China / Hong Kong Company Guide

ASM Pacific

Version 1 | Bloomberg: 522 HK EQUITY | Reuters: 522.HK

Refer to important disclosures at the end of this report

DBS Group Research . Equity 6 Jul 2020

BUY (Initiate Coverage)

Last Traded Price (6 Jul 2020):HK$88.60(**HSI :** 26,339)
Price Target 12-mth:HK$118.00 (33.2% upside)

Analyst
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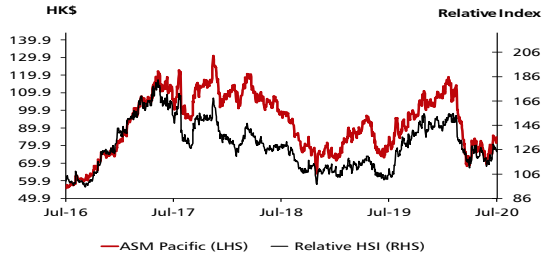
Price Relative



Forecasts and Valuation

FY Dec (HK$m)	2019A	2020F	2021F	2022F
Turnover	15,883	15,386	18,472	20,607
EBITDA	1,921	2,120	3,754	4,659
Pre-tax Profit	976	1,168	2,794	3,674
Net Profit	619	784	1,876	2,466
Net Pft (Pre Ex) (core profit)	729	894	1,985	2,575
Net Profit Gth (Pre-ex) (%)	(67.3)	22.6	122.2	29.7
EPS (HK$)	1.52	1.93	4.61	6.07
Core EPS (HK$)	1.79	2.20	4.88	6.34
EPS Gth (%)	(72.1)	26.6	139.2	31.5
Core EPS Gth (%)	(67.4)	22.6	122.2	29.7
Diluted EPS (HK$)	1.52	1.92	4.59	6.03
DPS (HK$)	2.00	2.40	2.40	2.40
BV Per Share (HK$)	28.60	27.74	29.95	33.62
PE (X)	58.2	45.9	19.2	14.6
Core PE (X)	49.4	40.3	18.1	14.0
P/Cash Flow (X)	9.8	17.6	20.5	15.1
P/Free CF (X)	11.7	24.2	33.3	22.1
EV/EBITDA (X)	19.2	17.2	9.7	7.7
Net Div Yield (%)	2.3	2.7	2.7	2.7
P/Book Value (X)	3.1	3.2	3.0	2.6
Net Debt/Equity (X)	0.1	0.0	0.0	CASH
ROAE(%)	5.2	6.8	16.0	19.1
Earnings Rev (%):		New	New	New
Consensus EPS (HK$)		3.09	4.73	5.75
Other Broker Recs:		B:9	S:4	H:8

Source of all data on this page: Company, DBS Bank (Hong Kong) Limited ("DBS HK"), Thomson Reuters

Riding on semi equipment upcycle

- **World's largest back-end semiconductor production equipment (SPE) supplier**
- **Back-end SPE on an investment upcycle in 2021F**
- **Beneficiary of supply chain localisation in China**
- **Initiating coverage with BUY and TP of HK$118**

Initiating coverage with BUY and TP of HK$118. We initiate coverage on ASM Pacific (ASMPT) with a BUY call and TP of HK$118. We expect net profit to grow 27% in FY20F and climb 139% in FY21F, amid back-end semiconductor production equipment (SPE) investment upcycle starting 2021F. The stock is trading at 2.6x FY21F P/BV, which is close to its 5-year trough.

Where we differ: Back-end SPE investment upcycle starting in 2021F. ASMPT's share price has dropped c.30% YTD, as the market is uncertain about the semiconductor and SPE market in 2H20 and 2021F, after a strong 1H20. However, from our channel checks with back-end outsourced semiconductor assembly and test (OSAT) providers, we understand they have been operating at a high utilisation rate of c.90% in 2Q20 and 2H20. Accelerating electronics sales and increasing IC dollar content per device led by the 5G upcycle will create an even larger capacity shortfall in 2021F, rekindling OSAT capex and back-end SPE market growth. We expect ASMPT's semi solutions revenue to stage a strong rebound of 32% in FY21F, after declining 4% y-o-y in FY20F.

