

December SIA

Why Good News Is Likely to Remain Good News for a VERY LONG Time...

Semiconductor Devices | Monthly

Bottom Line: SIA reported Dec Semi Rev of \$39.3bn, -0.5% m/m (+6.9% y/y), BELOW seasonal of +2.8% m/m. Semi Rev Ex-Memory of \$30.7bn was +4.0% m/m (+10.3% y/y), and INLINE with seasonal of +4.0% m/m. In aggregate 2020 Total Semi Rev grew 6.5% y/y after declining 12.1% y/y in 2019, while Semi Rev Ex-Memory grew 5.2% y/y after declining 1.7% y/y in 2019. Importantly, CY20 Analog and MCU Rev +2.7% y/y and -2.2% y/y, respectively after -8.3% y/y and -7.4% y/y in CY19. C4Q Semi Rev of \$117bn grew 3.5% q/q vs seasonal of +0.9% q/q and reflects C4Q Earnings-to-date for Semis which bottom up grew 12% q/q and beat Street estimates of +2.9% q/q by 945 bps. The Street is currently modeling C1Q21 Semi and Semi Ex-Memory Rev growth of -6.6% q/q and -7.6% q/q vs seasonal of -8.5% q/q and -9.0% q/q, respectively – current bottom-up trends clearly support upside and above seasonal. For CY21 Street estimates currently embed Semi Rev growth of +10.4% y/y vs CS CY21 estimate of +14.7% y/y.

Good News Will Remain Good News. We continue to see upside to CY21 estimates based on (1) Cyclical recovery in Autos/Industrial, (2) Upside to muted PC/Enterprise expectations, (3) Minimal risk to Comms/Cloud estimates which already embed digestion and (4) Strong 5G adoption in CY21 even calibrating for a likely seasonal Jan build peak ahead of CNY. More importantly, while investors understand the upturn directionally – they underestimate magnitude. The last broad-based upturn in Semis was CY10 and since then we would highlight: (1) 250+ fewer chip companies thru M&A, (2) Accelerating content growth of chips in non-traditional markets – Semi Rev/Auto has increased by >60% since CY10, (3) More outsourcing than insourcing – TSMC trailing edge has grown from 50% to 75% of Rev since CY10 and (4) Historically lean inventory in non-traditional markets like Auto and Industrial.

Positive for Semi Caps. The in/outsource dynamic is EXTREMELY important. Typically at the bottom of a cycle, supply catching up with demand is an exercise in increasing wafer starts in already existing underutilized fabs – and within 1-2Qs as “starts” become “outs” supply pressures are alleviated. Given how much more is outsourced today (~60% versus ~40%) and given that Foundries rarely have slack capacity – for this upturn supply catching demand is likely to be more dependent on building new fabs/wafer capacity which on average takes 12-18 months – underpinning our Stronger for Longer Cyclical Thesis. In addition, the growing strategic importance of domestic Semi production including the CHIPS Act in the US as outlined recently by the SIA and the EU discussing funding of a domestic foundry, provides a multi-year tailwind for the SemiCap Equipment Industry. Lastly, do not discount INTC pursuing (again) a strategy of becoming a leading-edge Foundry.

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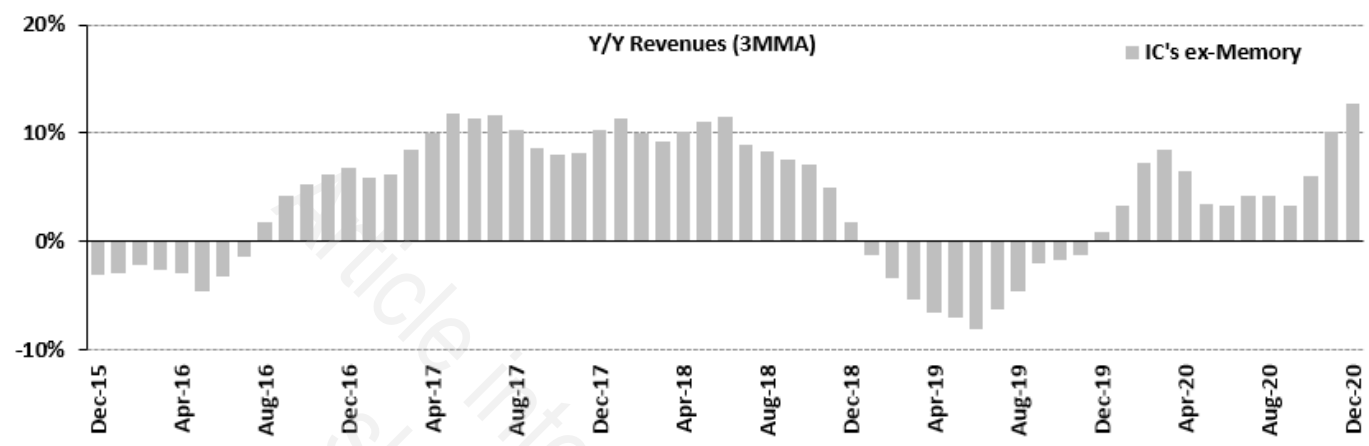
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Monthly Revenue, Unit, and ASP Trends

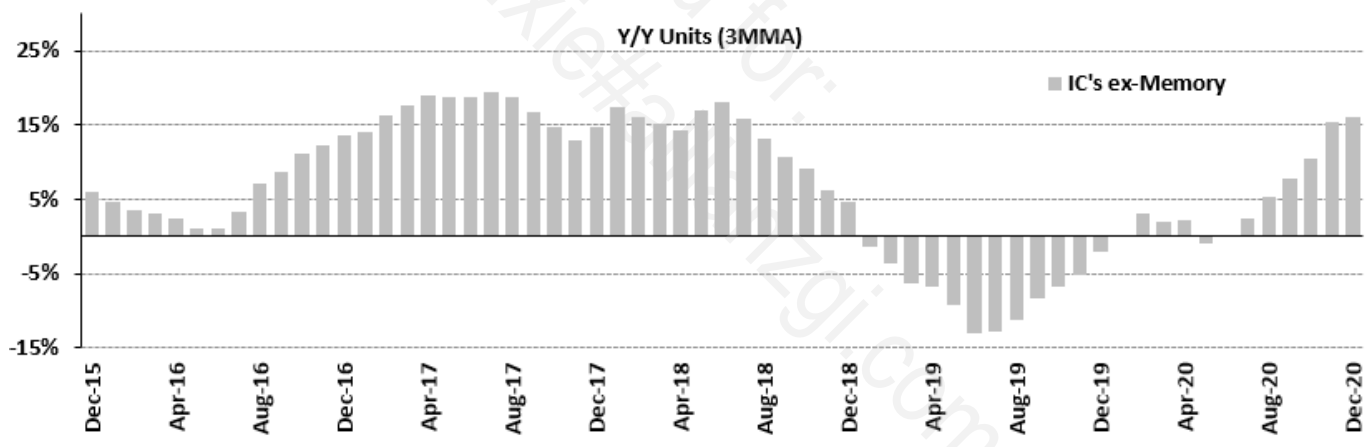
December **IC's Ex-Memory** Rev of \$23.1bn was +3.2% m/m (+10.7% y/y) **BELOW** seasonal of +4.3% m/m - embedding Units of 25.8bn, 4.9% m/m (+10.7% y/y) and ASP of \$0.896, -1.6% m/m (flat y/y).

