

Global Memory Market

Legacy fundamentals improving, stick with solid AI play;
SKH preferred pick and upgrade SEC/NYT to OW/N

We confirm that our shorter legacy memory down-cycle thesis is materializing following solid GP server spending, faster DDR5 transition, and inventory digestion. The growing evidence of a shorter down-cycle is creating a positive pricing reaction for the legacy memory cycle, and we see risk-reward for the overall memory space turning incrementally positive vs. our [December view](#). We upgrade **SEC/NYT** to OW/N and maintain **SKH** as our preferred Asia Memory OW idea.

- Legacy fundamentals improving; Raise GMM TAM by 10-12%.** The majority of our TAM upward revision is based on higher pricing assumptions to reflect lowered supply bit output amid rapid DDR5 transition and uptick in legacy DRAM demand. While it is expected to take a few more quarters to clear DDR4 inventory, DDR5 inventory across channels and memory makers remains tight, so that pricing is likely to remain strong vs. initial expectations. NAND ASP is also set to rebound upon supply control and continued eSSD demand strength.
- Shorter legacy downcycle leads to a shorter upcycle?** Following a shorter legacy downcycle (4Q vs. prev. 6-7Q), the consequent big growth appetite for traditional applications could be limited, so the duration of upcycle could potentially be shorter. However, the quality of the overall cycle is a lot better with less volatility offering memory makers a higher earnings visibility. We advise investors to focus on an upward ASP move direction from rising HBM mix (HBM as % of three suppliers' revenue up from 19% in '24 to 40% in 26E).
- Healthy HBM S-D throughout 2026, more clarity expected in 2Q25.** HBM is based on annual contract terms and memory makers should start witnessing a large amount of 2026 capacity being filled in after discussing initial order for next year. Aside from SEC seeing an HBM demand airocket in 1H25, we do not see signs of HBM capacity cuts nor upside in 2025. After GPU driven demand until 1H26, we expect ASIC to lead the next round of demand strength from 2H26, and anticipate healthy HBM S-D throughout next year (JPMe: 47% HBM bit demand increase next year requires 145kt additional capacity vs. 200kt of industry wspm increase).
- DRAM capex hike to support HBM business, limited bit output increase; supply discipline continues.** Capex hikes have historically been regarded as oversupply signals in the cyclical memory industry, but we believe 2025 capex hikes signal reinforcement of AI business capability. Memory makers are

Equity Ratings and Price Targets

Company	Ticker	Mkt Cap (\$ mn)	Price CCY	Rating		Price Target			
				Cur	Prev	Cur	End Date	Prev End Date	
Samsung Electronics	005930 KS	261,528	KRW	58,900	OW	N	74,000	Dec-25	60,000 Sep-25
SK hynix	000660 KS	97,766	KRW	197,600	OW	n/c	300,000	Dec-25	280,000 n/c
Nanya Technology	2408 TT	3,840	TWD	41.10	N	UW	46.50	Dec-25	20.00 n/c

Source: Company data, Bloomberg Finance L.P., J.P. Morgan estimates. n/c = no change. All prices as of 02 Apr 25.

See page 67 for analyst certification and important disclosures, including non-US analyst disclosures.

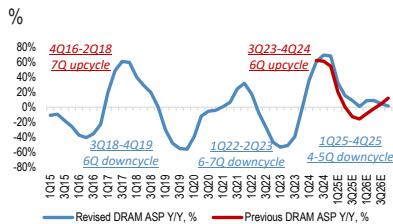
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allocating higher capital to greenfield fabs to support surging HBM demand and we expect the trend to be positively accepted in the market. NAND investment remains subdued as memory makers prioritize HBM capacity expansion more so than NAND fabs which are currently under-utilized. We forecast global DRAM capex to grow 18%/7% in FY25E/26E.

- **AI valuation premium continues vs. cyclical.** In the past 2M, we saw diverging share momentum between cyclical and AI memory (NYT: +37% vs. Samsung/SKH/MU: +12%/-1%/-3% vs. MXASJ +1% or SOX -15%) attributable to improving legacy fundamentals vs. cautious AI investment sentiment, in our view. In retrospect, what drove SKH's valuation to touch 2x P/B back in July-2024 was elongated demand visibility and HBM margin expansion, which has been the differentiating factor for cyclical memory products. Alongside improving legacy fundamentals, we believe memory makers with solid AI business execution and positioning deserve higher valuation premium vs. cyclical names. Our order of preference remains unchanged: **SKH (OW) > SEC (OW) > NYT (N)**. Next catalysts: 1) 2026 HBM order visibility update (2Q25), 2) SEC 1Q25 headline result on 8th April and NYT 1Q25 earnings call on 10th April, 3) SEC and SKH earnings calls in April, and 4) memory procurement and ASP trends post April 2nd tariff policy announcement.

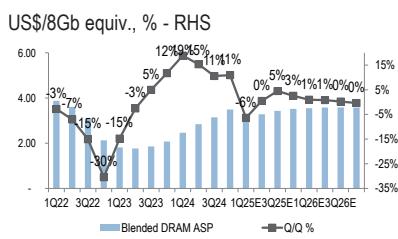
Investment summary

Figure 1: DRAM ASP Y/Y% change vs. previous assumptions



Source: WSTS, J.P. Morgan estimates.

Figure 2: DRAM quarterly pricing trend and Q/Q trend



Source: OMDIA, WSTS, J.P. Morgan estimates.

Shorter legacy down-cycle materializing with improving legacy fundamentals and supply constraints

What is driving shorter legacy down-cycle?

We see a shorter legacy downcycle scenario materializing with improving legacy ASP fundamentals as server/mobile customers are placing rush orders under normalized inventory levels (10 weeks / 6 weeks for server / mobile customers as of 4Q24). General purpose server demand from both U.S. and China DC customers remains stable with little seasonality and we have seen sharp production control of DDR4 output to channels. Almost every customer holds onto little DDR5 inventory, and the capacity migration has resulted in lower yield for DDR5 while cutting effective output more than our initial expectation. Lastly, we see leading memory producers continuously allocating their leading edge capacity to HBM (1ann/1bnm).

Magnitude and longevity of legacy memory price rebound?

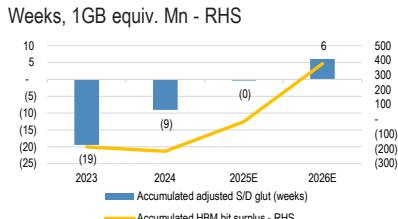
Compared to previous down-cycles (6-7 quarters of y-y pricing down-cycles), the current legacy memory down-cycle is substantially shorter due to the multiple reasons illustrated above. Given the highly commodity nature of memory price and contents growth, we believe a shorter downturn implies a potentially shorter upturn in both magnitude and longevity unless contents growth is supported by fundamental technology migration. On the Consumer device side, on-device AI penetration is a standalone organic contents growth driver that pushes up DRAM consumption for respective devices in next two years and we assume historical low contents growth for non-AI devices to reflect price elastic demand. Under such circumstances, we expect the pricing trend for the next 3-4 quarters to be “narrower price decline in the near-term followed by a small uptick in pricing move into year-end”, rather than a sharp price rise curve pattern. Although a milder pace of upturn, this is likely to support meaningful y-y memory earnings growth momentum, in our view.

What are the key considerations for legacy memory outlook?

The spot price market move pattern implies a high tendency of memory market pricing ahead of the scheduled tariff policy announcement on April 2. Such a trade uncertainty escalation elevates pull-in sourcing activities to some extent at the channel side. Yet, we have not witnessed such pull-in demand in major memory makers’ 1Q25 B/G trends. Having said that, channel inventory digestion was led by some pull-in, but we do not view it as material enough to deviate from memory makers’ initial short-term B/G outlook. Our legacy DRAM ASP outlook (low-single digit % ASP decline Q/Q vs. market consensus flat or our initial view of high-single % ASP decline from Dec-24) already reflects our view of little downside risk.

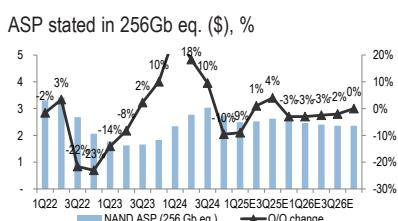
Lastly, we believe investors are continuously underestimating the series of supply discipline moves in the market and limited new clean room space impact to the market. SKH’s new M15X will be largely deployed for HBM, and MU will have new fresh capacity from Japan/US at earliest by 2027. While CHN DRAM capacity expansion is continuing, its supply output impact to the DDR5 market seems limited in the foreseeable future. Samsung, which holds the key to the supply equation, is taking a cautious approach on capex deployment in light of challenges at HBM and new process migration. These factors could keep the 2026E memory market S-D healthy.

Figure 3: Accumulated HBM bit surplus and glut ratio (weeks)



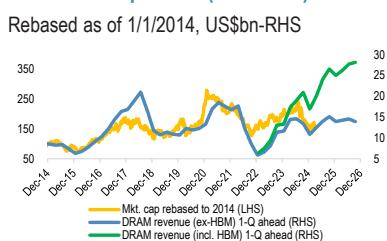
Source: Company data, J.P. Morgan estimates.

Figure 4: NAND quarterly pricing trend and Q/Q trend



Source: WSTS, J.P. Morgan estimates.

Figure 5: SEC/SKH market cap vs. DRAM revenue comparison (1Q ahead)



Source: Company data, Bloomberg Finance L.P., J.P. Morgan estimates. Note: 4Q24 onwards are J.P. Morgan estimates.

Limited upside/downside to 2025 HBM; All eyes on 2026. Contrary to negative market speculation on AI demand such as CoWoS capacity cut, DeepSeek impacting merchant GPU procurement etc, and GB300 ramp delay, we see limited evidence of HBM capacity cut nor upside/downside to HBM demand in 2025 (aside from SEC seeing an airocket in HBM demand in 1H25 due to China restriction and slower HBM qualification, in our view). We remain constructive on the HBM demand outlook supported by limited GPU production cuts, but also AI ASIC project ramps in 2025/2026 carrying higher HBM content similar to that of NVDA's (i.e. 144GB HBM content for Trainium 3 /and 288GB HBM content for TPU v7p). Similar to last year, memory makers plan to finalize 2026 order discussion within 1H25. SK Hynix is the frontier HBM vendor to discuss 2026 order/pricing with NVDA and we expect further clarity in mid-2025.

Improving NAND pricing following supply discipline action, but sustainability still questionable. Supported by eSSD demand strength and supply-discipline from memory makers (NAND fab loading rate has declined to 70% range in 2025-YTD from 80-85% in 2H24), we see NAND S/D improving and subsequently forecast NAND ASP to turn to positive growth within 2Q25. In the longer term, however, we remain conservative on the NAND pricing outlook as NAND market development has historically been fueled by price-elastic driven bit demand growth more so than ASP growth. We model in steady decline scenario from year-end (vs. previous decline through year-end and a pickup next year).

Sector dynamics improving, own all memories but we still prefer AI-centric suppliers. In the past 2M, there was a meaningful share divergence between conventional centric memory camp (SEC/NYT/Kioxia: +12%/37%/+28%) and the AI centric memory camp (SKH/MU: -1%/-5%) as investors priced in a shorter memory down-cycle amidst ongoing negative speculation of AI demand slowdown sentiment. Fundamentally, we turn positive on the conventional memory cycle (DRAM up-cycle to be longer than NAND), but we also like the secular AI tailwind from industry S/D dynamics. During a price bottom-out and earnings y-y growth cycle, we advise investors to own all major memory names, and we upgrade **SEC/NYT** to OW/Neutral (from previously N/UW) and maintain our positive view on **SK Hynix**. Improving industry dynamics favor stocks with high legacy memory exposure, in our view, and we see a positive shares return opportunity.

On the other hand, from a structural growth angle, we continue to view AI memory (i.e. HBM) growth visibility to be the highest, and technology leadership remains the key to our pecking order (**SK hynix** over **SEC** while both OW). Our **Neutral** view on **NYT** is due to prevailing DDR4 market exposure (still the majority of production output in next 12 months) and structural competition between CHN memory suppliers.

Upside risks. Upside risk includes robust legacy demand throughout FY26E to support pricing growth until 2H26E. Considering a shorter legacy downturn, we believe 4Q of legacy upturn cycle from 1Q26 is feasible under the pre-assumptions of: 1) Robust HBM demand throughout 2026 limiting idle supply capacity migrating to non-HBM; 2) demand surplus outgrowing bit shipment growth of current base case assumption of 16% growth in FY26E; and 3) limited China competition in DDR5 market.

Downside risks. Downside risk includes: 1) demand disruption at consumer electronic devices post trade conflict escalation, 2) AI demand peakout and consequent idle HBM capacity transitions to DDR5 production capacity resulting in price down-cycle, and 3) intensifying DDR4/5 pricing competition as CXMT rolls out competitive product alongside yield improvement.

Scenario analysis

We provide three different scenarios and their likely impact on DRAM ASP. We expect the magnitude of DRAM ASP swing to follow the sufficiency ratio dictated upon the demand situation. While we expect server demand to be relatively stable against the macro backdrop, we believe the price elastic nature of B2C (mobile/PC) related demand should be the most impacted by the macro situation. For simplicity, our scenario analysis assumes unit shipment changes across major end-applications across server, mobile, PC and not content change.

- **Bull 1:** DRAM bit demand grows 21% Y/Y in FY25E (server: +32% Y/Y, mobile: +20% Y/Y, PC: +9% Y/Y), meaningfully surpassing supply growth of 14%, which would result in 20-30% Y/Y ASP growth. Major assumptions include 9%/8% unit shipment growth in mobile/PC, likely driven by successful launch and reception of edge-AI products.
- **Base:** DRAM bit demand grows 18% Y/Y (server: +30% Y/Y, mobile: +15% Y/Y, PC: +7% Y/Y) followed by ASP growth of 13%. Our base case scenario assumes LSD% unit growth in GP server, 3% unit growth in smartphones, and 6% growth in NBPC unit.
- **Bear 1:** DRAM bit demand grows 16% (server: +28% Y/Y, mobile: +13% Y/Y, PC: +5% Y/Y) and ASP likely declines by 5% Y/Y from sufficiency rate reaching ~8%. Our first bear case scenario assumes 1%/2% mobile/PC shipment growth, which we believe the market will likely take as sluggish B2C demand and memory ASP trending down Y/Y.
- **Bear 2:** DRAM bit demand grows by 14% (server: +26% Y/Y, mobile: +10% Y/Y, PC: +5% Y/Y), meaningfully surpassing supply growth of 14%, which would result in 30-40% Y/Y ASP decline. This scenario assumes the most bearish assumptions, with mobile/PC shipment declining 3%/2% Y/Y. Coupled with weak B2C demand, the scenario assumes 1% GP server shipment decline, resulting in the memory industry heading into a downcycle.

Table 1: DRAM industry supply-demand sensitivity analysis

8Gb equiv. Mn, US\$mn

	25E (bear 2)	25E (bear 1)	25E (base)	25E (bull 1)
Global DRAM bit demand	34,032	34,692	35,247	36,030
Global DRAM bit supply - no change scenario	36,381	36,381	36,381	36,381
Global DRAM bit consumption	35,435	35,767	36,046	36,440
Inventory	2,737	2,405	2,126	1,731
S-D sufficiency (%)	10.4%	8.4%	6.8%	4.6%
S-D sufficiency change vs. base	3.6%	1.6%	0.0%	-2.2%
<i>Historical ASP change upon sufficiency change</i>	-30%-40% chg	-0-10% chg		20-30% chg
Global DRAM ASP (US\$/8Gb)	2.3	2.9	3.4	3.8
Y-Y changes (%)	-22%	-2%	13%	28%
Difference (%) vs. base	-31%	-13%	0%	13%
Global DRAM revenue (US\$ mn)	82,922	105,101	122,099	139,788
Y-Y changes (%)	-14%	9%	27%	45%
Difference (%) vs. base	-32%	-14%	0%	14%

Source: J.P. Morgan estimates.

Table 2: DRAM industry demand sensitivity analysis

8Gb equiv. Mn, US\$mn

	2025E (bear 2)	2025E (bear 1)	2025E (base)	2025E (bull)
Server	12,247	12,463	12,661	12,895
Y-Y changes (%)	26%	28%	30%	32%
Difference (%) vs. base	-3%	-2%	0%	2%
PC	5,353	5,439	5,529	5,610
Y-Y changes (%)	4%	5%	7%	9%
Difference (%) vs. base	-3%	-2%	0%	1%
Mobile	11,518	11,867	12,127	12,584
Y-Y changes (%)	10%	13%	15%	20%
Difference (%) vs. base	-5%	-2%	0%	4%
Others (incl. CE/Auto/Indus/else)	4,472	4,472	4,472	4,472
Sum total	33,590	34,241	34,789	35,562
Implied B/G yoy (%)	14%	16%	18%	21%
Difference (%) vs. base	-3%	-2%	0%	2%

Source: J.P. Morgan estimates.

Global memory model: Revisions

We raise the global memory TAM by 10%/12% in FY25/26E to reflect improving conventional DRAM and NAND fundamentals and incorporate HBM TAM upward revision from ASIC strength (see our Jan-2025 published [report](#)). Our shorter legacy downcycle view remains intact, and we believe earlier restocking demand across the supply chain is leading to better-than-feared conventional DRAM and NAND ASP trends. Supply discipline across memory makers also support pricing sentiment (especially NAND), but we advise investors to focus on the demand-driven ASP hike cycle, which carries higher quality of earnings growth rather than supply-driven ASP hike. Factoring in supply discipline and earlier restocking demand momentum, we raise DRAM and NAND ASPs by 4-25% in FY25-26E.

Memory ASP and content growth typically have an inverse relationship (ASP decline fuels content growth, and vice versa) and following our assumption of improving legacy DRAM and NAND ASP, we trim content growth assumptions for B2C related applications (smartphone/PC, etc.). On capex, we raise DRAM vs. trimming NAND to reflect memory makers' intent to prioritize DRAM capacity expansion (increase in both infrastructure/WFE spending). With the bulk of supply coming online from 2026 onwards, we do not pencil-in oversupply scenario and reiterate our bullish view on the memory market outlook.

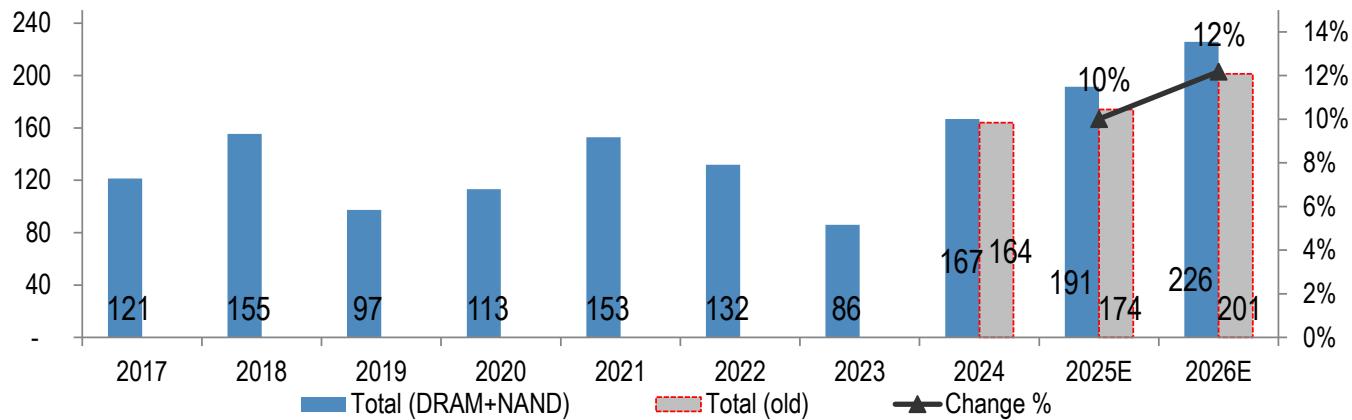
Table 3: J.P. Morgan Global Memory Model: Summary of changes

	Revised		Previous		Difference	
	2025E	2026E	2025E	2026E	2025E	2026E
Memory revenue	191.5	225.8	174.1	201.2	10%	12%
DRAM revenue	122.1	149.7	102.8	122.5	19%	22%
HBM revenue	31.5	45.6	30.6	43.1	3%	6%
NAND revenue	69.4	76.0	71.3	78.8	-3%	-4%
Memory price						
DRAM ASP (8Gbe.)	3.4	3.6	2.8	2.9	21%	25%
HBM ASP (8Gbe.)	14.4	14.2	13.9	13.6	4%	4%
NAND ASP (256Gbe.)	2.5	2.4	2.5	2.3	4%	2%
Memory Consumption						
DRAM consumption (8Gbe.)	36,046	41,923	36,591	42,861	-1%	-2%
NAND consumption (256Gbe.)	27,225	31,757	29,058	33,573	-6%	-5%
% growth assumption						
DRAM supply B/G	14%	16%	16%	16%	-2%	0%
NAND supply B/G	10%	16%	15%	17%	-6%	-1%
DRAM ASP Y/Y%	13%	5%	-4%	2%	17%	4%
NAND ASP Y/Y%	-6%	-6%	-8%	-4%	2%	-2%
Shipments						
Desktops	63	64	63	64	0%	0%
Notebooks	174	182	175	182	-1%	0%
Servers	12.7	13.3	12.6	13.0	1%	2%
Smartphones	1,258	1,283	1,246	1,258	1%	2%
SSDs	388	417	391	403	-1%	3%
Average DRAM memory (MB)						
Desktops	10,648	11,306	10,806	11,588	-1%	-2%
Notebooks	12,892	14,078	13,017	14,315	-1%	-2%
Servers	997,877	1,177,303	959,297	1,112,661	4%	6%
Smartphones	8,386	9,322	8,563	9,583	-2%	-3%
Average NAND memory (MB)						
SSDs	1,310,035	1,437,284	1,323,551	1,480,043	-1%	-3%
Smartphones	225,257	261,205	229,298	267,557	-2%	-2%
Supply assumptions						
DRAM (8Gbe., M)	36,381	42,202	37,112	42,994	-2%	-2%
HBM (8Gbe., M)	2,775	4,270	2,761	4,168	1%	2%
NAND (256Gbe., M)	27,827	32,335	29,564	34,553	-6%	-6%
Memory capex	69,874	76,251	70,167	73,343	0%	4%
DRAM	49,511	53,236	47,113	48,506	5%	10%
NAND	20,363	23,014	23,054	24,837	-12%	-7%

Source: J.P. Morgan estimates.

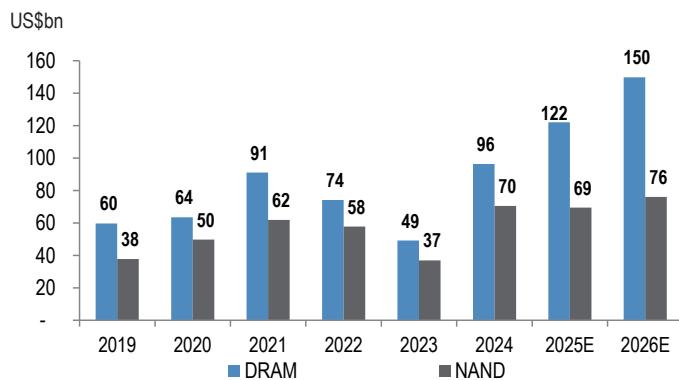
Figure 6: Global memory market (DRAM+NAND) size and % change

US\$b, % - RHS



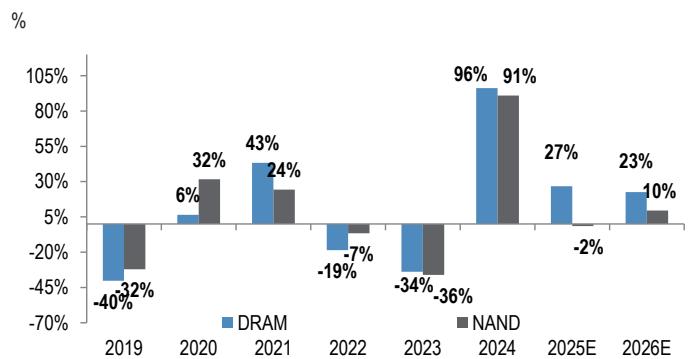
Source: WSTS, J.P. Morgan estimates.

Figure 7: DRAM and NAND market size



Source: WSTS, J.P. Morgan estimates.

Figure 8: DRAM and NAND market growth rates



Source: WSTS, J.P. Morgan estimates.

Shorter legacy downcycle - how long will it last?

We see a shorter legacy downcycle view materializing and see a sharper rebound of conventional DRAM ASP from earlier restocking demand on inventory normalization across memory customers. We expect both the magnitude and the duration of the upcoming price upcycle to be milder than the previous upcycle, which typically lasted 7-8Q and 30-90% price swings. We find lessening cyclicity of memory cycle as a positive development for the memory industry given higher earnings visibility that enhances memory makers to make prudent capex decisions.

What is driving shorter legacy downcycle?

Back in Dec-24, our rationale for a shorter legacy downcycle was the inventory restocking cycle transpiring in mid-2025 ahead of edge-AI launch amid robust HBM demand. Compared to our previous forecast, our view of a shorter legacy downcycle remains unchanged but see sharper legacy rebound helped by: 1) earlier restocking

demand across server/mobile customers from normalizing inventory partly due to GP server demand sustaining and China government subsidy for China mobile phones; 2) lean memory inventory across customers (10 weeks for server and 6 weeks for mobile); 3) accelerating DDR5 penetration where supply of DDR5 remains tight given higher wafer allocation to HBM from memory makers; and 4) supply discipline across memory makers to secure profitability.

What is the duration and magnitude of the upcoming memory upcycle?

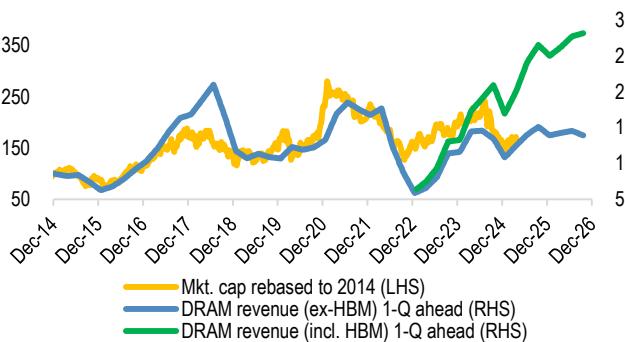
We believe a shorter legacy downcycle intuitively points to a shorter upcycle with both the magnitude and the duration lasting similarly to the most recent downcycle of 4-5Q. Compared to previous memory cycle price swings (30-90% range from bottom to peak, vice versa), we expect blended the DRAM ASP swing from bottom to peak to be much milder at 10% because of our conservative contents growth assumption following earlier price rebound. This is partly due to memory makers' intent to maintain supply discipline, and also the emergence of HBM which is creating memory price swings much milder from longer demand visibility.

What is the implication to the memory industry?

The cyclical nature of memory prices has led to heavy share price swings in multiple past memory cycles. We believe a milder price swing for upcoming memory cycles would be a positive development enhancing price visibility and lessening earning swings, which would help memory makers to make prudent capex decisions in the future. We also highlight that despite improving legacy DRAM ASP, HBM TAM growth is likely to be largely driven by DRAM TAM growth.

Figure 9: SEC/SKH market cap vs. DRAM revenue comparison (1Q ahead)

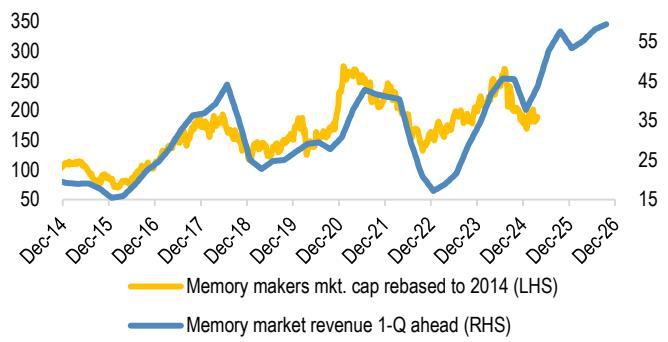
Rebased as of 1/1/2014, US\$bn-RHS



Source: Company data, Bloomberg Finance L.P., J.P. Morgan estimates. Note: 1Q25 onwards are J.P. Morgan estimates.

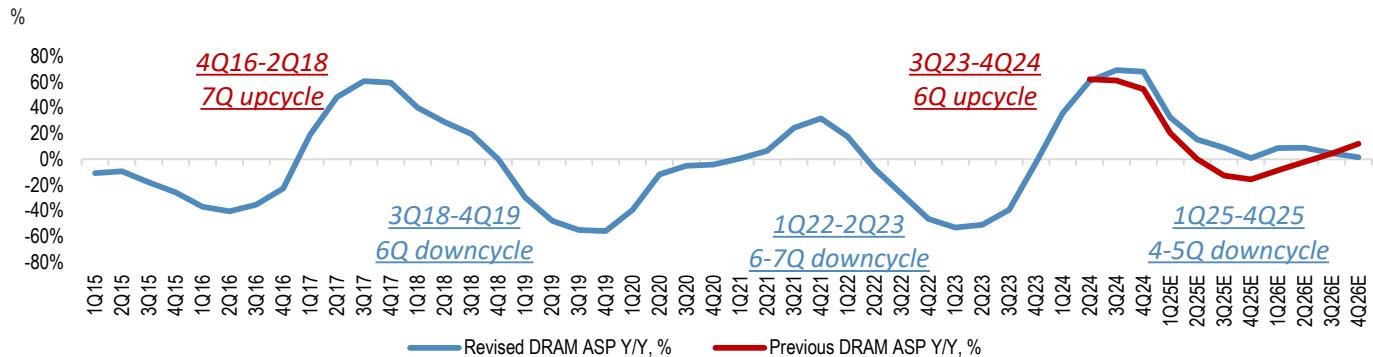
Figure 10: Aggregate market cap vs. leading memory market revenue trend (1Q ahead)

Rebased as of 1/1/2014, US\$bn-RHS



Source: WSTS, Bloomberg Finance L.P., J.P. Morgan estimates. Note: Market cap includes SEC, SK hynix, Micron, Nanya Technology, Western Digital, and Kioxia. Note: 4Q24 onwards are J.P. Morgan estimates.

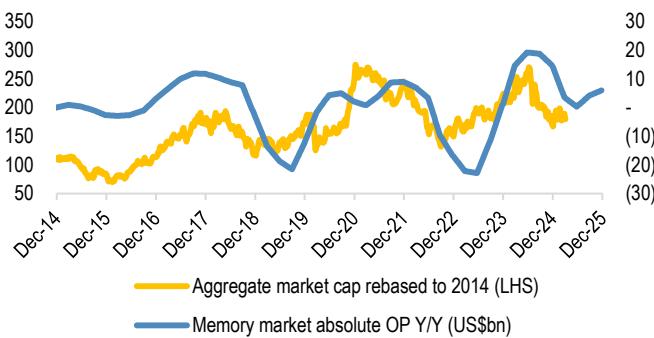
Figure 11: DRAM ASP Y/Y% change vs. previous assumptions



Source: WSTS, J.P. Morgan estimates.

Figure 12: Aggregate market cap vs. memory industry absolute OP Y/Y change

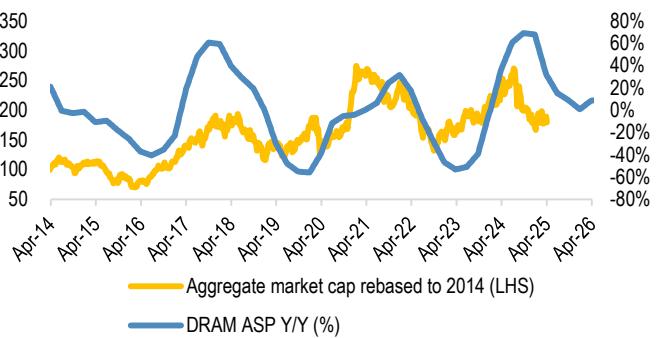
Rebased as of 1/1/2014, US\$bn-RHS



Source: WSTS, OMDIA, Bloomberg Finance L.P., J.P. Morgan estimates. Note: Market cap includes SEC, SK hynix, Micron, Nanya Technology and Western Digital. Note: 4Q24 onwards are J.P. Morgan estimates.

Figure 13: Aggregate market cap vs. DRAM ASP Y/Y change

Rebased as of 1/1/2014, % - RHS

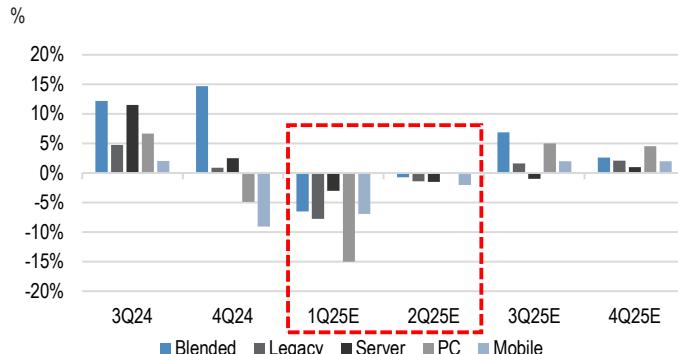


Source: WSTS, Bloomberg Finance L.P., J.P. Morgan estimates. Note: Market cap includes SEC, SK hynix, Micron, Nanya Technology and Western Digital. Note: 4Q24 onwards are J.P. Morgan estimates.

