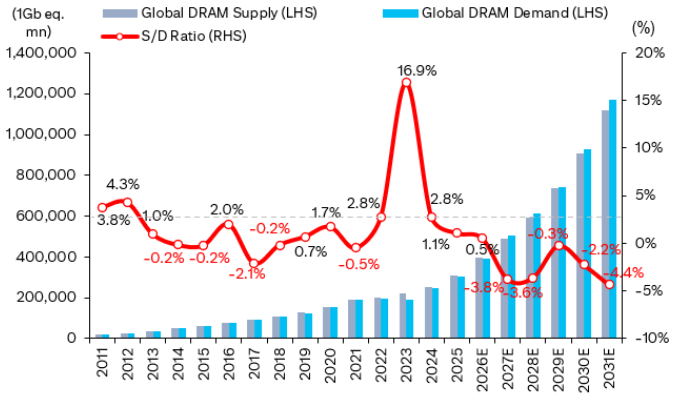
2027E Capex Outlook: DRAM +55%, NAND +35% (vs. DRAM +52%, NAND +34% before) — We revise up our 2027E DRAM capex growth estimate to +55% YoY (vs. +52% YoY before) and our 2027E NAND capex growth estimates to +35% YoY in 2027E (vs. +34% YoY before), respectively. In 2028E, we project DRAM capex to continue growth by +52% YoY and NAND Capex to rise by +34% YoY.

Continued Memory Undersupply in 2027E Despite Higher-than-Expected Supply Bit Growth — Despite recent market concern about higher-than-expected 4Q bit supply growth of Samsung and Hynix, we expect the memory supply shortage to persist as demand growth continues to outpace the incremental supply growth, with the current memory supply/ demand fulfillment ratio remaining at ~70%. As memory suppliers aren't seeking excessive price increases but are instead pursuing mid-to-long-term earnings visibility through LTAs, we believe memory undersupply will continue further. Over the mid-to long-term horizon, we expect continual learning and potential emergence of personal AI to continue to drive memory demand.

See Appendix A-1 for Analyst Certification, Important Disclosures and Research Analyst Affiliations



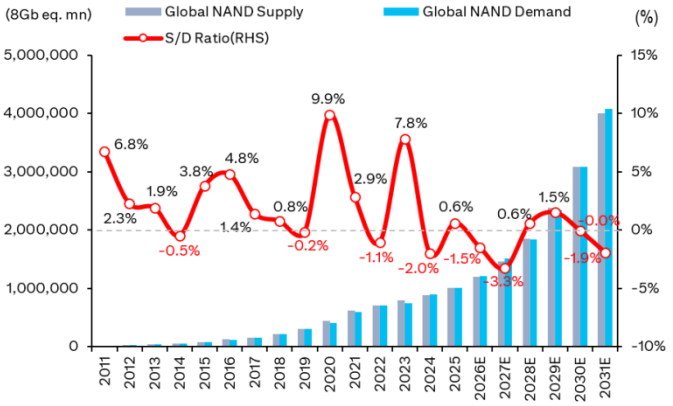
Figure 1. DRAM - Supply/Demand Outlook (2027E S/D Ratio: -3.8%)



© 2026 Citigroup Inc. No redistribution without Citigroup's written permission.

Source: Citi Research, DRAMeXchange

Figure 2. NAND - Supply/Demand Outlook (2027E S/D Ratio: -3.3%)



© 2026 Citigroup Inc. No redistribution without Citigroup's written permission.

