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CREDIT SUISSE

2020 Technology Conference Recap

Walking in a Semi Wonderland

Semiconductor Devices | Comment

Introduction: During the 24th Annual Credit Suisse Technology Conference, we hosted ~1,600 institutional clients along with 32 Chip Companies representing ~75% of total Global Semi Ecosystem Mrkt Cap with ~75% participation from CEOs. Presentations underscored a healthy demand environment portending upside to C4Q/C1Q Street Consensus. We would highlight the following management commentary: (1) GPU/Gaming Consoles trends supports ABOVE seasonal for AMD's C1Q and NVDA's F4Q/F1Q, (2) PC trends (WFH, SFH, On-Line Everything) continue unabated helped by TGL and Ryzen product launches and supportive of upside for INTC/AMD in C4Q/C1Q, (3) Handsets continue to benefit from iPhone12 launch and China OEMs jockeying for share – while CNY inventory is a risk – 5G adoption will accelerate in CY21 (15% of handsets exiting CY20), (4) Comms Inf/Cloud digestion continues in C4Q as anticipated with indications of a re-acceleration in 1HCY21, (5) Auto/Industrial cyclical recovery clearly sustainable in CY21 with current environment characterized by supply constraints (NXPI letter to customers), (6) Memory trends positive (MU pos-pre) but continue to bifurcate with DRAM improving, NAND abating, and (7) WFE trends in 1H21 trending flat/up vrs 2H20 with investor 2H21 deceleration concerns likely offset by continued rise in cost of capacity – DRAM better than Logic/Foundry, better than NAND for CY21. There was no meaningful update on US/China relative to Huawei/SMIC and despite no expected directional change from President-Elect Biden, newly found predictability of policy along with continued emphasis on US Semi incentives (**C**reating **H**elpful **I**ncentives to **P**roduce **S**emiconductors Act – CHIPS Act) underpins a neutral/positive geopolitical outlook.

Stock/Valuation Takeaways. We provide key takeaways for each of the 30 companies but highlight: (1) **INTC** commentary likely foreshadows a more evolutionary than revolutionary change to IDM strategy; Habana AWS win noteworthy, (2) **TXN** commentary was growth heavy – R-Fab phase 2, Embedded re-acceleration, cessation of disti headwinds – TXN Inv/IDM strategy should drive share gains in a tight supply environment, (3) **MU** F1Q pos-pre and 12/3 power outage and improving DDR6x yields support F2Q tailwinds, (4) **ADI** more than just a Comms play – with MXIM providing path to 40% FCFM and $100bn valuation, (5) **NVDA** supply constraints and product cadence should support F1Q at least FLAT despite one less week, (6) **MCHP** raises target model, we see upside beyond 45% OpM especially as cycle accelerates, (7) **KLAC** competitive motes remain underappreciated, solid Gen5 backlog for 1HCY21 provides highest visibility in SCE, (8) **Global Foundries** – near-term capacity remains tight, long-term More-than-Moore's represents that lion's share of foundry and is well levered to our Data Driven Society, (9) **AMAT** looks relatively cheap against re-accelerating CY21 DRAM CapEx and underappreciated Kokusai leverage, and (10) **ALGM** successful IPO backed up with strong leverage to xEV trends. While Semis are up 51% in CY20 and 142% since beginning of CY19, and valuations look more full/fair than cheap on 3-10 yr. basis – We see a post-COVID Semi environment supportive of a cyclical recovery and a structural recapture of value across ALL end markets/supply chains. With the GLOBAL Semi Ecosystem (<4x Rev) only being valued INLINE with AAPL (~10x Rev) at ~$2tn, we still see meaningful upside to Semis stocks as our "Value Capture" thesis become more apparent to investors.

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CS Tech Conference Attendance Summary

Figure 1: Fireside Chat Statistics – Semis Highest # of Attendees/Company of ~86

Fireside Stats by Sector								
	# of Companies	Agg. Market Cap	% of Sector MktCap	Agg. Fireside Attendees	% of Total Attendees	Avg # of Attendees/Co	# CEOs	% of Companies w/ CEO
Semis	25	$1,479,104	75%	2148	32%	85.9	18	72%
Software	32	$2,480,347	42%	1999	30%	62.5	13	41%
Fintech	18	$1,168,106	28%	1107	17%	61.5	9	50%
Internet	19	$193,157	2%	603	9%	31.7	11	58%
Hardware	9	$201,708	2%	341	5%	37.9	3	33%
Comms	10	$511,734	78%	321	5%	32.1	3	30%
Comms Services	6	$16,705	5%	151	2%	25.2	3	50%
Total	119	$6,050,860	19%	6670	100%	56.1	60	50%

Source: Knovio, Credit Suisse data

Figure 2: 1x1 Meeting Stats

1x1 Meeting Stats						
Sector Summary	# Companies	# Meetings Hosted	# of Attendees	% of Total Attendees	Avg Hit Rate	Avg # Attendees/C
Semis	32	271	1,565	28%	82%	49
Software	37	323	1,863	33%	70%	50
Fintech	18	110	547	10%	76%	30
Internet	22	128	699	13%	79%	32
Comms	14	77	398	7%	79%	28
Comms Services	11	60	222	4%	92%	20
Hardware	9	69	284	5%	71%	32
Total	**143**	**1,038**	**5,578**	**100%**	**78%**	**39**

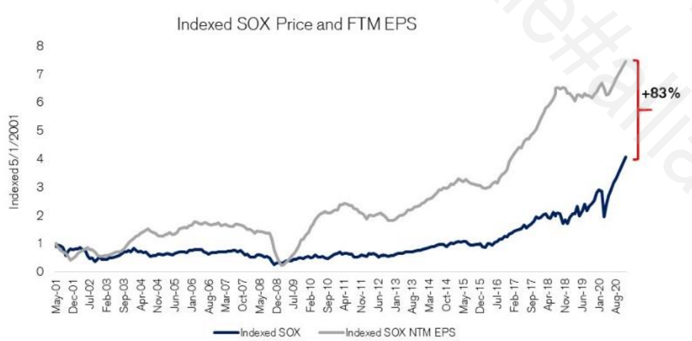
Source: Knovio, Credit Suisse data

Figure 3: Semi Companies were ~75% of Sector Mkt Cap

	Total # of Companies	Total Mkt Cap	Attending Companies	% of Total
Semis	25	$ 1,971	$ 1,479	75%
Software	32	$ 5,843	$ 2,480	42%
Fintech	18	$ 4,219	$ 1,168	28%
Internet	19	$ 10,885	$ 193	2%
Hardware	9	$ 8,372	$ 202	2%
Comms	10	$ 656	$ 512	78%
Comms Services	6	$ 347	$ 17	5%
Total	119	$ 32,294	$ 6,051	19%

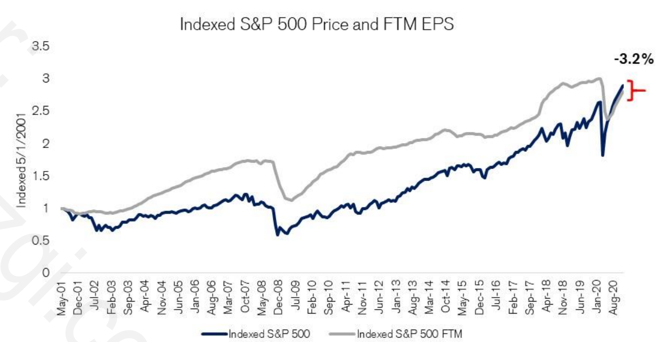
Source: Knovio, Credit Suisse data

Figure 4: SOX Price vs FTM EPS



Source: FactSet

Figure 5: SP50 Price vs FTM EPS



Source: FactSet

Semi-Cap Equipment Overall Positive

NT outlook for WFE was positive for all SCE companies – CY21 WFE should grow y/y from sustained Foundry/Logic and Memory recovery for NAND/DRAM in 1H21/2H21 – our view is still that 1H21 WFE is tracking up h/h benefitting KLAC, AMAT, followed by LRCX. Longer-term all companies highlighted rising capital intensity and increasing digitization driving secular and diversified demand drivers (Cloud, AI/ML, 5G). We continue to argue for SCE multiple expansion – when normalizing for Services, valuation on core equipment is trading at ~high-teens CY20 EPS, a ~28% discount to SP50, which still hasn't seen expansion vs. SOX now trading at ~2% premium to SP50. Specifically on CY20/21 WFE, (1) KLAC sees strength through 2H20 into 1H21, expects foundry/logic to be sustainable and memory to drive overall growth in WFE spending for CY21, (2) LRCX expects foundry/logic continuing strong into CY21, NAND Capex strong in 2H20 and 1H21 with DRAM Capex recovering mid-CY21, and (3) AMAT expects CY20 WFE spending at the high-end of the 10-15% growth range – Logic/Foundry ~55% of spend and NAND growing at 2x other segments – CY21 Foundry/Logic continuing to be strong and within Memory DRAM stronger y/y with NAND ~flat y/y. Company specific highlights included in Day 2 Company Recaps.

Figure 6: CS WFE Model – we expect CY21 WFE +5-10% y/y

Industry WFE by Segment ($ mm)	1Q20	2Q20	3Q20	4Q20E	1Q21E	2Q21E	3Q21E	4Q21E	2019	2020	2021E
Memory	5,818	6,344	6,539	7,594	6,595	6,967	7,030	7,530	22,566	26,295	28,122
Foundry	6,127	4,889	4,779	4,536	5,761	6,200	6,135	6,445	16,035	20,331	24,541
Logic	2,178	2,614	2,789	3,028	2,435	2,364	2,350	2,250	10,886	10,608	9,400
Total SemiCap WFE	**14,124**	**13,847**	**14,106**	**15,158**	**14,791**	**15,531**	**15,516**	**16,225**	**49,488**	**57,234**	**62,063**

% of Total	1Q20	2Q20	3Q20	4Q20E	1Q21E	2Q21E	3Q21E	4Q21E	2019	2020	2021E
Memory	41.2%	45.8%	46.4%	50.1%	44.6%	44.9%	45.3%	46.4%	45.6%	45.9%	45.3%
Foundry	43.4%	35.3%	33.9%	29.9%	38.9%	39.9%	39.5%	39.7%	32.4%	35.5%	39.5%
Logic	15.4%	18.9%	19.8%	20.0%	16.5%	15.2%	15.1%	13.9%	22.0%	18.5%	15.1%
Total SemiCap WFE	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**

Q/Q Growth	1Q20	2Q20	3Q20	4Q20E	1Q21E	2Q21E	3Q21E	4Q21E
Memory	2.2%	9.0%	3.1%	16.1%	-13.2%	5.6%	0.9%	7.1%
Foundry	11.3%	-20.2%	-2.3%	-5.1%	27.0%	7.6%	-1.0%	5.0%
Logic	-29.0%	20.0%	6.7%	8.6%	-19.6%	-2.9%	-0.6%	-4.2%
Total SemiCap WFE	**-1.0%**	**-2.0%**	**1.9%**	**7.5%**	**-2.4%**	**5.0%**	**-0.1%**	**4.6%**

Y/Y Growth	1Q20	2Q20	3Q20	4Q20E	1Q21E	2Q21E	3Q21E	4Q21E	2019	2020E	2021E
Memory	3.2%	7.3%	22.8%	33.4%	13.4%	9.8%	7.5%	-0.8%	30.6%	16.5%	6.9%
Foundry	111.7%	17.0%	38.2%	-17.6%	-6.0%	26.8%	28.4%	42.1%	2.6%	26.8%	20.7%
Logic	-6.6%	0.4%	-3.4%	-1.2%	11.8%	-9.5%	-15.7%	-25.7%	24.2%	-2.6%	-11.4%
Total SemiCap WFE	**30.0%**	**9.1%**	**20.9%**	**6.3%**	**4.7%**	**12.2%**	**10.0%**	**7.0%**	**-8.1%**	**15.7%**	**8.4%**

Source: Company data, Credit Suisse estimates

Company Day 1 Recaps

AMD (Restricted)

Strong demand in Gaming, PCs and Servers; specifically highlighting that C1Q should be better than seasonal of down 10% q/q and Street of down ~12% q/q. AMD noted no expected digestion in server demand with both Rome and Milan continuing to have strong growth in CY21. Despite concerns of a COVID-19 PC pull forward, AMD expects CY21 to be another growth year with Ryzen share gains. PS5 and Xbox XS remain supply constrained, supporting management's positive stance on C4Q/C1Q.

Figure 7: AMD Earnings Snapshot

AMD	Sep-20	Dec-20E		Mar-21E	CY2020E		CY2021E
	Reported	Cons	Guidance	Cons	Cons	Guidance	Cons
Revenue	$2,801	$2,978	*$3.0bn +/- $100m*	$2,603	$9,435	**~$9.50bn**	$11,804
% Q/Q chng	*45.0%*	*6.3%*	*~7%*	*-12.6%*			
% Y/Y chng	*55.5%*				*40.2%*	*Up +41% y/y*	*25.1%*
Seasonality (q/q)	*17.6%*						
Gross Margin	43.9%	45.2%	*~45%*	46.0%	44.9%	~45%	46.6%
Operating Expenses	$706	$755	*~$750m*	$755	$2,671	~28% of Rev	$3,169
Operating Margin	18.7%	19.9%		17.0%	16.6%		19.7%
Net Income	$501						
Net Margin	15.9%						
EPS PF (w/ options)	$0.36						
EPS (GAAP)	$0.24						
EPS PF (ex options)	$0.41	$0.46	*~$0.46*	$0.35	$1.22	*~$1.23*	$1.81
Fully diulted shares	1,230.0					1,230.0	

Source: Company data, FactSet

NVDA (Outperform, TP $620)

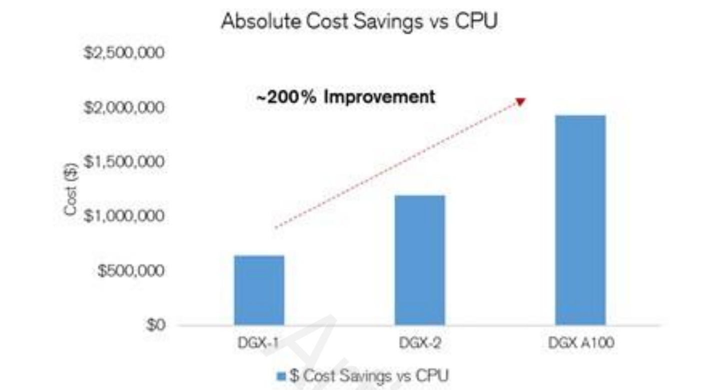
The strong ramp of RTX-30 series continues to be supply constrained thru at least JanQ. While AprQ will have one less week and is typically down seasonally q/q, both may be offset by strong demand, improving supply and a continued filling out of the RTX-30 stack. Management cited no meaningful impact from crypto. While DataCenter was guided down q/q in JanQ – core compute (ex-MLNX) is still expected to grow 7% q/q. Management remains confident in its competitive position as well as the growing ability to further capture value thru software.