Other critical factors: Beneficiary of supply chain localisation in China. ASMPT's market share gain is a long-term structural driver of its semi solutions business. We expect ASMPT's market share to continue to expand from 30% in FY19 to 33% in FY22F, growing with China's OSAT customers. This is because China has been increasing its supply chain localisation, especially in the semiconductor sub-segment.

Valuation:
Our TP of HK$118 is based on 4x FY21F P/BV, pegged to its upcycle valuation during 2016-2020.

Key Risks to Our View:
Slowdown in semiconductor capex.

At A Glance

Issued Capital (m shrs)	409
Mkt Cap (HK$m/US$m)	36,237 / 4,674
Major Shareholders (%)	
ASM International NV	25.2
First State Investments (HK) Ltd.	5.7
Free Float (%)	69.1
3m Avg. Daily Val. (US$m)	16.01
GICS Industry: Information Technology / Semiconductors	

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SWOT Analysis

Strengths

- **The world's largest back-end semiconductor production equipment supplier.** ASMPT is the world's largest back-end semiconductor production equipment (SPE) supplier, with 30% market share.
- **The world's second largest SMT equipment supplier.** ASMPT is the world's second largest surface mount technology (SMT, a technology of mounting integrated circuit [IC] onto printed circuit boards [PCBs]) equipment supplier, with 22% market share.

Weaknesses

- **Less upgrades in back-end SPE market versus front-end SPE market.** Front-end is a sophisticated process of manufacturing integrated circuits, which upgrades with smaller technology node semiconductors (i.e. from 90nm, to 65nm, 45nm, 32nm, 22nm, 14nm, 10nm, 7nm); while back-end is a precise process of packaging die, which upgrades with denser / thinner packages (i.e. from conventional package [i.e. Wire-Bond / Flip Chip] to advanced package [i.e. Fan-Out Wafer Level Package]). However, there are less upgrades taking place in back-end SPE market versus front-end SPE market.

Opportunities

- **Back-end SPE investment upcycle starting from 2021F.** Accelerating electronics sales and IC dollar content per device (i.e. applications / baseband processors, and CMOS image sensors) in tandem with 5G upcycle will create capacity shortfall in 2021F, which would rekindle outsourced semiconductor assembly and test (OSAT) capex and back-end SPE market growth.
- **Significant margin recovery.** Semi solutions' gross profit margin (GPM) varies with scale depending on whether the global back-end SPE market is on an upcycle or downcycle, as well as product mix change. We expect significant margin recovery, amid back-end semiconductor SPE market upcycle starting from FY21F, as well as product upgrades to higher-margin advanced packaging.
- **Beneficiary of supply chain localisation in China.** We expect ASMPT, as a dominant back-end SPE supplier in China, to deepen its presence within China's OSAT customer base. This is because China has been increasing its supply chain localisation, especially in the semiconductor sub-segment.

Threats

- **Slowdown in SPE market.** Electronic sales may further slow in the event the global COVID-19 contagion lasts beyond 2Q20. This may lead to a further slowdown in IC sales and semiconductor capex, and impact the SPE market.
- **Market share loss led by greater US sanctions.** ASMPT's market share in back-end SPE has been growing along with China's OSAT customers, driven by accelerating supply chain localisation in China. If the U.S. slaps further sanctions on non-Huawei players, we could see supply chain disruption especially in China's foundries and OSAT sectors. This may lead to market share loss for ASMPT.

Source: DBS HK

Industry overview

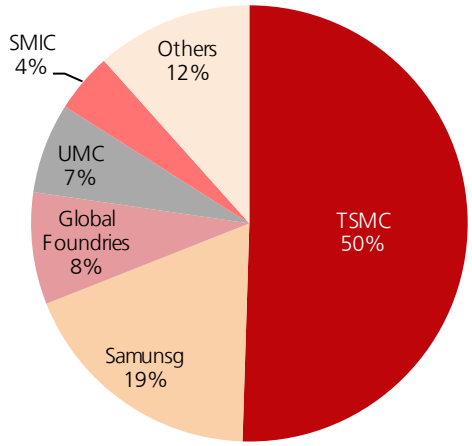
What is an integrated circuit (IC)? An integrated circuit (IC) is a set of electronic circuits on one small chip of semiconductor material that is usually silicon.