Source: Citi Research, DRAMeXchange

Figure 3. DRAM/NAND Capex Projections

DRAM Capex by Player (US$mn)	2025	2026E	2027E	2028E	2029E	2030E	2031E
Samsung	9,595	13,625	21,800	34,880	51,273	70,244	96,235
SK Hynix	7,211	10,889	17,640	27,343	39,647	55,109	76,602
Micron	7,100	10,630	15,828	22,317	32,360	47,570	66,598
Total DRAM Capex (US$mn)	**26,875**	**38,640**	**59,929**	**91,281**	**133,039**	**187,058**	**259,917**
DRAM Capex YoY %	15.2%	43.8%	55.1%	52.3%	45.7%	40.6%	39.0%

NAND Capex by Player (US$mn)	2025	2026E	2027E	2028E	2029E	2030E	2031E
Samsung	4,672	5,466	7,653	11,250	16,875	23,624	33,783
SK Hynix	1,987	2,384	3,338	4,773	6,682	9,689	13,565
Kioxia	2,069	3,200	3,900	4,200	4,500	4,800	5,000
Sandisk	1,324	2,202	2,900	2,999	3,485	4,008	4,609
Micron	1,500	1,650	2,100	2,940	3,969	5,755	8,057
Total NAND Capex (US$mn)	**12,488**	**16,264**	**21,988**	**29,410**	**38,760**	**51,125**	**68,263**
NAND Capex YoY %	-5.9%	30.2%	35.2%	33.8%	31.8%	31.9%	33.5%

Total DRAM+NAND Capex (US$mn)	2025	2026E	2027E	2028E	2029E	2030E	2031E
Total DRAM+NAND Capex	**39,364**	**54,905**	**81,917**	**120,692**	**171,798**	**238,183**	**328,180**
DRAM+NAND Capex YoY %	7.5%	39.5%	49.2%	47.3%	42.3%	38.6%	37.8%

© 2026 Citigroup Inc. No redistribution without Citigroup's written permission.

Source: Citi Research

Kioxia Holdings

(285A.T; ¥11345.0; 1H; 02 Nov 26; 15:30)

Valuation

We set our target price using PER, based on our FY3/28 forecasts. We set fair-value PER at 8.0x and apply this to FY3/28E EPS of ¥5,448 (common stock, before dilution of just under 1%) to derive a fair-value share price of ¥43,500, which we adopt as our target price.

Risks

We assign a High Risk rating because we believe share price volatility is likely to remain high given the firm's status as a specialist manufacturer of NAND flash memory, where earnings tend to be volatile, the high ratio of shares held by major shareholders, and the low free float ratio.
Risks to our target price include 1) a deterioration in supply-demand if the US relaxes restrictions on exports of semiconductor production equipment to China, 2) a loosening of supply-demand if companies expand investment, 3) temporary inventory adjustments in the smartphone and data center spaces, and 4) yen strength (we estimate that each ¥1 appreciation erodes OP by c¥55bn).

Micron Technology Inc

(MU.O; US$833.59; 1; 02 Nov 26; 16:00)

Valuation

We set our target price at $1,300 or ~8x C27E EPS, at a slight premium to its trading range during previous DRAM upturns given an unprecedented pricing environment and the emergence of SCA's.

Risks

Supply/Demand. Memory industry dynamics are dependent on the ability of DRAM and NAND suppliers to accurately align supply with industry demand. As a result, if memory suppliers ship excess DRAM or NAND bits into the channel, it could lead to an inventory reduction in the supply chain and lower pricing, resulting in downside to our estimates. Conversely, if memory demand exceeds memory industry supply, it could lead to higher DRAM pricing, resulting in upside to our estimates.

Pricing. If Micron or one of its competitors lowers DRAM or NAND pricing, it could lead to lower contract/spot pricing, resulting in downside to our estimates.

Capacity. If Micron or one of its competitors increases manufacturing capacity, it could result in excess bit supply if demand fails to materialize. The latter scenario could cause lower DRAM or NAND pricing, resulting in downside to our estimates. Conversely, memory capacity reductions could cause memory pricing to increase, resulting in upside to our estimates.

Competition: Micron faces a number of robust competitors in the memory market. Consequently, any fluctuations in market share among companies in the industry could result in risk to our estimates.

If the impact from any of the above risks turns out to be greater/less than we expect, the shares could fail to achieve/exceed our target price.