Figure 8: NVDA Earnings Snapshot

NVDA-US	Oct-20	Jan-21E			Apr-21E		FY2021E		FY2022E		FY2023E	
	Actual	CS	Cons	Guidance	CS	Cons	CS	Cons	CS	Cons	CS	Cons
Revenue	$4,726	$4,800	$4,779	$4.70-4.90bn	$4,500	$4,451	$16,472	$16,425	$19,300	$19,699	$22,000	$22,182
% q/q	*22.2%*	*1.6%*	*1.1%*	*-0.5% to +3.6%*	*-6.3%*	*-6.9%*						
Seasonal q/q %	*5.0%*	*3.9%*			*5.2%*							
% y/y	*56.8%*	*54.6%*	*116.7%*		*46.1%*	*47.7%*	*50.9%*	*50.4%*	*17.2%*	*19.6%*	*14.0%*	*12.6%*
Gross Margin	65.5%	65.5%	*65.3%*	65.5% +/- 0.5%	66.0%	*65.3%*	65.7%	*65.8%*	66.3%	*66.1%*	66.5%	*66.3%*
OpEx	$1,101	$1,180	$1,170	~1,180m	$1,180	$1,161	$4,065	$4,142	$4,725	$4,882	$5,090	$5,273
Operating Margin	42.2%	40.9%	*40.8%*	~41%	39.8%	*39.2%*	41.0%	*40.6%*	41.8%	*41.3%*	43.4%	*42.5%*
Net Income	$1,835	$1,756			$1,596		$6,077		$7,216		$8,502	
Net Margin	38.8%	36.6%			35.5%		36.9%		37.4%		38.6%	
EPS (Non-GAAP w/SBC)	$2.30	$2.20			$1.95		$7.53		$9.11		$11.14	
EPS (Non-GAAP ex-SBC)	$2.91	$2.79	$2.78	Implied $2.66-$2.92	$2.53	$2.50	$9.68	$9.69	$11.45	$11.67	$13.50	$13.34
Fully diluted shares	630	630			630		627		630		630	

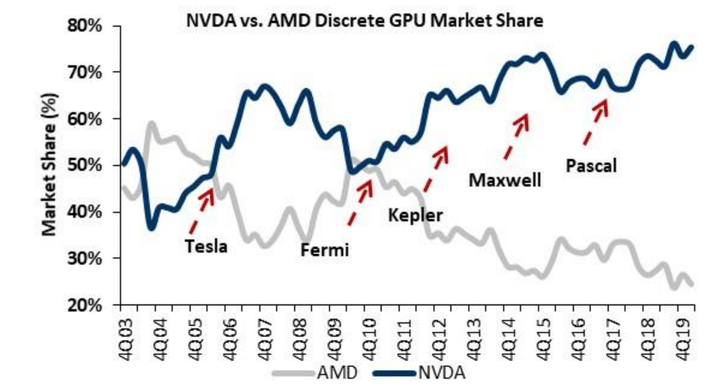
Source: Company data, Credit Suisse estimates, FactSet

Figure 9: DGX A100 Cost Savings vs Standard CPUs



Source: Company data, Credit Suisse estimates

Figure 10: Discrete GPU Market share Post-Product Launches



Source: Company data, Credit Suisse estimates, Mercury Data

Tower Semiconductor (Neutral) – EU Semis

Achal Sultania hosted group meetings with Dr. Avi Strum (SVP & GM, Sensors & Display BU) and Noit Levy (SVP, IR). Key takeaways from our sessions were:

Headwinds in Discrete and Sensor business likely to reverse in 2021. Management noted that Discretes sales has been a major headwind in 2020, with a decline of >20% potentially from a base of $40-45mn per quarter in 2019 (~15% of group sales). Now with demand starting to improve and channel inventories normalizing, order levels have stabilized and customer forecasts are rising, which should help drive a healthy recovery in 2021. For Sensors (also ~15% of sales in 2019) will likely be small down yoy for 2020 mainly due to weakness in Dental and Industrial sensors, but here again trends for 2021 should improve driven by recovery in Industrial market (already starting to see in customer forecasts) along with ramp of new products in MEMS microphone, fingerprint and ToF sensors. New products for Display (micro LED and micro OLED) are likely to ramp closer to end of 2022. For its Sensor business, we model sales of $197mn in 2019 to fall to $192mn (-3%) in 2020 and then grow to $205mn (+7%) in 2021.

Need for more 300mm capacity by end of 2021; 200mm capacity fine for now. TSEM has 1 fab for 300mm, which is in Uozu (Japan) focusing on 65nm Power and Image Sensors. Given the capacity addition during 2020, utilization in that fab is at 70% (would have been 85% with no capacity addition), which gives the company room to grow for most part of 2021, but then it may become a bottleneck. As such, TSEM may have to look at options available (including inorganic) to add more capacity before the end of 2021. For 200mm, given utilization rates are around 50% in Israel and Japan fabs, it has enough capacity for 2021. Given these capacity additions, we model capex of $172mn in 2019 rising to $260mn/$225mn in 2020/21. Here we note that around $175-180mn of capex can be termed as base level (linked to maintenance), with the rest linked to capacity additions.

Company Day 2 Recaps

KLAC (Outperform, TP $240)

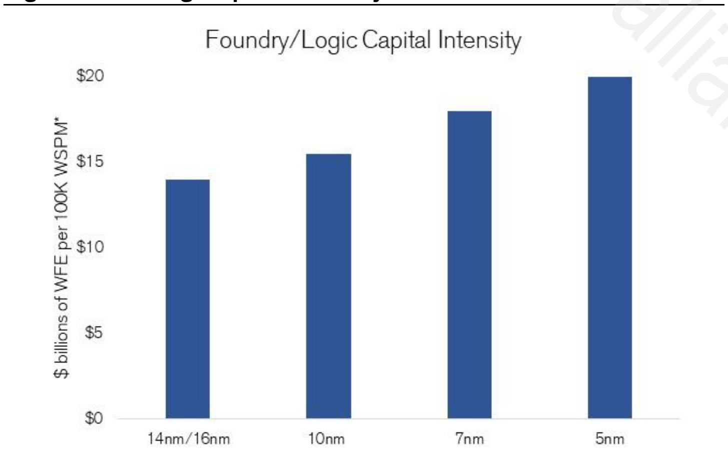
Company highlighted KLAC's its differentiation through the complexity of its inspection/measurement equipment and the rising requirement for multi-disciplinary expertise (optics, lasers, electronics, plasma physics, mechanics, and algorithms for defect detection) allowing for solid competitive moats (and industry leading GMs of ~62%). Additionally, (1) KLAC's optical inspection business is growing >40% y/y reaching all-time highs, proving e-beam is not taking over the market, (2) EUV continues to drive scaling, smaller defect requirements, and processing intensity on advanced nodes, and (3) ORBK acquisition continues to expand customer base in advanced packaging/5G.

Figure 11: KLAC CS/Street Expectations and Results

KLAC-US	Sep-20	Dec-20E			Mar-21E		CY20E		CY21E		F2021E		F2022E	
	Reported	CS	Cons	Guidance	CS	Cons	CS	Cons	CS	Cons	CS	Cons	CS	Cons
Total Revenue	**$1,539**	**$1,585**	**$1,593**	**$1,510m-$1,660m**	**$1,585**	**$1,577**	**$6,007**	**$6,016**	**$6,415**	**$6,429**	**$6,294**	**$6,274**	**$6,610**	**$6,543**
% Q/Q chng	*5.4%*	*3.0%*	*3.6%*	*~+3% q/q*	*0.0%*	*-1.0%*								
% Y/Y chng	*8.9%*	*5.0%*	*5.6%*		*11.3%*	*10.8%*	*13.8%*	*14.0%*	*6.8%*	*6.9%*	*37.7%*	*37.3%*	*5.0%*	*4.3%*
% q/q seasonal	*-12.5%*	*6.8%*			*0.3%*									
Gross Margin*	**62.1%**	**62.0%**	*61.9%*	*61% - 63%*	**62.0%**	*61.3%*	**61.4%**	*61.4%*	**62.0%**	*61.6%*	**62.0%**	*62.0%*	**62.0%**	*62.9%*
R&D Expense*	**$218.1**	**$217.0**			**$220.0**		**$866.4**		**$895.0**		**$875.1**		**$915.0**	
SG&A Expense*	**$157.3**	**$163.0**			**$165.0**		**$635.7**		**$675.0**		**$650.3**		**$695.0**	
Operating Exp.*	**$375.4**	**$380.0**		**~$380m**	**$385.0**	*$380.3*	**$1,502.1**		**$1,570.0**		**$1,525.4**		**$1,610.0**	
Operating Margin*	**37.7%**	**38.0%**	*38.0%*		**37.7%**	*37.2%*	**36.4%**	*36.4%*	**37.5%**	*37.3%*	**37.8%**	*37.6%*	**37.6%**	*37.5%*
Net Income*	**$474.3**	**$487.8**			**$483.5**		**$1,776.7**		**$1,948.2**		**$1,929.1**		**$2,018.6**	
Net Margin*	**30.8%**	**30.8%**			**30.5%**		**29.6%**		**30.4%**		**30.7%**		**30.5%**	
EPS*	**$3.03**	**$3.15**	**$3.17**	**$2.82-$3.46**	**$3.14**	**$3.02**	**$11.38**	**$11.40**	**$12.70**	**$12.50**	**$12.46**	**$12.23**	**$13.23**	**$12.96**
Fully diluted shares	156.4	155.0			154.0		156.2		153.4		154.8		152.6	

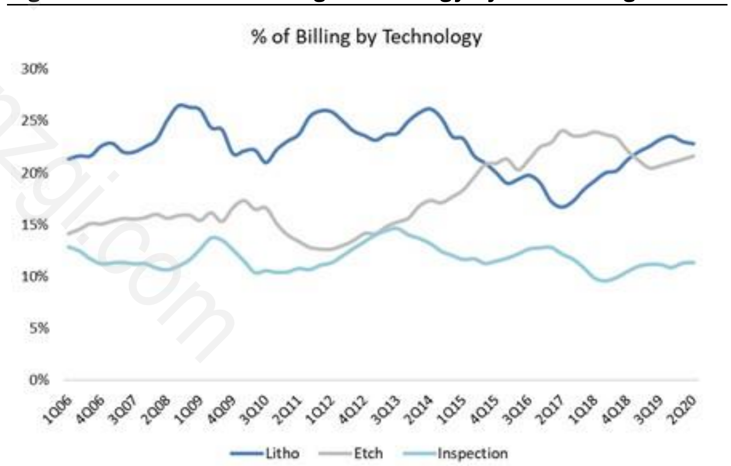
Source: Company data, Credit Suisse estimates, FactSet

Figure 12: Rising Capital Intensity



Source: Company data, Credit Suisse estimates

Figure 13: Wafer Processing Technology by % of Billings



Source: Company data, Credit Suisse estimates, SEMI data

LRCX (Outperform, TP $450)

The Company was positive on its 3 core growth areas: (1) SAM expansion by entering new markets with disruptive tech (i.e. $2B+ incremental EUV photoresist market), (2) Further share gains – still targeting ~4-8% gains in Etch/Deposition by CY23, and (3) Services growth – with installed base of 60,000+ chambers and Rev to increase >40% by CY23. LRCX also announced a new 8" tool for its photoresist strip and has seen record revenues on its refurbish business for retooling on mature nodes to support application growth/reuse.

Figure 14: LRCX CS/Street Expectations and Results

LRCX	Sep-20	Dec-20E			Mar-21E		F2021E		F2022E		CY20E		CY21E	
	Reported	CS	Cons	Guidance	CS	Cons	CS	Cons	CS	Cons	CS	Cons	CS	Cons
Total Revenue	$3,177.1	$3,300	$3,312	$3.1bn-$3.5bn	$3,100	$3,218	$12,827	$12,964	$13,675	$13,863	$11,773	$11,784	$13,175	$13,277
% Q/Q chng	13.8%	3.9%	4.2%	-2.4% to +10.2%	-6.1%	-2.8%								
% Y/Y chng	46.7%	27.7%	35.8%		23.8%	28.5%	27.7%	29.1%	6.6%	6.9%	23.3%	23.4%	11.9%	12.7%
% q/q seasonal	5.6%	8.2%			-3.1%									
Total GM*	47.5%	46.0%	46.1%	45% - 47%	46.5%	46.4%	46.8%	46.7%	47.3%	47.0%	46.5%	46.5%	47.0%	46.9%
R&D Expense*	$349.6	$368.0			$360.0		$1,437.6		$1,450.0		$1,368.4		$1,445.0	
SG&A Expense*	$173.5	$175.0			$170.0		$693.5		$744.0		$677.3		$715.0	
Operating Exp.*	$523.1	$543.0			$530.0		$2,131.1		$2,194.0		$2,045.7		$2,160.0	
Operating Margin*	31.1%	29.5%	29.7%	28.5% - 30.5%	29.4%	29.5%	30.1%	30.0%	31.2%	30.6%	29.1%	29.2%	30.6%	30.0%
Net Income*	$835.1	$818.1			$744.2		$3,212.1		$3,537.4		$2,948.0		$3,313.2	
Net Margin*	26.3%	24.8%			24.0%		25.0%		25.9%		25.0%		25.1%	
EPS*	$5.67	$5.60	$5.66	$5.20-$6.00	$5.10	$5.40	$21.96	$22.25	$24.40	$24.90	$20.03	$20.09	$22.80	$23.21
Fully diluted shares	147.2	146.0		146	146.0		146.2		145.0		147.2		145.3	

Source: Company data, Credit Suisse estimates, FactSet

Figure 15: Services Growth to ~30% of Rev

Source: Company data, Credit Suisse estimates

Figure 16: LRCX Still Expects to Take Share

Source: Company data

AMAT (Outperform, TP $100)

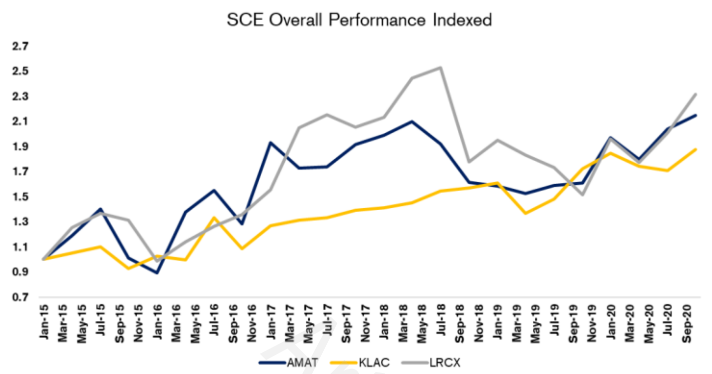
Continues to outperform WFE industry, Silicon Rev up ~25% in CY20 and set-up well for CY21. The Company also cited a number of areas it has been gaining share – in (1) CY19 Epi/CVD/PVD already having gained 8pts of share, and in (2) CY20 poised to expand with metal deposition up ~40% y/y, Etch ~30% y/y, and inspection/measurement ~46% y/y. CEO highlighted growing conductor etch gains in DRAM and leveraging this technology to 3D NAND transitions. Services still on-track for ~5% y/y installed base growth with long-term service agreements >90% renewal rate and 3-10x Rev/tool. Kokusai M&A is still pending China approval – but has clearance in all other geos to-date.

