17 Jun 2026 05:00:00 ET | 20 pages

US Semiconductor Equipment

$250B Reasons to Stay Long; Lifting PTs on AMAT, LRCX, & KLAC

CITI'S TAKE

We update our bull case WFE to $145B/$200B/$250B in 2026/27/28, align AMAT/LRCX/KLAC estimates to our revised WFE model, and lift PTs to $710/$450/$290 respectively as we roll forward our price targets based on CY28 earnings powers. Incrementally, we are bullish on NAND equipment demand as a widening gap between required DRAM and available supply helps adoption of complementary solutions such as KV cache off-loading.

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Introducing 2028 WFE of $250B — We update our top-down WFE analysis for 2026/2027, and introduce 2028 WFE forecasts based on Citi's updated hyperscaler capex model of 84%/56%/38% growth in CY26/27/28. We now see bull case WFE of ~$145Bn/$200Bn/$250Bn in 2026/27/28, implying another solid 25% growth in 2028. We are more constructive on 2028 WFE given continued capacity constraints and expansion at both TSMC and memory makers, as well as recent progress at Intel and Samsung foundries.

DRAM Bottleneck is Good for NAND Demand — The rise of agentic AI is driving a structural increase in NAND demand as memory requirements surge and DRAM supply tightens. Multi-step inference workflows are dramatically expanding KV cache footprints, pushing total memory requirements well beyond what high-cost HBM and DRAM can efficiently support, especially in an environment of constrained DRAM supply and elevated pricing. This pressure is already driving architectural trade-offs, as evidenced by report that Nvidia has reduced SoCAMM2 DRAM capacity in its Vera Rubin NVL72 systems by roughly 50% due to supply limitations and cost considerations (see note). This underscores a widening gap between required and available memory, and we are seeing companies accelerating the adoption of complementary solutions as a result, such as KV cache offloading where intermediate model state is shifted to lower-cost, higher-capacity storage tiers. Assuming a modern 150k wspm NAND fab can do ~15EB per year, implies we need 2-4 new greenfield fabs or $20-40Bn capex, or $15-$30Bn NAND WFE to overcome DRAM bottlenecks.

															Current Fiscal Year		Next Fiscal Year	
						Rating		Short-Term	Target Price						EPS		EPS	
Company	Ticker	Ccy	Price	Mkt Cap (M)	Date & Time	Old	New	View	Old	New	ESPR (%)	Div Yld (%)	ETR (%)	Last Rpt Yr	Old	New	Old	New
Applied Materials	AMAT	US$	568.23	451,152	16 Jun 16:00	1	nc	-	550.00	710.00	24.9	0.3	25.2	Oct-25	13.58	nc	16.54	nc
KLA Corp	KLAC	US$	237.33	310,018	16 Jun 16:00	1	nc	-	206.40	290.00	22.2	0.3	22.5	Jun-25	3.69	nc	4.99	nc
Lam Research	LRCX	US$	369.34	461,886	16 Jun 16:00	1	nc	-	315.00	450.00	21.8	0.4	22.2	Jun-25	5.65	nc	7.63	7.69

1 = Buy, 2 = Neutral, 3 = Sell, H = High Risk
ESPR = Expected Share Price Return, ETR = Expected Total Return, nc = no change
Source: Citi Research
^Catalyst Watch

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

Earnings Estimates

				Last Reported Year					Current Fiscal Year					Next Fiscal Year				
Company Name	Ticker	Last Rpt Year	Currency	1Q	2Q	3Q	4Q	FY0	1Q	2Q	3Q	4Q	FY1	1Q	2Q	3Q	4Q	FY2
Applied Materials	AMAT	Oct-25	US$	2.38	2.54	2.85	2.82	10.58	2.96	3.70	3.36	3.56	13.58	3.61	3.96	4.37	4.60	16.54
KLA Corp	KLAC	Jun-25	US$	0.73	0.64	0.84	0.94	3.15	0.88	0.88	0.94	0.99	3.69	1.10	1.21	1.29	1.39	4.99
Lam Research	LRCX	Jun-25	US$	0.86	0.91	1.04	1.33	4.13	1.26	1.27	1.47	1.65	5.65	1.73	1.81	1.99	2.16	7.69
Old		Jun-25	US$	0.86	0.91	1.04	1.33	4.13	1.26	1.27	1.47	1.65	5.65	1.73	1.81	1.98	2.11	7.63

Source: Citi Research

Lifting TPs on AMAT, LRCX, & KLAC

Updated Top-down WFE

We update our top-down WFE analysis for 2026/2027, and introduce 2028 WFE forecasts based on Citi's updated hyperscaler capex model of 84%/56%/38% growth in CY26/27/28. We now see bull case WFE of ~$145Bn/$200Bn/$250Bn in 2026/27/28, implying another solid 25% growth in 2028. We are now more constructive on 2028 WFE given continued capacity constraints and expansion at both TSMC and memory makers, as well as recent progress at Intel and Samsung foundries. On the foundry side, in addition to the news on Terafab (see our prior note), Intel foundry is gaining traction at Google and Apple at various capacities, and Samsung is reported to be accelerating Taylor fab and working with Google TPU v10 on memory I/O die at 2nm, as well as in discussion with BYD on 2nm and 4nm autonomous driving chips. The capacity expansion plans and incremental customers engagement at Samsung/Intel all bode well for WFE, and the semi cap companies have been adding capacity for the past few years and will continue to do so to ensure they do not become a bottleneck for the industry.

