Americas Technology: Semiconductor Capital Equipment

Cutting 2019 WFE on memory weakness; reinstate KLAC at Sell

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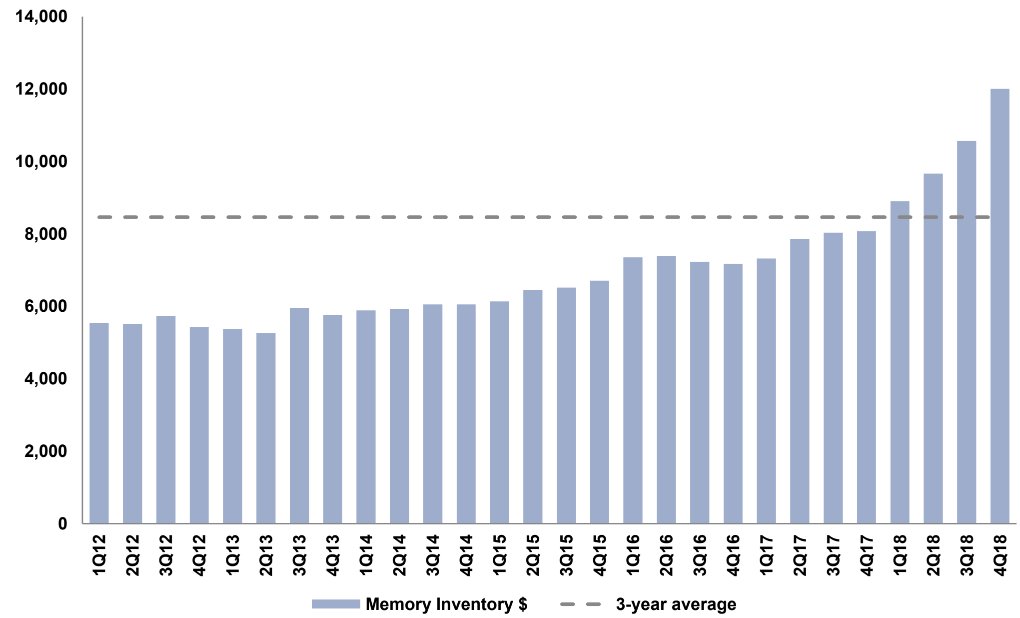
We reduce our 2019 Wafer Fab Equipment (WFE) market outlook from -20% yoy to -25% yoy as we incorporate a more negative view on memory spending following continued price declines in DRAM and NAND. We believe expectations for a 2H recovery in WFE - the primary driver behind Semi Cap stock price outperformance YTD, in our view - will fade over time as a) memory manufacturers make further adjustments to their respective spending plans and b) it becomes increasingly apparent that spending in logic and foundry is disproportionately 1H-weighted. Accordingly, over the next few months, we expect Semi Cap Equipment companies to revise WFE guidance (note most companies guided the 2019 WFE market to be down mid- to high-teens % yoy) and for Street earnings estimates to get cut. Additionally, while we recognize the positive steps (i.e., capex delays, production cuts) taken by memory manufacturers, we believe the trajectory of WFE fundamentals into 2020 is highly uncertain at this point, given elevated memory inventory. From a stock perspective, we remain on the sidelines and continue to await a better entry point before turning more constructive on the stocks. See below for an updated view on 2019/2020 WFE, thoughts on where we are in the cycle, and our updated investment theses on LRCX and AMAT. We also reinstate a rating on KLAC at Sell following the completion of the Orbotech acquisition, with a 12-month $107 price target (14% downside potential).

Memory inventory continues to increase and remain well above historical levels

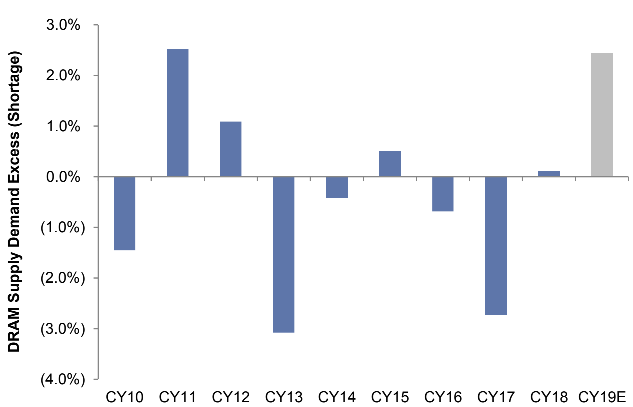


Source: Company data, Goldman Sachs Global Investment Research

Memory pricing continues to weaken...

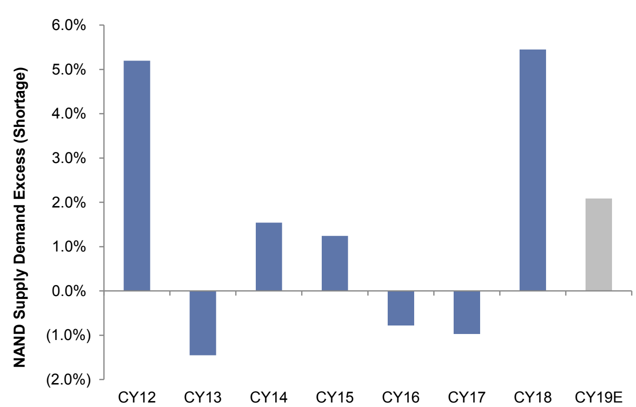
Our global memory team expects continued declines in memory pricing into 2H19 on a weak supply/demand outlook and elevated levels of inventory, with the potential for more benign pricing declines towards the end of the year (see Daiki Takayama's and Mark Delaney's recent notes here and here). The continued weakness in pricing comes after meaningful declines in 2018 and so far in 2019 (Exhibit 3-4). While weakness in memory pricing is not 'new news', the extent of the weakness and seemingly the lack of a bottom has the potential to impact the 2H19 recovery in capital spending that many industry participants (including KLAC and ASML) are pointing to given the correlation between memory profitability and spending.

Exhibit 1: We expect meaningful oversupply in DRAM...



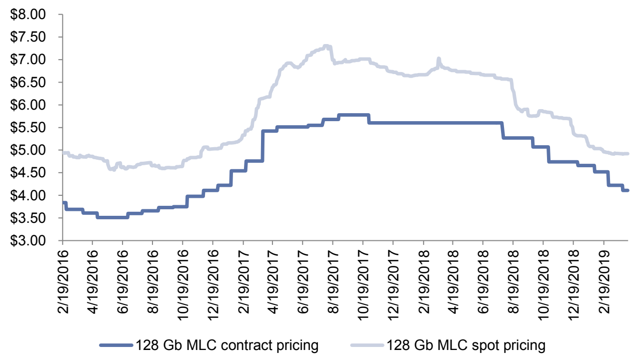
Source: Company data, Goldman Sachs Global Investment Research

Exhibit 2: ...as well as in NAND



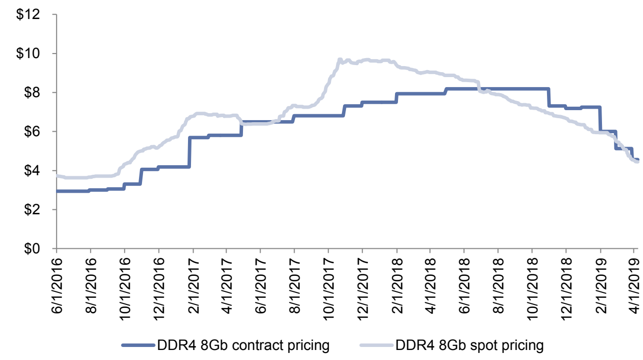
Source: Company data, Goldman Sachs Global Investment Research

Exhibit 3: Spot and contract pricing has trended lower in NAND...