Figure 17: AMAT CS/Street Expectations and Results

AMAT	Oct-20	Jan-21E			Apr-21E		F2021E		F2022E		CY20E		CY21E	
	Reported	CS	Cons	Guidance	CS	Cons	CS	Cons	CS	Cons	CS	Cons	CS	Cons
Total Revenue	$4,688.0	$4,950.0	$4,954.6	$4.75bn - $5.15bn	$4,675.0	$4,827.7	$19,150.0	$19,437	$19,550.0	$20,637	$17,990.0	$17,995	$19,000.0	$19,550
% Q/Q chng	*6.7%*	*5.6%*	*5.7%*	*+1.3% to +9.9%*	*-5.6%*	*-2.6%*								
% Y/Y chng	*24.9%*	*18.9%*	*19.0%*		*18.1%*	*22.0%*	*11.3%*	*13.0%*	*2.1%*	*6.2%*	*19.8%*	*19.8%*	*5.6%*	*8.6%*
Total GM*	45.7%	45.3%	*45.3%*		45.7%	*45.7%*	45.8%	*46.0%*	44.9%	*47.6%*	45.2%	*44.9%*	46.2%	*46.0%*
R&D Expense*	$560.0	$570.0			$575.0		$2,295.0		$2,335.0		$2,252.0		$2,305.0	
SG&A Expense*	$287.0	$290.0			$295.0		$1,175.0		$1,215.0		$1,119.0		$1,185.0	
Operating Exp.*	$817.0	$860.0	$859.8		$870	$865.4	$3,470.0	$3,561.2	$3,550.0	$4,002.7	$3,284.0	$3,249.0	$3,490.0	$3,557.8
Operating Mgin*	28.3%	27.9%	27.9%		27.1%	27.8%	27.7%	*27.7%*	28.3%	*28.2%*	26.9%	*26.9%*	27.8%	*27.8%*
Net Income*	$1,148.0	$1,155.1			$1,056.6		$4,438.6		$4,649.2		$4,096.1		$4,415.8	
Net Margin*	24.5%	23.3%			22.6%		23.2%		23.8%		22.8%		23.2%	
EPS	$1.25	$1.25	$1.27	*$1.20 -$1.32*	$1.15	$1.21	$4.82	$4.98	$5.05	$5.44	$4.44	$4.47	$4.80	$4.96
Fully diluted shares	921.0	921.0			921.0		921.0		920.0		921.8		920.8	

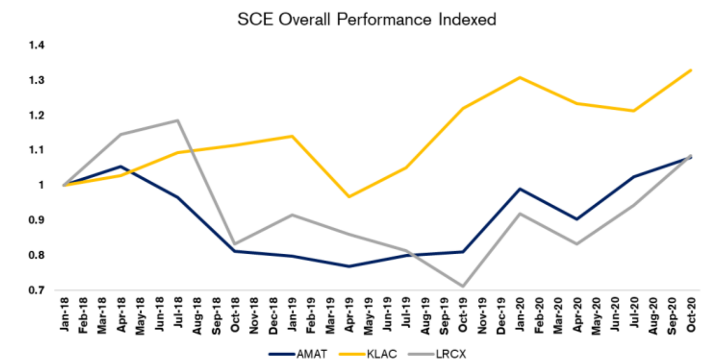
Source: Company data, Credit Suisse estimates, FactSet

Figure 18: SCE Overall Performance Indexed - 2015



Source: Company data, Credit Suisse estimates

Figure 19: SCE Overall Performance Indexed - 2018



Source: Company data, Credit Suisse estimates

INTC (Outperform, TP $65)

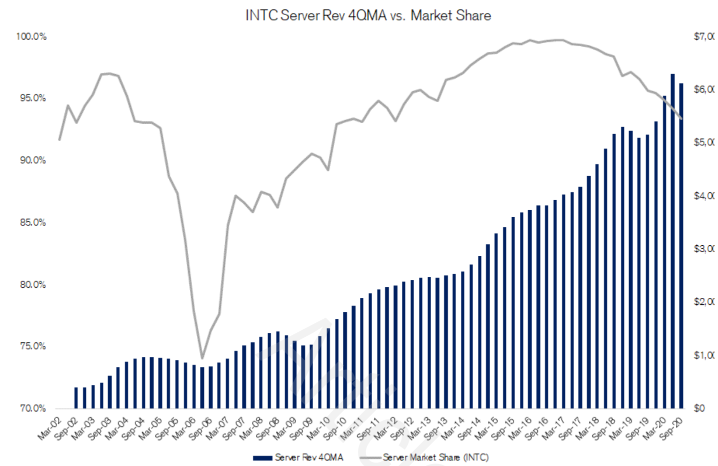
On (1) Manufacturing – Company emphasized its dedication to the IDM model, we expect JanQ announcement of outsourcing changes to be more evolutionary than revolutionary and our channel checks continue to suggest 7nm yield is progressing well. CEO still confirmed commitment to 3nm/5nm roadmaps internally – indicating increased outsourcing would result in modestly lower GMs w/ higher FCF. On (2) Product cycles – INTC remains focused on executing 10nm Ice Lake for Server – sampling in 4Q20, ramping in 1Q21 – with next-gen Sapphire Rapids volume production by end of CY21. Note, delayed Ice Lake does not impact C4Q guide and/or Sapphire Rapids timeline – both launches expected to be strong over next 2-3+ years – and Ice Lake will compete at same node with AMD's Milan until Genoa launches in 2HCY20. Also INTC's 10nm client TGL is ramping well w/ strong demand and next-gen Alder Lake on-track for DT/NB in 2H21 (3) Overall Demand – Similar to comments by AMD yesterday, the Company re-iterated strong PC demand in NT CY20 ~+HSD % y/y vs. previous expectations of ~flattish y/y (consistent with OEM commentary and channel checks). In Server market, despite (1) Enterprise down ~47% y/y in C3Q YTD Enterprise/Gov't is ~flattish balancing out strong 1H20 and (2) Cloud moderately digesting in 2H20 but LT demands for Cloud services have been more resilient than expected and should continue thru CY21. Additionally, away from CS Conference at AWS Re:Invent 2020 – INTC announced AMZN will be rolling out EC2 instances for AI/ML training on INTC's Habana Gaudi accelerators – which demonstrate ~40% better price performance than current AWS GPUs for ML training workloads.

Figure 20: INTC CS/Street Expectations and Results

INTC	Sep-20	Dec-20E			Mar-21E		CY2020E			CY2021E	
	Reported	CS	Cons	Guidance	CS	Cons	CS	Cons	Guidance	CS	Cons
Revenue	$18,333	$17,400	$17,444	~$17.4bn	$16,000	$16,404	$75,289	$75,327	~$75.3bn	$72,000	$71,194
% q/q	-7.1%	-5.1%	-4.8%	-5.1%	-8.0%	-6.0%					
Seasonal q/q %	9.6%	3.1%			-7.5%						
% y/y	-4.5%	-13.9%	-13.7%		-19.3%	-17.3%	4.6%	4.7%	4.6%	-4.4%	-5.5%
Gross Margin	54.8%	55.0%	54.9%	~55%	56.5%	55.6%	56.8%	56.4%	~57%	57.2%	56.6%
OpEx (R&D plus MG&A)	$4,655	$4,960			$4,700		$19,132			$19,500	
Operating Margin	29.4%	26.5%	26.8%	~26.5%	27.1%	26.4%	31.3%	31.4%	~31.5%	30.2%	29.4%
Net Income	$4,675	$4,497		TR ~15.5%	$3,861		$20,682		TR ~14.5%	$19,187	
Net Margin	25.5%	25.8%			24.1%		27.5%			26.6%	
EPS (Non-GAAP w/SBC)	$1.11	$1.10	$1.09	~$1.10	$0.95	$0.94	$4.89	$4.89	~$4.90	$4.70	$4.53
Fully diluted shares	4,211	4,080			4,080		4,222			4,080	

Source: Company data, Credit Suisse estimates, FactSet

Figure 21: INTC Server Rev Growth Despite Share Loss



Source: Company data, Credit Suisse estimates, Mercury Data

Figure 22: INTC Processor Core Timeline

Gen	Year	Process	Core	Graphics	SoC
1st Gen Core	2006	65nm	Conroe	-	Core 2
	2008	45nm	Nehalem	-	Lynnfield
	2010	32nm	Westmere	Gen5	Clarkdale
2nd Gen Core	2011	32nm	Sandy Bridge	Gen6	Sandy Bridge
3rd Gen Core	2012	22nm	Ivy Bridge	Gen7	Ivy Bridge
4th Gen Core	2013	22nm	Haswell	Gen7.5	Haswell
5th Gen Core	2015	14nm	Broadwell	Gen8	Broadwell
6th Gen Core	2015	14nm	Skylake	Gen9	Skylake
7th Gen Core	2017	14+	Kaby Lake	Gen9 LP	Kaby Lake
8th Gen Core	2017	14++	Coffee Lake	Gen9 LP	Coffee Lake
	2017	10 minus	Palm Cove	Gen10*	Cannon Lake
	2018	14++	Whiskey Lake	Gen9 LP	Whiskey Lake
	2019	14+	Amber Lake	Gen9 LP	Amber Lake
9th Gen Core	2018	14++	Coffee Lake	Gen9 LP	Coffee Lake-R
10th Gen Core	2019	14+++	Comet Lake	Gen9	Comet Lake
	2019	10nm	Sunny Cove	Gen11	Ice Lake
11th Gen Core	2020	10SF	Willow Cove	Xe-LP	Tiger Lake

Source: Company data, Credit Suisse estimates

MU (Outperform, TP $90)

Before market open, MU raised their F1Q (NovQ) Rev/GM/EPS guidance range: (1) Revenue $5.7bn-$5.75bn (midpoint ~$5.73bn or -5.5% q/q) up from $5.0bn-$5.4bn (midpoint $5.2bn or -14.1% q/q), (2) GM 29.5%-30.5% (midpoint ~30.0%) up from 26.5%-28.5% (midpoint 27.5%), and (3) EPS $0.69-$0.73 (midpoint $0.71) up from $0.40-$0.54 (midpoint $0.47). This positive pre was based on broad-based strength across Handsets, Auto, Industrial, Cloud, and PCs despite seasonally weak F1Q – with upside to both ASPs and Bit Growth. Note, QTD spot pricing for DRAM/NAND is -1.7%/+1.2% q/q vs. CS -7.9%/-13.0% q/q. CEO Sanjay Mehrota also noted that (1) enterprise demand remains weak, as expected, (2) DRAM demand should continue to build trough CY21 (i.e. Cloud, Edge, etc.), and (3) NAND though having strong volume/pricing in F1Q is still at risk of oversupply in CY21 – with MU still committed to CY21 NAND supply growth below industry demand. Updated guidance also includes normal ramp of GDDR6X DRAM Memory for Graphics – and MU continues to execute well on improving yields. Additionally, MU's progression to DRAM 1-alpha node and NAND 176L RG should provide greater opportunities for cost reductions by 2HFY21 – as highlighted yesterday at the Company's Technology Strategy Update.

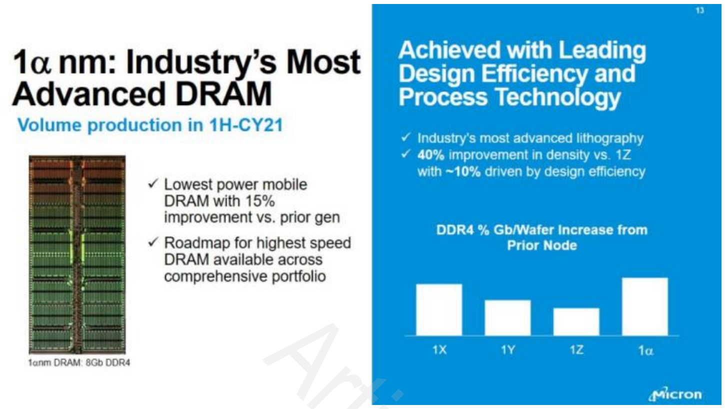
Figure 23: MU CS/Street Expectations and Results

MU	Aug-20	Nov-20E			
	Reported	CS	Cons	Prev. Guidance	Updated Guidance
Revenue	$6,056	$5,200	$5,282	$5.0-5.4bn	$5.7bn - $5.75bn
% Q/Q chng	11.4%	-14.1%	-12.8%	-17.4% to -10.8%	-5.9% to -5.1%
% Y/Y chng	24.4%	1.1%			
Gross Margin	34.9%	27.5%	28.2%	26.5% to 28.5%	29.5% to 30.5%
Total Operating Expenses	$809	$825	$838	$825m +/- 25m	-
Operating Income	$1,302	$605			
Operating Margin	21.5%	11.6%	12.3%		
Net Income (w/ options)	$1,142	$447			
Net Margin	18.9%	8.6%			
EPS (Pro Forma w/ options)	$1.00	$0.39			
EPS (Pro Forma ex options)	$1.08	$0.47	$0.51	~$0.40-0.54	~$0.69 to 0.73
EPS (GAAP)	$0.60	$0.16			
Diluted Shares Outstanding	1,142.0	1,142.0			

