

Taiwan Semiconductor Manufacturing

Above seasonal inventory build expected in H221

Neutral
Price Target \$120.00
Prior Price Target \$130.00

TSMC reported Q221 revenue in line with expectations, growing 20% YoY. However, gross margin of 50% was 1pt lower than expected, with EPS 1% behind consensus. Q321 revenue guidance was in line with expectations at the midpoint, but gross margin guidance of 50.5% at the midpoint was 170bps lower than expected. Management expects customers to build up inventory above normal seasonal levels in H221 to protect against Covid and geopolitical uncertainties. Although management can not rule out an inventory correction in the future, should a correction occur, management expects lower volatility compared to prior cycles given secular growth from 5G and high performance computing. We lower our FY22 EPS forecasts moderately, reflecting lower gross margins from the ramp of new nodes and lower our YE21 PT to \$120 (prior \$130), reflecting a de-rating of the SOX.

\$m unless stated	Actual	AE est.	Cons.		Comment
Revenue (TWD bn)	372	370	372	-	20% YoY, 0.1% ahead
Gross margin (%)	51.0%	51.0%	51.1%	X	-3pt YoY, 1pt behind consensus
Operating margin (%)	40.3%	40.3%	40.3%	X	-3pt YoY, 1pt behind consensus
EPS (TWD)	5.53	5.16	5.23	X	11% YoY, 1% behind consensus
Q2 rev guide (TWD bn)	412	397	412	-	In line with consensus
Q2 gross guide (%)	50.5%	51.0%	52.2%	X	1.7pt behind consensus

- Customer inventory build in H221:** Management expects customers to build up inventory in H2 above normal seasonal levels due to the need to protect against Covid and geopolitical uncertainties. The possibility of an inventory correction in the future that would result in a pull back in chip orders can therefore not be ruled out. However, should a correction occur, management expects less volatility compared to previous cycles due to strong secular growth from 5G and high performance computing applications (HPC). HPC revenue grew 40% YoY in Q221, representing half of group growth, and we expect that AMD CPUs, Mac silicon and NVIDIA GPUs contributed.
- Gross margin below expectations:** Q221 gross margin of 50% was below consensus, even after adjusting for a 50bps headwind from foreign exchange. Furthermore, guidance for gross margins of 49.5%-51.5% in Q321 was below consensus expectations of 52%, with the ramp of new nodes continuing to present a headwind. Management reiterated that a long term structural gross margin of 50% is achievable.
- \$120 YE21 PT:** We lower our PT primarily reflecting a de-rating of the SOX since our initiation, with our PT requiring the Taiwanese listed stock to trade at a 20% premium to the SOX and the ADR to trade at a 5% premium to the Taiwanese stock.

Ticker (NYSE)	TSM
Price	\$124.39
Price	\$124.39
Market Capitalisation	\$645,096m
Price Target	\$120.00
12 Month Range	\$64.32 - \$142.20
YTD Change	14.1%
Annualised Dividend	\$1.98
Dividend Yield	1.6%
Rating	Neutral
Pricing Date / Time	Jul 14 2021 11:00PM
S&P500 YTD Change	16.5%

Price Performance Chart



Y/E Dec	2020	2021E	2022E
Revenue (TWD bn)			
Q1	311	362	390E
Previous	--	--	396
Q2	311	372	406E
Previous	--	370	413
Q3	356	413E	510E
Previous	--	397	518
Q4	362	405E	535E
Previous	--	411	543
FY	1,339	1,553E	1,841E
EPS (TWD)			
Q1	4.51	5.39	5.36E
Previous	--	--	5.51
Q2	4.66	5.18	5.57E
Previous	--	5.16	5.73
Q3	5.30	5.67E	6.97E
Previous	--	5.53	7.16
Q4	5.51	5.57E	7.31E
Previous	--	5.72	7.52
FY	19.97	21.81E	25.21E
EPS (\$)			
FY	3.39	3.90E	4.52E
P/E (x)	36.7	31.9	27.5

Our Call:

Premium valuation is justified by technology leadership, but upcoming technology transitions and emerging competition introduce heightened risk over the next five years, limiting further multiple expansion in our view.