Source: DRAMeXchange, Trendforce

Exhibit 4: ...as well in DRAM

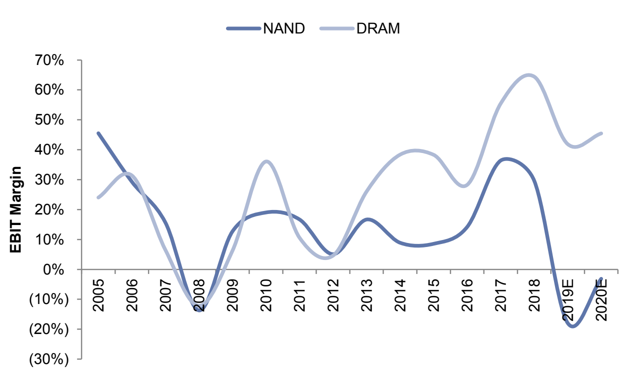


Source: DRAMeXchange, Trendforce

... which will negatively impact memory margins and ultimately WFE, in our view

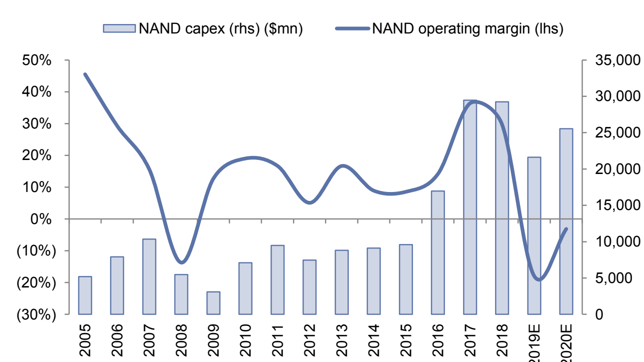
We believe the weak pricing environment will adversely impact margins, particularly in NAND where we expect industry margins to turn negative in 2019 (for the year overall as well as 2Q, 3Q and 4Q), before a modest recovery in 2020 (Exhibit 5). As mentioned above and shown in Exhibits 6-7, there is a strong correlation between profitability and capital spending in memory. For instance, in NAND, this relationship is clear during the 2008-2011 upturn in profitability, which in turn drove higher spending as well as the more recent period from 2015 to 2017 when NAND margins improved from 9% to 38%, resulting in a >200% increase in NAND capex (Exhibit 6). In DRAM, the correlation was evident during the 2012-2015 upturn in profitability as well as 2016-2018, when a 36 point increase in margins drove a 125% increase in DRAM capex (Exhibit 7). If large memory producers are rational with their spending (which recent cuts suggest they are), we expect lower levels of profitability to drive reductions in capital spending.

Exhibit 5: We expect both and NAND and DRAM margins to decline in 2019, before recovery slightly in 2020



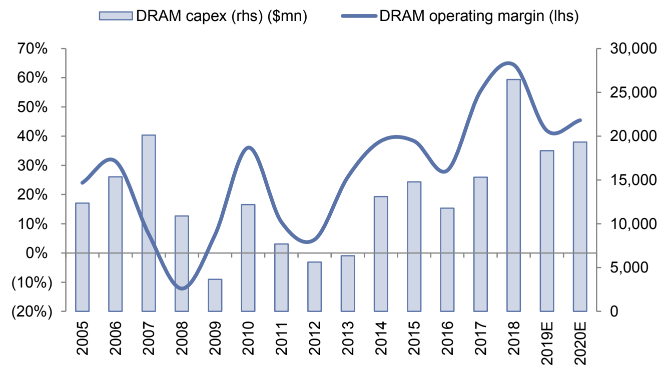
Source: Company data, Goldman Sachs Global Investment Research

Exhibit 6: Historically, spending on capex has been correlated with margins in NAND...



Source: Company data, Goldman Sachs Global Investment Research

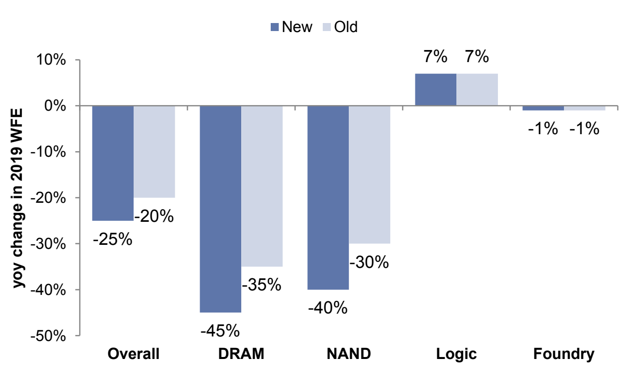
Exhibit 7: ...as well as in DRAM



Source: Company data, Goldman Sachs Global Investment Research

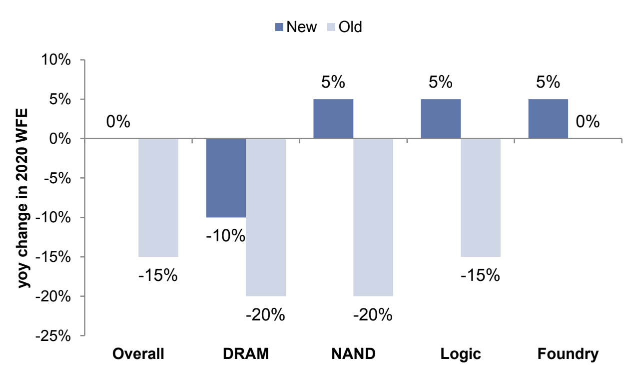
To reflect our expectation for incremental weakness in memory fundamentals - we adjust our WFE estimates for CY19/20 from down 20%/15% to down 25%/0%. We reduce our assumption for 2019 WFE by 5% to reflect an incrementally weaker outlook for memory and now expect the portion of WFE tied to NAND/DRAM to decline 40%/45%, which is down from our prior assumption of -30%/-35%, respectively (Exhibit 8). While we lower our outlook for spending in 2019, we raise 2020 as we believe the actions being taken by customers today to control spending, while painful for the equipment industry in the near-term, will help the memory industry return to a more balanced supply/demand dynamic. That said, we believe the shape/trajectory of any recovery in WFE spend in 2020 remains uncertain, given muted end-demand trends and elevated memory inventory levels. Note, as of Dec 2018, days of inventory at the memory manufacturers stood at 100 vs the past 3-year median of 63 *and* we expect DOI to grow further into Mar 2019. Longer-term, we think the meaningful cuts to spending we're seeing today, in spite of continued profitability, shows discipline and is a positive indicator for the health of the memory industry and ultimately capital spending on a multi-year view.

Exhibit 8: We lower our outlook for memory WFE in 2019 on weaker memory industry fundamentals...



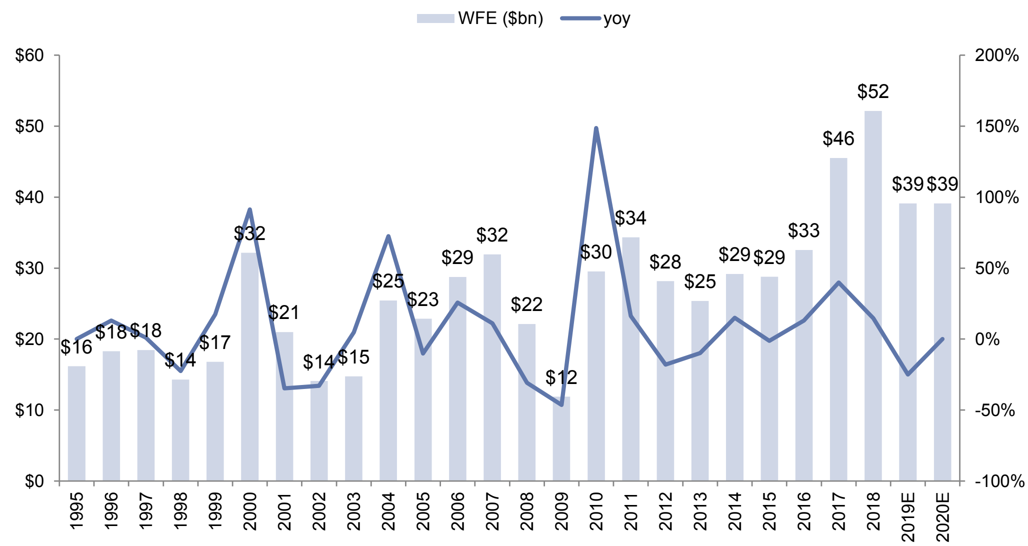
Source: Goldman Sachs Global Investment Research

Exhibit 9: ...but raise our estimate for 2020 as we believe lower spending in 2019 will drive a recovery in S/D dynamics in 2020



