US Semiconductors

State of the Union: raising estimates, industry TAM doubling to $3.2tn CY30

Industry Overview

18% CY26-30 CAGR up from 14% prior on memory/servers

We reiterate our thesis of the AI industry moving to addressing structural and physical (chips, power) constraints, from having to defend return-on-investment before. Memory chip shortages and price inflation remain a critical lever behind industry growth upside but we note a brighter outlook for AI/severs as well. Specifically, we raise our CY30E total semis industry TAM estimate to $3.2Tn, or +18% CAGR between CY26-30E, from $2.7Tn/+14% CAGR prior, led mostly by growth in memory/data center, and also incrementally by higher recovery in auto/industrial. Effectively, the industry took 50 years to reach the $1Tn sales milestone, and is already set to double its TAM in four years from $1.7Tn today.

WFE: raising TAM, expect $270bn by CY28, $360bn CY30

We raise our WFE estimates as AI continues to drive robust demand for logic and memory wafers on a multi-year basis with visibility extending into CY28 while additional cleanroom capacity unlocks NT upside. Our new CY26 WFE is $156bn (+33% YoY), up from $144bn, while CY27 moves to $210bn (+34% YoY) up from $190bn. Upside largely comes from higher expectations for memory WFE (especially DRAM), reaching $61bn (+46% YoY)/$85bn (+38% YoY) CY26/27, respectively. Longer-term, we believe the industry could expand towards $360bn WFE by CY30, +23% CY26-30 CAGR, faster than total semis (18% CAGR) on advanced logic (sub-3nm) expansion, new nodes like A14, high-bandwidth memory (HBM) and other advanced DRAM, and NAND greenfield.

Data Center/AI still the brightest area in semis

Despite rising concerns around potential AI infra/investment slowdown, we see no signs of slowing in customer orders, LTAs, capacity commitments, or semis pricing (memory/GPU rental). For instance, latest memory pricing is flattish week-on-week for both DRAM/NAND, and the latest GPU rental pricing for NVDA's B200 is $5.72/hr, up consistently over the last two months and only <10% below ~$6.10 peak from March. We also hosted AMD IR Matt Ramsay on Monday (see report here) who also sees no specific signs of customer slowdown. 2027 remains much a fully booked/contracted year across all compute/networking/memory vendors, and we expect 2028 to also remain tight led by accelerating demand for CPUs, XPU attach, and new optics-based scale-up, as well as accelerating AI accelerator business at multiple ASIC and GPU vendors.

Valuation compelling, favor compute, networking, analog

Despite a 67% YTD gain in the SOX, semis still screen attractively relative to growth. The group trades at 18x NTM PE, below SPX's 19x despite 139% YoY EPS growth, roughly 7x faster than the broader market. We remain tactically cautious until the midterms pass and macro concerns begin to moderate. More recently, the index has corrected approximately 17% as investors reassess AI durability. While the sector may remain range-bound in the near term, we expect Compute (NVDA, AMD), Networking (MRVL), and Analog (ADI, ON) to demonstrate greater resilience. If momentum resumes, we think MU, LRCX, AMAT, and INTC could lead.

14 September 2026

Equity
United States
Semiconductors

Vivek Arya
Research Analyst
BofAS
vivek.arya@bofa.com

Duksan Jang
Research Analyst
BofAS
duksan.jang@bofa.com

Michael Mani
Research Analyst
BofAS
michael.mani@bofa.com

Liam Pharr
Research Analyst
BofAS
liam.pharr@bofa.com

Glossary at end of report

BofA Securities does and seeks to do business with issuers covered in its research reports. As a result, investors should be aware that the firm may have a conflict of interest that could affect the objectivity of this report. Investors should consider this report as only a single factor in making their investment decision.
Refer to important disclosures on page 20 to 23. Analyst Certification on page 19. Price Objective Basis/Risk on page 17. **13017961**

Timestamp: 14 September 2026 09:53PM EDT

Contents

Global Semis Forecast Update	3
Wafer Fab Equipment (WFE) Forecast	6
WFE approaching $400bn by CY30	8

Global Semis Forecast Update

We model CY26 semis/core semis (ex-memory) growth of +113%/+30% YoY, led by growth in memory, data center, and greatly improved outlook in industrial and automotive, offset by continued unit headwinds in PCs/smartphones/consumer.

By end market, we now model (1) compute and storage up +50% YoY (continued server strength); (2) wireless comms down -8% YoY (smartphone unit headwind); (3) auto sales up +12% on weak units but quickly improving content; (4) Industrial up +32% YoY on improved end demand and inventory dynamics since 2H25; (5) consumer down -7% YoY; and (6) wired comms up +29% YoY on data center related infra buildout.

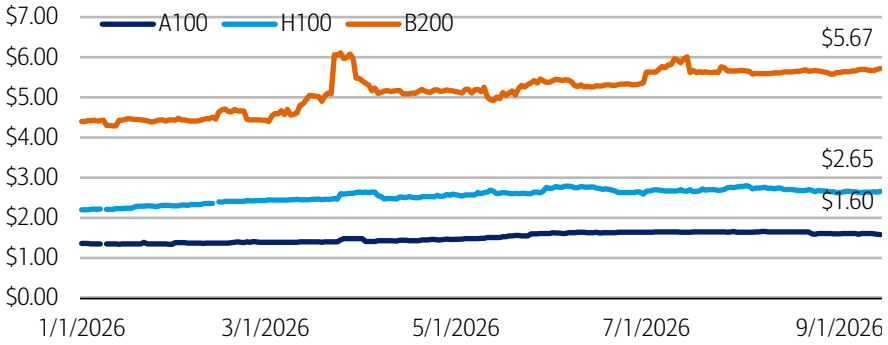
Exhibit 1: We now see total semis sales of $3.2Tn (+18% CAGR CY26-30), vs. $2.7Tn prior (+14% CAGR), with core semis now at $1.4Tn (+16% CAGR) vs. $1.1Tn prior (+11% CAGR)
BofA Semiconductor forecasts by end market: New vs. Old

	New			Old		
Semiconductor Sales Summary	**2026**	**2030**	**CAGR**	**2026**	**2030**	**CAGR**
Total Semis Sales ($bn)	**$1,676.9**	**$3,203.7**	**18%**	**$1,593.4**	**$2,734.3**	**14%**
YoY	113.2%	11.0%		102.6%	9.5%	
Memory	$937.4	$1,853.1	**19%**	$873.5	$1,645.7	**17%**
YoY	326.9%	11.9%		297.8%	12.0%	
Core Semis (ex-memory, $bn)	**$739.5**	**$1,350.7**	**16%**	**$719.9**	**$1,088.6**	**11%**
YoY	30.4%	9.9%		27.0%	5.9%	
Servers (traditional/AI)	**$359.9**	**$848.7**	24%	**$356.1**	**$614.6**	15%
YoY	74.0%	12.8%		70.6%	6.6%	
PC	**$55.8**	**$68.7**	5%	**$55.8**	**$68.1**	5%
YoY	(9.3%)	2.5%		(9.3%)	3.1%	
Smartphone	**$71.1**	**$77.8**	2%	**$68.1**	**$78.3**	4%
YoY	(9.2%)	2.2%		(13.0%)	3.2%	
Automotive	**$60.0**	**$90.2**	11%	**$54.5**	**$77.9**	9%
YoY	12.0%	10.2%		4.1%	6.7%	
Industrial	**$65.7**	**$99.2**	11%	**$58.9**	**$82.3**	9%
YoY	32.0%	5.6%		18.2%	5.6%	
Other (storage, wired, wireless infra, consumer)	**$127.0**	**$166.1**	7%	**$126.7**	**$167.3**	7%
YoY	8.6%	5.5%		8.8%	5.3%	
Wafer Fab Equipment Spend	**2026**	**2030**	**CAGR**	**2026**	**2030**	**CAGR**
Total WFE ($bn)	**$155.9**	**$359.8**	**23%**	**$144.4**	**$291.7**	**19%**
YoY	33.4%	17.6%		23.5%	8.7%	
WFE Intensity (% of semis sales)	9.3%	11.2%		9.1%	10.7%	
Memory WFE ($bn)	**$61.3**	**$144.4**	24%	**$53.4**	**$108.5**	19%
YoY	45.7%	16.5%		27.0%	15.0%	
WFE Intensity (% of semis sales)	6.5%	7.8%		6.1%	6.6%	
Non-Memory WFE ($bn)	**$94.6**	**$215.3**	23%	**$91.0**	**$183.2**	19%
YoY	26.5%	18.3%		21.6%	5.3%	
WFE Intensity (% of semis sales)	12.8%	15.9%		12.6%	16.8%	

Source: BofA Global Research, Mercury Research, Gartner, Omdia, SIA

BofA GLOBAL RESEARCH

Exhibit 2: NVDA B200 spot rental pricing is still ~$5.70 vs. prior $6.10 peak from March 2026, suggesting continued strong broad-based demand
NVDA A100, H100, B200 GPU Rental Pricing Index



Source: Bloomberg, Silicon Data

BofA GLOBAL RESEARCH

Exhibit 3: We model semis/core semis sales up +113%/+30% YoY in CY26E
Summary of BofA Semiconductor forecasts by end market