How is an IC manufactured? The manufacturing process of an integrated circuit can be divided into two steps: (1) Wafer fabrication (front-end), which is an extremely sophisticated process of manufacturing silicon ICs; (2) Assembly & test (back-end), which is a highly precise and automated process of packaging dies. (For further details, please refer to the chart on page 5 on "Integrated circuit (die) making process").

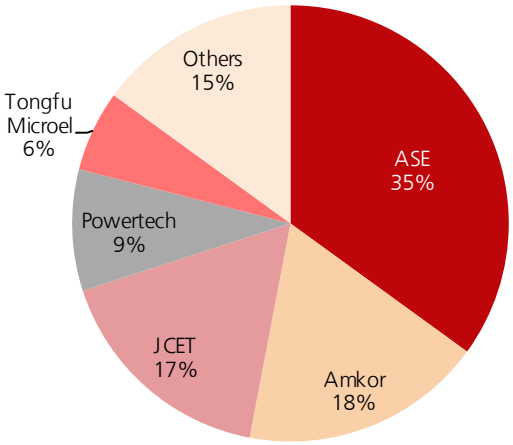
(1) Wafer fabrication (front-end) market. Front-end foundries provide wafer fabrication (i.e. front-end) services, which is dominated by TSMC (2330 TT, 51% market share in 2019), followed by Samsung (005930 KS, 19%), Global Foundries (8%), UMC (2303 TT, 7%), and SMIC (981 HK, 4%). Their suppliers are front-end semiconductor production equipment (SPE) suppliers, and the leading players are ASML (ASML NA, 22% market share in 2019), followed by Applied Materials (AMAT US, 19%), Tokyo Electron (8035 JP, 15%), Lam Research (LRCX US, 14%), and KLA (KLAC US, 7%). Both the front-end foundries and SPE markets are concentrated with top 5 players having c.80-90% market share.

Assembly & test (back-end) market. Back-end outsourced semiconductor assembly and test (OSAT) providers offer assembly & test (back-end) services, dominated by ASE (3711 TT, 35% market share in 2019, followed by Amkor (AMKR US, 18%), JCET (600584 CH, 17%), Powertech (6239 TT, 9%), and Tongfu Microel (002156 CH, 6%). In turn, their suppliers are back end-end semiconductor production equipment (SPE) suppliers, dominated by ASMPT (522 HK, 30% market share in 2019), followed by Disco (6146 JP, 23%), BE Semiconductor (BESI NA, 18%), Kulicke & Soffa (KLIC US, 13%), and Cohu (COHU US, 10%). Both back-end OSAT and SPE markets are concentrated with top 5 players having c.80-90% market share.

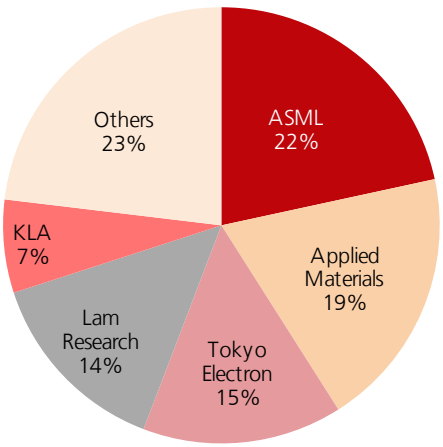
Global foundry market share (2019)



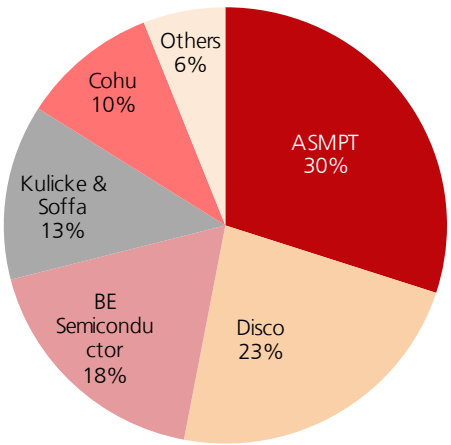
Global outsourced semiconductor assembly and test (OSAT) supplier market share (2019)