Figure 1: IC's Ex-Memory Revenue Change Y/Y



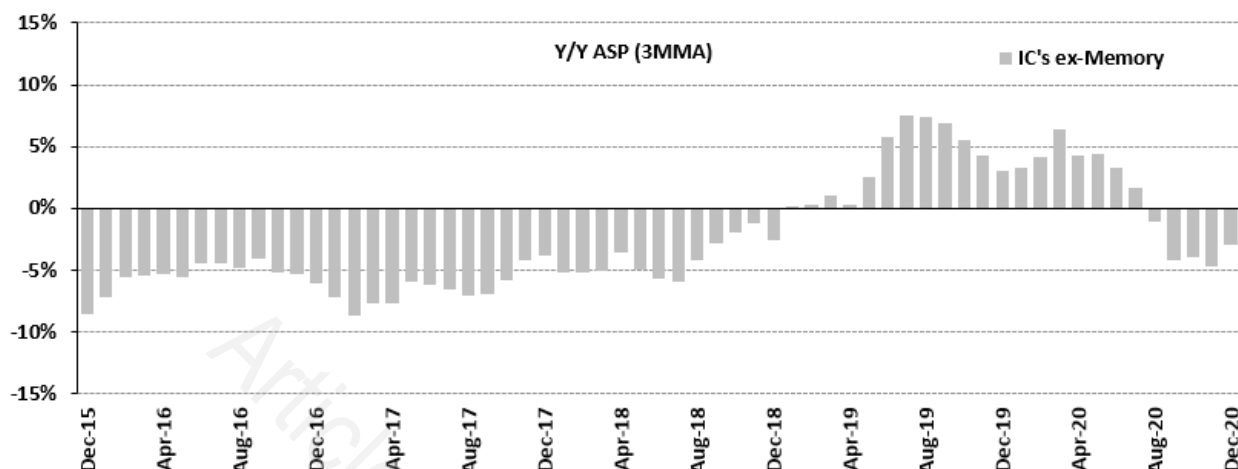
Source: SIA, Company data, Credit Suisse estimates

Figure 2: IC's Ex-Memory Unit Change Y/Y



Source: SIA, Company data, Credit Suisse estimates

Figure 3: IC's Ex-Memory ASPs Change Y/Y



Source: SIA, Company data, Credit Suisse estimates

Monthly Analysis: Summary of Figures

Figure 4: Comprehensive Summary – Semiconductor Industry, Single Month Basis

Semiconductors					ICs				
	Sep-20	Oct-20	Nov-20	Dec-20		Sep-20	Oct-20	Nov-20	Dec-20
Actuals					Actuals				
Revenue (\$bn)	\$41.8	\$38.6	\$39.5	\$39.3	Revenue (\$bn)	\$33.9	\$31.7	\$32.4	\$31.8
Units (bn)	90.7	85.6	86.6	89.3	Units (bn)	29.9	28.5	28.6	30.1
ASP	\$0.460	\$0.451	\$0.457	\$0.440	ASP	\$1.134	\$1.110	\$1.133	\$1.055
Y/Y % change					Y/Y % change				
Revenue	8.0%	8.1%	10.4%	6.9%	Revenue	9.3%	10.1%	11.6%	6.4%
Units	3.1%	11.4%	13.8%	6.0%	Units	7.6%	15.1%	17.6%	10.6%
ASP	4.8%	-2.8%	-3.0%	0.7%	ASP	1.6%	-4.3%	-5.1%	-3.8%
M/M % change					M/M % change				
Revenue	11.4%	-7.6%	2.5%	-0.5%	Revenue	9.7%	-6.6%	2.5%	-2.0%
Units	12.3%	-5.7%	1.1%	3.2%	Units	15.3%	-4.5%	0.3%	5.2%
ASP	-0.9%	-2.0%	1.3%	-3.7%	ASP	-4.9%	-2.1%	2.1%	-6.9%

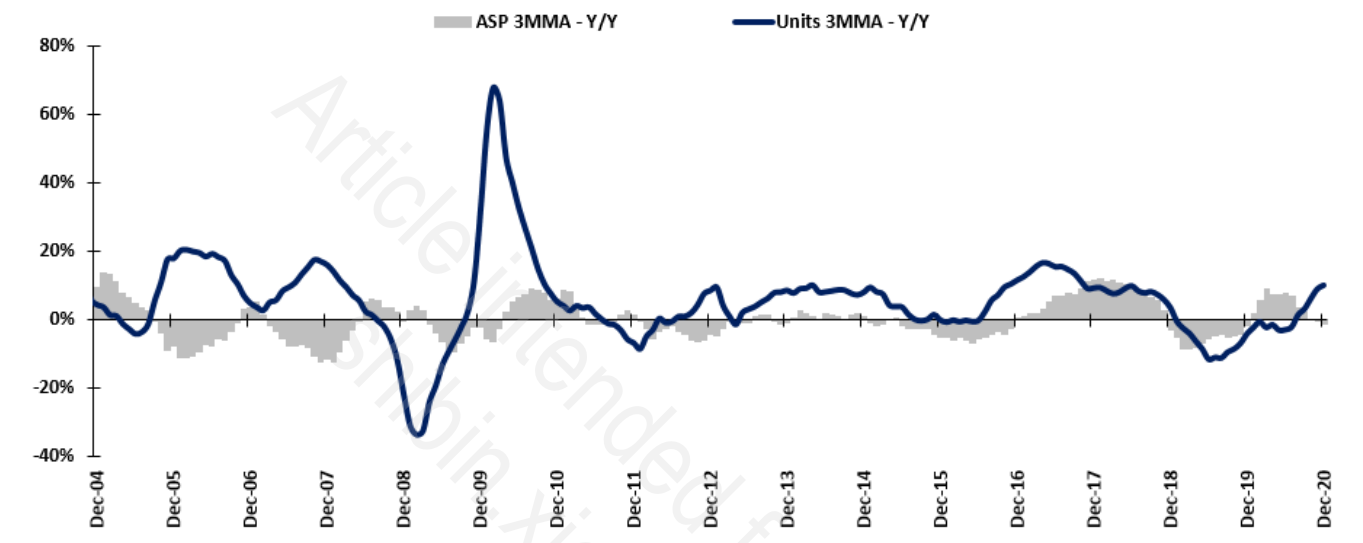
Discretes, Opto, Sensors					Analog				
	Sep-20	Oct-20	Nov-20	Dec-20		Sep-20	Oct-20	Nov-20	Dec-20
Actuals					Actuals				
Revenue (\$bn)	\$7.9	\$6.9	\$7.1	\$7.6	Revenue (\$bn)	\$5.2	\$5.3	\$5.2	\$5.4
Units (bn)	60.9	57.1	57.9	59.2	Units (bn)	17.1	16.2	16.2	16.8
ASP	\$0.129	\$0.121	\$0.123	\$0.128	ASP	\$0.304	\$0.327	\$0.320	\$0.323
Y/Y % change					Y/Y % change				
Revenue	2.8%	-0.1%	5.2%	9.0%	Revenue	3.1%	14.5%	19.2%	18.2%
Units	1.1%	9.6%	11.9%	3.8%	Units	11.0%	17.5%	19.7%	4.8%
ASP	1.7%	-8.8%	-6.0%	5.0%	ASP	-7.0%	-2.4%	-0.3%	12.9%
M/M % change					M/M % change				
Revenue	19.4%	-12.0%	2.7%	6.3%	Revenue	12.5%	2.1%	-2.3%	5.0%
Units	10.9%	-6.2%	1.5%	2.2%	Units	17.0%	-5.1%	-0.1%	3.9%
ASP	7.6%	-6.2%	1.1%	4.0%	ASP	-3.8%	7.6%	-2.1%	0.9%