Revenue ($mn)	2020	2021	2022	2023	2024	2025	2026E	2027E	2028E	2029E	2030E	CAGR '16-26	CAGR '21-26	CAGR '26-30
Total Semis	**$451**	**$572**	**$594**	**$528**	**$633**	**$787**	**$1,677**	**$2,243**	**$2,489**	**$2,885**	**$3,204**	**17.3%**	**24.0%**	**17.6%**
YoY%	7.7%	27.0%	3.8%	(11.0%)	19.7%	24.3%	113.2%	33.8%	10.9%	15.9%	11.0%			
Memory	**$128**	**$170**	**$150**	**$94**	**$170**	**$220**	**$937**	**$1,322**	**$1,402**	**$1,656**	**$1,853**	**28.4%**	**40.6%**	**18.6%**
YoY%	13.5%	33.4%	(11.9%)	(37.4%)	81.3%	28.9%	326.9%	41.1%	6.0%	18.2%	11.9%			
Core Semis (ex-memory)	**$323**	**$402**	**$444**	**$435**	**$463**	**$567**	**$739**	**$921**	**$1,087**	**$1,229**	**$1,351**	**10.9%**	**13.0%**	**16.3%**
YoY%	5.6%	24.4%	10.5%	(2.1%)	6.4%	22.6%	30.4%	24.5%	18.0%	13.1%	9.9%			
Compute and Storage	**$108**	**$128**	**$154**	**$167**	**$205**	**$297**	**$445**	**$599**	**$735**	**$851**	**$950**	**18.3%**	**28.3%**	**20.9%**
YoY%	11.2%	19.1%	20.3%	8.4%	22.5%	45.3%	49.8%	34.6%	22.6%	15.9%	11.6%			
PCs	**$56**	**$68**	**$59**	**$52**	**$57**	**$61**	**$56**	**$60**	**$64**	**$67**	**$69**	**3.2%**	**(3.9%)**	**5.4%**
YoY%	16.5%	22.3%	(12.4%)	(11.8%)	9.3%	7.2%	(9.3%)	7.1%	7.9%	4.0%	2.5%			
Servers (silicon only)	**$27**	**$32**	**$63**	**$80**	**$119**	**$207**	**$360**	**$509**	**$639**	**$753**	**$849**	**34.5%**	**62.5%**	**23.9%**
YoY%	2.2%	16.9%	97.3%	27.5%	48.7%	73.9%	74.0%	41.5%	25.6%	17.8%	12.8%			
Wireless Communications	**$85**	**$104**	**$111**	**$94**	**$93**	**$91**	**$83**	**$83**	**$87**	**$90**	**$92**	**2.4%**	**(4.4%)**	**2.5%**
YoY%	11.1%	22.3%	6.8%	(15.8%)	(0.5%)	(2.4%)	(8.4%)	(0.6%)	5.0%	3.3%	2.5%			
Smartphone	**$71**	**$88**	**$91**	**$77**	**$80**	**$78**	**$71**	**$70**	**$74**	**$76**	**$78**	**2.0%**	**(4.3%)**	**2.3%**
YoY%	12.3%	23.7%	3.2%	(15.4%)	3.6%	(2.0%)	(9.2%)	(1.2%)	5.0%	3.2%	2.2%			
Wireless Infrastructure	**$14**	**$16**	**$20**	**$16**	**$13**	**$13**	**$12**	**$13**	**$13**	**$14**	**$14**	**4.9%**	**(5.0%)**	**4.0%**
YoY%	5.0%	14.7%	27.1%	(17.5%)	(20.0%)	(5.0%)	(3.0%)	3.0%	5.0%	4.0%	4.0%			
Automotive	**$34**	**$46**	**$49**	**$59**	**$56**	**$54**	**$60**	**$66**	**$74**	**$82**	**$90**	**6.3%**	**5.4%**	**10.7%**
YoY%	(9.1%)	34.6%	5.4%	22.3%	(6.4%)	(3.7%)	12.0%	10.8%	11.8%	10.2%	10.2%			
Global Automotive Units (mn)	**74.6**	**77.2**	**82.3**	**90.5**	**92.5**	**93.1**	**91.3**	**91.7**	**93.1**	**95.0**	**96.9**	**(0.2%)**	**3.4%**	**1.5%**
YoY%	(16.1%)	3.5%	6.7%	9.9%	2.2%	0.6%	(1.9%)	0.4%	1.5%	2.0%	2.0%			
Auto semi content ($/LV) / Inv. Adj.	**$459**	**$597**	**$590**	**$657**	**$602**	**$576**	**$657**	**$725**	**$798**	**$862**	**$931**	**6.5%**	**1.9%**	**9.1%**
YoY%	8.4%	30.0%	(1.1%)	11.3%	(8.5%)	(4.3%)	14.2%	10.3%	10.1%	8.0%	8.0%			
Industrial & Other	**$43**	**$54**	**$62**	**$59**	**$45**	**$50**	**$66**	**$78**	**$88**	**$94**	**$99**	**6.7%**	**4.0%**	**10.8%**
YoY%	(2.6%)	26.5%	15.3%	(4.8%)	(24.3%)	10.8%	32.0%	18.0%	13.0%	7.2%	5.6%			
Automation	**$10**	**$13**	**$15**	**$15**	**$12**	**$13**	**$18**	**$21**	**$25**	**$26**	**$28**	**9.2%**	**7.0%**	**11.9%**
YoY%	(3.0%)	29.5%	17.0%	(1.0%)	(15.0%)	5.6%	35.0%	20.0%	15.0%	7.0%	6.0%			
Power/Energy	**$6**	**$7**	**$9**	**$9**	**$8**	**$8**	**$12**	**$16**	**$19**	**$22**	**$23**	**10.9%**	**10.4%**	**18.3%**
YoY%	(0.5%)	25.4%	22.0%	5.0%	(18.0%)	4.1%	50.0%	35.0%	20.0%	12.0%	8.0%			
Consumer	**$35**	**$48**	**$48**	**$30**	**$31**	**$33**	**$31**	**$30**	**$30**	**$32**	**$34**	**0.7%**	**(8.5%)**	**2.4%**
YoY%	6.5%	37.5%	0.1%	(37.1%)	3.4%	6.6%	(7.4%)	(3.4%)	1.3%	6.0%	5.8%			
TVs	**$10**	**$14**	**$14**	**$11**	**$11**	**$11**	**$11**	**$12**	**$12**	**$12**	**$13**	**1.5%**	**(4.4%)**	**2.9%**
YoY%	10.5%	37.1%	1.8%	(21.7%)	(4.0%)	2.1%	2.3%	2.8%	2.8%	3.0%	3.0%			
Video console SoCs (Gaming)	**$3**	**$6**	**$7**	**$7**	**$3**	**$4**	**$3**	**$3**	**$3**	**$4**	**$5**	**5.1%**	**(9.9%)**	**9.1%**
YoY%	102.2%	89.9%	26.2%	(4.3%)	(51.6%)	30.0%	(21.7%)	(11.7%)	(7.9%)	37.2%	27.2%			
Wired Communications	**$18**	**$21**	**$20**	**$25**	**$33**	**$42**	**$54**	**$65**	**$73**	**$80**	**$85**	**11.7%**	**20.7%**	**11.9%**
YoY%	1.0%	17.0%	(8.3%)	26.9%	32.8%	28.1%	29.3%	19.6%	12.2%	9.2%	6.9%			
Ethernet/Network switch	**$5**	**$5**	**$6**	**$9**	**$13**	**$17**	**$25**	**$31**	**$36**	**$40**	**$43**	**15.0%**	**34.9%**	**15.3%**
YoY%	(3.8%)	11.9%	15.0%	45.0%	40.0%	35.0%	42.0%	28.0%	15.0%	11.0%	8.0%			
Optical Equipment	**$4**	**$5**	**$5**	**$6**	**$9**	**$12**	**$15**	**$19**	**$21**	**$24**	**$26**	**22.7%**	**26.8%**	**13.4%**
YoY%	9.8%	11.8%	5.0%	30.0%	35.0%	35.0%	32.0%	20.0%	15.0%	11.0%	8.0%			

Source: BofA Global Research, Mercury Research, Gartner, Omdia, SIA

BofA GLOBAL RESEARCH

In 2026, we expect semis/core semis sales to grow +113%/+30% YoY. Memory is expected to be even stronger, now up nearly +327% YoY (after +81%/+29% YoY growth in CY24/25).

By device type, we see CY26 memory sales driven by both DRAM (+328% YoY) and NAND (+341% YoY).

Ex-memory, microprocessors (MPUs) strong (+32% YoY) on hyperscaler consumption modestly offset by weak PC units, and logic particularly strong (+41% YoY) on AI accelerator-related demand. We also model industrial-centric markets (MCUs, Analog) seeing recovery following inventory digestion throughout CY24-25. In CY26, we model other markets (discretes, optos, sensors) to generally return to healthy growths (+13% YoY) as well, particularly driven by data center-related optoelectronic demands.

Exhibit 4: We model memory, logic, microcomponents driving semiconductor growth
Summary of BofA Semis Forecast by device type

Revenue ($bn)	2020	2021	2022	2023	2024	2025	2026E	2027E	2028E	2029E	2030E	CAGR '16-26	CAGR '21-26	CAGR '26-30
Total Semis	**$451**	**$572**	**$594**	**$528**	**$633**	**$787**	**$1,677**	**$2,243**	**$2,489**	**$2,885**	**$3,204**	**17.3%**	**24.0%**	**17.6%**
YoY%	7.7%	27.0%	3.8%	(11.0%)	19.7%	24.3%	113.2%	33.8%	10.9%	15.9%	11.0%			
Memory	**$128**	**$170**	**$150**	**$94**	**$170**	**$220**	**$937**	**$1,322**	**$1,402**	**$1,656**	**$1,853**	**28.4%**	**40.6%**	**18.6%**
YoY%	13.5%	33.4%	(11.9%)	(37.4%)	81.3%	28.9%	326.9%	41.1%	6.0%	18.2%	11.9%			
DRAM	**$65**	**$92**	**$78**	**$47**	**$88**	**$134**	**$573**	**$846**	**$917**	**$1,088**	**$1,243**		**44.1%**	**21.4%**
YoY%	4.6%	40.9%	(15.7%)	(39.1%)	85.9%	52.2%	328.2%	47.7%	8.4%	18.7%	14.2%			
NAND	**$59**	**$73**	**$67**	**$42**	**$78**	**$81**	**$357**	**$468**	**$476**	**$560**	**$601**		**37.3%**	**13.9%**
YoY%	26.4%	25.3%	(8.2%)	(36.9%)	84.0%	3.7%	341.4%	30.8%	1.9%	17.4%	7.3%			
Core Semis (ex-memory)	**$323**	**$402**	**$444**	**$435**	**$463**	**$567**	**$739**	**$921**	**$1,087**	**$1,229**	**$1,351**	**10.9%**	**13.0%**	**16.3%**
YoY%	5.6%	24.4%	10.5%	(2.1%)	6.4%	22.6%	30.4%	24.5%	18.0%	13.1%	9.9%			
Analog	**$56**	**$74**	**$89**	**$81**	**$80**	**$87**	**$98**	**$112**	**$124**	**$132**	**$136**	**7.4%**	**5.8%**	**8.6%**
YoY%	3.2%	33.1%	20.1%	(8.8%)	(2.0%)	8.8%	13.3%	13.8%	10.9%	6.3%	3.6%			
Microcomponents	**$70**	**$81**	**$79**	**$77**	**$79**	**$85**	**$111**	**$150**	**$188**	**$222**	**$254**	**6.2%**	**6.6%**	**23.1%**
YoY%	4.9%	15.5%	(1.5%)	(3.5%)	3.7%	7.0%	30.6%	35.3%	25.1%	18.2%	14.6%			
Microprocessors	**$51**	**$56**	**$51**	**$45**	**$53**	**$59**	**$78**	**$105**	**$129**	**$155**	**$178**	**6.2%**	**6.8%**	**22.8%**
YoY%	6.5%	10.4%	(9.5%)	(11.2%)	18.0%	11.4%	31.7%	34.1%	22.8%	20.0%	15.0%			
Microcontrollers	**$18**	**$23**	**$27**	**$29**	**$24**	**$23**	**$26**	**$29**	**$31**	**$35**	**$39**	**4.7%**	**3.0%**	**10.8%**
YoY%	3.3%	25.0%	20.8%	7.6%	(19.2%)	(2.4%)	13.3%	10.7%	7.8%	11.3%	13.3%			
Logic	**$118**	**$154**	**$176**	**$178**	**$213**	**$301**	**$424**	**$525**	**$618**	**$701**	**$773**	**16.6%**	**22.4%**	**16.2%**
YoY%	11.1%	30.2%	14.2%	1.4%	19.1%	41.5%	40.7%	24.0%	17.6%	13.4%	10.2%			
Others (Discretes, optos, sensors)	**$79**	**$93**	**$100**	**$98**	**$91**	**$95**	**$107**	**$134**	**$157**	**$175**	**$188**	**5.6%**	**2.9%**	**15.0%**
YoY%	0.3%	17.4%	7.1%	(1.2%)	(7.5%)	4.0%	13.1%	25.1%	17.5%	10.9%	7.4%			

Source: BofA Global Research, Mercury Research, Gartner, Omdia, SIA

BofA GLOBAL RESEARCH

Looking at our forecasts versus BofA Global semis bottom-up estimates, we are generally in line with the growth trajectory for CY26E/CY27E ex-NVDA (which now realizes significant revenue from system sales growth and software). Modest outperformance versus industry reflects continued industry trends of industry consolidation and share gains by top vendors.

Exhibit 5: Our Semis industry outlook generally aligns with bottoms-up company estimates
Summary of BofA semis forecasts versus bottoms-up estimates

Semis ex-mem Forecast ($bn)	2025	2026E	2027E	2028E	2029E	2030E
BofA Semi Ex-Memory Forecast	$567	$739	$921	$1,087	$1,229	$1,351
YoY (%)	*22.6%*	*30.4%*	*24.5%*	*18.0%*	*13.1%*	*9.9%*
BofA Coverage Bottoms-Up Sales	$539	$767	$984	$1,208	$1,890	$2,116
YoY (%)	*26.8%*	*42.4%*	*28.2%*	*22.8%*	*56.4%*	*12.0%*
BofA Coverage Bottoms-Up Ex-NVDA Sales	$323	$407	$519	$650	$804	$944
YoY (%)	*9.6%*	*26.2%*	*27.3%*	*25.3%*	*23.7%*	*17.4%*

Source: BofA Global Research estimates, SIA, company reports

BofA GLOBAL RESEARCH

Wafer Fab Equipment (WFE) Forecast

We raise our CY26 WFE forecast 8% to $156bn (+33% YoY) from $144bn (+24% YoY). Most of our revision comes from memory, where we have raised our DRAM WFE by 15% to $45bn (prior $39.6bn) and NAND to $15bn (prior $13.3bn). Foundry sees more modest upside at just 5% higher to $79bn from $75bn prior.

