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.

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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

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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.

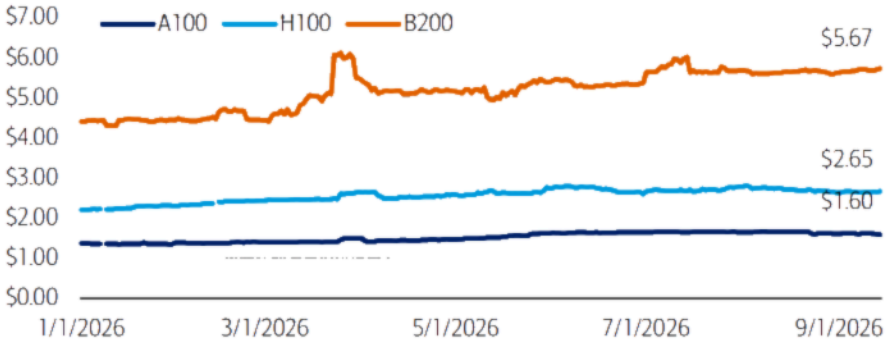
Exhibit 1: We now see total semis sales of $3.2Tn (+18% CAGR CY26-30), vs. $2.7Tn prior (+14% CAGR), with core semis now at $1.4Tn (+16% CAGR) vs. $1.1Tn prior (+11% CAGR)
BofA Semiconductor forecasts by end market: New vs. Old

	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

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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

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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

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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

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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	$1,327.2	$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**	**$114.1**	30.4%	21.8%	12.6%
YoY	47.6%	(25.4%)	7.2%	54.6%	(8.6%)	42.9%	34.7%	12.2%	50.0%	40.0%	28.0%	20.0%	17.0%			
DRAM sales ($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

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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

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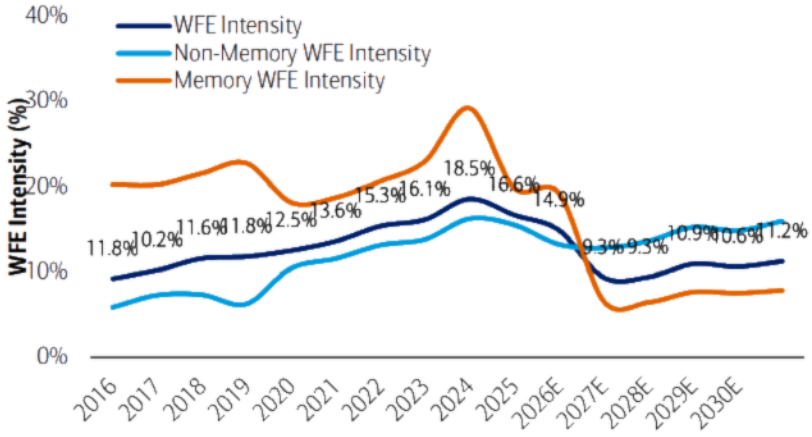
WFE approaching $400bn by CY30

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

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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

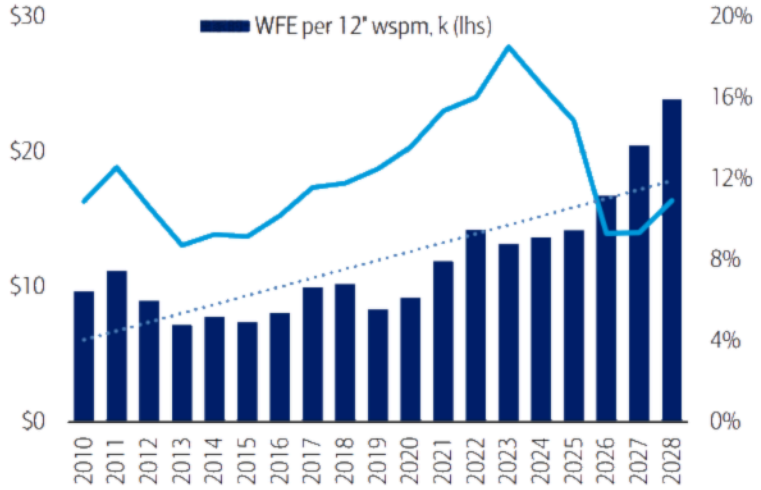
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WFE-per-wafer: structurally increasing through-cycle