Conventional DRAM pricing outlook

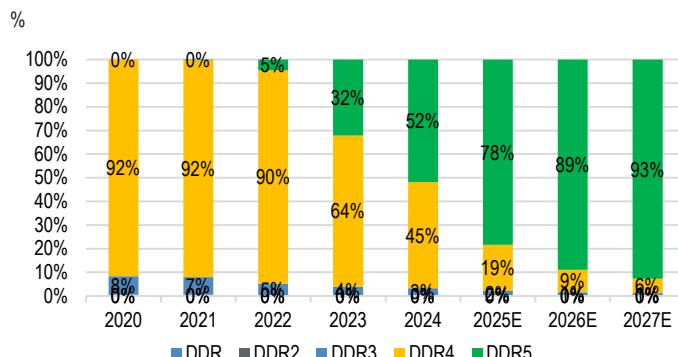
Post 4Q earnings, the major change to our memory market view was weaker conventional pricing in 1H offset by a stronger 2H25 outlook, considering the cyclical nature of the memory cycle as well as restocking demand kicking-in from mid-2025. Once the destocking cycle ends in 1Q, we expect the magnitude of conventional ASP decline to narrow and turn to positive growth territory in 4Q25E-1Q26E. Based on OMDIA data, DDR5 / LPDDR5 penetration rates are likely to surpass 70%+ / 50%+ in FY25E (see Figure 16-19) and we believe this is positive for memory makers considering less fierce competition against CXMT. Lean DDR5 inventory at memory makers supports pricing improvement and our discussions with major memory makers indicate the DDR4 sales mix is likely to decline to single-digit% in FY25E, implying the impact from CXMT should decline in the mid-to-long term.

Figure 14: SEC/SKH average DRAM ASP comparison by Blended vs. Legacy vs. Applications



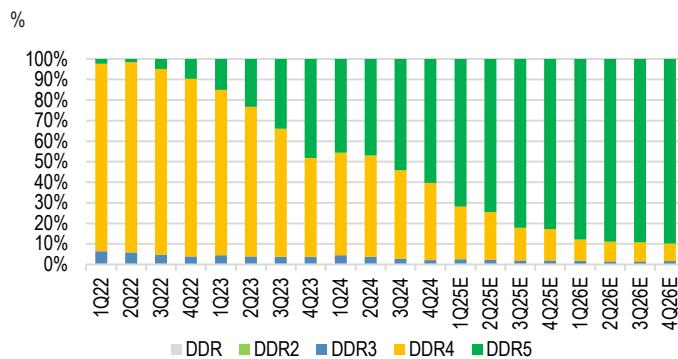
Source: Company data, J.P. Morgan estimates.

Figure 16: DDR bit shipment by technology



Source: OMDIA. Note: Shipment includes all DDR related technologies and excludes mobile DRAM.

Figure 18: Quarterly DDR bit shipment by technology



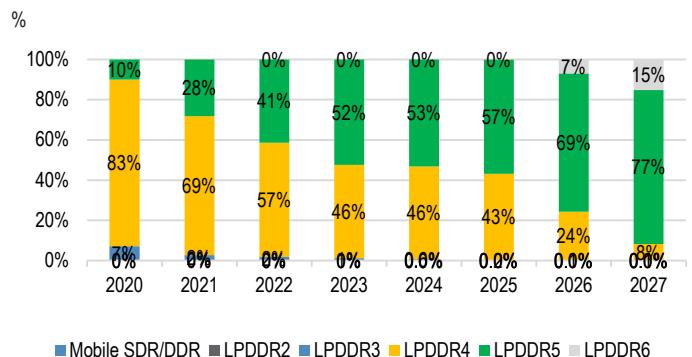
Source: OMDIA. Note: Shipment includes all DDR related technologies and excludes mobile DRAM.

Figure 15: DRAM inventory status across customers

Customer Type	CSP/OEM	Inventory Status			
		4Q24	1Q25	2Q25	3Q25
Server	CSP	Over 10 weeks (DDR4)	Rapid transition (DDR4 → DDR5) DDR5 likely to reach target in 2H25		
PC	OEM	Over 10 weeks (DDR4)	Early DDR4 EOL from suppliers		
Mobile		Around 6 weeks	Chinese brand: Prefer to have 6-8 weeks inventory Likely to start restocking from 2Q25		
Suppliers		Excessive (Over 10 weeks)	Excessive (Increased)	Excessive (Decreased)	Normalized

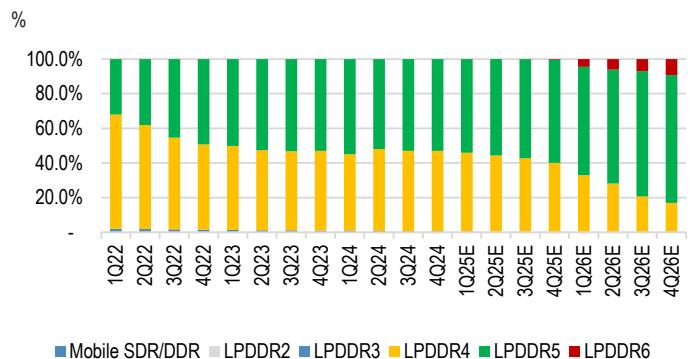
Source: OMDIA.

Figure 17: LPDDR bit shipment by technology



Source: OMDIA.

Figure 19: Quarterly LPDDR bit shipment by technology



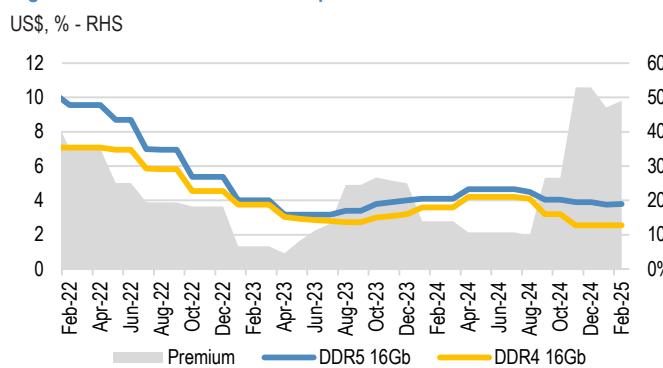
Source: OMDIA.

Spot price trend

The spot price data indicates: 1) DDR4/5 spot price rising by 10%/8% from early-Feb (Figure 22/23); 2) DDR4/5 pricing decoupling intensifying across end-applications; and 3) limited signs of NAND spot price rebound. While DRAM spot price data shows signs of bottoming out, we highlight the majority of DRAM sales are conducted in contract pricing terms and advise investors to focus on contract price data. We also note that higher DDR5 sales should be overall positive to memory earnings given the 50%+ pricing premium for DDR5 vs. DDR4. Comparing the pace of DDR4 bit shipment decline vs. DDR3 in the past cycle, we expect the pace of DDR4 decline to be much faster vs. DDR3 given memory makers' intent to phase out from DDR4 and prioritize DDR5. Based on OMDIA data, after DDR4 bit crossover vs. DDR3 in 2Q16, it took 5 quarters for DDR3 bit contribution to decline to the ~10% range. After DDR5 bit crossover vs. DDR4 in 3Q24, we expect the pace of decline to be much faster than 5 quarters for DDR4 to reach sub-10% bit shipment growth. This is broadly in-line with memory makers' guidance of expecting DDR4/LPDDR4 revenue contribution to be lower than 10% in FY25E.

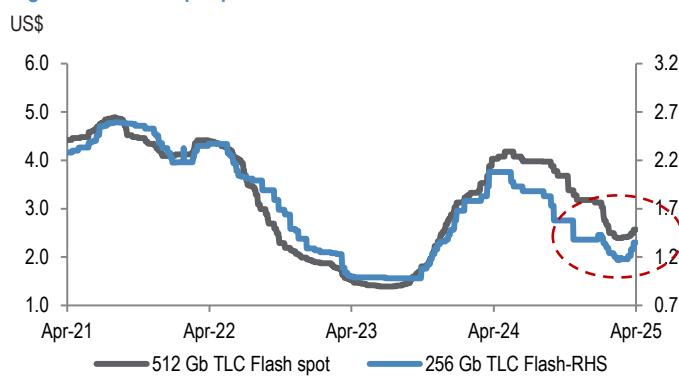
As for DDR4 premium vs DDR3, the maximum premium reached a high of 72% on 20th March (Figure 25) with DDR4 spot prices rising at a much faster rate than DDR3, which bodes well for NYT given its >50% exposure to the traditional legacy DDR4 market.

Figure 20: DDR5 vs. DDR4 16Gb price trend



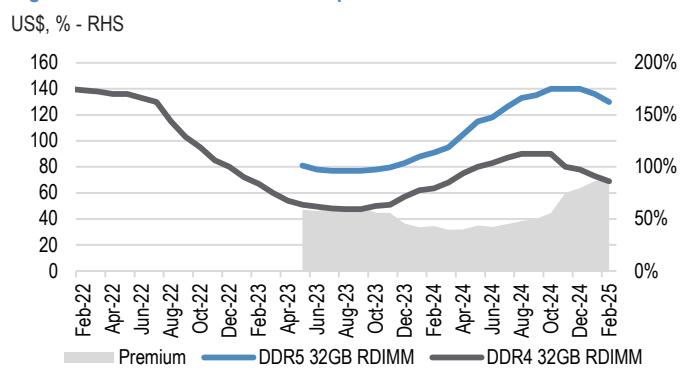
Source: Company data.

Figure 22: NAND spot price trend



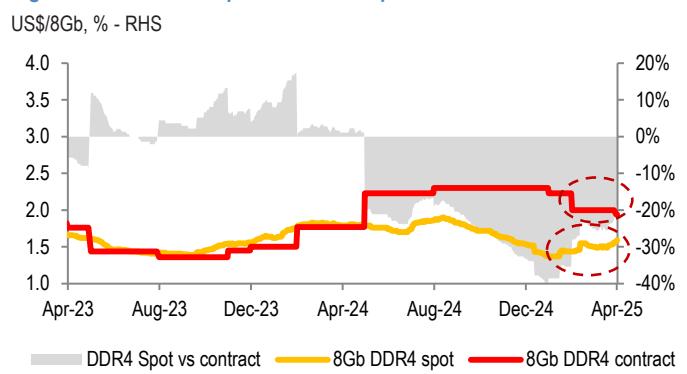
Source: Bloomberg Finance L.P.

Figure 21: DDR5 vs. DDR4 RDIMM price trend



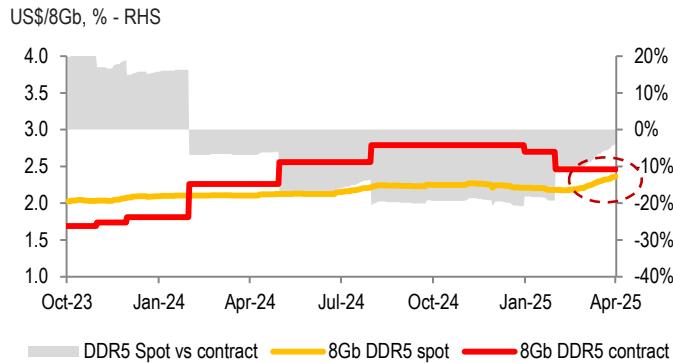
Source: Company data.

Figure 23: 8Gb DDR4 spot vs. contract price trend



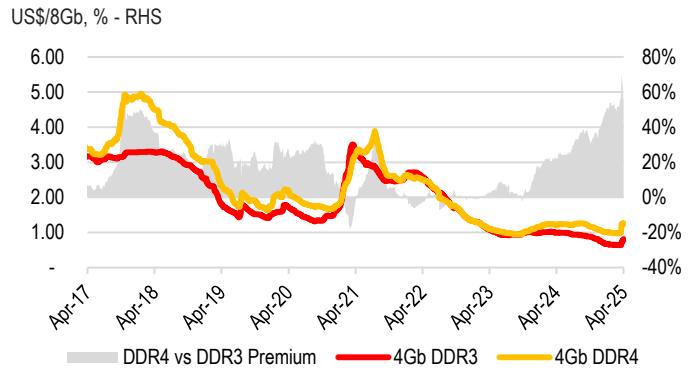
Source: Bloomberg Finance L.P.

Figure 24: 8Gb DDR5 spot vs. contract price trend



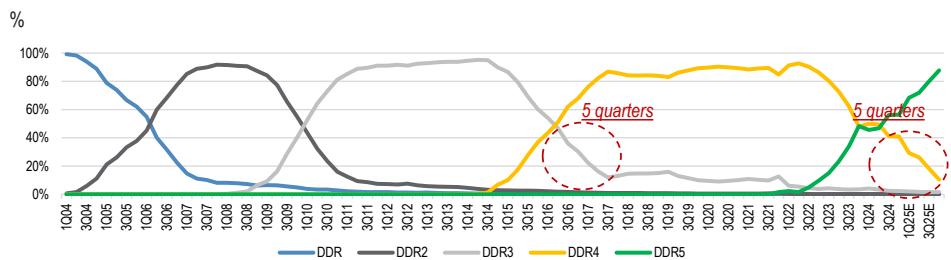
Source: Bloomberg Finance L.P.

Figure 25: DDR4 vs DDR3 spot price trend



Source: Bloomberg Finance L.P.

Figure 26: DDR shipment by technology



Source: OMDIA. Note: Shipment includes all DDR related technologies and excludes mobile DRAM.

HBM S-D update

As we highlighted in our HBM 2025 update note ([note](#)), we revised up FY25-26E HBM bit procurement demand by 9-13% on ASIC order strength from increased product rollout especially after the emergence of the cost-optimized LLM (i.e. DeepSeek) and content growth increases partially offset by lower HBM4 content for Rubin vs. our initial expectations (mainly owing to delayed 32Gb mono-die adoption).

On the supply side, we adjusted our assembly yield and HBM capacity quarterly ramp (+1%/+2%) in our new projection. On the Samsung side, we remain cautious on its HBM bit shipment plan of 2x in FY25E and pencil in 60+% shipment assumption due to slow 1H25. On the tight S/D environment, we expect the robust pricing (+18% y-y) trend to continue this year (both driven by like-to-like ASP rise and mix improvement) followed by steady pricing (-1% y-y) next year. As a result, we forecast three suppliers' combined HBM industry revenue at US\$40-61bn in FY25E-26E.

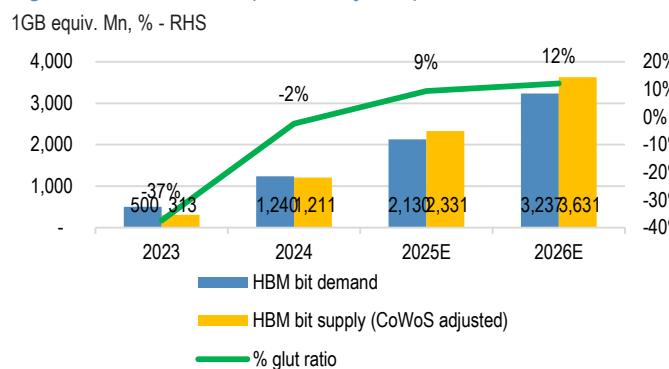
While it is too early to assess 2027E S-D, we believe a higher bit demand increase (FY27E at +58% vs. FY26E at +47%) and higher capacity increase are necessary to fully digest the demand.

Table 4: HBM model: Summary of changes

	Revised		Previous		% difference	
	FY25E	FY26E	FY25E	FY26E	FY25E	FY26E
HBM bit demand (unit mn, 1GB equiv) - calendar year	1,840	2,711	1,659	2,546	11%	6%
NVDA	1,158	1,604	1,110	1,694	4%	-5%
AMD	162	234	162	249	0%	-6%
Others	520	872	387	603	34%	45%
HBM bit demand (unit mn, 1GB equiv) - t+4 months procurement	2,130	3,237	1,955	2,872	9%	13%
NVDA	1,307	1,938	1,305	1,884	0%	3%
AMD	186	262	191	288	-3%	-9%
Others	637	1,037	459	700	39%	48%
HBM bit supply (1GB equiv)	2,775	4,270	2,761	4,168	1%	2%
Samsung	1,011	1,442	1,113	1,537	-9%	-6%
SK Hynix	1,434	2,088	1,436	2,101	0%	-1%
HBM bit supply after CoWoS	2,331	3,631	2,303	3,480	1%	4%
CoWoS yield (%)	84%	85%	83%	84%	1%	2%
HBM S-D glut ratio (%) : procurement year	9%	12%	18%	21%	-8%	-9%
HBM S-D glut (weeks)	4.9	6.3	9.3	11.0	(4.3)	(4.7)
HBM S-D glut (weeks) - accumulated	(0.4)	6.1	3.1	13.1	(3.5)	(7.1)
HBM Industry revenue (\$ mn)	39,866	60,577	38,304	56,767	4%	7%
HBM avg contents (GB) / chip	150	180	153	190	-2%	-5%
HBM ASP (US\$, 1GB equiv)	14.4	14.2	13.9	13.6	4%	4%
Samsung	13,151	18,796	13,473	18,675	-2%	1%
SK Hynix	21,540	31,698	21,328	30,456	1%	4%

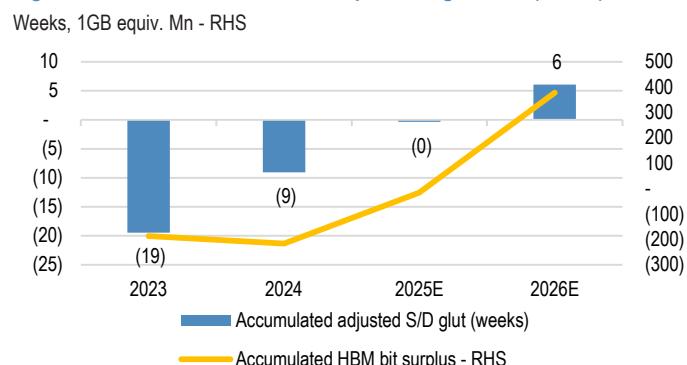
Source: J.P. Morgan estimates.

Figure 27: HBM S/D ratio (CoWoS adjusted)



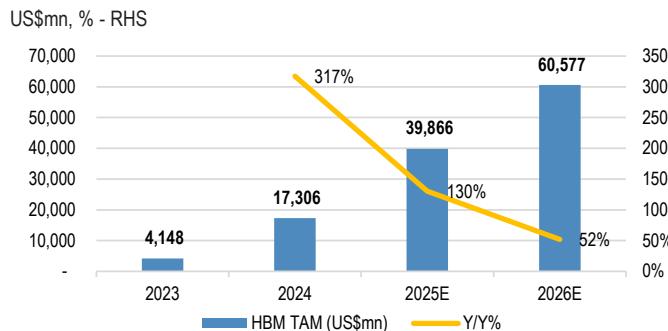
Source: Company data, J.P. Morgan estimates.

Figure 28: Accumulated HBM bit surplus and glut ratio (weeks)



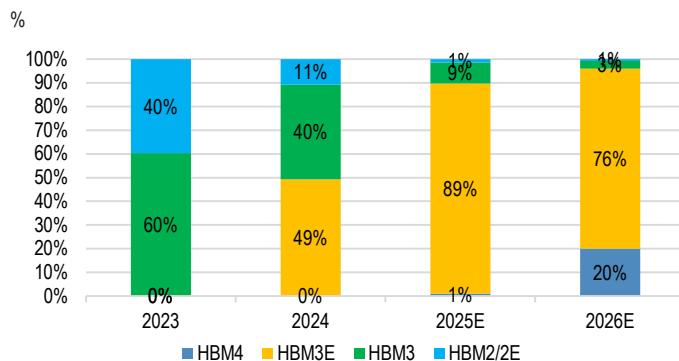
Source: Company data, J.P. Morgan estimates.

Figure 29: HBM TAM and Y/Y% growth



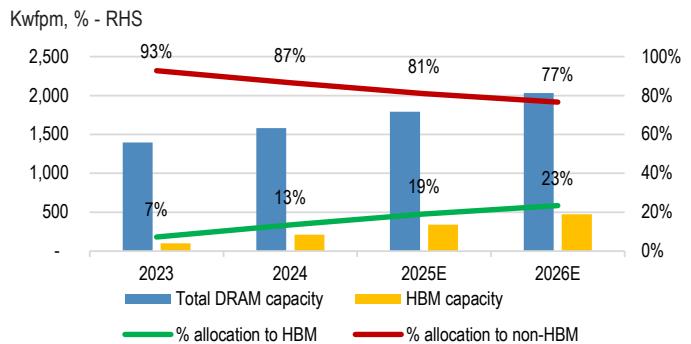
Source: Company data, J.P. Morgan estimates.

Figure 31: HBM TAM breakdown by application



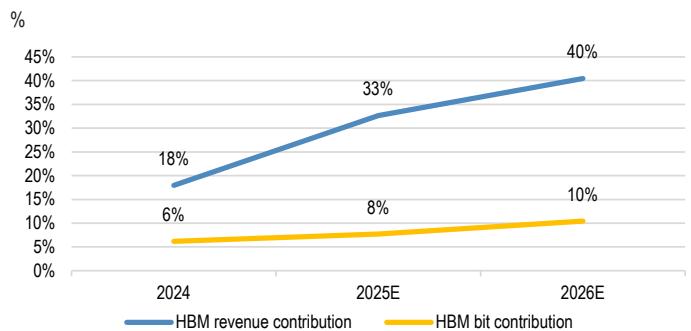
Source: Company data, J.P. Morgan estimates.

Figure 30: DRAM and HBM capacity mix



Source: Company data, J.P. Morgan estimates.

Figure 32: HBM revenue/bit contribution



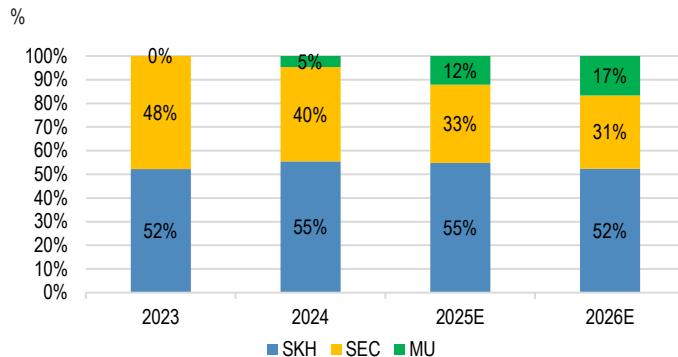
Source: Company data, J.P. Morgan estimates.

Table 5: HBM technology roadmap by major players

	Company	Technology	Stack height	2024				2025E				2026E				2027E			
				1Q24	2Q24	3Q24	4Q24	1Q25E	2Q25E	3Q25E	4Q25E	1Q26E	2Q26E	3Q26E	4Q26E	1Q27E	2Q27E	3Q27E	4Q27E
HBM3E	Samsung	TC-NCF	8-Hi				(24GB)												
		TC-NCF	12-Hi																
	SK Hynix	MR-MUF	8-Hi				(24GB)												
HBM4		aMR-MUF	12-Hi																
	SK Hynix	aMR-MUF	16-Hi																
	Micron	TC-NCF	8-Hi				(24GB)												
HBM4E	Samsung	TC-NCF	12-Hi																
		TBD	16-Hi																
	SK Hynix	aMR-MUF/HB	16-Hi																
Micron		TC-NCF	12-Hi																
		TBD	16-Hi																
		TBD	TBD																

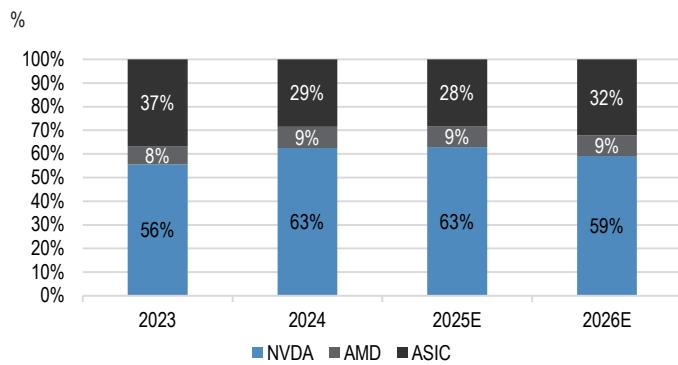
Source: Company data, J.P. Morgan estimates.

Figure 33: HBM M/S by player



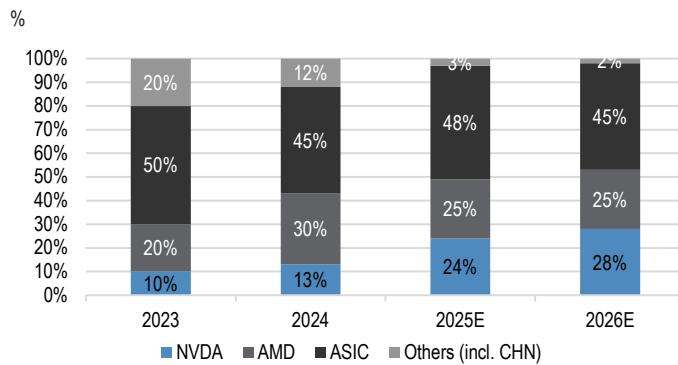
Source: Company data, J.P. Morgan estimates.

Figure 35: HBM bit demand mix by major customers



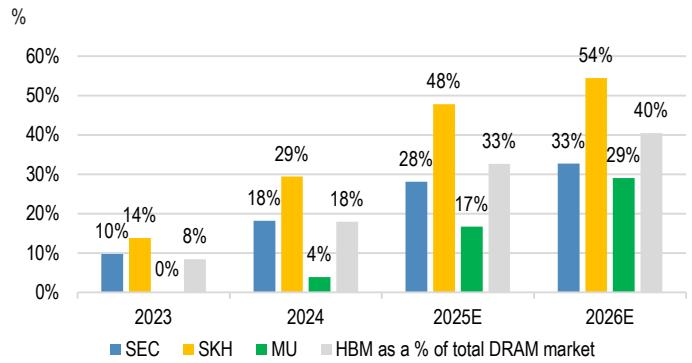
Source: Company data, J.P. Morgan estimates.

Figure 37: SEC - HBM sales mix by customers



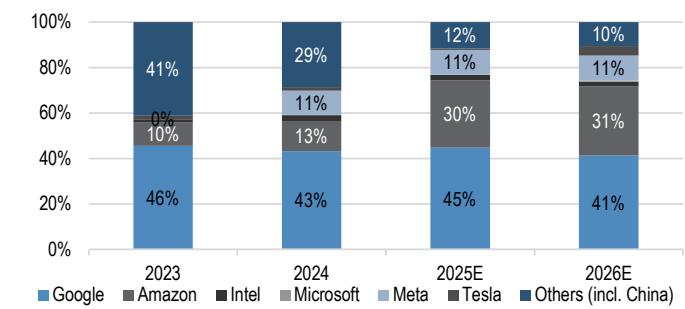
Source: Company data, J.P. Morgan estimates.

Figure 34: HBM sales mix by player



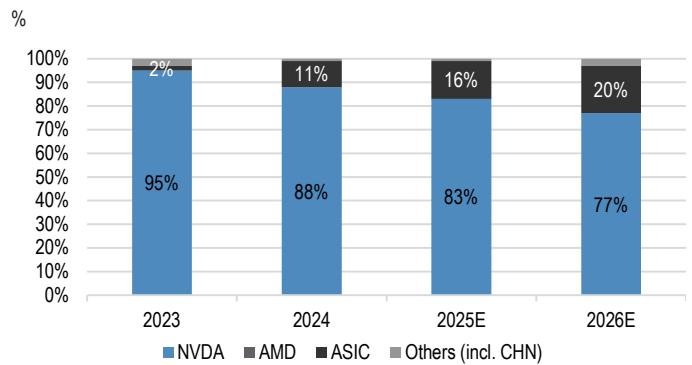
Source: Company data, J.P. Morgan estimates.

Figure 36: HBM bit demand mix within AI ASIC



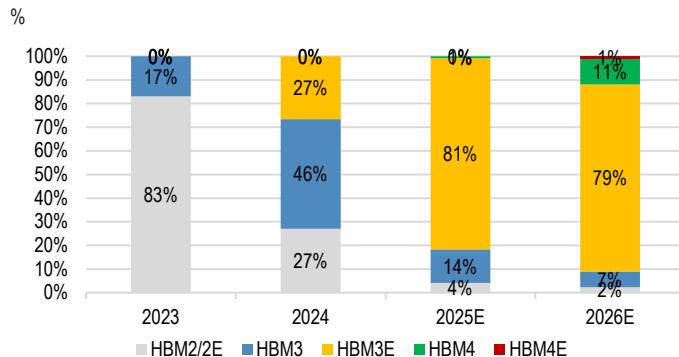
Source: Company data, J.P. Morgan estimates.

Figure 38: SKH - HBM sales mix by customers



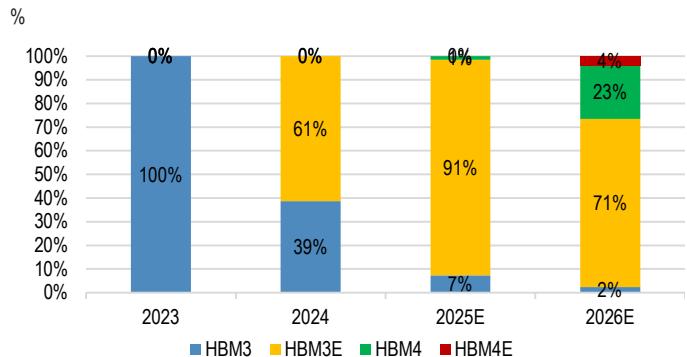
Source: Company data, J.P. Morgan estimates.

Figure 39: SEC - HBM sales mix by generation



Source: Company data, J.P. Morgan estimates.

Figure 40: SKH - HBM sales mix by generation



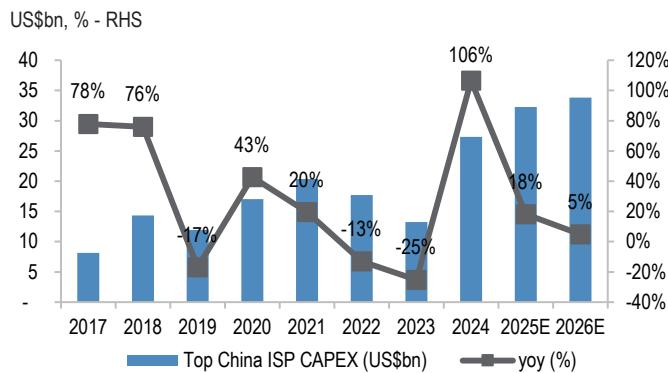
Source: Company data, J.P. Morgan estimates.

China ISP capex update

Recently, China ISP capex has been on an uptrend mainly driven by rapid adoption of gen AI in China, with the top 3 China ISPs' capex rising ~180% Y/Y in 2024. This was further boosted by the introduction of DeepSeek's models, with DeepSeek's open-source strategy, coupled with high model quality and high cost efficiency, potentially leading industry model costs to zero in China's AI market, while low entry barriers could greatly boost LLM usage and native gen AI application adoption.

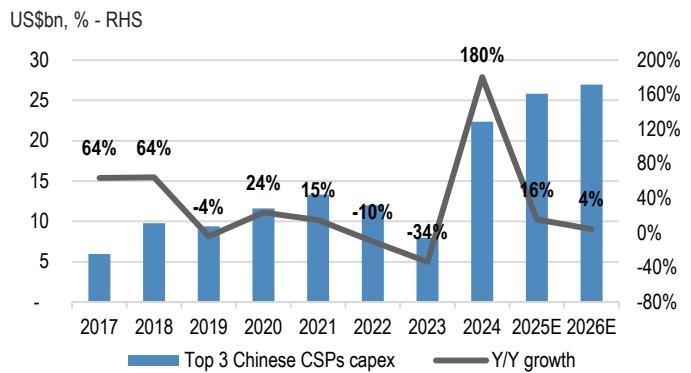
As for Tencent, while its capex was similar to that of Alibaba in the past two years despite having a smaller cloud revenue base, Tencent's capex has been growing at triple digits since 1Q24 due to investment in GPU servers. Likewise, Alibaba's mgmt revealed their 3-year capex plan that "total capex in the next 3 years will exceed total capex in the past decade". Consequentially, we expect China ISP capex to rise steadily by 17%/3% in FY25E/26E respectively as ISPs continue to strengthen their artificial intelligence development and infrastructure spending.

Figure 41: Top 10 China ISP capex



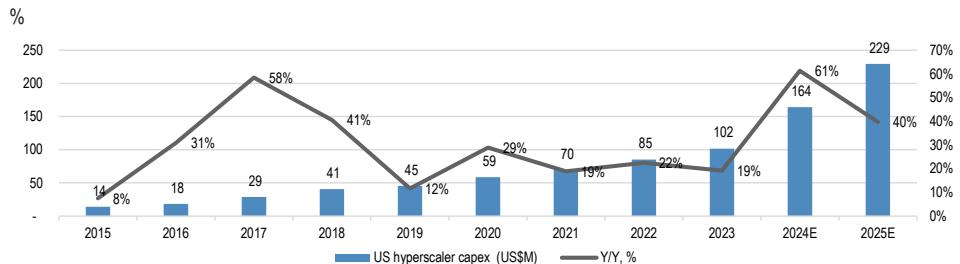
Source: Bloomberg Finance L.P.; Note: Forecasts based on Bloomberg Finance L.P

Figure 42: Top 3 China ISP capex



Source: Bloomberg Finance L.P. Note: Top 3 ISPs include Alibaba, Tencent and Baidu.; Forecasts based on Bloomberg Finance L.P.