We raise our CY27/28 WFE by 10%/9% to $209bn (+34%)/$271.9bn (+30%) from $189.8bn (+31% YoY)/$250bn (+32%). Once again, DRAM is the primary source of upside, now 21% higher each to $52bn (+40% YoY)/$81bn (+28% YoY), while NAND is 19%/2% higher CY27/28 to $20.5bn (+33% YoY)/$24.6bn (+20% YoY). Foundry/logic estimates edge up slightly higher to $125bn (+32% YoY) and $165bn (+32% YoY).

Our new CY30 WFE of $360bn (vs. ~$300bn prior) implies a 25% CY25-30E CAGR. Inside this view, DRAM reaches $114bn (+30% CAGR), NAND $30bn (+22% CAGR), and foundry/logic $215bn (+24% CAGR).

Exhibit 6: We estimate WFE of $156bn in CY26E, +33% YoY, and $210bn in CY27E, +34% YoY
Wafer Fab Equipment (WFE) outlook

														CAGR		
	2018	2019	2020	2021	2022	2023	2024	2025	2026E	2027E	2028E	2029E	2030E	'25-'30E	'19-'25	'15-'25
Wafer Fab Equipment (WFE) ($bn)	**$55.2**	**$52.2**	**$61.1**	**$87.8**	**$95.2**	**$97.9**	**$105.3**	**$116.9**	**$155.9**	**$209.6**	**$271.9**	**$305.9**	**$359.8**	**25.2%**	**14.4%**	**14.3%**
YoY	15.8%	(5.4%)	17.1%	43.6%	8.4%	2.9%	7.6%	11.0%	33.4%	34.4%	29.7%	12.5%	17.6%			
Memory WFE ($bn)	**$35.9**	**$20.4**	**$23.8**	**$35.1**	**$34.4**	**$27.4**	**$33.7**	**$42.1**	**$61.3**	**$84.5**	**$106.4**	**$123.9**	**$144.4**	28.0%	12.9%	10.4%
YoY	34.4%	(43.3%)	17.1%	47.3%	(1.9%)	(20.4%)	23.0%	24.9%	45.7%	37.8%	25.9%	16.5%	16.5%			
Memory sales ($bn)	$158.0	$112.5	$127.7	$170.3	$150.0	$94.0	$170.3	$219.6	$937.4	$1,322.2	$1,401.7	$1,656.4	$1,853.1			
Memory WFE capital intensity (% of sales)	23%	18%	19%	21%	23%	29%	20%	19%	7%	6%	8%	7%	8%			
Memory capex ($bn)	$53.9	$45.1	$40.5	$52.3	$59.6	$40.7	$59.1	$82.3	$266.3	$345.9	$372.2	$259.2	$299.4			
DRAM WFE ($bn)	**$12.4**	**$9.2**	**$9.9**	**$15.3**	**$14.0**	**$20.0**	**$26.9**	**$30.2**	**$45.4**	**$63.5**	**$81.3**	**$97.5**	**$114.1**	30.4%	21.8%	12.6%
YoY	42.6%	(25.4%)	7.2%	54.6%	(8.6%)	42.9%	34.7%	12.2%	50.0%	40.0%	28.0%	20.0%	17.0%			
DRAM sales ($bn)	$72.8	$62.5	$65.4	$92.1	$77.7	$47.3	$87.9	$133.8	$572.9	$846.5	$917.2	$1,088.3	$1,243.3			
DRAM WFE capital intensity (% of sales)	20%	15%	15%	17%	18%	42%	31%	23%	8%	8%	9%	9%	9%			
DRAM capex ($bn)	$18.4	$18.1	$15.9	$23.4	$26.9	$22.8	$37.4	$57.9	$220.8	$278.1	$284.5	$173.0	$206.6			
NAND WFE ($bn)	**$23.0**	**$10.8**	**$13.7**	**$19.5**	**$19.3**	**$6.7**	**$6.3**	**$11.2**	**$15.4**	**$20.5**	**$24.6**	**$25.9**	**$29.7**	21.6%	0.5%	6.2%
YoY	30.5%	(52.8%)	26.1%	42.5%	(0.8%)	(65.5%)	(5.2%)	77.0%	38.0%	33.0%	20.0%	5.0%	15.0%			
NAND sales ($bn)	$47.2	$46.3	$58.5	$73.3	$67.3	$42.4	$78.1	$81.0	$357.5	$467.5	$476.5	$559.5	$600.6			
NAND WFE capital intensity (% of sales)	50%	23%	23%	27%	29%	16%	8%	14%	4%	4%	5%	5%	5%			
NAND capex ($bn)	$32.2	$24.1	$21.5	$28.5	$32.2	$17.6	$21.1	$23.9	$44.6	$66.9	$86.8	$85.1	$91.5			
Other Memory WFE ($bn)	**$0.5**	**$0.3**	**$0.3**	**$0.3**	**$1.1**	**$0.7**	**$0.4**	**$0.7**	**$0.5**	**$0.5**	**$0.5**	**$0.6**	**$0.6**	(2.2%)	15.5%	10.4%
YoY	26.9%	(46.4%)	(6.9%)	25.2%	248.5%	(34.7%)	(40.8%)	51.5%	(20.0%)	(10.0%)	7.5%	7.5%	7.5%			
Other Memory sales ($bn)	$49.2	$3.7	$3.8	$4.9	$5.0	$4.2	$4.3	$4.8	$7.0	$8.2	$8.0	$8.6	$9.2			
Other Memory WFE intensity (% of sales)	1%	8%	7%	7%	22%	17%	10%	14%	8%	6%	6%	6%	6%			
Other Memory capex ($bn)	$3.2	$2.9	$3.1	$0.5	$0.4	$0.3	$0.6	$0.6	$0.9	$0.9	$0.9	$1.1	$1.3			
Non-memory WFE ($bn)	**$19.3**	**$31.9**	**$37.3**	**$52.7**	**$61.2**	**$70.5**	**$71.6**	**$74.8**	**$94.6**	**$125.1**	**$165.5**	**$182.0**	**$215.3**	23.5%	15.3%	17.4%
YoY	(7.9%)	64.8%	17.1%	41.3%	16.2%	15.1%	1.6%	4.5%	26.5%	32.2%	32.3%	10.0%	18.3%			
Non-memory semis (excl. Foundry) sales ($bn)	$310.8	$305.9	$322.9	$401.8	$443.9	$434.5	$462.5	$567.0	$739.5	$920.8	$1,086.8	$1,228.9	$1,350.7			
Non-memory WFE capital intensity (% of sales)	6%	10%	12%	13%	14%	16%	15%	13%	13%	14%	15%	15%	16%			
Non-memory capex ($bn)	$49.2	$54.3	$69.8	$100.3	$123.0	$131.6	$108.3	$114.8	$149.8	$174.6	$194.5	$204.5	$235.1			
Foundry WFE ($bn)	**$11.1**	**$19.3**	**$23.8**	**$36.9**	**$42.6**	**$50.5**	**$51.0**	**$60.5**	**$78.7**	**$106.2**	**$144.0**	**$158.4**	**$190.0**	25.7%	21.0%	19.6%
YoY	(19.0%)	73.3%	23.7%	54.7%	15.6%	18.6%	1.0%	18.7%	30.0%	35.0%	35.5%	10.0%	20.0%			
Foundry sales ($bn)	$63.4	$66.5	$72.4	$76.9	$81.2	$114.7	$138.0	$174.2	$218.8	$267.5	$315.5	$349.7	$384.7			
Foundry WFE capital intensity (% of sales)	18%	29%	33%	48%	52%	44%	37%	35%	36%	40%	46%	45%	49%			
Foundry capex ($bn)	$21.0	$24.2	$34.2	$51.0	$64.9	$58.8	$64.1	$73.4	$107.2	$123.6	$136.2	$140.9	$167.6			
Logic/Intel WFE ($bn)	**$5.3**	**$9.1**	**$9.6**	**$10.3**	**$12.2**	**$12.0**	**$13.3**	**$8.7**	**$10.9**	**$13.1**	**$15.1**	**$16.6**	**$17.8**	15.2%	(0.6%)	12.2%
YoY	19.0%	71.8%	6.2%	6.4%	18.5%	(1.5%)	11.1%	(34.4%)	25.0%	20.0%	15.0%	10.0%	7.0%			
Logic/Intel sales ($bn)	$132.2	$139.4	$141.7	$147.7	$153.1	$154.5	$159.8	$177.6	$236.5	$294.8	$332.6	$397.5	$513.6			
Logic/Intel WFE capital intensity (% of sales)	4%	7%	7%	7%	8%	8%	8%	5%	5%	4%	5%	4%	3%			
Logic/Intel capex ($bn)	$11.7	$15.7	$13.8	$18.7	$24.8	$25.8	$25.1	$17.7	$20.2	$27.2	$32.4	$35.2	$38.1			
IDM/Other WFE ($bn)	**$2.9**	**$3.5**	**$3.8**	**$5.6**	**$6.5**	**$8.0**	**$7.3**	**$5.5**	**$5.0**	**$5.7**	**$6.4**	**$7.1**	**$7.5**	6.4%	7.8%	10.1%
YoY	3.4%	20.2%	8.7%	45.3%	16.4%	23.2%	(8.7%)	(23.9%)	(10.0%)	15.0%	12.0%	10.0%	7.0%			
IDM/Other sales ($bn)	$178.6	$166.4	$181.2	$254.1	$290.8	$280.0	$302.7	$389.4	$503.0	$625.99	$754.23	$831.40	$837.11			
IDM/Other WFE capital intensity (% of sales)	2%	2%	2%	2%	2%	3%	2%	1%	1%	1%	1%	1%	1%			
IDM/Other capex ($bn)	$16.5	$14.4	$21.8	$30.7	$33.2	$47.0	$19.1	$23.7	$22.4	$23.8	$25.9	$28.4	$29.3			

Source: BofA Global Research estimates, SIA, IMF, Gartner

BofA GLOBAL RESEARCH

Memory, leading-edge logic, non-China, and EUV driving growth

We think the split of WFE will remain biased towards non-memory (60%) vs. memory (40%) through CY30. Leading-edge logic WFE of $55bn (+39% YoY) could expand to $79bn (+45%)/$113bn (+43%) by CY27/28 before reaching $154bn by CY30 (+31% 5-year CAGR). Trailing-edge WFE lags behind advanced process WFE (+12% CAGR) of which is largely driven by China spending. We estimate China WFE of $45bn (29% of WFE) CY26, and while it grows 13% CAGR through CY30, we expect mix of total WFE to decline towards 20%. EUV WFE is expected to grow faster than ex-EUV (+28% CAGR vs. +25%) as litho proliferates at sub-5nm nodes and for advanced DRAM.