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

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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%**	

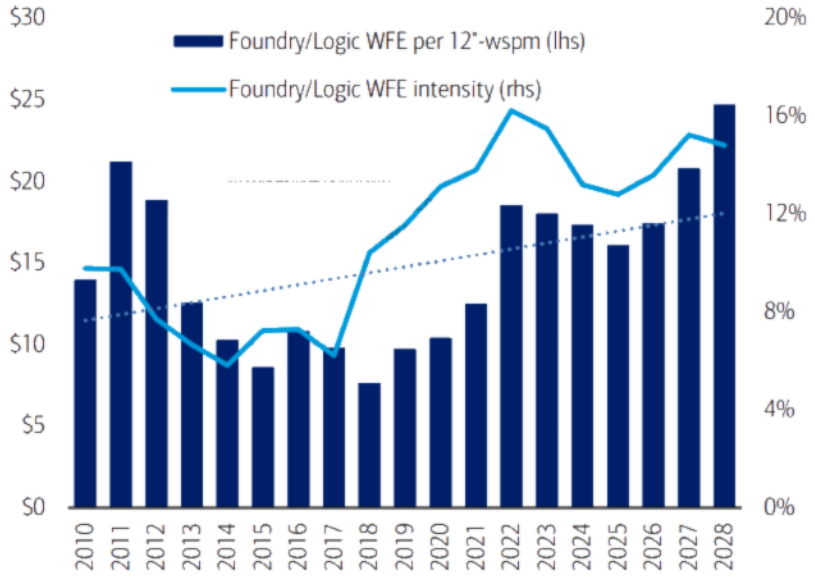
Source: BofA Global Research estimates, Gartner, company reports

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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

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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%**	

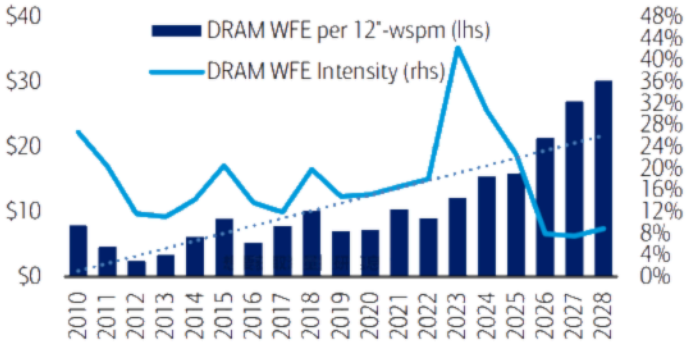
Source: BofA Global Research estimates, Gartner, company reports

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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

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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%**	

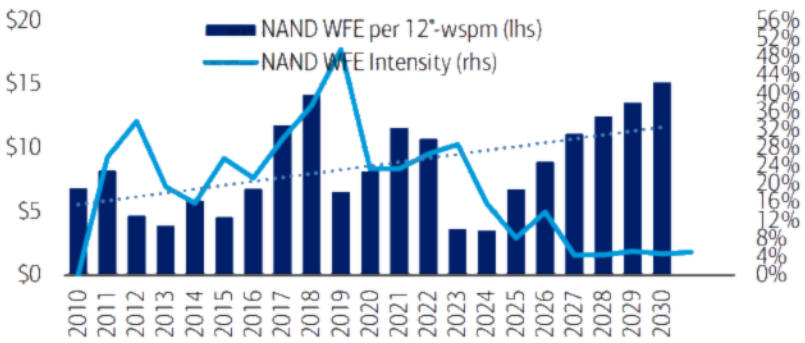
Source: BofA Global Research estimates, Gartner, company reports

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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

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WFE per wafer analysis implies WFE approaching $400bn by CY30E

Using our justifications above and increasing WFE per wafer by trends consistent with periods of aggressive node pacing, brownfield and greenfield capacity expansions, and tech transitions in the past, we can come up with implied WFE using our estimates for logic and memory wafers.

We expect the biggest gains in memory WFE per wafer but also expect modest growth in foundry/logic. In total, implied WFE could reach $210bn in CY27, $278bn by CY28, and $370bn by CY30 directionally supporting our updated WFE estimates.

