

Asia Semiconductor Insight

Cutting estimates on companies with China exposure

Equities

Asia Pacific Ex. Japan
Technology

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We lower our estimates on semi companies with China exposure

We recently downgraded [Silergy](#) to Neutral and lowered our estimates for [MediaTek](#) and [Hua Hong](#). We now lower our estimates for ASM Pacific, Realtek and SMIC, and downgrade each of them from Neutral to Sell. These are the companies in our coverage universe we believe have the largest exposure to China and we thus expect disruptions in both supply and demand. We note that ASM shares corrected 15% in the past week and SMIC shares have corrected 6%, versus our 2020E earnings cuts of 19% and 3%. Investors generally see downside, but we believe investors expect a rebound in demand, whereas we highlight some structural issues we see in supply and demand.

Demand downside difficult to assess

Silergy, Realtek, MediaTek, SMIC and Hua Hong likely have the largest exposure, in our view. We estimate China accounts for 50% of sales for Silergy, 70-80% for MediaTek, 40% for Realtek, 60% for SMIC, and 60% for Hua Hong. What about TSMC? Huawei (HiSilicon) is a key customer, but our view is that, given the strong demand for 7nm, TSMC is likely to be more defensive in the near-term.

Supply downside most prevalent for ASM Pacific

SMIC and Hua Hong conduct manufacturing in China, but we note that foundry is not labour intensive and so far we have heard of minimal disruptions. We do think labour issues will impact ASM Pacific, especially in its equipment division. Besides supply disruption, our view is that investors are too bullish on SMT demand for 2020.

Our best ideas

On the long side, we believe TSMC and Global Unichip (GUC) are poised to have strong years in 2020. In terms of downside, our new price target of NT\$200 for Realtek represents 16% downside, given muted growth expected in 2020. For ASM Pacific, we see near-term demand risks, and our price target of HK\$75.00 implies 21% downside. Our new price target of HK\$10.00 for SMIC implies 35% downside, given we think short-term profitability could be capped by higher capex spending.

Figure 1: Stock implications

Company	Ticker	Market cap (US\$ m)	Rating		Price target (LCY)		PE (x)		P/BV (x)	
			Current	Old	Current	Old	2019E	2020E	2019E	2020E
More defensive										
GUC	3443 TT	1,029	Buy	-	300.00	-	49.9	23.5	7.3	6.1
TSMC	2330 TT	276,585	Buy	-	380.00	-	24.0	18.2	5.0	4.5
Potentially adversely affected										
MediaTek	2454 TT	19,446	Buy	-	455.00	-	25.6	19.0	1.9	1.8
Hua Hong Semicon	1347 HK	3,027	Neutral	-	18.50	-	18.6	21.8	1.4	1.3
Silergy	6415 TT	3,047	Neutral	-	1,200.00	-	38.8	31.7	6.2	5.3
ASM Pacific Tech.	522 HK	4,968	Sell	Neutral	75.00	112.00	61.5	20.4	3.3	3.0
Realtek	2379 TT	3,986	Sell	Neutral	200.00	235.00	17.9	19.5	4.8	4.7
SMIC	981 HK	10,043	Sell (CBE)	Neutral (CBE)	10.00	10.50	42.0	nm	1.6	1.1

Note: Prices as of 24 February 2020. Source: Thomson Reuters, UBS estimates

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Company Pages

ASM Pacific Technology

Downgrade on China exposure and high expectations for 2020

Downgrade to Sell on China-related downside and valuation

Street expects 21% revenue growth and 219% EPS growth in 2020; we are at 10% growth for revenue and 201% for EPS. Given this, we see downside to both earnings and multiples, and we thus downgrade ASM Pacific to Sell and cut our price target to HK\$75.00. Where do we differ? First, we think uncertainties for China tech demand and production disruptions due to coronavirus impact could negatively affect ASM's backend equipment segment on demand and supply. Second, for surface-mount technology (SMT), we think demand for equipment upgrade from Apple supply chain might be less than expected.

Equipment: China headwinds our main concern

We think: 1) the coronavirus will likely impact China tech demand in the near term and thus reduce the need for capex expansion; (2) workforce disruptions will likely impact ASM's margins; and 3) semis capex in China will likely be up in 2020E, largely driven by YMTC and SMIC. Thus, we expect ASM's core market to see smaller growth. Net-net, we do see growth in advanced packaging and CIS, but we think market's overall growth expectations are too high.

SMT: Will Apple upgrade equipment this year?

Investors expect Apple's suppliers to upgrade SMT equipment this year, as Apple typically upgrades on a three-year cadence and the last time was 2017 (iPhone 10 cycle). Our view is the odds are less than 50/50. The key reason is the equipment Apple used last time (SLP) is still state-of-art today, and there is nothing significantly better at a reasonable price. We believe a slight capacity increase is likely, but that a wholesale upgrade is unlikely. We do think SMT will grow with the auto industry rebounding, but overall our expectation is lower than consensus.

Valuation: downgrade from Neutral to Sell, PT cut from HK\$112.00 to HK\$75.00

ASM shares historically trade at 10x to 25x PE. The stock rebounded in 2019 with the global rerating of semi stocks, as well as growth expectations for 2020. With global semi shares trading at record multiples, we believe a trough valuation is unlikely; but even if ASM trades down to mid-cycle valuation, we see significant downside. We realise that ASM is a strong company fundamentally and the long-term growth prospects are good; but we think the downside in 2020 is too substantial to ignore. Our new price target of HK\$75.00 is based on 16x 2020E PE (previously 20x 2020E PE), which is around the mid-cycle valuation and the average of the last Apple equipment upgrade cycle.

Equities

Hong Kong
Semiconductors

12-month rating **Sell**

Prior: Neutral

12m price target **HK\$75.00**

Prior: HK\$112.00

Price (24 Feb 2020) **HK\$94.85**

RIC: 0522.HK **BBG:** 522 HK

Trading data and key metrics

52-wk range HK\$119.00-73.05

Market cap. HK\$38.7bn/US\$4.97bn

Shares o/s 408m (ORD)

Free float 48%

Avg. daily volume ('000) 1,105

Avg. daily value (m) HK\$119.6

Common s/h equity (12/19E) HK\$11.6bn

P/BV (12/19E) 3.3x

Net debt / EBITDA (12/19E) NM

EPS (UBS, diluted) (HK\$)

	From	To	% ch	Cons.
12/19E	1.53	1.53	0	1.60
12/20E	5.70	4.62	-19	5.00
12/21E	6.67	6.09	-9	6.37

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Highlights (HK\$m)	12/16	12/17	12/18	12/19E	12/20E	12/21E	12/22E	12/23E
Revenues	14,249	17,523	19,551	15,265	16,770	18,086	19,162	19,505
EBIT (UBS)	2,131	3,268	3,248	1,205	2,599	3,267	3,511	3,577
Net earnings (UBS)	1,464	2,815	2,216	625	1,885	2,488	2,690	2,750
EPS (UBS, diluted) (HK\$)	3.61	6.51	5.30	1.53	4.62	6.09	6.59	6.73
DPS (HK\$)	1.20	2.17	2.62	1.90	2.54	3.35	3.62	3.70
Net (debt) / cash	(202)	2,249	1,454	5,108	6,468	7,472	8,714	9,642
Profitability/valuation	12/16	12/17	12/18	12/19E	12/20E	12/21E	12/22E	12/23E
EBIT margin %	15.0	18.7	16.6	7.9	15.5	18.1	18.3	18.3
ROIC (EBIT) %	24.3	35.6	32.8	14.0	40.1	50.0	53.1	52.9
EV/EBITDA (core) x	10.0	11.5	10.0	21.2	10.7	8.3	7.5	7.1
P/E (UBS, diluted) x	17.4	16.5	18.0	61.8	20.5	15.6	14.4	14.1
Equity FCF (UBS) yield %	6.3	2.4	3.0	11.7	2.6	5.8	5.7	6.8
Net dividend yield %	1.9	2.0	2.8	2.0	2.7	3.5	3.8	3.9

Source: Company accounts, Thomson Reuters, UBS estimates. Metrics marked as (UBS) have had analyst adjustments applied. Valuations: based on an average share price that year, (E): based on a share price of HK\$94.85 on 24 Feb 2020 16:54 HKT

UBS Research THESIS MAP a guide to our thinking and what's where in this report

PIVOTAL QUESTIONS

Q: What's the growth outlook for China in 2020?

We are more conservative on China for several reasons: 1) the coronavirus will impact near-term demand; 2) we believe supply and labour disruptions will impact ASM's GM in the near-term; and 3) while investors are bullish on China capex, we note that a significant portion of the increase is from YMTC and SMIC, and we are less certain on the back-end increasing.

[more →](#)

Q: What's the outlook for surface mount technology (SMT)?

We see SMT sales to the auto sector rebounding in 2020, along with auto unit growth. However, we are sceptical about SMT sales to the smartphone sector, and thus our estimates are below consensus.

[more →](#)

UBS VIEW

We downgrade ASM Pacific to Sell, as we are more conservative on near-term demand, and see downside risks for both backend equipment and SMT, due to 1) uncertainties from the China market (eg, coronavirus impact, backend spending); and 2) weaker-than-expected SMT sales amid a lack of technical upgrades. Longer term, we believe ASM's business outlook will be more robust as the industry transitions to new technologies such as multi-camera, 5G smartphone/infrastructure, advanced packages, 3D sensing, and auto-related sensors. However, we would like to see more concrete evidence before we turn constructive on the stock.

EVIDENCE

In the past, ASM Pacific's total revenue growth has been highly correlated with China as a percentage of total revenue. But UBS economists cut China GDP growth to 5.4% from 6.0% for 2020E to factor in the coronavirus impact. In addition, the increase of semis capex in China this year is expected to be mainly driven by YMTC and SMIC.

WHAT'S PRICED IN?

The stock is trading at 20x 12-month forward PE, towards the high end of its historical valuation range. The stock has rallied over 30% from the recent trough in June 2019, prompting us to believe investors have likely priced in strong expectations for: 1) a cyclical rebound in 2020; 2) China to increase sourcing from Asian suppliers; and 3) Apple to upgrade equipment on a three-year cycle.

[more →](#)

UPSIDE / DOWNSIDE SPECTRUM



Value drivers (2020E)

	Backend equip. revenue growth	SMT equip. revenue growth	Gross margin
HK\$120.00 upside	20%	25%	38.5%
HK\$75.00 base	10%	10%	35.7%
HK\$60.00 downside	5%	5%	33.5%

Source: UBS estimates

[more →](#)

COMPANY DESCRIPTION

ASM Pacific Technology (ASM) is a global market leader in the supply of semiconductor packaging and assembly (back-end) equipment. In terms of product mix, in 2018 semiconductor...

[more →](#)

PIVOTAL QUESTIONS

[return](#) ↑**Q: What's the growth outlook for China in 2020?****UBS VIEW**

We are more conservative on China for several reasons: 1) the coronavirus will impact near-term demand; 2) we believe supply and labour disruptions will impact ASM's GM in the near-term; and 3) while investors are bullish on China capex, we note that a significant portion of the increase is from YMTC and SMIC, and we are less certain on the back-end increasing.

EVIDENCE

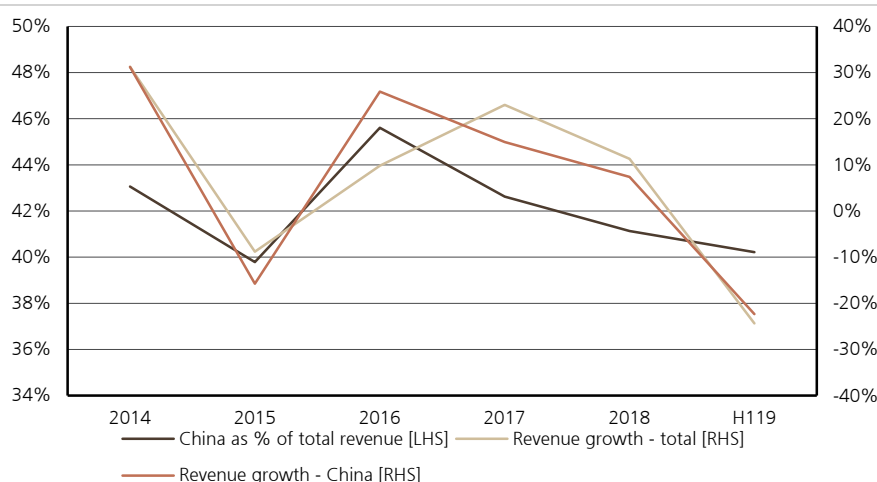
We note that UBS's economics team have benchmarked the current situation with the SARS virus, and cut our GDP forecast for 2020 from 6.0% growth to 5.4%. Companies that have reported so far are indicating uncertainties in demand, but many in tech have had issues resuming production. We would expect the same for ASM.

WHAT'S PRICED IN?

ASM Pacific shares have rallied over 30% from the recent trough in June 2019, mainly on expectations for a cyclical rebound and the potential for China to procure more from Asian sources.

ASM Pacific goes as China goes

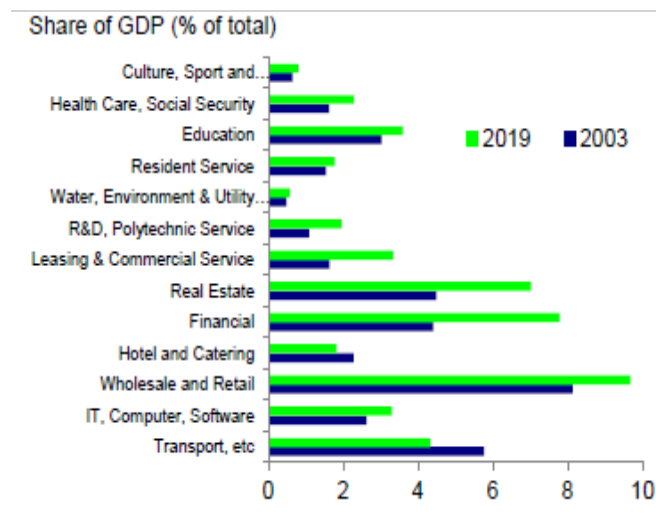
As shown in Figure 2 below, over the past six years, ASM PT's total revenue growth has been highly correlated with China as a percentage of total revenues. When China outperforms, ASM tends to outperform. When China slows, the company slows as well. We are now taking a more conservative stance on China in 2020 due to the coronavirus and also some sector-specific factors.

Figure 2: ASM Pacific's revenue is highly correlated with the China market

Source: Company data

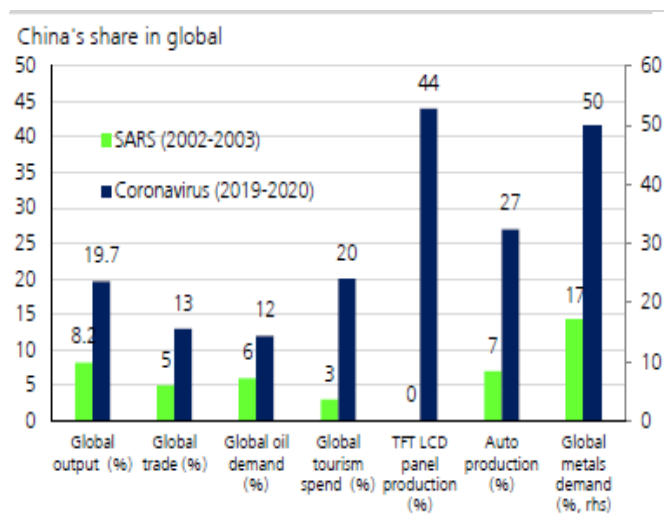
With the coronavirus disruption, we would expect demand in China to trend down in the near-term. We note that UBS recently cut China real GDP growth for 2020/21E to 5.4%/6.0%, from 6.0%/5.7%. The base case is the virus is controlled in Q120, similar to the SARS outbreak in 2003. We note that SARS brought down Q203 GDP growth by 200bp. Ultimately there was a V-shaped recovery post SARS, but it did impact total GDP growth for the year.