MU	Feb-21E		FY2021E		FY2022E		CY2020E		CY2021E	
	CS	Cons	CS	Cons	CS	Cons	CS	Cons	CS	Cons
Revenue	$5,300	$5,242	$23,000	$23,101	$28,400	$28,898	$21,491	$21,573	$25,000	$25,071
% Q/Q chng	1.9%	-0.8%								
% Y/Y chng	10.5%		7.3%	-1.3%	23.5%	25.1%	4.1%	4.5%	16.3%	16.2%
Gross Margin	27.0%	28.7%	32.5%	31.2%	45.0%	40.4%	31.4%	31.1%	37.2%	35.8%
Total Operating Expenses	$800	$833	$3,225	$3,417	$3,200	$4,003	$3,327		$3,413	
Operating Income	$631		$4,252		$9,580		$3,416		$5,875	
Operating Margin	11.9%	12.8%	18.5%	16.4%	33.7%	26.6%	15.9%		23.5%	
Net Income (w/ options)	$458		$3,426		$8,271		$2,890		$4,875	
Net Margin	8.6%		14.9%		29.1%		13.4%		19.5%	
EPS (Pro Forma w/ options)	$0.40		$3.00		$7.24		$2.53		$4.27	
EPS (Pro Forma ex options)	$0.48	$0.50	$3.30	$3.04	$4.76	$6.23	$2.84	$2.86	$4.57	$4.21
EPS (GAAP)	$0.28		$2.19		$3.65		$1.42		$3.46	
Diluted Shares Outstanding	1,142.0		1,142.0		1,142.0		1,142.5		1,142.0	

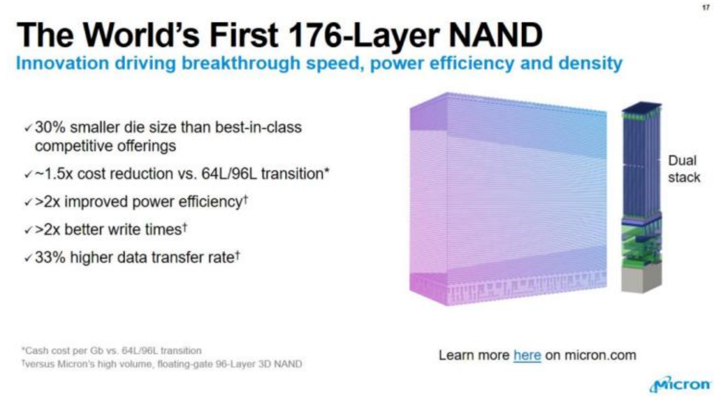
Source: Company data, Credit Suisse estimates, FactSet

Figure 24: MU - Industry Leading DRAM Technology



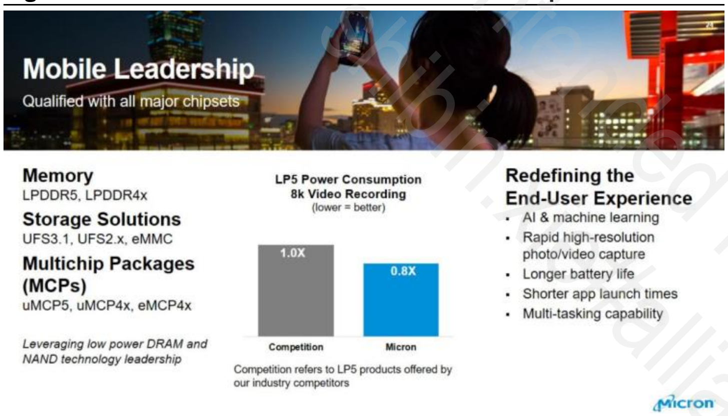
Source: Micron Technology, Inc.

Figure 25: MU - Industry Leading NAND Technology



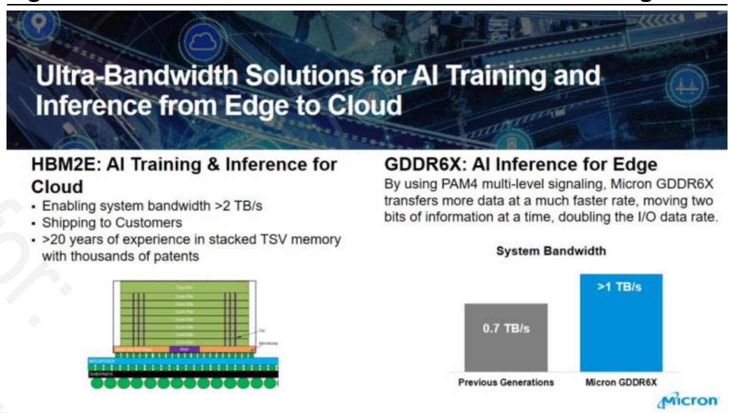
Source: Micron Technology, Inc.

Figure 26: MU - Demonstrated Mobile Leadership



Source: Micron Technology, Inc.

Figure 27: MU - Ultra-Bandwidth Solutions for AI Training



Source: Micron Technology, Inc.

MCHP (Outperform, TP $145)

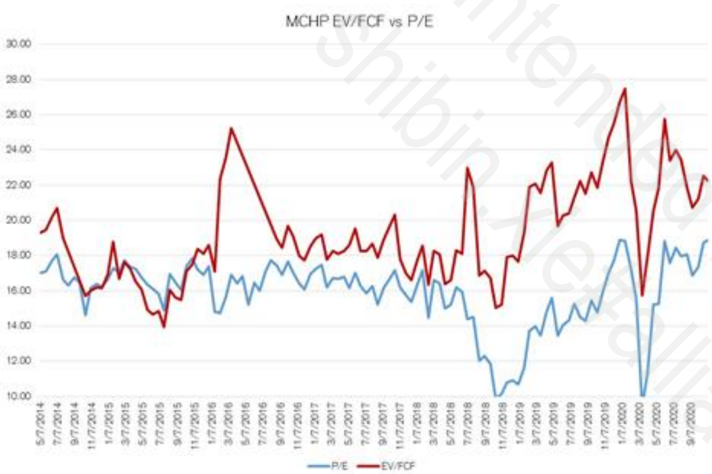
Updated operating model with GMs/OpM raised from 63.0%/40.5% to 65.0%/42.0% and Opex revised up from 22.5% to 23.0% for strategic product investments. Drivers of GM expansion include (1) eliminating factory underutilization ($12m in F2Q and ~zero by March), (2) expanding into existing clean room space in front-end/back-end, (3) insourcing of assembly from 45% to 60%+ and test from 54% to >70%, and (4) improving pricing discipline. We view F1Q/F2Q OpM of ~39% at trough Rev clearly supportive of OpM upside to at least 45% - and at 45% OpM our CY22 EPS would increase from $7.79 to $8.60. Mgmt. reiterated view that strength in NovQ (F2Q) bookings has continued into DecQ (F3Q) and was positive on NT business environment thru CY21. While we continue to argue that semi stocks are mid-stream in a re-rating higher, we do not need to argue for EV multiple expansion for MCHP in order to see significant upside in the equity – with net debt of $8.8bn and a market cap of $31.7bn – there is ~25% upside to the stock even if EV remains constant as MCHP continues to use excess cash to pay down debt ($2.95bn of debt pay down in the last 9 quarters).

Figure 28: MCHP CS/Street Expectations and Results

MCHP-US	Sep-20	Dec-20E			Mar-21E		FY2021E		FY2022E	
	Reported	CS	Cons	Guidance	CS	Cons	CS	Cons	CS	Cons
Revenue	**$1,310**	**$1,343**	**$1,345**	**$1,310m to $1,375m**	**$1,375**	**$1,380**	**$5,337**	**$5,343**	**$5,870**	**$5,867**
% Q/Q chng	*0.0%*	*2.5%*	*2.7%*	0% to +5% q/q	*2.4%*	*2.6%*				
% Y/Y chng	*-2.1%*	*4.3%*	*4.5%*		*3.7%*	*4.0%*	*1.2%*	*1.3%*	*10.0%*	*9.9%*
5YR Median	*4.1%*	*-1.8%*			*2.4%*					
Gross Margin	**62.2%**	**62.6%**	*62.5%*	62.4% to 62.8%	**62.5%**	*62.6%*	**62.2%**	*62.2%*	**62.9%**	*63.3%*
R&D Expense	**$175**	**$183**			**$185**		**$721**		**$760**	
SG&A Expense	**$125**	**$131**			**$135**		**$516**		**$565**	
Operating Expenses	**$300.1**	**$314.0**	**$317.2**	23.1% to 23.7%	**$320.0**	**$324.6**	**$1,236**	**$1,238**	**$1,325**	**$1,360**
Operating Margin	**39.2%**	**39.2%**	*39.0%*	38.7% to 39.7%	**39.2%**	*39.1%*	**39.1%**	*39.1%*	**40.3%**	*40.1%*
Net Income	**$416.4**	**$425.7**			**$438.8**		**$1,683**		**$1,962**	
Net Margin	**31.8%**	**31.7%**			**31.9%**		**31.5%**		**33.4%**	
EPS (Non-GAAP ex-SBC)	**$1.56**	**$1.57**	**$1.58**	**$1.51 to $1.63**	**$1.62**	**$1.63**	**$6.30**	**$6.31**	**$7.23**	**$7.11**
EPS (Non-GAAP w/SBC)	**$1.37**	**$1.39**			**$1.43**		**$5.59**		**$6.50**	
Fully diluted shares	**267.7**	**271.3**			**271.3**		**267.0**		**271.3**	

Source: Company data, Credit Suisse estimates, FactSet

Figure 29: EV vs Market Cap Multiples Expanding



Source: Company data, Credit Suisse estimates

Figure 30: MCHP TTM FCF Expanding

Source: Company data, Credit Suisse estimates

BRKS (Neutral, TP $58)

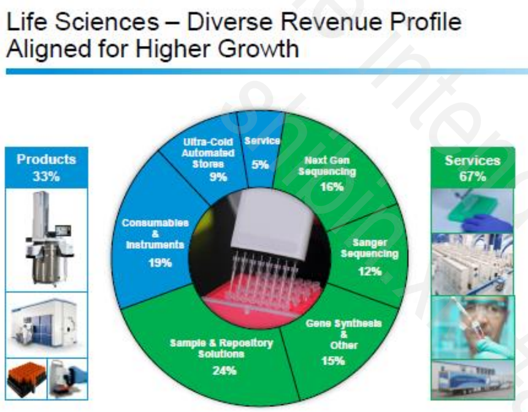
The Company continues to highlight itself as a unique Semi asset with optionality/leverage to life sciences – embedding (1) GENEWIZ acquisition optimizing well (2) growing and diversifying Life Sciences Services (NGS, Sanger Sequencing, SRS) segments, and (3) Semi products (CCS, Wafer-level automation) driven by increasing chip complexity and Logic/Foundry/Memory node transitions. NT business trends in Life Sciences, while not fully recovered in Academia, are nearing pre-COVID levels and mgmt. reiterated the ~$10m incremental COVID vaccine opportunity from storage/distribution offerings. They remain optimistic on revised FY22 target model with (1) previously revised Life Sciences Rev of ~$530m (45% of Rev) and GM/OpM of ~48-51%/16-20% raised from ~44-46%/18-20% and (2) Semi Solution remaining in-track to Rev of $580-680m (55% of Rev) and GM/OpM ~42-44%/20-22% - this results in BRKS Rev CAGR from CY20 of ~13% with Company OpM of ~19%.

Figure 31: BRKS CS/Street Expectations and Results

BRKS-US	Sep-20	Dec-20E			Mar-21E		F2020		F2021E		CY20E		CY21E	
	Reported	CS	Cons	Guidance	CS	Cons	CS	Cons	CS	Cons	CS	Cons	CS	Cons
Total Revenue	$246.2	$244.0	$243.6	$237m-$251m	$236.0	$246.7	$897.3	$1,003.9	$1,010.0	$1,119.4	$930.8	$897.3	$1,026.0	$1,003.9
% Q/Q chng	11.7%	-0.9%	-1.0%	-3.7% to +2.0%	0.4%	1.3%								
% Y/Y chng	23.0%	15.9%	15.7%		12.1%	12.0%	14.8%	28.4%	12.6%	11.5%	14.5%	10.4%	10.2%	11.9%
Total GM*	46.6%	46.0%	45.9%		42.5%	46.0%	43.6%	45.6%	46.0%	46.4%	44.7%	43.4%	46.1%	45.6%
Operating Exp.*	$70.0	$70.5	$71.5		$65.0	$73.6	$268.9		$286.0		$255.4		$288.5	
Operating Margin*	18.2%	17.1%	16.6%		15.0%	16.2%	13.6%	17.1%	17.7%	18.7%	15.3%	13.7%	18.0%	17.1%
Net Income*	$34.5	$31.1			$27.7		$92.9		$133.5		$107.4		$138.4	
Net Margin*	14.0%	12.8%			11.7%		10.4%		13.2%		11.5%		13.5%	
EPS*	$0.47	$0.42	$0.41	$0.37-$0.47	$0.37	$0.41	$1.26	$1.73	$1.80	$2.11	$1.45	$1.26	$1.87	$1.73
Fully diluted shares	74.0	74.0			73.9		73.8		74.0		73.9		74.0	

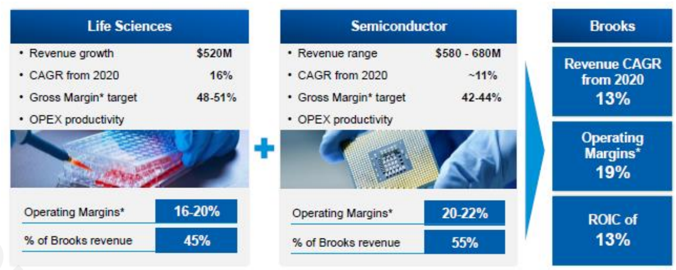
Source: Company data, Credit Suisse estimates, FactSet

Figure 32: Diversifying in Life Sciences



Source: Company data

Figure 33: FY22 Revised Target Model



Source: Company data

KEYS (Outperform, TP $125)

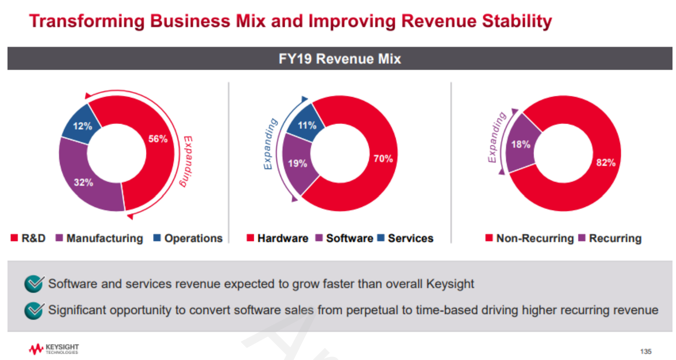
Despite concerns of the industry being in mid-to-late innings of 5G cycle, mgmt. reiterated its belief that the 5G cycle is in early innings and will be stronger for longer – citing their customers continually growing R&D budgets and the increased intensity of testing IoT/Auto/Industrial 5G networks. The Company expects multiple waves of 5G investment globally and has invested both organically and inorganically in SW/HW up/down the stack – their expanded portfolio goes beyond the physical layer and into protocol/SW/application layer – creating a foundation for sustainable CSG growth.