Exhibit 7: Breakdown of WFE estimates by trailing-edge vs. leading-edge, non-litho, China vs. non-China spending
We expect CY25E to likely be a strong year for leading-edge and non-China WFE

												CAGRs		
WFE ($bn)	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026E**	**2027E**	**2028E**	**2029E**	**2030E**	**'26-'30E**	**'21-'26E**	**'16-'26**
Total WFE	**61.1**	**87.8**	**95.7**	**97.9**	**105.3**	**116.9**	**155.9**	**209.6**	**271.9**	**305.9**	**359.8**	**25.2%**	**13.8%**	**16.3%**
YoY	**17.1%**	**43.6%**	**9.0%**	**2.3%**	**7.6%**	**11.0%**	**33.4%**	**34.4%**	**29.7%**	**12.5%**	**17.6%**			
Memory	**23.8**	**35.1**	**34.4**	**27.4**	**33.7**	**42.1**	**61.3**	**84.5**	**106.4**	**123.9**	**144.4**	**28.0%**	**12.0%**	**14.7%**
Foundry/Logic/IDM	**37.3**	**52.7**	**61.2**	**70.5**	**71.6**	**74.8**	**94.6**	**125.1**	**165.5**	**182.0**	**215.3**	**23.5%**	**14.9%**	**17.4%**
YoY	17.1%	41.3%	16.2%	15.1%	1.6%	4.5%	26.5%	32.2%	32.3%	10.0%	18.3%			
% of total WFE	61.0%	60.0%	64.0%	72.0%	68.0%	64.0%	60.7%	59.7%	60.9%	59.5%	59.9%			
Leading-edge (<=22nm)	**17.3**	**26.3**	**30.9**	**38.3**	**31.4**	**39.3**	**54.6**	**79.2**	**113.3**	**124.8**	**153.6**	**31.3%**	**17.8%**	**22.0%**
YoY	20.6%	52.2%	17.4%	24.0%	(18.0%)	25.0%	39.0%	45.0%	43.0%	10.2%	23.0%			
% of total WFE	28.3%	30.0%	32.3%	39.2%	29.9%	33.6%	35.0%	37.8%	41.7%	40.8%	42.7%			
Trailing-edge (>22nm)	**20.0**	**26.3**	**30.3**	**32.1**	**40.2**	**35.5**	**40.0**	**45.9**	**52.2**	**57.2**	**61.8**	**11.7%**	**12.2%**	**13.3%**
YoY	14.2%	31.8%	15.1%	6.0%	25.0%	(11.6%)	12.6%	14.7%	13.7%	9.6%	8.1%			
% of total WFE	32.7%	30.0%	31.7%	32.8%	38.1%	30.4%	25.6%	21.9%	19.2%	18.7%	17.2%			
EUV	**5.1**	**7.4**	**7.5**	**10.1**	**9.0**	**13.6**	**20.7**	**29.3**	**38.3**	**43.9**	**47.0**	**28.2%**	**21.5%**	**49.7%**
YoY	64.7%	44.5%	0.6%	35.5%	-10.4%	50.3%	52.3%	41.2%	31.0%	14.5%	7.2%			
% of total WFE	8.4%	8.4%	7.8%	10.3%	8.6%	11.6%	13.3%	14.0%	14.1%	14.3%	13.1%			
Total ex-EUV	**56.0**	**80.4**	**88.2**	**87.8**	**96.3**	**103.3**	**135.2**	**180.3**	**233.6**	**262.1**	**312.7**	**24.8%**	**13.0%**	**14.8%**
YoY	14.0%	43.6%	9.7%	-0.5%	9.7%	7.3%	30.9%	33.4%	29.5%	12.2%	19.3%			
% of total WFE	91.6%	91.6%	92.2%	89.7%	91.4%	88.4%	86.7%	86.0%	85.9%	85.7%	86.9%			
China	**15.5**	**21.4**	**21.6**	**31.7**	**38.1**	**39.2**	**45.2**	**52.4**	**59.8**	**66.1**	**72.0**	**12.9%**	**20.4%**	**25.0%**
YoY	34.1%	38.6%	0.6%	47.2%	20.0%	2.8%	15.5%	15.9%	14.2%	10.5%	8.9%			
% of total WFE	25.3%	24.4%	22.5%	32.4%	36.2%	33.5%	29.0%	25.0%	22.0%	21.6%	20.0%			
Total Non-China	**45.7**	**66.4**	**74.1**	**66.1**	**67.2**	**77.7**	**110.7**	**157.2**	**212.1**	**239.9**	**287.8**	**29.9%**	**11.2%**	**14.1%**
YoY	12.2%	45.3%	11.7%	(10.8%)	1.6%	15.6%	42.4%	42.0%	34.9%	13.1%	20.0%			
% of total WFE	74.7%	75.6%	77.5%	67.6%	63.8%	66.5%	71.0%	75.0%	78.0%	78.4%	80.0%			

Source: BofA Global Research estimates, company data, Gartner, SIA, IMF

BofA GLOBAL RESEARCH

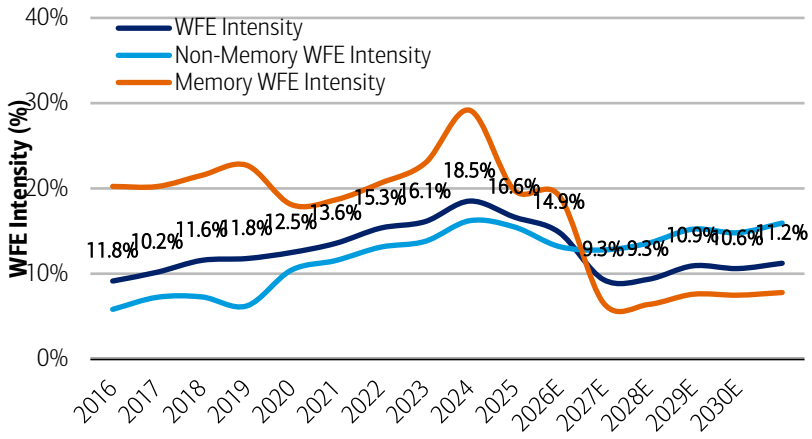
WFE approaching $400bn by CY30

We present case for WFE spending to approach $400bn by CY30E below. In our view, the combination of unit-driven industry sales gain by the end of the decade, tech inflections, and new capacity unlock should drive WFE to historically-high levels.

WFE intensity: ostensibly low and a less useful metric for this upcycle

A point of contention for investors is the collapse in WFE intensity anticipated from CY27 onwards from the typical mid-teens % range towards historic lows of 9-12%. We see this is mainly led by memory where dramatic ASP gains are artificially depressing intensity, making it a less useful metric to understand how WFE should trend during this upcycle. While we only model overall WFE intensity of ~11% by CY30E, we expect it to eventually recover to mid-teens % levels as units begin to drive industry growth.

Exhibit 8: Overall WFE intensity could decline to historical lows given ASP-driven sales gains
WFE intensity CY16-2030



Source: BofA Global Research estimates, Gartner, company reports

BofA GLOBAL RESEARCH

Analyzing six different semi industry upcycles since CY00 of varying duration, we see that WFE gained in all but one of them and outgrow total semi sales through-cycle in all but two. We note WFE intensity tends to increase a median of ~300bps through-cycle as IDMs/foundries typically perform upgrades and tech transitions during periods of strong industry growth in addition to capacity expansion. However, most of these historical semi cycles were unit-driven rather than ASP-driven aside from CY20-22 and CY24-25, the latter of which has seen a -400bps decline in WFE intensity to-date, partially impacted by the normalization of China spending. While elevated pricing may continue to depress WFE intensity over the next several years, we do expect units to eventually recover as a driving force as capacity comes online.

Exhibit 9: While each industry upcycle has differed in duration, unit vs. ASP contribution, and fundamental drivers, we observe that in most cases WFE intensity tends to rise during the period
WFE performance during every semi industry upcycle CY00-25

# Years	Semi Upcycle	Semi Sales CAGR	WFE CAGR	Unit CAGR	ASP CAGR	Avg. WFE Intensity during period	Change in WFE intensity	Change in WFE Intensity per Wafer	WFE per wafer CAGR
5	CY02-07	12.7%	19.1%	11.6%	1.0%	12.6%	365bps	NA	NA
2	CY10-11	15.0%	67.5%	11.7%	3.0%	9.8%	664bps	NA	NA
2	CY13-14	7.3%	0.3%	6.7%	0.5%	9.5%	-134bps	-12.9%	-6.7%
3	CY16-18	11.8%	21.7%	8.5%	3.1%	10.7%	264bps	38.0%	11.3%
3	CY20-22	11.6%	22.4%	5.6%	5.8%	14.4%	363bps	70.5%	2.3%
2	CY24-25	20.3%	9.3%	20.3%	19.8%	16.7%	-366bps	7.7%	2.3%
						Median	**313bps**	**22.9%**	**2.3%**

Source: BofA Global Research estimates, Gartner, company reports

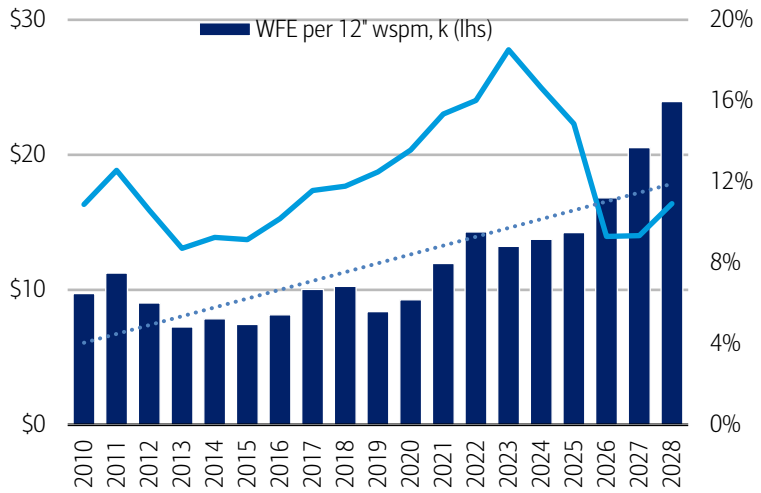
BofA GLOBAL RESEARCH

WFE-per-wafer: structurally increasing through-cycle

We think the more relevant metric to track is WFE per 12" wafer start which strips out pricing dynamics and focuses on the investment needed to produce the next unit of output. We see that WFE-per-wafer has steadily increased through various cycles as manufacturing complexity rises and based on historical through-cycle gains, we anticipate the trend will remain intact for overall WFE CY26-28 as massive capacity expansions and unique tech inflections drive higher levels of investment despite a drastic step-down in WFE intensity as a % of industry sales.

Exhibit 10: WFE per 12" wafer has been structurally rising through various cycles and we expect the same CY25-28 despite a sharp decline in WFE intensity

Overall WFE per 12" wafer (lhs) and WFE intensity % (rhs)



Source: BofA Global Research estimates, Gartner, company reports

BofA GLOBAL RESEARCH

Logic WFE/wafer: rises over time but locally peaks 1-2 years into volume ramp

We look at five different upcycles for core semis (ex-memory), i.e foundry/logic semis. Almost all cycles are unit-led but intensity trends have never consistently increased through-cycle as it is highly dependent on the relative maturity of each subsequent node. Each new node tends to reset per-wafer cost upward at launch but WFE per wafer tends to peak 1-2 years into the ramp when yields are low, tools are least productive, and capacity is largely greenfield before normalizing as the node matures. During tech transitions like EUV or the ramp of 28nm high-K metal gate, WFE per wafer grew above +20% CAGR.

Exhibit 11: WFE intensity and WFE per wafer trends tend to be less consistent across foundry/logic cycles but typically see strong expansion during tech transitions such as the move to EUV in CY18-22

History of foundry/logic semi sales (ex-memory) cycles since CY09 and corresponding WFE trends

# Years	Core Semi Upcycle	Core Semi Sales GAR	WFE CAGR	Unit CAGR	ASP CAGR	Avg. WFE Intensity during period	Change in WFE intensity	Change in WFE intensity per wafer	WFE per wafer CAGR	Notes
2	CY09-11	14.7%	-46.1%	11.7%	2.6%	**20.2%**	**(3,444)**	**51.6%**	**23.1%**	Global Financial Crisis recovery, minimal greenfield, 28nm high-K metal gate ramp
2	CY12-14	4.6%	-13.5%	6.9%	-2.1%	**8.0%**	**(309)**	**-45.3%**	**-26.1%**	28nm capacity maturing, short-lived 20nm ramp, efficient brownfield adds, booming smartphone-led sales
3	CY15-18	6.4%	8.8%	8.7%	-2.1%	**6.6%**	**40**	**13.8%**	**4.4%**	FinFET transition, 16/14nm ramp in CY15 and peaking CY16/17
4	CY18-22	9.3%	33.4%	2.3%	6.9%	**11.0%**	**758**	**141.5%**	**24.7%**	EUV adoption, introduction of 7nm and rapid pacing to 5nm/3nm, COVID trailing-edge boom
2	CY23-25	29.3%	3.0%	20.2%	7.5%	**15.0%**	**(302)**	**-10.7%**	**-5.5%**	AI accelerator demand ramping on scaled nodes (N5/N4/N3), maturing productivity, limited 2nm contribution
						Median	**-302bps**	**13.8%**	**4.4%**	