Figure 1. WFE reaching $200Bn/$250Bn in CY27/28

Base

WFE Mix	2025	2026 Growth	WFE 2026E	2027 Growth	WFE 2027E	2028 Growth	WFE 2028E	2028 WFE Mix
AI	$ 35	84%	$ 65	56%	$ 101	38%	$ 139	65%
China	$ 36	0%	$ 36	0%	$ 36	0%	$ 36	17%
Non-AI	$ 39	0%	$ 39	0%	$ 39	0%	$ 39	18%
Total WFE $b	**$ 110**	**27%**	**$ 139**	**26%**	**$ 176**	**22%**	**$ 214**	

Bull

WFE Mix	2025	2026 Growth	WFE 2026E	2027 Growth	WFE 2027E	2028 Growth	WFE 2028E	2028 WFE Mix
AI	$ 35	94%	$ 68	66%	$ 113	48%	$ 167	66%
China	$ 36	5%	$ 38	5%	$ 40	5%	$ 42	17%
Non-AI	$ 39	5%	$ 41	5%	$ 43	5%	$ 45	18%
Total WFE $b	**$ 110**	**33%**	**$ 147**	**33%**	**$ 196**	**30%**	**$ 254**	

Bear

WFE Mix	2025	2026 Growth	WFE 2026E	2027 Growth	WFE 2027E	2028 Growth	WFE 2028E	2028 WFE Mix
AI	$ 35	74%	$ 61	46%	$ 89	28%	$ 114	64%
China	$ 36	-5%	$ 34	-5%	$ 33	-5%	$ 31	17%
Non-AI	$ 39	-5%	$ 37	-5%	$ 35	-5%	$ 33	19%
Total WFE $b	**$ 110**	**20%**	**$ 132**	**19%**	**$ 157**	**14%**	**$ 178**	

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Source: Citi Research

DRAM bottleneck is good for NAND demand

The rise of agentic AI is driving a structural increase in NAND demand as memory requirements surge and DRAM supply tightens. Multi-step inference workflows are dramatically expanding KV cache footprints, pushing total memory requirements well beyond what high-cost HBM and DRAM can efficiently support, especially in an environment of constrained DRAM supply and elevated pricing. This pressure is already driving architectural trade-offs, as evidenced by report that Nvidia has reduced SoCAMM2 DRAM capacity in its Vera Rubin NVL72 systems by roughly 50% due to supply limitations and cost considerations (see note). Rather than indicating weaker demand, this underscores a widening gap between required and available memory, and we are seeing companies accelerating the adoption of complementary solutions as a result, such as KV cache offloading (as demonstrated by **Nvidia's CMX** earlier this year), where intermediate model state is shifted to lower-cost, higher-capacity storage tiers. More recently on Jun 15, **AMD acquired MEXT**, which focuses on memory optimization and has developed a predictive memory software solution that makes flash storage appear as DRAM-speed memory, which could expand usable memory capacity and potentially also reduce costs. Moreover, **Apple's AFM 3** announced on Jun 8 also highlighted a new architecture that stores the LLM models in NAND instead of DRAM in order to

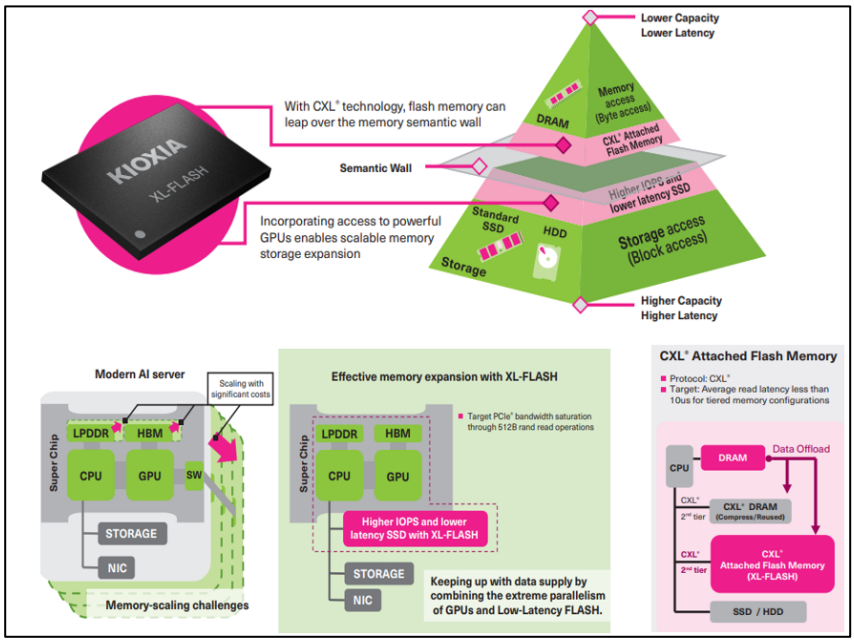
maximizing on-device AI capabilities. Coupled with ongoing innovation in high-performance NAND such as HBF and XL-Flash, we view this transition as structurally positive for NAND demand, as both cloud computing and on-device applications are increasingly rely on NAND to scale capacity, manage costs, and support the growing complexity of agentic AI workloads.