Figure 43: US hyperscalers capex and Y/Y% growth



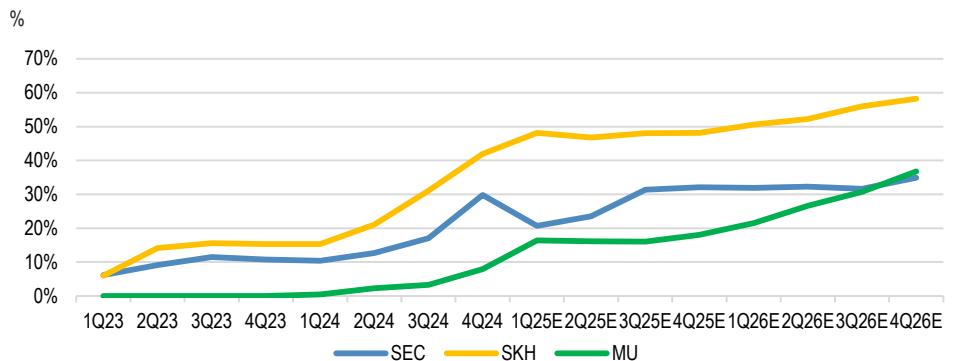
Source: Company data, J.P. Morgan US datacenter team estimates.; Note: US hyperscalers include GOOG/AMZN/MSFT/META

Memory and DRAM OP trend

Multiple investors have voiced concern on margin downside risk heading into mid-2025 due to MU's cautious margin guidance in 2QCY25 ([link](#) to the report). While the exact reason is difficult to verify, we assume the pace of 12-Hi HBM ramp (as well as the sales mix) could be the reason with MU's capacity being the lowest across three major vendors.

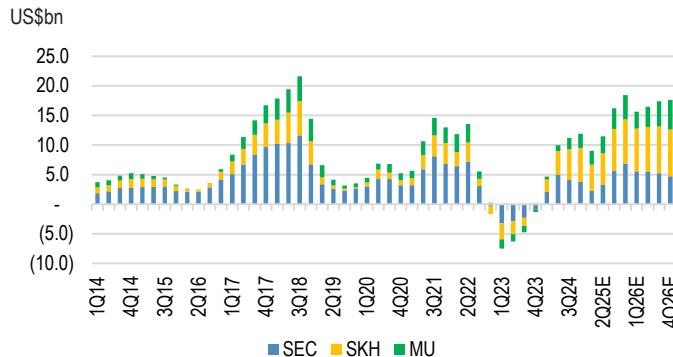
Charting quarterly memory and DRAM OP trend since 1Q14, though our forecast does not indicate quarterly earnings surpassing previous high in 3Q18 (peak earnings during server upcycle), we expect memory earnings to remain solid throughout our forecast horizon on robust HBM demand strength. We also do not see meaningful margin risk as improving HBM sales mix carries strong profitability (50-60% HBM OPM, similar margin profile during server peak cycle). We remain constructive on the memory market posting a healthy and stable earnings stream throughout FY26E.

Figure 44: HBM sales % mix trend across SEC/SKH/MU



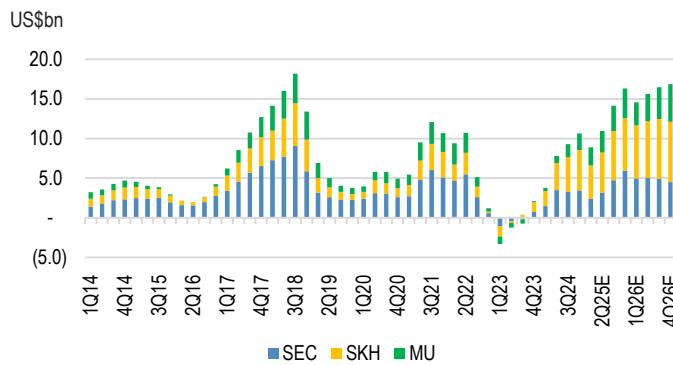
Source: Company data, OMDIA, J.P. Morgan estimates.

Figure 45: Quarterly memory OP trend



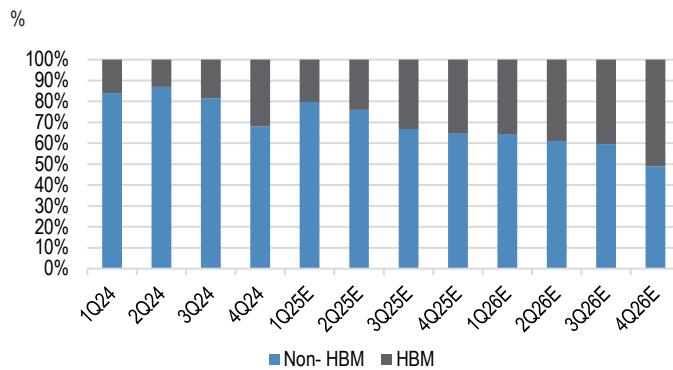
Source: Company data, OMDIA, J.P. Morgan estimates.

Figure 47: Quarterly DRAM OP trend



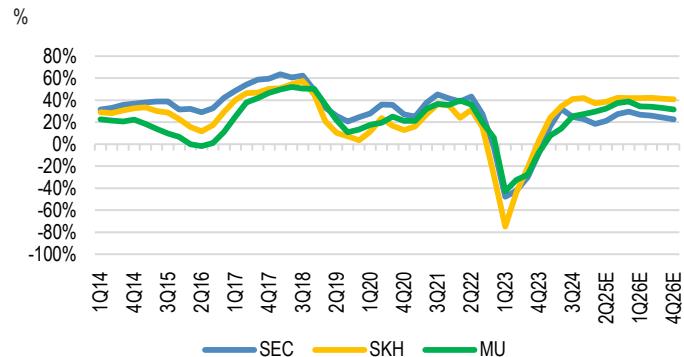
Source: Company data, OMDIA, J.P. Morgan estimates.

Figure 49: SEC DRAM OP mix



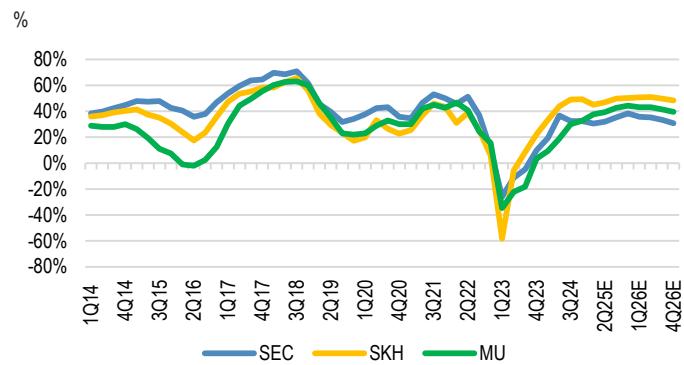
Source: Company data, J.P. Morgan estimates.

Figure 46: Quarterly memory OPM trend



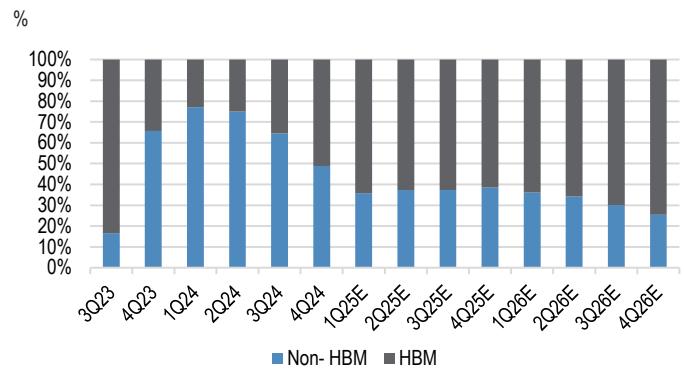
Source: Company data, OMDIA, J.P. Morgan estimates.

Figure 48: Quarterly DRAM OPM trend



Source: Company data, OMDIA, J.P. Morgan estimates.

Figure 50: SKH DRAM OP mix



Source: Company data, J.P. Morgan estimates.

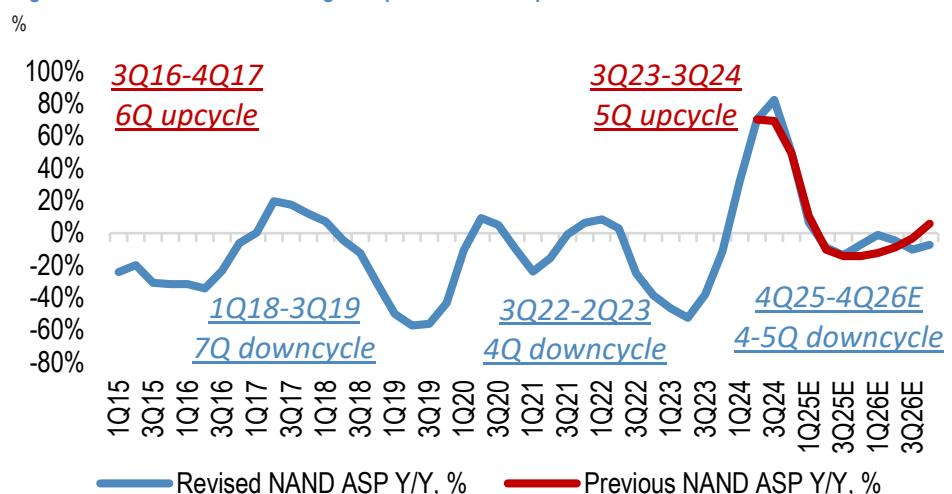
NAND pricing sentiment improving - our view on sustainability

Similar to legacy DRAM, we find NAND industry S/D improving from: 1) industry-wide supply discipline of maintaining 70%+ UTR; 2) Limited NAND supply from

depressed investment made in the past two years; and 3) robust enterprise SSD demand from GP server replacement but also on-premise AI server, where we see migration from HDD to SSD. Between supply discipline vs. better demand, we view supply discipline to be a bigger driver of NAND price hike than demand improvement. After eSSD sales growing 250% Y/Y in FY24, we expect the pace of growth to decelerate amid SSD penetration rate in AI server (or mission critical application, per Gartner®) reaching 84% in 2024.

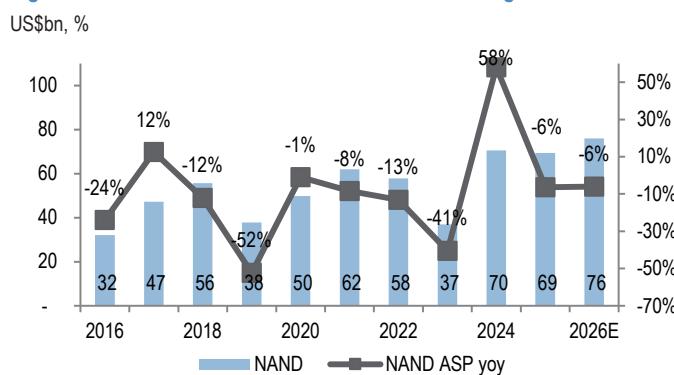
In the past, NAND market development was fueled by price-elastic driven content growth more so than ASP inflation. In fact, NAND ASP has been on a structural deflation from technology migration (and higher bit/wafer) which has been the key driver for NAND market growth. While we pencil-in NAND ASP improving from a potential supply shortage, we expect the trend to be short-lived and pencil-in ASP decline from yearend.

Figure 51: NAND ASP Y/Y% change vs. previous assumptions



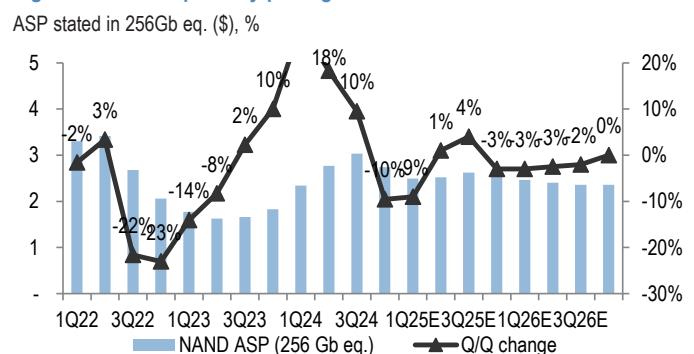
Source: WSTS, J.P. Morgan estimates.

Figure 52: NAND market revenue and ASP YoY change



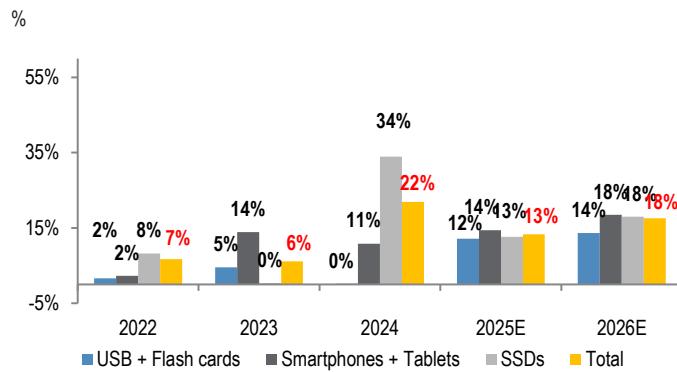
Source: WSTS, J.P. Morgan estimates.

Figure 53: NAND quarterly pricing trend and Q/Q trend



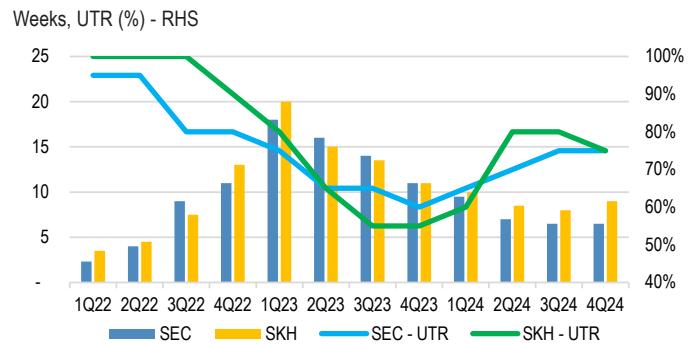
Source: WSTS, J.P. Morgan estimates.

Figure 54: NAND demand growth Y/Y by key application



Source: OMDIA, WSTS, J.P. Morgan estimates.

Figure 55: SEC/SKH NAND inventory and UTR trend



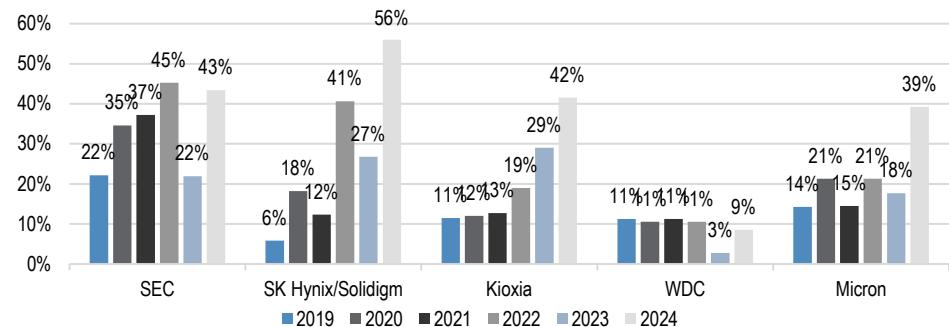
Source: J.P. Morgan estimates, Company data.

Finding the beneficiary of eSSD growth

Based on IDC, eSSD sales surged ~250% Y/Y in FY24, surpassing the growth rate in the 2017/18 server upcycle (~55% growth) and pandemic-driven upcycle in 2020 (~80% growth). Major NAND makers have likewise posted eSSD sales growing by 2.5x-3x in FY24, gradually leading the eSSD sales mix to account for 40%+ of total NAND sales.

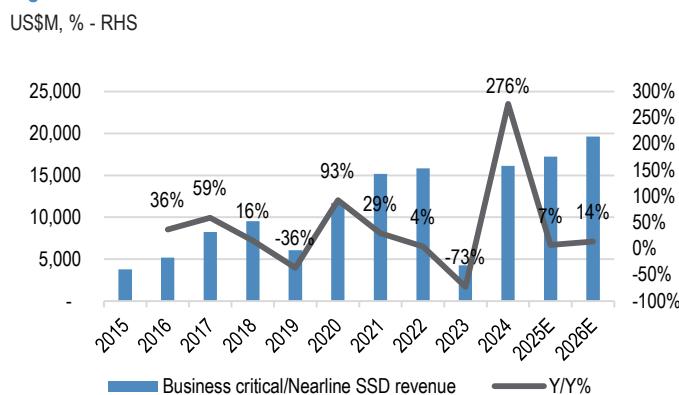
According to Gartner®, the drivers for steep eSSD sales growth have been replacement demand from general purpose server (business critical SSD) as well as US hyperscalers' intent to migrate HDD to SSD for on-premise AI server build-out (mission critical storage SSD). SSD has historically been treated as a less reliable storage source, but we believe the merits of power consumption and growing SSD content have attracted hyperscalers to prefer SSD over HDD (see our detailed [note](#)). Considering better-than-expected GP server build-out in 1H25, we expect eSSD sales to continue to grow and support the NAND ASP trend in the 1H25. Nevertheless, given the high base in 2024, we expect the eSSD growth rate to decelerate and remain conservative on the sustainability of ASP hikes.

Figure 56: eSSD sales exposure by NAND maker



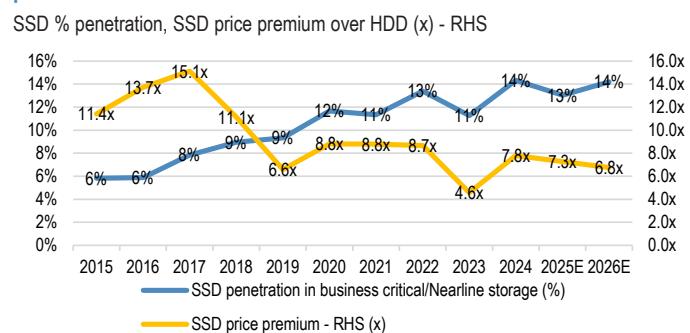
Source: Company data, IDC, Gartner®. Note: eSSD sales as a % of total NAND sales.

Figure 57: Business-critical/nearline sales and Y/Y%



Source: Gartner®.

Figure 58: SSD penetration in business-critical storage and SSD price premium over HDD



Source: Gartner®.

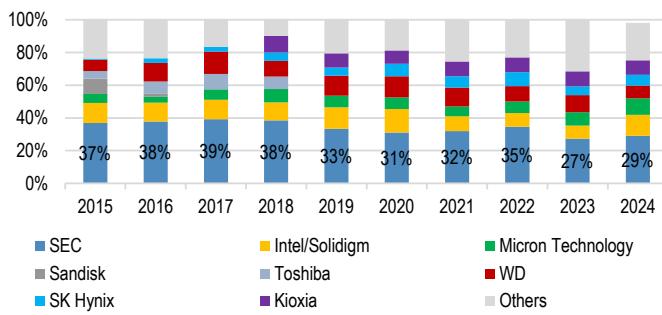
Figure 59: Mission-critical SSD sales and Y/Y%

US\$M, % - RHS



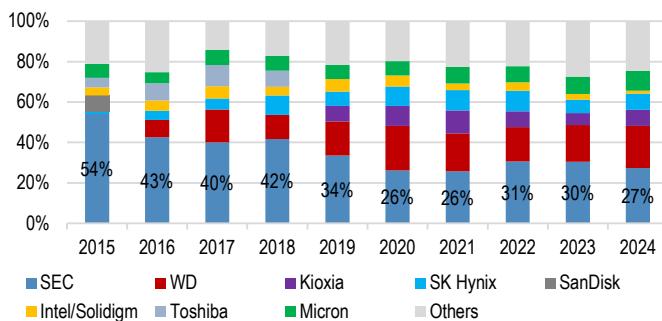
Source: Gartner®.

Figure 61: SSD market share by player



Source: Gartner®, OMDIA.

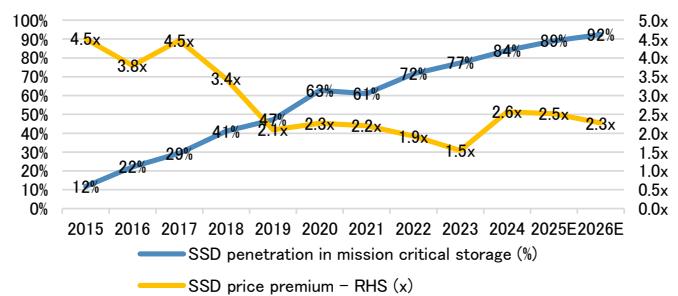
Figure 63: Client SSD market share by player



Source: Gartner®, OMDIA.

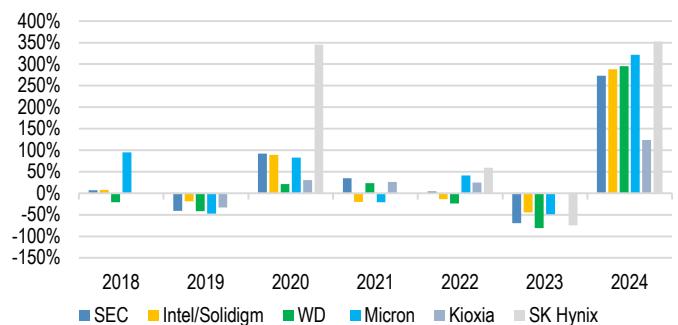
Figure 60: SSD penetration in mission-critical storage and SSD price premium trend

SSD % penetration, SSD price premium over HDD (x) - RHS



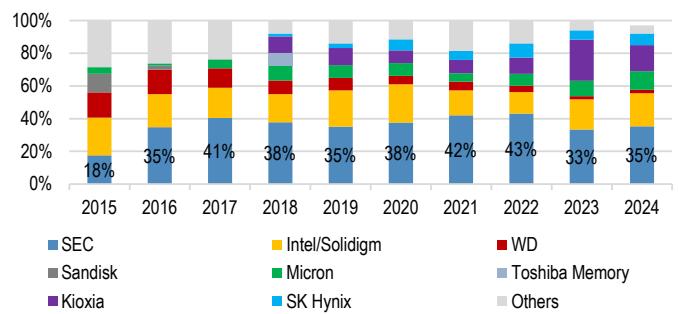
Source: Gartner®.

Figure 62: eSSD sales Y/Y% growth by players



Source: Gartner®, IDC.

Figure 64: Enterprise SSD market share by player



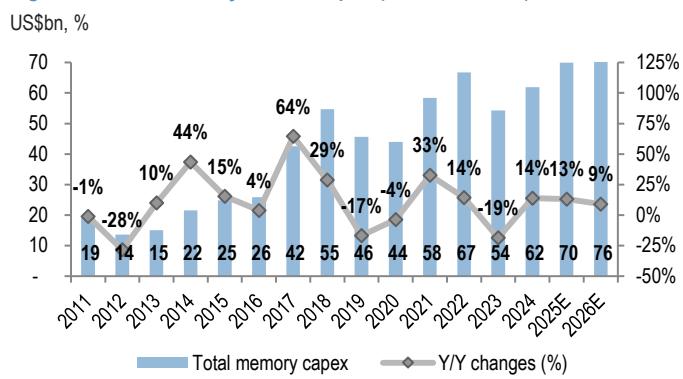
Source: Gartner®, OMDIA.

Capex outlook

Since the turn of the year, we have received multiple questions from investors aiming to gauge WFE/infrastructure capex for memory makers in FY25E. While we do not have the exact breakdown, we expect both Samsung/Hynix to raise DRAM capex by ~5-10% (based on Won) to accommodate growing infrastructure spending (P4 for Samsung and M15X for Hynix) and our checks indicate WFE capex likewise growing by DD% to address both HBM (frontend and backend) as well as equipment for technology migration (1bnm ramp up and 1nm migration). However, we expect EUV equipment procurement to be subdued especially for Samsung as the company is undergoing restructuring on its foundry business with a potential chance of relocating foundry EUV tools to DRAM fabs. Overall, we expect DRAM capex to grow by 18% Y/Y in FY25E (majority of the growth driven by Micron from infrastructure spending as well as HBM backend capacity expansion in TW/Singapore). As memory makers prioritize HBM capacity expansion, we do not expect DRAM capex growth to fuel oversupply concern especially when the majority of new capacity coming online from 2026 onwards is dedicated to HBM production vs. conventional DRAM.

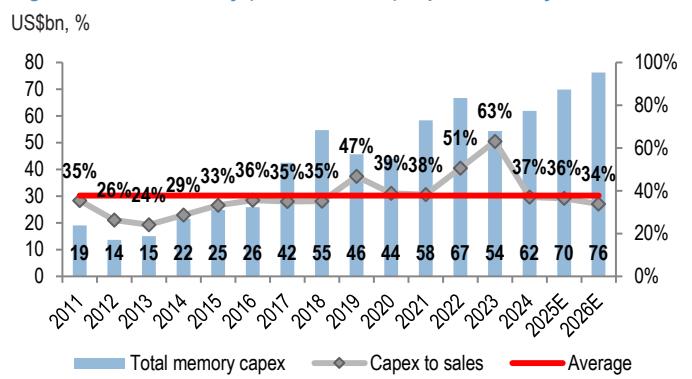
On NAND capex, coming off a low base after 2 years of decline, we expect NAND capex to grow LSD% in FY25E. Despite our upward revision in NAND pricing, we expect memory makers to use existing capacity to address growing demand amid sub-100% UTR. We do not expect memory makers to ramp up NAND capacity despite growing demand and expect to prioritize DRAM investment vs. NAND capacity expansion. Across NAND makers, we expect WFE spending growth will only likely come from SEC under active technology migration for V9 transition.

Figure 65: Total memory market capex (DRAM + NAND)



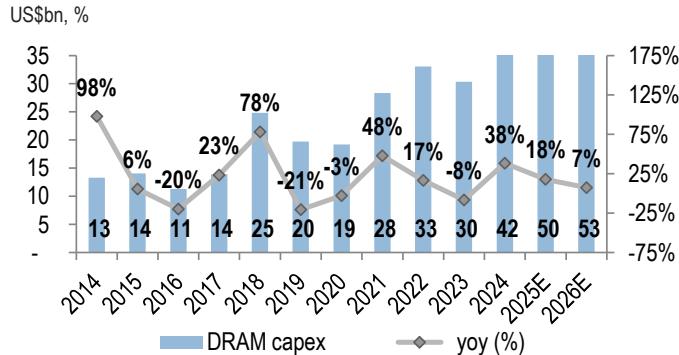
Source: Company data, J.P. Morgan estimates.

Figure 66: Total memory (DRAM + NAND) capital intensity



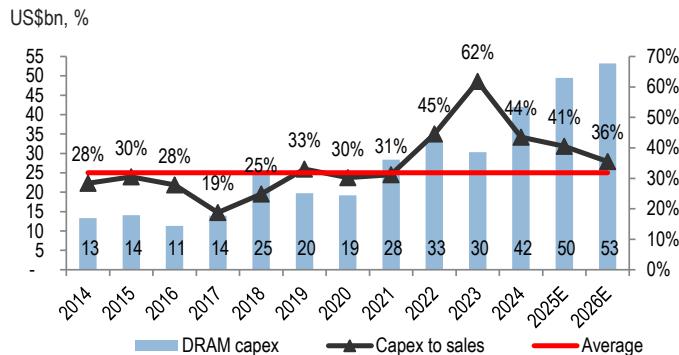
Source: Company data, J.P. Morgan estimates.

Figure 67: DRAM capex and Y/Y trend



Source: Company data, J.P. Morgan estimates.

Figure 69: DRAM capital intensity



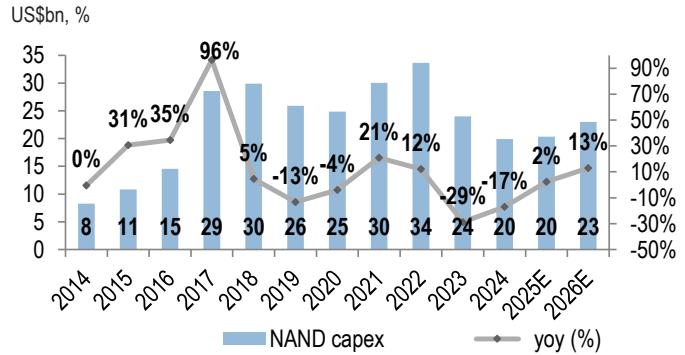
Source: Company data, J.P. Morgan estimates. Note: Average from 2011-24.

Table 6: Major capacity expansion plan announcements

	Location	Investment size (Wtrn)	Business	Remarks
SK Hynix	Korea (Cheongju, M15X)	20.3	Memory	Accumulated investment size: W20.3trn (US\$15.6bn) targeting production in 4Q25-1Q26E
	Korea (Yongin)	9.4	Memory	Investment size of W9.4trn for 1st fab construction targeting production in 2H27E
	US (Indiana)	5.0	HBM backend	Investment size of ~W5trn (US\$3.9b) targeting production in 2H28E
	Total	34.7		
Samsung	Korea (Pyeongtek 4)	n.a.	Memory	Likely MP in 4Q25E focusing on leading edge DRAM nodes (1bnm and 1cnm)
	Korea (Pyeongtek 5)	n.a.	Memory	Likely MP in the latter half of the decade (post 28E) focusing on leading edge nodes
Micron	Taiwan	n.a.	HBM backend	AUO announced to sell two legacy fabs to MU at NT\$8.1bn (~US\$243M) on Aug-2024
	Boise, Idaho	US\$30bn until 2030	Memory	Under construction since Oct-23; Will not contribute to bit supply in FY25/26 implying meaningful production in FY27E
	Clay, New York		Memory	Under review from state officials; Expect construction to begin in CY25E and anticipate to ramp in latter half of the decade
	Singapore	US\$7bn	HBM backend	Operation to begin in 2026 with meaningful expansion in CY27

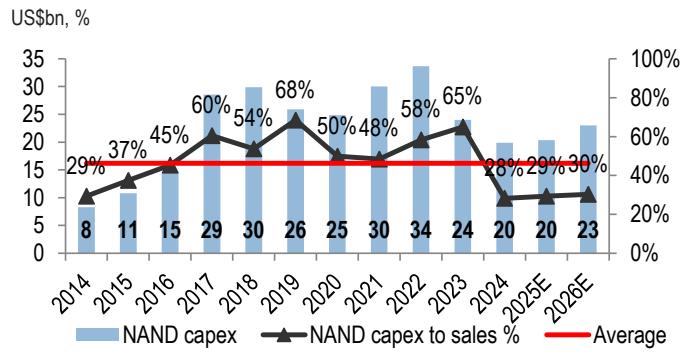
Source: Company data.

Figure 68: NAND capex and Y/Y trend



Source: Company data, J.P. Morgan estimates.

Figure 70: NAND capital intensity

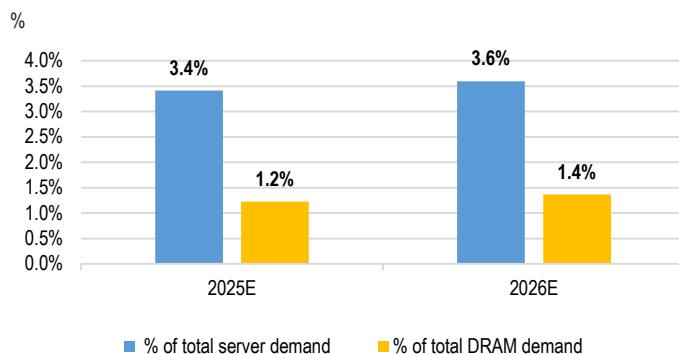


Source: Company data, J.P. Morgan estimates. Note: Average from 2011-24.

Our thoughts on LPCAMM

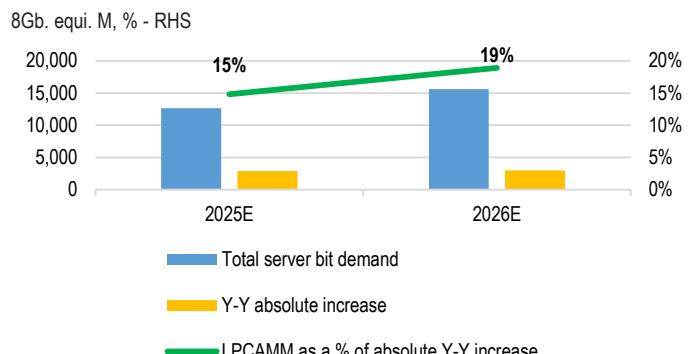
LPCAMM is a new standard for removable and modular LPDDR memory, which allows easier upgrades/repairs compared to soldered memory like LPPDDR, enhancing data center scalability. This modular memory is designed to replace traditional SO-DIMMs, using compression mounting for better signal integrity, higher speeds and space efficiency. Given GB200/GB300 NVL72 racks are expected to ramp sequentially from 1Q25/3Q25E, we expect 25k/32.5k racks to be shipped in FY25E/26E which translates to 900k/1.2mn CPUs respectively. Assuming 480GB content for each LPCAMM module, we estimate LPCAMM bit demand to contribute ~4% of total server bit demand in FY25/26E. While its contribution to total DRAM bit demand remains negligible, we believe it opens up new opportunities for memory makers to further solidify their position in the NVDA food chain.