Figure 34: KEYS CS/Street Expectations and Results

KEYS - Non-GAAP	Oct-20	Jan-21E			Apr-21E		F2021E		F2022E		C2020E			C2021E		
	Reported	CS	Cons	Guidance	CS	Cons	CS	Cons	CS	Cons	CS New	CS	Cons	CS New	CS	Cons
Total Revenue	$1,220.0	$1,150.0	$1,154.8	$1,140-1,160m	$1,195.0	$1,156.1	$4,790.0	$4,698.7	$5,077.0	$4,941.5	$4,276.0	$4,276.0	$4,280.8	$4,850.0	$4,850.0	$4,725.7
% Q/Q chng	20.7%	-5.7%	-5.3%		3.9%	0.1%										
% Y/Y chng	8.7%	5.0%	5.5%		33.5%	29.2%	13.5%	0.0%	6.0%	5.2%	-2.8%	-2.8%	-2.7%	13.4%	13.4%	10.4%
Gross Margin (ex SBC)	65.9%	65.7%	64.9%		65.0%	64.2%	65.2%	64.6%	65.5%	65.1%	64.9%	64.9%	64.7%	65.1%	65.1%	64.7%
Operating Exp.	$446.0	$454.2			$481.3		$1,889.9		$1,978.9		$1,677.2	$1,677.2		$1,927.9	$1,927.9	
Operating Margin (ex SBC)	29.3%	26.2%	26.3%		24.7%	24.8%	25.7%	26.0%	26.5%	26.9%	25.6%	25.6%	25.7%	25.4%	25.4%	26.0%
Net Income	$305.0	$253.7			$248.5		$1,038.1		$1,137.4		$932.7	$932.7		$1,036.8	$1,036.8	
Net Margin	25.0%	22.1%			20.8%		21.7%		22.4%		21.8%	21.8%		21.4%	21.4%	
EPS	$1.62	$1.35	$1.36	$1.32-1.38	$1.32	$1.30	$5.52	$5.58	$6.05	$6.07	$4.94	$4.94	$4.95	$5.51	$5.51	$5.63
Fully diluted shares	188.0	188.0			188.0		188.0		188.0		188.6	188.6		188.0	188.0	

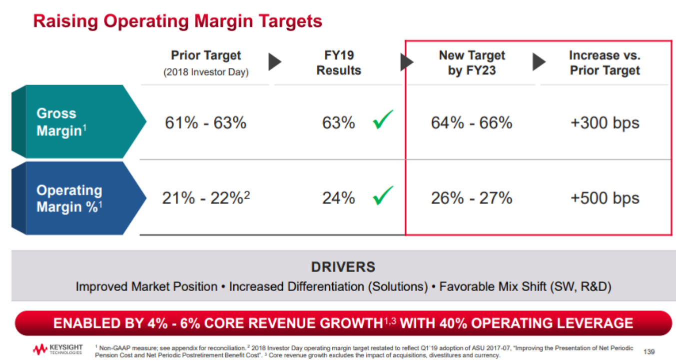
Source: Company data, Credit Suisse estimates, FactSet

Figure 35: Transforming Business Mix



Source: Keysight Technologies

Figure 36: GM/OpM Targets



Source: Keysight Technologies

Siltronic (Restricted) – EU Semis:

CS remains RESTRICTED on Siltronic and GlobalWafers (GWC) following the recent announcement on 29th Nov that Siltronic is in advanced (near to final) discussions to enter into a Business Combination Agreement (BCA) with GWC in Taiwan. At the conference, Achal Sultania hosted fireside chat and group meetings with Rainer Irle (CFO) and Petra Mueller (VP, IR & Communications). Key takeaways from his sessions were:

Utilization rates going up. Management noted that its fab utilization rates for 300mm wafers overall has been increasing – 300mm EPI wafers used by Logic customers continue to run at full utilization, while 300mm Polished wafers used by Memory customers still has room for improvement as demand picks up and inventory of finished goods normalizes. As such, blended utilization rate for 300mm fab is currently in the low 90%. For 2021, Siltronic expects a recovery in Smartphone units (although may still be below 2019 levels) along with AI momentum in Cloud/Servers to be positive drivers for 2021 offsetting any headwind from PC moderation. 5G, AI and EV adoption remain clear positives for silicon content growth across devices providing 3-4% incremental growth in wafer demand. As such, Siltronic expects moderate volume growth for wafer industry in 2021.

Inventory levels likely to normalize by end of 2020. Siltronic believes that 300mm raw wafers excess inventory built up in Q2 is now being digested through 2H20 and may likely normalize by year end. For 200mm, customers in Auto/Industrial domain who had built safety buffer of raw wafers in Q2 are also in the process of going through inventory reduction as demand has started to improve, although there is no sign of tightness here. When looking at finished goods, Siltronic noted that inventory of NAND chips still remains higher than normal levels.

ASML Holding (Outperform) – EU Semis

Achal Sultania hosted a fireside chat and group meetings with Peter Wennink (CEO) and Skip Miller (Head, IR Worldwide). Key takeaways from our sessions were:

EUV sales guidance for 20% growth in 2021 – risks to the upside. On Q3 earnings, ASML had guided for its EUV sales to grow 20% next year (we believe this implies mid to high 30 tools, CSe at 38 EUVs in 2021 up from 31 in 2020 as we show in Figure Error: Reference source not found!) which CEO noted was impacted by 2 factors: (1) Node delay at one of its Logic customers (we believe Intel) leading to tool pushout into 2022; and (2) Huawei restrictions resulting in one of its Foundry customers (we believe TSMC) having to readjust its capacity ramp schedule for advanced nodes (both 5nm and 3nm). But equally, the void created by lack of Huawei 5nm orders at one of its customers has been filled up faster than expected as other customers have accelerated their 5nm design roadmap. As such, it continues to target 40+ tool capacity for 2021 allowing it some buffer to ship more than its guidance in case there is some demand upside. In its EUV guidance, ASML flagged that DRAM is still a minor contributor in 2021 with ramp likely from 2022 driven by 1A (carrying 3-5 EUV layers vs. only 1 layer in 1z today) rising in the DRAM mix.

Figure 37: CS models 31/38 EUV tool shipments for ASML in 2020/21 mainly driven by Foundry demand

Global EUV system shipments	2018	2019	2020E	2021E	2022E	2023E	2024E	2025E
ASML EUV system shipments	**18**	**26**	**31**	**38**	**46**	**52**	**56**	**60**
of which High NA systems					0	3	6	9
EUV shipment breakdown:								
Foundry (TSMC / Samsung LSI)	15	21	23	26	29	31	30	31
Logic (Intel)	2	2	3	4	5	6	7	7
DRAM (Samsung, Hynix, Micron)	1	3	5	8	12	15	19	22

Source: Company data, Credit Suisse estimates

Memory outlook in 2021 – DRAM recovery to continue; NAND still lagging. CEO noted that feedback from its Memory customers suggest that inventory situation continues to improve with scope for DRAM to start to normalize in the next 1-2 months. ASML expects to ship a number of DUV tools (for capacity additions) in Q420 to one of its DRAM customers in Korea to help them ramp production by Q221. In the NAND space, utilization has increased here as well, but it may take a bit longer for customers to start ordering DUV tools for capacity increase. For ASML, we model Memory Systems revenue of €1.1bn in Q4 (+66% qoq/+111% yoy) leading to full year sales of €3.1bn (+29%) in 2020 and €3.7bn (+20%) in 2021.

Dialog Semi (Outperform) – EU Semis

Achal Sultania hosted group meetings with Jalal Bagherli (CEO) and Wissam Jabre (CFO) of Dialog Semiconductor at our conference. Key takeaways were as follows:

3 building blocks for Dialog in the future. Post the Apple licensing deal in Oct 2018, management have tried to build the company around 3 product areas – Apple sub-PMIC and mixed signal ICs, Consumer IoT and Industrial IoT. The recent acquisitions of Creative Chips and Adesto form the building blocks for the Industrial IoT business in the future.

Apple – multiple opportunities ahead. Dialog noted that beyond its traditional main PMIC (or licensing) business which will eventually go to zero, it has seen good traction for new products around sub-PMIC and mixed signal ICs. In addition to the existing sub-PMICs sold in iPhone11/12 models (we believe $0.90 content in iPhone12 and mini for 2 sub-PMICs and $1.25 content in iPhone12 Pro and Pro Max), it has won the battery management system chip for the future iPhone (all models) in 2H21 (we believe content for this chip to be at least $0.75). Beyond that, the company had recently announced on Q3 earnings that it has won a new design for next gen display technologies with Apple for 2022 production. Beyond that, it continues to work with its major customer in the area of audio technologies as well. Here we model Dialog's Apple sub-PMIC and other IC sales to grow from $149mn in 2018 to $668mn in 2022 (45% CAGR, which is well above its guidance of 30-35% CAGR).

ARM Holdings (Private)

We hosted fireside session along with group meetings with Inder M. Singh (CFO) and Ian Thornton (Head, IR) at the conference. Key takeaways were as follows:

NVIDIA merger joins two leading platforms to drive AI into more markets. ARM views the combination with NVIDIA as a coming together of strong engineering capabilities, and ecosystems. In addition, the combined entity will allow adoption of AI into more markets at a much faster pace. Smartphones part of ARM's business still can grow high single-digit CAGR till 2025 – CFO noted that smartphone market should benefit from a near term replacement cycle for the next couple of years (4G to 5G transition) along with tailwinds from adoption of ARM v9 architecture (over a 3-year period beyond 2022). This should result in good growth opportunity over the next five years driving its Smartphone related sales towards high single-digit CAGR vs. a maturing smartphone unit market (unit growth likely to be in low single digit CAGR).

Overall ARM sales can grow at low-teens CAGR. In addition to Smartphones, Servers have the potential to add a few ppts of sales growth to the group along with emerging opportunities in Auto space as the industry adopts more smart features and ADAS. These new markets offer much higher ASP/content and scope for much higher penetration can result in healthy top-line and profit growth.

Servers on track to get to 5% industry share in 2021. Server investments began 12 years ago, but investments have accelerated post the Softbank acquisition in the past 4-5 years to drive more wins (Amazon, Microsoft in select ways now but potentially bigger ways in the future). New products are now coming out that build on earlier generations (Graviton 2 ASIC) and also other hyperscalers (both in US and Asia) starting to follow the early adopters. The company believes its share in Servers will expand from 1% in 2018 to around 5% in 2021. CFO noted that the market is evolving from GP (general purpose) to purpose-built ASICs, which works in its favour as they can optimize the performance depending on different workloads.

PC opportunities opening up. ARM believes its successful attributes in the smartphone market can be translated to the PC/Tablet market, thereby making it more relevant in this part of the market over the next 3-5 years. It traditionally did not optimise smartphones for single-threaded performance, but is now investing in this area allowing its technology to offer better compute power and/or performance.

Impact of US-China trade tension. ARM maintains a model to operate independently and support the whole ecosystem with an optimized CPU development architecture to keep it relevant across markets over at least the next 5 years. Having said that, it will continue to comply with existing regulations, and work within those parameters.

Figure 38: ARM Market share by End-Market

ARM End-Market Opportunities		Marketshare	CY19 Market Value	CY29 Market Value Projection
Mobile	Apps processor	90%	$41bn	$43bn
	Other mobile	40%	$10bn	$13bn
Infrastructure	Networking	32%	$17bn	$36bn
	Datacenter/Cloud	5%	$20bn	$32bn
Automotive	IVI and ADAS	75%	$3bn	$12bn
	Other Auto	10%	$7bn	$10bn
Embedded	IoT Controllers	90%	$4bn	$16bn
	Microcontroller SIMs	25%	$10bn	$15bn
Other Markets	Consumer Electronics	42%	$15bn	$33bn
	Other Consumer	38%	$11bn	$23bn
Total	Total Market	34%	$138bn	$232bn

Source: Company data, Credit Suisse estimates

Figure 39: Breadth of Customers

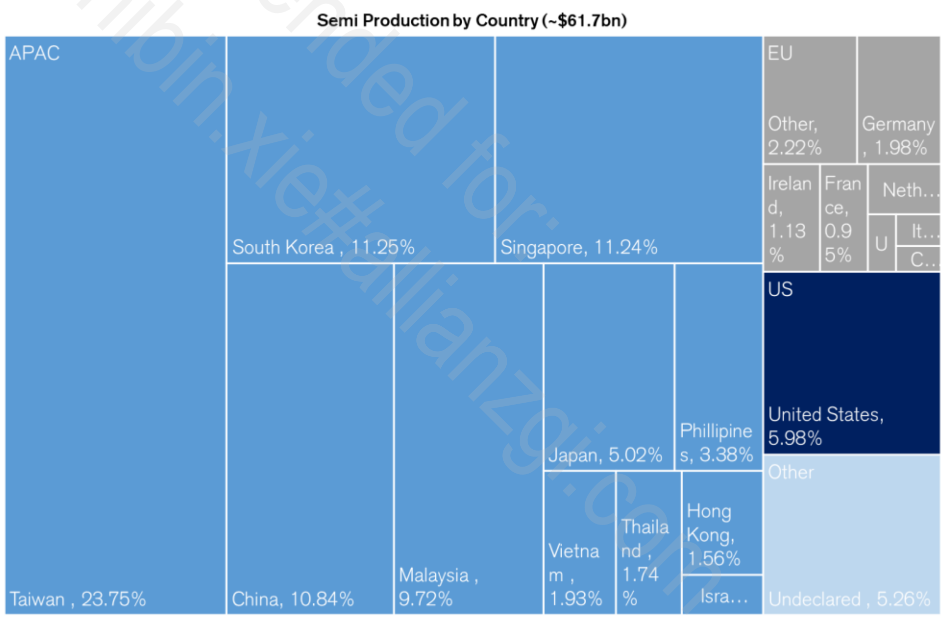
Source: Company data, Credit Suisse estimates

Company Day 3 Recaps

China Beige Book (CEO Leland Miller)

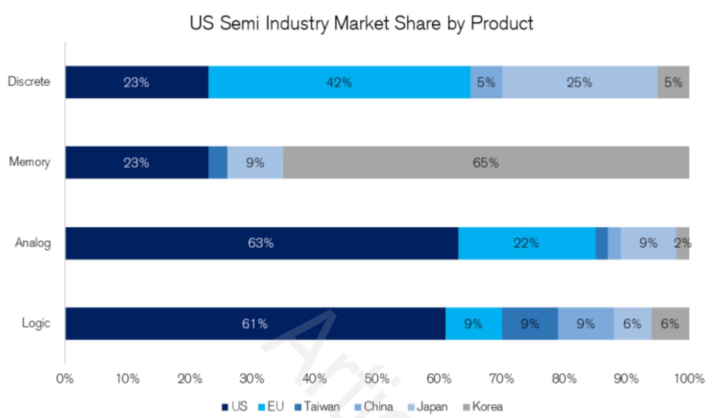
Assessed US-China relations along three vectors: (1) Trump Administration – Tech there has been "more bark than bite", Entity List is not as significant as blacklist (i.e. softer stance than market believes and has many optionality/workarounds - and direct attacks to Chinese companies haven't worked). (2) Beijing – Made in China 2025 initiative is focus on dominating advanced manufacturing sectors but expects growth in China to slow while gov't focuses on implementing its own economic strategy, (3) Biden Administration – should not try to undo many Trump policies due to legal difficulties and not wanting to appear soft on China. Biden could expand whitelists and CEO Leland Miller expects much more tech representation in Biden's administration. On M&A environment – China very much wants capital investments, key is not relinquishing too much control – deal needs to cater to this priorities. COVID impact has made companies rethink China supply chains, but not necessarily domestic US supply chains if more cost effective in APAC/Mexico (though more US support on industries focused on national security i.e. PPE/Pharma). Beige Book expects China CY21 GDP up y/y from lower CY20 base – but weekly/monthly economic improvements by their channel checks have not yet returned to y/y growth and LT they believe China's economy will slow down.