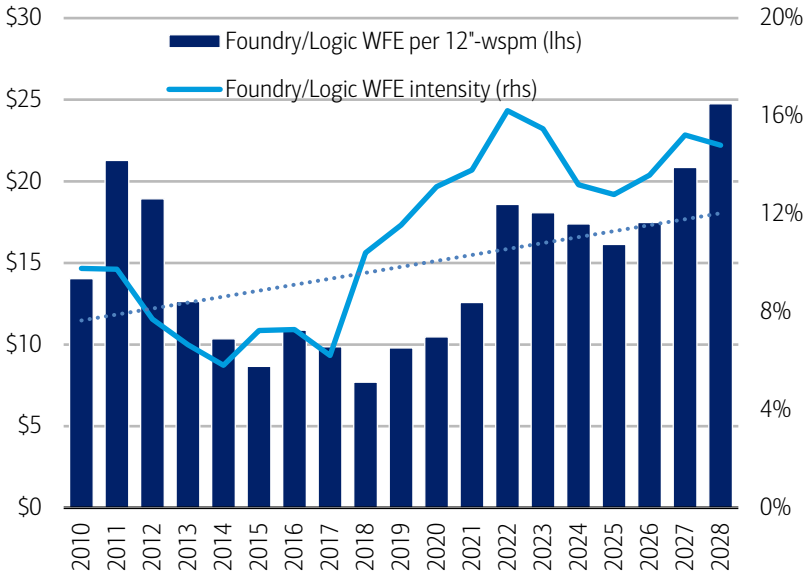
Source: BofA Global Research estimates, Gartner, company reports

BofA GLOBAL RESEARCH

Ahead, we expect strong expansion CY26-28 as 2nm gate-all-around ramps, especially at emerging foundries, where yields are likely low and tools less productive. We also expect

a wave of greenfield capacity expansion. High-NA EUV adoption could also be a critical driver in addition to backside power adoption.

Exhibit 12: Through-cycle WFE per wafer gains have been inconsistent for foundry/logic but generally have structurally increased over time via node migrations
Foundry/Logic WFE per 12" wafer start per month (lhs) and foundry/logic WFE intensity (rhs)



Source: BofA Global Research estimates, Gartner, company reports

BofA GLOBAL RESEARCH

DRAM WFE/wafer: litho insertion sharply increasing intensity

Absolute DRAM WFE intensity and WFE per wafer has increased virtually every DRAM sales upcycle since CY09 with the exception of CY23-25 where intensity collapsed following a sharp digestion in China investments. On average, WFE per wafer has increased 22% CAGR each cycle and WFE intensity adds ~300bps. The most important inflections for intensity was when multipatterning progress began to slow and EUV insertion became necessary. The rise of HBM with its high trade ratio (3-4 wafers for every 1 wafer of traditional DRAM), related advanced packaging, higher layer count stacking, and larger capacitors are also drivers.

Exhibit 13: DRAM intensity and WFE per wafer generally increases during DRAM sales cycles even if growth is mainly ASP-led with the exception being CY23-25
History of DRAM sales cycles since CY09 and corresponding WFE trends

# Years	DRAM Upcycle	DRAM Sales GAR	WFE CAGR	Unit CAGR	ASP CAGR	Avg. WFE Intensity during period	Change in WFE intensity	Change in WFE intensity per wafer	WFE per wafer CAGR	Notes
1	CY09-10	74.9%	74.9%	19.8%	46.0%	**25.9%**	**790**	**27.4%**	**27.4%**	Global Financial Crisis Recovery
2	CY12-14	34.0%	48.6%	-1.8%	36.5%	**12.3%**	**267**	**25.0%**	**11.8%**	Recovery post Elpida bankruptcy, sub-20nm planar multipatterning
2	CY16-18	55.3%	48.3%	-1.3%	57.3%	**15.1%**	**615**	**108.2%**	**44.3%**	multipatterning begins to hit a wall, capacitors, greenfield builds
2	CY19-21	22.0%	28.7%	12.6%	8.4%	**15.5%**	**184**	**48.1%**	**21.7%**	EUV debut, continued shrinks, buried-wordline, deeper capacitor
2	CY23-25	118.4%	23.0%	16.6%	-22.0%	**31.8%**	**(1,969)**	**30.4%**	**14.2%**	HBM, TSV, die-stacking, thermocompression bonding
						Median	**267bps**	**30.4%**	**21.7%**	

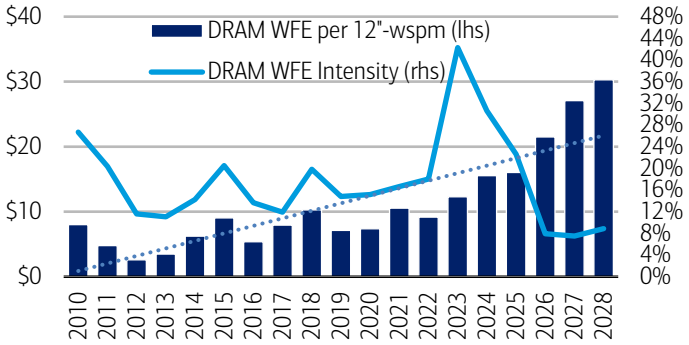
Source: BofA Global Research estimates, Gartner, company reports

BofA GLOBAL RESEARCH

Looking ahead, we anticipate DRAM WFE per wafer to steadily rise as HBM becomes a larger part of the mix with the trade ratio with conventional DRAM becoming even more stark as we move to higher-layer HBM4/5. Larger core dies and the shift from thermocompression bonding to hybrid bonding should also step up equipment adoption while capacitor aspect-ratios continue to climb and EUV insertion deepens. 4F squared DRAM could also drive intensity higher CY28 via greater etch/deposition.

Exhibit 14: Despite a collapse in WFE intensity to historical lows, we expect WFE per wafer to steadily increase through CY28

DRAM WFE per 12" wspm (lhs) and WFE intensity (rhs)



Source: BofA Global Research estimates, Gartner, company reports

BofA GLOBAL RESEARCH

NAND WFE/wafer: migration to higher layer counts drives intensity

During the 2010s, NAND investments exploded to address the surge in mobile demand but we also saw a sharp rise in WFE intensity as structures went vertical with the advent of 3D NAND which required greater etch/dep intensity. Over the last five years, the industry saw limited greenfield adds but steady brownfield spending as the install base saw continuous conversions to higher layer count devices to satisfy bit demand.

Exhibit 15: NAND WFE intensity per wafer has always increased in the past three cycles as bit growth is driven by migrations and conversions rather than greenfield capacity adds

History of NAND sales cycles since CY09 and corresponding WFE trends

# Years	Memory Upcycle	NAND sales CAGR	WFE CAGR	Unit CAGR	ASP CAGR	Avg. WFE Intensity during period	Change in WFE intensity	Change in WFE Intensity per Wafer	WFE per wafer CAGR	Notes
9	CY09-18	15.5%	22.0%	12.1%	3.0%	**28.5%**	**2,375**	**107.2%**	**8.4%**	SSD/mobile demand, 3D NAND transition
2	CY19-21	18.0%	34.0%	9.1%	8.1%	**24.5%**	**316**	**76.4%**	**32.8%**	migrations w/ limited greenfield, bit growth coming from higher layers (96L to 176L), multi-deck stacking,
2	CY23-25	77.5%	29.5%	10.8%	60.1%	**468.0%**	**(190)**	**86.3%**	**36.5%**	Migration-led cycle, trough of CY22-23 NAND downturn, move to 300L, double/triple-decks
						Median	**316**	**86.3%**	**32.8%**	

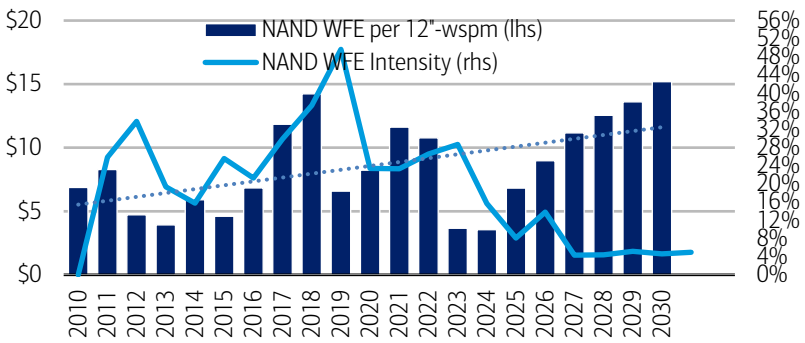
Source: BofA Global Research estimates, Gartner, company reports

BofA GLOBAL RESEARCH

While there could be greenfield activity by 2H27/CY28, we expect most of the WFE per wafer gains to come from layer count migrations to 300L/400L, moving to triple deck stacking architecture, and leveraging of deeper high-aspect ratio channel etch. Total expansion could be moderate versus prior cycles as the market is firmly off its trough but demand from high-capacity QLC for AI inference storage could be an upside risk.

Exhibit 16: While trends have been choppy, NAND WFE per wafer rises during periods of heightened migration/conversion activity

NAND WFE per 12" wafer start per month (lhs) and NAND WFE intensity (rhs)



Source: BofA Global Research estimates, Gartner, company reports

BofA GLOBAL RESEARCH

Glossary:

2.5D: Two-and-a-Half-Dimensional

3D: Three-Dimensional

4F²: Four-F-Squared

14A: Intel 14A Process Node

18A: Intel 18A Process Node

A/P: Advanced Packaging

ACLS: Axcelis Technologies

ADI: Analog Devices

ADR: American Depositary Receipt

AEC: Active Electrical Cable

AEIS: Advanced Energy Industries

AGI: Artificial General Intelligence

AI: Artificial Intelligence

ALAB: Astera Labs

ALC: Active LED Cable

ALGM: Allegro MicroSystems

AMAT: Applied Materials

AMBA: Ambarella

AMBQ: Ambiq Micro

AMD: Advanced Micro Devices

ARM: Arm Holdings

ASIC: Application-Specific Integrated Circuit

ASP: Average Selling Price

AWS: Amazon Web Services

AVGO: Broadcom

EDA: Electronic Design Automation

EUV: Extreme Ultraviolet

EV: Electric Vehicle / Enterprise Value

F/L: Foundry/Logic

FinFET: Fin Field-Effect Transistor

FLOPs: Floating-Point Operations per Second

GaN: Gallium Nitride

GB: Gigabyte

GFS: GlobalFoundries

GM: Gross Margin

GOOGL: Alphabet

GPU: Graphics Processing Unit

HBM: High-Bandwidth Memory

HBM4: Fourth-Generation High-Bandwidth Memory

HBM5: Fifth-Generation High-Bandwidth Memory

High-K: High-Dielectric-Constant

High-NA: High Numerical Aperture

HPC: High-Performance Computing

IDM: Integrated Device Manufacturer

IMF: International Monetary Fund

INTC: Intel

InP: Indium Phosphide

IP: Intellectual Property

KLAC: KLA Corporation

KV Cache: Key-Value Cache

LITE: Lumentum Holdings

LLC: Limited Liability Company

LPO: Linear Pluggable Optics

LPDDR: Low-Power Double Data Rate

LPU: Language Processing Unit

LRCX: Lam Research

LRO: Linear Receive Optics

LSCC: Lattice Semiconductor

LT: Long-Term

LTA: Long-Term Agreement

LTAs: Long-Term Agreements

LV: Light Vehicle

MCHP: Microchip Technology

MCU: Microcontroller Unit

MKSI: MKS Instruments

MOCVD: Metal-Organic Chemical Vapor Deposition

MPU: Microprocessor Unit

MRVL: Marvell Technology

MSFT: Microsoft

MTSI: MACOM Technology Solutions

MU: Micron Technology

NA: Numerical Aperture / Not Available

NAND: NOT-AND Flash Memory

NIC: Network Interface Card

nm: Nanometer

NVDA: NVIDIA

NVFP4: NVIDIA 4-Bit Floating Point

NVLink: NVIDIA High-Speed Interconnect

NVMI: Nova

NXPI: NXP Semiconductors

ON: onsemi

PC: Personal Computer

PCIe: Peripheral Component Interconnect Express

QLC: Quad-Level Cell

QCOM: Qualcomm

RISC-V: Reduced Instruction Set Computer Five

SBC: Stock-Based Compensation

SiC: Silicon Carbide

SIA: Semiconductor Industry Association

SK: SK Hynix

SNPS: Synopsys

SoC: System-on-Chip

SOTP: Sum-of-the-Parts

SRAM: Static Random Access Memory

SSD: Solid-State Drive

SWKS: Skyworks Solutions

TAM: Total Addressable Market

TB: Terabyte

TER: Teradyne

TIA: Transimpedance Amplifier

TPU: Tensor Processing Unit

TSMC: Taiwan Semiconductor Manufacturing Company

TSV: Through-Silicon Via

TXN: Texas Instruments

UALink: Ultra Accelerator Link

VECO: Veeco Instruments

WFE: Wafer Fab Equipment

WOLF: Wolfspeed

wspm: Wafer Starts Per Month

x86: Intel/AMD Processor Architecture

XPU: X Processing Unit

ZF: Zero-Flap

CAMT: Camtek

CDNS: Cadence Design Systems

CEO: Chief Executive Officer

CCG: Client Computing Group

CMP: Chemical Mechanical Planarization

COHR: Coherent Corp

CPO: Co-Packaged Optics

CPU: Central Processing Unit

CRDO: Credo Technology

CXL: Compute Express Link

CY: Calendar Year

DCAI: Data Center and AI

DC: Data Center

DRAM: Dynamic Random Access Memory

DSP: Digital Signal Processor

Exhibit 19: Stocks mentioned
Rating and price summary

BofA Ticker	Bloomberg ticker	Company name	Price	Rating
AMD	AMD US	Advanced Micro	US$ 493.41	C-1-9
ADI	ADI US	Analog Devices	US$ 361.02	B-1-7
AMAT	AMAT US	Applied Materials	US$ 424.21	B-1-7
INTC	INTC US	Intel	US$ 97.19	C-1-9
LRCX	LRCX US	Lam Research	US$ 273.49	C-1-7
MRVL	MRVL US	Marvell	US$ 218.82	C-1-7
MU	MU US	Micron	US$ 924.03	C-1-7
NVDA	NVDA US	NVIDIA	US$ 210.96	C-1-7
ON	ON US	ON Semiconductor	US$ 71.65	C-1-9

Source: BofA Global Research

BofA GLOBAL RESEARCH

Price objective basis & risk

Advanced Micro Devices, Inc (AMD)
Our $620 PO is based on 27x our 2028E non-GAAP EPS, including SBC. Our PO basis is in-line with historical fwd median of 27-28x and in the middle of historical 13x-58x range, well supported by AMD's 50%+ annual EPS CAGR potential and its AI CPU/GPU share gain potentials, modestly offset by slower growth in cyclical PC/embedded/console markets.

Downside risks: 1) Execution on first rack-scale product (MI400 Series), 2) Timing/Magnitude of Middle East AI Projects, 3) Lumpy nature of consumer and enterprise spending that could create delays in acceptance and success of new products, 4) High reliance on one outsourced manufacturing partner, 5) Maturity of current game console cycle.

Upside risks are greater share gain potential in the PC and server processor market against competitors.

Analog Devices Inc. (ADI)
Our $500 PO is based on 23x CY2028E P/E. Our PO basis is within the 14x-40x historical range and at a slight premium to analog semi peers. This is justified, in our view, based on ADI's best-in-class profitability and differentiated sources of both cyclical and secular growth across AI, industrial, auto, and comms.

Downside risks to our price objective: 1) Economic downturn, which could reduce demand for automotive, industrial products, impacting gross margins, especially given recent capital expenditures and higher fixed cost footprint. 2) Inability to realize the planned cost synergies from the Maxim combination. 3) Competition from larger vendors that have lower-cost production facilities. 4) Exposure to US-China tensions/tariffs via Chinese automotive market.

Applied Materials, Inc. (AMAT)
Our PO of $650 is based on 27x our CY28E P/E estimate. Our PO basis is near the middle of AMAT's historical 10-42x trading range justified given the potential for WFE outgrowth in 2026/27E and remains at a discount to other large peers given more balanced growth profile and lower profitability.

Downside risks to our PO are: ongoing US government probe that we are unable to size the financial impact at this time, slower-than-expected capital spending cycle, delay in memory capacity adds, market share loss in deposition, implant, thermal, CMP, etch, or process control segments, merger & integrations risk, and macro headwinds.

Intel (INTC)

Our $145 price objective is based on 29x CY30E EPS power of $6+, discounted back two years, given the company's key server CPU and external foundry wafer/packaging opportunities that extend far out. Our PO implies 8.9x our total company 2028E EV/S which is well above historical 1.7x-4x range but we view as appropriate given increasing server CPU and external foundry opportunity, offset by near-/medium-term manufacturing ramp-up uncertainties.

Upside risks to our price objective are 1) key external foundry packaging/wafer deals that could significantly boost sales/utilization, 2) greater than expected yields/ramps at 18A and upcoming 14A nodes, resulting in greater GM/utilization profile, 3) stronger than expected PC market from Windows 10 refresh or AI uplift, 4) geopolitical tensions boosting sentiment for domestic manufacturing asset.

Downside risks to our price objective are 1) lower than yield/ramp at Intel Foundry, particularly for its new 18A and upcoming 14A nodes, 2) lack of material external foundry customer in wafer processing, 3) weaker-than-expected trends in a mature PC market, which is largest revenue generator for Intel, 4) accelerated share loss to major CPU competitors.

Lam Research Corp. (LRCX)
We assign a $385 PO based on 29x CY28E PE. Our PO basis is near the middle of the historical 9x-50x trading range justified by ongoing memory and leading-edge foundry/logic WFE cycle, high-teens EPS CAGR over time, etch/deposition product leadership, rising etch/deposition intensity, share gains, growing foundry/logic exposure over memory, improving prospects of NAND greenfield along with continued upgrade spending,, and robust FCF generation, offset by near-term concerns around cost inflation and tariffs.

Upside risks are tech inflections, F/L share gains, NAND upgrades.

Downside risks are slower than expected capital spending cycle, delay in memory capacity adds, market share loss in etch or clean segments, merger & integrations risk, macro headwinds, customer consolidation and China.

Marvell Technology, Inc. (MRVL)
Our $365 price objective is based on 33x CY28E PE (excl. SBC), modestly higher than 26x historical median but within 14x-53x range and is justified by an improvement in visibility for major customer ASIC projects, broadening AI portfolio across connectivity/switch/compute, and cyclical industry risks offset by ASIC upside, networking strength, and AEC/CPO/scale-up share gains.

Upside risks: 1) Faster than anticipated ramp/visibility in major custom ASIC projects, 2) Continued growth in DSP-based pluggable market, versus new LPO/LRO techs, 3) Share gains in emerging AEC/CPO/scale-up switch markets against incumbents.

Downside risks: 1) Loss of visibility in key custom ASIC projects, particularly in the next-gen 3nm/2nm chips at AWS and Microsoft, 2) Competition in AI compute, with merchant vendors continuing to proliferate and ASIC incumbent AVGO winning many of the large hyperscaler/AI customers, 3) cyclical industry risks including potential slowdown in legacy storage, enterprise networking, carrier markets.

Micron Technology, Inc (MU)
Our $1550 PO is based on a sum-of-parts valuation that values: (1) traditional cyclical memory business at $1,040/sh at 3x CY28E P/B, toward the high-end of MU's long-term range 0.8x-3.1x as we are potentially in a memory upcycle, and (2) AI HBM business at 31x CY28E PE, in-line with AI compute peer group median.

Downside risks: (1) larger than expected memory ASP decline, (2) greater competition from China newcomers, (3) share loss to large competitors, (4) softening of demand across major end markets such as data center, smartphones, or PCs.

NVIDIA Corporation (NVDA)
Our $350 PO is based on 22x CY27E PE ex cash, within NVDA's historical 15x-56x forward year PE range, which we believe is justified by NVDA's leading share in fast-growing AI compute/networking markets, offset by lumpiness in global AI projects, cyclical gaming market, and concerns around access to power.

Downside risks are: 1) weakness in consumer driven gaming market, 2) Competition with major public firms, internal cloud projects and other private companies in AI and accelerated computing markets, 3) Larger than expected impact from restrictions on compute shipments to China, or additional restrictions placed on activity in the region, 4) Lumpy and unpredictable sales in new enterprise, data center, and autos markets, 5) Potential for decelerating capital returns, and 6) Enhanced government scrutiny of NVDA's dominant market position in AI chips.

onsemi (ON)
Our PO of $120 PO is based on 20x 2028E P/E. Our PO basis is in the middle of ON's 9x-28x trading range and auto/industrial peers trading 14x-29x, justified, in our view, given potential for strong EPS and FCF recovery along with ongoing content and share gains in areas like silicon carbide and image sensing which should drive strong secular growth longer-term. We also think this valuation credits the company's restructuring initiatives that should streamline its manufacturing and opex base.

Downside risks to our PO are 1) macro/cyclical risks, given high exposure to automotive and industrial markets, make ON susceptible to any potential global trade tensions/tariffs, 2) prolonged COVID-19 headwinds limiting pace of automotive/industrial recovery, impacting utilization levels, 3) difficulty in ramping 300mm fabrication facility limiting gross margin improvement, 4) sustained elevated capex levels relative to peers.

Analyst Certification

We, Vivek Arya, Duksan Jang and Michael Mani, hereby certify that the views each of us has expressed in this research report accurately reflect each of our respective personal views about the subject securities and issuers. We also certify that no part of our respective compensation was, is, or will be, directly or indirectly, related to the specific recommendations or view expressed in this research report.

Special Disclosures

BofA Securities is currently acting as financial advisor to One Investment Management Ltd in connection with the proposed acquisition with PayPay Corporation, a subsidiary of SoftBank Group Corp., of shares of T&D Financial Life Insurance Company, a consolidated subsidiary of T&D Holdings, Inc., which was announced on June 4, 2026.

BofA Securities is currently acting as joint financial advisor to ABB Ltd in connection with the sale of its Robotics Division to SoftBank Group Corp, which was announced on October 8, 2025.

US - Semiconductors and Semiconductor Capital Equipment Coverage Cluster

Investment rating	Company	BofA Ticker	Bloomberg symbol	Analyst
BUY				
	Advanced Energy Industries	AEIS	AEIS US	Duksan Jang
	Advanced Micro Devices, Inc	AMD	AMD US	Vivek Arya
	Allegro Microsystems	ALGM	ALGM US	Vivek Arya
	Analog Devices Inc.	ADI	ADI US	Vivek Arya
	Applied Materials, Inc.	AMAT	AMAT US	Vivek Arya
	Broadcom Inc	AVGO	AVGO US	Vivek Arya
	Cadence	CDNS	CDNS US	Vivek Arya
	Camtek	CAMT	CAMT US	Michael Mani
	Credo Technology	CRDO	CRDO US	Vivek Arya
	Intel	INTC	INTC US	Vivek Arya
	KLA Corporation	KLAC	KLAC US	Vivek Arya
	Lam Research Corp.	LRCX	LRCX US	Vivek Arya
	M/A-Com	MTSI	MTSI US	Vivek Arya
	Marvell Technology, Inc.	MRVL	MRVL US	Vivek Arya
	Microchip	MCHP	MCHP US	Vivek Arya
	Micron Technology, Inc	MU	MU US	Vivek Arya
	MKS Instruments	MKSI	MKSI US	Michael Mani
	Nova	NVMI	NVMI US	Michael Mani
	NVIDIA Corporation	NVDA	NVDA US	Vivek Arya
	onsemi	ON	ON US	Vivek Arya
	Quantinuum	QNT	QNT US	Vivek Arya
	Synopsys	SNPS	SNPS US	Vivek Arya
	Teradyne	TER	TER US	Vivek Arya
	Texas Instruments Inc.	TXN	TXN US	Vivek Arya
NEUTRAL				
	Ambarella	AMBA	AMBA US	Vivek Arya
	Ambiq Micro, Inc.	AMBQ	AMBQ US	Vivek Arya
	Arm Holdings	ARM	ARM US	Vivek Arya
	Astera Labs Inc	ALAB	ALAB US	Vivek Arya
	Coherent Corp	COHR	COHR US	Vivek Arya
	Lumentum Holdings	LITE	LITE US	Vivek Arya
	NXP Semiconductors NV	NXPI	NXPI US	Vivek Arya
UNDERPERFORM				
	Axcelis Technologies	ACLS	ACLS US	Duksan Jang
	GlobalFoundries	GFS	GFS US	Vivek Arya
	Lattice Semiconductor	LSCC	LSCC US	Duksan Jang
	Qualcomm	QCOM	QCOM US	Vivek Arya
	Skyworks Solutions, Inc.	SWKS	SWKS US	Vivek Arya
RVW				
	Wolfspeed Inc	WOLF	WOLF US	Vivek Arya

Disclosures

Important Disclosures

Equity Investment Rating Distribution: Technology Group (as of 30 Jun 2026)

Coverage Universe	Count	Percent	Inv. Banking Relationships [R1]	Count	Percent
Buy	243	60.60%	Buy	123	50.62%
Hold	87	21.70%	Hold	45	51.72%
Sell	71	17.71%	Sell	21	29.58%

Equity Investment Rating Distribution: Global Group (as of 30 Jun 2026)

Coverage Universe	Count	Percent	Inv. Banking Relationships [R1]	
Buy	1987	56.11%	Buy	%
Hold	797	22.51%	Hold	%
Sell	757	21.38%	Sell	%

[R1] Issuers that were investment banking clients of BofA Securities or one of its affiliates within the past 12 months. For purposes of this Investment Rating Distribution, the coverage
rated Neutral is included as a Hold, a stock rated Underperform is included as a Sell.