Figure 71: LPCAMM bit demand as a % of total server and DRAM bit demand



Source: J.P. Morgan estimates.

Figure 72: LPCAMM bit demand as a % of the absolute Y-Y increment in server bit demand



Source: J.P. Morgan estimates.

Trump 2.0 tariff update

Since Donald Trump's re-election in November 2024, the United States has focused on protecting American industries, particularly semiconductors, through various tariff discussions, with increased tariffs primarily affecting China, Mexico, and Canada, while also engaging in tech-related tariff talks with South Korea, China, and Taiwan. While a 50% tariff on Chinese semiconductors was implemented on January 1, 2025 citing concerns about China's technology transfer-related acts, policies, and practices, tariffs on South Korea have been hard to come by due to ally status while tariffs on Taiwan are highly unlikely given Taiwan's critical role in global semiconductor supply chains.

During Trump 1.0, the U.S.-South Korea trade relationship centered on renegotiating the KORUS Free Trade Agreement and imposing steel tariffs, with South Korea securing some concessions, while semiconductor tariffs were not a major issue. However, in Trump 2.0, South Korea has highlighted its economic contributions through investments and sought exclusion from new tariff plans, with discussions focusing on general trade rather than specific semiconductor tariffs.

As for Taiwan, during Trump 1.0, the semiconductor industry was central to U.S.-Taiwan trade relations, benefiting Taiwan's TSMC amid the U.S.-China trade war and

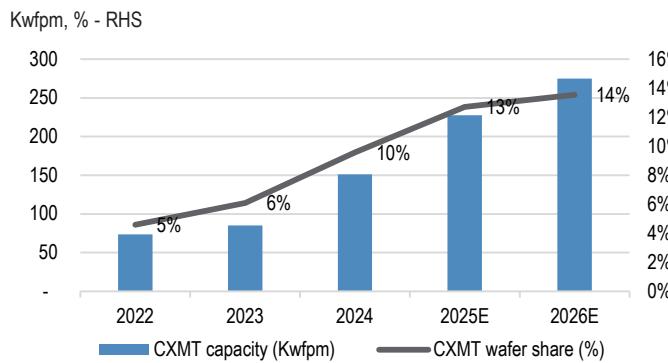
export restrictions on Chinese firms like Huawei, while the Biden administration further strengthened ties through the CHIPS Act and the U.S.-Taiwan Initiative on 21st Century Trade; likewise in Trump 2.0, the U.S. continues informal trade relations with Taiwan, focusing on strategic partnerships in technology sectors without specific chips tariff discussions, supported by major investments in the U.S. by TSMC.

Lastly, during Trump 1.0, the U.S.-China trade war from 2018-2020 involved heavy U.S. tariffs on Chinese goods, targeting sectors like intellectual property theft and semiconductor manufacturing, with the Phase 1 deal in 2020 easing tensions but not resolving core issues; in Trump 2.0, Trump has imposed 20 percent tariffs on approximately \$440 billion of Chinese imports, raising the average U.S. tariff on affected goods to 39 percent, while China has responded with tariffs on U.S. products and restrictions on U.S. companies. Overall, we believe the tariff impact on South Korea and Taiwan technology to be limited while China's semiconductor industry will continue to face scrutiny in the near future.

China memory update

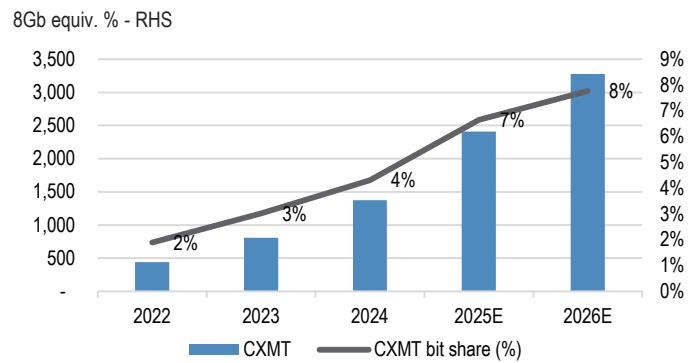
Based on our supply chain checks and discussions with the J.P. Morgan China semiconductor team and OMDIA, we update CXMT capacity and bit shipment to reflect which is slightly higher than our initial forecast. However, we view CXMT's impact to DDR5/LPDDR5 market is lower due to ongoing yield challenges and delayed qualification amidst stricter equipment sourcing curb. Our HBM market and DDR5 pricing view is based on relatively conservative CXMT's DDR5 ramp scenario.

Figure 73: Implied CXMT wafer capacity share of global DRAM capacity



Source: OMDIA, J.P. Morgan estimates (based on cross checks with the JPM China semiconductor team).

Figure 74: Implied CXMT bit share of global DRAM supply



Source: OMDIA, J.P. Morgan estimates (based on cross checks with the JPM China semiconductor team).

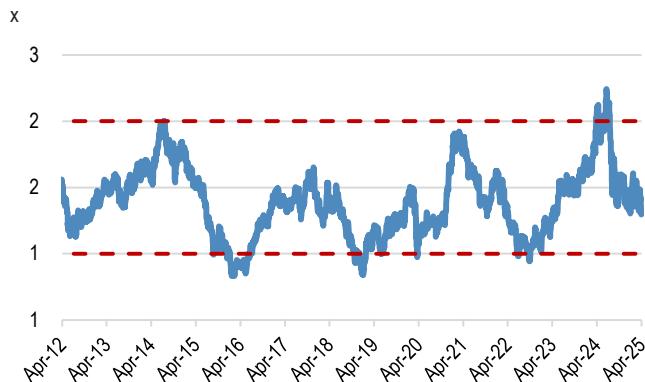
Share price outlook

In the past 2M, there was a meaningful share price divergence between the conventional centric memory camp (SEC/NYT/Kioxia: +12%/37%/+28%) and the AI centric memory camp (SKH/MU: -1%/-5%) as investors priced in a shorter memory down-cycle amidst ongoing negative speculation of AI demand slowdown sentiment.

Fundamentally, we turn positive on the conventional memory cycle (DRAM up-cycle to be longer than NAND), but we also like the secular AI tailwind from industry S/D dynamics. During a price bottom-out and earnings y-y growth cycle, we advise investors to own all major memory names, and we upgrade **SEC/NYT** to OW/Neutral (from previously N/UW) and maintain our positive view on **SK Hynix**. Improving industry dynamics favor stocks with high legacy memory exposure, in our view, and we see a positive shares return opportunity.

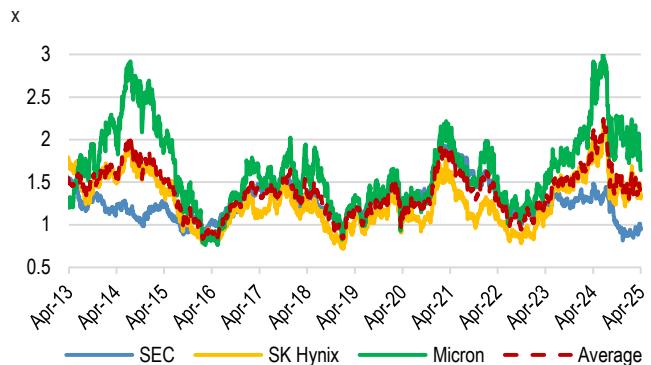
On the other hand, from a structural growth angle, we continue to view AI memory (i.e. HBM) growth visibility to be the highest and technology leadership remains the key to our pecking order (**SK hynix** over **SEC** while both **OW**). We highlight that the DRAM margin gap between SEC/SKH is unlikely to narrow in the near future from SKH's AI leadership and expect SKH to outperform. Our **Neutral** view on **NYT** is due to prevailing DDR4 market exposure (still majority of production output in next 12 months) and structural competition between CHN memory suppliers.

Figure 75: Average P/B multiple for top 3 DRAM makers



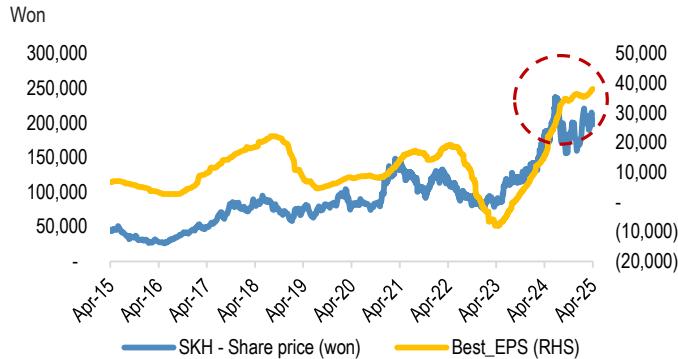
Source: Bloomberg Finance L.P.

Figure 76: 12M forward P/B multiple trend for DRAM makers



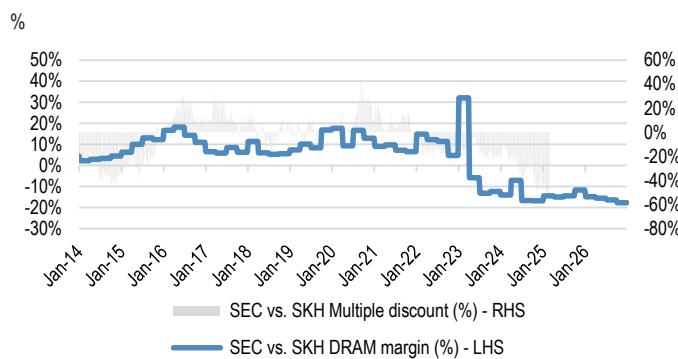
Source: Bloomberg Finance L.P.

Figure 77: SKH share price vs. FTM EPS revision cycle



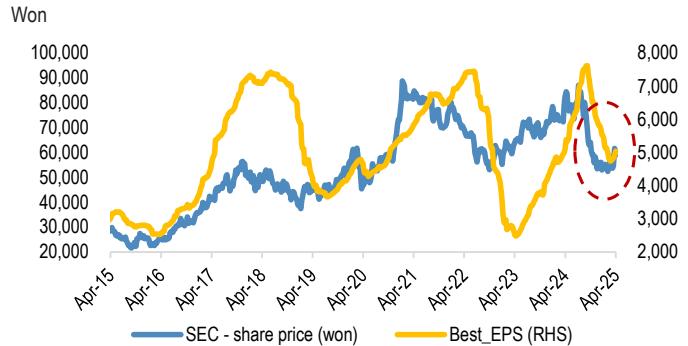
Source: Bloomberg Finance L.P.

Figure 79: SEC vs. SKH: DRAM margin difference vs FTM P/B multiple discount rate



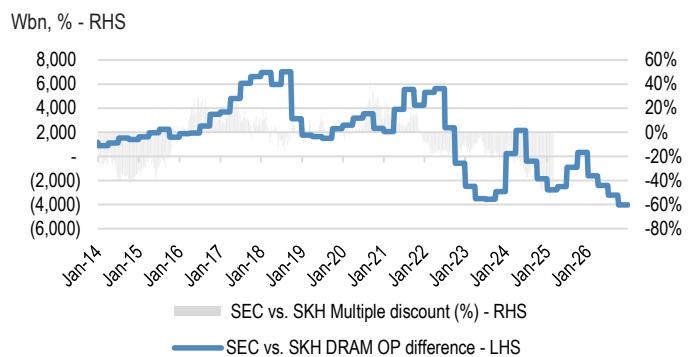
Source: Company data, Bloomberg Finance L.P., J.P. Morgan estimates.

Figure 78: SEC share price vs. FTM EPS revision cycle



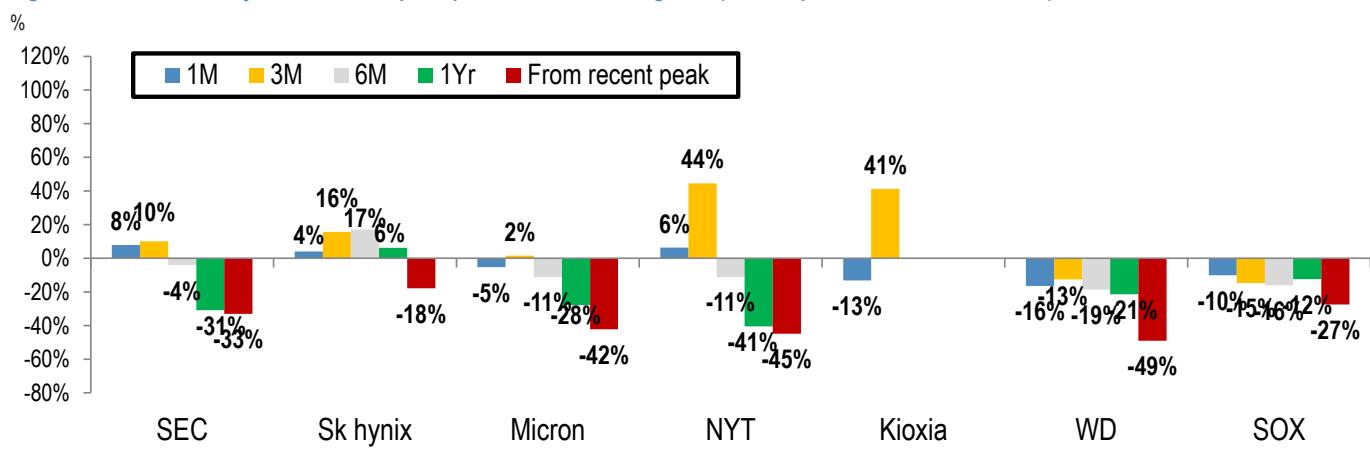
Source: Bloomberg Finance L.P.

Figure 80: SEC vs SKH: absolute DRAM OP difference vs FTM P/B multiple discount rate



Source: Company data, Bloomberg Finance L.P., J.P. Morgan estimates.

Figure 81: Global memory makers' share price performance including SOX (Philadelphia Semiconductor index)



Source: Bloomberg Finance L.P.

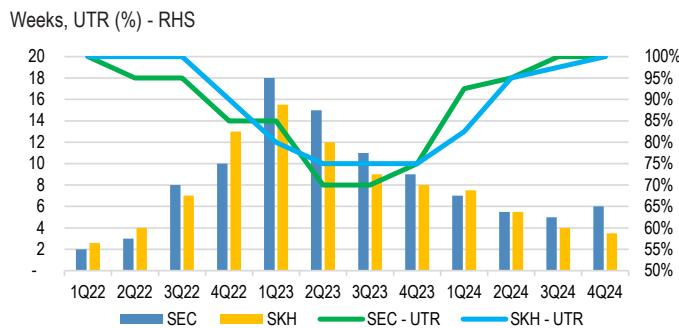
Key charts

Figure 82: DRAM market revenue and ASP YoY change



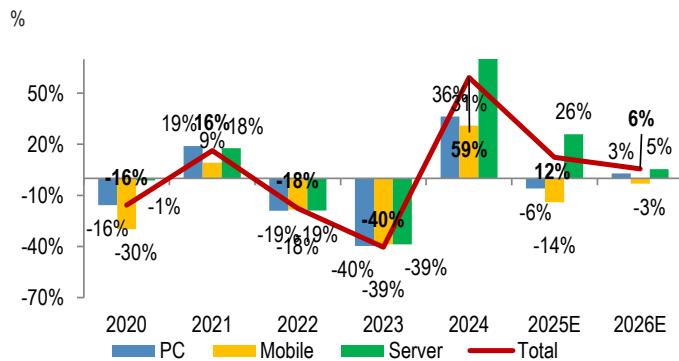
Source: WSTS, J.P. Morgan estimates.

Figure 84: SEC/SKH DRAM inventory and UTR trend



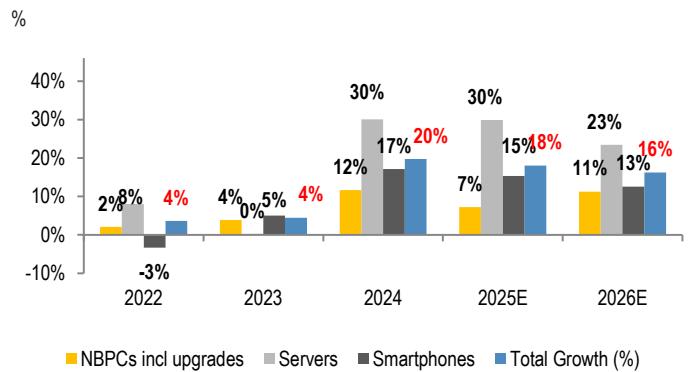
Source: Company data, J.P. Morgan estimates.

Figure 86: DRAM ASP changes by key application



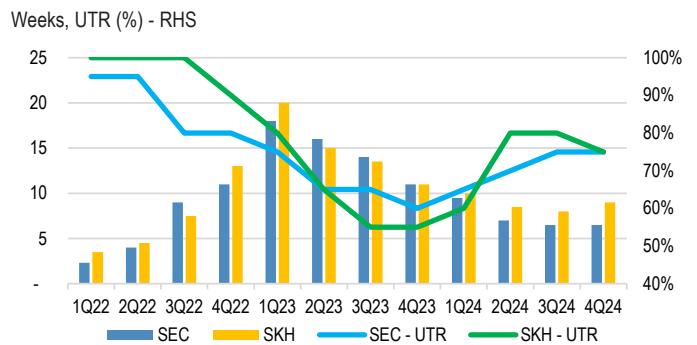
Source: OMDIA, WSTS, J.P. Morgan estimates.

Figure 83: DRAM bit demand growth Y/Y by key application



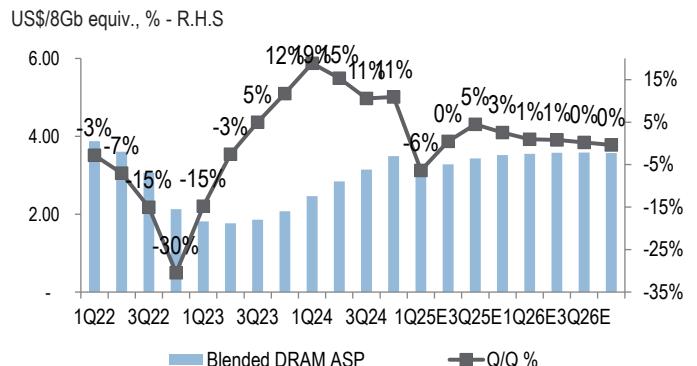
Source: Gartner®, IDC, OMDIA, J.P. Morgan estimates. Note: Server includes HBM.

Figure 85: SEC/SKH NAND inventory and UTR trend



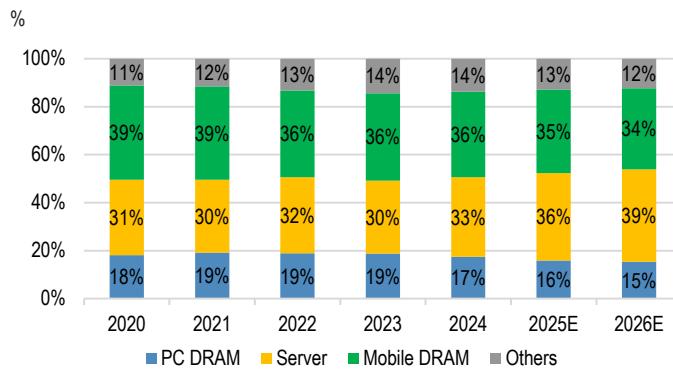
Source: Company data, J.P. Morgan estimates.

Figure 87: DRAM quarterly pricing trend and Q/Q trend



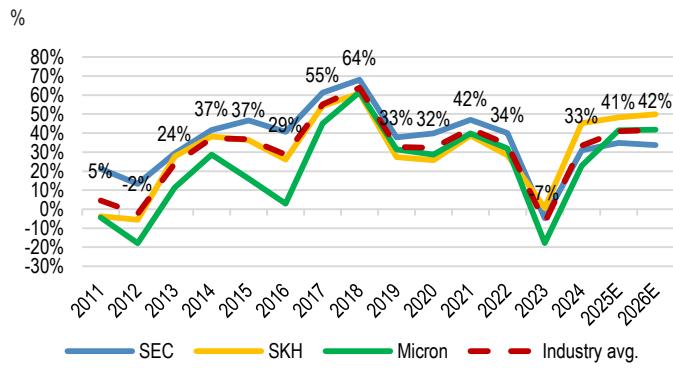
Source: OMDIA, WSTS, J.P. Morgan estimates.

Figure 88: DRAM bit demand mix



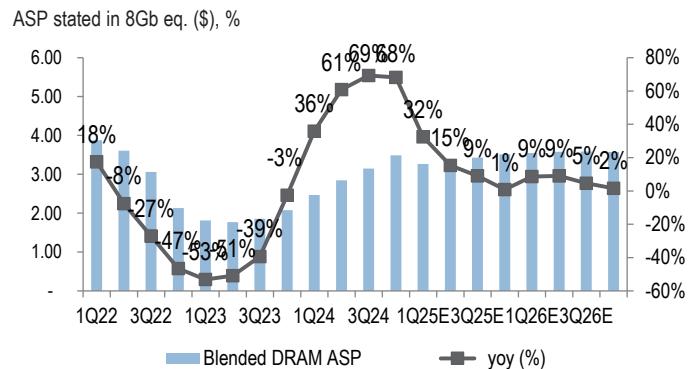
Source: Gartner®, J.P. Morgan estimates.

Figure 90: DRAM OPM trend



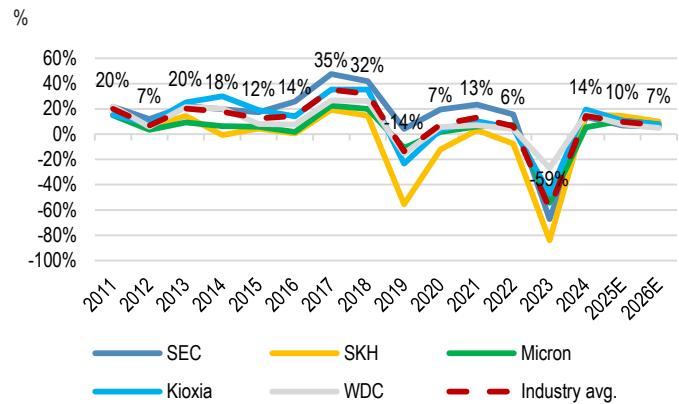
Source: OMDIA, Company data, J.P. Morgan estimates.

Figure 89: Blended quarterly DRAM ASP and Y/Y trend



Source: WSTS, J.P. Morgan estimates

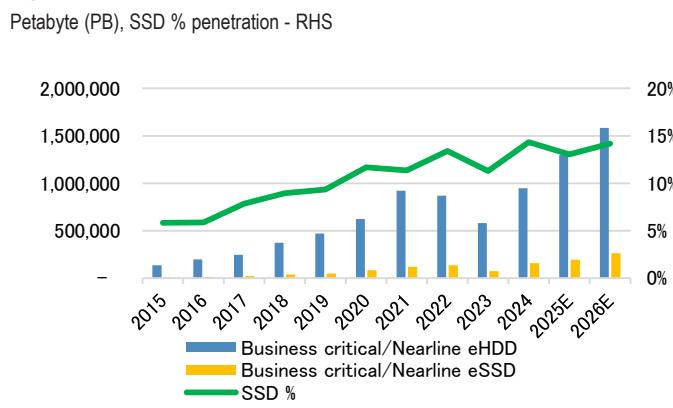
Figure 91: NAND OPM trend



Source: OMDIA, Company data, J.P. Morgan estimates.

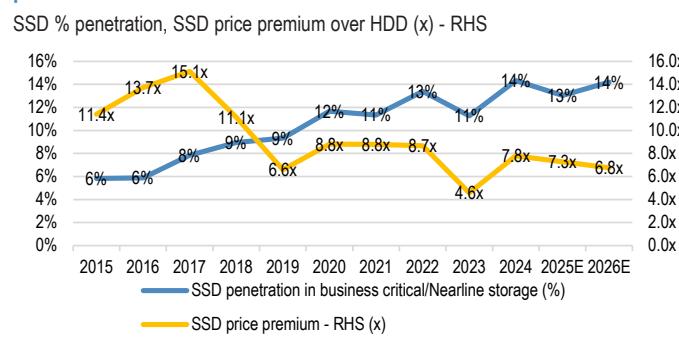
Key NAND related charts

Figure 92: Business-critical/nearline HDD and SSD shipment trends



Source: Gartner®.

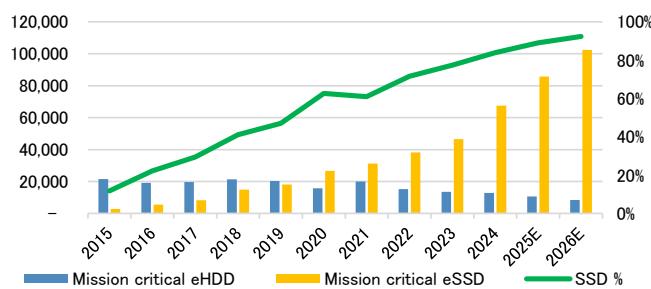
Figure 93: SSD penetration in business-critical storage and SSD price premium over HDD



Source: Gartner®.

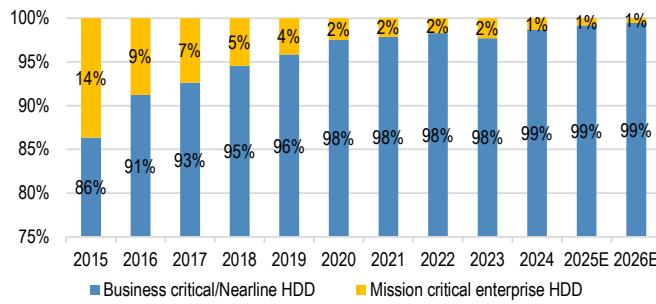
Figure 94: Mission-critical HDD and SSD shipment trends

Petabyte (PB), SSD % penetration - RHS



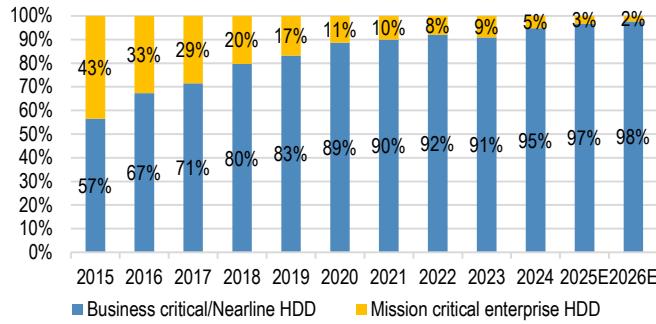
Source: Gartner®.

Figure 96: Enterprise-grade HDD shipment mix



Source: Gartner®. Note: Shipments in PB.

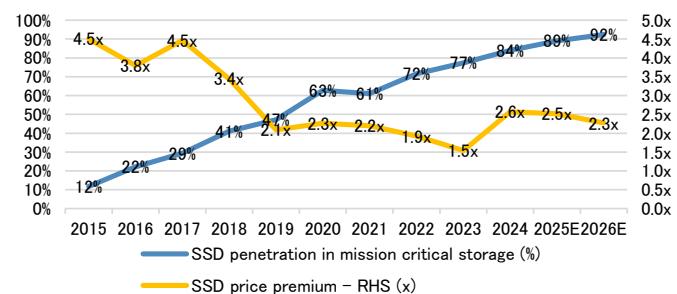
Figure 98: Enterprise-grade HDD revenue mix



Source: Gartner®.

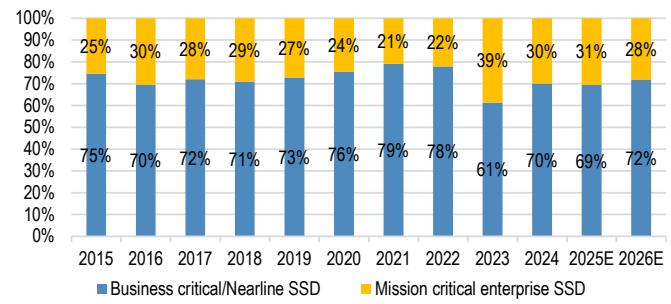
Figure 95: SSD penetration in mission-critical storage and SSD price premium trend

SSD % penetration, SSD price premium over HDD (x) - RHS



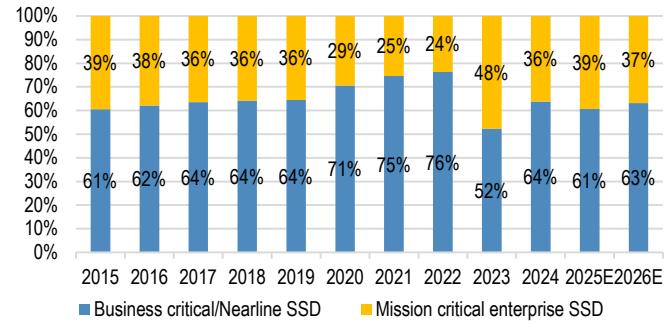
Source: Gartner®.

Figure 97: Enterprise-grade SSD shipment mix



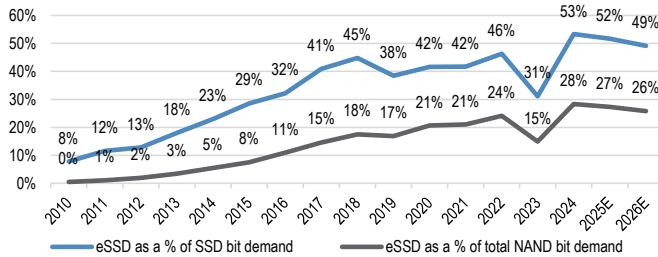
Source: Gartner®. Note: Shipments in PB.

Figure 99: Enterprise-grade SSD revenue mix



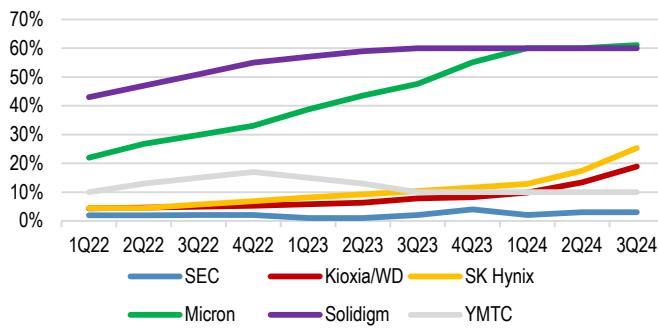
Source: Gartner®.

Figure 100: eSSD bit contribution in SSD and total NAND



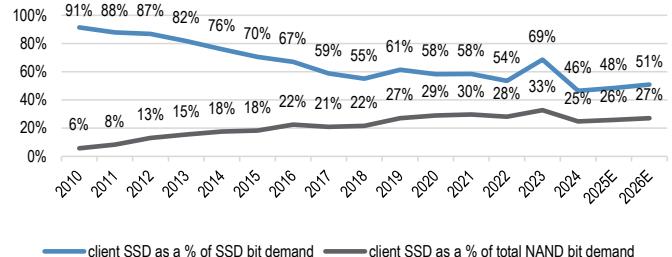
Source: IDC, J.P. Morgan estimates.

Figure 102: QLC bit mix by major NAND Flash maker



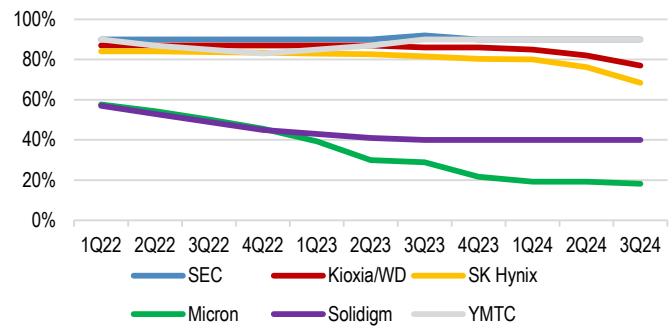
Source: OMDIA.

Figure 101: Client SSD bit contribution in SSD and total NAND



Source: IDC, J.P. Morgan estimates.

Figure 103: TLC bit mix by major NAND Flash maker



Source: OMDIA.

▲ Overweight

Previous: Neutral

005930.KS, 005930 KS
 Price (02 Apr 25): W58,900

▲ **Price Target (Dec-25): W74,000**
 Prior (Sep-25): W60,000

Technology - Semiconductors

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J.P. Morgan Securities (Far East) Limited, Seoul Branch

Key Changes (FYE Dec)

	Prev	Cur
Adj. EPS - 25E (W)	4,583	5,239
Adj. EPS - 26E (W)	5,828	6,567

Quarterly Forecasts (FYE Dec)

Adj. EPS (W)	2024A	2025E	2026E
Q1	1,059	832	1,630
Q2	1,565	978	1,587
Q3	1,589	1,686	1,860
Q4	1,219	1,743	1,490
FY	5,433	5,239	6,567

Style Exposure

Quant Factors	Current %Rank	Hist %Rank (1=Top)			
		6M	1Y	3Y	5Y
Value	59	51	60	59	56
Growth	70	25	75	47	39
Momentum	83	33	44	30	12
Quality	53	46	72	20	28
Low Vol	10	9	5	3	12
ESGQ	88	16	5	14	9

Samsung Electronics

Legacy fundamentals bottoming out; Raise PT to W74K and upgrade to OW

Industry dynamics are shifting in a positive direction, as witnessed in the earlier legacy memory price bottom-out. Despite ongoing technology moat and HBM execution concerns, we believe an earnings upgrade cycle is coming for Samsung Electronics that is likely to be a positive setup for multiple quarters of share price appreciation opportunity. Following the improvement in legacy DRAM/NAND fundamentals, we revise up our FY25E-26E EPS and view the stock's risk-reward as attractive, and upgrade to Overweight. In order for SEC shares to fundamentally be more appealing, we believe increasing evidence of its technology leadership needs to be clear to restore investor confidence. Our OW view on the shares recovery is based on short- to mid-term horizon.