Q221 results summary

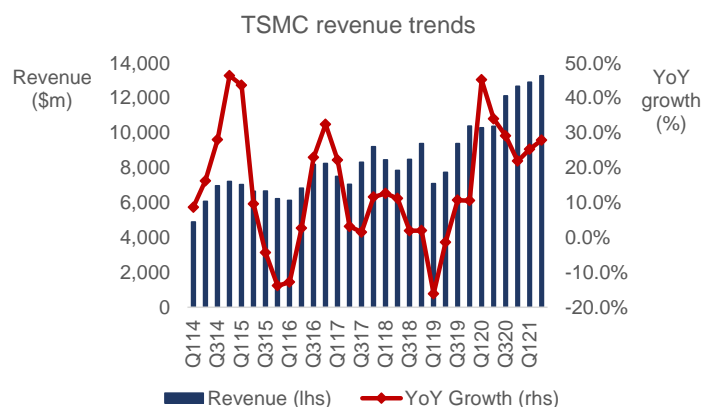
Figure 1: Q221 results summary

TWD bn, YE December	Q221A	YoY	AE	Delta	Cons	Delta
Revenue	372	19.8%	370	0.5%	372	0.1%
Gross margin (%)	50.0%	-295bps	51.0%	-97bps	51.1%	-104bps
Operating margin (%)	39.1%	-305bps	40.3%	-116bps	40.3%	-120bps
EPS (TWD)	5.18	11.2%	5.16	0.4%	5.23	-1.0%

Source: TSMC, Atlantic Equities, Bloomberg

Revenue of TWD 372bn was in line with consensus expectations, growing 20% YoY. Revenue from high performance computing customers (CPUs, GPUs, AI chips etc..) grew 40% YoY representing 50% of group revenue growth, with management continuing to cite high performance computing as a long-term secular growth driver. Automotive revenue grew 20% YoY, with management working to address chip supply challenges for automotive OEMs and increasing critical microcontroller (MCU) production by 30% compared to H120, with MCU production guided to grow 60% YoY in FY21. However, we note that automotive customers still only represent 4% of group revenue and we do not expect any significant changes to the mix.

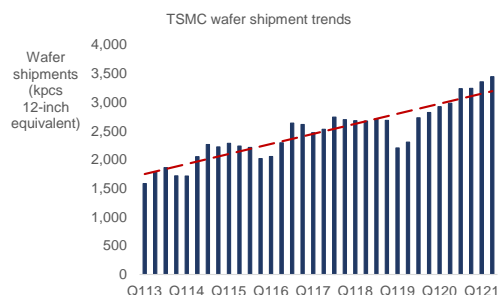
Figure 2: TSMC revenue trends (USD)



Source: TSMC, Atlantic Equities

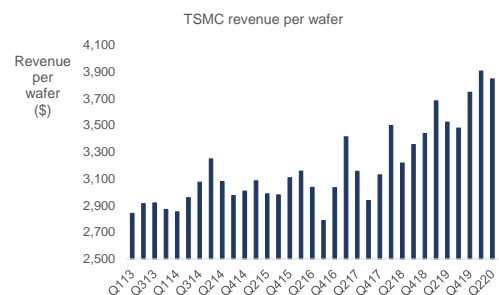
Wafer shipment growth grew 16% YoY, ahead of our expectations of 6.5% YoY. However, revenue per wafer growth of 11% YoY was lower than our expected 18%, with the mix of leading-edge nodes (7nm and 5nm) remaining unchanged from Q121 at 49%. We still expect a ramp in leading edge mix over the remainder of the year, with management guiding that 5nm will represent 20% of revenue in 2021. We believe that growth of leading-edge nodes in 2021 will primarily be driven by the continued roll out of Macs with Apple silicon, the launch of the iPhone 13, AMD CPU market share gains and NVIDIA AI chip growth.