Figure 3: Different services as a share of GDP



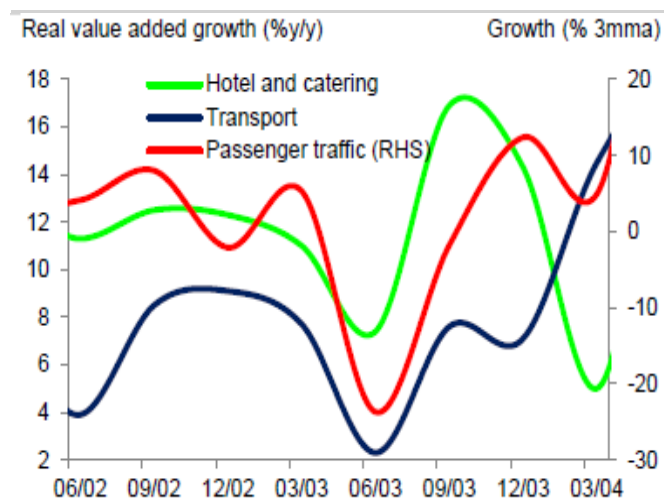
Source: CEIC, UBS estimates

Figure 4: China's role in the global economy



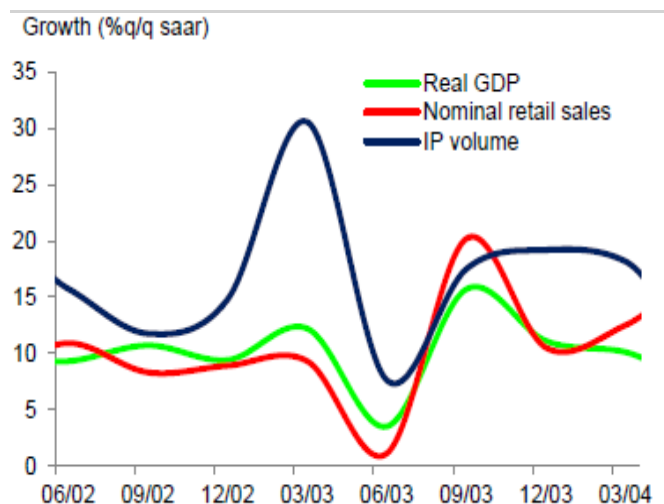
Note: China's GDP share is PPP-adjusted share in world total.
Source: BIS, IMF DOTS, IFS, Haver, Bloomberg, UBS research

Figure 5: V-shaped hit and rebound in transport, hotel & catering and passenger traffic after SARS outbreak



Source: CEIC, UBS estimates

Figure 6: Retail sales, IP and GDP also rebounded sequentially in Q203



Source: CEIC, UBS estimates

Specifically for the semiconductor industry, we note that UBS is currently forecasting semiconductor capex in China of US\$8.6bn in 2020, up 41% from 2019. However, majority of the uptick is in NAND flash and SMIC, where YMTC is expected to expand its capacity significantly and SMIC is expanding its leading edge. Taking out YMTC and SMIC, China capex is still increasing, but we would expect some downside due to lower demand. We also note that ASM historically

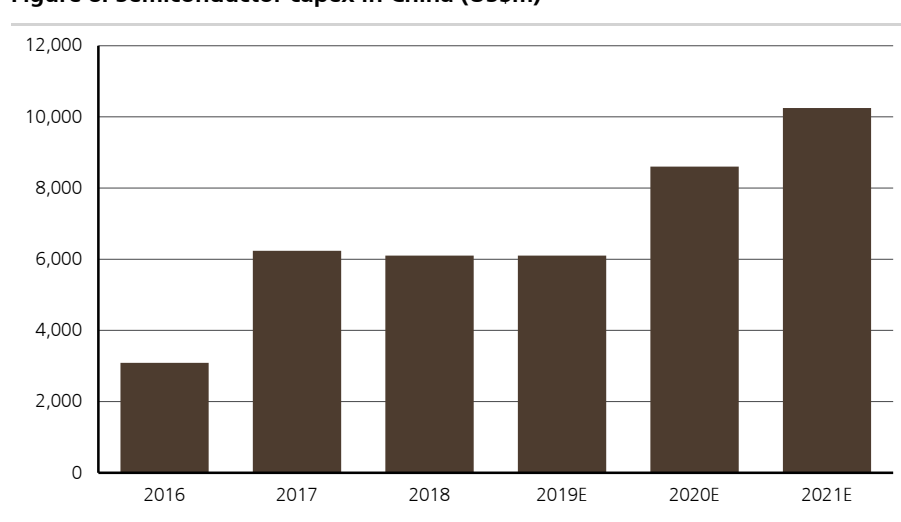
does better in logic versus memory (but is gaining share in Korean memory), and in the case of YMTC, we believe the company uses competitor Kulicke & Soffa exclusively.

Figure 7: Semiconductor capex by major companies in China

		2019E	% YoY	2020E	% YoY
SMIC	Foundry	1,500	-34.8%	1,500	0.0%
Shanghai Huali	Foundry	600	20.0%	1,000	66.7%
Unigroup/YMTC	Memory	3,500	50.0%	4,500	33.3%
	DRAM	500		500	
	NAND	3,000		4,000	
Fujian Jinhua IC	DRAM	--		--	
Changxin Memory (Innotron)	DRAM	500	-50.0%	1,600	220.0%
Total		6,100	-21.8%	8,600	41.0%

Source: Company data, UBS estimates

Figure 8: Semiconductor capex in China (US\$m)



Source: Company data, UBS estimates

Lastly, advanced package is a long-term growth driver for ASM, in our view. We continue to believe that ASM's thermal compression bonder (TCB) offers likely the best performance amongst peers, but it also appears to be priced accordingly. Our view is Asian customers are more likely to adopt solutions from BE Semi, KNS, or Shinkawa (for memory), whereas ASM's lead is more significant with US IDMs. With Intel spending most of its capex on EUV, 10nm and 7nm development, we believe packaging capex likely follows when the front-end process is more mature, potentially in 2021.

PIVOTAL QUESTIONS

[return](#) ↑**Q: What's the outlook for surface mount technology (SMT)?****UBS VIEW**

We see SMT sales to the auto sector rebounding in 2020, along with auto unit growth. However, we are sceptical about SMT sales to the smartphone sector, and thus our estimates are below consensus.

EVIDENCE

Conversations with industry experts would suggest that technology wise, what Apple's suppliers purchased three years ago is still state-of-art, and thus we believe Apple could potentially break from the three-year upgrade cadence.

WHAT'S PRICED IN?

We think investors expect a large increase in SMT growth this year, partially from an auto rebound, but more so because, historically, Apple upgrades equipment on a three-year cycle.

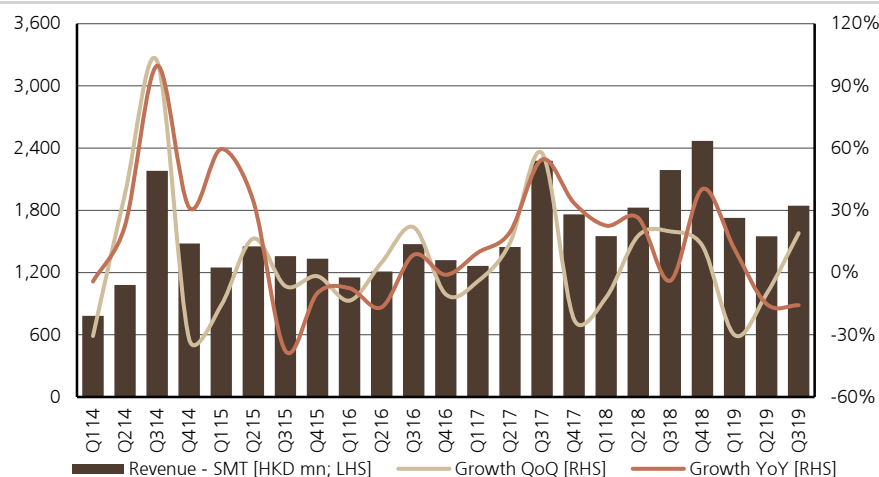
We think investors are bullish on SMT growth for two reasons: 1) Apple upgrade cycle; and 2) auto sector rebounding.

Will Apple suppliers upgrade SMT this year? We think the odds are lower than 50/50

On Apple, we note that Apple and its suppliers historically upgrade SMT equipment on a three-year cycle, the last one being 2017 with the iPhone 10. As shown in Figure 9 below, ASM saw significant increases in 2014 and 2017, which we believe was a result of Apple's procurement. In 2014, we believe the uptick was smaller as ASM had roughly 50% of the business, and in 2017, ASM was the exclusive supplier. Investors generally expect another upgrade cycle this year, since it has been another three years, and also the iPhone 12 is a larger design change versus the last two years.

We are more sceptical than consensus on this. We note that with the iPhone 10, Apple moved to substrate-like PCB (SLP). Now, three years later, SLP is in fact still the best technology in the industry, and there is nothing superior at a reasonable cost. In fact, many in the Android camp have not moved to SLP for cost reasons. Given such, we are puzzled as to why Apple would upgrade. Certainly we can see Apple suppliers adding to the fleet of tools as the iPhone 12 could drive more volume and use a slightly larger PCB, but we believe a complete change of the equipment set is unlikely, since there is nothing new, in our view.

Figure 9: ASM Pacific's historical SMT revenue vs revenue growth

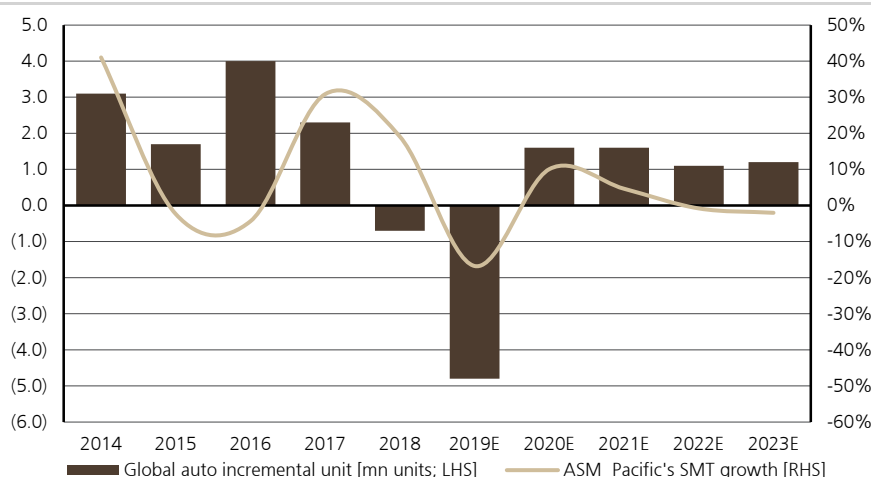


Source: Company data

Auto set for a modest rebound

The other driver for ASM's SMT business historically is automotive. As shown in Figure 10 below, ASM's SMT revenue does correlate with incremental units. In 2020, UBS is expecting a modest rebound in auto units, and given such, a modest increase in SMT sales is a reasonable scenario. With that said, our view is that risk is to the downside, given the supply chain disruptions that are happening with the coronavirus.

Figure 10: ASM Pacific's SMT growth vs global auto incremental shipments



Source: Company data, UBS estimates

WHAT'S PRICED IN?

[return](#) ↑

Revising our estimates

We lower our 2020 revenue estimates to 10% growth, which assumes equipment revenues grows by 10% and SMT grows by 10%. We also assume that lead frame grows in line with industry growth, roughly 8%. As a point of reference, consensus is at 21% growth for 2020 and 11% for 2021.

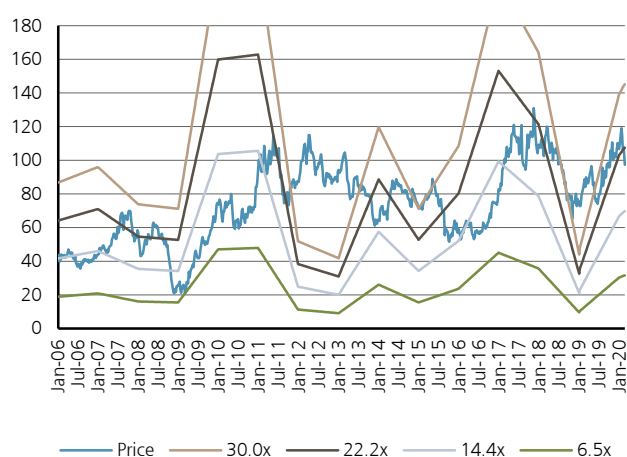
We lower our GM estimates, especially for H120. We believe the coronavirus likely will cause disruptions in the supply chain, both in terms of labour availability and parts disruptions. We would expect this to have the biggest impact in H120, with production back to normal in H220. Added together, we forecast 2020/21 EPS of NT\$4.62/6.09, down 19%/9% from our previous estimates and roughly 10% below consensus for 2020 and 5% below consensus for 2021.

Lowering our price target

We lower our price target from HK\$112.00 to HK\$75.00, representing 21% downside. Our price target is based on 16x 2020E PE, which is mid-cycle valuation applied to our lower-than-consensus earnings estimate. The stock is currently trading at 20x forward PE, vs a historical trading range of 10-25x PE.

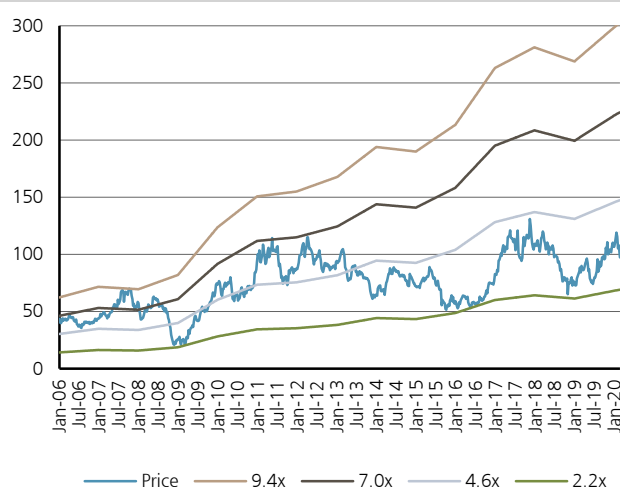
ASM has rebounded >50% from the beginning of 2019 with the global rerating of semi stocks, as well as growth expectations for 2020. Meanwhile, with global semi shares trading at record multiples, we believe a trough valuation is unlikely, but even if ASM trades down to a mid-cycle valuation, we see significant downside.

Figure 11: ASM Pacific historical trading band – PE (HK\$)



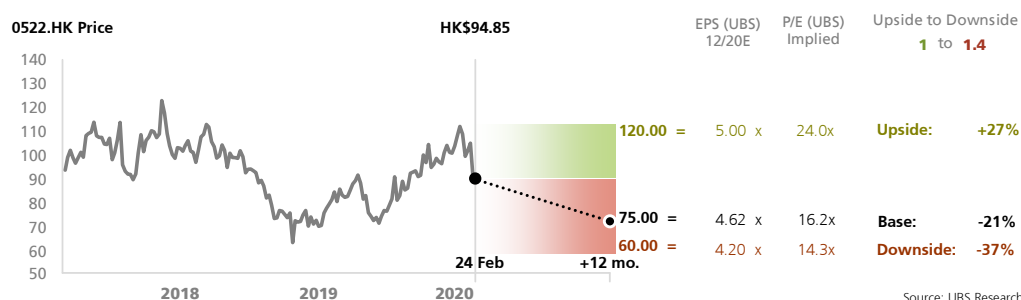
Source: Bloomberg, UBS estimates

Figure 12: ASM Pacific historical trading band - P/BV (HK\$)



Source: Bloomberg, UBS estimates

UPSIDE / DOWNSIDE SPECTRUM

[return](#) ↑

ASM Pacific is trading
at HK\$94.85
(as of 24 February).

Value drivers (2020E)

	Backend equip. revenue growth	SMT equip. revenue growth	Gross margin
HK\$120.00 upside	20%	25%	38.5%
HK\$75.00 base	10%	10%	35.7%
HK\$60.00 downside	5%	5%	33.5%

Source: UBS estimates

Risk to the current share price is skewed (1:1.4) to the downside

ASM Pacific is trading at **HK\$94.85** (as of 24 February).