FUNDAMENTAL EQUITY OPINION KEY: Opinions include a Volatility Risk Rating, an Investment Rating and an Income Rating. VOLATILITY RISK RATINGS, indicators of potential price fluctuation, are: A - Low, B - Medium and C - High. INVESTMENT RATINGS reflect the analyst's assessment of both a stock's absolute total return potential as well as its attractiveness for investment relative to other stocks within its Coverage Cluster (defined below). Our investment ratings are: 1 - Buy stocks are expected to have a total return of at least 10% and are the most attractive stocks in the coverage cluster; 2 - Neutral stocks are expected to remain flat or increase in value and are less attractive than Buy rated stocks and 3 - Underperform stocks are the least attractive stocks in a coverage cluster. An investment rating of 6 (No Rating) indicates that a stock is no longer trading on the basis of fundamentals. Analysts assign investment ratings considering, among other things, the 0-12 month total return expectation for a stock and the firm's guidelines for ratings dispersions (shown in the table below). The current price objective for a stock should be referenced to better understand the total return expectation at any given time. The price objective reflects the analyst's view of the potential price appreciation (depreciation).

Investment rating	Total return expectation (within 12-month period of date of initial rating)	Ratings dispersion guidelines for coverage cluster[R2]
Buy	≥ 10%	≤ 70%
Neutral	≥ 0%	≤ 30%
Underperform	N/A	≥ 20%

[R2]Ratings dispersions may vary from time to time where BofA Global Research believes it better reflects the investment prospects of stocks in a Coverage Cluster.

INCOME RATINGS, indicators of potential cash dividends, are: 7 - same/higher (dividend considered to be secure), 8 - same/lower (dividend not considered to be secure) and 9 - pays no cash dividend. *Coverage Cluster* is comprised of stocks covered by a single analyst or two or more analysts sharing a common industry, sector, region or other classification(s). A stock's coverage cluster is included in the most recent BofA Global Research report referencing the stock.

Price Charts for the securities referenced in this research report are available on the Price Charts website, or call 1-800-MERRILL to have them mailed.
BofAS or one of its affiliates acts as a market maker for the equity securities recommended in the report: Advanced Micro, Analog Devices, Applied Materials, Intel, Lam Research, Marvell, Micron, NVIDIA, ON Semiconductor.
BofAS or an affiliate was a manager of a public offering of securities of this issuer within the last 12 months: Advanced Micro, Applied Materials, Intel, Marvell Tech, ON Semiconductor.
The issuer is or was, within the last 12 months, an investment banking client of BofAS and/or one or more of its affiliates: Advanced Micro, Analog Devices, Applied Materials, Intel, Lam Research, Marvell Tech, Micron, ON Semiconductor.
BofAS or an affiliate has received compensation from the issuer for non-investment banking services or products within the past 12 months: Advanced Micro, Analog Devices, Applied Materials, Intel, Lam Research, Marvell Tech, Micron, NVIDIA, ON Semiconductor.
The issuer is or was, within the last 12 months, a non-securities business client of BofAS and/or one or more of its affiliates: Advanced Micro, Analog Devices, Applied Materials, Intel, Lam Research, Marvell Tech, Micron, NVIDIA, ON Semiconductor.
BofAS or an affiliate has received compensation for investment banking services from this issuer within the past 12 months: Advanced Micro, Analog Devices, Applied Materials, Intel, Lam Research, Marvell Tech, Micron, ON Semiconductor.
BofAS or an affiliate expects to receive or intends to seek compensation for investment banking services from this issuer or an affiliate of the issuer within the next three months: Advanced Micro, Analog Devices, Intel, Lam Research, Marvell Tech, Micron, ON Semiconductor.
BofAS together with its affiliates beneficially owns one percent or more of the common stock of this issuer. If this report was issued on or after the 9th day of the month, it reflects the ownership position on the last day of the previous month. Reports issued before the 9th day of a month reflect the ownership position at the end of the second month preceding the date of the report: Analog Devices, Applied Materials, Lam Research, Marvell Tech, NVIDIA, ON Semiconductor.
BofAS or one of its affiliates is willing to sell to, or buy from, clients the common equity of the issuer on a principal basis: Advanced Micro, Analog Devices, Applied Materials, Intel, Lam Research, Marvell, Micron, NVIDIA, ON Semiconductor.
The issuer is or was, within the last 12 months, a securities business client (non-investment banking) of BofAS and/or one or more of its affiliates: Advanced Micro, Analog Devices, Applied Materials, Intel, Lam Research, Marvell Tech, Micron, NVIDIA, ON Semiconductor.
BofA Global Research personnel (including the analyst(s) responsible for this report) receive compensation based upon, among other factors, the overall profitability of Bank of America Corporation, including profits derived from investment banking. The analyst(s) responsible for this report may also receive compensation based upon, among other factors, the overall profitability of the Bank's sales and trading businesses relating to the class of securities or financial instruments for which such analyst is responsible.

Other Important Disclosures

From time to time research analysts conduct site visits of covered issuers. BofA Global Research policies prohibit research analysts from accepting payment or reimbursement for travel expenses from the issuer for such visits.
Prices are indicative and for information purposes only. Except as otherwise stated in the report, for any recommendation in relation to an equity security, the price referenced is the publicly traded price of the security as of close of business on the day prior to the date of the report or, if the report is published during intraday trading, the price referenced is indicative of the traded price as of the date and time of the report and in relation to a debt security (including equity preferred and CDS), prices are indicative as of the date and time of the report and are from various sources including BofA Securities trading desks.
The date and time of completion of the production of any recommendation in this report shall be the date and time of dissemination of this report as recorded in the report timestamp.

Recipients who are not institutional investors or market professionals should seek the advice of their independent financial advisor before considering information in this report in connection with any investment decision, or for a necessary explanation of its contents.
Officers of BofAS or one or more of its affiliates (other than research analysts) may have a financial interest in securities of the issuer(s) or in related investments.
Refer to BofA Global Research policies relating to conflicts of interest.
"BofA Securities" includes BofA Securities, Inc. ("BofAS") and its affiliates. Investors should contact their BofA Securities representative or Merrill Global Wealth Management financial advisor if they have questions concerning this report or concerning the appropriateness of any investment idea described herein for such investor. "BofA Securities" is a global brand for BofA Global Research.
Information relating to Non-US affiliates of BofA Securities and Distribution of Affiliate Research Reports:
BofAS and/or Merrill Lynch, Pierce, Fenner & Smith Incorporated ("MLPF&S") may in the future distribute, information of the following non-US affiliates in the US (short name: legal name, regulator): Merrill Lynch (South Africa): Merrill Lynch South Africa (Pty) Ltd., regulated by the Financial Sector Conduct Authority; MLI (UK): Merrill Lynch International, regulated by the Financial Conduct Authority (FCA) and the Prudential Regulation Authority (PRA); BofASE (France): BofA Securities Europe SA is authorized by the Autorité de Contrôle Prudentiel et de Résolution (ACPR) and regulated by the ACPR and the Autorité des Marchés Financiers (AMF). BofA Securities Europe SA ("BofASE") with registered address at 51, rue La Boétie, 75008 Paris is registered under no 842 602 690 RCS Paris. In accordance with the provisions of French Code Monétaire et Financier (Monetary and Financial Code), BofASE is an établissement de crédit et d'investissement (credit and investment institution) that is authorised and supervised by the European Central Bank and the Autorité de Contrôle Prudentiel et de Résolution (ACPR) and regulated by the ACPR and the Autorité des Marchés Financiers. BofASE's share capital can be found at www.bofaml.com/BofASEdisclaimer; BofA Europe (Milan): Bank of America Europe Designated Activity Company, Milan Branch, regulated by the Bank of Italy, the European Central Bank (ECB) and the Central Bank of Ireland (CBI); BofA Europe (Frankfurt): Bank of America Europe Designated Activity Company, Frankfurt Branch regulated by BaFin, the ECB and the CBI; BofA Europe (Zurich): Bank of America Europe Designated Activity Company, Zurich Branch, regulated by the Swiss Financial Market Supervisory Authority FINMA, the ECB and CBI; BofA Europe (Madrid): Bank of America Europe Designated Activity Company, Sucursal en España, regulated by the Bank of Spain, the ECB and the CBI; Merrill Lynch (Australia): Merrill Lynch Equities (Australia) Limited, regulated by the Australian Securities and Investments Commission; Merrill Lynch (Hong Kong): Merrill Lynch (Asia Pacific)