KV Cache offloading - KV cache offloading refers to the architectural technique of dynamically transferring intermediate attention states (key–value tensors) from HBM into lower-cost, higher-capacity tiers such as DRAM and, increasingly, NAND flash, effectively extending the usable memory footprint for LLM inference. As KV cache grows with agentic AI workload, it can quickly overwhelm GPU memory, and offloading mitigates this "memory wall" by creating a hierarchical system in which hot data remains on-GPU with HBM, while colder, less frequently accessed context is migrated to DRAM and further to SSDs and reloaded on demand. This shift directly drives NAND demand because enterprise SSDs become an active inference memory tier rather than passive storage - they are needed to deliver high-throughput, low-latency access to massive, persistent KV datasets that can span petabytes at scale.

Samsung and Micron both talked about their solution of TLC based PCIe Gen6 SSD for such AI workload. Sandisk is in the development of HBF and the timeline has recently been pulled forward by 6 months to 2H 26 pilot line (see note)

Kioxia's XL-Flash – The memory bottleneck is also driving innovation for storage companies. Kioxia's XL-FLASH is a low-latency, high-performance NAND-based flash memory designed to bridge the widening gap between ultra-fast but expensive DRAM and higher-capacity but slower conventional flash, especially for AI workloads. It addresses growing challenges in the memory hierarchy—where DRAM is limited by cost and scalability, and traditional flash cannot deliver memory-like responsiveness—by offering a non-volatile solution that can serve as an intermediate performance tier. XL-FLASH is compatibility with the CXL protocol, which allows flash-based memory to be accessed coherently as an extension of host memory rather than just as storage. Through CXL, XL-FLASH can function as part of a tiered memory architecture, expanding effective system memory at lower cost than DRAM while delivering near-memory performance for certain workloads, helping overcome bottlenecks such as limited memory slots, PCIe bandwidth constraints, and the increasing data demands of GPUs.

Figure 2. Kioxia's XL-Flash



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Source: Citi Research, Kioxia

Raising Estimates on AMAT/LRCX/KLAC

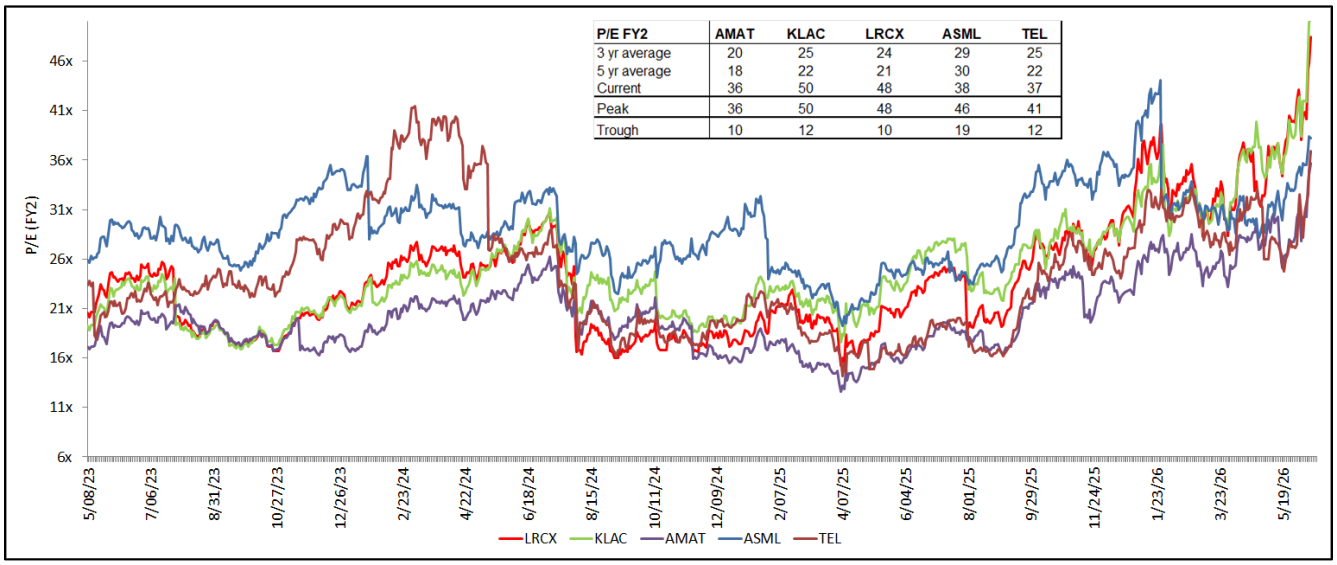
As investor focus shifts beyond 2027 toward 2028, we introduce CY28 estimates for AMAT, LRCX, and KLAC and roll forward our price targets based on CY28 earnings power.