Exhibit 17: Using our forecasts for logic and memory wafers and assuming WFE per wafer gains in-line consistent with historical precedent, we calculate implied WFE of $210bn in CY27E and $360bn by CY30E supporting our updated forecasts
Translating WFE per wafer trends into aggregate potential WFE through CY28

	2023	2024	2025	2026	2027	2028	2029	2030	CY26-30 CAGR
NAND wafers 12" wspm K	1,820	1,781	1,638	1,720	1,720	1,963	1,902	1,959	7%
NAND WFE per 12" wspm	$4	$4	$7	$9	$11	$13	$16	$19	**20%**
NAND WFE	**$6,667**	**$6,320**	**$11,184**	**$15,433**	**$18,520**	**$25,368**	**$29,494**	**$36,454**	**28%**
YoY Growth		*-5.2%*	*77.0%*	*38.0%*	*20.0%*	*37.0%*	*16.3%*	*23.6%*	
DRAM wafers 12" wspm K	1,628	1,734	1,887	2,110	2,345	2,684	2,474	2,573	13%
DRAM WFE per 12" wspm	$12	$16	$16	$21	$25	$30	$35	$42	**18%**
DRAM WFE	**$20,002**	**$26,943**	**$30,237**	**$45,356**	**$59,474**	**$80,319**	**$87,364**	**$107,213**	**33%**
YoY Growth		*34.7%*	*12.2%*	*50.0%*	*31.1%*	*35.0%*	*8.8%*	*22.7%*	
Memory wafers 12" wspm K	3,447	3,515	3,525	3,830	4,064	4,646	4,375	4,531	10%
Memory WFE per 12" wspm	$8	$9	$12	$16	$19	$23	$27	$32	20%
Memory WFE	**$26,670**	**$33,263**	**$41,421**	**$60,789**	**$77,994**	**$105,687**	**$116,858**	**$143,668**	**32%**
YoY Growth		*24.7%*	*24.5%*	*46.8%*	*28.3%*	*35.5%*	*10.6%*	*22.9%*	
Leading-edge F/Lwafers 12" wspm K	294	404	576	816	1,183	1,502	1,510	1,790	36%
Leading-edge F/LWFE per 12" wspm	$130	$78	$68	$65	$72	$79	$87	$95	**10%**
Leading-edge F/L WFE	**$38,347**	**$31,445**	**$39,306**	**$53,063**	**$84,609**	**$118,167**	**$130,688**	**$170,412**	**49%**
YoY Growth		*-18.0%*	*25.0%*	*35.0%*	*59.4%*	*39.7%*	*10.6%*	*30.4%*	
Trailing-edge F/L wafers 12" wspm K	3,605	3,716	4,084	4,696	5,067	5,582	5,512	5,218	9%
Trailing-edge F/L WFE per 12" wspm	$9	$11	$9	$9	$9	$10	$10	$11	**5%**
Trailing-edge F/L WFE	**$32,128**	**$40,166**	**$35,507**	**$41,544**	**$47,066**	**$54,442**	**$56,453**	**$56,113**	**14%**
YoY Growth		*25.0%*	*-11.6%*	*17.0%*	*13.3%*	*15.7%*	*3.7%*	*-0.6%*	
Total Foundry/Logic wafers 12" wspm K	3,899	4,119	4,660	5,512	6,250	7,084	7,023	7,008	13%
Total Foundry/Logic WFE per 12" wspm	$18.1	$17.4	$16.1	$17.2	$21.1	$24.4	$26.6	$32.3	19%
Total Foundry/Logic WFE	**$70,475**	**$71,611**	**$74,813**	**$94,607**	**$131,674**	**$172,609**	**$187,141**	**$226,525**	**35%**
YoY Growth		*1.6%*	*4.5%*	*26.5%*	*39.2%*	*31.1%*	*8.4%*	*21.0%*	
WFE wafers 12" wspm K	7,346	7,635	8,185	9,342	10,314	11,730	11,398	11,540	12%
WFE per 12" wspm	$13	$14	$14	$17	$20	$24	$27	$32	19%
WFE	**$97,145**	**$104,873**	**$116,234**	**$155,396**	**$209,668**	**$278,296**	**$303,999**	**$370,193**	**34%**
YoY Growth		*8.0%*	*10.8%*	*33.7%*	*34.9%*	*32.7%*	*9.2%*	*21.8%*	

Source: BofA Global Research estimates, Gartner, company reports

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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.