- **Shorter legacy downcycle and earlier memory price improvement.** After B/G slump and ASP erosion in 1Q25, we expect conventional B/G and ASP momentum to recover from 2Q25. Memory inventory across the supply chain remains lean amid accelerating DDR5 transition to cope with edge-AI launch in 2H25. Shorter legacy downcycle indicates a possibility of a shorter upcycle, but we like to focus on the improving longevity of memory cycle from prudent supply discipline from an FCF generation standpoint.
- **HBM business progress update.** Overall HBM3E 12-hi qualification progress is on track; step-by-step customer qualification and production ramp starting 2Q25. It is a relief to see improvement in NVDA-grade HBM3E 12-hi qualification ([link](#)), but technology cadence concerns on HBM4/1nm remain unchanged, in our view. After ~50% Q/Q sales slump in 1Q25, we expect a 2Q25 recovery to be rather slow and meaningful revenue make-up will begin from 3Q25, showing a 2H-loaded recovery shape (FY25E HBM sales: +90% driven by +60% B/G and +20% ASP).
- **Foundry restructuring direction update.** Amid media speculation ([link](#)) of Samsung's potential foundry business exit and strategic action (e.g. reallocating SoC design team to MX division), we expect the restructuring direction to be rather gradual, not substantial. It is indeed true that the Samsung team is taking leading-edge development cadence slower than in the past (i.e. not rushing to develop 2nm/1.4nm but rather focusing on stabilizing 3nm on its own schedule). These initiatives will be positive to bottom-line earnings recovery once engineering wafer related spend is mostly completed in 1H25.
- **Higher memory price likely be cost headwind to MX division.** Compared to the SEC team's initial target of y-y volume increase, we see slightly weaker GS25 model component build signs (flat to marginal increase y-y) across the supply chain after two months of sales. Despite stronger AI feature offerings, overall changes appear not robust enough to stimulate replacement cycle appetite after a high base last year. Reflecting marketing expense hikes and increasing memory BOM cost pressure, we trim our MX margin assumptions to 8.8%/9.3% for FY25E-26E.
- **Key risks and catalysts.** Key risks to our OW thesis are an unexpectedly short legacy memory up-cycle due to unexpected demand disappointment from the consumer electronics side (vs. AI and server spending likely more resilient). While further HBM order disappointment (e.g. failure to win NVDA order in 3Q25E) could pressurize sentiment, we think investors mostly view HBM progress as an option value in the share price. Key drivers continue to be evidence of technology moat recovery, and we would watch for a value-up plan announcement from a long-term capital allocation standpoint.

Price Performance



Company Data

Shares O/S (mn)	6,533
52-week range (W)	88,800-49,900
Market cap (\$ mn)	261,528
Exchange rate	1,471.41
Free float (%)	82.1%
3M ADV (mn)	20.29
3M ADV (\$ mn)	772.1
Volatility (90 Day)	29
Index	KOSPI
BBG ANR (Buy Hold Sell)	35 5 0

Key Metrics (FYE Dec)

	FY24A	FY25E	FY26E
Financial Estimates			
Revenue	300,871	332,114	352,138
Adj. EBIT	32,726	36,015	45,468
Adj. EBITDA	75,357	83,613	95,061
Adj. net income	32,433	31,013	38,876
Adj. EPS	5,433	5,239	6,567
BBG EPS	4,920	4,662	6,215
Cashflow from operations	77,450	61,504	91,548
FCFF	12,536	2,877	32,298
Margins and Growth			
Revenue Growth Y/Y (%)	16.2%	10.4%	6.0%
EBIT margin	10.9%	10.8%	12.9%
EBIT Growth Y/Y (%)	398.3%	10.1%	26.2%
EBITDA margin	25.0%	25.2%	27.0%
EBITDA Growth Y/Y (%)	66.6%	11.0%	13.7%
Net margin	10.8%	9.3%	11.0%
Adj. EPS growth	144.1%	(3.6%)	25.4%
Ratios			
Adj. tax rate	8.2%	19.5%	19.5%
Interest cover	NM	NM	NM
Net debt/Equity	NM	NM	NM
Net debt/EBITDA	NM	NM	NM
ROE	8.5%	7.5%	8.8%
Valuation			
FCFF yield	3.6%	0.8%	9.3%
Dividend yield	2.5%	2.5%	2.5%
EV/Revenue	1.1	1.0	1.0
EV/EBITDA	4.4	3.8	3.5
Adj. P/E	10.8	11.2	9.0

Summary Investment Thesis and Valuation

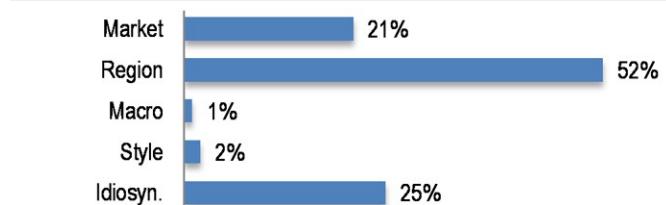
Investment Thesis

We are OW on SEC on profit growth cycle reaccelerating from improving legacy fundamentals. Although our view on SEC's HBM business execution remains conservative given the lack of evidence of it regaining its technology moat (1cnm), we believe its improving HBM qualification progress tactically bodes well for near to mid-term share price trajectory amid positive industry set up. In order for SEC shares to fundamentally be more appealing, we believe increasing evidence of its technology leadership is required to restore investor confidence.

Valuation

Our Dec-25 PT of W74K is based on 1x FY25E P/B using the mid-down-cycle valuation. Despite positive industry set up, we apply a mid-down cycle valuation to reflect the cyclical nature of the legacy cycle (shorter legacy upcycle and less magnitude of price swing) amid SEC's relatively slow HBM business progress.

Performance Drivers



Factors	6M Corr	1Y Corr
Market: MSCI Asia Pac ex JP	0.41	0.45
Region: Korea	0.78	0.81
Macro:		
HSI Volatility Index	-0.29	-0.29
JPM Global Equity Sentiment	-0.35	-0.25
Emerging Central Bank Rate	-0.15	-0.18
Quant Styles:		
Size	0.06	0.24
Momentum	0.03	0.19
LowVol	0.20	0.18

Estimate revisions

Table 7: Samsung Electronics: Estimate revisions

Wtrn, year end December

	Revised		Previous		Difference (%)	
	FY25E	FY26E	FY25E	FY26E	FY25E	FY26E
DRAM shipment (MM, 8Gb eq)	15,139	17,355	15,205	17,386	-0.4%	-0.2%
ASP (US\$, 8Gb equiv)	3.1	3.3	2.7	2.8	13.4%	17.9%
NAND flash shipment (MM, 256Gb E)	10,021	11,466	9,926	11,421	1.0%	0.4%
ASP (US\$, 256Gb equiv)	2.4	2.3	2.4	2.3	3.5%	0.4%
Smartphone shipments	226	228	226	228	0.0%	0.0%
Sales	332.1	352.1	324.6	341.3	2.3%	3.2%
Semiconductor	131.8	150.6	122.9	138.2	7.2%	9.0%
Display Panel	31.5	32.5	31.4	32.5	0.3%	0.1%
DX (MX + VD + Appliance)	180.5	179.5	181.2	180.6	-0.4%	-0.6%
Harman	14.8	15.6	14.8	15.6	0.0%	0.0%
Others	-26.5	-26.0	-25.8	-25.5	na	na
Operating profit	36.0	45.5	31.2	40.3	15.4%	12.8%
Semiconductor	18.0	26.6	12.3	20.0	46.8%	32.9%
Display Panel	4.3	4.5	4.2	4.5	1.6%	0.9%
DX (MX + VD + Appliance)	12.4	13.1	13.4	14.5	-7.5%	-10.0%
Harma/Others/Adjustment	1.3	1.3	1.3	1.3	0.0%	0.0%
Net income	33.2	41.0	29.5	36.9	12.4%	11.1%
Net income (after minority interest)	32.2	40.1	28.5	36.0	12.8%	11.4%
EPS (Common shares)	5,239	6,567	4,583	5,828	14.3%	12.7%

Source: J.P. Morgan estimates.

Table 8: Samsung Electronics – 1Q25 earnings preview

Wbn

	1Q24	4Q24	1Q25 JPMe	1Q25 Previous	Diff. (%)	Q/Q (%)	Y/Y (%)
Total Sales	71,915	75,787	76,355	76,263	0.1	0.7	6.2
DS (Semi)	23,140	30,100	24,773	24,634	0.6	-17.7	7.1
DP (Display)	5,361	8,103	6,017	5,969	0.8	-25.8	12.2
DX (Device Experience)	47,010	40,213	49,051	49,146	-0.2	22.0	4.3
Others	-3,596	-2,629	-3,486	-3,486	na	na	na
Operating profit	6,606	6,496	5,311	5,154	3.1	-18.2	-19.6
DS (Semi)	1,910	2,908	618	631	-2.1	-78.7	-67.6
OP Margin	8.3	9.7	2.5	2.6			
DP (Display)	340	920	381	320	19.2	-58.6	12.2
OP Margin	6.3	11.4	6.3	5.4			
DX (Device Experience)	4,040	2,331	4,012	3,902	2.8	72.1	-0.7
OP Margin	8.6	5.8	8.2	7.9			
Others	316	337	300	300	0.0	-11.0	-5.1
Net non-OP gains	1,101	1,415	1,363	1,407	-3.1	-3.6	23.9
Recurring profit	7,707	7,910	6,675	6,561	1.7	-15.6	-13.4
Tax	-952	-153	-1,302	-1,312	na	na	na
Net profit	6,621	7,579	5,223	5,099	2.4	-31.1	-21.1

Source: Company data, J.P. Morgan estimates.

Table 9: J.P. Morgan estimates vs. consensus

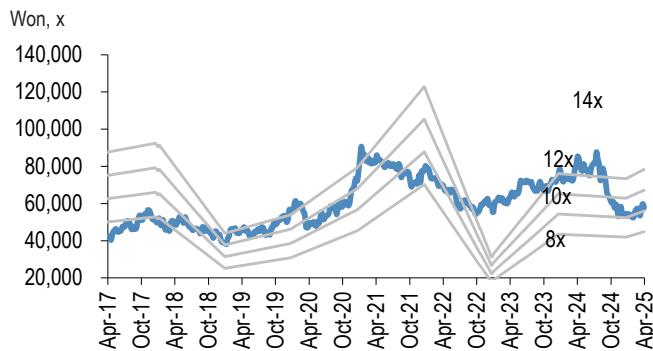
Wtrn, %

	JPM estimates				Market consensus				Difference			
	1Q25E	2Q25E	2025E	2026E	1Q25E	2Q25E	2025E	2026E	1Q25E	2Q25E	2025E	2026E
Sales	76.4	76.6	332.1	352.1	78.1	75.6	323.5	345.8	-2%	1%	3%	2%
OP	5.3	6.5	36.0	45.5	5.2	6.6	33.6	48.8	2%	-1%	7%	-7%
NP	5.2	6.1	32.2	40.1	5.1	6.0	29.9	41.2	3%	1%	8%	-3%

Source: Bloomberg Finance L.P., J.P. Morgan estimates.

Share price charts

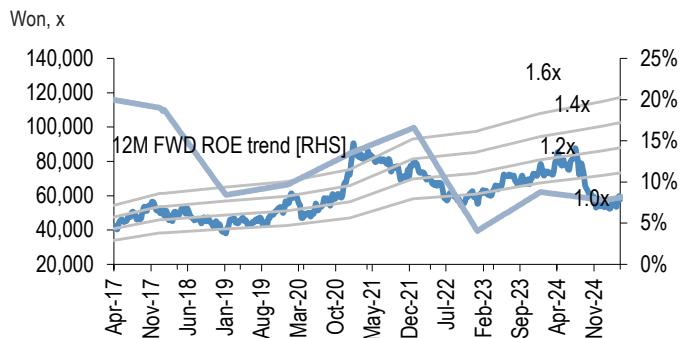
Figure 104: SEC – 12M forward P/E



Source: Bloomberg Finance L.P., Company data, J.P. Morgan estimates.

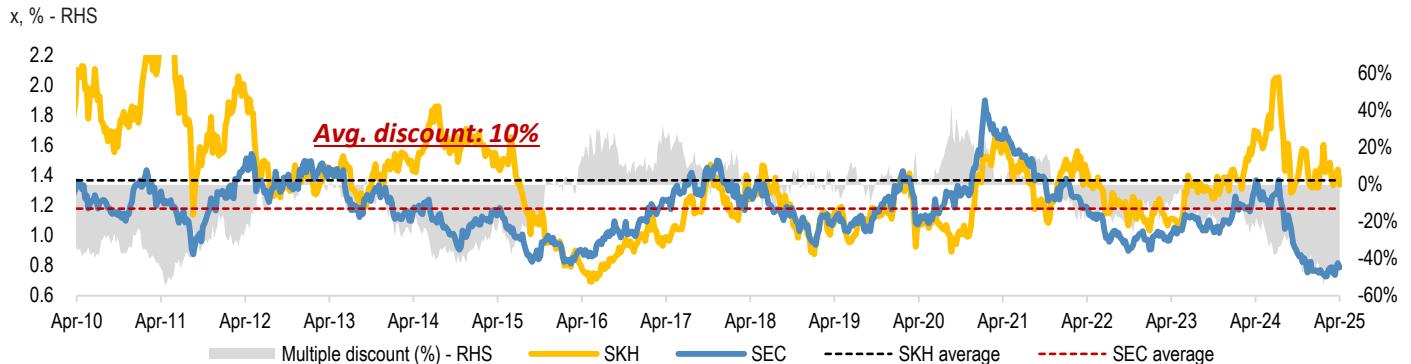
Figure 105: SEC – 12 month forward P/B

Figure 105: SEC – 12 month forward P/B



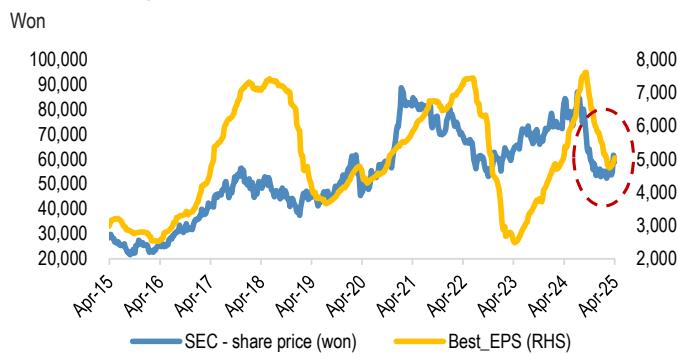
Source: Bloomberg Finance L.P., Company data, J.P. Morgan estimates.

Figure 106: SEC/SKH FTM P/B history and discount rate



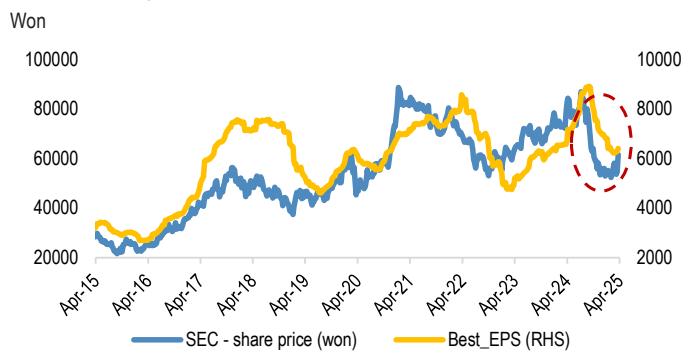
Source: Company data, J.P. Morgan estimates.

Figure 107: SEC: Share price vs. consensus estimates (1yr forward blended average)



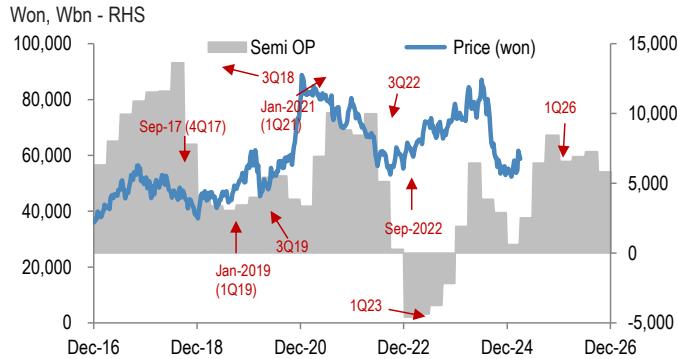
Source: Bloomberg Finance L.P.

Figure 108: SEC: Share price vs. consensus estimates (2yr forward blended average)



Source: Bloomberg Finance L.P.

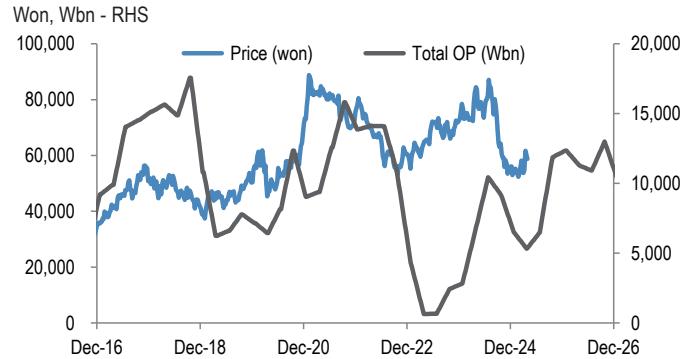
Figure 109: Share price vs. semi OP trend



Source: Company data, Bloomberg Finance L.P., J.P. Morgan estimates.

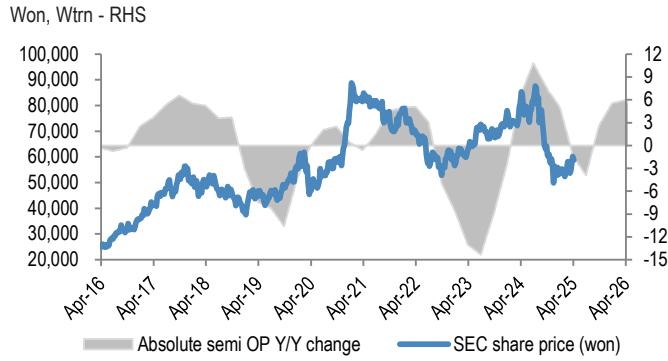
Figure 110: Share price vs. total OP trend

Figure 110: Share price vs. total OP trend



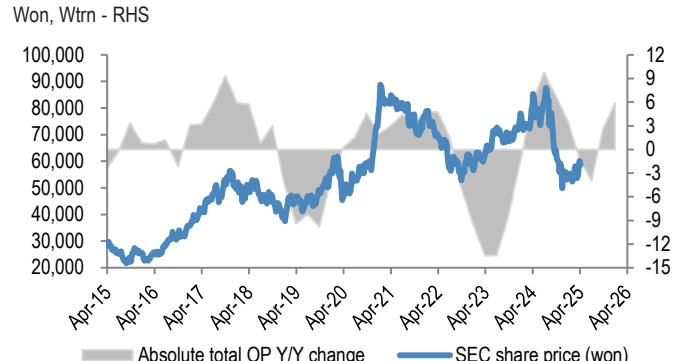
Source: Company data, Bloomberg Finance L.P., J.P. Morgan estimates.

Figure 111: Share price vs. absolute semi OP Y/Y trend



Source: Company data, Bloomberg Finance L.P., J.P. Morgan estimates. Note: 4Q24 onwards are J.P. Morgan estimates.

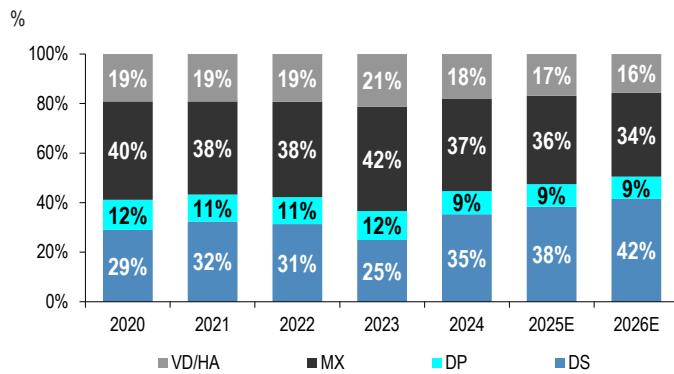
Figure 112: Share price vs. total absolute OP Y/Y trend



Source: Company data, Bloomberg Finance L.P., J.P. Morgan estimates. Note: 4Q24 onwards are J.P. Morgan estimates.

Key business charts

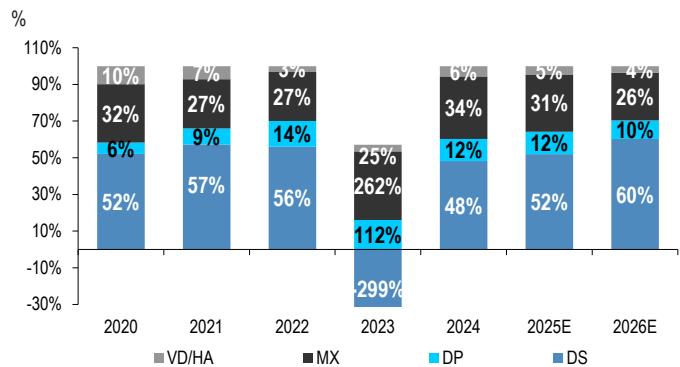
Figure 113: SEC – Revenue composition



Source: Company data, J.P. Morgan estimates.

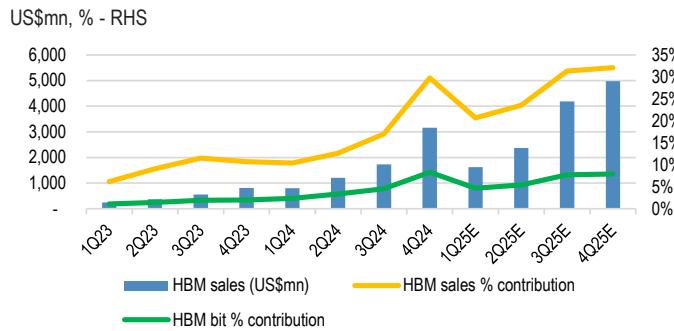
Figure 114: SEC – OP composition

Figure 114: SEC – OP composition



Source: Company data, J.P. Morgan estimates.

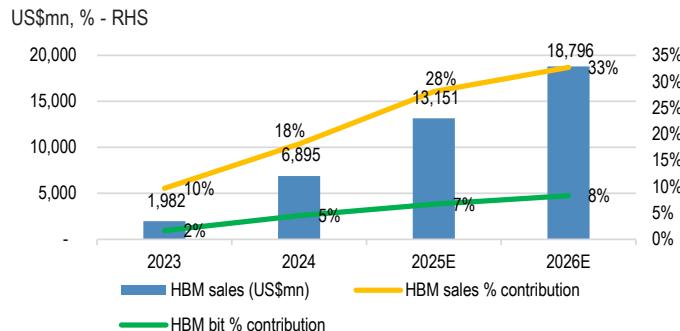
Figure 115: SEC - Quarterly HBM sales/ bit contribution



Source: Company data, J.P. Morgan estimates. Note: sales/bit % contribution to DRAM

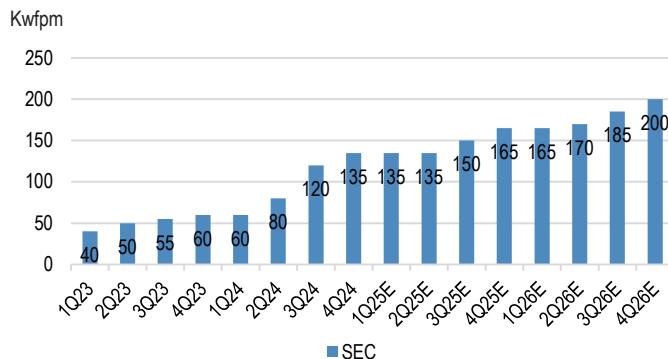
Figure 116: SEC - Annual HBM sales and sales/bit contribution

Figure 116: SEC - Annual HBM sales and sales/bit contribution



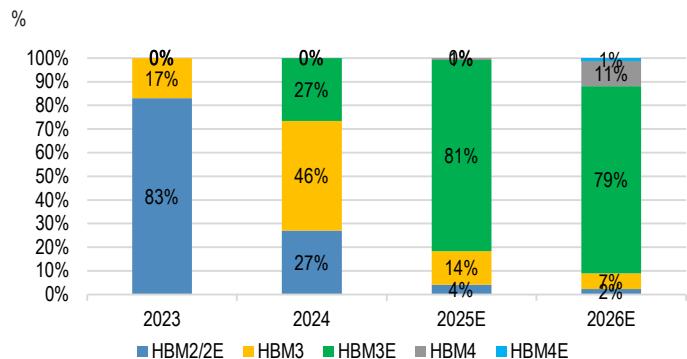
Source: Company data, J.P. Morgan estimates. Note: sales/bit % contribution to DRAM

Figure 117: SEC - HBM capacity trend



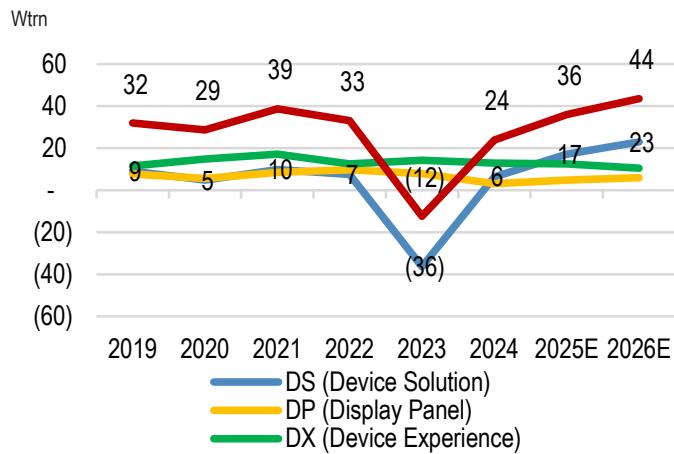
Source: Company data, J.P. Morgan estimates.

Figure 118: SEC - HBM sales mix by product generation



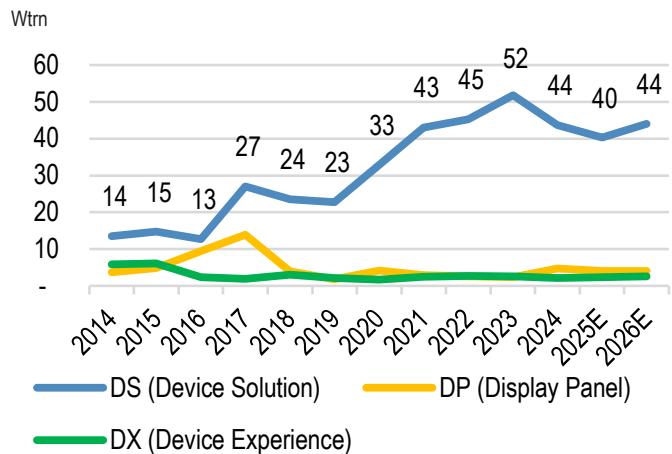
Source: Company data, J.P. Morgan estimates.

Figure 119: Annual FCF by division



Source: Company data, J.P. Morgan estimates. Note: (1) FCF = EBITDA - capex; (2) Consolidated FCF includes others.

Figure 120: Annual capex by division



Source: Company data, J.P. Morgan estimates.

Earnings projections by division

Table 10: SEC – Key assumptions/earnings projections for DRAM business

(8Gb equiv.)	1Q24	2Q24	3Q24	4Q24	1Q25E	2Q25E	3Q25E	4Q25E	1Q26E	2Q26E	3Q26E	4Q26E	2023	2024	2025E	2026E
Sales (W billion)	10,142	13,040	13,826	14,855	11,422	14,474	18,956	21,996	19,398	19,914	20,598	20,553	26,739	51,863	66,848	80,463
Unit shipments (8Gb equiv.)	3,456	3,655	3,627	3,153	2,759	3,476	4,186	4,719	4,154	4,243	4,505	4,453	12,048	13,890	15,139	17,355
Sequential change, %	-15%	6%	-1%	-13%	-12%	26%	20%	13%	-12%	2%	6%	-1%	12%	15%	9%	15%
Blended ASP (8Gb equiv.), US\$	2.2	2.6	2.8	3.4	2.9	2.9	3.2	3.3	3.3	3.4	3.3	3.3	1.7	2.7	3.1	3.3
Sequential change, %	19%	18%	8%	20%	-15%	1%	10%	3%	2%	1%	-3%	1%	-45%	61%	13%	7%
Total cost, US\$	1.8	1.6	1.9	2.3	2.0	2.0	2.1	2.0	2.1	2.2	2.2	2.3	1.8	1.9	2.0	2.2
Cash cost, US\$	1.1	1.0	1.1	1.3	0.9	1.1	1.3	1.3	1.3	1.3	1.3	1.4	1.0	1.1	1.2	1.3
Operating profit	1,974	4,798	4,455	4,828	3,490	4,616	6,705	8,467	6,953	7,035	6,868	6,319	-1,237	16,055	23,278	27,175
OP margin (%)	19%	37%	32%	33%	31%	32%	35%	38%	36%	35%	33%	31%	-5%	31%	35%	34%

Source: Company data, J.P. Morgan estimates.

Table 11: SEC – Key assumptions/earnings projections for NAND business

(64Gb equivalent)	1Q24	2Q24	3Q24	4Q24	1Q25E	2Q25E	3Q25E	4Q25E	1Q26E	2Q26E	3Q26E	4Q26E	2023	2024	2025E	2026E
Sales (W billion)	7,036	8,407	8,521	8,061	6,550	7,742	10,035	10,708	9,725	9,530	9,620	8,802	16,283	32,025	35,035	37,678
Unit shipments (64Gb equiv.)	9,828	9,337	8,940	8,672	7,631	9,005	11,166	12,282	11,545	11,545	11,892	10,881	32,175	36,776	40,083	45,863
Sequential change, %	-3%	-5%	-4%	-3%	-12%	18%	24%	10%	-6%	0%	3%	-9%	16%	14%	9%	14%
Blended ASP (64Gb equiv.), US\$	0.54	0.66	0.70	0.66	0.59	0.60	0.63	0.61	0.60	0.59	0.58	0.58	0.39	0.64	0.61	0.59
Sequential change, %	32%	22%	7%	-6%	-11%	1%	6%	-3%	-2%	-2%	-2%	0%	-46%	65%	-4%	-4%
Total cost, US\$	0.48	0.50	0.61	0.63	0.61	0.59	0.55	0.54	0.55	0.55	0.55	0.56	0.65	0.55	0.57	0.55
Cash cost, US\$	0.30	0.32	0.40	0.42	0.38	0.39	0.39	0.40	0.40	0.41	0.41	0.41	0.43	0.36	0.39	0.41
Operating profit	798	2,056	1,094	443	-196	116	1,254	1,231	807	600	481	282	-10,964	4,391	2,405	2,170
OP margin (%)	11%	24%	13%	6%	-3%	2%	13%	12%	8%	6%	5%	3%	-67%	14%	7%	6%

Source: Company data, J.P. Morgan estimates.

Figure 121: SEC – Key assumptions/earnings projections for System LSI business

Sales in Wbn

System LSI	1Q23	2Q23	3Q23	4Q23	1Q24	2Q24	3Q24	4Q24	1Q25E	2Q25E	3Q25E	4Q25E	1Q26E	2Q26E	3Q26E	4Q26E	2023	2024	2025E	2026E
Total sales (Won in billions)	4,814	5,760	5,910	5,980	5,650	6,820	7,000	7,084	6,706	7,385	7,537	7,860	7,437	8,093	8,556	7,881	22,464	26,554	29,488	31,968
Growth, %	-39%	20%	3%	1%	-6%	21%	3%	1%	-5%	10%	2%	4%	-5%	9%	6%	-8%	-25%	18%	11%	8%
Operating profit	(392)	(603)	(700)	(900)	(840)	(400)	(1,650)	(2,370)	(2,682)	(2,216)	(1,507)	(1,258)	(1,190)	(728)	(86)	(788)	(2,595)	(5,260)	(7,663)	(2,792)
OP margin, %	-8%	-10%	-12%	-15%	-15%	-6%	-24%	-33%	-40%	-30%	-20%	-16%	-16%	-9%	-1%	-10%	-12%	-20%	-26%	-9%
EBITDA	1,714	1,556	1,620	1,554	1,714	2,207	964	219	(104)	337	1,034	1,200	1,265	1,676	2,304	1,556	6,445	5,103	2,467	6,801
EBITDA margin, %	36%	27%	27%	26%	30%	32%	14%	3%	-2%	5%	14%	15%	17%	21%	20%	29%	19%	8%	21%	

Source: Company data, J.P. Morgan estimates.