Source: Goldman Sachs Global Investment Research

Exhibit 10: We expect WFE to decline 25% yoy in 2019 and remain flat in 2020

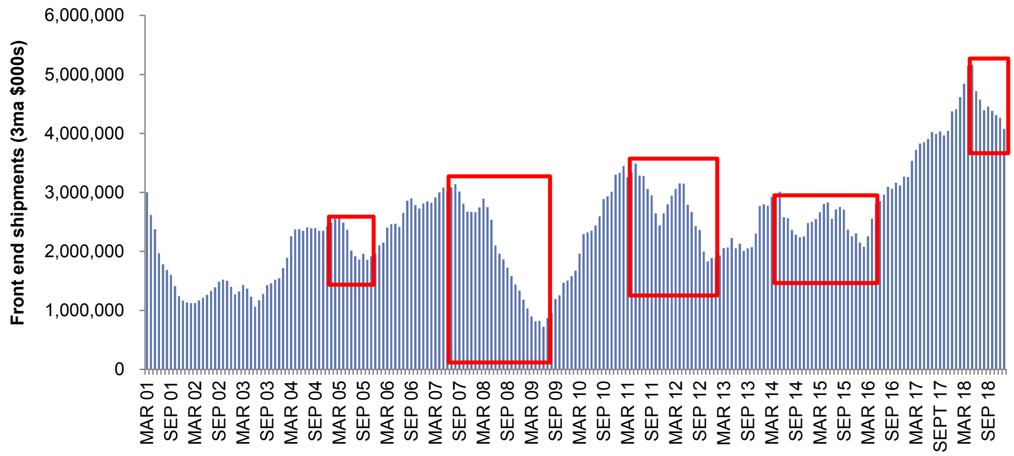


Source: SIA, Goldman Sachs Global Investment Research

Where are we in the WFE cycle?

Our analysis of 4 prior industry cycles indicates that the average downturn has lasted 17 months, compared with the current downturn at 8 months (as of January - see Exhibit 11), and that over those same 4 prior cycles, the average peak-to-trough decline in front-end equipment shipments was 46%, compared with 21% (Exhibit 12) in the current cycle. While historical precedent alone is not enough to call a bottom or predict incremental downside - we believe framing the current weakness in the context of past downturns helps to frame the longevity and magnitude both of which would be the shortest (8 months) and the weakest (21% peak to trough decline) downturn we identified (Exhibit 12).

Exhibit 11: We examined 4 prior downturns



Source: SEMI, Goldman Sachs Global Investment Research

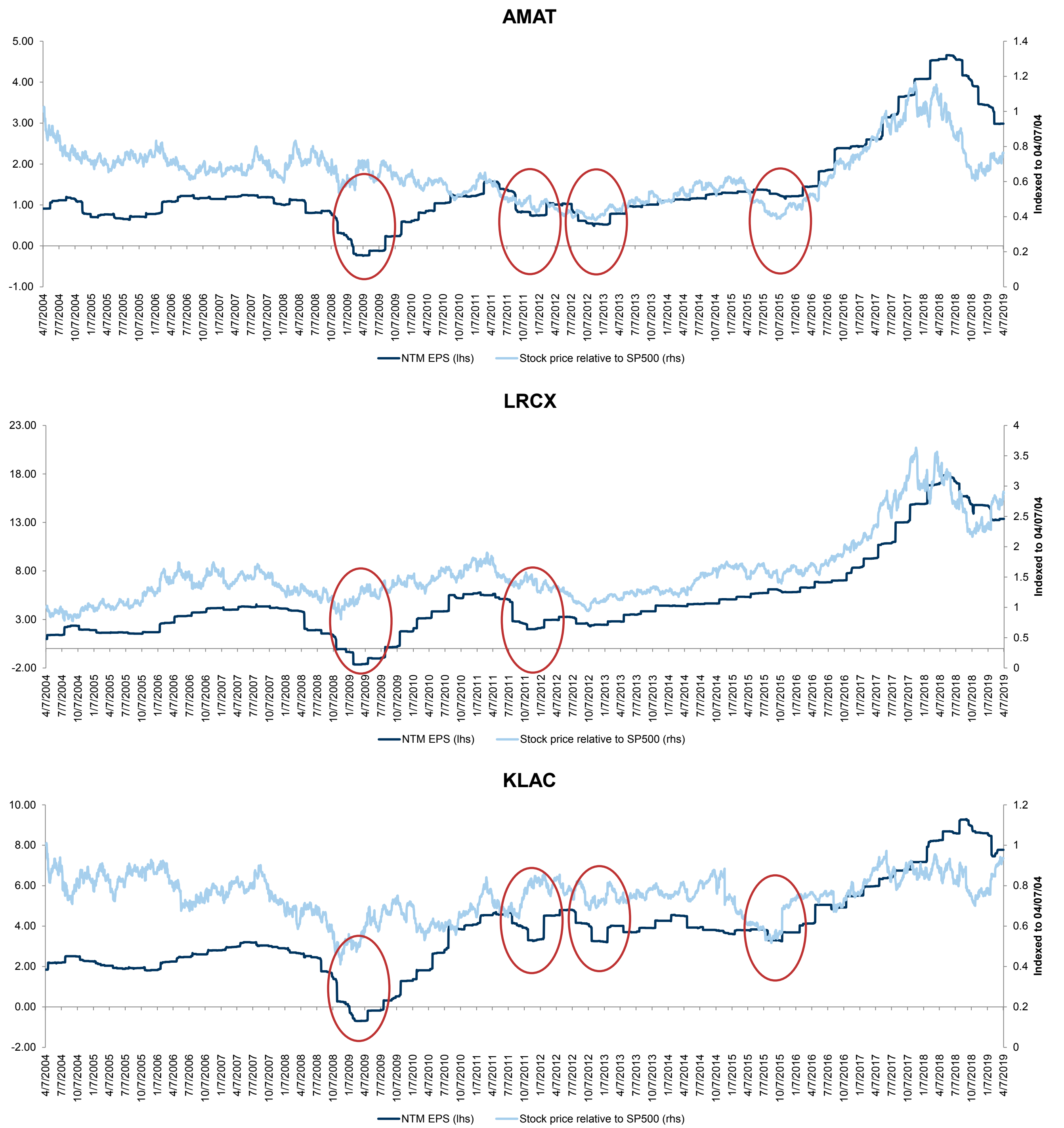
Exhibit 12: There is further downside to fundamentals based on historical cycles

	Dates			3 month average shipments ($mn)		
Front-end equipment	Peak	Trough	Months	Peak	Trough	Change
Cycle 1	Mar 05	Oct 05	7	2,563	1,855	-28%
Cycle 2	Aug 07	Jun 09	22	3,142	721	-77%
Cycle 3	May 11	Nov 12	18	3,488	1,831	-48%
Cycle 4	May 14	Feb 16	21	3,013	2,078	-31%
Current	**May 18**	**Jan 19**	**8**	**5,164**	**4,076**	**-21%**
Avg ex Current			**17**			**-46%**

Source: SEMI, Goldman Sachs Global Investment Research

Despite downside risk to fundamentals as outlined above, Semi Cap stocks have outperformed recently with AMAT/LRCX/KLAC 48%/57%/54% above their recent troughs in late 2018. We believe the rally in the stocks may be premature based on our view that 1) 2H recovery (that we believe is now embedded in expectations) is far from certain given continued weakness in memory datapoints, and 2) Street expectations will continue to decline through 2Q and 2H. Note that historically, stocks tend to trough with anticipated earnings estimates but the recent rally in front-end equipment names has come at a time when we still see downside to estimates, based on our lowered estimates (Exhibit 32). In our view, current stock prices reflect a near-term recovery in estimates that will not materialize.

Exhibit 13: Historically, stocks have troughed in-line with or ahead of earnings estimates, but recently stocks have begun to recover while we see further downside to estimates...