Source: SIA, Company data, Credit Suisse estimates

Revenue, Units, and ASPs

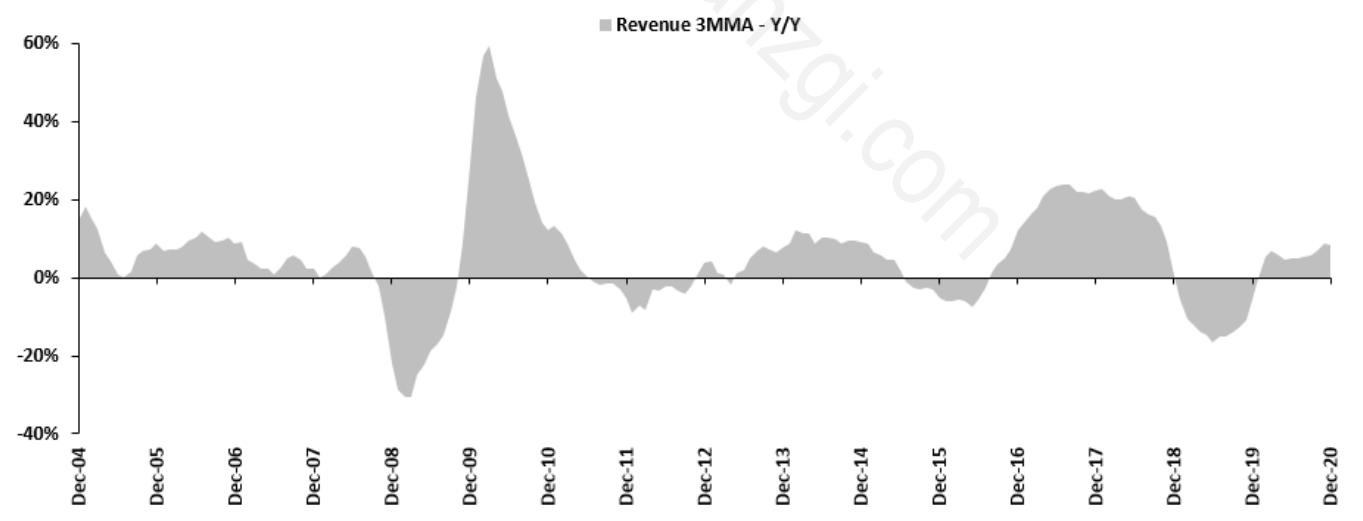
The exhibits below show 3 Month Moving Average (3MMA) year-over-year trends for Semi units, pricing, and Rev. December Total Semiconductor Rev of \$39.3bn was -0.5% m/m (+6.9% y/y) BELOW seasonal of +2.8% m/m - embedding Units of 89.3bn was +3.2% m/m (+6.0% y/y) and ASP of \$0.440, -3.7% m/m (+0.7% y/y).

Figure 5: Semiconductor Industry 3MMA Y/Y Growth – ASPs & Units



Source: SIA, Company data, Credit Suisse estimates

Figure 6: Semiconductor Industry 3MMA Y/Y Growth – Revenue



Source: SIA, Company data, Credit Suisse estimates

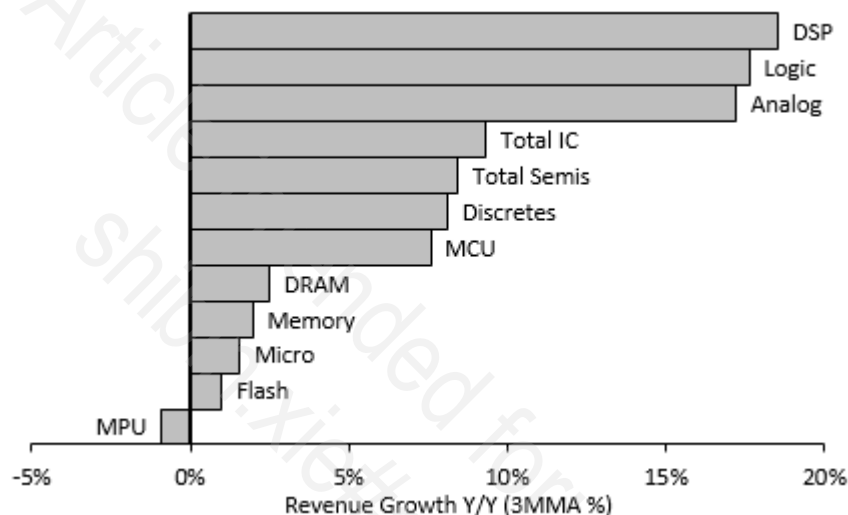
Product Analysis

Year-over-Year Growth

December **Logic** Rev of \$11.2bn was +0.4% m/m (+17.9% y/y) BELOW seasonal of +0.4% m/m - embedding Units of 6.3bn, +3.0% m/m (+22.2% y/y) and ASP of \$1.771, -2.5% m/m (-3.5% y/y).

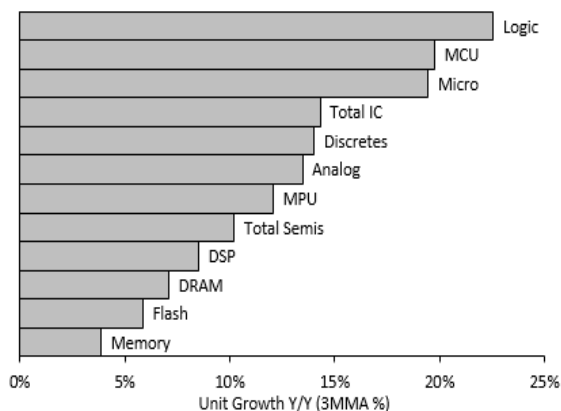
December **Memory** Rev of \$8.7bn was -13.8% m/m (-3.7% y/y) BELOW seasonal of -6.1% m/m - embedding Units of 4.3bn +7.4% m/m (+10.2% y/y) and ASP of \$2.000, -19.8% m/m (-12.6% y/y).