Figure 40: Global Semi Production Breakdown



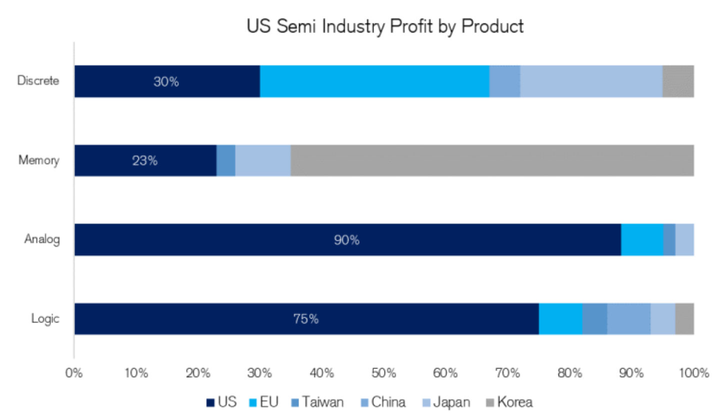
Source: Company data, Credit Suisse estimates

Figure 41: US Semi Revenue Market share



Source: Company data, Credit Suisse estimates, SEMI data

Figure 42: US Semi Profit Market share



Source: Company data, Credit Suisse estimates, SEMI data

ADI (Outperform, TP $165)

On NT business trends – the company seeing strong growth in C3Q/C4Q Industrial/Auto to offset the 2H20 digestion in its Comms business. Mgmt. reiterated the Comms value expansion in the radio head from 4G to 5G – expanding by 50-100% for sub-6GHz and much higher for mmWave – which should help Rev LT (noting ~60-65% of Comms from wireless and 35-40% from wired/data center/optical). ADI has removed Huawei from guide, w/ good content at other vendors but emphasized the Wireless business remains very lumpy – 1H20 growth was mostly China, CY21 growth (particularly 2H21) should be NA, and CY22 more EU. Current 5G engagement is in consumer/smartphones but industrial customers are looking at adding connectivity and ADI expects wider spread adoption by CY23-24. Consumer (11% of Rev) should have a Rev recovery year in CY21 after NT AAPL and macro headwinds of CY19/20 (down ~16% y/y in FY20) and its GM should rise to corporate average longer-term. On M&A – no update on status – but ADI believes it can get >$275m in synergies and has history of exceeding internal targets (Linear/Hittite). We would note combined ADI/MXIM will have 80-85% of Rev in end markets with 3-5 year design cycles with product life cycles of >10 years and the deal provides a credible 2025 roadmap to $10bn of Rev (4.5% CAGR from $8.4 bb in CY21), ~40% FCF Margin (TTM is 33%), $4bn in FCF (TTM is ~$2.7bn) and a potential market capitalization of $100bn. Our TP to $165 is still an 11% discount to PF ADI/MXIM TP of $185 based on share count of ~542m.

Figure 43: ADI CS/Street Expectations and Results

ADI-US	F4Q20	F1QE21			F2QE21		FY2021E		FY2022E	
	Reported	CS	Cons	Guidance	CS	Cons	CS	Cons	CS	Cons
Revenue	$1,526	$1,500	$1,500	*$1,430m to $1,570m*	$1,520	$1,529	$6,270	$6,235	$6,670	$6,650
% Q/Q chng	*4.8%*	*-1.7%*	*-1.8%*	*-6.3% to +2.9%*	*1.3%*	*2.0%*				
Seasonal ADI + LLTC (5-year)	*5.7%*	*-3.5%*			*1.2%*					
% Y/Y chng	*5.8%*	*15.1%*	*15.0%*		*15.4%*	*16.1%*	*11.9%*	*4.1%*	*6.4%*	*6.7%*
Gross Margin	70.0%	70.0%	*69.8%*		71.0%	*70.1%*	70.8%	*69.9%*	71.0%	*70.8%*
Operating Expenses	$431	$450	$447		$450	$448	$1,810	$1,791	$1,860	$1,889
Operating Margin	41.7%	40.0%	*40.0%*	*39% to 41%*	41.4%	*40.8%*	41.9%	*41.2%*	43.1%	*42.4%*
Net Income	$534	$484			$512		$2,142		$2,366	
Net Margin	35.0%	32.2%			33.7%		34.2%		35.5%	
EPS (Non-GAAP ex-SBC)	$1.54	$1.41			$1.48		$6.19		$6.79	
EPS (Non-GAAP w/ SBC)	$1.44	$1.30	$1.31	*$1.20 to $1.40*	$1.38	$1.37	$5.75	$5.67	$6.35	$6.31
Fully diluted shares	372.3	372.3			372.3		372.3		372.3	

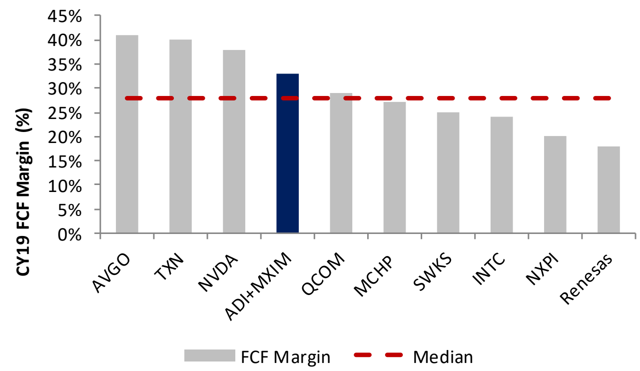
Source: Company data, Credit Suisse estimates, FactSet

Figure 44: ADI/MXIM Pro-Forma Operating Model

FY19	ADI	MXIM	ADI+MXIM
Revenue ($bn)	$6.0	$2.2	$8.2
Gross Profit ($bn)	$4.2	$1.4	$5.6
% Margin	70%	65%	69%
Operating Profit ($bn)	$2.4	$0.7	$3.1
% Margin	41%	32%	38%
Free Cash Flow ($bn)	$2.0	$0.7	$2.7
% Margin	33%	33%	33%
Net Leverage Ratio	1.9x	-0.8x	1.2x

Source: Company data, Credit Suisse estimates

Figure 45: ADI/MXIM FCF Margin vs. Other Semis



Source: Company data

CDNS (Neutral, TP $80)

CDNS has enabled designs with 12-15% better performance in AI/ML training and is now starting to engage on computing 3/2nm nodes. The Company can offer entire end-to-end solution with its Jasper industry standard verification suite (~80% of customers adopting) and growing share in its simulation tool. Its intelligent system design (Celsius and Clarity) could be the next 10%+ growth driver for the Company – as well as secular drivers of AI, 5G, Cloud, etc. driving need for compute/Data Economy. Mgmt. also noted they have focused on building moats around IP over the past 12+ years and it is now 15% of Rev and a high-margin/stable business. On China – still seeing strong growth with many of its customers not on entity list (Hyperscaler, Mixed Signal, Digital) and over the past 2Qs China HW/IP growth has been notably robust.

Figure 46: CDNS CS/Street Expectations and Results

CDNS	Sep-20	Dec-20E			Mar-21E		2020E			2021E	
	Reported	CS	Cons	Guidance	CS	Cons	CS	Cons	Guidance	CS	Cons
Total Revenue	**$666.6**	**$730.0**	**$732.0**	**$720mn-$740mn**	**$695.0**	**$701.9**	**$2,653.0**	**$2,655.2**	**$2,643mn-$2,663mn**	**$2,850.0**	**$2,829.5**
% Q/Q chng	*4.4%*	*9.5%*	*9.8%*	*0.0%*	*-4.8%*	*-4.1%*					
% Y/Y chng	*15.0%*	*21.8%*	*22.1%*	*21.8%*	*12.5%*	*13.6%*	*13.6%*	*13.6%*	*13.6%*	*7.4%*	*6.6%*
Gross Margin*	**89.6%**	**90.4%**	*88.8%*		**90.0%**	**89.7%**	**90.1%**	**89.4%**		**90.0%**	**89.5%**
R&D Expense*	**$216.2**	**$235.0**			**$225.0**		**$876.7**			**$876.7**	
SG&A Expense*	**$142.1**	**$172.0**			**$160.0**		**$597.8**			**$597.8**	
Operating Exp.*	**$358.3**	**$408.0**			**$385.0**		**$1,475.5**			**$1,603.0**	
Operating Margin*	**35.9%**	**34.5%**	*34.7%*	*34%-35%*	**34.6%**	*35.7%*	**34.4%**	*34.5%*	***34%-35%***	**33.8%**	*32.4%*
Net Income*	**$196.5**	**$207.4**			**$197.8**		**$754.8**			**$791.2**	
Net Margin*	**29.5%**	**28.4%**			**28.5%**		**28.5%**			**27.8%**	
EPS* (Non-GAAP)	**$0.70**	**$0.74**	*$0.74*	*$0.72-$0.76*	**$0.71**	**$0.71**	**$2.70**	**$2.70**	$2.68-$2.72	**$2.83**	**$2.87**
EPS (GAAP)	**$0.58**	**$0.56**			**$0.72**		**$2.05**			**$2.91**	
Fully diluted shares	280.0	280.0			280.0		279.6			280.0	

Source: Company data, Credit Suisse estimates, FactSet

TER (Neutral, TP $90)

During Day 2, TER hosted 1:1 investor meetings and highlighted in SoC Test that (1) despite CY20 smartphone units down y/y, TER grew SoC test ~15% y/y from robust CY21 builds (i.e. AAPL 5G and OEMs trying to gain Huawei lost share) – CY22+ demand will depend on magnitude of 5G sell-thru and trajectory of CY21 customer builds, (2) test times have increased with mmWave complexity, and (3) while handsets builds can be lumpy and make up ~40-50%

of ~$3.3bn SoC TAM if there is a down year for smartphone builds Auto/Consumer could grow to fill in gaps – as both of these industries are currently operating below peak levels. Also TER believes in CY20 they gained ~4-5ppts of share – based on trend line growth rather than absolute Rev – given differing timelines of handset customer builds. In Memory Test, mgmt. emphasized TAM of ~$900m or even $1bn as LDDR5 ramps well in mobile and LDDR6 for Datacenter has yet to be fully introduced – allowing room for CY21+ growth. In IA – (1) reiterated 20%+ LT Rev CAGR, (2) cited ~high-50%s GM demonstrating differentiation of their products, (3) OpM currently ~10% growing to mid-20%s longer-term as Rev matures and less Opex is needed to develop sales channels, and (4) lower-priced competition in China not an issue NT as the entire market is poised to accelerate – rising tide lifting all boats.

Figure 47: TER CS/Street Expectations and Results

TER-US	Sep-20	Dec-20E			Mar-21E		2020E		2021E	
	Reported	CS	Cons	Guidance	CS	Cons	CS	Cons	CS	Cons
Total Revenue	**$819.5**	**$710.0**	**$715.8**	**$680m-740m**	**$750.0**	**$722.3**	**$3,072.5**	**$3,079.7**	**$3,200.0**	**$3,223.0**
% Q/Q chng	*-2.3%*	*-13.4%*	*-12.6%*	*-17.0% to -9.7%*	*5.6%*	*0.9%*				
% Y/Y chng	*40.8%*	*8.5%*			*26.0%*		*33.9%*	*34.2%*	*4.1%*	*4.7%*
% Q/Q seasonal	*-9.1%*	*-7.4%*			*7.6%*					
Total GM*	**56.0%**	**58.5%**	*58.7%*	*58-59%*	**57.5%**	*58.3%*	**57.0%**	*57.4%*	**58.0%**	*59.0%*
Operating Exp.*	**$210.7**	**$209.5**			**$208.0**		**$824.2**		**$853.0**	
Operating Margin*	**30.3%**	**29.0%**	*28.7%*	*~29%*	**29.8%**	*28.0%*	**30.2%**	*30.0%*	**31.3%**	*30.4%*
Net Income*	**$206.0**	**$170.8**			**$187.0**		**$778.6**		**$839.8**	
Net Margin*	**25.1%**	**24.1%**			**24.9%**		**25.3%**		**26.2%**	
EPS*	**$1.18**	**$0.99**	**$0.99**	***$0.91-$1.06***	**$1.09**	**$1.00**	**$4.49**	**$4.50**	**$4.90**	**$4.80**
Fully diluted shares	175.2	173.0			172.0		173.6		171.2	

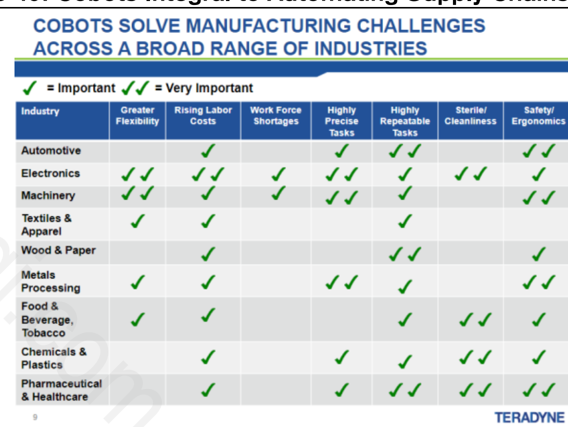
Source: Company data, Credit Suisse estimates, FactSet

Figure 48: SoC/Memory Test TAM

	SoC TAM	Memory Test
C3Q20	~$3.3bn	~$900m
C2Q20	$3.1-3.4bn	$800-850m
C1Q20	N/A	N/A
C4Q19	$3.1-3.4bn	$650-750m
C3Q19`	$3.0-3.2bn	$600m
C2Q19	$2.6-3.0bn	$600-700m
C1Q19	$2.3-2.7bn	$600-700m
C4Q18	$2.3-2.7bn	$650-750m