Table 12: Key assumptions/earnings projections for handset business (MX)

	1Q24	2Q24	3Q24	4Q24	1Q25E	2Q25E	3Q25E	4Q25E	1Q26E	2Q26E	3Q26E	4Q26E	2023	2024	2025E	2026E
Sales (W billion)	32,790	26,640	29,980	25,030	34,481	27,508	31,270	26,903	33,676	27,149	31,362	27,579	108,631	114,440	120,163	119,767
Handset shipments (mn)	60	54	58	52	60	54	58	54	61	55	58	54	226	224	226	228
Q/Q and Y/Y change, %	13%	-11%	8%	-10%	16%	-10%	6%	-7%	14%	-10%	6%	-7%	-13%	-1%	1%	1%
Smartphone shipments	60.2	53.8	58.0	52.0	60.3	54.3	57.6	53.5	61.0	54.9	58.2	54.1	225.7	224.1	225.7	228.3
% of total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Tablet PCs	7.0	7.0	7.0	7.0	7.1	7.1	7.1	7.1	7.3	7.3	7.3	7.3	26.0	28.0	28.6	29.1
Blended ASP (US\$)	367	320	340	303	352	311	340	312	352	312	342	321	331	334	330	332
Q/Q and Y/Y change, %	21%	-13%	6%	-11%	16%	-12%	9%	-8%	13%	-11%	10%	-6%	6%	1%	-1%	1%
OP (W billion)	3,421	2,249	2,863	2,028	3,582	2,356	2,771	2,020	3,614	2,413	2,999	2,286	12,461	10,562	10,729	11,312
OP margin (%)	10%	8%	10%	8%	10%	9%	9%	8%	11%	9%	10%	8%	11.5%	9.2%	8.9%	9.4%

Source: Company data, J.P. Morgan estimates.

Table 13: Key assumptions/earnings projections for DP business

	1Q24	2Q24	3Q24	4Q24	1Q25E	2Q25E	3Q25E	4Q25E	1Q26E	2Q26E	3Q26E	4Q26E	2023	2024	2025E	2026E
Sales (W billion)	5,361	7,650	8,000	8,103	6,017	7,438	8,889	9,128	5,691	7,226	9,320	10,293	30,977	29,115	31,472	32,530
OLED sales	5,195	7,431	7,850	8,003	5,867	7,238	8,739	9,028	5,541	7,026	9,170	10,193	30,253	28,480	30,872	31,930
OLED OP	340	1,010	1,510	920	381	869	1,660	1,354	277	843	1,742	1,631	5,573	3,780	4,265	4,493
OLED OPM, (%)	7	14	19	11	7	12	19	15	5	12	19	16	18.4	13.3	13.8	14.1
Operating profit	340	1,010	1,510	920	381	869	1,660	1,354	277	843	1,742	1,631	5,573	3,780	4,265	4,493
OP margin (%)	6.3%	13.2%	18.9%	11.4%	6.3%	11.7%	18.7%	14.8%	4.9%	11.7%	18.7%	15.8%	18.0%	13.0%	13.6%	13.8%

Table 14: SEC – Earnings table

Wbn, yearend December

	2024				2025E				2026E				2022	2023	2024	2025E	2026E
	1Q	2Q	3Q	4Q	1QE	2QE	3QE	4QE	1QE	2QE	3QE	4QE					
Revenue	71,915	74,066	79,097	75,787	76,355	76,626	89,319	89,814	87,630	84,453	92,077	87,978	302,231	258,933	300,865	332,114	352,138
DS (Semi)	23,140	28,560	29,270	30,100	24,773	29,702	36,633	40,673	36,664	37,648	38,890	37,357	98,455	66,585	111,070	131,781	150,559
DRAM	10,142	13,040	13,766	14,855	11,422	14,474	18,956	21,996	19,398	19,914	20,598	20,553	42,580	26,820	51,803	66,848	80,463
NAND/others	7,348	8,700	8,504	8,161	6,645	7,842	10,140	10,818	9,829	9,640	9,735	8,923	25,954	17,301	32,713	35,445	38,128
System LSI	5,650	6,820	7,000	7,084	6,706	7,385	7,537	7,860	7,437	8,093	8,556	7,881	29,920	22,464	26,554	29,488	31,968
DP (Display)	5,361	7,650	8,000	8,103	6,017	7,438	8,889	9,128	5,691	7,226	9,320	10,293	34,383	30,977	29,115	31,472	32,530
DX (Device Experience)	47,010	41,800	44,660	40,213	49,051	42,471	46,485	42,534	48,348	42,126	46,364	42,651	181,457	168,846	173,682	180,541	179,489
MX (Mobile Experience)	33,530	27,380	30,520	25,810	35,141	28,208	31,910	27,663	34,369	27,884	32,034	28,377	120,820	112,411	117,240	122,923	122,665
VD/HA (Visual Display & Appliance)	13,480	14,420	14,140	14,403	13,910	14,263	14,574	14,871	13,979	14,242	14,330	14,274	60,637	56,435	56,443	57,619	56,824
Harman	3,200	3,620	3,530	3,900	3,264	3,765	3,812	3,978	3,427	3,953	4,003	4,177	13,220	14,390	14,250	14,819	15,560
Others	-6,796	-7,564	-6,363	-6,529	-6,750	-6,750	-6,500	-6,500	-6,500	-6,500	-6,500	-6,500	-25,284	-21,866	-27,252	-26,500	-26,000
Dep. & Amor. Expenses	-9,951	-10,122	-11,058	-11,501	-11,663	-11,758	-12,025	-12,151	-12,279	-12,288	-12,448	-12,577	-39,108	-38,667	-42,631	-47,598	-49,592
COGS	-45,886	-44,312	-49,095	-47,269	-50,421	-50,935	-53,932	-51,362	-52,677	-53,213	-54,842	-52,134	-190,042	-180,389	-186,562	-206,650	-212,865
Gross Profit	26,029	29,756	30,004	28,519	25,934	25,691	35,387	38,452	34,953	31,241	37,235	35,844	112,190	78,547	114,309	125,464	139,273
Operating Expense	-19,423	-19,312	-20,820	-22,027	-20,622	-19,213	-23,510	-26,103	-23,667	-20,331	-24,236	-25,569	-68,813	-71,980	-81,583	-89,449	-93,804
EBIT	6,606	10,444	9,183	6,496	5,311	6,478	11,877	12,349	11,286	10,909	12,998	10,275	43,377	6,567	32,729	36,015	45,468
DS (Semi)	1,910	6,450	3,860	2,908	618	2,523	6,459	8,449	6,578	6,915	7,272	5,821	23,825	-14,870	15,128	18,049	26,585
DS OPM (%)	8.3	22.6	13.2	9.7	2.5	8.5	17.6	20.8	17.9	18.4	18.7	15.6	24.2	-22.3	13.6	13.7	17.7
DP (Display)	340	1,010	1,510	920	381	869	1,660	1,354	277	843	1,742	1,631	5,953	5,573	3,780	4,265	4,493
DP OPM (%)	6.3	13.2	18.9	11.4	6.3	11.7	18.7	14.8	4.9	11.7	18.7	15.8	17.3	18.0	13.0	13.6	13.8
DX (Device Experience)	4,040	2,725	3,350	2,331	4,012	2,812	3,307	2,296	4,131	2,877	3,534	2,548	12,729	14,271	12,446	12,427	13,090
DX OPM (%)	12.0	10.0	11.0	9.0	11.4	10.0	10.4	8.3	12.0	10.3	11.0	9.0	10.5	12.7	10.6	10.1	10.7
Others (incl. Harman/adjustment)	316	259	463	337	300	275	450	250	300	275	450	275	870	1,593	1,376	1,275	1,300
Non operating incomes	1,101	1,151	1,137	1,415	1,363	1,298	1,290	1,234	1,259	1,350	1,444	1,446	3,064	4,439	4,804	5,185	5,500
Pre Tax Profit	7,707	11,595	10,320	7,910	6,675	7,777	13,167	13,583	12,545	12,260	14,443	11,721	46,440	11,006	37,530	41,201	50,968
Tax	-952	-1,754	-220	-153	-1,302	-1,516	-2,567	-2,649	-2,446	-2,391	-2,816	-2,286	9,214	4,481	-3,078	-8,034	-9,939
Minority Interest	-134	-199	-319	-178	-150	-175	-320	-320	-150	-175	-320	-320	-924	-1,014	-830	-965	-965
Net Profit (After minority interest)	6,621	9,643	9,782	7,579	5,223	6,085	10,279	10,614	9,948	9,694	11,306	9,116	54,730	14,473	33,621	32,201	40,064
EPS (W)	1,109	1,615	1,639	1,270	882	1,028	1,736	1,793	1,681	1,638	1,910	1,540	8,778	2,225	5,433	5,239	6,567
EPS (W) inc. pref. Shares	975	1,420	1,440	1,116	775	902	1,525	1,574	1,475	1,438	1,677	1,352	7,906	2,131	4,950	4,776	5,942
EBITDA	16,557	20,566	20,241	17,996	16,975	18,237	23,901	24,500	23,565	23,198	25,446	22,852	82,484	45,234	75,360	83,613	95,061
CAPEX	-13,422	-11,941	-10,959	-15,086	-11,050	-11,800	-12,100	-12,600	-11,350	-12,350	-13,900	-13,900	-49,430	-57,611	-51,406	-47,550	-51,500

Source: Company data, J.P. Morgan estimates.

Investment Thesis, Valuation and Risks

Samsung Electronics (Overweight; Price Target: W74,000)

Investment Thesis

We are OW on SEC on profit growth cycle reaccelerating from improving legacy fundamentals. Although our view on SEC's HBM business execution remains conservative given the lack of evidence of it regaining its technology moat (1cnm), we believe its improving HBM qualification progress tactically bodes well for near to mid-term share price trajectory amid positive industry set up. In order for SEC shares to fundamentally be more appealing, we believe increasing evidence of its technology leadership is required to restore investor confidence.

Valuation

Our Dec-25 PT of W74K is based on 1x FY25E P/B using the mid-down-cycle valuation. Despite positive industry set up, we apply a mid-down cycle valuation to reflect the cyclical nature of the legacy cycle (shorter legacy upcycle and less magnitude of price swing) amid SEC's relatively slow HBM business progress.

Risks to Rating and Price Target

Downside risks include: (1) an elongated memory price downcycle; (2) weaker-than-expected HBM demand from ASIC customers in FY25-26E; (3) delayed HBM qualification for future product generation; and (4) slower-than-expected mobile unit growth.

Samsung Electronics: Summary of Financials

Income Statement	FY23A	FY24A	FY25E	FY26E	FY27E	Cash Flow Statement	FY23A	FY24A	FY25E	FY26E	FY27E
Revenue	258,935	300,871	332,114	352,138	-	Cash flow from operating activities	48,864	77,450	61,504	91,548	-
COGS	(180,389)(186,562)(206,650)(212,865)				-	o/w Depreciation & amortization	38,667	42,631	47,598	49,592	-
Gross profit	78,547	114,309	125,464	139,273	-	o/w Changes in working capital	(5,290)	368	(19,261)	926	-
SG&A	(27,563)	(30,012)	(26,399)	(27,051)	-	Cash flow from investing activities	(68,682)	(70,131)	(58,435)	(58,959)	-
Adj. EBITDA	45,234	75,357	83,613	95,061	-	o/w Capital expenditure	(57,877)	(61,320)	(55,279)	(55,680)	-
D&A	(38,667)	(42,631)	(47,598)	(49,592)	-	as % of sales	22.4%	20.4%	16.6%	15.8%	-
Adj. EBIT	6,567	32,726	36,015	45,468	-	Cash flow from financing activities	(3,193)	13,524	(15,899)	(13,630)	-
Net Interest	3,428	3,915	4,160	4,435	-	o/w Dividends paid	(9,809)	(9,809)	(9,809)	(9,809)	-
Adj. PBT	11,006	37,530	41,201	50,968	-	o/w Shares issued/(repurchased)	0	0	0	0	-
Tax	4,481	(3,078)	(8,034)	(9,939)	-	o/w Net debt issued/(repaid)	3,366	9,461	(5,991)	(3,793)	-
Minority Interest	(1,014)	(830)	(965)	(965)	-	Net change in cash	(23,012)	20,843	(12,830)	18,959	-
Adj. Net Income	13,284	32,433	31,013	38,876	-	Adj. Free cash flow to firm	(11,046)	12,536	2,877	32,298	-
Reported EPS	2,225	5,433	5,239	6,567	-	y/y Growth	(138.5%)	(213.5%)	(77.1%)	1022.7%	-
Adj. EPS	2,225	5,433	5,239	6,567	-						
DPS	1,444	1,444	1,444	1,444	-						
Payout ratio	64.9%	26.6%	27.6%	22.0%	-						
Shares outstanding	5,970	5,970	5,920	5,920	-						
Balance Sheet	FY23A	FY24A	FY25E	FY26E	FY27E	Ratio Analysis	FY23A	FY24A	FY25E	FY26E	FY27E
Cash and cash equivalents	91,772	112,615	99,785	118,744	-	Gross margin	30.3%	38.0%	37.8%	39.6%	-
Accounts receivable	36,647	43,623	45,790	39,070	-	EBITDA margin	17.5%	25.0%	25.2%	27.0%	-
Inventories	51,626	51,755	53,459	44,653	-	EBIT margin	2.5%	10.9%	10.8%	12.9%	-
Other current assets	15,891	19,069	22,598	22,136	-	Net profit margin	5.1%	10.8%	9.3%	11.0%	-
Current assets	195,937	227,062	221,632	224,603	-	ROE	3.7%	8.5%	7.5%	8.8%	-
PP&E	187,256	205,945	213,626	219,714	-	ROA	2.9%	6.7%	6.0%	7.4%	-
LT investments	23,324	24,960	25,820	26,709	-	ROCE	1.1%	7.5%	6.7%	8.0%	-
Other non current assets	49,389	56,564	58,861	61,251	-	SG&A/Sales	10.6%	10.0%	7.9%	7.7%	-
Total assets	455,906	514,532	519,939	532,276	-	Net debt/Equity	NM	NM	NM	NM	-
Short term borrowings	8,423	15,380	14,077	13,543	-	Net debt/EBITDA	NM	NM	NM	NM	-
Payables	11,320	12,370	11,842	10,212	-						
Other short term liabilities	55,976	65,576	54,244	40,811	-	Sales/Assets (x)	0.6	0.6	0.6	0.7	-
Current liabilities	75,719	93,326	80,163	64,566	-	Assets/Equity (x)	1.3	1.3	1.3	1.2	1.2
Long-term debt	4,262	3,950	2,056	1,073	-	Interest cover (x)	NM	NM	NM	NM	-
Other long term liabilities	12,366	15,183	12,389	10,113	-	Operating leverage	592.4%	2459.6%	96.8%	435.3%	-
Total liabilities	92,348	112,459	94,608	75,752	-	Tax rate	40.7%	8.2%	19.5%	19.5%	-
Shareholders' equity	363,558	402,073	425,331	456,524	-	Revenue y/y Growth	(14.3%)	16.2%	10.4%	6.0%	-
Minority interests	-	-	-	-	-	EBITDA y/y Growth	(45.2%)	66.6%	11.0%	13.7%	-
Total liabilities & equity	455,906	514,532	519,939	532,276	-	EPS y/y Growth	(74.6%)	144.1%	(3.6%)	25.4%	-
BVPS	60,920	67,372	71,871	77,141	-						
y/y Growth	4.7%	10.6%	6.7%	7.3%	-						
Net debt/cash)	(79,086)	(93,285)	(83,652)	(104,129)	-						

Source: Company reports and J.P. Morgan estimates.

Note: W in billions (except per-share data). Fiscal year ends Dec. o/w - out of which

Samsung Electronics (005930 KS) - Rating and price target changes as of 02-Apr-25

Date	Rating	Price Target (Won)
18-Apr-23	OW	75,000
27-Apr-23	OW	75,000
15-Jun-23	OW	90,000
27-Jul-23	OW	90,000
22-Sep-23	OW	90,000
26-Sep-23	OW	90,000
01-Nov-23	OW	90,000
01-Feb-24	OW	95,000
03-Apr-24	OW	110,000
01-May-24	OW	110,000
03-Jul-24	OW	120,000
04-Jul-24	OW	120,000
31-Jul-24	OW	120,000
08-Sep-24	OW	100,000
08-Oct-24	OW	84,000
31-Oct-24	OW	83,000
10-Dec-24	N	60,000
31-Jan-25	N	60,000
18-Feb-25	N	60,000
02-Apr-25	OW	74,000

Source: Bloomberg Finance L.P., J.P. Morgan.

Overweight

000660.KS, 000660 KS

Price (02 Apr 25): W197,600

▲ Price Target (Dec-25): W300,000

Prior (Dec-25): W280,000

Technology - Semiconductors

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J.P. Morgan Securities (Far East) Limited, Seoul Branch

Key Changes (FYE Dec)

	Prev	Cur
Adj. EPS - 25E (W)	28,892	36,246
Adj. EPS - 26E (W)	35,989	44,970

Quarterly Forecasts (FYE Dec)

Adj. EPS (W)	2024A	2025E	2026E
Q1	2,633	6,538	10,518
Q2	5,659	7,964	11,103
Q3	7,902	10,549	11,640
Q4	10,997	11,195	11,709
FY	27,190	36,246	44,970

Style Exposure

Quant Factors	Current %Rank	Hist %Rank (1=Top)				
		6M	1Y	3Y	5Y	
Value	21	26	51	39	48	
Growth	86	15	87	52	10	
Momentum	26	10	4	5	9	
Quality	23	93	78	51	10	
Low Vol	69	62	40	38	63	
ESGQ	96	86	22	8	17	

SK hynix

Positive development in cyclical and AI; No signs of HBM demand slowdown; Raise PT to W300K and reiterate OW

Hynix shares have underperformed memory peers in the past 3M (+16% vs. memory peers: +19%) from negative AI datapoints stoking fears of AI demand sustainability and investors rotating to cyclical players. We believe a shorter legacy downcycle and improving conventional fundamentals put SKH in a positive position given the pure-memory business carries higher beta on top of AI leadership where we have not picked up evidence of HBM capacity cut. Reflecting legacy ASP strength (both DRAM and NAND), we revise up FY25-26E EPS by 25% respectively and raise our PT to 300K based on 1.9x FY25/26E P/B.

- **Improving memory fundamentals demand EPS upward revision.** We raise conventional FY25-26E DRAM and NAND ASP by 5%-9% to reflect earlier memory restocking as inventory normalizes across the supply chain and faster DDR5 penetration where pricing risk remains tepid from Chinese competition. Contrary to our previous NAND assumption, NAND pricing is also seeing positive developments with tight S/D continuing in FY25E (eSSD demand upside for GP/AI server vs. limited supply output from production cutback). Given SKH's pure-memory business model, we expect improving legacy DRAM/NAND pricing to result in strong margin expansion on top of solid HBM dollar monetization.
- **Tight HBM S/D throughout 2025; HBM4 roll-out on schedule.** Given HBM3E qualification delay from a local competitor, we expect tight HBM S/D to continue with SKH capturing the highest dollar share in the market until 2026. Management signaled no signs of a demand airocket nor upside/downside to HBM capacity in 2025, indicating solid HBM business progress, in our view. 12-Hi HBM4 for Rubin GPU is slated to roll-out in late-3Q/early-4Q and we see Hynix continuing to lead the market with the introduction of the most advanced product 1-2Q earlier than competitors.
- **Capex hike supports HBM sales growth; Step-up in HBM sales from 3Q.** Despite surging HBM demand in 2025, Hynix faced limitations in expanding HBM capacity from limited cleanroom space. Consequently, management hinted higher infrastructure capex mix in 2025 with the nearest greenfield fab being M15X slated for MP in 4Q25E. In contrast to when capex hikes were regarded as a signal of oversupply in the memory industry, we believe Hynix's DRAM capex hike will prepare Hynix to address growing HBM demand across multiple product generations, solidifying its AI leadership. In the near-term, we expect a 15Kwfprom capacity hike in 3Q with meaningful production increase for 12-Hi HBM3E for Blackwell GPU.
- **Raise PT to W300K; HBM deserves higher valuation more so than cyclical legacy business.** In retrospect, elongated AI demand visibility and margin expansion led Hynix to touch 2x FTM P/B valuation back in July-2024. While we revise up earnings estimates based on improving conventional business, we advise investors to focus on quality of earnings with AI being less cyclical and higher margin generation deserves higher valuation premium. Shorter legacy downcycle points to shorter legacy upcycle and we view NAND pricing upcycle to be short-lived as the driver of NAND market growth has been on bit growth more so than ASP hike. SKH currently trades 1.4x FTM P/B and we find risk/reward attractive considering 29% EPS CAGR growth in FY24-26E.

Price Performance



Company Data

Shares O/S (mn)	728
52-week range (W)	248,500-144,700
Market cap (\$ mn)	97,766
Exchange rate	1,471.41
Free float (%)	66.9%
3M ADV (mn)	3.94
3M ADV (\$ mn)	539.8
Volatility (90 Day)	49
Index	KOSPI
BBG ANR (Buy Hold Sell)	40[2]0

Key Metrics (FYE Dec)

	FY24A	FY25E	FY26E
Financial Estimates			
Revenue	66,193	88,829	105,712
Adj. EBIT	23,467	34,944	42,840
Adj. EBITDA	36,049	50,433	60,937
Adj. net income	19,797	26,390	32,742
Adj. EPS	27,190	36,246	44,970
BBG EPS	24,667	36,404	43,601
Cashflow from operations	34,366	34,868	47,065
FCFF	15,161	16,379	26,979
Margins and Growth			
Revenue Growth Y/Y (%)	102.0%	34.2%	19.0%
EBIT margin	35.5%	39.3%	40.5%
EBIT Growth Y/Y (%)	-403.6%	48.9%	22.6%
EBITDA margin	54.5%	56.8%	57.6%
EBITDA Growth Y/Y (%)	506.5%	39.9%	20.8%
Net margin	29.9%	29.7%	31.0%
Adj. EPS growth	-316.7%	33.3%	24.1%
Ratios			
Adj. tax rate	17.1%	23.0%	23.0%
Interest cover	36.0	183.4	NM
Net debt/Equity	0.1	NM	NM
Net debt/EBITDA	0.2	NM	NM
ROE	31.1%	30.5%	28.4%
Valuation			
FCFF yield	10.5%	11.4%	18.8%
Dividend yield	0.8%	0.8%	0.8%
EV/Revenue	2.3	1.5	1.0
EV/EBITDA	4.2	2.7	1.8
Adj. P/E	7.3	5.5	4.4

Summary Investment Thesis and Valuation

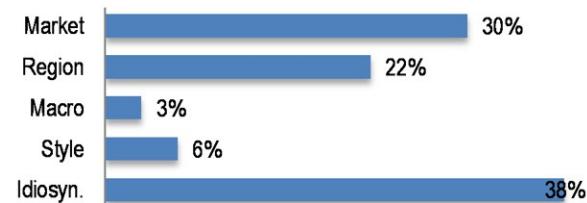
Investment Thesis

Our OW view on SK hynix is based on the company's solid AI solution execution capability, which has substantially improved its earnings generation capability. We believe a shorter legacy downcycle and improving conventional fundamentals put SKH in a positive position given the pure-memory business carries higher beta.

Valuation

Our Dec-25 PT of W300K is based on 1.9x FY25/26E P/B, representing a premium to the previous trough cycle during 2019 to reflect our expectation for a shorter memory market downcycle while also applying a premium to SKH's HBM business due to its tech leadership and higher order visibility.

Performance Drivers



Factors	6M Corr	1Y Corr
Market: MSCI Asia Pac ex JP	0.47	0.55
Region: Korea	0.61	0.56
Macro:		
US 10 Year Yield	0.18	0.17
JPM Global Equity Sentiment	-0.21	-0.14
HSI Volatility Index	-0.05	-0.12
Quant Styles:		
Growth	0.38	0.38
Momentum	0.00	0.25
Size	-0.04	0.23

Estimate revisions

Table 15: SK hynix – Estimate revisions

Won in billions, year-end December

	Revised		Prior		Difference	
	2025E	2026E	2025E	2026E	2025E	2026E
DRAM Shipments (8Gb equiv.)	10,425	11,868	10,403	11,843	0.2	0.2
ASP (US\$, 8Gb equiv.)	4.39	4.90	4.07	4.49	7.9	9.2
NAND shipments (256Gb equiv.)	5,074	5,839	5,060	5,839	0.3	0.0
ASP (US\$, 256Gb equiv.)	2.9	2.7	2.7	2.5	7.1	4.7
Sales	88,829	105,712	82,099	97,731	8.2	8.2
DRAM sales	65,476	81,480	60,277	74,482	8.6	9.4
NAND (Inc. MCP) sales	23,353	24,232	21,822	23,249	7.0	4.2
Operating profit	34,944	42,840	28,112	34,709	24.3	23.4
OP margin, %	39.3	40.5	34.2	35.5	5.1	5.0
DRAM OP	31,637	40,631	26,003	33,005	21.7	23.1
NAND+MCP OP	3,306	2,209	2,109	1,704	56.8	29.7
Net Income	26,390	32,742	21,036	26,203	25.5	25.0
EPS (Won)	36,246	44,970	28,892	35,989	25.5	25.0

Source: J.P. Morgan estimates.

Table 16: SKH – 1Q25 earnings preview

Wbn

	1Q24	4Q24	1Q25 JPMe	1Q25 Previous esti.	Diff. (%) vs Prev.	Q/Q (%)	Y/Y (%)
Sales	12,430	19,767	17,747	17,375	2.1	-10.2	42.8
DRAM	7,493	14,489	13,524	13,228	2.2	-6.7	80.5
NAND Flash	4,407	4,702	3,673	3,598	2.1	-21.9	-16.7
MCP and others	529	576	550	550	0.0	-4.5	4.0
COGS	7,635	9,401	9,206	9,190	0.2	-2.1	20.6
Gross profit	4,795	10,366	8,542	8,185	4.4	-17.6	78.2
GP margin (%)	39	52	48	47			
SG&A expenses	1,909	2,283	2,130	2,085	2.1	-6.7	11.6
% of sales	15	12	12	12			
Operating profit	2,886	8,081	6,412	6,100	5.1	-20.7	122.2
OP margin (%)	23	41	36	35			
DRAM	2,508	7,135	6,144	5,901	4.1	-13.9	145.0
Margin (%)	33	49	45	45			
NAND Flash	331	926	257	189	36.1	-72.2	-22.2
Margin (%)	8	20	7	5			
MCP and others	48	20	11	11	0.0	-44.5	-76.9
Margin (%)	9	3	2	2			
Net Interest Income	-322	-170	-109	-124	n/a	n/a	n/a
Net Other Income	-191	1,669	-121	-123	n/a	n/a	n/a
Recurring profit	2,373	9,579	6,182	5,854	5.6	-35.5	160.6
Tax/Minority interest	456	1,575	1,422	1,346	5.6	-9.7	212.1
Net profit	1,917	8,006	4,760	4,507	5.6	-40.5	148.3

Source: Company data, J.P. Morgan estimates.

Table 17: SK hynix – J.P. Morgan estimates vs Street consensus

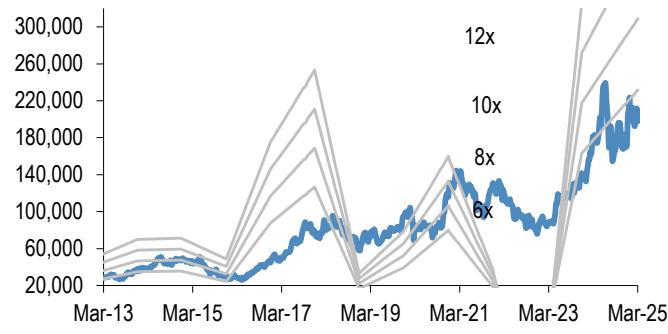
Won in billions, year-end December

	JPM estimates				Market consensus				Difference			
	1Q25E	2Q25E	2025E	2026E	1Q25E	2Q25E	2025E	2026E	1Q25E	2Q25E	2025E	2026E
Sales	17,747	20,545	88,829	105,712	17,069	19,325	86,974	103,198	4%	6%	2%	2%
OP	6,412	7,715	34,944	42,840	6,336	7,382	34,284	42,048	1%	5%	2%	2%
NP	4,760	5,799	26,390	32,742	4,988	6,098	26,742	32,973	-5%	-5%	-1%	-1%

Source: Bloomberg Finance L.P., J.P. Morgan estimates. Note: Market consensus based on last 28 days BBG estimates.

Figure 122: SK hynix – 12M forward P/E bands

Won, x, %



Source: Bloomberg Finance L.P., J.P. Morgan estimates.

Figure 124: SKH: Share price vs. DRAM sales

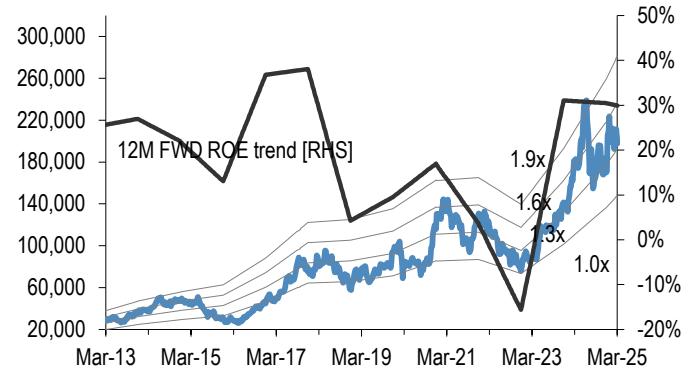
Won, Wbn - RHS



Source: Company data, Bloomberg Finance L.P., J.P. Morgan estimates. Note: 1Q25 onwards are J.P. Morgan estimates.

Figure 123: SK hynix – 12M forward P/B bands and ROE trend

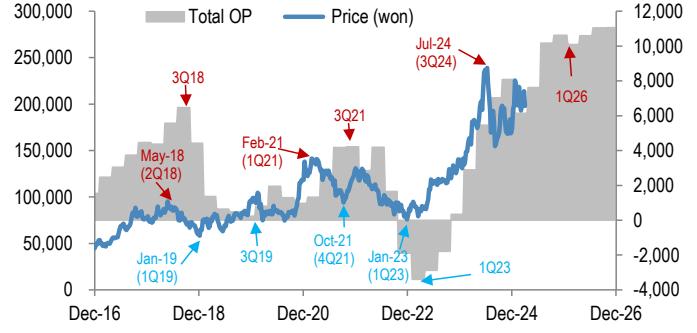
Won, x



Source: Bloomberg Finance L.P., J.P. Morgan estimates.

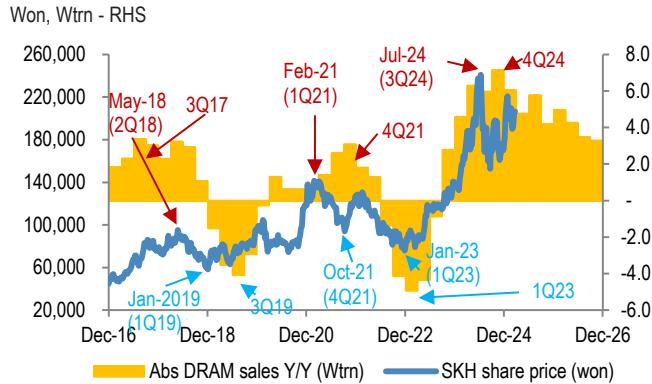
Figure 125: SKH: Share price vs. total OP

Won, Wbn - RHS



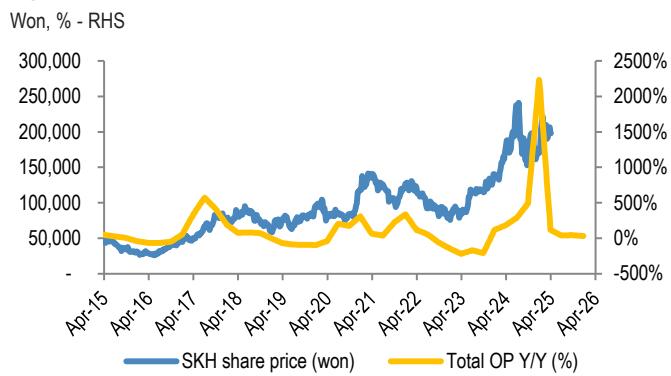
Source: Company data, Bloomberg Finance L.P., J.P. Morgan estimates. Note: 1Q25 onwards are J.P. Morgan estimates.

Figure 126: SKH: Share price vs. absolute DRAM sales y/y



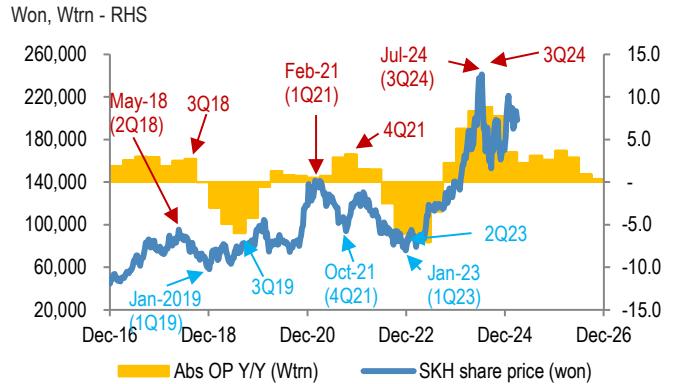
Source: Company data, Bloomberg Finance L.P., J.P. Morgan estimates. Note: 1Q25 onwards are J.P. Morgan estimates.