Source: FactSet, Goldman Sachs Global Investment Research

Exhibit 14: Months that stocks and EPS troughed in past cycles

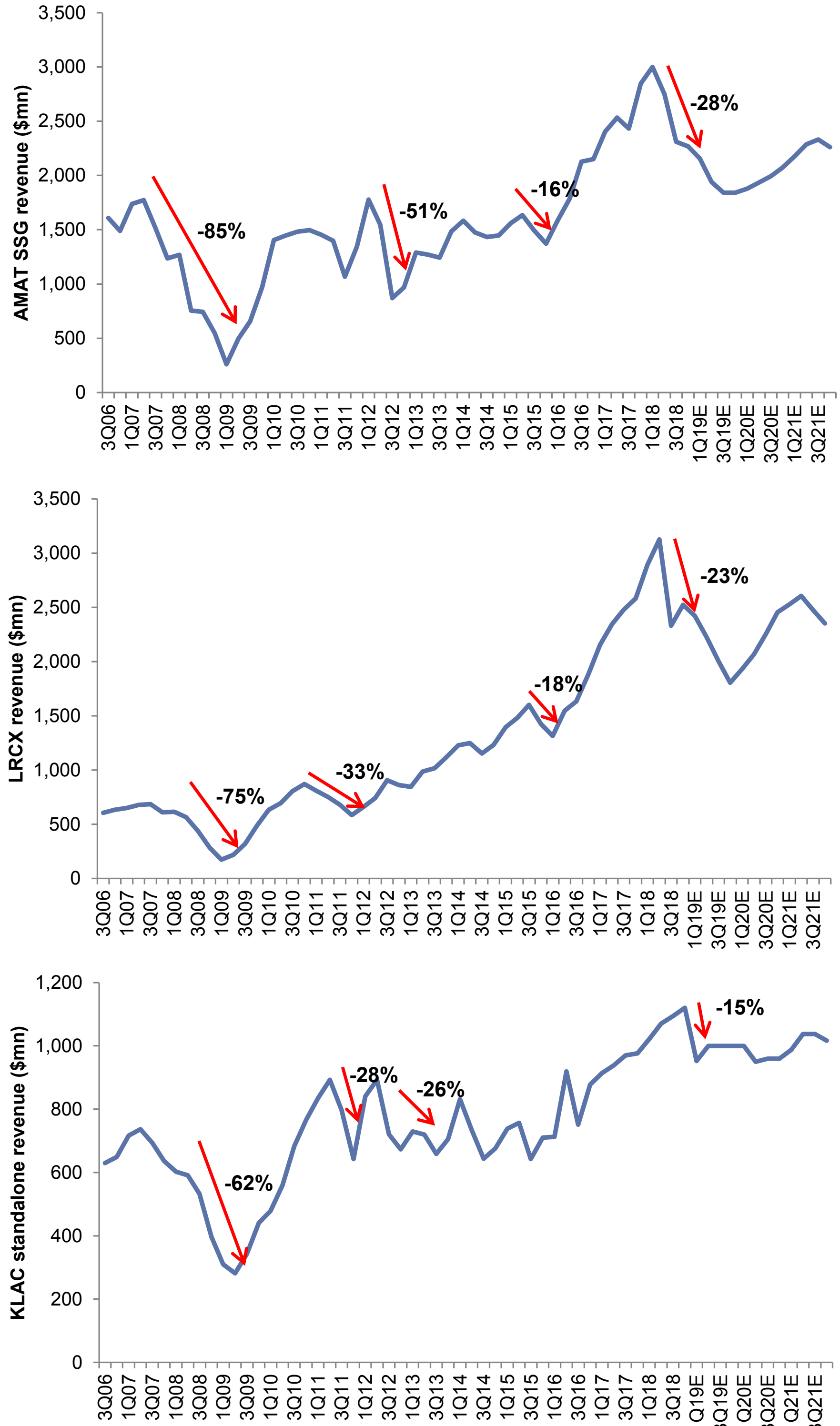
AMAT			
Cycle	Stock	EPS	Stock vs. EPS (months)
1	Nov '08	April '09	-5
2	Dec '11	Nov '11	+1
3	Nov '13	Nov '13	0
4	Sept '15	Nov '15	-2
Current	**Dec '18**	**?**	**-3**

LRCX			
Cycle	Stock	EPS	Stock vs. EPS (months)
1	Nov '08	Feb '09	-3
2	Jan '12	Oct '11	+3
Current	**Dec '18**	**?**	**-3**

KLAC			
Cycle	Stock	EPS	Stock vs. EPS (months)
1	Nov '08	Feb '09	-3
2	Sept '11	Nov '11	-2
3	Oct '12	Jan '13	-3
4	Aug '15	Oct '15	-2
Current	**Dec '18**	**?**	**-3**

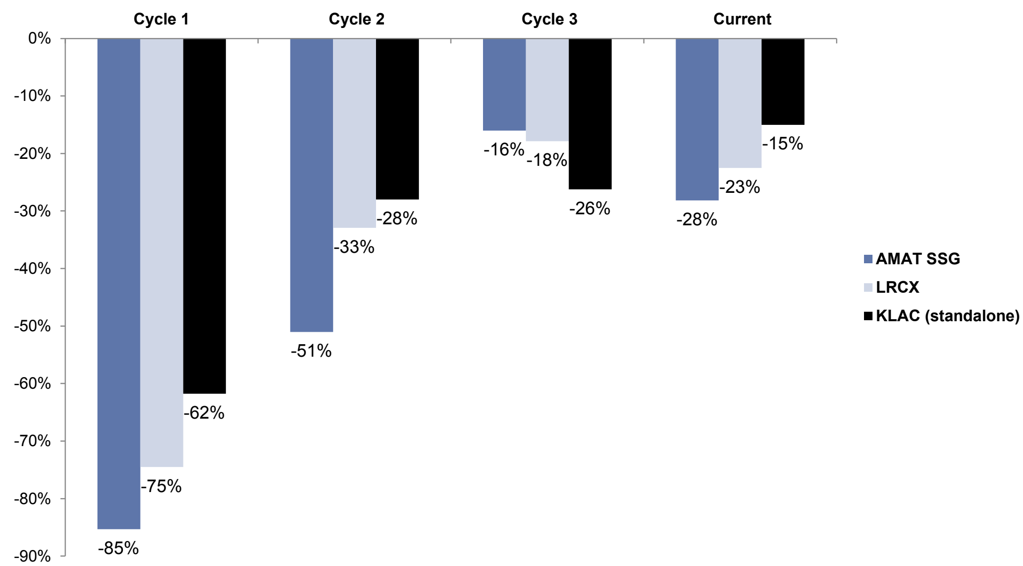
Source: Goldman Sachs Global Investment Research

Exhibit 15: Outside of the 2008/09 correction, revenue for front-end equipment companies have, on average, declined around 30% peak to trough



Source: Company data, Goldman Sachs Global Investment Research

Exhibit 16: The magnitude of the current revenue downturn (as of CY1Q19) is similar to the prior two for both AMAT and LRCX