AMAT – We model total revenue growth of 30%/22% Y/Y in CY27/28, including 35%/25% from Silicon, and 14%/13% from AGS. We lift our TP to $710 from $550 prior, based on 31x P/E applied to CY28 EPS. The 31x P/E is consistent with our prior valuation and 55%% above historical average of 20x on group AI re-rating and extended strong WFE upcycle, but 15% below peak P/E of 36x.

LRCX - We model total revenue growth of 28%/22% Y/Y in CY27/28, including 36%/25% from Systems, and 12%/13% from CSBG. We lift our TP to $450 from $315 prior, based on 40x P/E applied to CY28 EPS. The 40x P/E is up from 37x prior, 67% above historical average of 24x on group AI re-rating, extended strong WFE upcycle, and over-indexed NAND exposure, and 15% below peak P/E of 48x.

KLAC - We model total revenue growth of 24%/22% in CY27/28, including 28%/25% from SPC-systems, and 14%14% for SPC-services, and 15%/15% for EPC. We lift our TP to $290 from $206.4 prior, based on 40x P/E applied to CY28 EPS. The 40x P/E is up from 36x prior, 60% above historical average of 25x on group AI re-rating and extended strong WFE upcycle, and 20% below peak P/E of 50x.

Figure 3. Big 5 Semi Cap Historical P/E

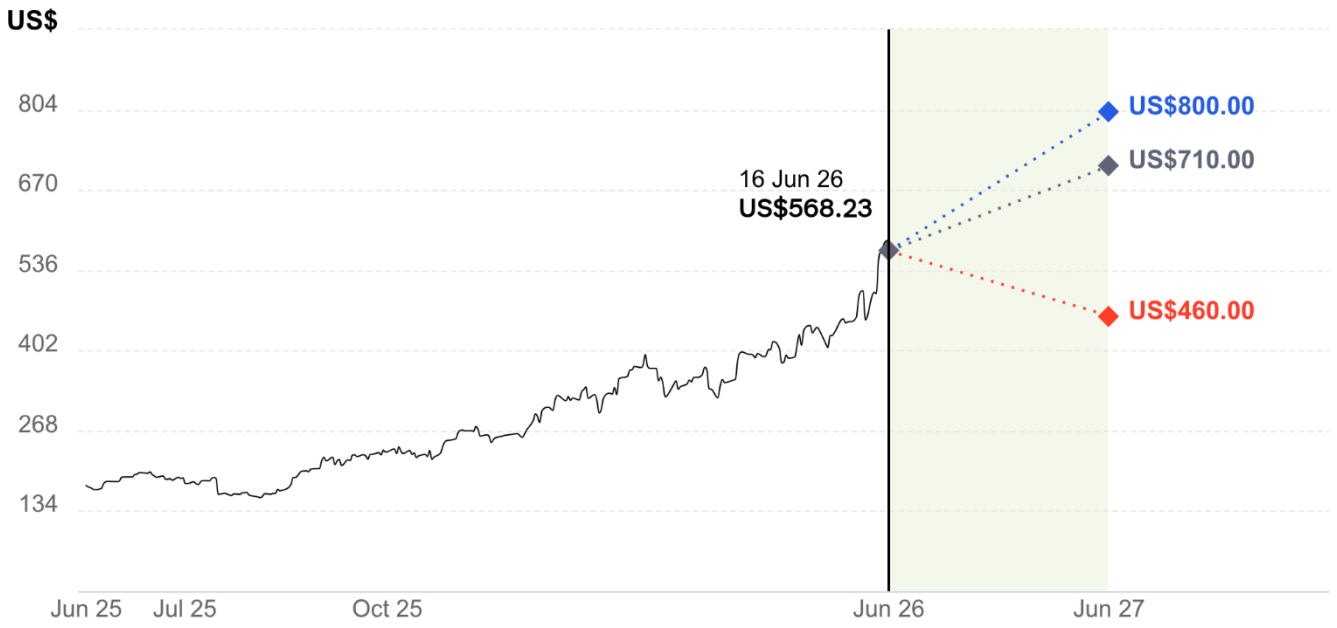


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Source: Citi Research, FactSet