Upside (HK\$120.00) In our upside scenario, we assume ASM's sales growth is stronger than in our base case as: 1) overall semis demand growth is better than expected; 2) faster adoption of substrate-like PCB from Android smartphone suppliers and faster 5G roll-out, which drive SMT sales; and 3) advanced packaging business is meaningfully ramping up. If these events materialise, we would expect 23% revenue growth in 2020, compared with our base-case estimate of 10%. We assume gross margin to rise to 38.5% owing to better demand/favourable product mix and greater cost savings. As a result, assume 2020E EPS would increase to HK\$5.00. Our valuation in this scenario would be HK\$120.00 per share, implying a peak valuation of 24x 2020E PE.

Base (HK\$75.00) In our base-case scenario, we expect ASM's revenue to increase 10% in 2020 due to demand uncertainties in China and potentially weaker-than-expected SMT sales, plus upside from partial equipment upgrades in the Apple supply chain, modest demand from auto and 5G roll-out. We expect GM to improve slightly, from 34.4% in 2019E to 35.7% in 2020E. We base our HK\$75.00 price target on 16x 2020E PE.

Downside (HK\$60.00) In our downside scenario, we assume ASM's sales growth is weaker than in our base case owing to: 1) lacklustre semis demand growth; 2) sluggish SMT orders; and 3) limited demand for the advanced packaging business. We assume gross margin declines to 33.5% owing to low demand. As a result, we assume 2020E EPS would drop to HK\$4.20. Our valuation in this scenario would be HK\$60.00 per share, implying a trough valuation of 14x 2020E PE.

Figure 13: Earnings forecasts

(HK\$ m)	2019E	Q120E	Q220E	Q320E	Q420E	2020E	2021E
Revenue	15,265	3,607	3,975	4,659	4,528	16,770	18,086
- YoY chg (%)	-22%	-1%	9%	29%	9%	10%	8%
- QoQ chg (%)	-	-6%	10%	17%	-3%	-	-
Gross profit	5,247	1,170	1,369	1,755	1,688	5,982	7,248
- Gross margin	34.4%	32.4%	34.4%	37.7%	37.3%	35.7%	40.1%
Operating income	1,205	369	542	873	816	2,599	3,267
- Operating margin	7.9%	10.2%	13.6%	18.7%	18.0%	15.5%	18.1%
Non-op income	-219	-64	-64	-63	-63	-253	-231
Pre-tax income	986	305	478	810	753	2,346	3,100
Net income	627	246	385	650	604	1,885	2,488
Diluted EPS (HK\$)	1.53	0.60	0.94	1.59	1.48	4.62	6.09
- YoY chg (%)	-71%	123%	249%	834%	171%	201%	32%
- QoQ chg (%)	-	10%	56%	69%	-7%	-	-

Source: Company data, UBS estimates

Figure 14: Earnings revisions

(HK\$m)	New			Old			Change		
	2019E	2020E	2021E	2019E	2020E	2021E	2019E	2020E	2021E
Revenue	15,265	16,770	18,086	15,265	18,855	19,649	0%	-11%	-8%
- YoY chg	-22%	10%	8%	-22%	24%	4%			
Gross profits	5,247	5,982	7,248	5,247	6,958	7,877	0%	-14%	-8%
- Gross margin	34.4%	35.7%	40.1%	34.4%	36.9%	40.1%			
Operating profits	1,205	2,599	3,267	1,205	3,153	3,561	0%	-18%	-8%
- Operating margin	7.9%	15.5%	18.1%	7.9%	16.7%	18.1%			
Pre-tax income	986	2,346	3,100	986	2,900	3,394	0%	-19%	-9%
Reported net income	627	1,885	2,488	627	2,328	2,723	0%	-19%	-9%
- YoY chg	-72%	201%	32%	-72%	271%	17%			
Diluted EPS (HK\$)	1.53	4.62	6.09	1.53	5.70	6.67	0%	-19%	-9%
- YoY chg	-71%	201%	32%	-71%	272%	17%			

Source: Company data, UBS estimates

COMPANY DESCRIPTION

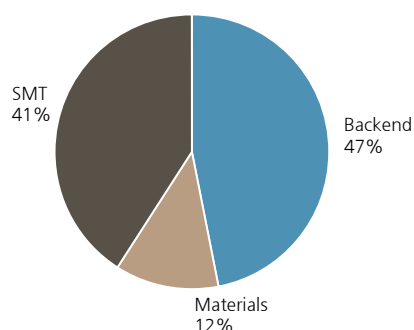
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ASM Pacific Technology (ASM) is a global market leader in the supply of semiconductor packaging and assembly (back-end) equipment. In terms of product mix, in 2018 semiconductor back-end equipment accounted for 47% of sales, surface-mount technology (SMT) 41%, and lead frames 12%. ASM was formed in 1975 and is a subsidiary of Dutch-listed ASM International. ASM was listed on the Hong Kong Stock Exchange in 1989.

Industry outlook

For traditional packaging equipment, some new technologies are entering volume production: InFO and SiP. The advanced packages are picking up steam as TSMC increases its 2019/2020E capex for 5/7nm, but unit demand is small at present. These new technologies offer opportunities for new equipment suppliers, and we think the upside for ASM is uncertain. For the SMT segment, we expect a slowdown in 2019 but foresee some potential upsides in 2020, due to equipment upgrades in the Apple supply chain and 5G roll-out.

Revenues by segment (2018)



Source: Company data

Revenue by segment

(HK\$m)	2015	2016	2017	2018	2019E	2020E	2021E
Backend	5,870	7,220	8,630	9,260	6,710	7,390	8,183
Materials	1,715	1,872	2,144	2,255	1,868	2,019	2,199
SMT	5,392	5,157	6,749	8,036	6,688	7,362	7,703
Total	12,977	14,249	17,523	19,551	15,265	16,770	18,086

Source: Company data, UBS estimates

ASM Pacific Technology (0522.HK)

	12/16	12/17	12/18	12/19E	% ch	12/20E	% ch	12/21E	12/22E	12/23E
Income statement (HK\$m)										
Revenues	14,249	17,523	19,551	15,265	-21.9	16,770	9.9	18,086	19,162	19,505
Gross profit	5,357	7,051	7,437	5,247	-29.4	5,982	14.0	7,248	7,858	7,994
EBITDA (UBS)	2,526	3,690	3,711	1,671	-55.0	3,092	85.1	3,826	4,098	4,151
Depreciation & amortisation	(395)	(422)	(462)	(465)	0.7	(492)	5.8	(559)	(587)	(575)
EBIT (UBS)	2,131	3,268	3,248	1,205	-62.9	2,599	115.7	3,267	3,511	3,577
Associates & investment income	0	0	0	0	-	0	-	0	0	0
Other non-operating income	(149)	169	(98)	(7)	92.6	(10)	-39.4	64	61	59
Net interest	(189)	(162)	(178)	(212)	-19.3	(243)	-14.5	(231)	(219)	(208)
Exceptionals (incl goodwill)	0	0	0	0	-	0	-	0	0	0
Profit before tax	1,793	3,274	2,973	986	-66.8	2,346	138.0	3,100	3,353	3,427
Tax	(355)	(479)	(761)	(362)	52.5	(469)	-29.6	(620)	(671)	(685)
Profit after tax	1,438	2,796	2,212	624	-71.8	1,877	200.8	2,480	2,682	2,742
Preference dividends	0	0	0	0	-	0	-	0	0	0
Minorities	25	20	4	1	-66.3	8	NM	8	8	8
Extraordinary items	0	0	0	0	-	0	-	0	0	0
Net earnings (local GAAP)	1,464	2,815	2,216	625	-71.8	1,885	201.4	2,488	2,690	2,750
Net earnings (UBS)	1,464	2,815	2,216	625	-71.8	1,885	201.4	2,488	2,690	2,750
Tax rate (%)	19.8	14.6	25.6	36.7	43.4	20.0	-45.5	20.0	20.0	20.0
Per share (HK\$)										
EPS (UBS, diluted)	3.61	6.51	5.30	1.53	-71.0	4.62	201.0	6.09	6.59	6.73
EPS (local GAAP, diluted)	3.61	6.51	5.30	1.53	-71.0	4.62	201.0	6.09	6.59	6.73
EPS (UBS, basic)	3.62	6.90	5.47	1.54	-71.8	4.64	200.9	6.12	6.62	6.77
Net DPS (HK\$)	1.20	2.17	2.62	1.90	-27.4	2.54	33.6	3.35	3.62	3.70
Cash EPS (UBS, diluted) ¹	4.58	7.48	6.40	2.67	-58.2	5.82	117.7	7.46	8.03	8.14
Book value per share	22.61	27.87	29.79	28.50	-4.3	31.64	11.0	34.51	37.55	40.54
Average shares (diluted)	405.45	432.66	418.50	407.78	-2.6	408.34	0.1	408.34	408.34	408.34
Balance sheet (HK\$m)										
Cash and equivalents	2,139	2,366	2,240	5,612	150.5	6,972	24.2	7,976	9,217	10,146
Other current assets	9,779	12,206	12,928	9,194	-28.9	10,342	12.5	10,191	10,935	10,819
Total current assets	11,918	14,572	15,168	14,806	-2.4	17,313	16.9	18,166	20,153	20,965
Net tangible fixed assets	2,158	2,426	2,850	2,937	3.0	3,144	7.1	3,285	3,398	3,523
Net intangible fixed assets	0	0	0	0	-	0	-	0	0	0
Investments / other assets	1,563	1,603	3,057	4,596	50.3	4,596	0.0	4,596	4,596	4,596
Total assets	15,639	18,600	21,075	22,339	6.0	25,053	12.2	26,048	28,147	29,084
Trade payables & other ST liabilities	3,896	4,667	7,007	5,014	-28.4	5,502	9.7	5,262	5,641	5,543
Short term debt	2,341	117	786	504	-35.92	504	0.00	504	504	504
Total current liabilities	6,237	4,784	7,793	5,518	-29.2	6,006	8.8	5,766	6,145	6,047
Long term debt	0	0	0	0	-	0	-	0	0	0
Other long term liabilities	376	2,439	1,122	5,187	362.2	6,130	18.2	6,196	6,674	6,490
Preferred shares	0	0	0	0	-	0	-	0	0	0
Total liabilities (incl pref shares)	6,613	7,223	8,915	10,705	20.1	12,136	13.4	11,962	12,819	12,537
Common s/h equity	9,026	11,377	12,161	11,634	-4.3	12,917	11.0	14,086	15,327	16,547
Minority interests	0	0	0	0	-	0	-	0	0	0
Total liabilities & equity	15,639	18,600	21,075	22,339	6.0	25,053	12.2	26,048	28,147	29,084
Cash flow (HK\$m)										
Net income (before pref divs)	1,464	2,815	2,216	625	-71.8	1,885	201.4	2,488	2,690	2,750
Depreciation & amortisation	395	422	462	465	0.7	492	5.8	559	587	575
Net change in working capital	(13)	(1,997)	(2,295)	3,495	-	(876)	-	(2)	(523)	82
Other operating	112	381	1,559	507	-67.5	209	-58.8	(96)	150	(72)
Operating cash flow	1,958	1,621	1,942	5,093	162.2	1,710	-66.4	2,950	2,904	3,335
Tangible capital expenditure	(367)	(559)	(763)	(575)	24.6	(700)	-21.7	(700)	(700)	(700)
Intangible capital expenditure	0	0	0	0	-	0	-	0	0	0
Net (acquisitions) / disposals	0	0	0	0	-	0	-	0	0	0
Other investing	(876)	420	(900)	(29)	-	0	-	0	0	0
Investing cash flow	(1,243)	(139)	(1,662)	(604)	63.7	(700)	-15.9	(700)	(700)	(700)
Equity dividends paid	(487)	(939)	(1,095)	(775)	29.2	(1,037)	-33.8	(1,368)	(1,480)	(1,512)
Share issues / (buybacks)	0	0	0	0	-	0	-	0	0	0
Other financing	(84)	(386)	28	3,741	13,205.28	1,387	-62.93	123	517	(194)
Change in debt & pref shares	15	(78)	723	(144)	-	0	-	0	0	0
Financing cash flow	(556)	(1,403)	(344)	2,823	-	350	-87.6	(1,246)	(963)	(1,706)
Cash flow inc/(dec) in cash	158	79	(64)	7,311	-	1,360	-81.4	1,004	1,242	929
FX / non cash items	(40)	148	(62)	(3,940)	NM	0	-	0	0	0
Balance sheet inc/(dec) in cash	119	227	(126)	3,371	-	1,360	-59.7	1,004	1,242	929

Source: Company accounts, UBS estimates. (UBS) metrics use reported figures which have been adjusted by UBS analysts. ¹Cash EPS (UBS, diluted) is calculated using UBS net income adding back depreciation and amortization.

ASM Pacific Technology (0522.HK)

Valuation (x)	12/16	12/17	12/18	12/19E	12/20E	12/21E	12/22E	12/23E
P/E (local GAAP, diluted)	17.4	16.5	18.0	61.8	20.5	15.6	14.4	14.1
P/E (UBS, diluted)	17.4	16.5	18.0	61.8	20.5	15.6	14.4	14.1
P/CEPS	13.7	13.5	14.4	35.3	16.2	12.6	11.8	11.6
Equity FCF (UBS) yield %	6.3	2.4	3.0	11.7	2.6	5.8	5.7	6.8
Net dividend yield (%)	1.9	2.0	2.8	2.0	2.7	3.5	3.8	3.9
P/BV x	2.8	3.8	3.2	3.3	3.0	2.7	2.5	2.3
EV/revenues (core)	1.8	2.4	1.9	2.3	2.0	1.8	1.6	1.5
EV/EBITDA (core)	10.0	11.5	10.0	21.2	10.7	8.3	7.5	7.1
EV/EBIT (core)	11.9	13.0	11.4	29.4	12.7	9.7	8.7	8.3
EV/OpFCF (core)	10.4	11.8	10.2	22.2	10.9	8.5	7.6	7.3
EV/op. invested capital	2.9	4.6	3.7	4.1	5.1	4.9	4.6	4.4
Enterprise value (HK\$m)	12/16	12/17	12/18	12/19E	12/20E	12/21E	12/22E	12/23E
Market cap.	25,069	43,454	38,816	38,718	38,718	38,718	38,718	38,718
Net debt (cash)	242	(1,023)	(1,851)	(3,281)	(5,788)	(6,970)	(8,093)	(9,178)
Buy out of minorities	0	0	0	0	0	0	0	0
Pension provisions/other	0	0	0	0	0	0	0	0
Total enterprise value	25,311	42,430	36,965	35,437	32,930	31,748	30,625	29,540
Non core assets	0	0	0	0	0	0	0	0
Core enterprise value	25,311	42,430	36,965	35,437	32,930	31,748	30,625	29,540
Growth (%)	12/16	12/17	12/18	12/19E	12/20E	12/21E	12/22E	12/23E
Revenue	9.8	23.0	11.6	-21.9	9.9	7.8	6.0	1.8
EBITDA (UBS)	31.7	46.1	0.6	-55.0	85.1	23.7	7.1	1.3
EBIT (UBS)	38.4	53.4	-0.6	-62.9	115.7	25.7	7.5	1.9
EPS (UBS, diluted)	52.2	80.2	-18.6	-71.0	NM	32.0	8.1	2.2
Net DPS	-47.8	80.8	20.6	-27.4	33.6	32.0	8.1	2.2
Margins & Profitability (%)	12/16	12/17	12/18	12/19E	12/20E	12/21E	12/22E	12/23E
Gross profit margin	37.6	40.2	38.0	34.4	35.7	40.1	41.0	41.0
EBITDA margin	17.7	21.1	19.0	10.9	18.4	21.2	21.4	21.3
EBIT margin	15.0	18.7	16.6	7.9	15.5	18.1	18.3	18.3
Net earnings (UBS) margin	10.3	16.1	11.3	4.1	11.2	13.8	14.0	14.1
ROIC (EBIT)	24.3	35.6	32.8	14.0	40.1	50.0	53.1	52.9
ROIC post tax	19.5	30.4	24.4	8.9	32.0	40.0	42.5	42.3
ROE (UBS)	17.2	27.6	18.8	5.3	15.4	18.4	18.3	17.3
Capital structure & Coverage (x)	12/16	12/17	12/18	12/19E	12/20E	12/21E	12/22E	12/23E
Net debt / EBITDA	0.1	(0.6)	(0.4)	(3.1)	(2.1)	(2.0)	(2.1)	(2.3)
Net debt / total equity %	2.2	(19.8)	(12.0)	(43.9)	(50.1)	(53.0)	(56.9)	(58.3)
Net debt / (net debt + total equity) %	2.2	(24.6)	(13.6)	(78.3)	NM	NM	NM	NM
Net debt/EV %	0.8	(5.3)	(3.9)	(14.4)	(19.6)	(23.5)	(28.5)	(32.6)
Capex / depreciation %	92.9	132.6	165.0	123.6	142.1	125.2	119.2	121.8
Capex / revenue %	2.6	3.2	3.9	3.8	4.2	3.9	3.7	3.6
EBIT / net interest	11.3	20.1	18.3	5.7	10.7	14.2	16.0	17.2
Dividend cover (UBS)	3.0	3.2	2.1	0.8	1.8	1.8	1.8	1.8
Div. payout ratio (UBS) %	33.2	31.5	47.8	123.3	54.7	54.7	54.7	54.7
Revenues by division (HK\$m)	12/16	12/17	12/18	12/19E	12/20E	12/21E	12/22E	12/23E
Backend equipment	7,220	8,630	9,260	6,710	7,390	8,183	9,293	9,799
SMT equipment	5,157	6,749	8,036	6,688	7,362	7,703	7,640	7,485
Leadframe	1,872	2,144	2,255	1,868	2,019	2,199	2,228	2,221
Others	0	0	0	0	0	0	0	0
Total	14,249	17,523	19,551	15,265	16,770	18,086	19,162	19,505
EBIT (UBS) by division (HK\$m)	12/16	12/17	12/18	12/19E	12/20E	12/21E	12/22E	12/23E
Others	2,131	3,268	3,248	1,205	2,599	3,267	3,511	3,577
Total	2,131	3,268	3,248	1,205	2,599	3,267	3,511	3,577

Source: Company accounts, UBS estimates. (UBS) metrics use reported figures which have been adjusted by UBS analysts.