Global front-end semiconductor production equipment (SPE) market share (2019)

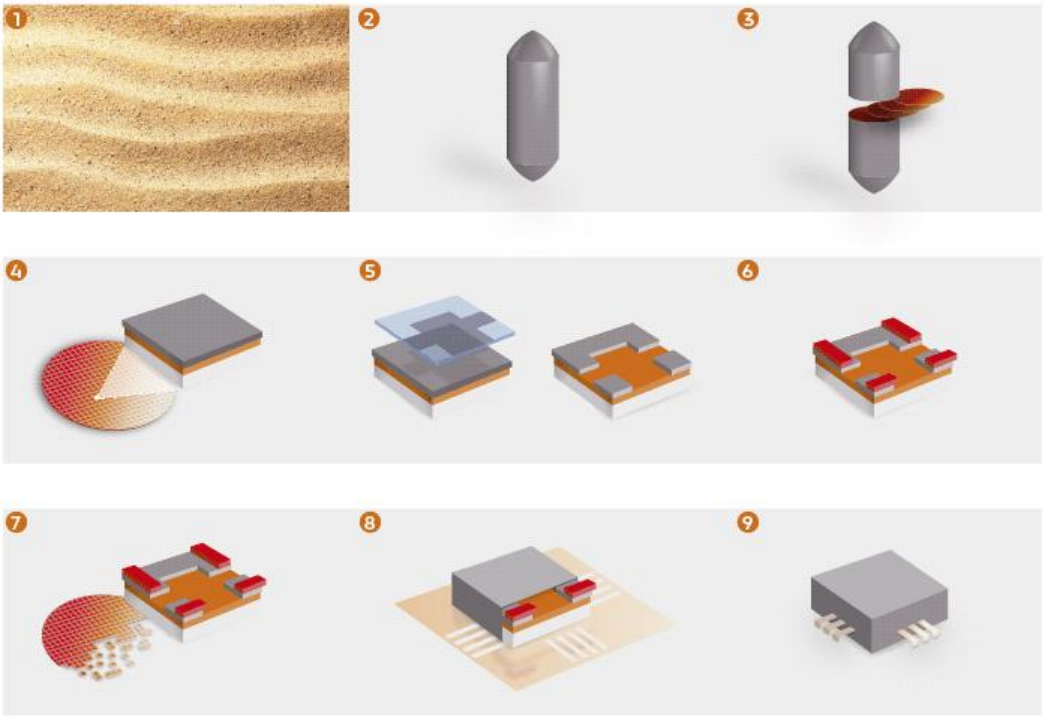


Global back-end semiconductor production equipment (SPE) market share (2019)



Source: Trendforce, The Information Network, DBS HK

Integrated circuit (die) making process



Wafer fabrication (front end)

1) From sand to pure silicon. The silicon is found in sand in the form of silicon dioxide. The silicon is separated from the oxygen molecules to make pure silicon.
2) Wafer blanks: The silicon is extracted and pulled from liquid silicon to form of long cylindrical ingots at high temperature.
3) Wafers are cut. Wafers are cut from ingots and polished to produce a smooth surface. They are then sent to foundries (i.e TSMC [2330 TT], Global Foundries, UMC [2303 TT], SMIC [981 HK]) for processing.
4) Coating wafers. The wafer is put into a high-temperature furnace and exposed to oxygen, forming a layer of silicon dioxide on the surface. Chemical vapor deposition (CVD) is used to add a layer of nitride.
5) Creating masks. Once the circuit layout of the integrated circuits has been designed, masks are created which help copy the design onto the surface of the wafer.
6) Adding a pattern. The mask is placed above the wafer, with ultraviolet (UV) light shining above the mask. The wafer which is exposed to UV light is etched, leaving the parts not exposed to UV light intact. Dielectric or insulating film is then deposited in the trenches, to form gates between the trenches, which can be switched to allow charge carriers, such as electrons, to flow or to prevent them from flowing.