Bull/Bear: Applied Materials Inc (AMAT.O)

US$ 800.00 ▲41% Upside | US$ 710.00 ▲25% Upside | US$ 460.00 ▼19% Downside



Spread 60pp
Current Price and expected returns (upside/downside) as of 16 Jun 2026

BULL Assumptions

- WFE +30%/+40%/30% in 2026/27/28
- Market share gains in 3D logic deposition and etch drive revenue higher
- 35x P/E multiple expansion on faster secular growth

BASE Assumptions

- WFE +25%/+35%/25% in 2026/27/28
- Stable market share in dep and etch in 2026/27
- 31x P/E

BEAR Assumptions

- WFE digest in 2028 due to macro slowdown and slower AI data center investment
- 20x P/E - share loss

Bull/Bear: KLA Corp (KLAC.O)

US$330.00 ▲39% Upside | US$290.00 ▲22% Upside | US$183.00 ▼23% Downside



Spread 62pp
Current Price and expected returns (upside/downside) as of 16 Jun 2026

BULL Assumptions

- WFE +30%/+35%/+30% in 2026/27/28
- 45x P/E - Multiple expansion on share gains in new products and above average WFE growth led by SPC sales

BASE Assumptions

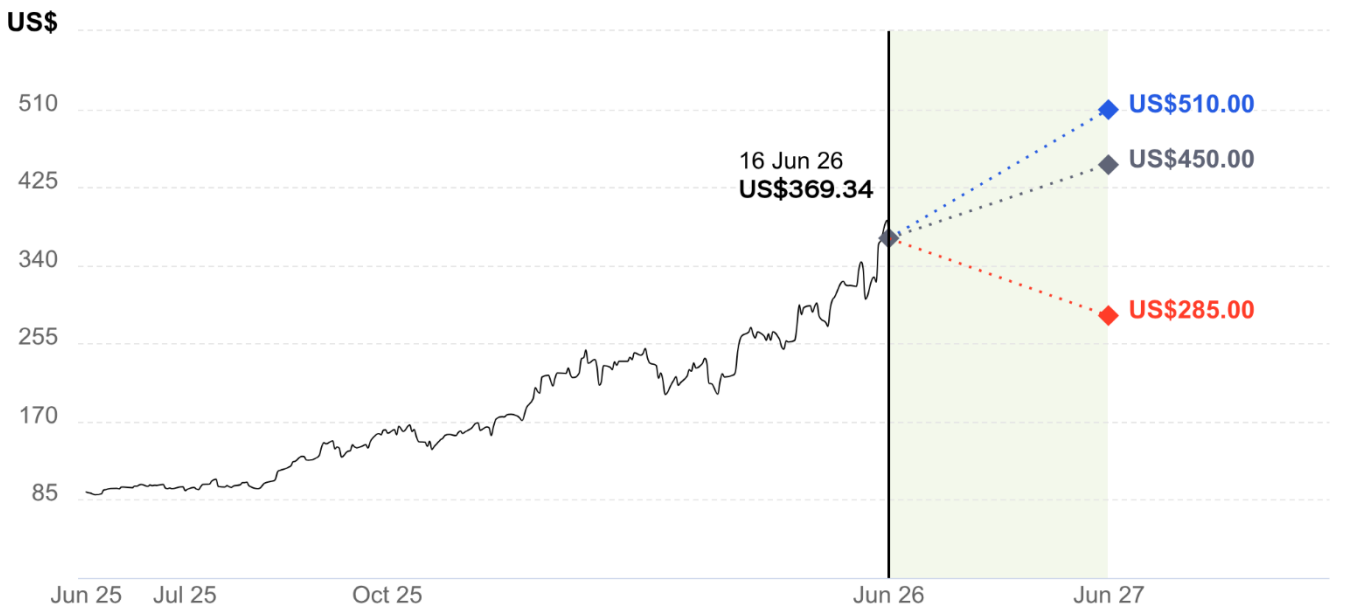
- WFE 25%/+35%/25% in 2026/27/28
- 40x P/E - Stable share and modestly better relative WFE growth

BEAR Assumptions

- WFE digestion in 2028
- 25x P/E - Multiple contraction

Bull/Bear: Lam Research Corp (LRCX.O)

US$ 510.00 ▲38% Upside | US$ 450.00 ▲22% Upside | US$ 285.00 ▼23% Downside



Spread 61pp
Current Price and expected returns (upside/downside) as of 16 Jun 2026

BULL Assumptions

- WFE +25%/40%/30% in 2026/27/28
- Memory market share gains in deposition and etch drive increased revenue opportunity
- P/E 45x multiple expansion on faster secular growth

BASE Assumptions

- WFE +25%/35%25% in 2026/27/28
- Stable market share in deposition and etch
- P/E 40x 3D devices to drive outsized WFE growth

BEAR Assumptions

- WFE enter into digestion period in 2028
- Slow memory recovery lowers capex spend and limits top and bottom line growth
- P/E 25x - loss in market share in deposition and etch

Applied Materials Inc

Company description

Applied Materials is the leader in materials engineering solutions used to produce virtually every new chip and advanced display in the world. Applied's expertise in modifying materials at atomic levels and on an industrial scale enables customers to transform possibilities into reality.