Figure 3: TSMC wafer shipment trends



Source: TSMC, Atlantic Equities

Figure 4: TSMC revenue per wafer trends



Source: TSMC, Atlantic Equities

Gross margin of 50% was below consensus expectations for 51%. However, 50bps of this difference was a result of foreign exchange effects. In addition, management stated that gross margin faces headwinds from the ramp of new nodes and a reduced ability to implement cost savings as fabs are currently running at high capacity.

Figure 5: TSMC gross margin trends



Source: TSMC, Atlantic Equities

Guidance and forecast updates

Figure 6: Q321 guidance¹

TWD bn	Guidance	AE Old	Delta (mid)	Cons	Delta (mid)
Revenue	407-415	397	3.5%	412	-0.1%
Gross margin (%)	49.5%-51.5%	51.0%	-50bps	52.2%	-173bps
Operating margin (%)	38.5%-40.5%	40.3%	-80bps	41.5%	-205bps

Source: TSMC, Atlantic Equities

Q321 revenue guidance is in line with consensus expectations. For FY21 management expects revenue growth above 20% in USD terms, with our old forecast for 20% YoY growth. Management has guided that it expects customers to build up higher inventory levels in H221 compared to normal seasonality to protect against Covid and geopolitical uncertainties. There is a risk that

¹ Assumes an exchange rate of 27.9 TWD per \$.

elevated inventories could unwind in the future, but if this were to happen management expects the correction to be less volatile compared to prior cycles given strong secular growth from high performance computing applications and 5G. Management expects that its capacity will remain tight throughout the remainder of 2021 and into 2022.

Gross margin guidance of 49.5%-51.5% is below consensus expectations of 52%, but unchanged from the guidance for Q221. Consensus expectations for FY21/FY22/FY23 are for gross margins of ~51.8% and given the ramp of 5nm and 3nm nodes over the coming years we believe that there could be downside to these forecasts.

We raise our Q321 EPS forecast by 2.6%, with a 3.9% increase in our revenue forecast partially offset by a 50bps reduction in our assumed gross margin. Our new revenue forecast of \$14.8bn / TWD 413bn is in the upper half of management guidance, with our 50.5% gross margin assumption in line with the gross margin delivered in Q221 after adjusting for foreign exchange impacts. Our FY21 revenue forecast rises by 0.7%, however our EPS forecasts remain unchanged offset by lower gross margin assumption.

Figure 7: FY21 forecast updates

	Q321			FY21		
	AE Old	AE New	Delta	AE Old	AE New	Delta
Revenue (TWD bn)	397	413	3.9%	1,542	1,553	0.7%
Gross margin (%)	51.0%	50.5%	-50bps	51.3%	50.8%	-50bps
Operating margin (%)	40.3%	39.8%	-50bps	40.6%	40.0%	-54bps
EPS (TWD)	5.53	5.67	2.6%	21.80	21.81	0.0%

Source: Atlantic Equities

We leave our FY22 revenue forecasts unchanged in USD terms, although we note that there is a risk that demand has been pulled forward into H220 as customers build up inventories above normal seasonal levels. Our TWD revenue forecasts drop 1.5% driven by updated foreign exchange assumptions. We lower our gross margin assumption to 50.5% in line with those delivered in Q221, and we expect the ramp of new nodes to continue to be a headwind to margins. Our TWD EPS forecasts falls 3% with our USD forecast falling 1%.