Realtek Semiconductor Corp.

Downgrade on China risks and TWS competition

Growth moderating

Realtek shares historically trade with the company's YoY revenue growth rate and we see growth moderating in 2020. We are 15% below consensus for 2020 earnings and believe PE multiple could contract to the 10x to 18x range. Given such, we downgrade Realtek from Neutral to Sell, and lower our price target from NT\$235.00 to NT\$200.00, implying 16% downside. Key risks are China exposure generally and true wireless stereo (TWS) specifically.

True wireless: near-term downside to unit sales, long-term downside to ASP

We see some downside to TWS demand in the near-term: 1) smartphone sales in China are likely impacted by the coronavirus; and 2) we believe suppliers built some inventory into CNY. The more critical concern is ASP. We see local Chinese competitors ramping in 2020 and offering chips at less than half the price of Realtek. This could pressure profits and we expect TWS to decline to 6% of total gross profits, down from around 15% in 2019E.

What about other growth areas?

We see potential for several products: Wi-Fi 6, auto Ethernet and additional IoT opportunities. With that said, our analysis shows that they are not enough to offset the TWS and China downside in 2020. We would look to get more bullish if contributions from new products were to become more meaningful.

Valuation: Downgrade from Neutral to Sell, PT cut to NT\$200.00

Realtek shares historically trade at 8x to 18x PE multiple, and the multiple tends to correlate with YoY revenue growth. The stock rebounded in 2019 on significant growth, but we think it could de-rate in 2020 given our expectation for slower growth. We think a trough valuation is unlikely as global semi shares have re-rated, but our new price target of NT\$200.00 is based on a mid-cycle valuation of 16x 2020E PE (vs 18x 2020E PE previously).

Equities

Taiwan

Semiconductors

12-month rating **Sell**
Prior: Neutral
12m price target **NT\$200.00**
Prior: NT\$235.00
Price (24 Feb 2020) **NT\$239.00**
RIC: 2379.TW **BBG:** 2379 TT

Trading data and key metrics

52-wk range NT\$262.00-165.00

Market cap. NT\$121bn/US\$3.99bn

Shares o/s 508m (ORD)

Free float 77%

Avg. daily volume ('000) 3,283

Avg. daily value (m) NT\$801.5

Common s/h equity (12/19E) NT\$25.2bn

P/BV (12/19E) 4.8x

Net debt / EBITDA (12/19E) 2.6x

EPS (UBS, diluted) (NT\$)

	From	To	% ch	Cons.
12/19E	13.36	13.36	0	13.36
12/20E	12.98	12.26	-6	14.49
12/21E	11.67	11.42	-2	15.69

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Highlights (NT\$m)	12/16	12/17	12/18	12/19E	12/20E	12/21E	12/22E	12/23E
Revenues	38,914	41,688	45,806	60,744	62,565	63,701	66,420	69,988
EBIT (UBS)	3,343	3,192	3,758	6,331	6,266	6,026	6,501	7,219
Net earnings (UBS)	3,040	3,380	4,338	6,790	6,230	5,805	6,163	6,804
EPS (UBS, diluted) (NT\$)	6.02	6.69	8.54	13.36	12.26	11.42	12.13	13.39
DPS (NT\$)	4.00	4.99	5.50	6.00	10.96	9.81	9.14	9.70
Net (debt) / cash	17,156	(8,458)	(10,217)	(20,320)	(17,296)	(18,643)	(17,918)	(17,032)
Profitability/valuation	12/16	12/17	12/18	12/19E	12/20E	12/21E	12/22E	12/23E
EBIT margin %	8.6	7.7	8.2	10.4	10.0	9.5	9.8	10.3
ROIC (EBIT) %	72.7	76.2	131.8	194.9	159.9	154.7	116.4	107.3
EV/EBITDA (core) x	6.3	5.1	7.1	11.9	13.3	14.1	13.5	12.4
P/E (UBS, diluted) x	16.4	16.4	14.5	17.9	19.5	20.9	19.7	17.8
Equity FCF (UBS) yield %	9.7	5.9	12.0	2.6	7.2	2.9	4.3	4.7
Net dividend yield %	4.1	4.6	4.4	2.5	4.6	4.1	3.8	4.1

Source: Company accounts, Thomson Reuters, UBS estimates. Metrics marked as (UBS) have had analyst adjustments applied. Valuations: based on an average share price that year, (E): based on a share price of NT\$239.00 on 24 Feb 2020 13:56 HKT

UBS Research THESIS MAP a guide to our thinking and what's where in this report**PIVOTAL QUESTIONS****Q: Is the strength of true wireless stereo (TWS) sustainable?**

We expect significant unit growth in 2020 but think the coronavirus could cause short-term disruptions to demand. More importantly, we believe competition is picking up and therefore pricing likely has downside. Our analysis suggests that TWS as a percentage of profits will decline from 13% in 2019 to 6% in 2020E.

[more →](#)**Q: What about other growth drivers such as auto, DTV and Wi-Fi 6?**

Unlikely for 2019/2020E. We are fundamentally positive on the business potential of auto Ethernet and Wi-Fi 6 in the longer term, but think current market expectations for a pick-up appear too high.

[more →](#)**UBS VIEW**

We downgrade Realtek to a Sell rating mainly to factor in downside from Bluetooth – mostly from the TWS business, which we expect to contribute 6% of profits in 2020E from 15% in 2019E as the ramp up of Chinese players could intensify competition and put downward pressure on pricing, plus the potential impact on China smartphone sales from the coronavirus. Potential drivers in the longer term include auto Ethernet and Wi-Fi 6, but this is a few years away, in our view.

EVIDENCE

Although Realtek was first with a Bluetooth/audio codec solution, we are seeing more competition, especially on ASP, which is in the US\$1.2-1.5 range from US\$2 at the beginning of 2019. Our scenario analysis shows TWS likely contributed 9%/15% to Realtek's 2019 revenue/gross profit, but in our base case, it would be only 6%/6% for 2020E.

WHAT'S PRICED IN?

Realtek is trading at 20x forward PE, which is at its peak valuation. The share price has doubled from the trough in October 2018. We believe the market expects growth momentum to continue and ASP to remain stable with features like ANC and the meaningful pick-up of potential drivers like Wi-Fi 6 and auto Ethernet.

[more →](#)**UPSIDE / DOWNSIDE SPECTRUM**

Value drivers (2020E)	Networking revenue growth	Gross margin	Target PE
NT\$300 upside	10%	46.0%	22x
NT\$200 base	2%	43.0%	16x
NT\$150 downside	-5%	39.0%	13x

Source: UBS

[more →](#)**COMPANY DESCRIPTION**

Founded in 1987, Realtek Semiconductor (Realtek) is one of the world's leading integrated circuit (IC) design houses. It has technological expertise in digital and mixed-signal IC...

[more →](#)

PIVOTAL QUESTIONS

[return](#) ↑**Q: Is the strength of true wireless stereo (TWS) sustainable?****UBS VIEW**

We expect significant unit growth in 2020 but think the coronavirus could cause short-term disruptions to demand. More importantly, we believe competition is picking up and therefore pricing likely has downside. Our analysis suggests that TWS as a percentage of profits will decline from 13% in 2019 to 6% in 2020E.

EVIDENCE

We note that SMIC is reporting strong growth in Bluetooth sales, and most of Realtek's Chinese competitors use SMIC as their supplier. We also note that ASP has started to decline for chips.

WHAT'S PRICED IN?

Realtek shares are trading at peak valuation, and thus we believe investors generally expect growth to continue and for ASP to remain stable with additional features such as active noise cancellation.

We see risk to both unit sales and ASP

We estimate TWS was 8-10% of Realtek's revenues and 13-17% of profits in 2019. Going into 2020, we see downside to consensus for both unit sales and ASP, which means it likely declines to roughly 6% as a share of total gross profit.

TWS is seeing growth structurally, but the non-Apple market likely will see China related impact. Our base case assumption is that the TWS market was roughly 150m units in 2019E and will grow to 250m units in 2020E. Of that, we see China growing from 100m units in 2019 to 150m units in 2020. We think this is not unreasonable for a product that is now becoming ubiquitous, but we are concerned about the near-term for two reasons: 1) we believe the run-rate in Q4 would suggest that there is some inventory in the channel already; and 2) with the coronavirus, demand in Q1 will likely come in below expectations. We also note that on the Q1 conference call, management stated that they have not seen impact from the virus. Our view is that, timing wise, when the company reported the quarter, it was too early to tell.

We see pricing as the bigger risk longer-term. Realtek's TWS ASP has declined moderately over the past 12 months. We note that at the beginning of 2019, ASP was roughly US\$2 but is now in the US\$1.2-1.5 range, depending on features. The high-end chip with active noise cancellation (ANC) is still at US\$2. We also note that Chinese competitors such as BES are pricing at below US\$0.40. The presence of Chinese competitors is not new, but we believe the capabilities of Chinese competitors have improved. Most still cannot offer ANC, but they match the other features and thus can now address the mainstream market. Given the large discrepancy in pricing, we believe Realtek could see more meaningful pricing downside in 2020 and beyond. Can ANC become a standard feature and thus help maintain ASP? Our view is that, first of all, this would be difficult as ANC requires a

tight seal around the ear canal, which is potentially a safety hazard for everyday use. Secondly, ANC design is significantly more difficult, and thus we are not sure if many of the Chinese TWS makers would move to it quickly.

Figure 15: Scenario analysis of TWS contribution to Realtek

	2019E		2020E	
		Bull	Base	Bear
Total brand market volume (m pairs)	150	350	250	150
- Apple volume	50	150	100	75
Realtek's market share	30%	25%	20%	15%
- Implied market share for non-apple	45%	44%	33%	30%
Revenue (NT\$m)	5,559	7,873	3,599	1,350
% of total revenue	9%	13%	6%	2%
Gross profit	3,336	4,199	1,500	405
Gross margin	60%	53%	42%	30%
% of total gross profit	13%	16%	6%	2%

Source: UBS estimates

PIVOTAL QUESTIONS

[return](#) ↑**Q: What about other growth drivers such as auto, DTV and Wi-Fi 6?****UBS VIEW**

Unlikely for 2019/2020E. We are fundamentally positive on the business potential of auto Ethernet and Wi-Fi 6 in the longer term, but think current market expectations for a pick-up appear too high.

EVIDENCE

UBS Evidence Lab did a tear-down on Tesla Model 3 ([link](#)), which shows that Tesla has used Ethernet as the connectivity system within the central control module (CCM). Some other automakers have implemented Ethernet to connect part of the electronic modules, especially for those that are data intensive, but the usage is still limited as of total. For Wi-Fi 6, we believe most of the initial Wi-Fi 6 peripherals that are introduced in 2020 will use chipsets from Qualcomm, Broadcom or MediaTek. For Realtek, the company does have some operator wins but it is lagging others in the enterprise and retail markets. For digital TV (DTV), after significant share gains for Realtek, we think upside is likely limited.

WHAT'S PRICED IN?

Realtek shares have traded up to 20x 1-year forward PE from recent trough of 10x in October 2018, as investors are excited about a growth re-acceleration from the auto sector.

Wi-Fi 6:

Wi-Fi 6 is a significant step up in performance from Wi-Fi 5, and thus we are bullish on the adoption. Additionally, we would expect most flagship phones and PCs to use Wi-Fi 6 as 2020 progresses. We also believe that Wi-Fi 6 chips are now roughly 2x the ASP of Wi-Fi 5, thus improving both blended ASP and GM for the companies involved. That said, we believe most of the initial enterprise and retail units have chips from Qualcomm and Broadcom, with MediaTek as number three. We do believe Realtek has some operator wins, but those typically carry lower ASP and GM.

Auto:

Currently, within a vehicle, most of the electronic modules are connected via CAN, FlexRay, MOST and LVDS protocols. These protocols have different bandwidths for data rates and also different cost structures and thus are ideal for different applications. Among these, CAN has been the most widely adopted as its data transmission capability (125kbps to 1mbps) and cost structure are optimal for a vast amount of sub-systems. However, with the increasing data in a car and growing electronic modules, CAN and other existing communication standards no longer suffice for the newer generation of automobiles. That is why there is increasing interest in Ethernet as cars become more autonomous, connected and electric.

We think Realtek investors are excited about this opportunity. We agree that the technology looks promising in the long-term, but are less certain about its earnings contribution in next 2-3 years considering current progress for most auto makers. We note that for auto Ethernet to achieve 1% of total revenue in 2020, it would imply monthly shipments (including switch and PHY) of at least 800k units/month. This translates to around 80k units/month of automobile volume assuming the auto makers roll out to both infotainment and ADAS system. Our industry study suggests that most of Realtek's volume will be for just one European auto maker, and 80k units/month of automobile adoption seems challenging in the initial roll-out.

Why Ethernet for new cars?

Ethernet has not been a mainstream approach for in-car communication as it used to have significant interference issues for high speed connections; other concerns include more complicated data security control for Ethernet than that for CAN. However, the whole industry has become more active in looking into this protocol in recent years given its advantage for ADAS and EV. The key benefits of Ethernet include much wider bandwidth (10 Gbps to 100Mbps) and lower latency over traditional CAN system. This more powerful communication network can enable:

- Increasing electronic modules with stronger functions;
- Faster and more efficient communication between sub-systems;
- Massive savings in wiring usage/weight and cost, which are critical for car performance and BOM cost improvement;
- Simpler electronic module design for inside of sub-system and between sub-systems;
- More comprehensive in-car architecture that integrates more sub-systems and features stronger central control.

Figure 16: Tesla Model 3 –Central Control Module (CCM)



Source: UBS Evidence Lab

Figure 17: UBS BOM analysis of the Tesla Model 3's CCM (US\$)

Manufacturer	Chip	Value
Intel	Atom chip to run main OS	25.0
Memory	2GB DDR4 DRAM	23.5
NXP Semiconductor	32-bit MCU	12.0
Texas Instruments	HDMI to FPD Serializer	6.3
Texas Instruments	HDMI to FPD Serializer	5.8
STMicroelectronics	PMIC	4.2
Intel	Ethernet controller	4.0
Analog Devices	Clock driver	4.0
Maxim Integrated	Voltage regulator x4	3.6
Marvell	Ethernet PHY	3.0
Others		30.4
Total		121.8

Source: UBS, UBS Evidence Lab

WHAT'S PRICED IN?