Figure 7: Year over Year Revenue (3MMA) Growth by Product



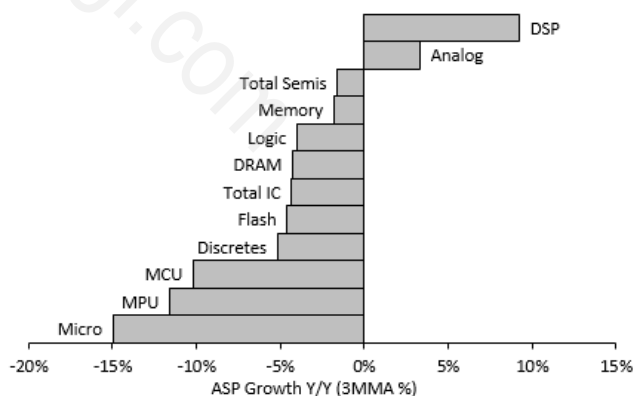
Source: SIA, Company data, Credit Suisse estimates

Figure 8: Year over Year Unit Growth (3MMA)



Source: SIA, Company data, Credit Suisse estimates

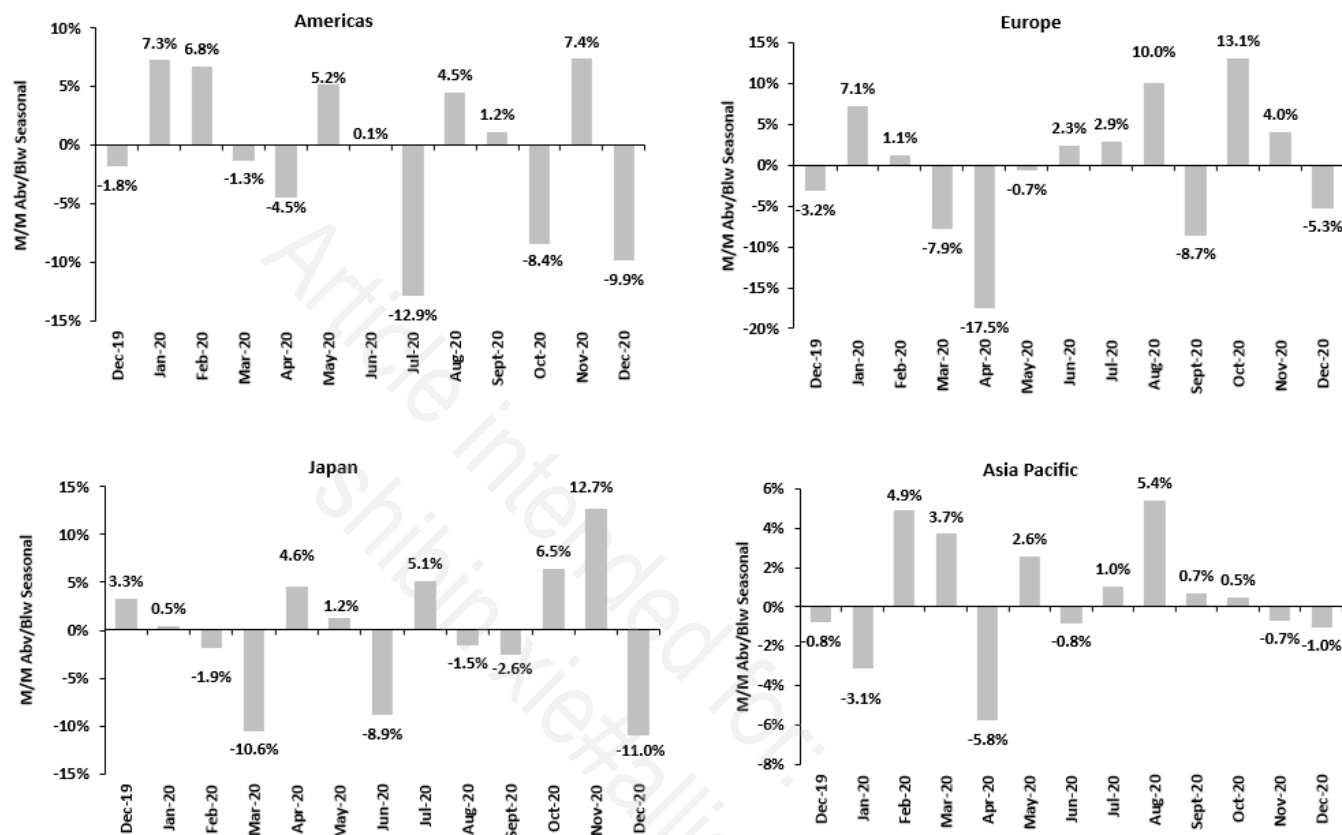
Figure 9: Year over Year ASP Growth (3MMA)



Source: SIA, Company data, Credit Suisse estimates

Geographic Analysis

Figure 10: Geographic Trends vs. Seasonality



Source: SIA, Company data, Credit Suisse estimates

Appendices

Geographic Trends

Figure 11: Geographic Analysis – Single Month

Overall Revenue												
Single Month % M/M Growth	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sept-20	Oct-20	Nov-20	Dec-20
Americas	-3.9%	-0.6%	8.0%	-10.7%	7.4%	15.1%	-16.5%	11.5%	12.4%	-8.3%	5.9%	-6.0%
Europe	9.7%	-3.7%	6.4%	-26.1%	-0.3%	15.1%	-5.0%	8.0%	7.0%	5.2%	0.4%	-5.9%
Japan	-8.7%	-2.0%	5.7%	-7.3%	3.4%	7.8%	-0.3%	-3.1%	7.6%	0.1%	8.1%	-7.2%
Asia Pacific	-13.4%	1.5%	15.5%	-15.5%	7.3%	7.4%	-6.7%	10.7%	12.0%	-9.8%	0.8%	3.1%
TOTAL SEMIS	-9.1%	0.2%	12.2%	-14.8%	6.4%	9.7%	-8.3%	9.4%	11.4%	-7.6%	2.5%	-0.5%

Overall Revenue												
Single Month % Y/Y Growth	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sept-20	Oct-20	Nov-20	Dec-20
Americas	21.1%	26.8%	18.1%	28.9%	27.3%	32.0%	19.7%	17.8%	19.8%	7.7%	18.4%	9.0%
Europe	-0.2%	-2.6%	-0.6%	-20.6%	-22.4%	-9.6%	-13.6%	-7.4%	-8.6%	4.0%	6.4%	4.1%
Japan	0.1%	1.4%	1.9%	-4.5%	-0.2%	-2.8%	2.4%	-3.0%	-4.3%	4.9%	17.3%	1.6%
Asia Pacific	5.0%	4.4%	4.3%	2.8%	1.1%	3.7%	3.3%	3.0%	8.5%	9.4%	7.5%	7.2%
TOTAL SEMIS	7.1%	7.4%	6.2%	4.2%	3.2%	7.1%	4.5%	4.3%	8.0%	8.1%	10.4%	6.9%

Source: SIA, Company data, Credit Suisse estimates

Figure 12: Geographic Analysis – Rolling 3-month Average

Overall Revenue												
3MMA % M/M Growth	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sept-20	Oct-20	Nov-20	Dec-20
Americas	-1.8%	-0.8%	1.1%	-1.3%	1.2%	3.7%	1.0%	2.3%	1.7%	4.4%	2.9%	-3.0%
Europe	1.2%	0.6%	4.0%	-8.1%	-7.6%	-6.1%	2.9%	5.6%	3.3%	6.7%	4.1%	-0.2%
Japan	-1.9%	-1.4%	-2.0%	-1.3%	0.4%	1.1%	3.5%	1.3%	1.3%	1.4%	5.2%	0.1%
Asia Pacific	-2.6%	-3.1%	0.5%	-0.3%	1.5%	-1.0%	2.3%	3.6%	5.3%	3.5%	0.6%	-2.2%
TOTAL SEMIS	-2.1%	-2.2%	0.8%	-1.4%	0.5%	-0.2%	2.2%	3.3%	4.0%	3.8%	1.7%	-2.0%