Figure 8: FY22 forecast updates

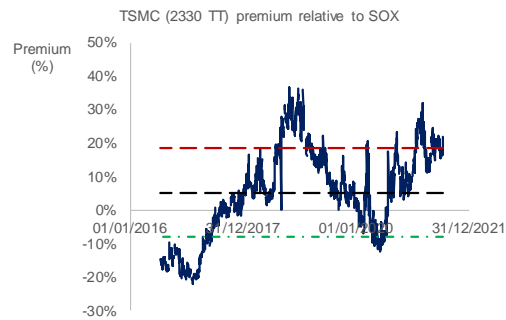
	AE Old	AE New	Delta
Revenue (TWD bn)	1,869	1,841	-1.5%
Gross margin (%)	51.0%	50.5%	-50bps
Operating margin (%)	40.3%	39.8%	-50bps
EPS (TWD)	25.92	25.21	-2.7%

Source: Atlantic Equities

\$120 YE21 PT

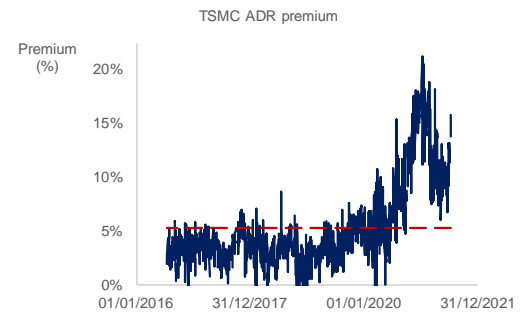
We lower our YE21 PT to \$120 requiring ~27x FY22 earnings per ADR. Our PT requires the Taiwanese listed stock to trade at a 20% premium to the SOX, at the upper end of its range over the last 5 years (Figure 9), and for the ADR to trade at a ~5% premium to the Taiwanese listed stock, broadly in line with the premium over the last five years (Figure 10). Furthermore, the SOX has de-rated since we initiated, now trading on a ~21x PE compared to ~23x in April.

Figure 9: 2330 TT premium to the SoX



Source: Bloomberg, Atlantic Equities

Figure 10: TSM US premium to 2330 TT



Source: Bloomberg, Atlantic Equities

Taiwan Semiconductor Manufacturing

Figure 11: P&L (USD)

\$m, YE December	FY19	Q120	Q220	Q320	Q420	FY20	Q121e	Q221e	Q321e	Q421e	FY21e	FY22e
Net revenue	34,633	10,306	10,385	12,138	12,676	45,505	12,919	13,289	14,800	14,523	55,530	65,969
Cost of revenue	18,685	4,971	4,883	5,651	5,831	21,342	6,152	6,640	7,326	7,189	27,305	32,655
Gross Profit	15,948	5,335	5,502	6,487	6,845	24,163	6,767	6,649	7,474	7,334	28,224	33,314
Research and development expenses	2,959	829	832	1,011	1,050	3,720	1,096	1,102	1,184	1,162	4,545	5,278
Sales, general and administrative	909	244	288	382	294	1,209	298	347	400	392	1,436	1,781
Total operating expenses	3,868	1,073	1,120	1,393	1,344	4,929	1,394	1,449	1,584	1,554	5,981	7,059
Other operating income and expenses	-16	2	0	15	7	24	-7	2	0	0	-5	0
Income from operations	12,063	4,265	4,382	5,110	5,509	19,258	5,366	5,201	5,890	5,780	22,239	26,256
Total non-operating income and expenses	555	120	177	173	140	611	161	133	71	71	436	236
Income before tax	12,618	4,385	4,559	5,283	5,649	19,869	5,528	5,334	5,961	5,851	22,675	26,492
Income tax expenses	1,440	501	518	604	641	2,264	546	532	686	673	2,437	3047
Net income	11,178	3,884	4,041	4,678	5,008	17,606	4,981	4,802	5,276	5,178	20,238	23,445
Earnings per ADR	2.15	0.75	0.78	0.90	0.97	3.39	0.96	0.93	1.02	1.00	3.90	4.52
YoY growth												
Net revenue	1.3%	45.2%	34.1%	29.2%	22.0%	31.4%	25.3%	28.0%	21.9%	14.6%	22.0%	18.8%
Operating income	-5.1%	104.5%	78.7%	47.7%	35.3%	59.6%	25.8%	18.7%	15.3%	4.9%	15.5%	18.1%
Net income	-4.0%	95.0%	88.3%	44.3%	31.7%	57.5%	28.2%	18.8%	12.8%	3.4%	15.0%	15.8%
Earnings per diluted share	-4.0%	94.9%	88.2%	44.3%	31.7%	57.5%	28.3%	18.8%	12.8%	3.4%	14.9%	15.9%
Margins												
Gross	46.0%	51.8%	53.0%	53.4%	54.0%	53.1%	52.4%	50.0%	50.5%	50.5%	50.8%	50.5%
Operating	34.8%	41.4%	42.2%	42.1%	43.5%	42.3%	41.5%	39.1%	39.8%	39.8%	40.0%	39.8%
Net income	32.3%	37.7%	38.9%	38.5%	39.5%	38.7%	38.6%	36.1%	35.6%	35.7%	36.4%	35.5%