Assembly & test (back-end)

7) Wafers separated into individual integrated circuits (die). Once wafer manufacturing has been completed, the finished wafers are transported to outsourced semiconductor assembly and test (OSAT) providers (i.e. ASE [3711 TT], Amkor [AMKR US], JCET [600584 CH]) for cutting, assembly, and packaging. The wafers are cut by dicers into separate integrated circuits (die).
8) Die attachment, wine bonding, and encapsulation. The integrated circuits (die) are attached to lead frames by die bonders. Lead wires are bonded between integrated circuits (die) and lead frames by wire bonder. The integrated circuits (die) are encapsulated with ceramic, plastic, or epoxy to prevent physical damage or corrosion.
9) Testing & packaging. Each integrated circuit is then tested and packaged, and sent for placement on printed circuit boards (PCBs).

Source: ASM International, DBS HK

Global IC sales and semiconductor capex outlook. VLSI Research estimates global electronic sales (i.e. PCs & tablets, smartphones, Internet of Things [IoT], automotive, industrial devices, and servers) to decline 5% in 2020F. The COVID-19 situation would have an uneven impact on global electronic sales. Demand of smartphones, and IoT and automotive devices have slowed down owing to weak consumer sentiment, while "home schooling" and "work from home" have led to strong demand for PCs and cloud. In 2021, global electronic sales are expected to stage a strong rebound at 13%. This will be driven by continuous demand for PCs and cloud from increasing remote learning / working and other online activities, as well as accelerating electronics sales (i.e. smartphones, IoT, and automotive devices) and IC dollar content per device (i.e. applications / baseband processors, and CMOS image sensors) on 5G upcycle. Global 5G smartphone penetration is estimated to ramp up from 10% in 2020 to 30% in 2021F.

VLSI Research estimates global IC sales to grow by a marginal 1% in 2020F, as a decline in electronic sales will be offset by increasing IC dollar content per 5G device versus 4G device, and stage a strong 15% rebound in 2021F.

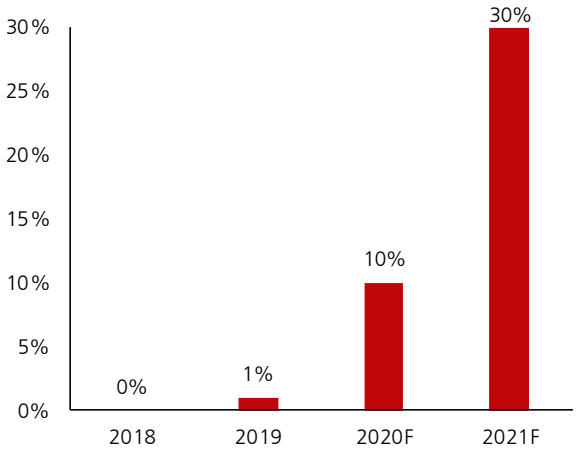
Global semiconductor capex is very reliant on healthy IC sales; therefore capex is estimated to be flattish in 2020F and increase by 4% in 2021F.

Global IC sales and semiconductor capex

US$ bn	2018	2019	2020F	2021F
Electronic sales	2,165	2,122	2,020	2,284
y-o-y	*5%*	*-2%*	*-5%*	*13%*
IC sales	407	352	355	409
y-o-y	*15%*	*-13%*	*1%*	*15%*
Semiconductor capex	101	97	97	101
y-o-y	*9%*	*-4%*	*0%*	*4%*

Source: VLSI Research, DBS HK

Global 5G smartphone shipment penetration



Source: IDC, DBS HK

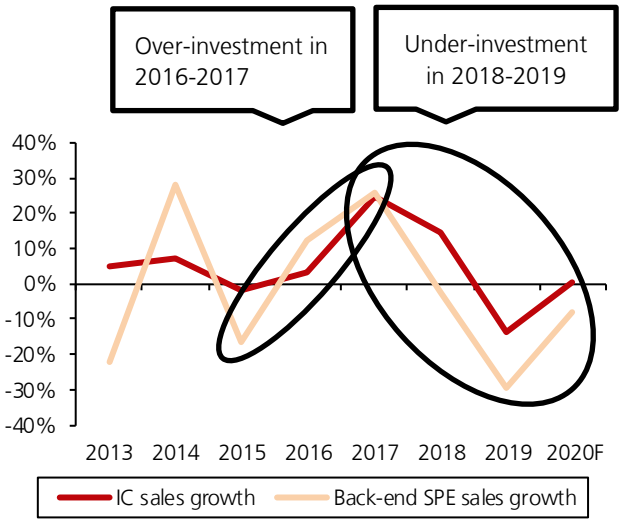
BOM cost comparison table between Galaxy S20 Ultra (5G), S10+ (5G), and S10+ (4G)