Source: Company data, Goldman Sachs Global Investment Research

Reinstate KLAC at Sell on near-term concerns at stand-alone KLA and Orbotech

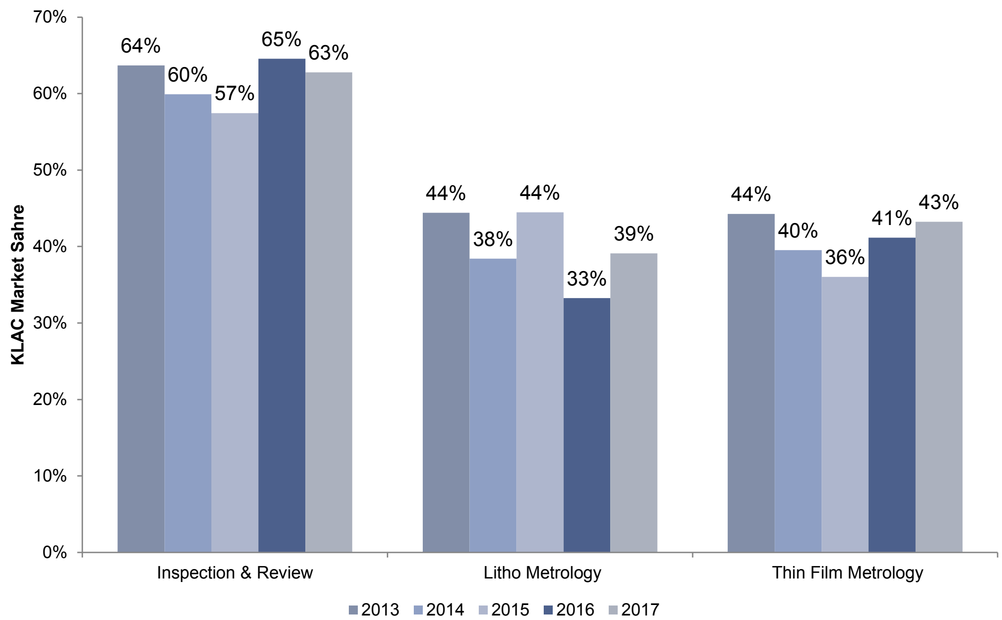
We reinstate our rating on KLAC at Sell post the closure of the Orbotech acquisition on 2/20. While we appreciate KLA's strong competitive position in Process Control, best-in-class margin profile and ability to outgrow peers in the near-term (i.e. given less exposure to memory capex), we are cautious on the stock given 1) potential downside to CY2H Street estimates (we forecast CY3Q and CY4Q stand-alone KLA revenue to be flat qoq vs management guidance provided on 1/29 indicating sequential growth in CY2Q-CY4Q), 2) near-term concerns regarding Orbotech's business, particularly Display and PCB equipment, and 3) relative downside (note we have 14% potential downside for KLAC vs. 11%/7% downside for LRCX/AMAT, respectively and 11% potential downside including dividends compared with an average of 7% potential downside for our coverage universe). Our 12-month price target of $107 represents 14% downside potential and we expect CY2Q guidance and updated management commentary on CY2H to unveil challenging near-term fundamentals at both stand-alone KLA (i.e. memory push-outs) and Orbotech.

KLA's competitive position remains strong...

Recall, KLA participates in Process Control with yield-enhancing products focused on 1) Wafer Inspection and Defect Review, and 2) Metrology. Within these markets, the company's market share has remained strong and stable. In Wafer Inspection and Defect Review (~42% of CY17 revenue), KLA had 63% market share in 2017, per Gartner (Exhibit 17), compared with Applied Materials at 17% share, and ASML and

Hitachi High-Technologies at 5-6% each. Despite increased focus on this segment by Applied Materials over the years, KLA has managed to maintain more than 50% share since at least 2002. In Lithography Metrology (Exhibit 17) and Thin-film Metrology (Exhibit 17), KLA's position is not as dominant as that in Wafer Inspection and Defect Review; however, like Wafer Inspection and Defect Review, KLA sits at the top of the table with 39% and 43% market share, respectively. While efforts at Applied Materials as well as ASML (who acquired Hermes in 2016) deserve close monitoring, we do *not* embed any meaningful changes in KLA's competitive position throughout our forecast period.

Exhibit 17: KLA has strong and stable share in the markets in which it participates

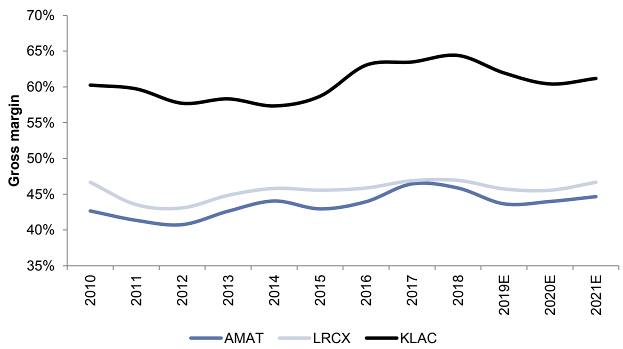


Source: Gartner

... as does its margin profile...

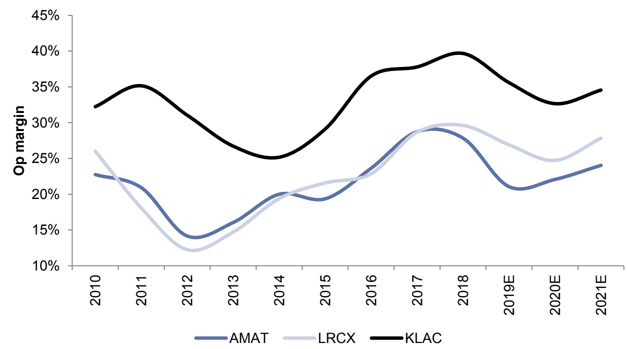
KLA has also achieved best-in-class margins with CY18 gross margins of 64.4%, exceeding front-end equipment peers AMAT and LRCX by 1850bps and 1750bps, respectively (Exhibit 18). The same is true for operating margins with CY18 operating margins of 39.7%, exceeding AMAT/LRCX by 1180bps and 1000bps (Exhibit 19). That said, the addition of Orbotech will have a dilutive impact on gross and operating margins. Note we forecast CY19/20 gross margins of 59.9.%/61.0% (down from 64.4% in CY18), and operating margins of 31.8.%/33.5% (down from 39.7% in CY18). On Orbotech, GAAP gross margins have historically been steady in the mid-40's%, compared with mid-60's% for KLA (non-GAAP), while non-GAAP operating margins of ~19% are well below KLA's 40% margins.

Exhibit 18: ... and maintains best-in-class gross margins...



Source: Company data, Goldman Sachs Global Investment Research

Exhibit 19: ... as well as operating margins

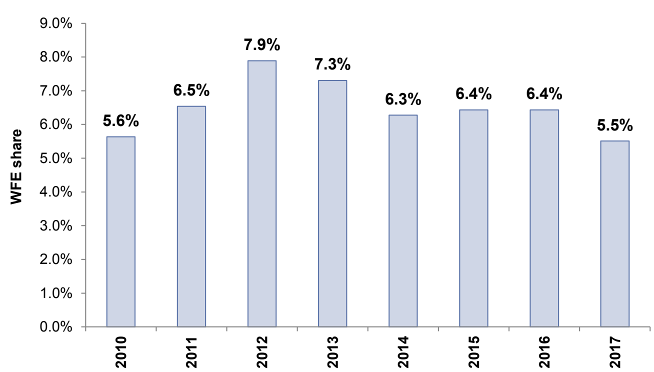


Source: Company data, Goldman Sachs Global Investment Research

... however, KLA has undergrown peers through cycle...

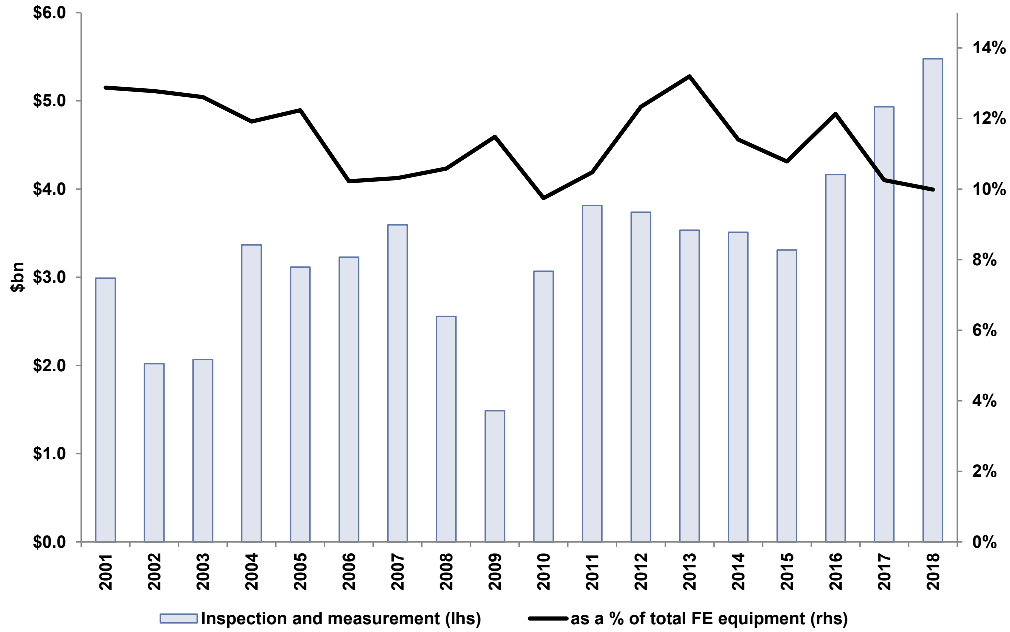
Despite KLA's strong share position in Process Control and stable/high margin profile, we would note that KLA has historically under-grown its peers. Specifically, as a % of the WFE market, KLA's share declined to 5.5% in 2017 after peaking at 7.9% in 2012 (Exhibit 20, though we expect share will tick up in 2019 given weakness in memory spending). The main culprit here has been the decline in the Inspection and Measurement (defined by SEMI and analogous to Process Control) market relative to overall WFE spending (Exhibit 21-22). Etch and Deposition (CVD or Chemical Vapor Deposition, in particular), on the other hand, have meaningfully outgrown the market as the number of etch and deposition steps have increased across both memory (NAND, in particular, given the transition to 3D) and logic.