Samsung Electronics

(005930.KS; W219500.0; 1; 03 Nov 26; 15:45)

Valuation

Our 12-month target price for Samsung of W430,000 is derived using a sum-of-the-parts (SOTP) methodology, based on 2026E EBITDA. In calculating total operating value, we reference global peers in assigning fair-value EV/EBITDA multiples for the five main divisions (5.9x for Memory, 1.1x for Foundry, 0.5x for Display Panel, 4.0x for Mobile and 2.0x for Consumer Electronics), in line with trading multiples of relevant peer companies.

Risks

Downside risks that could prevent the shares from reaching our target price include: 1) Longer-than-expected approval delay in HBM shipment to its key customers; 2) PC sales weaken more than our forecast and NAND demand fails to meet our expectations; 3) aggressive investment by competitors in memory semiconductor/foundry could have a negative impact on prices; 4) competition in the handset market intensifies, reducing SEC's handset margins; 5) any major appreciation of the won would impact SEC's earnings.

Sandisk Corp

(SNDK.O; US$1075.08; 1; 02 Nov 26; 16:00)

Valuation

Our target price for SNDK is $2,100, where we value shares at 7-8x CY27E EPS, vs its closest competitor, Kioxia, at a median of 8x, as well as the larger peer group at 6-8x P/E, as we believe Sandisk's LTAs merit the higher range multiple vs peers. We also note most peers have DRAM exposure while SNDK does not. That said, we note Sandisk additionally has an estimated $15-20B in invested capital (replacement cost) within the JV that is not reflected in the company's financials.

Risks

Downside risks that could impede SNDK share price from reaching our target price include:
1) Sandisk's efforts to increase its share in the Enterprise could take longer than expected;
2) Macro environment could deteriorate, adversely impacting critical datacenter spend, PC refresh, or AI-PC traction, all of which are supporting current demand conditions; and

3) Supply-demand imbalances or pricing competition could cause volatile pricing fluctuations, significantly impacting margins.

SK Hynix

(000660.KS; W1398000.0; 1; 03 Nov 26; 15:45)

Valuation

Our 12-month target price for SK Hynix of W3,000,000 is derived using a sum-of-the-parts (SOTP) methodology, based on 2026E EBITDA. In calculating total operating value, we break down SK Hynix's operating businesses into HBM and commodity/others business to reflect a structural change in next-gen memory market. We reference a global peer (TSMC) in assigning a fair-value EV/EBITDA multiple for HBM business, as we project the memory market is evolving from a traditional commodity market into a highly customized & customer-specific market much closer to the foundry business. For commodity memory business, we apply a historical average of 12m fwd EV/EBITDA during the beginning or early stage of memory upcycles in the past. We apply 7.9x EV/EBITDA to HBM segment and 6.3x to commodity segment to derive the target price.

Risks

Downside risks that could prevent the shares from reaching our target price include: 1) a downturn in DRAM demand; 2) weaker NAND demand than our forecasts; and 3) weakness in global consumption.

TSMC

(2330.TW; NT$2295.0; 1; 03 Nov 26; 13:30)

Valuation

Our target price for TSMC shares of NT$4,000 is based on 25x our 2027E EPS, higher than its three-year average forward PER, versus global peers' average of 16-25x. We believe our target PER is justified by TSMC's leading position in advanced process node and robust AI demand growth outlook. Given its continuing leadership in the semiconductor foundry industry, we believe TSMC's stable order visibility and earnings outlook make it less vulnerable to a potential global economic downturn than some of its peers. Our target price equates to 2026E/27E P/E of ~36x/25x and 2026E/27E P/B of ~13x/10x.

Risks

Key downside risks that could impede the shares from achieving our target price include: 1) weakness in the global semiconductor market; 2) larger-than-expected margin contractions due to depreciation cost increases and strong NTD; 3) competitors entering the foundry business; 4) longer-than-expected digestion of inventory in the supply chain; and 5) a slowdown in demand either due to a global economic downturn or a global trade disruption triggered by tariffs.