Overall Revenue												
3MMA % Y/Y Growth	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sept-20	Oct-20	Nov-20	Dec-20
Americas	0.6%	14.6%	21.8%	24.2%	24.4%	29.5%	26.5%	23.2%	19.1%	15.0%	15.2%	11.6%
Europe	-5.7%	-3.6%	-1.1%	-7.7%	-14.2%	-17.5%	-15.2%	-10.2%	-9.8%	-4.2%	0.3%	4.8%
Japan	-5.5%	-1.5%	1.1%	-0.4%	-0.9%	-2.5%	-0.3%	-1.2%	-1.8%	-0.9%	5.5%	7.8%
Asia Pacific	1.0%	4.7%	4.5%	3.9%	2.8%	2.6%	2.7%	3.4%	5.1%	7.0%	8.5%	8.0%
TOTAL SEMIS	-0.3%	5.2%	6.9%	6.0%	4.6%	4.9%	5.0%	5.3%	5.7%	6.9%	8.8%	8.5%

Source: SIA, Company data, Credit Suisse estimates

End Market Trends

Figure 13: End-Market Analysis – Single Month

Overall Revenue												
Single Month % M/M Growth	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sept-20	Oct-20	Nov-20	Dec-20
Consumer	-8.2%	-3.0%	10.5%	-8.3%	0.7%	5.7%	4.7%	0.4%	5.6%	-1.5%	0.1%	6.3%
Computer/Peripheral	-9.8%	0.6%	5.0%	-4.5%	0.9%	14.2%	-9.3%	3.8%	8.6%	-3.5%	3.7%	6.0%
Communications - Wireless	-5.0%	-1.3%	-0.9%	-5.6%	1.0%	9.5%	1.9%	7.5%	7.7%	14.3%	-2.7%	-4.2%
Communications - Wireline	-5.0%	-6.9%	4.9%	3.6%	1.5%	5.5%	3.6%	0.8%	0.2%	-0.7%	3.0%	3.1%
Automotive	-1.7%	-5.1%	1.4%	-30.8%	-0.3%	26.7%	7.1%	0.5%	18.4%	7.7%	-5.1%	5.5%
Industrial/Multipurpose/Other	-8.9%	-7.9%	14.9%	-4.5%	-0.4%	11.3%	-0.7%	-10.8%	20.9%	-4.9%	-9.7%	20.2%
TOTAL ASIC	-6.5%	-2.7%	4.0%	-8.2%	0.7%	11.9%	-0.2%	2.3%	9.7%	4.5%	-1.7%	3.2%

Overall Revenue												
Single Month % Y/Y Growth	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sept-20	Oct-20	Nov-20	Dec-20
Consumer	-2.7%	7.2%	-0.9%	0.2%	0.9%	0.5%	3.9%	1.8%	4.2%	8.3%	9.1%	11.7%
Computer/Peripheral	19.5%	20.5%	19.2%	13.7%	13.0%	24.6%	6.3%	6.1%	8.5%	8.6%	13.7%	13.7%
Communications - Wireless	6.0%	12.5%	2.0%	-0.7%	0.8%	7.5%	7.8%	10.1%	11.4%	23.9%	25.9%	21.9%
Communications - Wireline	-1.7%	-1.6%	-6.4%	5.5%	7.2%	10.3%	15.0%	13.3%	7.3%	11.0%	15.4%	13.4%
Automotive	5.0%	6.7%	-7.5%	-31.6%	-31.1%	-17.7%	-8.3%	-7.8%	-2.7%	9.7%	10.5%	13.8%
Industrial/Multipurpose/Other	-7.7%	1.4%	-13.8%	-4.2%	-2.3%	-3.1%	0.6%	-8.3%	0.3%	5.6%	3.6%	12.8%
TOTAL ASIC	5.3%	10.4%	1.0%	-2.0%	-1.1%	5.6%	4.5%	4.0%	6.4%	14.0%	16.2%	16.2%

Source: SIA, Company data, Credit Suisse estimates

Figure 14: End-Market Analysis – Rolling 3-month Average

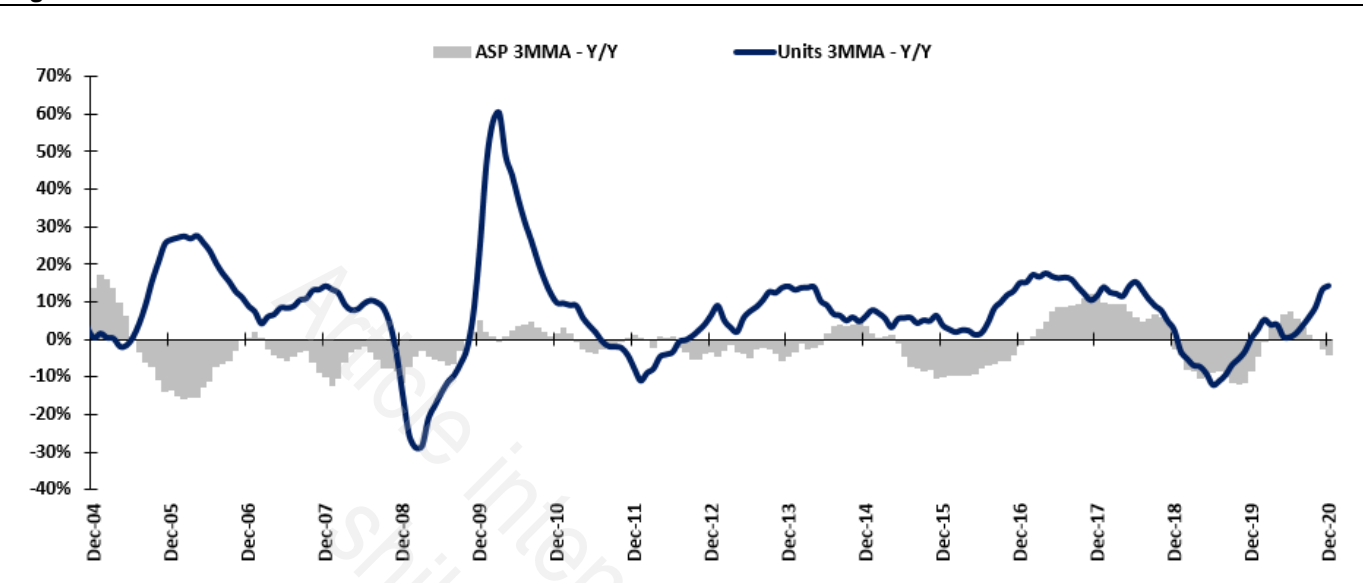
Overall Revenue												
3MMA % M/M Growth	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sept-20	Oct-20	Nov-20	Dec-20
Consumer	-1.7%	-2.5%	-0.6%	-0.6%	0.6%	-0.8%	3.7%	3.5%	3.6%	1.4%	1.3%	1.6%
Computer/Peripheral	-1.7%	-1.2%	-1.7%	0.3%	0.4%	3.4%	1.4%	2.4%	0.8%	2.8%	2.8%	2.0%
Communications - Wireless	-3.5%	-2.5%	-2.5%	-2.6%	-1.9%	1.5%	4.1%	6.2%	5.8%	10.0%	6.0%	2.0%
Communications - Wireline	-0.4%	-2.4%	-2.6%	0.4%	3.3%	3.5%	3.5%	3.2%	1.5%	0.1%	0.9%	1.8%
Automotive	-1.8%	-1.4%	-1.8%	-11.5%	-11.0%	-5.3%	10.8%	10.0%	8.7%	8.8%	6.1%	2.5%
Industrial/Multipurpose/Other	-2.5%	-2.3%	-1.3%	0.4%	2.8%	2.0%	3.2%	-0.5%	2.5%	0.9%	1.1%	1.1%
TOTAL ASIC	-2.3%	-2.0%	-1.9%	-2.4%	-1.3%	1.2%	3.9%	4.4%	4.0%	5.5%	3.9%	1.9%