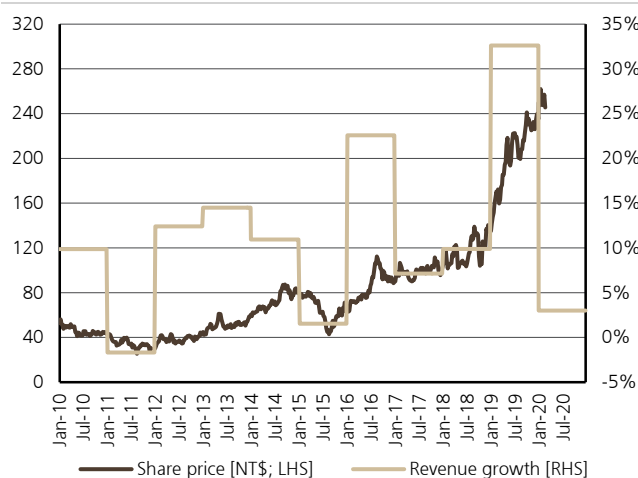
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Revising our estimates and price target

We lower our revenue estimate to 3% growth YoY for 2020. This compares with consensus for 10% growth. We still expect the core business to grow in line with the semiconductor industry at roughly 8% YoY, but we expect TWS contribution to decline by around 10% YoY in 2020 and the other new businesses to see slight growth off of a small base. We revise our 2020E EPS down by 6% to NT\$12.26, which is below consensus by 15%, as we see downside for both unit sales and ASP of TWS products into 2020, and expect TWS likely declines to roughly 6% of total gross profit, from 13-15% level in 2019.

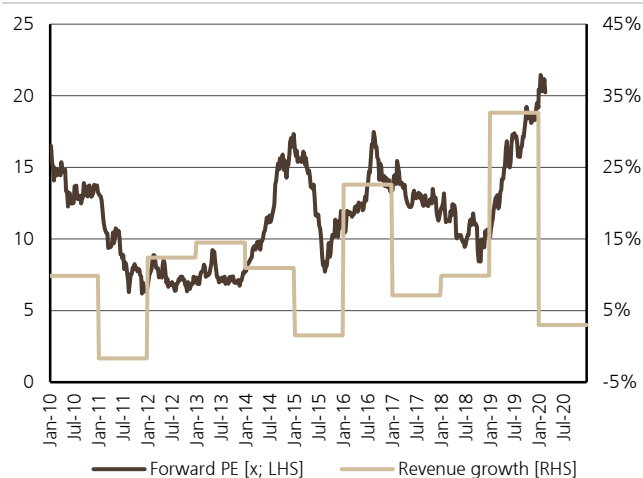
We note that Realtek shares historically trade in line with the YoY growth rate for revenues. The share price hiked about 70% in 2019 and is currently trading at a peak valuation of 20x forward PE. We believe YoY growth likely peaked in 2019 and should trend significantly lower in 2020. Given such, we expect the stock to trade back to a mid-cycle valuation of 10-18x range. Our new price target of NT\$200.00 is based on 16x 2020E PE.

Figure 18: Realtek's share price vs revenue growth



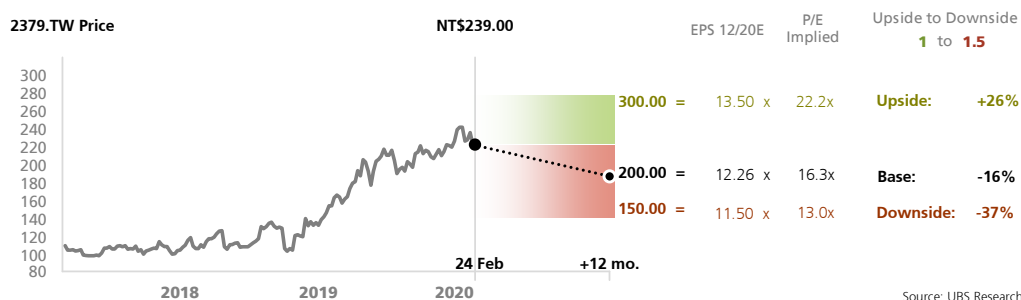
Source: Company data, TEJ, UBS estimates

Figure 19: Realtek's forward PE vs revenue growth



Source: Company data, TEJ, UBS estimates

UPSIDE / DOWNSIDE SPECTRUM

[return](#) ↑

Realtek is trading
at NT\$239.00
(as of 24 February).

Value drivers (2020E)	Networking revenue growth	Gross margin	Target PE
NT\$300 upside	10%	46.0%	22x
NT\$200 base	2%	43.0%	16x
NT\$150 downside	-5%	39.0%	13x

Source: UBS estimates

Risk to the current share price is skewed (1:1.5) to the downside

Realtek is trading at NT\$239.00 (as of 24 February).

Upside (NT\$300.00): In our upside scenario, we assume stronger demand from new Bluetooth/Wi-Fi applications (such as TWS headsets, IoT products, and OTT boxes) and TV markets. We assume PC growth is not impacted by Intel's CPU shortage into 2020 as Intel increases capacity and AMD closes the gap. We also assume that auto Ethernet picks up faster than that in our base case. This would raise our 2020E networking revenue growth to 10% YoY, from 2% YoY in our base case. We assume stronger end demand would help gross margin rise to 46.0%, from 43.0% in our base case. In this scenario, our upside valuation would be NT\$300.00 per share, implying a peak valuation of 22x 2020E PE.

Base (NT\$200.00): In our base case, we expect flattish growth in the Bluetooth/Wi-Fi segment, given intensifying competition in true wireless products. For TV SoC, we expect competition in China to remain fierce while Realtek's share in Korea declines. We assume limited revenue contribution from auto Ethernet. We think that gross margin will slightly decline due to pricing pressure. Based on these assumptions, we forecast 2020 EPS of NT\$12.26. Our NT\$200.00 price target is based on 16x 2020E PE.

Downside (NT\$150.00): In our downside scenario, we assume weaker demand from Bluetooth/Wi-Fi new applications and TV markets. We assume Intel's CPU supply disruption also has a greater impact on the PC market. This would lower our 2020E networking revenue growth to -5%. We assume gross margin would decline to 39.0% due to slower end demand and, thus, price negotiations. In this scenario, our downside valuation would be NT\$150.00 per share, implying 13x 2020E PE.

Figure 20: Earnings forecasts

(NT\$ m)	2019E	Q120E	Q220E	Q320E	Q420E	2020E	2021E
Revenue	60,744	15,350	15,417	16,204	15,594	62,565	63,701
- YoY chg (%)	33%	20%	2%	1%	-7%	3%	2%
- QoQ chg (%)	-	-8%	0%	5%	-4%	-	-
Gross profit	26,584	6,546	6,618	7,055	6,704	26,923	27,418
- Gross margin	43.8%	42.6%	42.9%	43.5%	43.0%	43.0%	43.0%
Operating expense	20,253	4,913	5,233	5,448	5,063	20,657	21,392
Operating income	6,331	1,633	1,384	1,608	1,641	6,266	6,026
- Operating margin	10.4%	10.6%	9.0%	9.9%	10.5%	10.0%	9.5%
Non-op income	905	120	195	155	187	657	424
Pre-tax income	7,235	1,753	1,579	1,762	1,828	6,923	6,450
Net profit	6,790	1,578	1,421	1,586	1,645	6,230	5,805
EPS (NT\$)	13.36	3.11	2.80	3.12	3.24	12.26	11.42
- YoY chg (%)	56%	14%	-23%	-17%	0%	-8%	-7%
- QoQ chg (%)	-	-4%	-10%	12%	4%	-	-

Source: Company data, UBS estimates

Figure 21: Earnings revisions

(NT\$ m)	New			Old			Change		
	2019E	2020E	2021E	2019E	2020E	2021E	2019E	2020E	2021E
Revenue	60,744	62,565	63,701	60,744	63,811	64,157	0%	-2%	-1%
- YoY chg (%)	33%	3%	2%	33%	5%	1%			
Gross profit	26,584	26,923	27,418	26,584	27,501	27,582	0%	-2%	-1%
- Gross margin	43.8%	43.0%	43.0%	43.8%	43.1%	43.0%			
Operating income	6,331	6,266	6,026	6,331	6,664	6,152	0%	-6%	-2%
- Operating margin	10.4%	10.0%	9.5%	10.4%	10.4%	9.6%			
Pre-tax income	7,235	6,923	6,450	7,235	7,329	6,591	0%	-6%	-2%
Net profit	6,790	6,230	5,805	6,790	6,596	5,932	0%	-6%	-2%
- Net margin	11.2%	10.0%	9.1%	11.2%	10.3%	9.2%			
EPS (NT\$)	13.36	12.26	11.42	13.36	12.98	11.67	0%	-6%	-2%

Source: Company data, UBS estimates

COMPANY DESCRIPTION

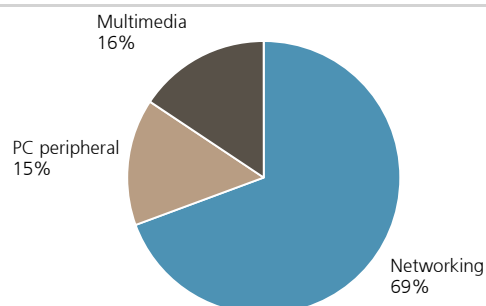
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Founded in 1987, Realtek Semiconductor (Realtek) is one of the world's leading integrated circuit (IC) design houses. It has technological expertise in digital and mixed-signal IC design, with product lines for networking, communication and PC applications. To capture the communication-related market, Realtek started to expand its non-PC penetration and now has over 50% of revenue from non-PC sources.

Industry outlook

For Wi-Fi products, while traditional applications such as PCs and smartphones are slowing, new uses are emerging for Wi-Fi and connectivity, including set-top boxes, wireless speakers, IoT, automotive and more. As for the PC peripheral segment, we remain conservative, given muted PC end demand.

Revenue by application (2019)



Source: Company data

Revenue by product segment (NT\$ m)

	2017	2018	2019	2020E	2021E
Networking	25,902	29,350	42,133	42,874	44,922
PC peripheral	8,207	8,596	9,108	9,390	9,465
Multimedia	7,580	7,860	9,504	10,301	9,315

Source: Company data, UBS estimates

Realtek Semiconductor Corp. (2379.TW)

	12/16	12/17	12/18	12/19E	% ch	12/20E	% ch	12/21E	12/22E	12/23E
Income statement (NT\$m)										
Revenues	38,914	41,688	45,806	60,744	32.6	62,565	3.0	63,701	66,420	69,988
Gross profit	16,897	17,903	20,461	26,584	29.9	26,923	1.3	27,418	28,781	30,268
EBITDA (UBS)	5,043	4,746	5,297	7,885	48.8	7,353	-6.7	6,896	7,198	7,775
Depreciation & amortisation	(1,700)	(1,555)	(1,539)	(1,554)	1.0	(1,088)	-30.0	(870)	(696)	(557)
EBIT (UBS)	3,343	3,192	3,758	6,331	68.5	6,266	-1.0	6,026	6,501	7,219
Associates & investment income	(34)	(41)	(43)	(16)	62.8	0	-	0	0	0
Other non-operating income	(476)	(105)	81	161	99.1	1,117	NM	893	819	784
Net interest	503	568	849	760	-10.5	(461)	-	(469)	(472)	(442)
Exceptionals (incl goodwill)	0	0	0	0	-	0	-	0	0	0
Profit before tax	3,335	3,614	4,645	7,235	55.8	6,923	-4.3	6,450	6,848	7,560
Tax	(296)	(234)	(306)	(445)	-45.4	(692)	-55.4	(645)	(685)	(756)
Profit after tax	3,040	3,380	4,338	6,790	56.5	6,230	-8.2	5,805	6,163	6,804
Preference dividends	0	0	0	0	-	0	-	0	0	0
Minorities	0	0	0	0	-	0	-	0	0	0
Extraordinary items	0	0	0	0	-	0	-	0	0	0
Net earnings (local GAAP)	3,040	3,380	4,338	6,790	56.5	6,230	-8.2	5,805	6,163	6,804
Net earnings (UBS)	3,040	3,380	4,338	6,790	56.5	6,230	-8.2	5,805	6,163	6,804
Tax rate (%)	8.9	6.5	6.6	6.2	-6.7	10.0	62.4	10.0	10.0	10.0
Per share (NT\$)										
EPS (UBS, diluted)	6.02	6.69	8.54	13.36	56.5	12.26	-8.2	11.42	12.13	13.39
EPS (local GAAP, diluted)	6.02	6.69	8.54	13.36	56.5	12.26	-8.2	11.42	12.13	13.39
EPS (UBS, basic)	6.02	6.69	8.54	13.36	56.4	12.26	-8.2	11.42	12.13	13.39
Net DPS (NT\$)	4.00	4.99	5.50	6.00	9.0	10.96	82.6	9.81	9.14	9.70
Cash EPS (UBS, diluted) ¹	9.39	9.76	11.57	16.42	42.0	14.40	-12.3	13.14	13.50	14.49
Book value per share	45.19	43.22	48.53	49.65	2.3	50.95	2.6	52.57	55.56	59.24
Average shares (diluted)	504.95	505.51	508.10	508.10	0.0	508.10	0.0	508.10	508.10	508.10
Balance sheet (NT\$m)										
Cash and equivalents	37,874	9,594	4,310	1,080	-74.9	1,604	48.5	2,257	2,982	3,868
Other current assets	9,539	10,452	14,236	21,643	52.0	19,704	-9.0	20,233	21,300	22,540
Total current assets	47,413	20,047	18,546	22,722	22.5	21,308	-6.2	22,490	24,282	26,408
Net tangible fixed assets	3,193	3,163	3,317	3,342	0.8	3,055	-8.6	2,984	3,088	3,331
Net intangible fixed assets	2,434	2,185	1,815	3,936	116.9	3,679	-6.5	3,776	3,995	4,229
Investments / other assets	2,480	26,917	34,575	42,681	23.4	42,562	-0.3	42,443	42,324	42,205
Total assets	55,520	52,311	58,252	72,682	24.8	70,604	-2.9	71,693	73,689	76,173
Trade payables & other ST liabilities	11,098	11,468	17,976	23,798	32.4	23,705	-0.4	21,918	22,269	22,746
Short term debt	20,718	18,053	14,526	21,400	47.32	18,900	-11.68	20,900	20,900	20,900
Total current liabilities	31,816	29,521	32,502	45,198	39.1	42,605	-5.7	42,818	43,169	43,646
Long term debt	0	0	0	0	-	0	-	0	0	0
Other long term liabilities	888	941	1,113	2,259	103.0	2,112	-6.5	2,167	2,292	2,426
Preferred shares	0	0	0	0	-	0	-	0	0	0
Total liabilities (incl pref shares)	32,705	30,461	33,615	47,457	41.2	44,716	-5.8	44,985	45,462	46,072
Common s/h equity	22,815	21,850	24,637	25,225	2.4	25,888	2.6	26,708	28,227	30,101
Minority interests	0	0	0	0	-	0	-	0	0	0
Total liabilities & equity	55,520	52,311	58,252	72,682	24.8	70,604	-2.9	71,693	73,689	76,173
Cash flow (NT\$m)										
Net income (before pref divs)	3,040	3,380	4,338	6,790	56.5	6,230	-8.2	5,805	6,163	6,804
Depreciation & amortisation	1,700	1,555	1,539	1,554	1.0	1,088	-30.0	870	696	557
Net change in working capital	(407)	(1,376)	(2,614)	(5,297)	-102.6	1,768	-	(287)	(651)	(695)
Other operating	894	188	4,918	941	-80.9	452	-51.9	(2,006)	(165)	(184)
Operating cash flow	5,227	3,746	8,181	3,988	-51.2	9,539	139.2	4,382	6,044	6,483
Tangible capital expenditure	(413)	(462)	(630)	(800)	-27.1	(800)	0.0	(800)	(800)	(800)
Intangible capital expenditure	0	0	0	0	-	0	-	0	0	0
Net (acquisitions) / disposals	0	0	0	0	-	0	-	0	0	0
Other investing	422	(24,516)	(7,546)	(10,223)	-	0	-	0	0	0
Investing cash flow	9	(24,978)	(8,175)	(11,023)	-34.8	(800)	92.7	(800)	(800)	(800)
Equity dividends paid	(2,020)	(2,525)	(2,794)	(3,049)	-9.1	(5,568)	-82.6	(4,984)	(4,644)	(4,930)
Share issues / (buybacks)	0	0	0	0	-	0	-	0	0	0
Other financing	(1)	266	0	16	-	(147)	-	55	125	134
Change in debt & pref shares	7,217	(2,665)	(3,526)	6,874	-	(2,500)	-	2,000	0	0
Financing cash flow	5,196	(4,924)	(6,321)	3,841	-	(8,215)	-	(2,929)	(4,519)	(4,797)
Cash flow inc/(dec) in cash	10,432	(26,156)	(6,315)	(3,193)	49.4	524	-	653	725	886
FX / non cash items	(103)	(2,124)	1,030	(36)	-	0	-	0	0	0
Balance sheet inc/(dec) in cash	10,328	(28,280)	(5,285)	(3,230)	38.9	524	-	653	725	886

Source: Company accounts, UBS estimates. (UBS) metrics use reported figures which have been adjusted by UBS analysts.¹Cash EPS (UBS, diluted) is calculated using UBS net income adding back depreciation and amortization.