Limited, regulated by the Hong Kong Securities and Futures Commission (HKSFC); Merrill Lynch (Singapore): Merrill Lynch (Singapore) Pte Ltd, regulated by the Monetary Authority of Singapore (MAS); Merrill Lynch (Canada): Merrill Lynch Canada Inc, regulated by the Canadian Investment Regulatory Organization; Merrill Lynch (Mexico): Merrill Lynch Mexico, SA de CV, Casa de Bolsa, regulated by the Comisión Nacional Bancaria y de Valores; BofAS Japan: BofA Securities Japan Co., Ltd., regulated by the Financial Services Agency; Merrill Lynch (Seoul): Merrill Lynch International, LLC Seoul Branch, regulated by the Financial Supervisory Service; Merrill Lynch (Taiwan): Merrill Lynch Securities (Taiwan) Ltd., regulated by the Securities and Futures Bureau; BofAS India: BofA Securities India Limited, regulated by the Securities and Exchange Board of India (SEBI); Merrill Lynch (Israel): Merrill Lynch Israel Limited, regulated by Israel Securities Authority; Merrill Lynch (DIFC): Merrill Lynch International (DIFC Branch), regulated by the Dubai Financial Services Authority (DFSA); Merrill Lynch (Brazil): Merrill Lynch S.A. Corretora de Títulos e Valores Mobiliários, regulated by Comissão de Valores Mobiliários; Merrill Lynch KSA Company: Merrill Lynch Kingdom of Saudi Arabia Company, regulated by the Capital Market Authority.
This information: has been approved for publication and is distributed in the United Kingdom (UK) to professional clients and eligible counterparties (as each is defined in the rules of the FCA and the PRA) by MLI (UK), which is authorized by the PRA and regulated by the FCA and the PRA - details about the extent of our regulation by the FCA and PRA are available from us on request; has been approved for publication and is distributed in the European Economic Area (EEA) by BofASE (France), which is authorized by the ACPR and regulated by the ACPR and the AMF; has been considered and distributed in Japan by BofAS Japan, a registered securities dealer under the Financial Instruments and Exchange Act in Japan, or its permitted affiliates; is issued and distributed in Hong Kong by Merrill Lynch (Hong Kong) which is regulated by HKSFC; is issued and distributed in Taiwan by Merrill Lynch (Taiwan); is issued and distributed in India by BofAS India; and is issued and distributed in Singapore to institutional investors and/or accredited investors (each as defined under the Financial Advisers Regulations) by Merrill Lynch (Singapore) (Company Registration No 198602883D). Merrill Lynch (Singapore) is regulated by MAS. Merrill Lynch Equities (Australia) Limited (ABN 65 006 276 795), AFS License 235132 (MLEA) distributes this information in Australia only to 'Wholesale' clients as defined by s.761G of the Corporations Act 2001. With the exception of Bank of America N.A., Australia Branch, neither MLEA nor any of its affiliates involved in preparing this information is an Authorised Deposit-Taking Institution under the Banking Act 1959 nor regulated by the Australian Prudential Regulation Authority. No approval is required for publication or distribution of this information in Brazil and its local distribution is by Merrill Lynch (Brazil) in accordance with applicable regulations. Merrill Lynch (DIFC) is authorized and regulated by the DFSA. Information prepared and issued by Merrill Lynch (DIFC) is done so in accordance with the requirements of the DFSA conduct of business rules. BofA Europe (Frankfurt) distributes this information in Germany and is regulated by BaFin, the ECB and the CBI. BofA Securities entities, including BofA Europe and BofASE (France), may outsource/delegate the marketing and/or provision of certain research services or aspects of research services to other branches or members of the BofA Securities group. You may be contacted by a different BofA Securities entity acting for and on behalf of your service provider where permitted by applicable law. This does not change your service provider. Please refer to the Electronic Communications Disclaimers for further information.
This information has been prepared and issued by BofAS and/or one or more of its non-US affiliates. The author(s) of this information may not be licensed to carry on regulated activities in your jurisdiction and, if not licensed, do not hold themselves out as being able to do so. BofAS and/or MLPF&S is the distributor of this information in the US and accepts full responsibility for information distributed to BofAS and/or MLPF&S clients in the US by its non-US affiliates. Any US person receiving this information and wishing to effect any transaction in any security discussed herein should do so through BofAS and/or MLPF&S and not such foreign affiliates. Hong Kong recipients of this information should contact Merrill Lynch (Asia Pacific) Limited in respect of any matters relating to dealing in securities or provision of specific advice on securities or any other matters arising from, or in connection with, this information. Singapore recipients of this information should contact Merrill Lynch (Singapore) Pte Ltd in respect of any matters arising from, or in connection with, this information. For clients that are not accredited investors, expert investors or institutional investors Merrill Lynch (Singapore) Pte Ltd accepts full responsibility for the contents of this information distributed to such clients in Singapore.

General Investment Related Disclosures:

Taiwan Readers: Neither the information nor any opinion expressed herein constitutes an offer or a solicitation of an offer to transact in any securities or other financial instrument. No part of this report may be used or reproduced or quoted in any manner whatsoever in Taiwan by the press or any other person without the express written consent of BofA Securities.
This document provides general information only, and has been prepared for, and is intended for general distribution to, BofA Securities clients. Neither the information nor any opinion expressed constitutes an offer or an invitation to make an offer, to buy or sell any securities or other financial instrument or any derivative related to such securities or instruments (e.g., options, futures, warrants, and contracts for differences). This document is not intended to provide personal investment advice and it does not take into account the specific investment objectives, financial situation and the particular needs of, and is not directed to, any specific person(s). This document and its content do not constitute, and should not be considered to constitute, investment advice for purposes of ERISA, the US tax code, the Investment Advisers Act or otherwise. Investors should seek financial advice regarding the appropriateness of investing in financial instruments and implementing investment strategies discussed or recommended in this document and should understand that statements regarding future prospects may not be realized. Any decision to purchase or subscribe for securities in any offering must be based solely on existing public information on such security or the information in the prospectus or other offering document issued in connection with such offering, and not on this document.
Securities and other financial instruments referred to herein, or recommended, offered or sold by BofA Securities, are not insured by the Federal Deposit Insurance Corporation and are not deposits or other obligations of any insured depository institution (including, Bank of America, N.A.). Investments in general and, derivatives, in particular, involve numerous risks, including, among others, market risk, counterparty default risk and liquidity risk. No security, financial instrument or derivative is suitable for all investors. Digital assets are extremely speculative, volatile and are largely unregulated. In some cases, securities and other financial instruments may be difficult to value or sell and reliable information about the value or risks related to the security or financial instrument may be difficult to obtain. Investors should note that income from such securities and other financial instruments, if any, may fluctuate and that price or value of such securities and instruments may rise or fall and, in some cases, investors may lose their entire principal investment. Past performance is not necessarily a guide to future performance. Levels and basis for taxation may change.
This report may contain a short-term trading idea or recommendation, which highlights a specific near-term catalyst or event impacting the issuer or the market that is anticipated to have a short-term price impact on the equity securities of the issuer. Short-term trading ideas and recommendations are different from and do not affect a stock's fundamental equity rating, which reflects both a longer term total return expectation and attractiveness for investment relative to other stocks within its Coverage Cluster. Short-term trading ideas and recommendations may be more or less positive than a stock's fundamental equity rating.
BofA Securities is aware that the implementation of the ideas expressed in this report may depend upon an investor's ability to "short" securities or other financial instruments and that such action may be limited by regulations prohibiting or restricting "shortselling" in many jurisdictions. Investors are urged to seek advice regarding the applicability of such regulations prior to executing any short idea contained in this report.
Foreign currency rates of exchange may adversely affect the value, price or income of any security or financial instrument mentioned herein. Investors in such securities and instruments, including ADRs, effectively assume currency risk.
BofAS or one of its affiliates is a regular issuer of traded financial instruments linked to securities that may have been recommended in this report. BofAS or one of its affiliates may, at any time, hold a trading position (long or short) in the securities and financial instruments discussed in this report.
BofA Securities, through business units other than BofA Global Research, may have issued and may in the future issue trading ideas or recommendations that are inconsistent with, and reach different conclusions from, the information presented herein. Such ideas or recommendations may reflect different time frames, assumptions, views and analytical methods of the persons who prepared them, and BofA Securities is under no obligation to ensure that such other trading ideas or recommendations are brought to the attention of any recipient of this information.
In the event that the recipient received this information pursuant to a contract between the recipient and BofAS for the provision of research services for a separate fee, and in connection therewith BofAS may be deemed to be acting as an investment adviser, such status relates, if at all, solely to the person with whom BofAS has contracted directly and does not extend beyond the delivery of this report (unless otherwise agreed specifically in writing by BofAS). If such recipient uses the services of BofAS in connection with the sale or purchase of a security referred to herein, BofAS may act as principal for its own account or as agent for another person. BofAS is and continues to act solely as a broker-dealer in connection with the execution of any transactions, including transactions in any securities referred to herein.

Copyright and General Information:

Copyright 2026 Bank of America Corporation. All rights reserved. iQdatabase® is a registered service mark of Bank of America Corporation. This information is prepared for the use of BofA Securities clients and may not be redistributed, retransmitted or disclosed, in whole or in part, or in any form or manner, without the express written consent of BofA Securities. This document and its content is provided solely for informational purposes and cannot be used for training or developing artificial intelligence (AI) models or as an input in any AI application (collectively, an AI tool). Any attempt to utilize this document or any of its content in connection with an AI tool without explicit written permission from BofA Global Research is strictly prohibited. BofA Global Research utilizes AI, including machine learning and other technologies, to enhance the services we provide to our clients. These technologies assist our analysts in various aspects of their work, including but not limited to data analysis, content extraction, content creation, data aggregation and summarization and identifying relevant information from diverse sources. All AI-driven processes are subject to review by BofA Global Research employees. BofA Global Research information is distributed simultaneously to internal and client websites and other portals by BofA Securities and is not publicly-available material. Any unauthorized use or disclosure is prohibited. Receipt and review of this information constitutes your agreement not to redistribute, retransmit, or disclose to others the contents, opinions, conclusion, or information contained herein (including any investment recommendations, estimates or price targets) without first

obtaining express permission from an authorized officer of BofA Securities.

Materials prepared by BofA Global Research personnel are based on public information. Facts and views presented in this material have not been reviewed by, and may not reflect information known to, professionals in other business areas of BofA Securities, including investment banking personnel. BofA Securities has established information barriers between BofA Global Research and certain business groups. As a result, BofA Securities does not disclose certain client relationships with, or compensation received from, such issuers. To the extent this material discusses any legal proceeding or issues, it has not been prepared as nor is it intended to express any legal conclusion, opinion or advice. Investors should consult their own legal advisers as to issues of law relating to the subject matter of this material. BofA Global Research personnel's knowledge of legal proceedings in which any BofA Securities entity and/or its directors, officers and employees may be plaintiffs, defendants, co-defendants or co-plaintiffs with or involving issuers mentioned in this material is based on public information. Facts and views presented in this material that relate to any such proceedings have not been reviewed by, discussed with, and may not reflect information known to, professionals in other business areas of BofA Securities in connection with the legal proceedings or matters relevant to such proceedings.

This information has been prepared independently of any issuer of securities mentioned herein and not in connection with any proposed offering of securities or as agent of any issuer of any securities. None of BofAS any of its affiliates or their research analysts has any authority whatsoever to make any representation or warranty on behalf of the issuer(s). BofA Global Research policy prohibits research personnel from disclosing a recommendation, investment rating, or investment thesis for review by an issuer prior to the publication of a research report containing such rating, recommendation or investment thesis.

Any information relating to sustainability in this material is limited as discussed herein and is not intended to provide a comprehensive view on any sustainability claim with respect to any issuer or security.

Any information relating to the tax status of financial instruments discussed herein is not intended to provide tax advice or to be used by anyone to provide tax advice. Investors are urged to seek tax advice based on their particular circumstances from an independent tax professional.

The information herein (other than disclosure information relating to BofA Securities and its affiliates) was obtained from various sources and we do not guarantee its accuracy. This information may contain links to third-party websites. BofA Securities is not responsible for the content of any third-party website or any linked content contained in a third-party website. Content contained on such third-party websites is not part of this information and is not incorporated by reference. The inclusion of a link does not imply any endorsement by or any affiliation with BofA Securities. Access to any third-party website is at your own risk, and you should always review the terms and privacy policies at third-party websites before submitting any personal information to them. BofA Securities is not responsible for such terms and privacy policies and expressly disclaims any liability for them.

All opinions, projections and estimates constitute the judgment of the author as of the date of publication and are subject to change without notice. Prices also are subject to change without notice. BofA Securities is under no obligation to update this information and BofA Securities ability to publish information on the subject issuer(s) in the future is subject to applicable quiet periods. You should therefore assume that BofA Securities will not update any fact, circumstance or opinion contained herein.

Subject to the quiet period applicable under laws of the various jurisdictions in which we distribute research reports and other legal and BofA Securities policy-related restrictions on the publication of research reports, fundamental equity reports are produced on a regular basis as necessary to keep the investment recommendation current.

Certain outstanding reports or investment opinions relating to securities, financial instruments and/or issuers may no longer be current. Always refer to the most recent research report relating to an issuer prior to making an investment decision.

In some cases, an issuer may be classified as Restricted or may be Under Review or Extended Review. In each case, investors should consider any investment opinion relating to such issuer (or its security and/or financial instruments) to be suspended or withdrawn and should not rely on the analyses and investment opinion(s) pertaining to such issuer (or its securities and/or financial instruments) nor should the analyses or opinion(s) be considered a solicitation of any kind. Sales persons and financial advisors affiliated with BofAS or any of its affiliates may not solicit purchases of securities or financial instruments that are Restricted or Under Review and may only solicit securities under Extended Review in accordance with firm policies.

Neither BofA Securities nor any officer or employee of BofA Securities accepts any liability whatsoever for any direct, indirect or consequential damages or losses arising from any use of this information.