Overall Revenue												
3MMA % Y/Y Growth	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sept-20	Oct-20	Nov-20	Dec-20
Consumer	-4.4%	-1.0%	0.9%	1.9%	0.0%	0.5%	1.8%	2.1%	3.3%	4.7%	7.1%	9.7%
Computer/Peripheral	12.8%	17.2%	19.7%	17.8%	15.3%	17.2%	14.5%	12.0%	7.0%	7.8%	10.2%	12.0%
Communications - Wireless	-0.2%	5.0%	6.7%	4.4%	0.7%	2.6%	5.4%	8.5%	9.8%	15.3%	20.4%	23.9%
Communications - Wireline	-4.2%	-3.0%	-3.3%	-1.0%	1.9%	7.7%	10.9%	12.9%	11.8%	10.5%	11.2%	13.3%
Automotive	0.7%	3.5%	1.1%	-11.2%	-23.0%	-26.6%	-18.9%	-11.3%	-6.1%	-0.1%	5.6%	11.3%
Industrial/Multipurpose/Other	-6.1%	-6.1%	-7.4%	-6.3%	-7.1%	-3.2%	-1.6%	-3.5%	-2.3%	-0.7%	3.1%	7.5%
TOTAL ASIC	1.2%	4.7%	5.4%	2.9%	-0.7%	0.9%	3.1%	4.7%	5.0%	8.2%	12.1%	15.4%

Source: SIA, Company data, Credit Suisse estimates

IC Summary

Figure 15: Total IC ASPs vs. Units

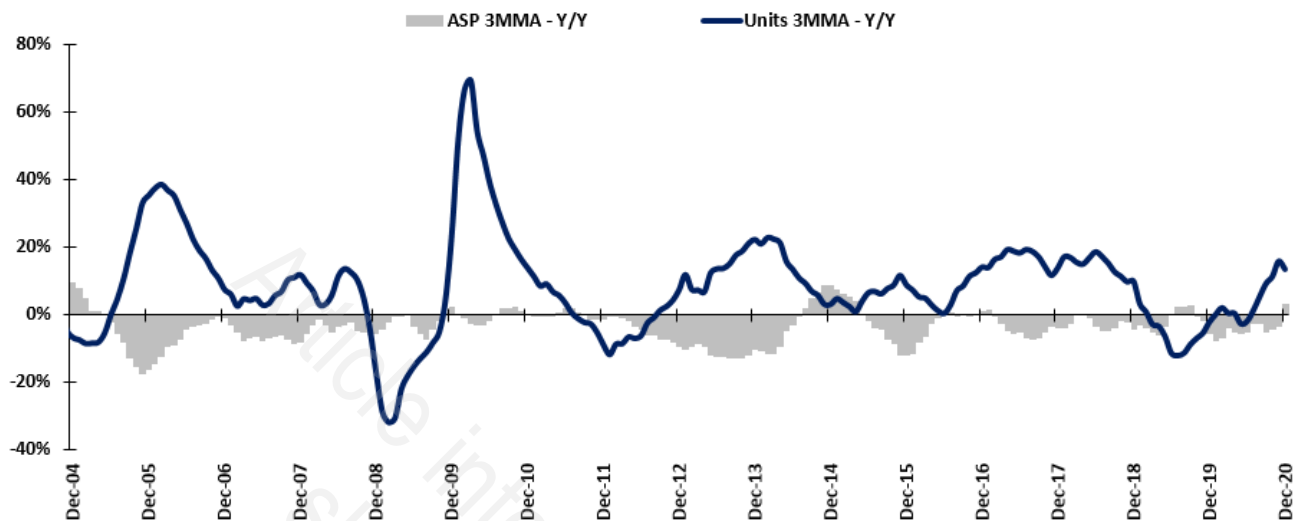


Source: SIA, Company data, Credit Suisse estimates

December **IC's** Rev of \$31.8bn was -2.0% m/m (+6.4% y/y) BELOW seasonal of +2.8% m/m - embedding Units of 30.1bn, +5.2% m/m (+10.6% y/y) and ASP of \$1.055, -6.9% m/m (-3.8% y/y).

Analog Summary

Figure 16: Total Analog ASPs vs. Units

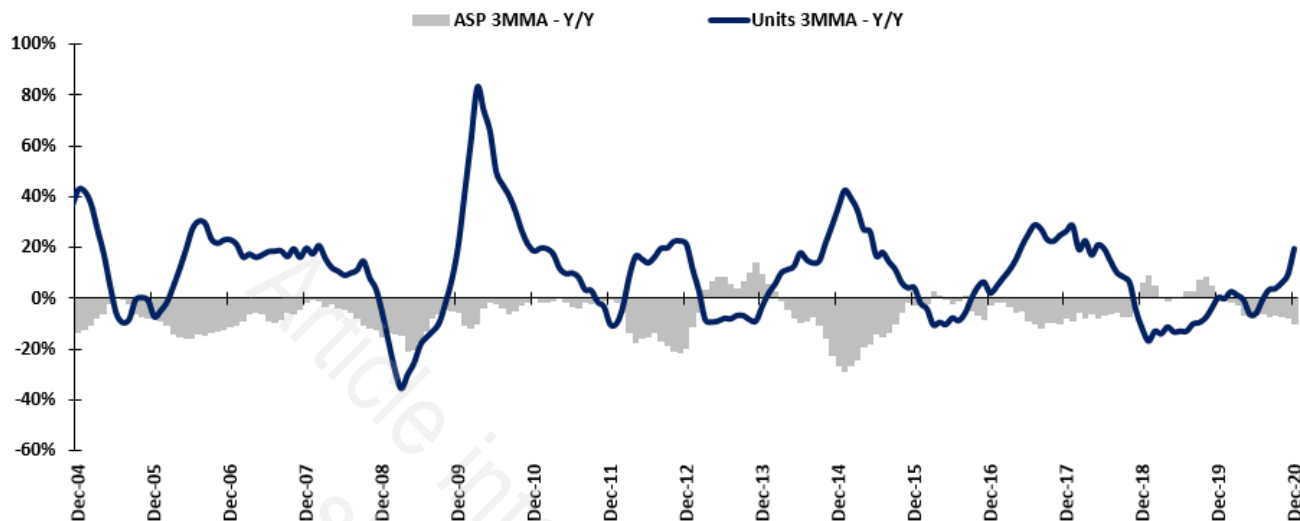


Source: SIA, Company data, Credit Suisse estimates

December **Analog** Rev of \$5.4bn was +5.0% m/m (+18.2% y/y) BELOW seasonal of +5.9% m/m - embedding Units of 16.8bn +3.9% m/m (+4.8% y/y) and ASP of \$0.323, +0.9% m/m (+12.9% y/y).