Source: Atlantic Equities

Figure 12: P&L TWD

TWD bn, YE December	FY19	Q120	Q220	Q320	Q420	FY20	Q121e	Q221e	Q321e	Q421e	FY21e	FY22e
Net revenue	1,070	311	311	356	362	1,339	362	372	413	405	1,553	1,841
Cost of revenue	577	150	146	166	166	628	173	186	204	201	763	911
Gross Profit	493	161	165	190	195	711	190	186	209	205	789	929
Research and development expenses	91	25	25	30	30	109	31	31	33	32	127	147
Sales, general and administrative	28	7	9	11	8	36	8	10	11	11	40	50
Total operating expenses	120	32	34	41	38	145	39	41	44	43	167	197
Other operating income and expenses	0	0	0	0	0	1	0	0	0	0	0	0
Income from operations	373	129	131	150	157	567	151	146	164	161	622	733
Total non-operating income and expenses	17	4	5	5	4	18	5	4	2	2	12	7
Income before tax	390	132	136	155	161	585	155	149	166	163	634	739
Income tax expenses	45	15	16	18	18	67	15	15	19	19	68	85
Net income	345	117	121	137	143	518	140	134	147	144	566	654
Earnings per share diluted	13.32	4.51	4.66	5.30	5.51	19.97	5.39	5.18	5.67	5.57	21.81	25.21
Weighted average outstanding shares - diluted (m)	25,930	25,930	25,930	25,930	25,930	25,930	25,930	25,930	25,930	25,930	25,930	25,930
<u>YoY growth</u>												
Net revenue	3.7%	42.0%	28.9%	21.6%	14.0%	25.2%	16.7%	19.8%	15.9%	12.1%	15.9%	18.5%
Operating income	-2.8%	100.0%	71.8%	39.1%	26.5%	52.1%	17.1%	11.1%	9.5%	2.6%	9.7%	17.8%
Net income	-1.7%	90.7%	81.0%	35.9%	23.0%	50.0%	19.4%	11.2%	7.1%	1.1%	9.2%	15.6%
Earnings per diluted share	-1.7%	90.6%	81.0%	35.9%	23.0%	50.0%	19.4%	11.2%	7.1%	1.1%	9.2%	15.6%
<u>Margins</u>												
Gross	46.0%	51.8%	53.0%	53.4%	54.0%	53.1%	52.4%	50.0%	50.5%	50.5%	50.8%	50.5%
Operating	34.8%	41.4%	42.2%	42.1%	43.5%	42.3%	41.5%	39.1%	39.8%	39.8%	40.0%	39.8%
Net income	32.3%	37.7%	38.9%	38.5%	39.5%	38.7%	38.6%	36.1%	35.6%	35.7%	36.4%	35.5%

Source: Atlantic Equities

IMPORTANT DISCLOSURES

Stocks under the analyst's coverage

Advanced Micro Devices [AMD], Apple [AAPL], Autodesk [ADSK], Cadence Design Systems [CDNS], Intel [INTC], NVIDIA [NVDA], Synopsys [SNPS], Taiwan Semiconductor Manufacturing Company [TSM]

Risks

Risks to TSMC include but are not limited to; competitors gaining a technology lead in semiconductor manufacturing, increased competition in semiconductor manufacturing as governments and customers look for supply chain diversification, a cyclical downturn in demand for semiconductor devices, geopolitical tensions impacting relations with customers in China or the US.