Investment strategy

We are Buy-rated on AMAT as we see it well exposed to multi-year WFE upcycle and secular megatrends like GAA, advanced packaging, and ICAPS in the next 2-3 years.

Valuation

We value AMAT at $710 using a 31x P/E multiple on 2028E EPS. We view a 31x multiple, above AMAT's 3-year average multiple of 20x, as appropriate given multi-year WFE upcycle, secular tailwinds, and incremental AI data center investment.

Risks

Downside risks to the achievement of our target price include the following: 1) As fab utilization and capital equipment orders are closely linked to the stock price, any material differences to our supply/demand model (e.g. demand drops suddenly, or supply increases more rapidly than we predict) may cause our valuation methodology to be inaccurate. 2) As the market share leader in multiple sub-segments of semiconductor equipment, AMAT is uniquely positioned to capitalize on inflections as well as face tough competition from large peers in industry cycles.

KLA Corp

Company description

KLA develops industry-leading equipment and services that enable innovation throughout the electronics industry. It provides advanced process control and process-enabling solutions for manufacturing wafers and reticles, integrated circuits, packaging, printed circuit boards, and flat panel displays.

Investment strategy

We are Buy rated on KLAC as a good play on growing process control intensity and AI-driven WFE multi-year upcycle.

Valuation

We value KLAC at $290 using a 40x P/E multiple on 2028E earnings power. We view a 40x multiple or above 3-year average of 25x on multiple re-rating in the group due to growing AI WFE exposure.

Risks

The key upside/downside risks that could impede the stock from achieving our target price are: 1) lower/higher competition from competitors like AMAT/ASML; 2) foundry inventory correction risk on 10nm/7nm; and 3) fast/slow adoption of new Gen 4/5 and EUV products.

Lam Research Corp

Company description

Lam Research Corporation is a global supplier of innovative wafer fabrication equipment and services to the semiconductor industry. Today, nearly every advanced chip is built with Lam technology.

Investment strategy

We are Buy-rated on LRCX as a good stock play on the 3D devices megatrend in the next 2-3 years and beneficiary of AI-driven data center capex spending with muti-year WFE upcycle.

Valuation

We value LRCX at $450 using 40x P/E multiple on CY2028 earnings. We view a 40x multiple vs 3-yr average of 24x but below peak of 48x as appropriate given extended WFE cycle, secular AI tailwinds, higher services or one third of total sales contribution, share gains, and rising equipment capital intensity.

Risks

The key downside risks to our investment thesis and target price on LRCX include: 1) increasing competition in deposition and etch; 2) weaker-than-expected overall semi market demand, especially memory; and 3) slower-than-expected demand in China due to US-China trade and IP tensions.

If you are visually impaired and would like to speak to a Citi representative regarding the details of the graphics in this document, please call USA 1-888-500-5008 (TTY: 711), from outside the US +1-210-677-3788

Appendix A-1

ANALYST CERTIFICATION

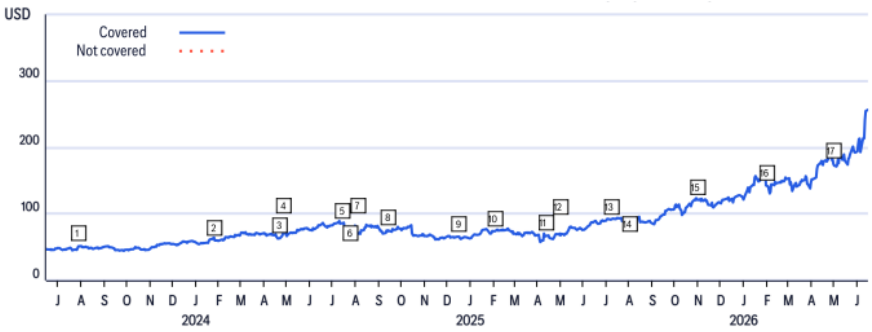
The research analysts primarily responsible for the preparation and content of this research report are either (i) designated by "AC" in the author block or (ii) listed in bold alongside content which is attributable to that analyst. If multiple AC analysts are designated in the author block, each analyst is certifying with respect to the entire research report other than (a) content attributable to another AC certifying analyst listed in bold alongside the content and (b) views expressed solely with respect to a specific issuer which are attributable to another AC certifying analyst identified in the price charts or rating history tables for that issuer shown below. Each of these analysts certify, with respect to the sections of the report for which they are responsible: (1) that the views expressed therein accurately reflect their personal views about each issuer and security referenced and were prepared in an independent manner, including with respect to Citigroup Global Markets Inc. and its affiliates; and (2) no part of the research analyst's compensation was, is, or will be, directly or indirectly, related to the specific recommendations or views expressed by that research analyst in this report.