Figure 128: Share price vs. total OP Y/Y trend



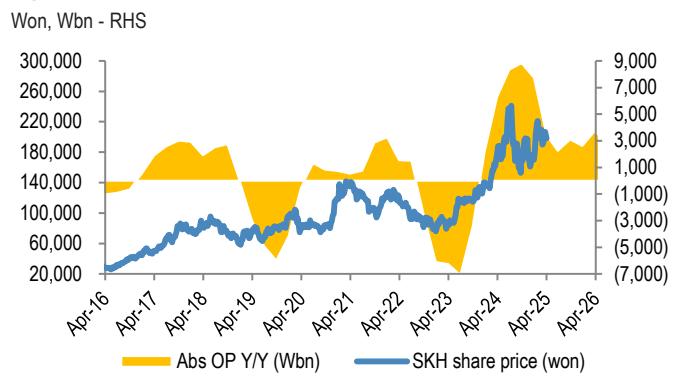
Source: Company data, Bloomberg Finance L.P., J.P. Morgan estimates. Note: 1Q25 onwards are J.P. Morgan estimates.

Figure 127: SKH: Share price vs. absolute total OP y/y



Source: Company data, Bloomberg Finance L.P., J.P. Morgan estimates. Note: 1Q25 onwards are J.P. Morgan estimates.

Figure 129: Share price vs. absolute total OP Y/Y trend



Source: Company data, Bloomberg Finance L.P., J.P. Morgan estimates. Note: 1Q25 onwards are J.P. Morgan estimates.

Key business charts and tables

Table 18: SK hynix: Key assumptions for DRAM business

Units in 8Gb eq., W in billions; year-end Dec

US\$ millions, US\$, 8Gb equiv, K/month	1Q24	2Q24	3Q24	4Q24	1Q25E	2Q25E	3Q25E	4Q25E	4Q26E	4Q26E	4Q26E	4Q26E	2023	2024	2025E	2026E
ASP (US\$)	2.9	3.4	3.9	4.3	4.4	4.3	4.4	4.5	4.7	4.8	5.0	5.1	2.0	3.7	4.4	4.9
Seq. change, %	21.3	14.4	16.4	9.6	2.3	-2.9	3.5	2.3	4.3	2.7	4.3	0.5	-37.7	79.1	20.0	11.7
Operating cost (US\$)	2.0	1.9	2.0	2.2	2.4	2.3	2.2	2.2	2.3	2.4	2.5	2.6	2.0	2.0	2.3	2.5
Cash Cost (US\$)	1.3	1.4	1.5	1.6	1.7	1.7	1.6	1.7	1.7	1.7	1.8	1.9	1.4	1.5	1.7	1.8
Cost change, %	4%	-4%	6%	9%	10%	-6%	-2%	2%	3%	2%	7%	3%	-13%	-1%	13%	9%
Cash cost chg. %	2%	5%	6%	13%	4%	-4%	-1%	2%	0%	2%	8%	3%	-14%	7%	14%	7%
Shipments (mn)	1,922	2,325	2,274	2,413	2,127	2,526	2,851	2,921	2,814	2,924	3,026	3,105	7,704	8,933	10,425	11,868
Seq. change, %	-16.4	21.0	-2.2	6.1	-11.9	18.8	12.9	2.4	-3.6	3.9	3.5	2.6	14.4	16.0	16.7	13.8
Sales	7,493	10,700	12,048	14,489	13,524	15,469	17,817	18,667	18,498	19,735	21,293	21,955	20,769	44,732	65,476	81,480
OP	2,508	4,699	5,915	7,135	6,144	7,255	8,876	9,362	9,368	10,048	10,577	10,638	211	20,257	31,637	40,631
OP margin (%)	33	44	49	49	45	47	50	50	51	51	50	48	1	45	48	50
Revenue per wafer (US\$)	5,695	7,767	8,585	9,843	8,507	9,678	11,006	11,235	10,875	11,188	11,392	11,364	3,940	8,035	10,120	11,214

Source: Company data, J.P. Morgan estimates.

Table 19: SK hynix – Key assumptions in the NAND business

Units in 256Gb. equivalent, Won in billions, year-end December

64Gb equiv.	1Q24	2Q24	3Q24	4Q24	1Q25E	2Q25E	3Q25E	4Q25E	4Q26E	4Q26E	4Q26E	4Q26E	2023	2024	2025E	2026E
ASP US\$ (64Gb equiv.)	0.6	0.7	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.4	0.7	0.7	0.7
Q/Q ASP, %	32.2	16.5	15.6	-4.0	-8.0	-4.0	4.0	-4.0	-3.5	-3.0	-2.0	0.0	-45.6	96.4	-2.2	-8.4
Operating cost (US\$)	0.6	0.6	0.7	0.6	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.6	0.6	0.6
Cash Cost (US\$)	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.4	0.4	0.4
Cost change, %	-13%	7%	6%	-1%	7%	-7%	-8%	-3%	4%	0%	0%	1%	-7%	-11%	-2%	-2%
Cash cost chg. %	-13%	14%	2%	0%	-10%	4%	2%	1%	-1%	0%	-1%	-2%	5%	-7%	-2%	0%
Shipments (64Gb equiv.)	5,301	5,190	4,359	4,146	3,400	4,351	5,831	6,715	5,842	5,842	5,959	5,714	19,347	18,995	20,297	23,355
Q/Q or Y/Y change, %	0.5	-2.1	-16.0	-4.9	-18.0	28.0	34.0	15.2	-13.0	0.0	2.0	-4.1	21.2	-1.8	6.8	15.1
Sales	4,407	5,185	4,981	4,702	3,673	4,477	6,152	6,801	5,629	5,460	5,458	5,234	9,653	19,274	21,103	21,782
OP	331	762	1,096	926	257	448	1,230	1,326	732	546	464	419	-8,090	3,115	3,261	2,160
OP margin (%)	8	15	22	20	7	10	20	20	13	10	9	8	-84	16	15	10
Revenue per wafer (US\$)	3,948	4,503	4,373	3,992	3,012	3,701	5,158	5,702	4,787	4,643	4,641	4,451	2,191	4,204	4,383	4,630

Source: Company data, J.P. Morgan estimates.

Figure 130: SK hynix – Revenue breakdown

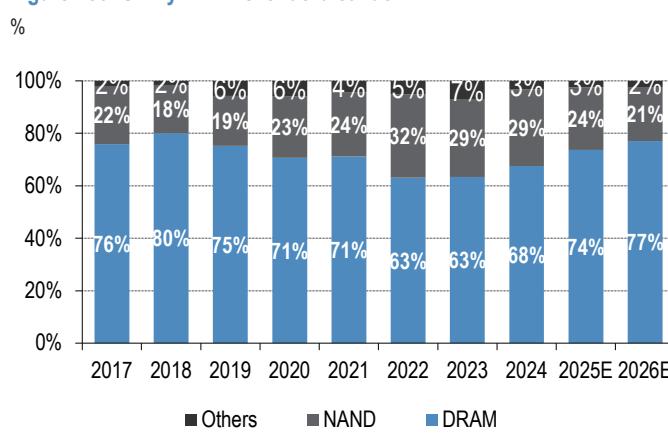
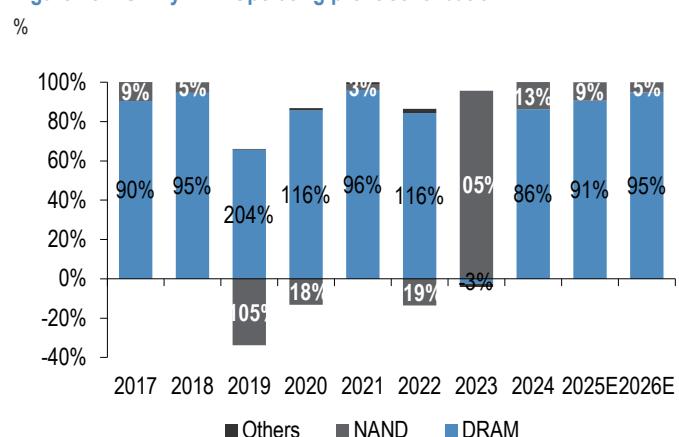


Figure 131: SK hynix – Operating profit contribution

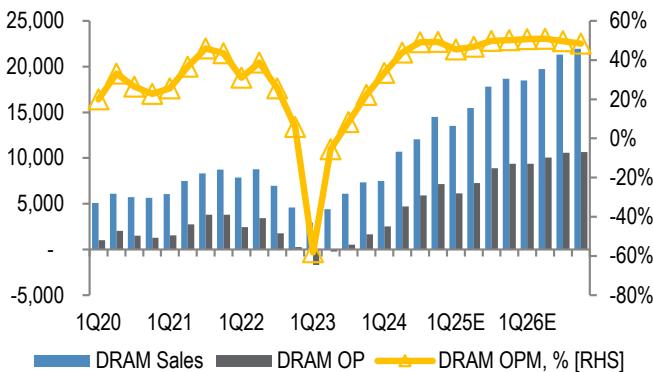


Source: Company data, J.P. Morgan estimates.

Source: Company data, J.P. Morgan estimates. Note: Negative earnings in FY23.

Figure 132: SK hynix – DRAM quarterly sales/OP/OPM trend

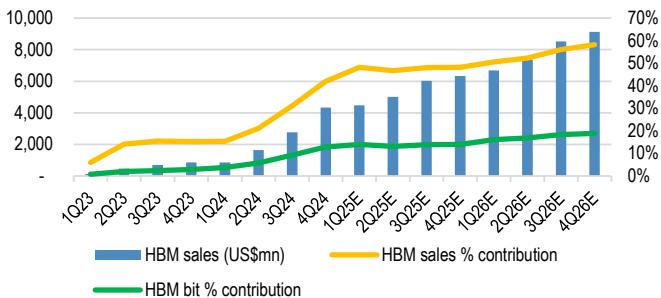
Won in billions, OPM (%)



Source: Company data, J.P. Morgan estimates.

Figure 134: SK hynix - Quarterly HBM sales/bit % contribution to DRAM

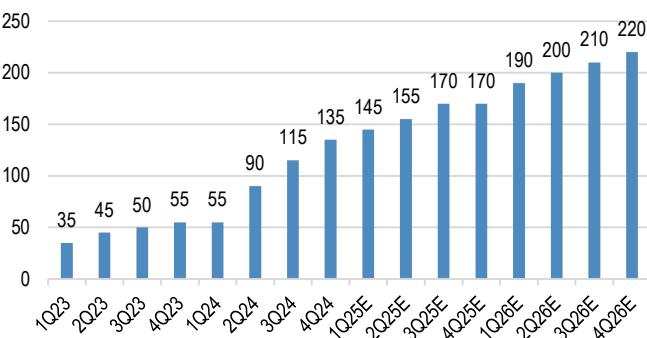
US\$mn, % - RHS



Source: Company data, J.P. Morgan estimates.

Figure 136: SK hynix HBM back-end capacity trend

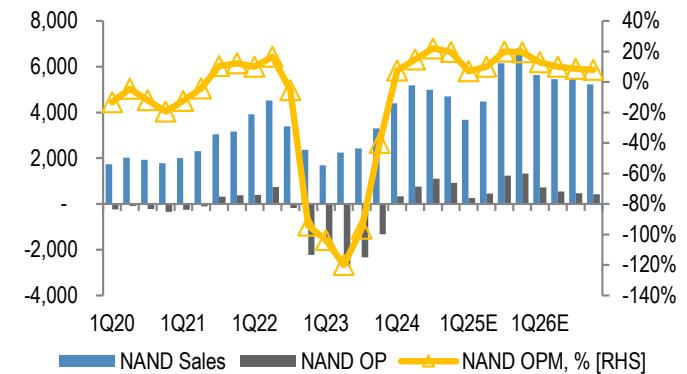
Kwfpmp



Source: Company data, J.P. Morgan estimates.

Figure 133: SK hynix – NAND quarterly sales/OP/OPM trend

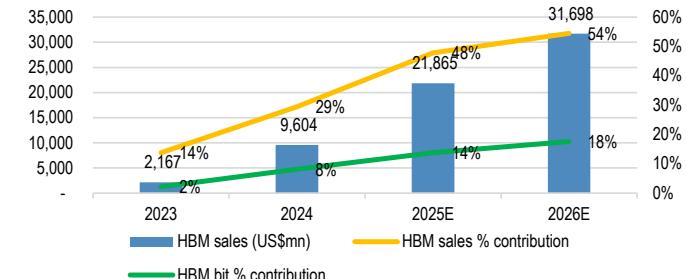
Won in billions, OPM (%)



Source: Company data, J.P. Morgan estimates.

Figure 135: SK hynix - Annual HBM sales/bit % contribution to DRAM

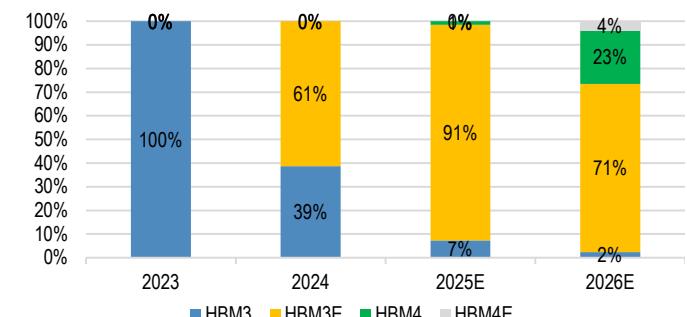
US\$mn, % - RHS



Source: Company data, J.P. Morgan estimates.

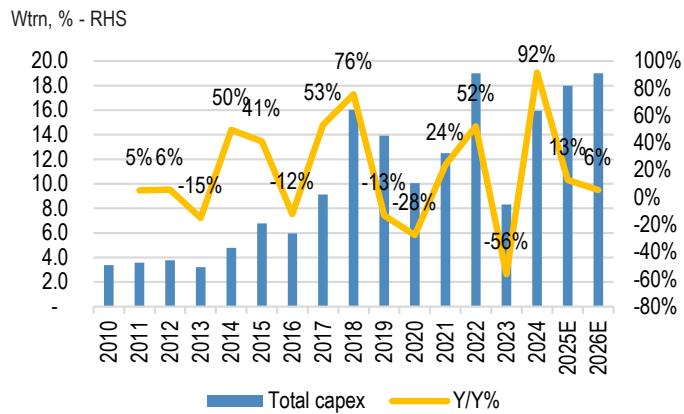
Figure 137: SK hynix - HBM sales mix by application

%



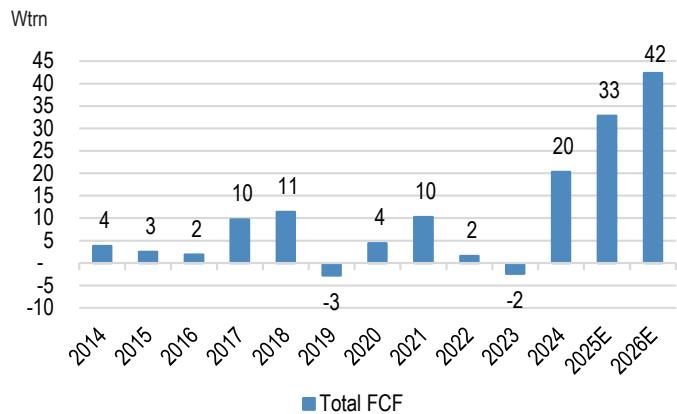
Source: Company data, J.P. Morgan estimates.

Figure 138: SKH – Total capex and Y/Y% trend



Source: Company data, J.P. Morgan estimates. Note: Capital intensity = capex/sales.

Figure 139: SKH – Annual memory FCF



Source: Company data, J.P. Morgan estimates. Note: FCF = EBITDA - capex.

Table 20: SKH: Earnings model

Won in billions

(W in billion)	2024				2025E				2026E				2023	2024	2025E	2026E
	1Q	2Q	3Q	4Q	1QE	2QE	3QE	4QE	1QE	2QE	3QE	4QE				
Revenue	12,430	16,423	17,573	19,767	17,747	20,545	24,519	26,017	24,727	25,845	27,351	27,789	32,766	66,193	88,829	105,712
DRAM	7,493	10,700	12,048	14,489	13,524	15,469	17,817	18,667	18,498	19,735	21,293	21,955	20,769	44,732	65,476	81,480
NAND Flash	4,407	5,185	4,981	4,702	3,673	4,477	6,152	6,801	5,629	5,460	5,458	5,234	9,653	19,274	21,103	21,782
Others	529	538	544	576	550	600	550	550	600	650	600	600	2,344	2,187	2,250	2,450
Depreciation	-3,048	-2,994	-2,934	-3,010	-3,549	-3,658	-3,754	-3,829	-4,024	-4,216	-4,430	-4,643	-13,674	-12,582	-15,489	-18,096
COGS	7,635	8,927	8,402	9,401	9,206	10,365	11,459	12,196	11,648	12,137	13,016	13,385	-33,299	-34,365	-43,226	-50,186
Gross Profit	4,795	7,496	9,171	10,366	8,542	10,180	13,060	13,821	13,079	13,709	14,335	14,404	-533	31,828	45,603	55,526
SG&A Expenses	1,909	2,028	2,141	2,283	2,130	2,465	2,942	3,122	2,967	3,101	3,282	3,335	7,197	8,361	10,659	12,685
% of Revenue (%)	15	12	12	12	12	12	12	12	12	12	12	12	-22	-13	-12	-12
EBIT	2,886	5,469	7,030	8,081	6,412	7,715	10,118	10,699	10,112	10,607	11,053	11,069	-7,730	23,467	34,944	42,840
DRAM	2,508	4,699	5,915	7,135	6,144	7,255	8,876	9,362	9,368	10,048	10,577	10,638	211	20,257	31,637	40,631
Margin (%)	33	44	49	49	45	47	50	50	51	51	50	48	1	45	48	50
Flash/SRAM	331	762	1,096	926	257	448	1,230	1,326	732	546	464	419	-8,090	3,115	3,261	2,160
Margin (%)	8	15	22	20	7	10	20	20	13	10	9	8	-83.8	16.2	15.5	9.9
Others	48	8	19	20	11	12	11	11	12	13	12	12	149	94	45	49
Margin (%)	9	1	3	3	2	2	2	2	2	2	2	2	6	4	2	2
Net Interest Income	-322	-275	-233	-170	-109	-77	-56	-34	20	72	127	174	-1,252	-1,000	-275	393
Net Other Income	-191	-141	82	1,669	-121	-107	-87	-80	-186	-181	-173	-171	-2,676	1,418	-396	-711
Pre Tax Profit	2,373	5,052	6,879	9,579	6,182	7,531	9,975	10,585	9,945	10,499	11,006	11,072	-11,658	23,883	34,273	42,522
Tax	456	932	1,126	1,575	1,422	1,732	2,294	2,435	2,287	2,415	2,531	2,546	-2,520	4,088	7,883	9,780
Extraordinary gain/(loss)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Net Profit	1,917	4,120	5,753	8,006	4,760	5,799	7,680	8,151	7,658	8,084	8,475	8,525	-9,138	19,795	26,390	32,742
EPS (W)	2,633	5,659	7,902	10,997	6,538	7,964	10,549	11,195	10,518	11,103	11,640	11,709	-12,550	27,190	36,246	44,970
Margins (%)																
Gross Margin	39	46	52	52	48	50	53	53	53	53	52	52	-2	48	51	53
Operating Margin	23	33	40	41	36	38	41	41	41	41	40	40	-24	35	39	41
EBITDA Margin	48	52	57	56	56	55	57	56	57	57	57	57	18	54	57	58
Net Margin	15	25	33	41	27	28	31	31	31	31	31	31	-28	30	30	31
Sequential Growth (%)																
Revenue	10	32	7	12	-10	16	19	6	-5	5	6	2	-27	102	34	19
Gross Profit	115	56	22	13	-18	19	28	6	-5	5	5	0	na	na	43	22
EBIT	734	89	29	15	-21	20	31	6	-5	5	4	0	na	na	49	23
Net Profit	na	115	40	39	-41	22	32	6	-6	6	5	1	na	na	33	24
EPS	na	115	40	39	-41	22	32	6	-6	6	5	1	na	na	33	24
EBITDA	5,934	8,463	9,964	11,091	9,961	11,372	13,871	14,528	14,135	14,823	15,482	15,712	5,391	35,451	49,733	60,153
CAPEX	-3,103	-2,063	-3,506	-7,273	-5,000	4,500	4,500	-4,000	4,500	4,500	5,000	-5,000	-8,325	-15,946	-18,000	-19,000

Source: Company data and J.P. Morgan estimates.

Investment Thesis, Valuation and Risks

SK hynix (*Overweight; Price Target: W300,000*)

Investment Thesis

Our OW view on SK hynix is based on the company's solid AI solution execution capability, which has substantially improved its earnings generation capability. We believe a shorter legacy downcycle and improving conventional fundamentals put SKH in a positive position given the pure-memory business carries higher beta.

Valuation

Our Dec-25 PT of W300K is based on 1.9x FY25/26E P/B, representing a premium to the previous trough cycle during 2019 to reflect our expectation for a shorter memory market downcycle while also applying a premium to SKH's HBM business due to its tech leadership and higher order visibility.

Risks to Rating and Price Target

Key downside risks include lower-than-expected DRAM prices and margins, and uncertainty around end demand/inventories. Key upside catalysts include further DRAM ASP rallies, led by stronger-than-expected demand.

SK hynix: Summary of Financials

Income Statement	FY23A	FY24A	FY25E	FY26E	Cash Flow Statement	FY23A	FY24A	FY25E	FY26E
Revenue	32,766	66,193	88,829	105,712	Cash flow from operating activities	4,043	34,366	34,868	47,065
COGS	(19,625)	(21,783)	(27,736)	(32,090)	o/w Depreciation & amortization	13,674	12,582	15,489	18,096
Gross profit	(533)	31,828	45,603	55,526	o/w Changes in working capital	(493)	1,987	(7,012)	(3,773)
SG&A	(283)	(257)	(373)	(444)	Cash flow from investing activities	(8,398)	(20,296)	(18,700)	(19,783)
Adj. EBITDA	5,943	36,049	50,433	60,937	o/w Capital expenditure	(6,150)	(20,034)	(18,700)	(19,783)
D&A	(13,674)	(12,582)	(15,489)	(18,096)	as % of sales	18.8%	30.3%	21.1%	18.7%
Adj. EBIT	(7,730)	23,467	34,944	42,840	Cash flow from financing activities	6,866	(8,834)	(4,169)	(3,982)
Net Interest	(1,252)	(1,000)	(275)	393	o/w Dividends paid	(826)	(826)	(1,032)	(1,032)
Adj. PBT	(11,658)	23,885	34,273	42,522	o/w Shares issued/(repurchased)	193	1,711	0	0
Tax	2,520	(4,088)	(7,883)	(9,780)	o/w Net debt issued/(repaid)	6,474	(6,785)	(3,429)	(3,266)
Minority Interest	-	-	-	-	Net change in cash	2,512	5,235	11,998	23,300
Adj. Net Income	(9,138)	19,797	26,390	32,742	Adj. Free cash flow to firm	(584)	15,161	16,379	26,979
Reported EPS	(12,550)	27,190	36,246	44,970	y/y Growth	-93.0%	-2695.7%	8.0%	64.7%
Adj. EPS	(12,550)	27,190	36,246	44,970					
DPS	1,200	1,500	1,500	1,500					
Payout ratio	NM	5.5%	4.1%	3.3%					
Shares outstanding	728	728	728	728					
Balance Sheet	FY23A	FY24A	FY25E	FY26E	Ratio Analysis	FY23A	FY24A	FY25E	FY26E
Cash and cash equivalents	8,921	14,156	26,154	49,454	Gross margin	-1.6%	48.1%	51.3%	52.5%
Accounts receivable	6,600	13,019	13,971	14,922	EBITDA margin	18.1%	54.5%	56.8%	57.6%
Inventories	13,481	13,314	17,524	18,717	EBIT margin	-23.6%	35.5%	39.3%	40.5%
Other current assets	1,466	1,790	2,253	2,215	Net profit margin	-27.9%	29.9%	29.7%	31.0%
Current assets	30,468	42,279	59,903	85,309	ROE	-15.6%	31.1%	30.5%	28.4%
PP&E	52,705	60,157	63,368	65,056	ROA	-8.9%	18.0%	20.3%	21.2%
LT investments	13,323	13,400	13,400	13,400	ROCE	-11.1%	21.7%	25.0%	24.8%
Other non current assets	3,835	4,019	4,019	4,019	SG&A/Sales	0.9%	0.4%	0.4%	0.4%
Total assets	100,330	119,855	140,690	167,783	Net debt/Equity	0.4	0.1	NM	NM
Short term borrowings	9,857	5,252	5,247	5,241	Net debt/EBITDA	3.5	0.2	NM	NM
Payables	1,846	2,277	2,634	2,373	Sales/Assets (x)	0.3	0.6	0.7	0.7
Other short term liabilities	9,305	17,436	15,693	14,287	Assets/Equity (x)	1.7	1.7	1.5	1.3
Current liabilities	21,008	24,965	23,574	21,902	Interest cover (x)	4.7	36.0	183.4	NM
Long-term debt	19,611	17,431	14,008	10,748	Operating leverage	803.6%	-395.6%	143.0%	118.9%
Other long term liabilities	6,207	3,543	3,835	4,151	Tax rate	-21.6%	17.1%	23.0%	23.0%
Total liabilities	46,826	45,940	41,417	36,800	Revenue y/y Growth	-26.6%	102.0%	34.2%	19.0%
Shareholders' equity	53,504	73,916	99,274	130,983	EBITDA y/y Growth	-71.2%	506.5%	39.9%	20.8%
Minority interests	-	-	-	-	EPS y/y Growth	-507.6%	-316.7%	33.3%	24.1%
Total liabilities & equity	100,330	119,855	140,690	167,783					
BVPS	73,485	101,520	136,348	179,900					
y/y Growth	-15.5%	38.2%	34.3%	31.9%					
Net debt/(cash)	20,548	8,527	(6,900)	(33,466)					
Valuation	FY23A	FY24A	FY25E	FY26E					
P/E (x)	NM	7.3	5.5	4.4					
P/BV (x)	2.7	1.9	1.4	1.1					
EV/EBITDA (x)	27.7	4.2	2.7	1.8					
Dividend Yield	0.6%	0.8%	0.8%	0.8%					

Source: Company reports and J.P. Morgan estimates.

Note: W in billions (except per-share data). Fiscal year ends Dec. o/w - out of which

SK hynix (000660 KS) - Rating and price target changes as of 02-Apr-25

Date	Rating	Price Target (Won)
26-Apr-23	OW	120,000
12-Jun-23	OW	150,000
26-Jul-23	OW	150,000
22-Sep-23	OW	150,000
07-Nov-23	OW	160,000
25-Jan-24	OW	175,000
22-Feb-24	OW	185,000
28-Mar-24	OW	260,000
25-Apr-24	OW	260,000
16-Jul-24	OW	300,000
25-Jul-24	OW	300,000
08-Sep-24	OW	240,000
24-Oct-24	OW	260,000
10-Dec-24	OW	210,000
23-Jan-25	OW	280,000
02-Apr-25	OW	300,000

Source: Bloomberg Finance L.P., J.P. Morgan.

Nanya Technology

▲ Neutral

Previous: Underweight

2408.TW, 2408 TT

Price (02 Apr 25): NT\$41.10

▲ Price Target (Dec-25): NT\$46.50

Prior (Dec-25): NT\$20.00

Technology - Semiconductors

Jay Kwon AC

(82-2) 758-5725

jay.h.kwon@jpmorgan.com

J.P. Morgan Securities (Far East) Limited, Seoul Branch

Key Changes (FYE Dec)

	Prev	Cur
Adj. EPS - 25E (NT\$)	(2.12)	0.36
Adj. EPS - 26E (NT\$)	0.66	2.67

Quarterly Forecasts (FYE Dec)

Adj. EPS (NT\$)	2024A	2025E	2026E
Q1	(0.39)	(0.43)	0.53
Q2	(0.26)	(0.33)	0.71
Q3	(0.48)	0.45	0.72
Q4	(0.51)	0.68	0.71
FY	(1.64)	0.36	2.67

Style Exposure

Quant Factors	Current %Rank	Hist %Rank (1=Top)				
		6M	1Y	3Y	5Y	
Value	98	63	82	40	59	
Growth	54	26	9	79	53	
Momentum	99	100	58	18	42	
Quality	99	98	98	93	43	
Low Vol	70	54	51	59	75	
ESGQ	8	96	91	21	14	

Shorter upcycle and moderate pricing growth; Upgrade to N and raise PT to NT\$46.5

We upgrade NYT to Neutral with a revised Dec-25 PT of NT\$46.5, based on 0.85x FY25E P/B on earlier legacy bottom-out. After two consecutive years of loss-making and bit shipment decline, we expect improving legacy fundamentals and DDR5 migration points to positive ROE generation throughout FY25E-26E. Compared to previous upcycles, we expect magnitude of earnings growth to moderate under our shorter legacy upcycle view. China competition remains intact and we see lingering pricing risk poses structural overhang on the share price. After 41% share rally YTD (vs. peers: 10%), we expect NYT shares to range-bound and recommend investors to stay on the sidelines.

- **Memory upcycle bodes well with earnings, albeit moderating magnitude.** 1Q25 revenue turned out to be ahead consensus, and we expect NYT to print positive earnings from 3Q as pricing turns positive from 2Q25 aided by improving legacy fundamentals across supply side (i.e. DDR4 phase out from major memory makers) and demand side (normalizing inventory at customers, pull-in demand from tariff risk, etc.). DDR5 transition is on track and bodes well for bit growth and blended ASP trend and we assume DDR5 bit mix to reach ~45% by yearend. Provided positive market setup, we expect NYT to exit the year with positive earnings, albeit both the magnitude of y-y earnings growth and absolute OP print being much less than previous upcycles given our view of shorter legacy downcycle which points to shorter upcycle .

- **China competition poses structural risk to NYT.** We expect competition from CXMT to persist as its nameplate capacity ramps to~230k wfpm this year, which far surpasses NYT's current capacity of 63K wfpm, potentially leading to market share loss in the domestic Chinese market. While NYT is on track to migrate capacity to DDR5, we expect legacy DRAM (DDR3/4) portion to account near half of NYT's total sales in FY25E, exposing itself to pricing risk, in our view. Of note, China sales accounted mid-10% of NYT's total sales in FY23/24 vs. mid-40% in FY21/22.

- **U/G to Neutral on positive earnings setup discounted by China competition and shorter upcycle.** NYT shares have risen 41% since the turn of the year (vs. memory peers: 10%), making it the best performing stock among memory peers due to an earlier-than-expected legacy bottom out and pure-DRAM beta player, in our view. Compared to previous memory upcycles, we highlight current upcycle points to NYT printing lower OP and moderating OP y-y growth that valuation discount is necessary under lingering China competition risk. Despite positive ROE generation in the next two years, we expect valuation to derate with company trading <1x P/B (vs. previous upcycle trading at 1.4x.-1.6x). Key catalysts include: (1) SEC/SKH faster-than-expected DDR4 phase out, where legacy demand improvement may result in a DDR4 shortage and pricing hike; (2) CXMT's capacity ramp progress and yield updates in DDR5/LPDDR5 market; and (3) NYT's faster-than-expected DDR5 ramp-up.

Estimate changes

Table 21: NYT – Annual revised vs. previous estimates

NT\$ in millions, year-end December

NT\$ billion	Revised			Previous			Change (%)		
	2024	2025E	2026E	2024	2025E	2026E	2024	2025E	2026E
Revenues (NT\$ in bn)	34,132	39,487	52,829	34,132	30,520	42,031	0%	29%	26%
Gross profit	(421)	8,199	17,842	(421)	120	10,146	n.a.	6730%	76%
GM (%)	-1.2%	20.8%	33.8%	-1.2%	0.4%	24.1%	0bps	2,037bps	963bps
Operating profit	(10,555)	(2,594)	7,213	(10,555)	(9,320)	1,429	n.a.	n.a.	405%
OPM (%)	-30.9%	-6.6%	13.7%	-30.9%	-30.5%	3.4%	0bps	2,397bps	1,025bps
Net profit	(5,083)	1,116	8,262	(5,083)	(6,576)	2,050	n.a.	n.a.	303%
EPS (NT\$)	-1.64	0.36	2.67	-1.64	-2.12	0.66	n.a.	n.a.	303%

Source: J.P. Morgan estimates.

Table 22: J.P. Morgan estimates vs. consensus

NT\$ in millions

	JPM estimates				Market consensus				Difference			
	1Q25E	2Q25E	2025E	2026E	1Q25E	2Q25E	2025E	2026E	1Q25E	2Q25E	2025E	2026E
Revenues (NT\$ in mn)	7,188	8,294	39,487	52,829	6,388	7,234	33,467	46,767	13%	15%	18%	13%
Operating profit	-2,645	-2,394	-2,594	7,213	-3,016	-2,414	-8,426	-484	n.a.	n.a.	n.a.	n.a.
Net profit	-1,340	-1,038	1,116	8,262	-1,678	-1,164	-3,908	2,936	n.a.	n.a.	n.a.	181%

Source: Bloomberg Finance L.P., J.P. Morgan estimates.