Source: Company data, Credit Suisse estimates

Figure 49: Cobots Integral to Automating Supply Chains



Source: Company data

TXN (Outperform, $110)

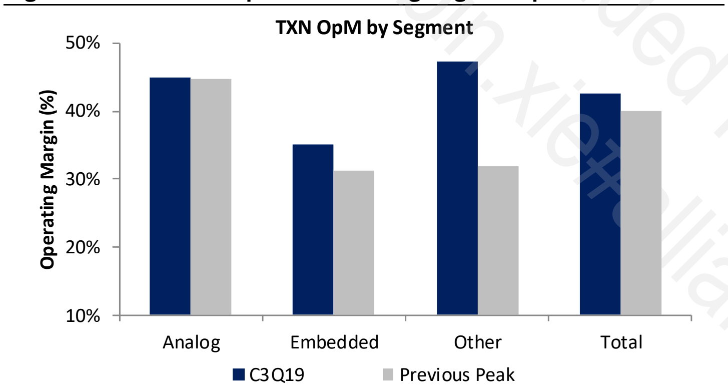
Perspective on Semis cycle: (1) TXN remained aggressive on spend to produce thru cycle even if customers were unable to forecast which has helped the Company stay supplied, (2) Many investors under-estimated that CY19 was already a down year after CY17/18 – inventory was lean, (3) Demand view reasonably positive into CY21 - Analog/Embedded lagging since COVID drove mix to compute while Auto lost ~2.5-3 months with NA/Europe shut-downs but poised to recover strongly, and (4) mgmt. remains focused on improving Embedded business – seeing C3Q stabilizing after 4-5Qs of underperformance. CEO Templeton highlighted TXN's Direct-To-Consumer distribution strategy is progressing well – they've been draining inventory from channel for ~8Qs which created NT headwind but LT this is direction the industry will move – allows for more customer insight/engagement and flexible sales force. On China, still views more as opportunity than threat – customers want better products, pricing, availability and that's going to win business LT. As for M&A – the Company remains disciplined on investments and needs compelling ROIC, already in a position of strength from scale/internal manufacturing power. Additionally, capacity build-out/construction is steady in the TXN's 3rd 12" fab (R-Fab 2) which is built based on Rev in 2-3+ years and allows for ~6% capex/sales as a LT framework, up from ~4% for 7-9 years due to a higher % of new equipment.

Figure 50: TXN CS/Street Expectations and Results

TXN	Sep-20	Dec-20E			Mar-21E		CY20E		CY21E	
	Reported	CS	Cons	Guidance	CS	Cons	CS	Cons	CS	Cons
Revenue	$3,817	$3,550	$3,584	$3,410m-$3,690m	$3,475	$3,558	$13,935	$13,967	$14,785	$15,059
% Q/Q chng	*17.8%*	*-7.0%*	*-6.1%*	***-3.9% to +3.9%***	*-2.1%*	*-0.7%*				
% Y/Y chng	*1.2%*	*6.0%*	*7.0%*		*4.4%*	*6.9%*	*-3.1%*	*-2.9%*	*6.1%*	*7.8%*
Seasonal	*6.1%*	*-8.9%*			*-3.3%*					
Gross Margin	64.3%	64.0%	64.1%		64.0%	63.6%	63.8%	63.9%	64.4%	64.9%
R&D Expense	$386	$390			$390		$1,532		$1,600	
SG&A Expense	$407	$400			$400		$1,625		$1,615	
Operating Expenses (GAAP)	$844	$840	$852		$840	$835	$3,382	$3,358	$3,365	$3,476
Operating Margin (GAAP)	42.2%	40.3%	40.3%		39.8%	40.1%	39.6%	39.8%	41.7%	41.8%
Net Income (GAAP)	$1,353	$1,216			$1,186		$5,123		$5,254	
Net Margin (GAAP)	35.4%	34.2%			34.1%		36.8%		35.5%	
Operating EPS (w\o options)	$1.56	$1.37			$1.34		$5.48		$5.90	
GAAP EPS	$1.45	$1.30	$1.33	$1.20-$1.40	$1.28	$1.31	$5.47	$5.48	$5.66	$5.80
Fully Diluted Sharecount	929	929			925		932		925	

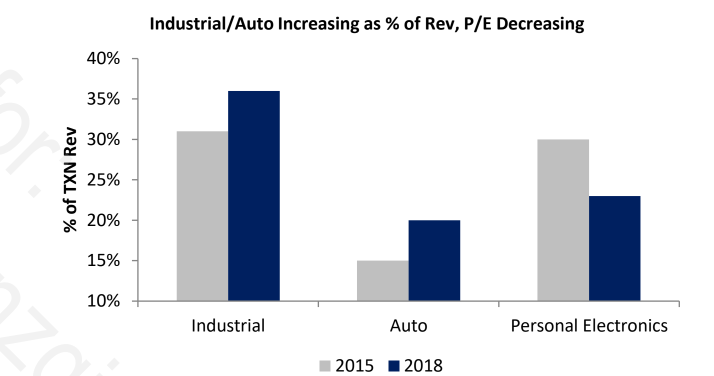
Source: Company data, Credit Suisse estimates, FactSet

Figure 51: 300mm Expansion Driving Higher OpM



Source: Company data, Credit Suisse estimates

Figure 52: Improving Mix as Auto/Industrial Grow



Source: Company data, Credit Suisse estimates

RMBS (Neutral, $16)

The Company highlighted its strong foundation for growth – (1) its patent licensing business will soon be equal to Silicon/IP/Products, (2) extension of MU contract for another 4 years – and should have a run-rate of ~$10m/Q up from C3Q $4.5m stepdown, and (3) Product business growing as need for security and memory buffer chips increases with Data Economy. In the buffer chip business, RMBS reaffirmed their $600mn TAM of which they represent ~18%. Management noted that the ramp of DDR5 should position them to gain share moving forward – also Ice Lake launching in C4Q will be additive to growth, as it is run on higher speed DDR4 and with 8 Memory channels (up from 6). IP and Core Security: The IP and Core Security Segment have a combined TAM of >$400mn and is expected to grow at 8-10% on an annualized basis. Datacenter continues to play a key role for RMBS as it has grown ~50% YTD vrs. the market which only grew ~5% YTD. This is partially a result of RMBS sharp focus on high speed interface low latency solutions which serves the increasing speed requirements between the memory and processor. Although datacenter is expected to realize a digestion period in C4Q – resultant of inventory builds from COVID – management noted that these fears have abated in CY21 should mark the return to a normalized environment. Given CS models RMBS in ASC 606 vs Street 605 – so FCF becomes important metric for performance – note, (1) CY20 Capex was 35m, though $10-12m should be normalized rate, (2) recently issued

~50m ASR should more than offset dilution, and (3) RMBS remains committed to dedicating 40-40% FCF to shareholder returns.

Figure 53: RMBS CS Expectations and Results

RMBS - ASC 606	Jun-20	Sep-20E		Dec-20E	2020E	2021E
	Reported	CS	Guidance	CS	CS	CS
Total Revenue	**$56.9**	**$48.0**	**$39-$57m**	**$60.0**	**$228.8**	**$265.0**
% Q/Q chng	*-5.0%*	*-15.7%*		*25.0%*		
% Y/Y chng	*-0.8%*	*-19.9%*		*-6.2%*	*2.1%*	*15.8%*
Gross Margin	**80.8%**	**80.2%**		**80.0%**	**80.9%**	**80.2%**
R&D Expense	**$33.7**	**$34.0**		**$35.0**	**$139.1**	**$146.0**
SG&A Expense	**$20.2**	**$20.0**		**$20.0**	**$84.4**	**$80.0**
Operating Exp.	**$56.7**	**$54.0**	**$55-$59m**	**$61.8**	**$233.7**	**$248.1**
Operating Income	**$0.8**	**$0.9**		**$0.8**	**$0.8**	**$0.7**
Operating Mgin	**0.4%**	**-12.5%**	**(41%) to (4%)**	**-3.1%**	**-2.1%**	**6.4%**
Net Income	**$2.2**	**($5.4)**		**$0.4**	**$1.5**	**$20.0**
Net Margin	**3.8%**	**-11.1%**		**0.7%**	**0.6%**	**7.6%**
EPS	**$0.02**	**($0.05)**	**-$0.10 to -$0.03**	**$0.00**	**$0.01**	**$0.17**
Fully diluted shares	113.8	116.7		116.7	103.2	116.7

Source: Company data, Credit Suisse estimates, FactSet

Global Foundries (Private)

This was the first appearance by CEO Tom Caulfield at the CS Tech Conference – he emphasized the unique strategy of GF as a US-based specialty foundry. Originally a spin-off from AMD's fabless transition GF has invested in >$15bn organically to pursue the ~75% of Foundry TAM ~$65bn that is not at the leading edge - Moore's Law isn't a proxy for innovation, there is a lot of work to be done at trialing edge. GF made the decision to move away from "single digit node" to focus on custom solutions and platform integrations for a global base of >250+ customers – offering differentiated products in mobility, datacenter, and Auto/Industrial. For example, there is GF silicon in front-end modules connecting to broadband in almost every handset, silicon for secure transactions technology, image sensors/processors – Caulfield claims GF has as almost many sq. inches of silicon in a smartphone as app processor itself. GF is the sole source for ~85% of its customers and believes HSD % LT growth will be driven by (1) Acceleration of data driven economy, (2) 5G "super cycle", and more NT (3) Huawei share loss which should incentivize OEM supply chain to build product to compete for this market. Finally, on China – GF noted that of Semi's~$500bn industry while 49% of Rev comes from US HQ companies, only ~12% of Semis manufacturing is in the US. Caulfield is optimistic of US Chips Bill passing later in CY21 which should create broader opportunities for domestic expansion – and cited future public offering for GF in ~CY22/23 as a potential means to acquire additional greenfield capital.

Figure 54: Semiconductor Manufacturing Incentives Gap: US vs ROW

	China	South Korea	Singapore	Japan	Taiwan	Europe	Israel	US
Share of 300mm Manufacturing Capacity (2019)	12%	26.7%	6.5%	16.3%	22.9%	2.8%	0.8%	12%
Manufacturing Grants/Subsidies (2000-2020)	~$50bn	$7-10bn+	$5bn+	$5-7bn+	$0.5bn+	$2.5bn+	$2.5bn+	$0
Federal Tax Incentives (2000-2020)	5-yr tax holiday, Reduced tax rate, tax credits, VAT refunds	5-yr tax holiday, reduced tax rate, tax credits	Reduced tax rate (0-13%)	Tax credits	5-yr tax holiday	Tax credits	Reduced tax rate (6-12%), tax credits	None
Other Federal Incentives	Free/discounted land infrastructure support, Equipment leasing, preferential loans, localization policies	Infrastructure support, equipment incentives, workforce training	Equipment incentives, hiring credit	Preferential loans	Free/discounted land infrastructure support, preferential loans, workforce training, hiring credits	Preferential loans	Free or discounted land	None
% CAGR of 300mm Capacity (2013-2020)	15.7%	11.3%	10%	7.4%	6.5%	N/A	N/A	2.2%

Source: IC Insights – Strategic reviews Fab Database, SIA, OECO Semiconductor Report (2019)

CREE – Not Covered

While not under our coverage, we moderated a fireside discussion with CREE, a Company specializing in the manufacturing of Silicon Carbide (SiC) products – its Rev split ~50/50 between Material/Devices end-markets though by CY24 should be more weighted to Devices at ~34/66. Mgmt. highlighted the increasing opportunities for SiC in electric vehicles (EVs) given their properties in high-power/high-temperature environments. Its $1.5bn Rev target for CY24 driven by ~$700m in design "ins" to-date– especially impressive given in the Auto industry design ins (or firm agreements with supplier) are harder to win and can last 2-3+ years before products actually ship – then becoming tangible "design wins". Note, the targeted ~$1.5bn in CY24 Rev only includes ~10% of Rev from China, embedding conservative assumptions about US/China trade tensions. On its competitive positioning, CREE highlighted (1) its expertise in SiC manufacturing, which is a very intensive process that requires knowledge in defect detection for growing, slicing and manufacturing – all competitive moats, (2) Scale – they make ~60% silicon carbide supply in the world, and (3) using scale advantage to drive costs down – cost/wafer is much lower than 2 years ago and still had reached asymptote. While CREE believes they are now in a "transformational" period with R&D and Capex remaining high thru CY22/23 for investments in technical expertise, sales channels, and product development – LT once their EV business begins to reach run-rate Rev potential the Company believes they will execute well on earnings/shareholder returns.

SYNA – Not Covered

Though not covered by CS, we moderated a fireside discussion with SYNA a Semi company that specializes in custom-designed interfaces for mobile computing, communications, entertainment, and other electronic devices. They recently completed the acquisitions of DisplayLink and AVGO's wireless IoT connectivity business early in their F1Q (NovQ) and mgmt. is pleased with the initial performance of these assets and are already seeing better than expected revenue as well as robust design win pipelines. In IoT, SYNA is seeing accelerated demand for broad range of products (1) new DisplayLink video interface solutions, (2) audio chipsets and Edge SoC processors that feature far-field voice/echo cancelation and (3) chips powering new remote working solutions for DELL, GOOG, Logitech, Bose etc. In Mobile, mgmt. highlighted OLED touch controllers winning almost every new design by major handset OEMs using flexible on-cell OLED panels, including new wins at Oppo/OnePlus. Thru COVID their PC business has also seen additional growth opportunities as PC OEMs incorporate larger, more intelligent touchpads with haptic/force feedback, increasing SYNA Rev/unit. Mgmt also highlighted guided ~50.5% GM in F2Q exceeding targeted 50% and potential for further expansion as IoT business grows.

Infineon (Underperform) – EU Semis

Achal Sultania hosted a fireside chat and group meetings with Dr. Sven Schneider (CFO) and Alexander Foltin (Head, IR & Treasury). Key takeaways from his sessions were:

Heathy demand and inventory trends. IFX expects to see heathy demand trends for FY21 helped by a combination of short term and long term trends: i) Continued recovery in Auto sales led by China, recovery in Japan/Korea (Japan inventory high in the last 6 months, now normalized); ii) Healthy levels of inventory in the channel (~10 weeks); iii) Clear acceleration in EU to PHEV/BEV supported by subsidies and emission norms, with China xEV market also recovering (xEV is ~5% of group sales); and iv) Renewables (~4% of group) on track to deliver robust growth in 2021 (and also 8-10% CAGR till FY25). As such, we continue to see upside risks to IFX's sales guidance of €10.5bn, +/-5% for FY21 (we model €10.6bn, +24% yoy/+11% yoy adjusted for CY full year consolidation, consensus also at €10.6bn).