IMPORTANT DISCLOSURES

KLA Corp (KLAC)

Ratings and Target Price History
Fundamental Research

Analyst: Atif Malik



	Date	Rating	Target Price	Closing Price
1	28-Jul-23 07:16:00	1	*57.00	51.10
2	26-Jan-24 01:30:59	1	*70.00	59.94
3	22-Apr-24 22:36:22	1	*72.50	63.36
4	26-Apr-24 08:20:01	1	*76.00	70.63
5	15-Jul-24 02:30:56	1	*98.00	85.81
6	25-Jul-24 03:09:22	1	*99.00	76.28

	Date	Rating	Target Price	Closing Price
7	05-Aug-24 03:23:32	1	*96.00	70.35
8	15-Sep-24 23:50:21	1	*90.00	75.15
9	16-Dec-24 09:56:22	1	*83.20	65.61
10	03-Feb-25 23:43:37	1	*91.00	74.02
11	11-Apr-25 06:00:04	1	*80.00	67.02
12	01-May-25 08:56:44	1	*83.50	67.63

	Date	Rating	Target Price	Closing Price
13	07-Jul-25 01:00:00	1	*103.50	91.26
14	01-Aug-25 02:32:02	1	*106.00	88.66
15	30-Oct-25 06:59:10	1	*145.00	121.44
16	30-Jan-26 09:51:40	1	*180.00	142.79
17	30-Apr-26 13:39:18	1	*206.40	175.04

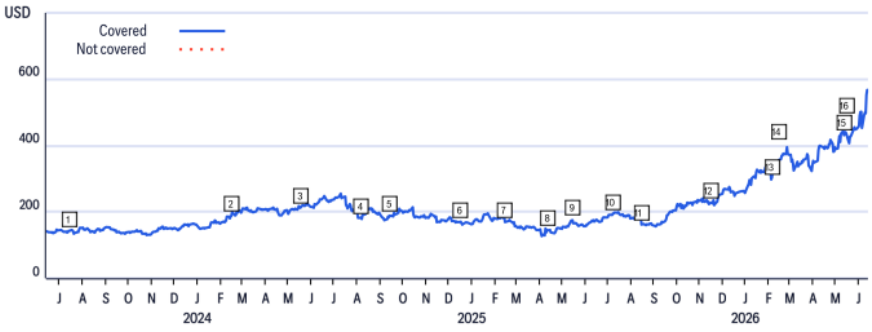
*Indicates Change

Rating/target price changes above reflect Eastern Time

Applied Materials Inc (AMAT)

Ratings and Target Price History
Fundamental Research

Analyst: Atif Malik



	Date	Rating	Target Price	Closing Price
1	14-Jul-23 00:06:55	1	*170.00	142.74
2	15-Feb-24 23:57:10	1	*211.00	187.66
3	17-May-24 06:21:39	1	*250.00	212.08
4	05-Aug-24 03:23:32	1	*240.00	181.89
5	15-Sep-24 23:50:21	1	*217.00	188.47
6	16-Dec-24 09:56:22	1	*194.00	169.41

	Date	Rating	Target Price	Closing Price
7	14-Feb-25 06:42:05	1	*202.00	169.20
8	11-Apr-25 06:00:04	1	*170.00	144.94
9	15-May-25 22:16:52	1	*190.00	174.75
10	07-Jul-25 01:00:00	1	*220.00	190.78
11	15-Aug-25 00:22:48	1	*205.00	161.76
12	14-Nov-25 03:00:51	1	*250.00	226.01

	Date	Rating	Target Price	Closing Price
13	04-Feb-26 05:00:00	1	*400.00	297.60
14	13-Feb-26 00:07:10	1	*420.00	354.91
15	12-May-26 02:05:55	1	*520.00	431.20
16	15-May-26 00:04:20	1	*550.00	436.62

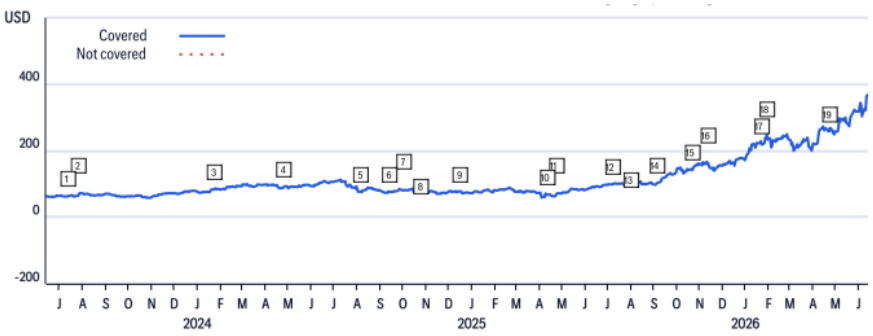
*Indicates Change

Rating/target price changes above reflect Eastern Time

Lam Research Corp (LRCX)