Exhibit 20: ...though KLAC's share of WFE has trended lower



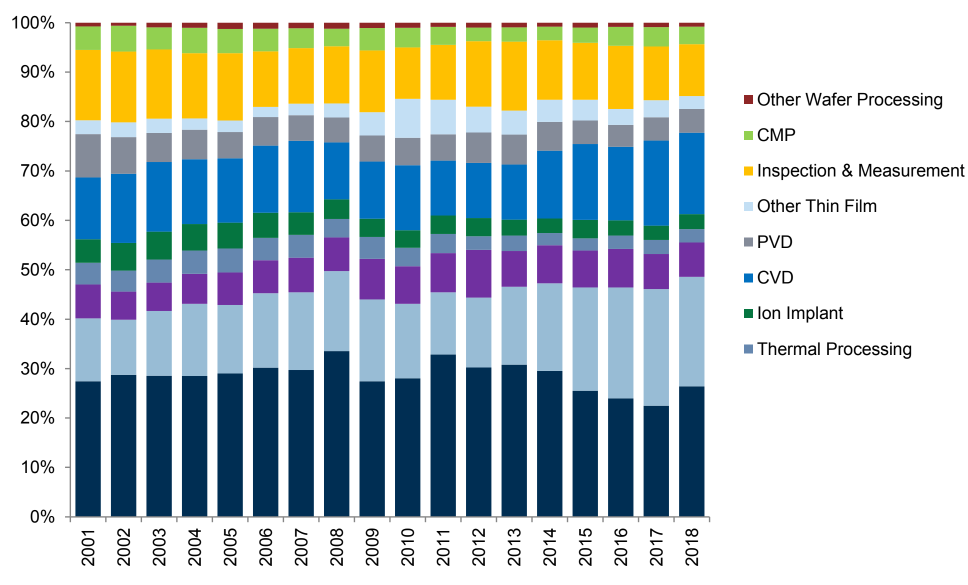
Source: Gartner

Exhibit 21: Inspection and measurement billings have declined as a % of total front-end equipment spending...



Source: SEMI, Goldman Sachs Global Investment Research

Exhibit 22: ...driven by increased spending on Etch and Deposition and now Lithography equipment

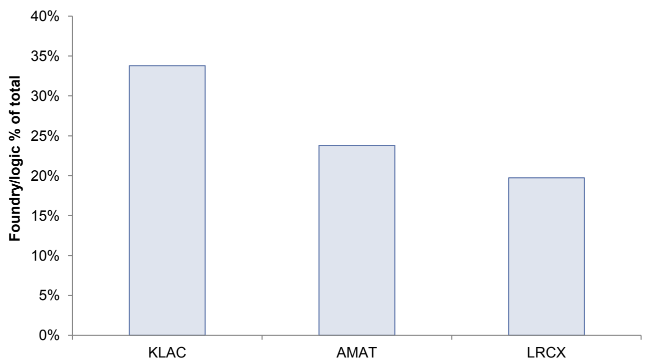


Source: SEMI, Goldman Sachs Global Investment Research

... the broader WFE market outlook remains challenged...

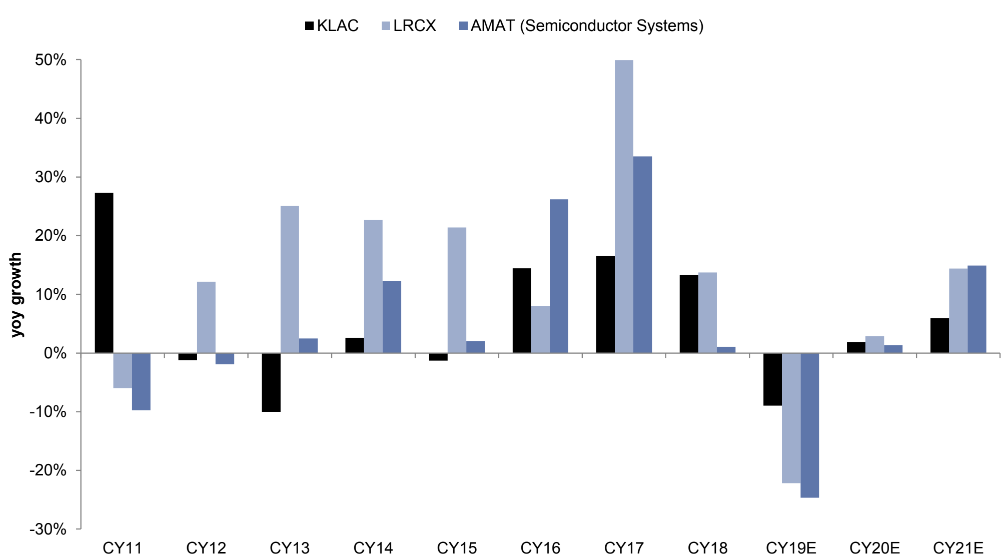
As we illustrated above, we expect the WFE market to decline 25% yoy in 2019, with much of the weakness stemming from memory (both NAND and DRAM). Given KLA's disproportionate exposure to the foundry and logic segments (34% of revenue compared with 24%/20% for AMAT and LRCX) - we expect KLA, for the most part, to show resilience vis-a-vis AMAT and LRCX. That said, strength in products that have been accretive to corporate gross margins over the past several quarters - such as bare wafer inspection and reticle inspection - is likely to subside, in our view, as bare wafer supply/demand loosens and foundry 7nm transitions from tape-out to volume production. All in, despite our expectation for stand-alone KLA to outperform peers in CY19, we foresee the company underperforming in 2020/2021 as memory spending recovers. For context, note KLA has underperformed the average growth rate of Lam and Applied's Semiconductor Systems segment in 6 of the last 8 years (Exhibit 24).

Exhibit 23: KLAC is better positioned for the near-term...



Source: Company data

Exhibit 24: ...but we expect they will under-grow peers longer-term and consistent with history
2019 KLA growth adjusted for ORBK



Source: Company data, Goldman Sachs Global Investment Research

...and the Orbotech acquisition has added uncertainty to the growth and margin profile

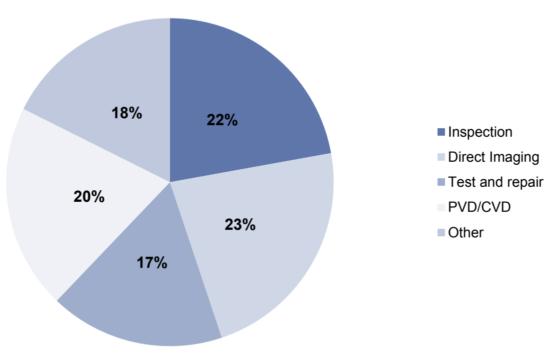
KLA announced its intention to acquire Orbotech on 3/19/18 for a total consideration of $3.2bn. Following an 11-month long approval process, the deal closed on 2/20/19, after which KLA updated its FY3Q guidance to reflect contribution from Orbotech.

Orbotech sells equipment to the Printed Circuit Board (PCB, 35% of 2018 revenue), Flat Panel Display (FPD, 30%) and Semiconductor Device (SD, 32% end-markets and is accretive to KLA's growth, but dilutive to margins (Exhibit 26).

Recall that Orbotech management provided a long-term (2020) revenue growth outlook of 12%, initially at their November 2017 Analyst Day (compared with KLA's stand-alone target model of 6%-8%). While we believe Orbotech is indeed a higher-growth business relative to stand-alone KLA, given trends in the PCB and Display end-markets, we are not forecasting a double-digit growth rate and take a more conservative approach to modeling their growth (Exhibit 27).