Realtek Semiconductor Corp. (2379.TW)

Valuation (x)	12/16	12/17	12/18	12/19E	12/20E	12/21E	12/22E	12/23E
P/E (local GAAP, diluted)	16.4	16.4	14.5	17.9	19.5	20.9	19.7	17.8
P/E (UBS, diluted)	16.4	16.4	14.5	17.9	19.5	20.9	19.7	17.8
P/CEPS	10.5	11.2	10.7	14.6	16.6	18.2	17.7	16.5
Equity FCF (UBS) yield %	9.7	5.9	12.0	2.6	7.2	2.9	4.3	4.7
Net dividend yield (%)	4.1	4.6	4.4	2.5	4.6	4.1	3.8	4.1
P/BV x	2.2	2.5	2.6	4.8	4.7	4.5	4.3	4.0
EV/revenues (core)	0.8	0.6	0.8	1.5	1.6	1.5	1.5	1.4
EV/EBITDA (core)	6.3	5.1	7.1	11.9	13.3	14.1	13.5	12.4
EV/EBIT (core)	9.5	7.5	10.0	14.9	15.6	16.1	15.0	13.4
EV/OpFCF (core)	6.3	5.1	7.2	12.0	13.4	14.1	13.6	12.5
EV/op. invested capital	6.9	5.7	NM	NM	NM	NM	NM	NM
Enterprise value (NT\$m)	12/16	12/17	12/18	12/19E	12/20E	12/21E	12/22E	12/23E
Market cap.	49,747	55,267	62,815	121,435	121,435	121,435	121,435	121,435
Net debt (cash)	(15,600)	(4,349)	9,337	15,268	18,808	17,970	18,281	17,475
Buy out of minorities	0	0	0	0	0	0	0	0
Pension provisions/other	0	0	0	0	0	0	0	0
Total enterprise value	34,146	50,918	72,152	136,703	140,243	139,404	139,715	138,910
Non core assets	(2,480)	(26,917)	(34,575)	(42,681)	(42,562)	(42,443)	(42,324)	(42,205)
Core enterprise value	31,667	24,001	37,577	94,022	97,681	96,962	97,392	96,705
Growth (%)	12/16	12/17	12/18	12/19E	12/20E	12/21E	12/22E	12/23E
Revenue	22.6	7.1	9.9	32.6	3.0	1.8	4.3	5.4
EBITDA (UBS)	54.3	-5.9	11.6	48.8	-6.7	-6.2	4.4	8.0
EBIT (UBS)	83.7	-4.5	17.7	68.5	-1.0	-3.8	7.9	11.0
EPS (UBS, diluted)	25.2	11.1	27.7	56.5	-8.2	-6.8	6.2	10.4
Net DPS	-33.3	24.9	10.2	9.0	82.6	-10.5	-6.8	6.2
Margins & Profitability (%)	12/16	12/17	12/18	12/19E	12/20E	12/21E	12/22E	12/23E
Gross profit margin	43.4	42.9	44.7	43.8	43.0	43.0	43.3	43.2
EBITDA margin	13.0	11.4	11.6	13.0	11.8	10.8	10.8	11.1
EBIT margin	8.6	7.7	8.2	10.4	10.0	9.5	9.8	10.3
Net earnings (UBS) margin	7.8	8.1	9.5	11.2	10.0	9.1	9.3	9.7
ROIC (EBIT)	72.7	76.2	131.8	194.9	159.9	154.7	116.4	107.3
ROIC post tax	66.3	71.3	NM	NM	NM	NM	NM	NM
ROE (UBS)	13.5	15.1	18.7	27.2	24.4	22.1	22.4	23.3
Capital structure & Coverage (x)	12/16	12/17	12/18	12/19E	12/20E	12/21E	12/22E	12/23E
Net debt / EBITDA	(3.4)	1.8	1.9	2.6	2.4	2.7	2.5	2.2
Net debt / total equity %	(75.2)	38.7	41.5	80.6	66.8	69.8	63.5	56.6
Net debt / (net debt + total equity) %	NM	27.9	29.3	44.6	40.1	41.1	38.8	36.1
Net debt/EV %	(54.2)	35.2	27.2	21.6	17.7	19.2	18.4	17.6
Capex / depreciation %	24.3	29.7	40.9	51.5	73.5	91.9	114.9	143.6
Capex / revenue %	1.1	1.1	1.4	1.3	1.3	1.3	1.2	1.1
EBIT / net interest	NM	NM	NM	NM	13.6	12.8	13.8	16.3
Dividend cover (UBS)	1.5	1.3	1.6	2.2	1.1	1.2	1.3	1.4
Div. payout ratio (UBS) %	66.4	74.7	64.4	44.9	89.4	85.9	75.3	72.5
Revenues by division (NT\$m)	12/16	12/17	12/18	12/19E	12/20E	12/21E	12/22E	12/23E
Networking	23,785	25,902	29,350	42,133	42,874	44,922	47,417	50,450
Multimedia	7,565	7,580	7,860	9,504	10,301	9,315	9,768	10,342
PC peripheral	7,564	8,207	8,596	9,108	9,390	9,465	9,235	9,195
Others	0	0	0	0	0	0	0	0
Total	38,914	41,688	45,806	60,744	62,565	63,701	66,420	69,988
EBIT (UBS) by division (NT\$m)	12/16	12/17	12/18	12/19E	12/20E	12/21E	12/22E	12/23E
Core	3,343	3,192	3,758	6,331	6,266	6,026	6,501	7,219
Others	0	0	0	0	0	0	0	0
Total	3,343	3,192	3,758	6,331	6,266	6,026	6,501	7,219

Source: Company accounts, UBS estimates. (UBS) metrics use reported figures which have been adjusted by UBS analysts.

Semiconductor Manufacturing Intl Corp

A little more short-term pain; big investments in technology but payback period is uncertain

Downgrade post earnings; 2020 outlook in line, capex the key surprise

On the Q1 earnings call, SMIC management guided 2020 capex of US\$3.1bn (vs US\$2bn in 2019). We were above consensus at US\$2.2bn, but capex was the key surprise. We see more profit pressure short-term; our 2020/21E EPS of –US\$0.02 /US\$0.00 is far below consensus of US\$0.04/0.05. We downgrade SMIC to Sell with a price target of HK\$10.00. We continue to view SMIC as an interesting company for the long term as China ramps its semis industry and the growth of semis demand accelerates—the key question is how much of this demand SMIC can capture.

Larger capex on both mature and advanced technologies

Management stated US\$2bn of capex will be used for leading edge technologies, with the rest on mature technologies. On mature tech, since the company is essentially running at full utilisation, this is a no brainer in terms of expanding for future growth. We note Vanguard paid US\$236m for GlobalFoundries Fab 3E, or roughly US\$7m/k wafer capacity. SMIC's capex would suggest roughly US\$15m/k. We view it as a positive, but higher spend likely implies future profitability will be below peers. On leading edge technology, we like that SMIC is proceeding cautiously with 14nm expansion; the key unknown is what SMIC calls the "N+1" node, which we believe is essentially a non-EUV 8nm node. Management expects small volume by end-2020, but we believe that is a fairly aggressive target, given the track record on 28nm and 14nm.

Political factors likely to play a bigger role

Amid US/China trade tensions, we see additional risks with SMIC: 1) government likely will need SMIC to invest aggressively out of national interest, but what's good for China may not necessarily be good for SMIC; and 2) SMIC could be caught between restrictions to sell to entity list companies (de minimus rule and direct product rule) versus new revenue sources.

Valuation: Downgrade from Neutral to Sell, trim PT from HK\$10.50 to HK\$10.00

We revise our 2020/2021E net earnings down 3%/8%, mainly on higher capex and expenses. We trim our price target to HK\$10.00 based on 0.7x 2020E P/BV (0.8x previously), which is around 1 standard deviation below its historical valuation average. Given downward pressure on profitability caused by higher spending/depreciation, and additional risks on shipments to Huawei to offset upside from China localisation trend, we believe it is more reasonable for SMIC to trade at a slight discount to book value, and downgrade the stock from Neutral to Sell.

Equities

China

Semiconductors

12-month rating **Sell ***
Prior: Neutral
12m price target **HK\$10.00**
Prior: HK\$10.50
Price (24 Feb 2020) **HK\$15.50**
RIC: 0981.HK **BBG:** 981 HK

Trading data and key metrics

52-wk range HK\$17.36-7.67

Market cap. HK\$78.3bn/US\$10.1bn

Shares o/s 5,050m (ORD)

Free float 62%

Avg. daily volume ('000) 78,009

Avg. daily value (m) HK\$1,132.2

Common s/h equity (12/19E) US\$6.23bn

P/BV (12/19E) 1.6x

Net debt / EBITDA (12/19E) 0.3x

EPS (UBS, diluted) (US\$)

	From	To	% ch	Cons.
12/19E	0.03	0.04	33	0.04
12/20E	(0.02)	(0.02)	NM	0.04
12/21E	0.00	0.00	NM	0.05

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Highlights (US\$K)	12/16	12/17	12/18	12/19E	12/20E	12/21E	12/22E	12/23E
Revenues	2,914,180	3,101,175	3,359,984	3,115,672	3,575,450	4,060,395	4,456,153	4,871,855
EBIT (UBS)	339,206	124,896	14,700	51,743	(154,291)	(34,309)	232,589	318,961
Net earnings (UBS)	376,630	179,679	134,102	237,514	(93,305)	20,456	265,311	342,510
EPS (UBS, diluted) (US\$)	0.08	0.04	0.03	0.04	(0.02)	0.00	0.05	0.06
DPS (US\$)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Net (debt) / cash	(207,236)	(1,246,265)	(922,941)	(327,819)	(1,002,448)	(2,427,587)	(3,378,866)	(4,088,816)
Profitability/valuation	12/16	12/17	12/18	12/19E	12/20E	12/21E	12/22E	12/23E
EBIT margin %	11.6	4.0	0.4	1.7	-4.3	-0.8	5.2	6.5
ROIC (EBIT) %	7.6	2.0	0.2	0.6	(1.6)	(0.3)	2.0	2.5
EV/EBITDA (core) x	3.8	5.9	6.5	9.0	8.9	8.4	7.1	6.7
P/E (UBS, diluted) x	12.9	34.8	45.4	45.5	NM	NM	43.4	33.6
Equity FCF (UBS) yield %	(36.2)	(9.1)	(17.0)	(8.8)	(7.9)	(15.9)	(10.4)	(8.1)
Net dividend yield %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Source: Company accounts, Thomson Reuters, UBS estimates. Metrics marked as (UBS) have had analyst adjustments applied. Valuations: based on an average share price that year, (E): based on a share price of HK\$15.50 on 24 Feb 2020 16:55 HKT

* Exception to core rating bands; See page 40.

UBS Research THESIS MAP a guide to our thinking and what's where in this report**PIVOTAL QUESTIONS****Q: What is SMIC's strategy at the leading edge?**

SMIC is now ramped up at 14nm, but we see limited demand at 14nm, and our expectation is the company will move aggressively to more advanced nodes. We like that SMIC is closing the technology gap, but we also see a high level of capex spend into 2021 after the hike in 2020, and therefore higher depreciation and lower profits. A lack of profits is one of our key concerns.

[more →](#)**Q: Demand for 28nm has dropped off significantly; can SMIC grow 28nm and take share?**

We believe SMIC could increase revenue in two ways: 1) some China customers are likely to use SMIC to increase their Chinese content; and 2) SMIC likely will continue to convert some 28nm capacity to older geometries. With that said, we expect 28nm to remain a drag into 2020 and likely 2021 as well.

["Management is bullish on growth, but we remain focused on profitability" 11/15/2019 →](#)**UBS VIEW**

We downgrade SMIC from Neutral to Sell. We continue to view SMIC as an interesting long-term story, as China ramps up its semiconductor industry, but we think profitability is likely to decline in the short term as the company accelerates its technology development. Market appears to be optimistic about the potential re-acceleration of its technology development and growth. We think it will take time for SMIC to develop its technology given the complexity of semiconductor processes, and the company lags industry leaders by five years or more. We await both long- and short-term drivers.

EVIDENCE

Several key manufacturers at 28nm have stated that utilisation rates remain low due to industry supply/demand imbalance. Meanwhile, more high-end smartphone SOC demand has migrated from 14nm to 12nm or 7nm.

WHAT'S PRICED IN?

SMIC's share price is trading at 1.1x forward P/BV, around the high end of its historical range. We think this is due to: 1) the improving outlook on the semis cycle into 2020E; and 2) market optimism about faster technology migration.

[more →](#)**UPSIDE / DOWNSIDE SPECTRUM****Value drivers (2020E)**

HK\$20.00 upside
HK\$10.00 base
HK\$7.00 downside

Capacity utilisation

96%
92%
85%

Gross margin

24.0%
20.2%
15.0%

Target P/BV

1.4x
0.7x
0.5x

Source: UBS estimates

[more →](#)**COMPANY DESCRIPTION**

Semiconductor Manufacturing International Corp (SMIC) is a semiconductor foundry vendor based in China. It was first established and incorporated on Cayman Islands in April 2000....

[more →](#)

PIVOTAL QUESTIONS

[return](#) ↑**Q: What is SMIC's strategy at the leading edge?****UBS VIEW**

SMIC is now ramped up at 14nm, but we see limited demand at 14nm, and our expectation is the company will move aggressively to more advanced nodes. We like that SMIC is closing the technology gap, but we also see a high level of capex spend into 2021 after the hike in 2020, and therefore higher depreciation and lower profits. A lack of profits is one of our key concerns.

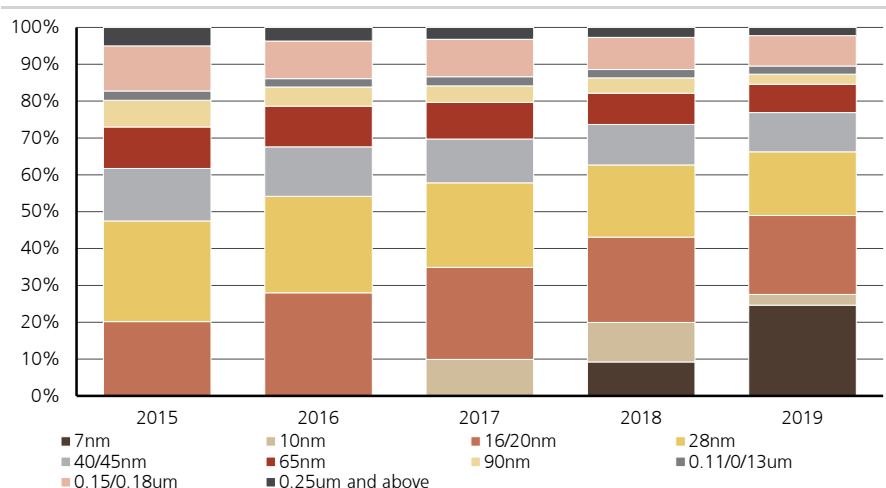
UBS VIEW

SMIC should be given credit for successfully ramping 14nm, and the pace was faster than it was at 28nm. With that said, many smartphone SoCs have moved onto 12nm or 7nm for the high-end, and demand for 14nm has dropped off from 2017/2018. With the US/China trade war, we believe SMIC will have to accelerate technology development to fulfil local demand, which likely implies higher capex.