Table 23: 1Q25 earnings preview table

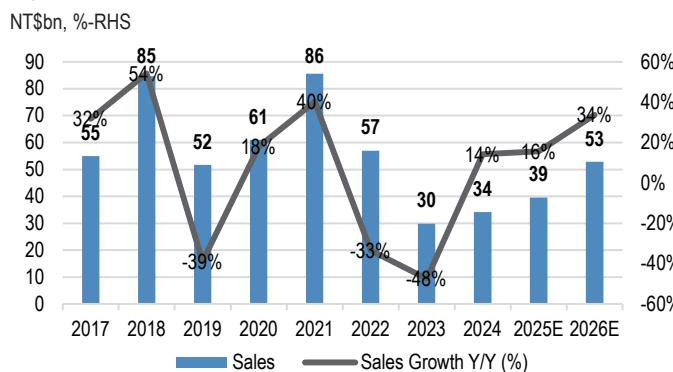
NT\$ in millions, year-end 31 December

(NT\$ mn)	1Q24	4Q24	1Q25 JPMe	Q/Q (%)	Y/Y (%)	BBG	Diff. (%)
Sales	9,503	6,575	7,188	9.3%	-24.4%	6,388	13%
Gross profit	(277)	(695)	(95)	na	na	-585	na
Gross Margin	-3%	-11%	-1%	925 bps	159 bps	-9.2%	784 bps
Operating profit	(2,918)	(2,812)	(2,645)	na	na	(3,016)	na
Operating Margin	-31%	-43%	-37%	596 bps	-609 bps	-47%	1041 bps
Net Income	(1,208)	(1,574)	(1,340)	na	na	(1,678)	na
Net Income Margin (%)	-13%	-24%	-19%	529 bps	-592 bps	-26%	763 bps
New Taiwan GAAP EPS	(0.39)	(0.51)	(0.43)	na	na	(0.61)	na

Source: J.P. Morgan estimates, Bloomberg Finance L.P., Company data.

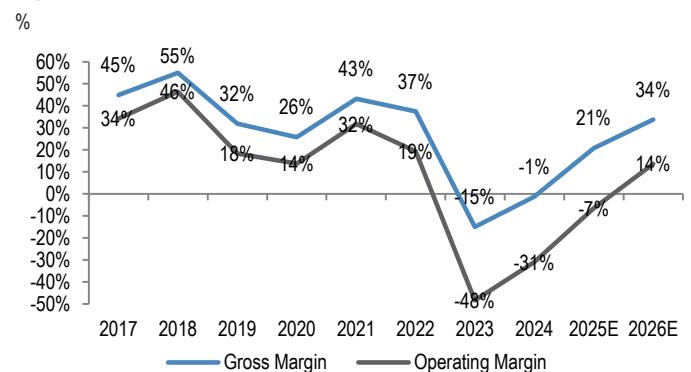
Key business charts

Figure 140: NYT - Annual revenue and Y/Y trend



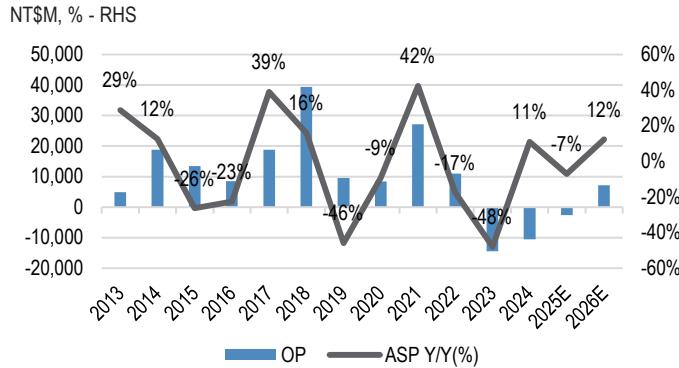
Source: Company data, J.P. Morgan estimates.

Figure 141: NYT - OPM and GM trends



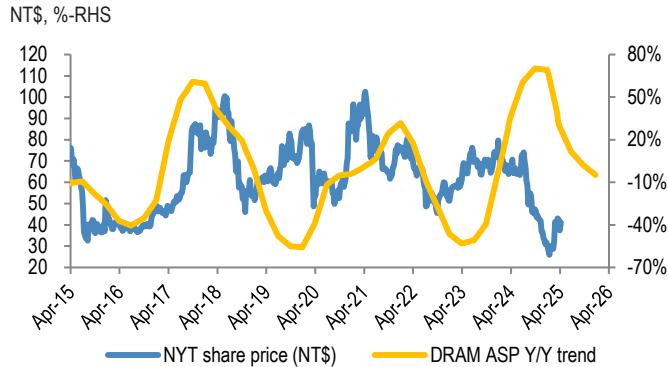
Source: Company data, J.P. Morgan estimates.

Figure 142: NYT absolute OP vs. ASP % change trend



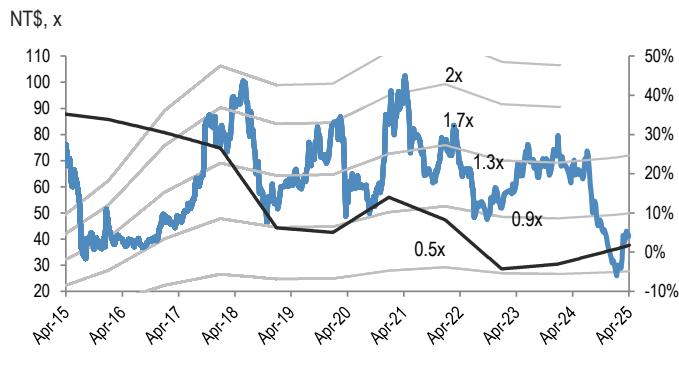
Source: Company data, J.P. Morgan estimates.

Figure 144: NYT shares vs. DRAM ASP Y/Y trend



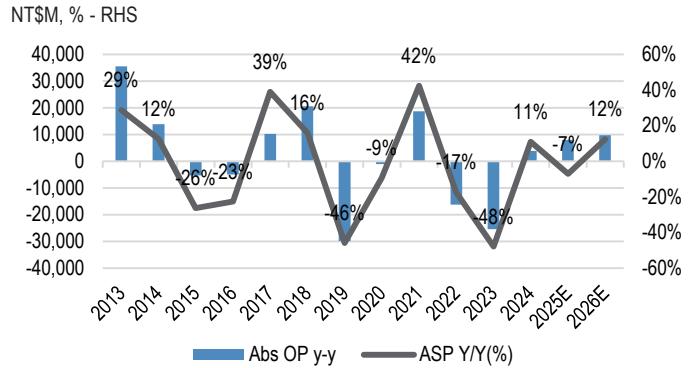
Source: Bloomberg Finance L.P., J.P. Morgan estimates. Note: Dec-24 onwards are J.P. Morgan estimates.

Figure 146: NYT - FTM P/B bands



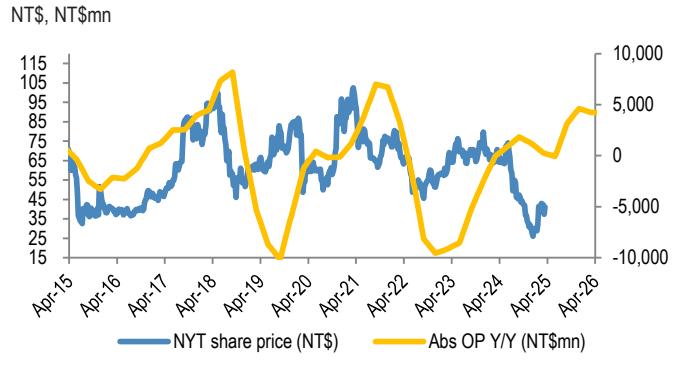
Source: Bloomberg Finance L.P., J.P. Morgan estimates, Company data.

Figure 143: NYT absolute OP y-y vs. ASP % change trend



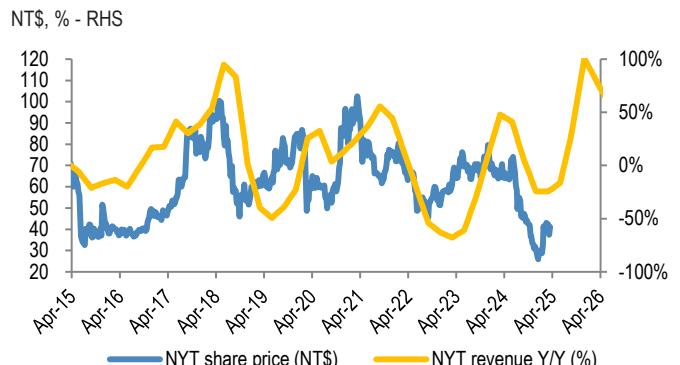
Source: Company data, J.P. Morgan estimates.

Figure 145: NYT shares vs. absolute OP Y/Y trend



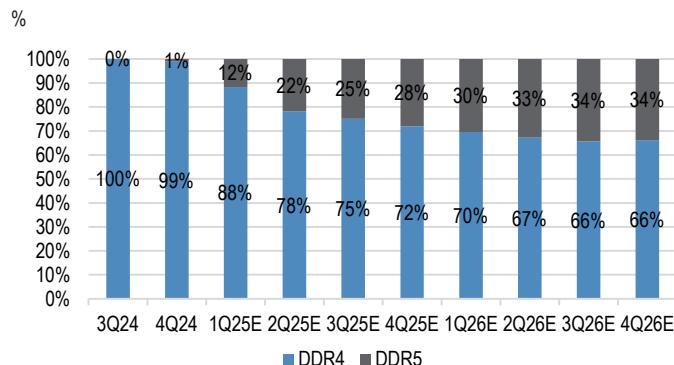
Source: Bloomberg Finance L.P., Company data, J.P. Morgan estimates. Note: Dec-24 onwards are J.P. Morgan estimates.

Figure 147: NYT shares vs. absolute revenue Y/Y trend



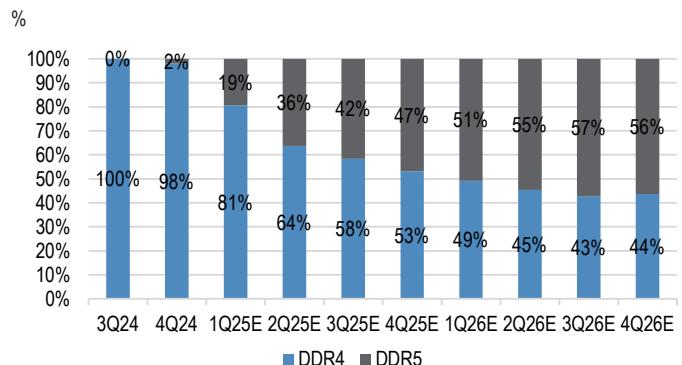
Source: Bloomberg Finance L.P., Company data, J.P. Morgan estimates. Note: Dec-24 onwards are J.P. Morgan estimates.

Figure 148: DDR3/4 vs. DDR5 wafer input mix



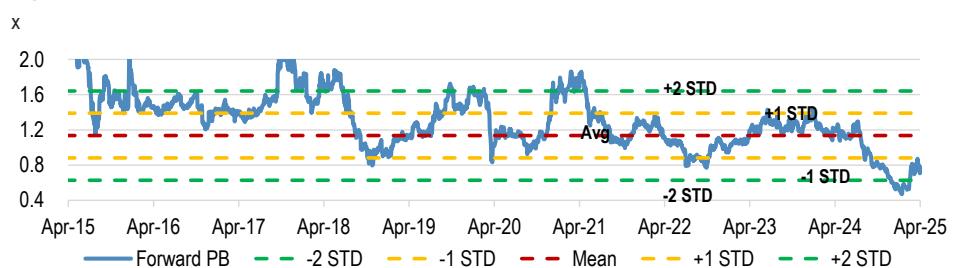
Source: J.P. Morgan estimates, Company data.

Figure 149: DDR3/4 vs. DDR5 bit mix trend



Source: J.P. Morgan estimates, Company data.

Figure 150: NYT FTM P/B chart



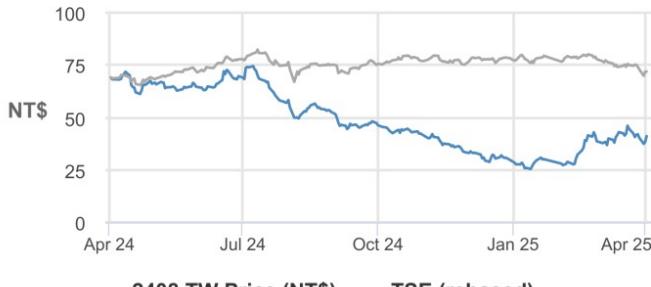
Source: Bloomberg Finance L.P.

Table 24: NYT - Earnings table

NT\$mn	FY23				FY24				FY25E				FY26E				FY23	FY24	FY25E	FY26E	
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1QE	2QE	3QE	4QE	1QE	2QE	3QE	4QE					
Sales	6,425	7,027	7,736	8,704	9,503	9,921	8,133	6,575	7,188	8,294	10,806	13,199	12,894	13,196	13,176	13,563	29,892	34,132	39,487	52,829	
Gross profit	-554	-788	-1,953	-1,188	-277	287	264	-695	-95	281	3,412	4,600	4,295	4,518	4,495	4,535	-4,483	-421	8,199	17,842	
Operating (EBIT)	-2,885	-3,185	-4,340	-4,050	-2,918	-2,319	-2,505	-2,812	-2,645	-2,394	638	1,806	1,599	1,827	1,832	1,955	-14,460	-10,555	-2,594	7,213	
Net profit	-1,685	-771	-2,505	-2,480	-1,208	-814	-1,487	-1,574	-1,340	-1,038	1,382	2,112	1,640	2,194	2,236	2,191	-7,440	-5,083	1,116	8,262	
FD EPS (NT\$)	-0.54	-0.25	-0.81	-0.80	-0.39	-0.26	-0.48	-0.51	-0.43	-0.33	0.45	0.68	0.53	0.71	0.72	0.71	-2.40	-1.64	0.36	2.67	
Key assumption																					
Capacity wpm ('000 waf, 12'eq)	64	64	62	60	60	60	60	60	60	62	64	64	64	64	64	68	63	60	63	65	
Bit shipments (4Gb eq.)	168	192	225	249	253	237	184	169	197	222	275	321	297	297	297	316	834	843	1,014	1,207	
Blended ASP (US\$/4Gb)	1.25	1.18	1.08	1.09	1.19	1.31	1.38	1.20	1.10	1.13	1.19	1.24	1.31	1.34	1.34	1.30	1.14	1.27	1.18	1.32	
Margins (%)																					
Gross	-8.6	-11.2	-25.2	-13.6	-2.9	2.9	3.2	-10.6	-1.3	3.4	31.6	34.9	33.3	34.2	34.1	33.4	-15.0	-1.2	20.8	33.8	
Operating	-44.9	-45.3	-56.1	-46.5	-30.7	-23.4	-30.8	-42.8	-36.8	-28.9	5.9	13.7	12.4	13.8	13.9	14.4	-48.4	-30.9	-6.6	13.7	
EBITDA	13.6	9.4	-6.1	-2.2	12.2	17.5	18.6	18.0	14.4	15.9	38.0	39.1	38.3	39.5	40.0	40.1	-2.9	16.4	29.4	39.5	
Net	-26.2	-11.0	-32.4	-28.5	-12.7	-8.2	-18.3	-23.9	-18.6	-12.5	12.8	16.0	12.7	16.6	17.0	16.2	-24.9	-14.9	2.8	15.6	
Growth (% Q/Q)																					
Shipment	-9	14	17	11	2	-6	-23	-8	17	13	24	17	-7	0	0	6					
ASP	-9	-5	-9	1	9	11	5	-13	-8	2	5	4	6	2	0	-3					
Sales	-19	9	10	13	9	4	-18	-19	9	15	30	22	-2	2	0	3					
Gross profit	-153	42	148	-39	-77	-204	-8	-363	-86	-397	1,113	35	-7	5	-1	1					
EBIT	n.m.	183	-11	14	0	7															
Net profit	n.m.	53	-22	34	2	-2															
EPS	n.m.	53	-22	34	2	-2															
Growth (% Y/Y)																					
Shipment	(36)	(22)	19	35	50	23	(18)	(32)	(22)	(6)	50	90	51	34	8	(2)	(6)	1	20	19	
ASP	(54)	(52)	(43)	(20)	(5)	11	28	10	(7)	(14)	(14)	4	19	19	13	4	(48)	11	(7)	12	
Sales	(68)	(61)	(30)	9	48	41	5	(24)	(24)	(16)	33	101	79	59	22	3	(48)	14	16	34	
Gross profit	(106)	(110)	(154)	(215)	(50)	(136)	(114)	(42)	(66)	(2)	1,194	(762)	(4,639)	1,506	32	(1)	(121)	(91)	(2,049)	118	
EBIT	n.m.	n.m.	187	8	n.m.	n.m.	n.m.	n.m.													
Net profit	n.m.	n.m.	62	4	n.m.	n.m.	n.m.	641													
EPS	n.m.	n.m.	62	4	n.m.	n.m.	n.m.	641													

Source: Company data, J.P. Morgan estimates.

Price Performance



	YTD	1m	3m	12m
Abs	40.5%	6.3%	44.5%	-40.5%
Rel	48.0%	14.0%	51.2%	-44.6%

Company Data

Shares O/S (mn)	3,103
52-week range (NT\$)	75.40-24.70
Market cap (\$ mn)	3,840
Exchange rate	33.22
Free float (%)	34.9%
3M ADV (mn)	56.00
3M ADV (\$ mn)	64.7
Volatility (90 Day)	62
Index	TAIEX
BBG ANR (Buy Hold Sell)	3[8]4

Key Metrics (FYE Dec)

	FY24A	FY25E	FY26E
Financial Estimates			
Revenue	34,132	39,487	52,829
Adj. EBIT	(10,555)	(2,594)	7,213
Adj. EBITDA	5,589	11,621	20,848
Adj. net income	(5,083)	1,116	8,262
Adj. EPS	(1.64)	0.36	2.67
BBG EPS	(1.56)	(0.92)	0.48
Cashflow from operations	10,289	(17,592)	26,418
FCFF	(19,357)	(48,880)	(3,146)
Margins and Growth			
Revenue Growth Y/Y (%)	14.2%	15.7%	33.8%
EBIT margin	(30.9%)	(6.6%)	13.7%
EBIT Growth Y/Y (%)	(27.0%)	(75.4%)	(378.0%)
EBITDA margin	16.4%	29.4%	39.5%
EBITDA Growth Y/Y (%)	545.8%	107.9%	79.4%
Net margin	(14.9%)	2.8%	15.6%
Adj. EPS growth	(31.7%)	(121.9%)	640.5%
Ratios			
Adj. tax rate	(22.5%)	20.0%	20.0%
Interest cover	NM	NM	NM
Net debt/Equity	NM	NM	NM
Net debt/EBITDA	NM	NM	NM
ROE	(3.1%)	0.7%	4.8%
Valuation			
FCFF yield	(15.2%)	(38.4%)	(2.5%)
Dividend yield	0.0%	0.0%	0.0%
EV/Revenue	4.2	4.5	3.3
EV/EBITDA	25.5	15.4	8.4
Adj. P/E	NM	114.2	15.4

Summary Investment Thesis and Valuation

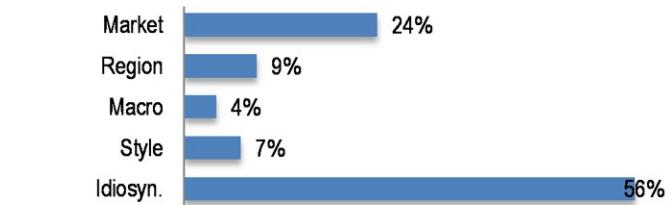
Investment Thesis

We are Neutral on NYT due to earlier pricing upcycle leading to profit turnaround in FY25E offset by shorter legacy upcycle and structural China competition risk. Despite the pricing turnaround in 2Q, we believe the magnitude and longevity of the upcoming pricing upcycle will be milder compared to previous upcycles. Despite NYT's intention to migrate to DDR5, we believe legacy DRAM exposure still remains high (53% of sales in FY25E) which poses structural risk on pricing from China competition.

Valuation

Our Dec-25 PT of NT\$46 is based on 0.85x FY25E P/B, based on a mid-down-cycle valuation. Despite memory pricing turnaround, we expect the magnitude of the OP print and OP y-y growth to be milder compared to historical upcycles, hence we think a valuation discount is necessary to reflect tepid growth under lingering China competition.

Performance Drivers



Factors	6M Corr	1Y Corr
Market: MSCI Asia Pac ex JP	0.51	0.49
Region: Taiwan	0.28	0.35
Macro:		
Emerging Central Bank Rate	-0.35	-0.31
Emerging Economies CPI(YoY)	0.34	0.28
HSI Volatility Index	-0.23	-0.19
Quant Styles:		
Quality	-0.21	-0.23
Momentum	0.15	0.21
Growth	0.05	0.17

Investment Thesis, Valuation and Risks

Nanya Technology (*Neutral; Price Target: NT\$46.50*)

Investment Thesis

We are Neutral on NYT due to earlier pricing upcycle leading to profit turnaround in FY25E offset by shorter legacy upcycle and structural China competition risk. Despite the pricing turnaround in 2Q, we believe the magnitude and longevity of the upcoming pricing upcycle will be milder compared to previous upcycles. Despite NYT's intention to migrate to DDR5, we believe legacy DRAM exposure still remains high (53% of sales in FY25E) which poses structural risk on pricing from China competition.

Valuation

Our Dec-25 PT of NT\$46 is based on 0.85x FY25E P/B, based on a mid-down-cycle valuation. Despite memory pricing turnaround, we expect the magnitude of the OP print and OP y-y growth to be milder compared to historical upcycles, hence we think a valuation discount is necessary to reflect tepid growth under lingering China competition.

Risks to Rating and Price Target

Upside risks include: (1) SEC/SKH faster-than-expected DDR4 phase out, where legacy demand improvement may result in a DDR4 shortage and pricing hike; (2) CXMT's slower capacity ramp and yield/performance challenges in the LPDDR5 market; and (3) NYT's faster-than-expected DDR5 ramp-up.

Downside risks include: (1) CXMT's faster capacity ramp and yield/performance improvements in the LPDDR5 market; and (2) NYT's slower-than-expected DDR5 ramp-up.

Nanya Technology: Summary of Financials

Income Statement	FY23A	FY24A	FY25E	FY26E	Cash Flow Statement	FY23A	FY24A	FY25E	FY26E
Revenue	29,892	34,132	39,487	52,829	Cash flow from operating activities	(135)	10,289	(17,592)	26,418
COGS	(19,050)	(18,408)	(17,073)	(21,353)	o/w Depreciation & amortization	15,326	16,144	14,215	13,634
Gross profit	(4,483)	(421)	8,199	17,842	o/w Changes in working capital	(13,021)	(5,772)	(37,923)	(478)
SG&A	(2,401)	(2,449)	(3,393)	(3,429)	Cash flow from investing activities	(12,648)	(30,576)	(33,600)	(32,575)
Adj. EBITDA	865	5,589	11,621	20,848	o/w Capital expenditure	(12,528)	(25,931)	(28,600)	(27,575)
D&A	(15,326)	(16,144)	(14,215)	(13,634)	as % of sales	41.9%	76.0%	72.4%	52.2%
Adj. EBIT	(14,460)	(10,555)	(2,594)	7,213	Cash flow from financing activities	6,243	15,109	(1,589)	687
Net Interest	3,097	3,032	3,361	2,486	o/w Dividends paid	(6,600)	0	0	0
Adj. PBT	(10,705)	(6,557)	1,395	10,327	o/w Shares issued/(repurchased)	1	5	0	0
Tax	3,265	1,474	(279)	(2,065)	o/w Net debt issued/(repaid)	11,181	10,089	(2,589)	(313)
Minority Interest	0	0	0	0	Net change in cash	(6,783)	(5,421)	(53,023)	(5,713)
Adj. Net Income	(7,440)	(5,083)	1,116	8,262	Adj. Free cash flow to firm	(16,704)	(19,357)	(48,880)	(3,146)
Reported EPS	(2.40)	(1.64)	0.36	2.67	y/y Growth	(765.3%)	15.9%	152.5%	(93.6%)
Adj. EPS	(2.40)	(1.64)	0.36	2.67	Ratio Analysis	FY23A	FY24A	FY25E	FY26E
DPS	2.13	0.00	0.00	0.00	Gross margin	(15.0%)	(1.2%)	20.8%	33.8%
Payout ratio	NM	0.0%	0.0%	0.0%	EBITDA margin	2.9%	16.4%	29.4%	39.5%
Shares outstanding	3,098	3,099	3,099	3,099	EBIT margin	(48.4%)	(30.9%)	(6.6%)	13.7%
Balance Sheet	FY23A	FY24A	FY25E	FY26E	Net profit margin	(24.9%)	(14.9%)	2.8%	15.6%
Cash and cash equivalents	58,812	61,903	22,401	27,030	ROE	(4.3%)	(3.1%)	0.7%	4.8%
Accounts receivable	8,668	8,040	16,140	16,585	ROA	(3.8%)	(2.5%)	0.5%	3.8%
Inventories	27,634	35,318	67,282	66,910	ROCE	(10.5%)	(7.1%)	(1.1%)	3.0%
Other current assets	1,396	2,685	6,003	6,960	SG&A/Sales	8.0%	7.2%	8.6%	6.5%
Current assets	96,510	107,946	111,825	117,486	Net debt/Equity	NM	NM	NM	NM
PP&E	81,838	84,327	87,612	90,477	Net debt/EBITDA	NM	NM	NM	NM
LT investments	-	-	-	-	Sales/Assets (x)	0.2	0.2	0.2	0.2
Other non current assets	14,003	14,433	14,600	14,575	Assets/Equity (x)	1.1	1.2	1.3	1.3
Total assets	192,351	206,706	214,037	222,538	Interest cover (x)	NM	NM	NM	NM
Short term borrowings	11,181	21,270	18,681	18,369	Operating leverage	487.1%	(190.4%)	(480.7%)	(1118.8%)
Payables	3,443	5,180	3,769	3,958	Tax rate	(30.5%)	(22.5%)	20.0%	20.0%
Other short term liabilities	5,493	6,330	13,199	13,563	Revenue y/y Growth	(47.5%)	14.2%	15.7%	33.8%
Current liabilities	20,118	32,780	35,650	35,890	EBITDA y/y Growth	(96.7%)	545.8%	107.9%	79.4%
Long-term debt	0	0	0	0	EPS y/y Growth	(150.9%)	(31.7%)	(121.9%)	640.5%
Other long term liabilities	5,309	8,873	8,873	8,873	Valuation	FY23A	FY24A	FY25E	FY26E
Total liabilities	25,427	41,653	44,523	44,763	P/E (x)	NM	NM	114.2	15.4
Shareholders' equity	166,924	165,053	169,514	177,776	P/BV (x)	0.8	0.8	0.8	0.7
Minority interests	0	0	0	0	EV/EBITDA (x)	155.6	25.5	15.4	8.4
Total liabilities & equity	192,351	206,706	214,037	222,538	Dividend Yield	5.2%	0.0%	0.0%	0.0%
BVPS	53.88	53.27	54.71	57.37					
y/y Growth	(7.8%)	(1.1%)	2.7%	4.9%					
Net debt/cash)	(47,631)	(40,633)	(3,719)	(8,661)					

Source: Company reports and J.P. Morgan estimates.

Note: NT\$ in millions (except per-share data).Fiscal year ends Dec. o/w - out of which

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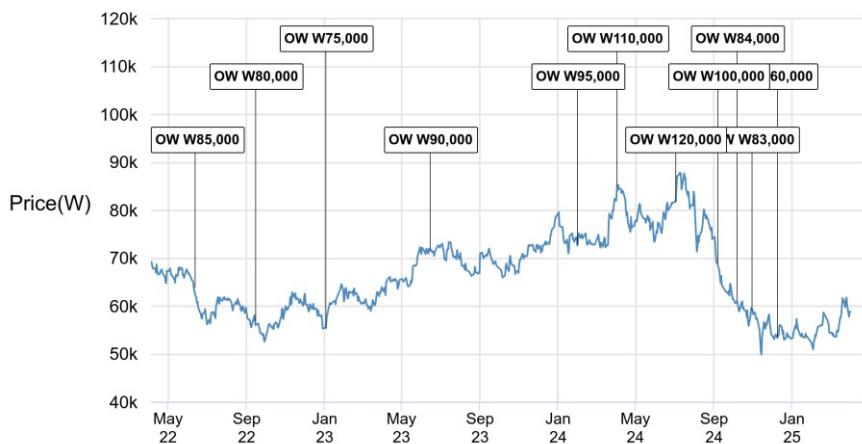
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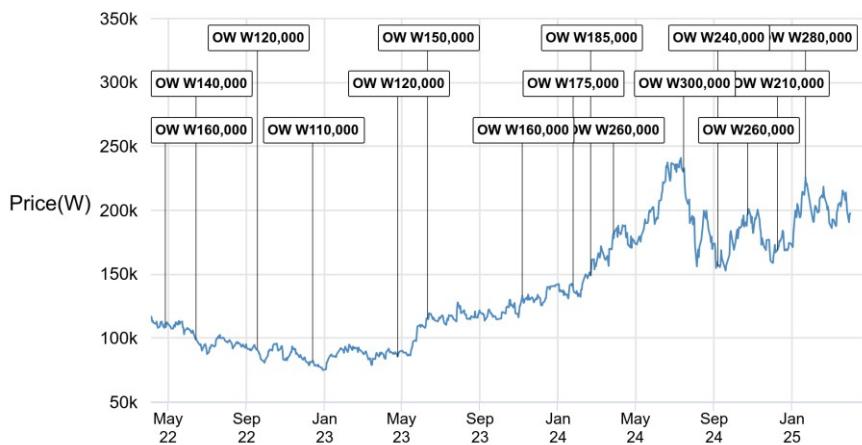
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Samsung Electronics (005930.KS, 005930 KS) Price Chart



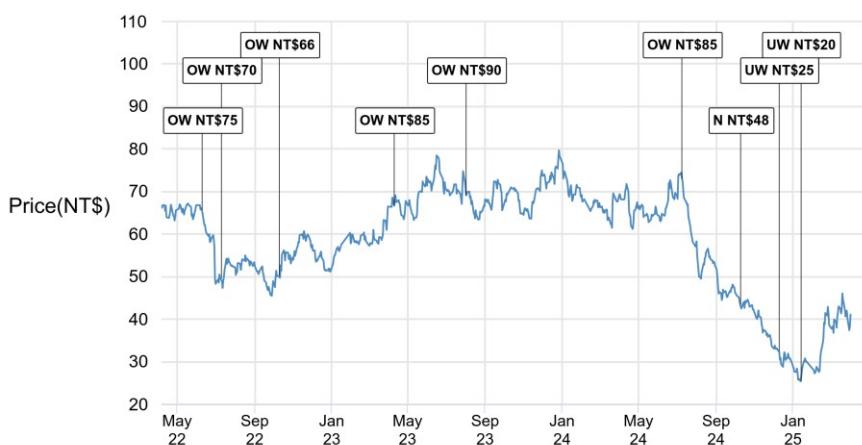
Source: Bloomberg Finance L.P. and J.P. Morgan; price data adjusted for stock splits and dividends.
 Initiated coverage Oct 09, 2011. All share prices are as of market close on the previous business day.

SK hynix (000660.KS, 000660 KS) Price Chart



Source: Bloomberg Finance L.P. and J.P. Morgan; price data adjusted for stock splits and dividends.
 Initiated coverage Dec 31, 2000. All share prices are as of market close on the previous business day.

Nanya Technology (2408.TW, 2408 TT) Price Chart



Source: Bloomberg Finance L.P. and J.P. Morgan; price data adjusted for stock splits and dividends.
 Initiated coverage Jun 11, 2018. All share prices are as of market close on the previous business day.

Date	Rating	Price (W)	Price Target (W)
13-Jun-22	OW	63800	85,000
15-Sep-22	OW	56800	80,000
03-Jan-23	OW	55500	75,000
15-Jun-23	OW	71900	90,000
01-Feb-24	OW	72700	95,000
03-Apr-24	OW	85000	110,000
03-Jul-24	OW	81800	120,000
08-Sep-24	OW	68900	100,000
08-Oct-24	OW	61000	84,000
31-Oct-24	OW	59100	83,000
10-Dec-24	N	53400	60,000

Date	Rating	Price (W)	Price Target (W)
27-Apr-22	OW	111000	160,000
15-Jun-22	OW	99100	140,000
19-Sep-22	OW	91200	120,000
14-Dec-22	OW	82300	110,000
26-Apr-23	OW	85500	120,000
12-Jun-23	OW	115400	150,000
07-Nov-23	OW	133000	160,000
25-Jan-24	OW	141500	175,000
22-Feb-24	OW	149000	185,000
28-Mar-24	OW	181200	260,000
16-Jul-24	OW	230000	300,000
08-Sep-24	OW	156400	240,000
24-Oct-24	OW	196000	260,000
10-Dec-24	OW	168900	210,000
23-Jan-25	OW	225500	280,000

Date	Rating	Price (NT\$)	Price Target (NT\$)
10-Jun-22	OW	65.70	75
11-Jul-22	OW	49.65	70
11-Oct-22	OW	50.20	66
11-Apr-23	OW	66.70	85
03-Aug-23	OW	69.10	90
10-Jul-24	OW	73.00	85
11-Oct-24	N	43.50	48
10-Dec-24	UW	32.50	25
14-Jan-25	UW	25.40	20

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