MCU Summary

Figure 17: Total MCU ASPs vs. Units

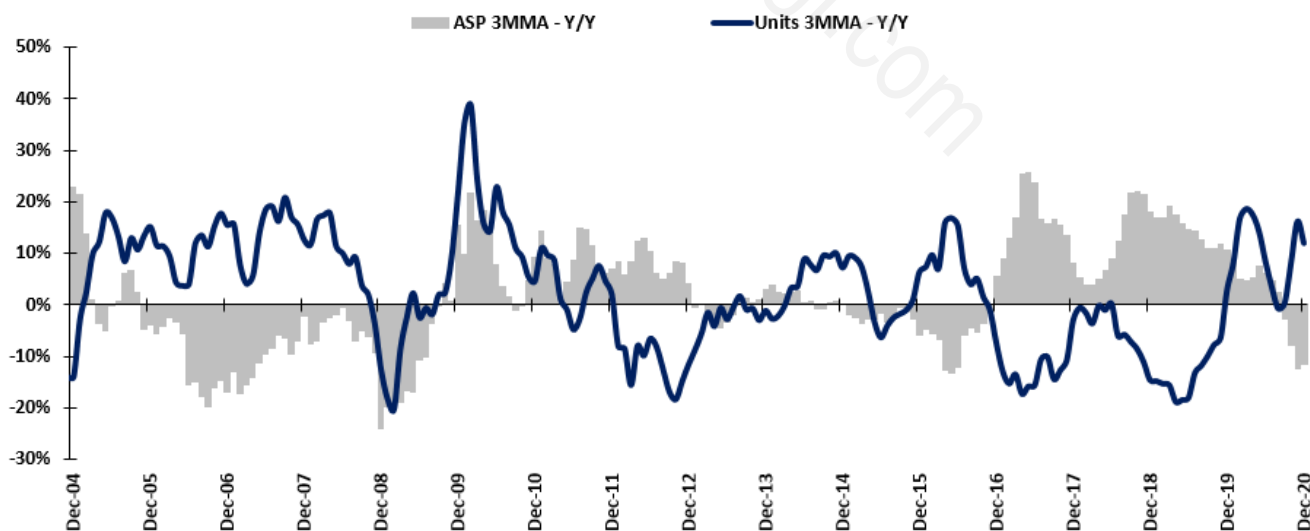


Source: SIA, Company data, Credit Suisse estimates

December **MCU** Rev of \$1.6bn was 18.3% m/m (+13.5% y/y) ABOVE seasonal of +9.0% m/m - embedding Units of 2.6bn, +17.6% m/m (+28.5% y/y) and ASP of \$0.602, +0.7% m/m (-11.6% y/y).

MPU Summary

Figure 18: Total MPU ASPs vs. Units

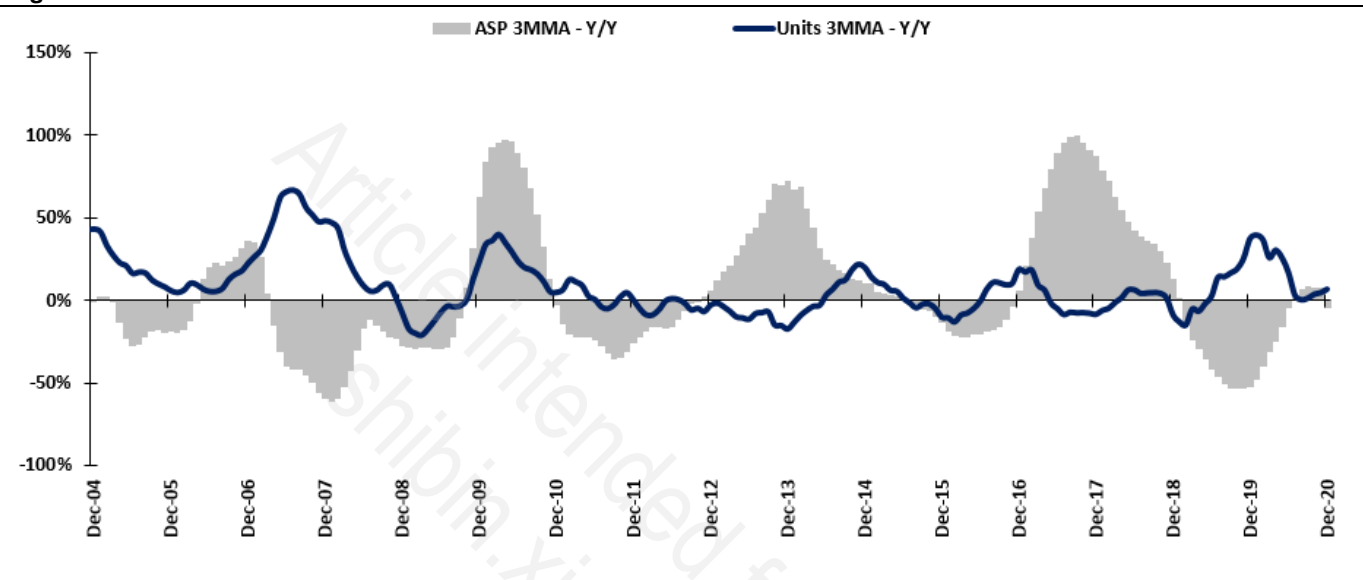


Source: SIA, Company data, Credit Suisse estimates

December **MPU** Rev of \$4.7bn was +4.1% m/m (-9.9% y/y) BELOW seasonal of +13.6% m/m - embedding Units of 0.04bn, +5.2% m/m (-1.6% y/y) and ASP of \$113.755, -1.0% m/m (-8.4% y/y).