WHAT'S PRICED IN?

Investors are incrementally more bullish that SMIC finally has 14nm in production, but our view is the 14nm ramp will be fairly small, and the next phase in terms of 7nm (or N+1/N+2 announced) will be a detriment to profits.

Management guides 2020 capex of US\$3.1bn for foundry, with US\$2bn to be used for leading-edge technologies. We like the fact that SMIC is proceeding cautiously with 14nm expansion and guides for 15k/month by the end of the year. We believe that is a smart decision given the current demand environment as many smartphone SoCs have moved onto 12nm or 7nm for the high-end and demand for 14nm has dropped off from 2017/2018.

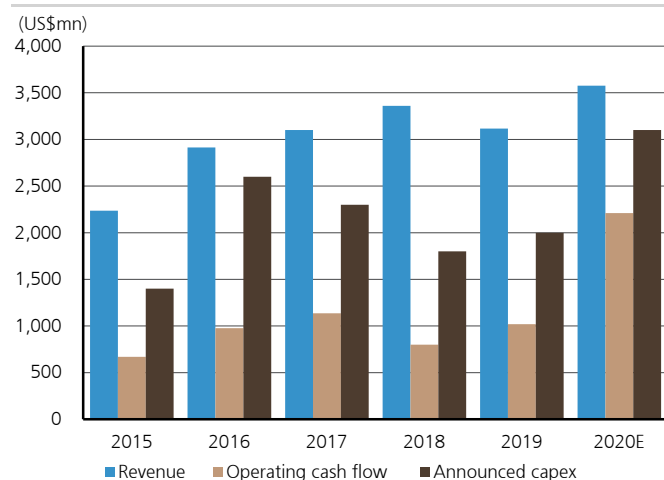
Figure 22: TSMC's revenue breakdown by technology node

Source: Company data

However, higher capex means more depreciation, which could raise pressure on profitability. We forecast 2020E depreciation to grow at 20% YoY, vs 8%/8% for 2018/2019, and we see gross margin struggling at the low 20% range in the near

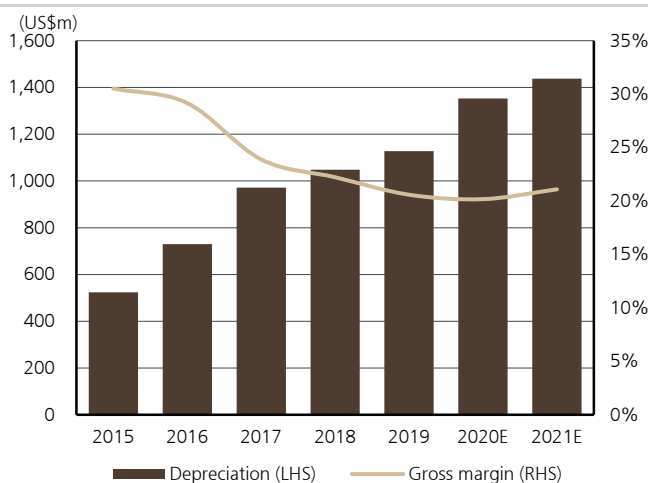
term. Nevertheless, capex could continue to trend up as SMIC pursues leading edge, but we believe SMIC lags industry leaders by at least five years. As a reference, TSMC guides US\$15-16bn for 2020 capex.

Figure 23: Capex planned is trending higher



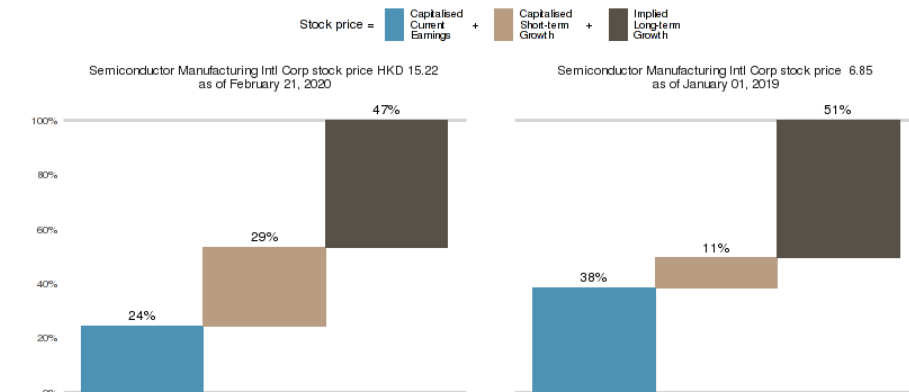
Source: Company data, UBS estimates

Figure 24: Higher depreciation is dragging profitability



Source: Company data, UBS estimates

WHAT'S PRICED IN?

[return](#) ↑

Source: UBS

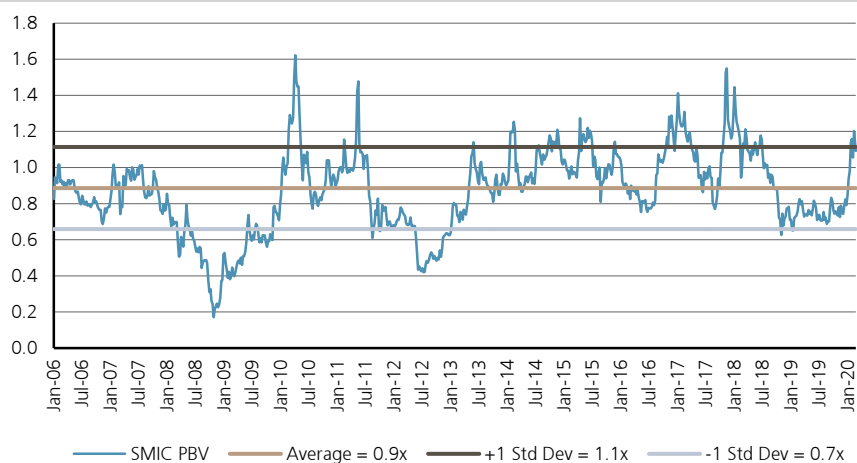
Source: UBS estimates

According to our residual income analysis, consensus is more positive about the short-term expectation of SMIC vs the beginning of 2019. We agree for topline as 14nm finally entered production, aggressive capex/expansion plan announced, plus potential upside from China's localisation trend. However, the dilution of profitability caused by increasing depreciation is our key concern in the near term. Our 2020/2021 revenue estimates are in line with consensus, but our EPS estimates of -US\$0.02 and US\$0.00 are far below consensus at US\$0.04/0.05.

We downgrade SMIC from Neutral to Sell with a price target of HK\$10.00, given downward pressure on profitability caused by higher capex spending needs and likely limited 14nm demand upside. SMIC's share price rose over 100% from the beginning of 2019, and is currently trading at 1.1x forward P/BV, we believe market has priced in successful ramp of new technology node and SMIC as the key beneficiary of China's local replacement trend.

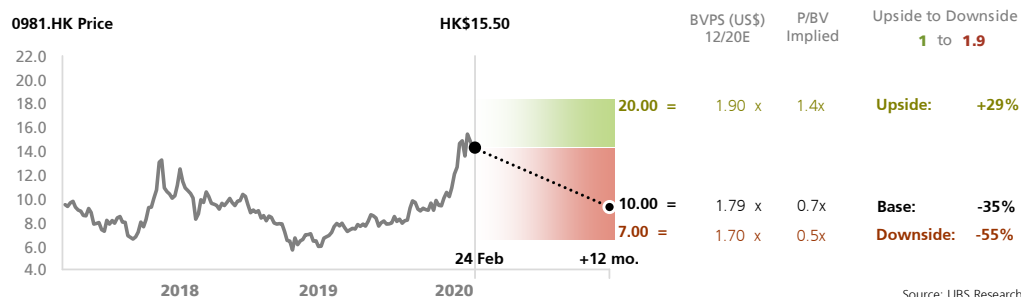
Our price target implies 35% downside. We note recent media [reports](#) that the US seeks to change its current regulation (ie, de minimis threshold, direct product rule) to block more shipments to Huawei. We see this as an additional downside risk as it might prevent SMIC from shipping to US entity list companies such as Huawei as the US is major maker of semi-manufacturing equipment.

Figure 25: Historical trading band - P/BV



Source: Bloomberg, UBS estimates

UPSIDE / DOWNSIDE SPECTRUM

[return](#) ↑

SMIC is trading
at HK\$15.50
(as of 24 February).

Value drivers (2020E)	Capacity utilisation	Gross margin	Target P/BV
HK\$20.00 upside	96%	24.0%	1.4x
HK\$10.00 base	92%	20.2%	0.7x
HK\$7.00 downside	85%	15.0%	0.5x

Source: UBS estimates

Risk to the current share price is skewed (1:1.9) to the downside

SMIC is trading at **HK\$15.50** (as of 24 February).

Upside (HK\$20.00): We assume a stronger economic environment in China and globally, driving higher demand for 8-inch and 12-inch semiconductors from the communication and consumer fields than in our base case. We also assume SMIC quickly finds new customers and incremental revenues. In this scenario, we would expect a 2020 capacity utilisation rate (CUR) of 96%. With higher utilisation, we assume gross margin improves to 24.0%. Our upside valuation of HK\$20.00 is based on 1.4x 2020E P/BV, which is close to the historical peak valuation.

Base (HK\$10.00): In our base case, we expect a better demand environment and ramp-up of new applications (5G, IoT) in 2020, and estimate revenue grows 15% YoY and gross margin is flattish at 20.2%. Our price target of HK\$10.00 is based on 0.7x 2020E P/BV.

Downside (HK\$7.00): We assume a weaker economic environment in China and globally, leading to lower semiconductor demand than in our base case and thus serious oversupply of 28nm nodes and 8-inch wafers. We assume CUR drops to 85% and gross margin declines to 15.0%. Our downside valuation of HK\$7.00 is based on 0.5x 2020E P/BV, which is near the trough of SMIC's trading range.

Figure 26: Earnings forecasts

(US\$ m)	2019E	Q120E	Q220E	Q320E	Q420E	2020E	2021E
Revenue	3,116	839	873	931	933	3,575	4,060
- YoY chg (%)	-7%	25%	10%	14%	11%	15%	14%
- QoQ chg (%)	-	0%	4%	7%	0%	-	-
Gross profit	641	178	180	187	177	721	856
- Gross margin	20.6%	21.2%	20.6%	20.0%	19.0%	20.2%	21.1%
Operating income	51	(16)	(25)	(49)	(64)	(154)	(34)
- Operating margin	1.6%	-1.9%	-2.9%	-5.3%	-6.9%	-4.3%	-0.8%
Non-op income	133	(0)	0	(0)	(1)	(1)	(4)
Pre-tax income	184	(17)	(25)	(49)	(65)	(155)	(39)
Net income	237	0	(10)	(34)	(50)	(93)	20
Basic EPS (US\$)	0.0469	0.0001	(0.0019)	(0.0068)	(0.0098)	(0.0185)	0.0041
- YoY chg (%)	74%	-98%	-153%	-129%	-156%	-139%	-78%
- QoQ chg (%)	-	-100%	-3717%	257%	45%	-	-

Source: Company data, UBS estimates

Figure 27: Revisions to earnings estimates

(US\$ m)	New			Old			Change		
	2019E	2020E	2021E	2019E	2020E	2021E	2019E	2020E	2021E
Revenue	3,116	3,575	4,060	3,112	3,508	4,055	0%	2%	0%
- YoY chg (%)	-7%	15%	14%	-7%	13%	16%			
Gross profit	641	721	856	643	717	896	0%	1%	-4%
- Gross margin	20.6%	20.2%	21.1%	20.6%	20.4%	22.1%			
Operating income	51	(154)	(34)	45	(151)	(31.4)	12%	-2%	-9%
- Operating margin	1.6%	-4.3%	-0.8%	1.5%	-4.3%	-0.8%			
Pre-tax income	184	(155)	(39)	109	(156)	(43)	68%	0%	10%
Net profit	237	(93)	20	178	(91)	22	33%	-3%	-8%
- Net margin	7.6%	-2.6%	0.5%	5.7%	-2.6%	0.5%			
EPS (US\$)	0.0469	(0.0185)	0.0041	0.0352	(0.0179)	0.0044	33%	-3%	-8%
- YoY chg (%)	74%	-139%	122%	31%	-151%	124%			

Source: Company data, UBS estimates

COMPANY DESCRIPTION

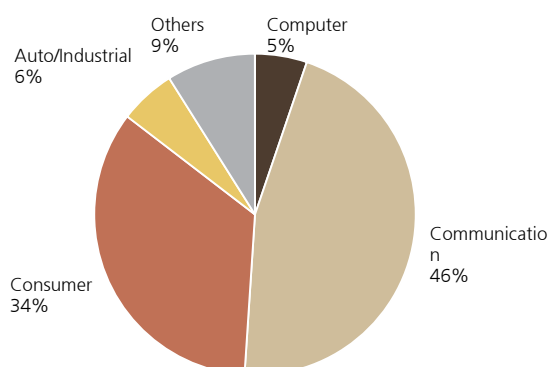
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Semiconductor Manufacturing International Corp (SMIC) is a semiconductor foundry vendor based in China. It was first established and incorporated on Cayman Islands in April 2000. It operates four 8-inch fabs: its Shanghai mega fab, a Tianjin fab, a Shenzhen fab and a majority-owned fab in Italy. For its 12-inch fab, SMIC has three production sites: one in Shanghai and two in Beijing (one is majority-owned).

Industry outlook

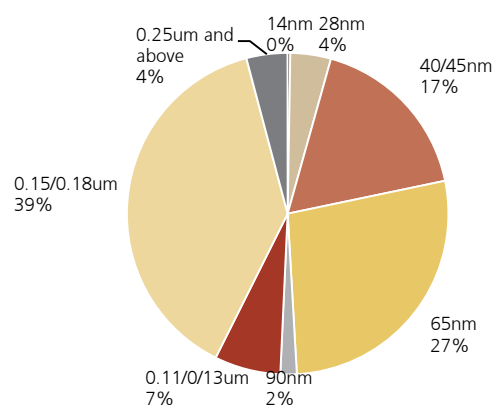
The semiconductor foundry industry has outgrown the overall semiconductor market in the past few years due to market share gains by fabless companies in mobile devices, such as smartphones and tablets. Tight supply of foundry capacity has helped tier-2 companies such as UMC, SMIC and Vanguard to turn around. However, slowing smartphone growth and higher capex intensity of advanced processes could slow technology migration in the semiconductor industry, in our view.