Consensus Estimates

Bloomberg

ANALYST CERTIFICATION

Ianjit Bhatti, hereby certifies that the views expressed in this research report accurately reflects his/her personal views about the subject Security and Issuer as of the date of this report. He/She further certifies that no part of his/her compensation was, is, or will be directly, or indirectly, related to the specific recommendations or views contained in this research report.

No analysts at Atlantic Equities LLP hold shares in companies they follow. No partner or employee of Atlantic Equities LLP, holds shares in the companies under analyst coverage which give rise to an interest which exceeds 1% of the total issued share capital of the company. Atlantic Equities LLP does not act as a market maker in the securities of any company under analyst coverage and does not carry out investment banking or corporate finance business.

RATING DEFINITIONS

Investment opinions are based on a stock's total return potential relative to those stocks under the analyst's coverage:

"Overweight" stocks are the most attractive stocks under the analyst's coverage over the next 12 months.

"Underweight" stocks are deemed to be particularly unattractive stocks over the next 12 months.

"Neutral" stocks are those stocks which are neither classified as "Overweight" nor "Underweight".

Stocks covered are subject to continuous review. Updates will be provided whenever a change in recommendation is to be made or, at the discretion of the analyst, whenever there is news worth of note. It is anticipated that a report for each company covered will be produced at least once per annum.

Atlantic Equities LLP does not act as a market maker in the securities of any company under analyst coverage and does not carry out investment banking or corporate finance business for any company under analyst coverage.

**Issued by Atlantic Equities LLP. Authorized and regulated by the Financial Conduct Authority.
25 Copthall Avenue, London EC2R 7BP, United Kingdom**

Atlantic Equities LLP is an independent equities research firm. Atlantic Equities LLP's Code of Ethics contains procedures which employees are required to follow so as to prevent or mitigate any conflicts of interest which may arise. The investment services of Atlantic Equities LLP are only available to professional clients and eligible counterparties as defined by the rules of the FCA. They are not available to retail clients. Views expressed herein accurately reflect the views of the relevant analysts with respect to the security, securities or issuer(s) which are the subject of the research. This document is not intended to be an offer or the solicitation of an offer to buy or sell securities and has been prepared exclusively for the use of existing clients of Atlantic Equities LLP. Any recommendations contained in this document must not be relied upon as investment advice based on the recipient's personal circumstances. In the US, it has been prepared for US institutional investors only and such investors wishing to undertake transactions in the securities mentioned in this report should pass orders to FINRA registered firms and not to Atlantic Equities LLP. Whilst all reasonable care has been taken in the preparation of this document, no responsibility can be accepted for the accuracy or completeness of the information herein or upon which opinions herein have been based. Please note the value of investments and the income derived from them may fall as well as rise and you may not receive the original amount invested in return. Where an investment is denominated in a foreign currency, changes in rate of exchange may have an adverse effect on its value, price or income. Unless otherwise specified, charts and statistics are compiled by Atlantic Equities LLP. Updates to estimates, where the analyst considers the changes to be immaterial to his/her recommendation, will be published solely through research aggregators such as Bloomberg and First Call. Where consensus figures are used, these have been sourced from First Call and/or Bloomberg. Atlantic Equities LLP's conflicts of interest policy, its recommendation distribution and other important disclosures are shown on its web-site www.atlantic-equities.com. A list of all recommendations in securities traded on EU regulated markets is located at <http://atlantic-equities.com/european-disclosure/european-disclosure.pdf>

Additional information on the securities discussed herein is available on request.

Registered office: Suite 1, 3rd Floor, 11-12 St. James's Square, London SW1Y 4LB.

Registered Number OC304696 England and Wales