DRAM Summary

Figure 19: Total DRAM ASP vs. Units

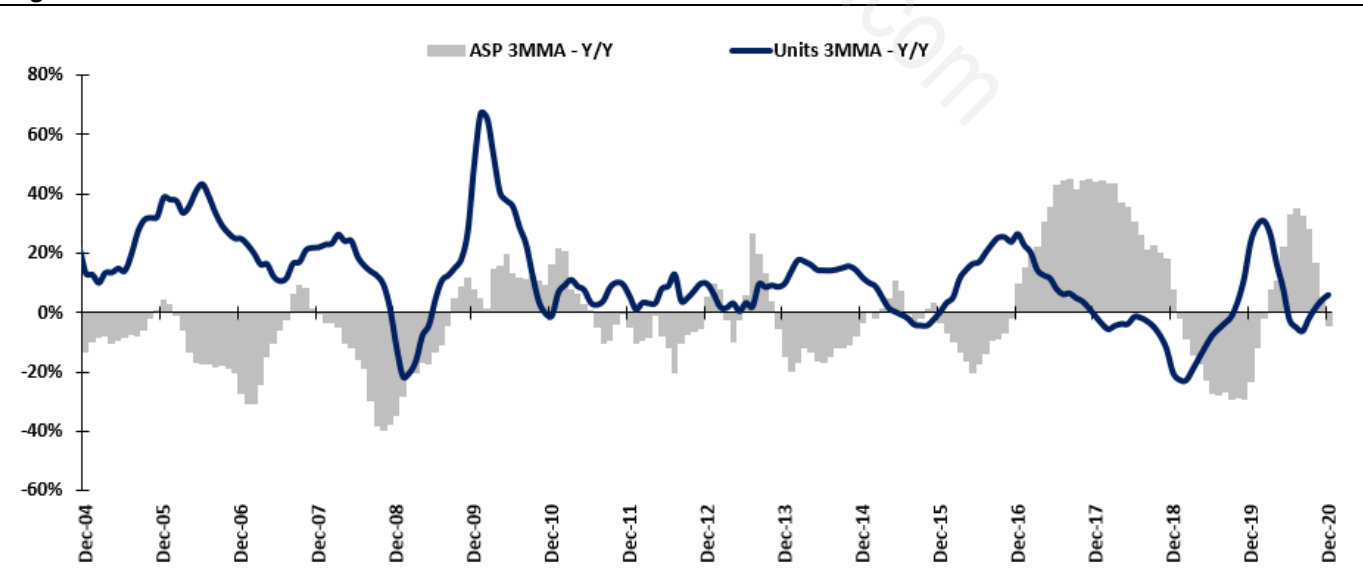


Source: SIA, Company data, Credit Suisse estimates

December **DRAM** Rev of \$4.3bn was -27.1% m/m (-12.7% y/y) BELOW seasonal of -7.2% m/m - embedding Units of 1.8bn, +1.4% m/m (+13.6% y/y) and ASP of \$2.336, -28.1% m/m (-23.2% y/y).

Flash Summary

Figure 20: Total Flash ASP vs. Units



Source: SIA, Company data, Credit Suisse estimates

December **Flash** Rev of \$4.2bn was +4.2% m/m (+6.4% y/y) ABOVE seasonal of -2.0% m/m - embedding Units of 1.5bn +3.7% m/m (+10.4% y/y) and ASP of \$2.765, +0.5% m/m (-3.6% y/y).

Article intended for:
shibin.xie#allianzgi.com

Valuation, Methodology and Risks

Target Price and Rating

Valuation Methodology and Risks: (12 months) for Intel Corp. (INTC.OQ)

Method: Our \$80 target price and Outperform rating for Intel are based on 17x 2021E P/E. Our Outperform rating is based upon the following: INTC remains well levered to Data Growth not only in DCG but also in its IoT and NSG businesses. We believe the company's business model/IP has significant barriers to entry (evidenced by one of the highest "R&D + CapEx to Revenue" ratio), and we continue to argue that Moore's Law has been the cornerstone of Tech economics for 40 years and that INTC will be the Last-man-standing on Moore's Law, leading to market share gains in Compute (including Mobile), as well as Foundry.

Risk: Risks to our \$80 target price and Outperform rating for Intel are aggressive pricing, higher manufacturing spending, loss of market share in key enterprise markets, reversal of recent strength in servers where Intel has renewed momentum, ability to maintain share in desktop and mobile, with the new Core i3/i5/i7 offering, lower gross margin due to higher manufacturing costs, and seeing slower-than-expected unit growth of PC units.

Target Price and Rating

Valuation Methodology and Risks: (12 months) for Taiwan Semiconductor Manufacturing (2330.TW)

Method: Our NT\$650 target price for TSMC is based on 25x 2022E EPS (earnings per share), in line with the SOX index. We see its business outlook improving, and technology leadership should keep its market share and profitability intact; dividends will likely rise again as capex moderates. We therefore have an OUTPERFORM rating on the stock.

Risk: Risks that could impede achievement of our NT\$650 target price and OUTPERFORM rating for TSMC would include: fierce competition, demand failing to pick up, or Apple orders not being as strong as expected.

Companies Mentioned (Price as of 10-Feb-2021)**Intel Corp.** (INTC.OQ, \$58.86)**Taiwan Semiconductor Manufacturing** (2330.TW, NT\$632.0)

Disclosure Appendix

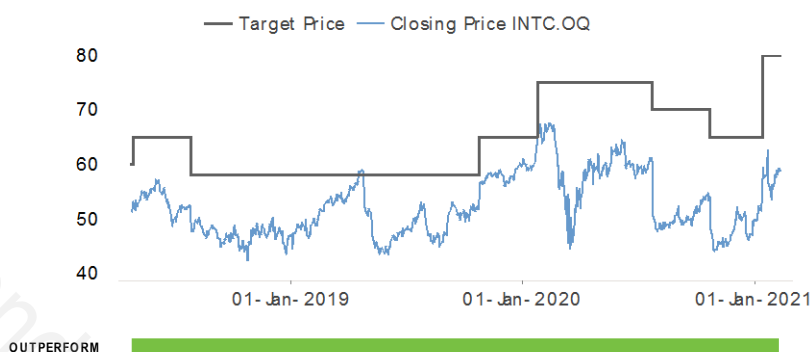
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3-Year Price and Rating History for Intel Corp. (INTC.OQ)

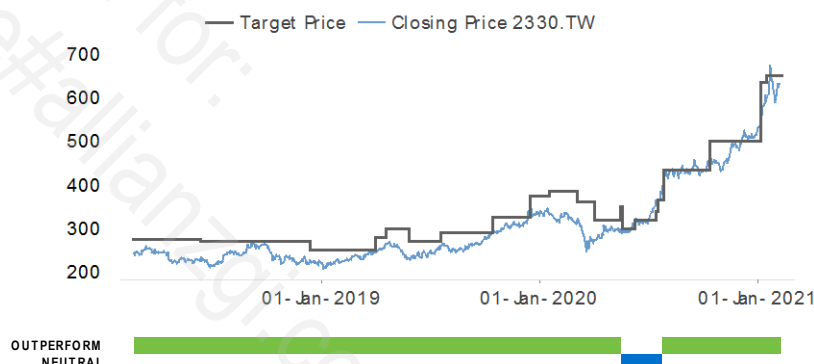
INTC.OQ	Closing Price	Target Price	
Date	(US\$)	(US\$)	Rating
24-Apr-18	51.45	60.00	O
27-Apr-18	52.73	65.00	
27-Jul-18	47.68	58.00	
25-Oct-19	56.46	65.00	
24-Jan-20	68.47	75.00	
23-Jul-20	60.40	70.00	
22-Oct-20	53.90	65.00	
13-Jan-21	56.95	80.00	

* Asterisk signifies initiation or assumption of coverage.

**3-Year Price and Rating History for Taiwan Semiconductor Manufacturing (2330.TW)**

2330.TW	Closing Price	Target Price	
Date	(NT\$)	(NT\$)	Rating
20-Feb-18	236.50	275.00	O
12-Jun-18	229.00	270.00	
12-Dec-18	226.50	250.00	
01-Apr-19	245.50	280.00	
19-Apr-19	264.50	300.00	
27-May-19	231.00	270.00	
19-Jul-19	259.00	290.00	
14-Oct-19	290.00	325.00	
16-Dec-19	336.00	375.00	
17-Jan-20	333.00	385.00	
04-Mar-20	320.50	360.00	
02-Apr-20	271.50	320.00	
15-May-20	298.00	350.00	
18-May-20	290.00	300.00	N
09-Jun-20	319.00	320.00	
13-Jul-20	354.50	340.00	
17-Jul-20	367.00	365.00	
27-Jul-20	424.50	435.00	O
12-Oct-20	460.00	500.00	
05-Jan-21	542.00	635.00	
15-Jan-21	601.00	650.00	

* Asterisk signifies initiation or assumption of coverage.

**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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Underperform/Sell*	12%	(21% banking clients)
Restricted	2%	

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