Revenue by node (2019)



Source: Company data

Revenue by application (2019)



Source: Company data

Semiconductor Manufacturing Intl Corp (0981.HK)

Income statement (US\$K)	12/16	12/17	12/18	12/19E	% ch	12/20E	% ch	12/21E	12/22E	12/23E
Revenues	2,914,180	3,101,175	3,359,984	3,115,672	-7.3	3,575,450	14.8	4,060,395	4,456,153	4,871,855
Gross profit	849,681	740,744	746,677	642,459	-14.0	721,323	12.3	856,430	1,022,344	1,134,606
EBITDA (UBS)	1,069,072	1,096,278	1,063,110	1,179,499	10.9	1,198,278	1.6	1,403,270	1,812,413	2,069,137
Depreciation & amortisation	(729,866)	(971,382)	(1,048,410)	(1,127,756)	7.6	(1,352,570)	19.9	(1,437,579)	(1,579,824)	(1,750,176)
EBIT (UBS)	339,206	124,896	14,700	51,743	252.0	(154,291)	-	(34,309)	232,589	318,961
Associates & investment income	0	0	0	0	-	0	-	0	0	0
Other non-operating income	(17,530)	(5,696)	53,410	60,838	13.9	0	-	3,500	0	0
Net interest	(11,794)	9,069	23,637	72,528	206.8	(1,014)	-	(7,832)	(14,173)	(18,418)
Exceptionals (incl goodwill)	0	0	0	0	-	0	-	0	0	0
Profit before tax	309,882	128,269	91,747	185,109	101.8	(155,305)	-	(38,640)	218,416	300,543
Tax	6,552	(1,846)	(14,476)	(23,416)	-61.8	0	-	(904)	(13,105)	(18,033)
Profit after tax	316,434	126,423	77,271	161,693	109.3	(155,305)	-	(39,544)	205,311	282,510
Preference dividends and Minorities	60,196	53,256	56,831	75,821	33.4	62,000	-18.2	60,000	60,000	60,000
Extraordinary items	0	0	0	0	-	0	-	0	0	0
Net earnings (local GAAP)	376,630	179,679	134,102	237,514	77.1	(93,305)	-	20,456	265,311	342,510
Net earnings (UBS)	376,630	179,679	134,102	237,514	77.1	(93,305)	-	20,456	265,311	342,510
Tax rate (%)	0.0	1.4	15.8	12.6	-19.8	0.0	-	0.0	6.0	6.0
Per share (US\$)	12/16	12/17	12/18	12/19E	% ch	12/20E	% ch	12/21E	12/22E	12/23E
EPS (UBS, diluted)	0.08	0.04	0.03	0.04	66.5	(0.02)	-	0.00	0.05	0.06
EPS (local GAAP, diluted)	0.08	0.04	0.03	0.04	66.5	(0.02)	-	0.00	0.05	0.06
EPS (UBS, basic)	0.09	0.04	0.03	0.05	74.6	(0.02)	-	0.00	0.05	0.07
Net DPS (US\$)	0.00	0.00	0.00	0.00	-	0.00	-	0.00	0.00	0.00
Book value per share	0.98	1.11	1.19	1.23	3.4	1.79	45.0	1.79	1.85	1.91
Average shares (diluted)	4,838.08	4,993.52	5,100.19	5,424.00	6.3	5,788.00	6.7	5,788.00	5,788.00	5,788.00
Balance sheet (US\$K)	12/16	12/17	12/18	12/19E	% ch	12/20E	% ch	12/21E	12/22E	12/23E
Cash and equivalents	2,126,011	1,838,300	1,786,420	2,238,840	25.3	2,714,211	21.2	2,439,072	3,087,793	3,977,843
Other current assets	1,557,742	2,330,684	4,363,171	4,623,186	6.0	4,695,258	1.6	5,365,514	5,730,588	6,134,478
Total current assets	3,683,753	4,168,984	6,149,591	6,862,026	11.6	7,409,469	8.0	7,804,586	8,818,380	10,112,321
Net tangible fixed assets	5,786,624	6,620,880	6,777,970	7,757,247	14.4	9,404,677	21.2	10,667,099	11,787,275	12,737,098
Net intangible fixed assets	404,765	370,346	361,317	679,230	88.0	679,230	0.0	679,230	679,230	679,230
Investments / other assets	240,136	758,241	1,135,442	1,139,317	0.3	1,139,317	0.0	1,142,817	1,142,817	1,142,817
Total assets	10,115,278	11,918,451	14,424,320	16,437,820	14.0	18,632,694	13.4	20,293,731	22,427,702	24,671,466
Trade payables & other ST liabilities	1,771,726	1,466,171	2,329,223	2,642,366	13.4	3,727,240	41.1	4,109,529	4,347,610	4,608,566
Short term debt	209,174	440,608	530,005	562,833	6.19	562,833	0.00	562,833	562,833	562,833
Total current liabilities	1,980,900	1,906,779	2,859,228	3,205,199	12.1	4,290,073	33.8	4,672,362	4,910,443	5,171,399
Long term debt	2,124,073	2,643,957	2,179,356	2,003,826	-8.1	3,153,826	57.4	4,303,826	5,903,826	7,503,826
Other long term liabilities	607,078	646,380	462,156	1,030,933	123.1	1,146,238	11.2	1,314,531	1,405,109	1,505,408
Preferred shares	0	0	0	0	-	0	-	0	0	0
Total liabilities (incl pref shares)	4,712,051	5,197,116	5,500,740	6,239,958	13.4	8,590,137	37.7	10,290,719	12,219,379	14,180,633
Common s/h equity	4,150,674	5,233,033	6,017,814	6,233,245	3.6	9,036,359	45.0	9,056,814	9,322,126	9,664,636
Minority interests	1,252,553	1,488,302	2,905,766	3,964,617	36.4	1,006,198	-74.6	946,198	886,198	826,198
Total liabilities & equity	10,115,278	11,918,451	14,424,320	16,437,820	14.0	18,632,694	13.4	20,293,731	22,427,702	24,671,466
Cash flow (US\$K)	12/16	12/17	12/18	12/19E	% ch	12/20E	% ch	12/21E	12/22E	12/23E
Net income (before pref divs)	376,630	179,679	134,102	237,514	77.1	(93,305)	-	20,456	265,311	342,510
Depreciation & amortisation	729,866	971,382	1,048,410	1,127,756	7.6	1,352,570	19.9	1,437,579	1,579,824	1,750,176
Net change in working capital	(330,079)	(19,042)	(277,450)	(895,972)	-222.9	933,908	-	(73,909)	(37,274)	(41,481)
Other operating	200,785	3,361	(104,550)	514,172	-	16,894	-96.7	(277,558)	(149,719)	(161,453)
Operating cash flow	977,202	1,135,380	800,512	983,470	22.9	2,210,066	124.7	1,106,568	1,658,142	1,889,753
Tangible capital expenditure	(2,497,403)	(1,653,707)	(1,792,912)	(1,869,563)	-4.3	(3,000,000)	-60.5	(2,700,000)	(2,700,000)	(2,700,000)
Intangible capital expenditure	0	0	0	0	-	0	-	0	0	0
Net (acquisitions) / disposals	0	0	0	0	-	0	-	0	0	0
Other investing	54,070	(1,063,126)	(1,405,473)	(68,627)	-	0	-	0	0	0
Investing cash flow	(2,443,333)	(2,716,833)	(3,198,385)	(1,938,190)	39.4	(3,000,000)	-54.8	(2,700,000)	(2,700,000)	(2,700,000)
Equity dividends paid	0	0	0	0	-	0	-	0	0	0
Share issues / (buybacks)	0	326,351	160,878	698,603	334.2	0	-	0	0	0
Other financing	848,864	311,107	1,470,207	(571,803)	-	115,305	-	168,293	90,579	100,298
Change in debt & pref shares	1,765,914	634,133	745,875	1,261,675	69.15	1,150,000	-8.85	1,150,000	1,600,000	1,600,000
Financing cash flow	2,614,778	1,271,591	2,376,960	1,388,475	-41.6	1,265,305	-8.9	1,318,293	1,690,579	1,700,298
Cash flow inc/(dec) in cash	1,148,647	(309,862)	(20,913)	433,755	-	475,371	9.6	(275,140)	648,721	890,051
FX / non cash items	(27,837)	22,151	(30,967)	18,665	-	0	-	0	0	0
Balance sheet inc/(dec) in cash	1,120,810	(287,711)	(51,880)	452,420	-	475,371	5.1	(275,140)	648,721	890,051

Source: Company accounts, UBS estimates. (UBS) metrics use reported figures which have been adjusted by UBS analysts.

Semiconductor Manufacturing Intl Corp (0981.HK)

Valuation (x)	12/16	12/17	12/18	12/19E	12/20E	12/21E	12/22E	12/23E
P/E (local GAAP, diluted)	12.9	34.8	45.4	45.5	NM	NM	43.4	33.6
P/E (UBS, diluted)	12.9	34.8	45.4	45.5	NM	NM	43.4	33.6
P/CEPS	3.8	5.1	5.0	7.4	8.0	6.9	5.4	4.8
Equity FCF (UBS) yield %	(36.2)	(9.1)	(17.0)	(8.8)	(7.9)	(15.9)	(10.4)	(8.1)
Net dividend yield (%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
P/BV x	1.0	1.1	1.0	1.6	1.1	1.1	1.1	1.0
EV/revenues (core)	1.4	2.1	2.1	3.4	3.0	2.9	2.9	2.8
EV/EBITDA (core)	3.8	5.9	6.5	9.0	8.9	8.4	7.1	6.7
EV/EBIT (core)	12.0	NM	NM	NM	NM	NM	NM	NM
EV/OpFCF (core)	NM	NM	NM	NM	NM	NM	NM	NM
EV/op. invested capital	0.9	1.0	0.9	1.2	1.1	1.1	1.1	1.1
Enterprise value (US\$K)	12/16	12/17	12/18	12/19E	12/20E	12/21E	12/22E	12/23E
Market cap.	4,204,383	5,689,058	5,836,500	10,044,657	10,044,657	10,044,657	10,044,657	10,044,657
Net debt (cash)	(134,430)	726,751	1,084,603	625,380	665,133	1,715,018	2,903,227	3,733,841
Buy out of minorities	0	0	0	0	0	0	0	0
Pension provisions/other	0	0	0	0	0	0	0	0
Total enterprise value	4,069,952	6,415,808	6,921,103	10,670,037	10,709,791	11,759,675	12,947,884	13,778,498
Non core assets	0	0	0	0	0	0	0	0
Core enterprise value	4,069,952	6,415,808	6,921,103	10,670,037	10,709,791	11,759,675	12,947,884	13,778,498
Growth (%)	12/16	12/17	12/18	12/19E	12/20E	12/21E	12/22E	12/23E
Revenue	30.3	6.4	8.3	-7.3	14.8	13.6	9.7	9.3
EBITDA (UBS)	43.4	2.5	-3.0	10.9	1.6	17.1	29.2	14.2
EBIT (UBS)	52.8	-63.2	-88.2	NM	-	77.8	-	37.1
EPS (UBS, diluted)	32.2	-53.8	-26.9	66.5	-	-	NM	29.1
Net DPS	-	-	-	-	-	-	-	-
Margins & Profitability (%)	12/16	12/17	12/18	12/19E	12/20E	12/21E	12/22E	12/23E
Gross profit margin	29.2	23.9	22.2	20.6	20.2	21.1	22.9	23.3
EBITDA margin	36.7	35.4	31.6	37.9	33.5	34.6	40.7	42.5
EBIT margin	11.6	4.0	0.4	1.7	-4.3	-0.8	5.2	6.5
Net earnings (UBS) margin	12.9	5.8	4.0	7.6	NM	0.5	6.0	7.0
ROIC (EBIT)	7.6	2.0	0.2	0.6	(1.6)	(0.3)	2.0	2.5
ROIC post tax	7.6	2.0	0.2	0.5	NM	NM	1.8	2.3
ROE (UBS)	9.6	3.8	2.4	3.9	(1.2)	0.2	2.9	3.6
Capital structure & Coverage (x)	12/16	12/17	12/18	12/19E	12/20E	12/21E	12/22E	12/23E
Net debt / EBITDA	0.2	1.1	0.9	0.3	0.8	1.7	1.9	2.0
Net debt / total equity %	3.8	18.5	10.3	3.2	10.0	24.3	33.1	39.0
Net debt / (net debt + total equity) %	3.7	15.6	9.4	3.1	9.1	19.5	24.9	28.0
Net debt/EV %	5.1	19.4	13.3	3.1	9.4	20.6	26.1	29.7
Capex / depreciation %	NM	170.2	171.0	165.8	NM	187.8	170.9	154.3
Capex / revenue %	NM	NM	NM	NM	NM	NM	NM	NM
EBIT / net interest	28.8	NM	NM	NM	NM	NM	16.4	17.3
Dividend cover (UBS)	-	-	-	-	-	-	-	-
Div. payout ratio (UBS) %	-	-	-	-	-	-	-	-
Revenues by division (US\$K)	12/16	12/17	12/18	12/19E	12/20E	12/21E	12/22E	12/23E
Logic wafers	2,914,180	3,101,175	3,186,784	3,115,633	3,575,450	4,060,395	4,456,153	4,871,855
Management fee/Wuhan Xinxin	0	0	0	0	0	0	0	0
Others	0	0	173,200	39	0	0	0	0
Total	2,914,180	3,101,175	3,359,984	3,115,672	3,575,450	4,060,395	4,456,153	4,871,855
EBIT (UBS) by division (US\$K)	12/16	12/17	12/18	12/19E	12/20E	12/21E	12/22E	12/23E
Others	339,206	124,896	14,700	51,743	(154,291)	(34,309)	232,589	318,961
Total	339,206	124,896	14,700	51,743	(154,291)	(34,309)	232,589	318,961

Source: Company accounts, UBS estimates. (UBS) metrics use reported figures which have been adjusted by UBS analysts.

Valuation Method and Risk Statement

ASM Pacific: We derive our price target from a target multiple approach relative to the company's historical trading range.

Realtek: We derive our price target using a PE valuation relative to the historical trading range.

SMIC: Our price target is based on a P/BV multiple.

Tech investing involves risk. It is difficult for the investment community, ourselves included, to project the financial results of tech companies, as their operating models are highly volatile and unpredictable and they compete in a highly dynamic marketplace. In addition to their low predictability, valuing tech stocks can be challenging because neither traditional nor non-traditional valuation measures have provided much insight into how tech stocks trade.

ASM Pacific's sales are tied to the global semiconductor industry, which historically has been tied to global economic growth and is volatile. Although it is the market leader in the packaging assembly industry, the company faces global competition. It is relatively weak in the flip-chip bonder segment, which the industry forecasts could grow at the expense of the traditional wire-bonder segment. Failure to adapt to technological changes is a risk. Key upside risks for ASM include: 1) stronger-than-expected China demand environment; 2) faster adoption of advanced packaging; and 3) quicker ramping of auto-related semi demand.

Realtek is exposed to a number of risks, including: 1) an inventory correction at customers; 2) rising pricing pressure from its foundry partners; 3) increasing competition from other low-cost IC design houses; 4) slowing demand in the PC segment; 5) development risks for its core products; and 6) product obsolescence in existing markets. Key upside risks for Realtek include: 1) less competitive environment for TWS products and higher penetration of ANC features; 2) faster deployment of auto Ethernet; and 2) quicker migration to Wi-Fi 6.

For SMIC, we believe risks include rapidly changing technology, intense competition, high capital investments and cyclical demand. Key upside risks for SMIC include: 1) faster technology development; 2) stronger-than-expected demand from China's localization; and 3) less volatility of profitability.

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12-Month Rating	Definition	Coverage ¹	IB Services ²
Buy	FSR is > 6% above the MRA.	44%	32%
Neutral	FSR is between -6% and 6% of the MRA.	41%	29%
Sell	FSR is > 6% below the MRA.	15%	20%
Short-Term Rating	Definition	Coverage ³	IB Services ⁴
Buy	Stock price expected to rise within three months from the time the rating was assigned because of a specific catalyst or event.	<1%	<1%
Sell	Stock price expected to fall within three months from the time the rating was assigned because of a specific catalyst or event.	<1%	<1%

Source: UBS. Rating allocations are as of 31 December 2019.

1: Percentage of companies under coverage globally within the 12-month rating category.

2: Percentage of companies within the 12-month rating category for which investment banking (IB) services were provided within the past 12 months.

3: Percentage of companies under coverage globally within the Short-Term rating category.

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UBS Securities LLC: Bill Lu. **UBS Securities Pte. Ltd., Taipei Branch:** Sunny Lin.

Company Disclosures

Company Name	Reuters	12-month rating	Short-term rating	Price	Price date
ASM Pacific Technology	0522.HK	Neutral	N/A	HK\$94.85	24 Feb 2020
Global Unichip	3443.TW	Buy	N/A	NT\$236.00	24 Feb 2020
Hua Hong Semiconductor	1347.HK	Neutral	N/A	HK\$18.38	24 Feb 2020
MediaTek Inc.	2454.TW	Buy	N/A	NT\$377.00	24 Feb 2020
Realtek Semiconductor Corp.	2379.TW	Neutral	N/A	NT\$239.00	24 Feb 2020
Semiconductor Manufacturing Intl Corp ^{2, 4, 5, 13, 16a, 20}	0981.HK	Neutral (CBE)	N/A	HK\$15.50	24 Feb 2020
Silergy Corporation ¹³	6415.TW	Neutral	N/A	NT\$1,030.00	24 Feb 2020
Taiwan Semiconductor Manufacturing ^{16b, 22}	2330.TW	Buy	N/A	NT\$320.00	24 Feb 2020

Source: UBS. All prices as of local market close.

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