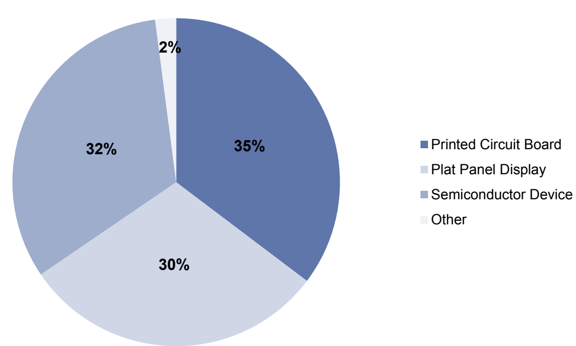
In fact, given our expectation of headwinds in the PCB (-10% yoy) and FPD (-7% yoy) segments in CY19, partially offset by continued growth in SD (+15%) - we believe Orbotech's business will decline modestly in 2019 (-1%) before returning to growth in 2020 (+6%) and 2021 (+8%). Specifically, we expect growth in the PCB segment will be negatively impacted by broader weakness in smartphones and would highlight SCREEN's (#2 market share player behind Orbotech) recent reduction in guidance in their PCB segment (note SCREEN cut their FY3/19 revenue guidance by 4% from JPY13.0bn to JPY12.5bn due to smartphone weakness, Exhibit 29). We also expect further weakness in the FPD segment as the near-term outlook for spending in the industry remains weak (Exhibit 30). We forecast FPD segment revenue to decline 7% yoy in CY19 following at least 6 consecutive years of double-digit growth. For context and while not a perfect comp, we estimate Applied Materials' Display business will decline 38% in 2019. Finally, we expect growth in the SD business to decelerate from 23% yoy in 2018 to 15% yoy in 2019 given exposure to weaker overall spending on semiconductor capital equipment.

Exhibit 25: Orbotech's revenue is diversified by process...
% of CY18 revenue



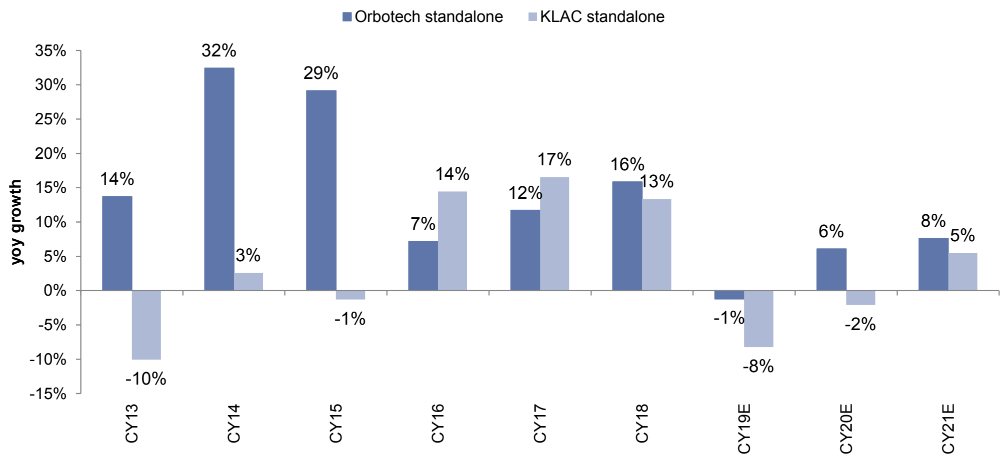
Source: Company data

Exhibit 26: ...and end market
% of CY18 revenue



Source: Company data

Exhibit 27: We expect Orbotech to out-grow KLA standalone, but remain well below the company's long-term target
Revenue growth



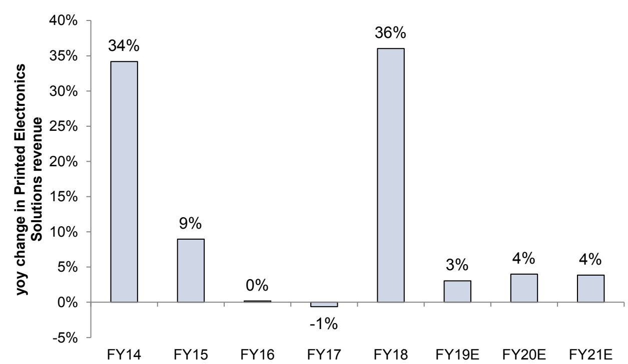
Source: Company data, Goldman Sachs Global Investment Research

Exhibit 28: According to the company's target model, ORBK's growth outlook is above KLA, but margins are dilutive

	KLA 2020 model	Orbotech 2020 model	Pro-forma (incl. synergies)
Revenue growth	6%-8%	12%	7%-9%
Gross margin	63%+	50%	61%+
Operating margin	38%+	25%	36%+

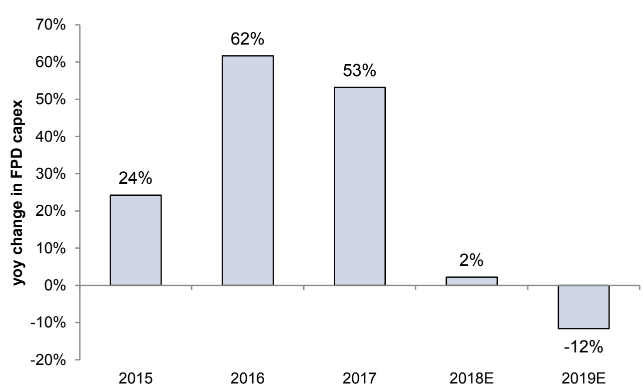
Source: Company data

Exhibit 29: We expect muted growth in SCREEN's Printed Electronics business



Source: Company data, Goldman Sachs Global Investment Research

Exhibit 30: We expect display capex to decline 12% yoy in 2019



Source: Company data, Goldman Sachs Global Investment Research

We raise estimates to include Orbotech...

We update estimates to reflect the acquisition of Orbotech as well as the incremental weakness in the WFE market (Exhibit 10). We now forecast 13%/9%/2% yoy revenue growth in FY19/20/21 for the combined company, and 3%/-5%/flat for classic KLA. Given the margin dilutive nature of Orbotech, we reduce our FY19/20/21 gross margin forecasts from 63.3%/63.3%/63.3% to 62.0%/60.4%/61.2% and operating margin forecasts from 36.9%/35.9%/34.7% to 35.6%/32.7%/34.6%, respectively. Accordingly, primarily driven by higher revenue, we raise FY19/20/21 EPS from $8.41/$8.33/$8.19 to $8.61/$8.30/$9.32.

... however, we are well below the Street on out-year estimates

Despite the positive revision, our estimates remain well below consensus (Exhibit 32). Specifically, our FY19/20/21 EPS estimates are 2%/19%/8% below FactSet at $8.61/$8.30/$9.32. Consensus estimates may swing over the next month as analysts (collectively) reflect Orbotech, but we believe the delta between our updated estimates and consensus is significant enough for us to take a cautious view on the stock based on a potential earnings miss.

In the near-term, we are largely in-line with consensus on CY1Q and CY2Q, but expect downside to CY2H estimates. Specifically, we forecast CY3Q and CY4Q classic KLA revenue to be flat qoq vs management guidance provided on 1/29 indicating sequential growth in CY2Q-CY4Q.

Investment thesis and price target methodology

We are cautious on KLAC given 1) potential downside to CY2H Street estimates, 2) near-term concerns regarding Orbotech's business, particularly Display and PCB equipment), and 3) relative downside to price targets among the Semi Cap stocks we cover (note we have 14% potential downside for KLAC vs. 10%/6% downside for LRCX/AMAT, respectively). Our 12-month price target of $107 represents 14% potential downside and is based on 12x normalized EPS (adjusted for potential cost synergies at Orbotech) of $8.90.

What would make us turn more positive?