Different moving parts in FY21 EBIT bridge. Here IFX noted multiple drivers for margin improvement, with positives being: i) reduction in idle fab charges from €570mn in FY20 (~€420mn cyclical + ~€150mn structural) to ~€250mn in FY21 (~€100mn cyclical + close to €150mn structural), or 3ppt of tailwind to GM/EBIT margins (we model idle fab charges of €235mn in FY21), and ii) higher operating leverage from increased scale as organic sales growth should be 10% or slightly higher; and negatives being i) higher R&D (we model €1.33bn adjusted R&D in FY21 up from €1.09bn in FY20), and ii) increased SG&A with ~€150mn headwind from increase in salaries, promotions, etc. (we model €1.03bn adjusted SG&A in FY21 up from €0.86bn in FY20). This should result in ~300bp of EBIT margin improvement to its guidance of around 16.5% in FY21 (CS 16.6%, cons 16.5%).

Day 4 Company Recaps

AMKR – Taiwan Semis

The company's comments are consistent with Randy Abrams' upgrade following our Asian Technology Conference in September on the positive tailwinds from 5G with low exposure to Huawei, recovery in automotive and growing SiP business. 4Q20 is tracking to a modest seasonal drop. Amkor had guided a modest low single digit QoQ decline in 4Q20, noting automotive is recovering but more modest compared with customers who are depleting their inventory. The SiP business is also somewhat impacted by the supply shortage and some products generation migration. However, with strong performance through the year, the company is still tracking to grow 20%+ YoY in 2020.

2021 has good growth tailwinds. Amkor believes the automotive market should continue to recover in 2021 following a slower 1H20 and the company should also benefit from the growing semiconductor content in vehicles. The 5G ramp in smartphone market should also drive both volume and content opportunity while the share shift from HiSilicon to other smartphone brands should also present good opportunity for Amkor to gain share, with 5G smartphone units also doubling to close to 500mn units. For the high performance computing and consumer segments, Amkor expects to see continued strength. The challenging part would be how 2H would play out after initial views that 1H will hold at current strong levels.

Inventory levels in the supply chain depleted by the healthy end market sell through. Amkor sees the supply chain inventory levels exiting 3Q20 are more balanced and will return to normal for the automotive supply chain exiting 2020 and replenishing in 2021. Although the automotive sales could still be depressed in 2021 relative to 2019 levels, the base is already low and the semiconductor content growth should drive the opportunity for back-end though it notes a modest rather than v-shaped recovery for this market.

ALGM (Outperform, TP $27)

Auto Exposure Providing Tailwinds. With the highest Automotive exposure in semis (~70% of Rev), ALGM remains well positioned to capitalize on the recovering automotive market. The business is expected to benefit from a rising Automotive SAAR - while ALGM anticipates content growth in excess of SAAR growth. ALGM noted that vehicle electrification is reaching an inflection point that should accelerate revenue growth for ALGM given their differentiated product offering – i.e. >1000 worldwide patents which have led to sensor ASPs that are 80% higher than the market. Near term, ALGM highlighted their presence in motion control solutions which has seen content growth across all vehicles types. According to channel checks, the automotive market continues to recover with supply chains bottlenecks abating which should provide tailwinds for ALGM heading into CY21 – albeit visibility is somewhat clouded by COVID.

Datacenter Opportunity for Industrial. As Datacenters continue grow ALGM expects to capitalize on this opportunity via their Thermal Cooling IP. Given the insatiable demand for data, minimum power requirements for Datacenter are expected to increase which has resulted in increased thermal loads for these facilities. ALGM continues to leverage the same Thermal Cooling IP embedded into automobiles for the Datacenter, providing more energy efficient and quieter cooling solutions than market standards. While Datacenter spend has somewhat moderated in C4Q20 relative to CY20, this business is expected to perform well in CY21 as ALGM continues to service most Datacenter players through leading fan OEMs.

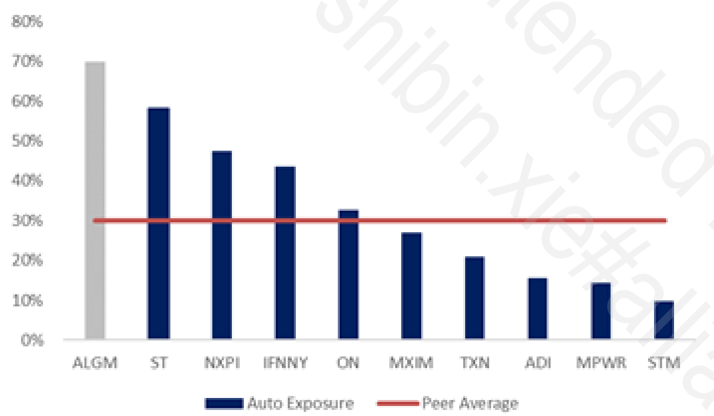
Execution Strategy. ALGM reaffirmed its 55% LT GM target and underscored increasing leverage from OpEx as the business scales. On the R&D front, ALGM specifically highlighted their current LiDAR investments that should lead to significant revenue beyond FY23. In terms of Inorganic growth, ALGM reaffirmed their vision towards maintaining a pure-play Sensing and Power Management business, and discussed a GM neutral/accretive requirement for potential acquisition targets. While visibility is somewhat clouded by COVID, CY21 is expected to be a growth year with improving profitability as the company completes facility consolidations that should improve GMs moving forward.

Figure 55: ALGM CS Expectations and Results

ALGM - Non-GAAP	Sep-20	Dec-20E			Mar-21E		CY2020E		CY2021E	
	Reported	CS	Cons	Guidance	CS	Cons	CS	Cons	CS	Cons
Total Revenue	$136.6	$149.0	$149.1	$147mn-151mn	$150.0	$151.1	$543.8	$551.8	$612.0	$625.6
% Q/Q chng	*18.8%*	*9.0%*	*9.1%*		*0.7%*	*1.4%*	*0.0%*		*0.0%*	
% Y/Y chng	*-0.1%*	*10.0%*	*10.0%*		*4.8%*	*5.6%*	*0.9%*		*12.5%*	
Gross Margin (ex SBC)	47.7%	50.5%	50.5%	*50-51%*	50.5%	50.7%	50.6%	*50.7%*	52.0%	*53.0%*
R&D Expense	$25.1	$26.5			$26.3		$99.2		$110.6	
SG&A Expense	$23.7	$21.2			$21.4		$85.7		$87.2	
Operating Exp.	$45.2	$47.7			$47.6		$184.9		$197.8	
Operating Margin (ex SBC)	14.6%	18.5%	18.4%		18.8%	18.8%	16.6%	*16.9%*	19.7%	*20.4%*
Net Income	$17.8	$22.6			$23.1		$76.0		$99.2	
Net Margin	13.0%	15.1%			15.4%		14.0%		16.2%	
EPS	$0.11	$0.12	$0.12	$0.11-$0.12	$0.12	$0.12	$0.40	$0.43	$0.52	$0.55
Fully diluted shares	$165.4	$189.4			$189.4		$189.4		$189.4	

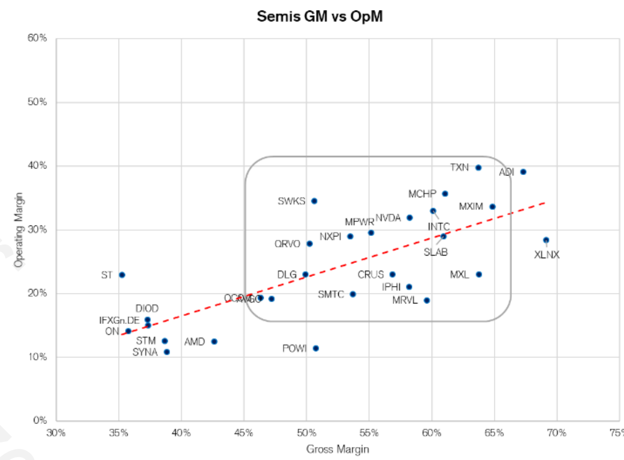
Source: Company data, Credit Suisse estimates, FactSet

Figure 56: ALGM Auto Exposure vs Peers



Source: Company data, Credit Suisse estimates

Figure 57: Potential for Margin Expansion



Source: Company data, Credit Suisse estimates

SIMO – Not Covered

Randy Abram and Liu Haas (Taiwan Semis) highlighted key takeaways from leading memory controller supplier Silicon Motion, which presented on Thursday at our US Tech Conference. The company's comments are broadly consistent with its 3Q20 earnings report where it delivered sales down 8% q/q to US$126mn, 5pts above its 3Q20 sales guidance to track +33% YTD sales to US$396mn and also guided +3-10% q/q growth in 4Q20.

Sales outlook rebounding late in 3Q20 and 4Q20. Silicon Motion's business YTD has seen solid growth but has been volatile. The company's SSD shipments were impacted earlier in the year as strong server procurement in 2Q20 diverted supply away from PCs impacting its controller business. In 3Q20, it has also seen an impact on its mobile business as its customers deplete excess inventory. Finally in 4Q20, it is seeing its SSD and mobile business ramping to more than offset end of the 2020 programs in its SSD solutions business to still drive its +3-10% QoQ guidance. The company believes NAND should have reasonably healthy supply growth from continued migration to higher layer count 3D NAND to support its SSD units into 2021. It also expects incremental output from China to support its business as it has a good relationship supplying the controller for YMTC.

Mobile business poised for a good recovery in 4Q20 into 2021. SIMO's mobile business is ramping with UFS now as that standard is rising from 1/3 to 1/2 of smartphones this year and expected to have more penetration next year. SIMO's mobile business has rebounded +70% YoY on the back of its US customer and module makers, offsetting gradual decline of the eMMC controller on its Korea customers' platform. The company expects more growth next year from on-going UFS penetration and controllers to support the ramp of LP DDR5

Companies Mentioned *(Price as of 04-Dec-2020)*
ARM Holdings (ARM.L^I16)
ARM Holdings (ARM.L^I16)
ASML Holding N.V. (ASML.AS, €378.3)
Advanced Micro Devices, Inc. (AMD.OQ, $94.04)
Allegro Microsystems, Inc. (ALGM.OQ, $28.0)
Amkor Technology Inc. (AMKR.OQ, $15.49)
Analog Devices Inc. (ADI.OQ, $143.97)
Apple Inc (AAPL.OQ, $122.25)
Applied Materials Inc. (AMAT.OQ, $88.84)
Brooks Automation Inc. (BRKS.OQ, $75.19)
Cadence Design System (CDNS.OQ, $118.34)
Cree (CREE.OQ, $93.5)
Dialog Semiconductor (DLGS.DE, €43.44)
Infineon Technologies AG (IFXGn.DE, €29.57)
Intel Corp. (INTC.OQ, $51.98)
KLA Corporation (KLAC.OQ, $263.7)
Keysight Technologies (KEYS.N, $123.21)
Lam Research Corp. (LRCX.OQ, $499.98)
Maxim Integrated Products (MXIM.OQ, $86.41)
Microchip Technology Inc. (MCHP.OQ, $144.24)
Micron Technology Inc. (MU.OQ, $73.34)
NVIDIA Corporation (NVDA.OQ, $542.33)
Rambus Incorporated (RMBS.OQ, $17.48)
Silicon Mtn Tec (SIMO.OQ, $44.41)
Siltronic (WAFGn.DE, €124.15)
Synaptics (SYNA.OQ, $81.84)
Teradyne Inc. (TER.OQ, $116.03)
Texas Instruments Inc. (TXN.OQ, $166.52)
Tower Semiconductor (TSEM.OQ, $26.72)
Tower Semiconductor (TSEM.TA, agora8468.0)

Disclosure Appendix

Analyst Certification

John W. Pitzer, Dalya Hahn and Jerome Darling each certify, with respect to the companies or securities that the individual analyzes, that (1) the views expressed in this report accurately reflect his or her personal views about all of the subject companies and securities and (2) no part of his or her compensation was, is or will be directly or indirectly related to the specific recommendations or views expressed in this report.

As of December 10, 2012 Analysts' stock rating are defined as follows:

Outperform (O) : The stock's total return is expected to outperform the relevant benchmark* over the next 12 months.

Neutral (N) : The stock's total return is expected to be in line with the relevant benchmark* over the next 12 months.

Underperform (U) : The stock's total return is expected to underperform the relevant benchmark* over the next 12 months.

**Relevant benchmark by region: As of 10th December 2012, Japanese ratings are based on a stock's total return relative to the analyst's coverage universe which consists of all companies covered by the analyst within the relevant sector, with Outperforms representing the most attractive, Neutrals the less attractive, and Underperforms the least attractive investment opportunities. As of 2nd October 2012, U.S. and Canadian as well as European (excluding Turkey) ratings are based on a stock's total return relative to the analyst's coverage universe which consists of all companies covered by the analyst within the relevant sector, with Outperforms representing the most attractive, Neutrals the less attractive, and Underperforms the least attractive investment opportunities. For Latin America, Turkey and Asia (excluding Japan and Australia), stock ratings are based on a stock's total return relative to the average total return of the relevant country or regional benchmark (India - S&P BSE Sensex Index); prior to 2nd October 2012 U.S. and Canadian ratings were based on (1) a stock's absolute total return potential to its current share price and (2) the relative attractiveness of a stock's total return potential within an analyst's coverage universe. For Australian and New Zealand stocks, the expected total return (ETR) calculation includes 12-month rolling dividend yield. An Outperform rating is assigned where an ETR is greater than or equal to 7.5%; Underperform where an ETR less than or equal to 5%. A Neutral may be assigned where the ETR is between -5% and 15%. The overlapping rating range allows analysts to assign a rating that puts ETR in the context of associated risks. Prior to 18 May 2015, ETR ranges for Outperform and Underperform ratings did not overlap with Neutral thresholds between 15% and 7.5%, which was in operation from 7 July 2011.*

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Analysts' sector weightings are distinct from analysts' stock ratings and are based on the analyst's expectations for the fundamentals and/or valuation of the sector* relative to the group's historic fundamentals and/or valuation:

Overweight : The analyst's expectation for the sector's fundamentals and/or valuation is favorable over the next 12 months.

Market Weight : The analyst's expectation for the sector's fundamentals and/or valuation is neutral over the next 12 months.

Underweight : The analyst's expectation for the sector's fundamentals and/or valuation is cautious over the next 12 months.

**An analyst's coverage sector consists of all companies covered by the analyst within the relevant sector. An analyst may cover multiple sectors.*

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Global Ratings Distribution

Rating	Versus universe (%)	Of which banking clients (%)
Outperform/Buy*	52%	(33% banking clients)
Neutral/Hold*	36%	(28% banking clients)
Underperform/Sell*	11%	(20% banking clients)
Restricted	1%	

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