Ratings and Target Price History
Fundamental Research

Analyst: Atif Malik



	Date	Rating	Target Price	Closing Price
1	13-Jul-23 23:05:14	1	*69.50	63.83
2	27-Jul-23 03:53:50	1	*80.00	70.20
3	24-Jan-24 23:16:05	1	*97.50	84.82
4	25-Apr-24 00:26:58	1	*102.50	90.15
5	05-Aug-24 03:23:32	1	*99.00	77.04
6	15-Sep-24 23:50:21	1	*89.30	76.97
7	03-Oct-24 11:44:18	1	*89.30	81.11

	Date	Rating	Target Price	Closing Price
8	24-Oct-24 06:27:53	1	*90.00	76.57
9	16-Dec-24 09:56:22	1	*87.00	77.83
10	11-Apr-25 06:00:04	1	*80.00	67.48
11	24-Apr-25 00:47:29	1	*87.00	70.90
12	07-Jul-25 01:00:00	1	*108.00	98.14
13	31-Jul-25 08:47:20	1	*113.00	94.84
14	07-Sep-25 19:22:39	1	*120.00	102.95

	Date	Rating	Target Price	Closing Price
15	22-Oct-25 23:08:18	1	*175.00	141.25
16	11-Nov-25 09:06:12	1	*190.00	159.18
17	22-Jan-26 02:00:00	1	*265.00	220.70
18	28-Jan-26 22:58:07	1	*300.00	239.58
19	23-Apr-26 00:28:20	1	*315.00	258.56

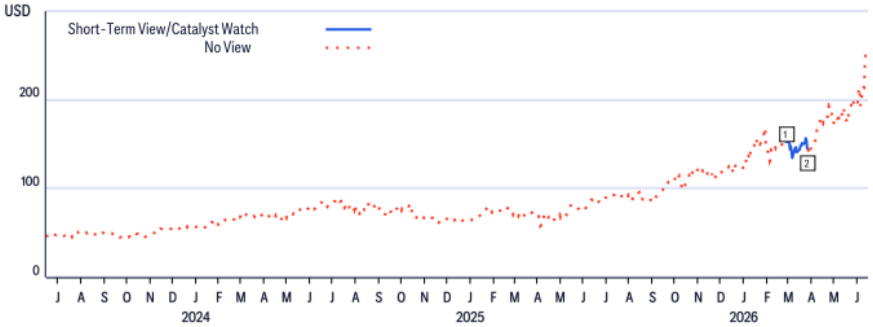
*Indicates Change

Rating/target price changes above reflect Eastern Time

KLA Corp (KLAC)

Short-Term View/Catalyst Watch Research

Analyst: Atif Malik



	Date	Action	Expected Direction	Duration	Closing Price
1	26-Feb-26 00:00:00	Add CW	Upside	30 Days	152.43

	Date	Action	Expected Direction	Duration	Closing Price
2	27-Mar-26 14:05:27	Remove CW	Upside	30 Days	144.32

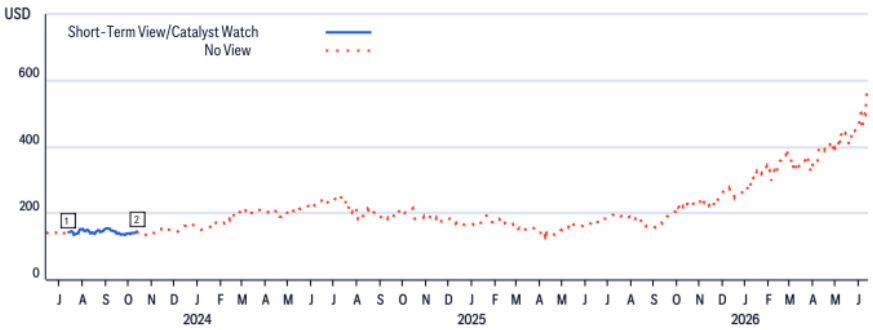
CW - Catalyst Watch , STV - Short-Term View

Rating/target price changes above reflect Eastern Time

Applied Materials Inc (AMAT)

Short-Term View/Catalyst Watch Research

Analyst: Atif Malik



	Date	Action	Expected Direction	Duration	Closing Price
1	13-Jul-23 20:55:39	Add CW	Upside	90 Days	142.65

	Date	Action	Expected Direction	Duration	Closing Price
2	12-Oct-23 12:04:49	Remove CW	Upside	90 Days	145.00

CW - Catalyst Watch , STV - Short-Term View

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