We would turn more positive on KLAC if we saw evidence of 1) the industry outlook (i.e. front-end equipment spending) improving or deteriorating less than we forecast (our estimates embed a 25% yoy decline in WFE and no change in 2020). 2) An improvement in the outlook for growth in Orbotech's Printed Circuit Board and Flat Panel Display businesses, both of which we expect will decline yoy in 2019. 3) A reduction in consensus estimates to a level more consistent with our forecasts as we believe that downward estimate revisions could weigh on the stock. 4) More attractive valuation relative to our coverage (note we currently see 14% potential downside, compared with 11% potential downside for our Neutral-rated companies under coverage).

Upside Risks

1) A near-term recovery in WFE: Our revenue forecasts are based on our industry-level view of WFE declining 25% yoy in 2019 and remaining flat at those levels in 2020. A stronger spending environment could drive upside to our revenue and earnings estimates.

2) Upside to Orbotech's business: We believe we are taking a prudent, though potentially conservative approach to Orbotech's growth given the uncertain outlook for the PCB and FPD businesses. If expected weakness in the PCB and FPD segments fails to materialize, there could be upside to our Orbotech estimates and ultimately KLA earnings.

3) Upside to cost synergies: We assume roughly $50mn in cost synergies stemming from the Orbotech acquisition, consistent with company guidance. Synergies above $50mn would drive upside to our earnings estimates.

Investment thesis and updated price targets

We remain Neutral-rated on AMAT and LRCX and Semi Cap broadly given potential downside to company 2H guidance and Street expectations and balanced risk/reward, in our view. In order to turn more constructive, we would need to see 1) signs of memory price stabilization (which would in turn drive up our 2020 WFE expectations), 2) Semi Cap management teams lower 2H guidance, and/or 3) attractive valuations on normalized earnings.

AMAT: Our 12-month price target of $40 (up from $38) is based on 12x (up from 11x on higher comps) normalized EPS of $3.35 (down from $3.45 on lower go-forward estimates). Risks to the upside as well as the downside include, 1) changes in memory supply/demand and therefore the memory capex outlook, 2) timing/ramp of capex by local Chinese semiconductor manufacturers, 3) insertion of EUV lithography and the impact it could have on other parts of the WFE market, and 4) changes in the competitive landscape, particularly in Etch and Deposition, 5) changes to the outlook for Display spending.

LRCX: Our 12-month price target of $172 (up from $158) is based on 12x (up from 11x on higher comps) normalized EPS of $14.30 (down from $14.40 on lower go-forward estimates). Risks to the upside as well as the downside include, 1) changes in memory supply/demand and therefore the memory capex outlook, 2) timing/ramp of capex by local Chinese semiconductor manufacturers, 3) insertion of EUV lithography and the impact it could have on other parts of the WFE market, and 4) changes in the competitive landscape, particularly in Etch and Deposition.

Exhibit 31: We lower of FY19/20/21 revenue and EPS estimates for AMAT and LRCX. We raise revenue estimates for KLA to reflect the inclusion of Orbotech...

	New vs Old					
	Revenue			EPS (Non-GAAP)		
	FY19E	FY20E	FY21E	FY19E	FY20E	FY21E
AMAT						
New	13,892	13,796	15,449	$2.72	$2.82	$3.72
Old	14,419	14,312	15,141	$2.96	$3.07	$3.63
Difference	**-4%**	**-4%**	**2%**	**-8%**	**-8%**	**3%**
LRCX						
New	9,503	7,807	9,840	$14.06	$11.40	$17.02
Old	9,576	8,420	8,672	$14.25	$12.91	$14.79
Difference	**-1%**	**-7%**	**13%**	**-1%**	**-12%**	**15%**
KLAC						
New	4,572	4,990	5,092	$8.61	$8.30	$9.32
Old	4,151	4,136	4,052	$8.41	$8.33	$8.19
Difference	**10%**	**21%**	**26%**	**2%**	**0%**	**14%**
Average	**2%**	**3%**	**14%**	**-2%**	**-7%**	**11%**

Source: Goldman Sachs Global Investment Research

Exhibit 32: ...and our EPS estimates move further below the Street

	GS vs Street					
	Revenue			EPS (Non-GAAP)		
	FY19E	FY20E	FY21E	FY19E	FY20E	FY21E
AMAT						
GS	13,892	13,796	15,449	$2.72	$2.82	$3.72
Street	14,579	15,825	16,907	$3.03	$3.83	$4.33
Difference	**-5%**	**-13%**	**-9%**	**-10%**	**-26%**	**-14%**
LRCX						
GS	9,503	7,807	9,840	$14.06	$11.40	$17.02
Street	9,594	9,640	10,806	$13.93	$14.67	$17.74
Difference	**-1%**	**-19%**	**-9%**	**1%**	**-22%**	**-4%**
KLAC						
GS	4,572	4,990	5,092	$8.61	$8.30	$9.32
Street	4,408	4,949	4,983	$8.39	$9.11	$9.76
Difference	**4%**	**1%**	**2%**	**3%**	**-9%**	**-5%**
Average	**-1%**	**-10%**	**-5%**	**-2%**	**-19%**	**-8%**

Source: FactSet, Goldman Sachs Global Investment Research

Disclosure Appendix

Reg AC

We, Toshiya Hari, Charles Long and Matthew Fahey, hereby certify that all of the views expressed in this report accurately reflect our personal views about the subject company or companies and its or their securities. We also certify that no part of our compensation was, is or will be, directly or indirectly, related to the specific recommendations or views expressed in this report.

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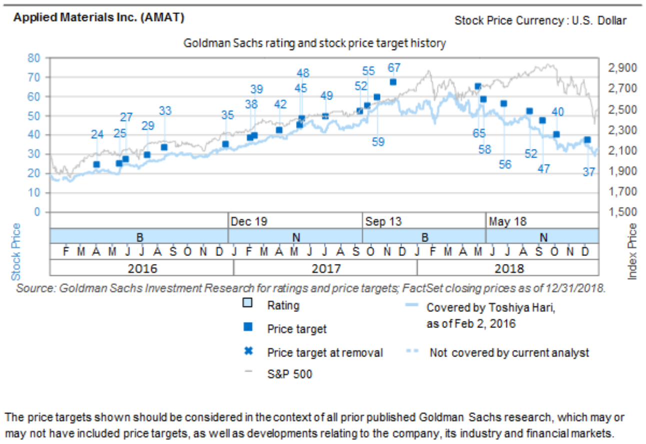

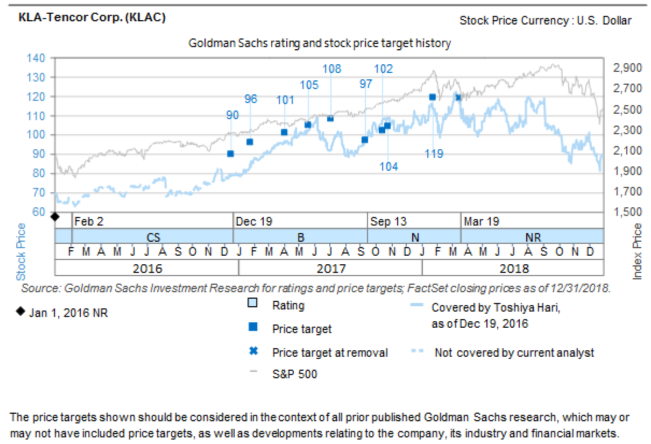

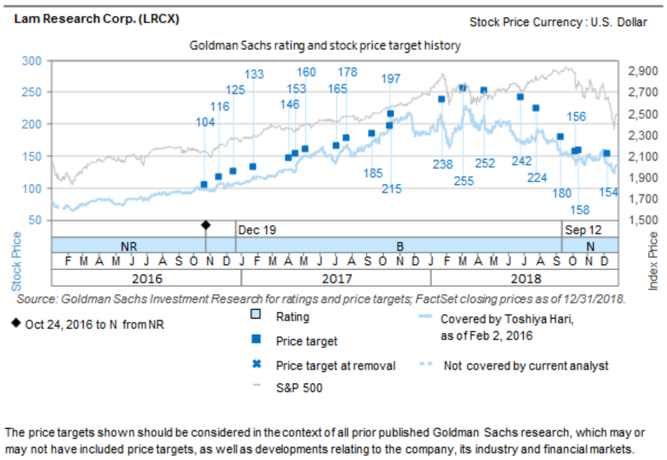

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