	Samsung Galaxy S20 Ultra (5G)	Samsung Galaxy S10+ (5G)	Samsung Galaxy S10+ (4G)	Difference between Samsung Galaxy S20 Ultra (5G) and S10+ (4G)	Difference between Samsung Galaxy S20 Ultra (5G) and Samsung Galaxy S10+ (5G)
Applications / Baseband Processor	108	103	71	52%	5%
Camera / Image	108	63	57	90%	72%
Memory	68	56	51	34%	22%
Sensor	11	3	4	214%	340%
Supporting materials	10	9	21	-54%	12%
Mixed signal	1	1	1	0%	0%
Connectivity	10	10	11	-10%	-5%
Power management / Audio	10	10	7	36%	-5%
Non-electronics	31	33	29	5%	-6%
Display / Touchscreen	67	90	87	-23%	-26%
RF component	33	46	31	6%	-28%
Battery	8	12	11	-29%	-35%
Substrates	13	26	13	0%	-52%
Others	28	18	17	65%	56%
Final assembly & test	28	14	14	96%	96%
Total	**529**	**490**	**420**	**26%**	**8%**

Source: Tech Insights, DBS HK

We find that global back-end SPE sales (in terms of units) always outperform the IC market during upcycles, and underperform IC sales during downcycles. For example, during 2016-2017, global back-end SPE sales outperformed IC sales, driven by (a) demand for CMOS image sensor (CIS) equipment, led by accelerating adoption of dual cameras by smartphones since 2016, and (b) demand for memory equipment, led by evolving memory technology (i.e. 3D NAND) and lower yield rate in 2016, coupled with an increase in memory dollar content per device. After over-investments during 2016-2017, memory oversupply issues started to surface during 2018-2019. Global back-end SPE sales trend underperformed IC sales trend during 2018-2019.

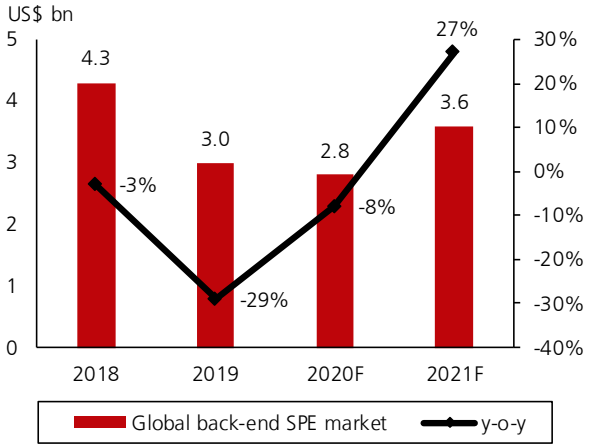
Global back-end semiconductor production equipment (SPE) sales versus IC sales (in terms of units)



Source: VLSI Research, DBS HK

After under-investing during 2018-2019, from our channel checks with back-end outsourced semiconductor assembly and test (OSAT) providers, we understand they have been operating at a high utilisation rate of c.90% in 2Q20 and 2H20 on the back of c.10-20% sales growth in 1H20. Accelerating electronics sales (i.e. smartphones, IoT, and automotive devices) and IC dollar content per device with 5G upcycle will create an even larger capacity shortfall in 2021F, which should help to rekindle OSAT capex and back-end SPE market growth. Besides, transition to new technology (i.e. advanced packaging) should rekindle the replacement cycle in 2021, as OSAT providers had adopted a wait and see strategy to time the onset of replacement demand post 4G era during 2018-2020. VLSI Research estimates global back-end SPE market to outperform IC sales growth of 15% to stage a strong rebound of 27% in FY21F, after declining 8% y-o-y in FY20F.

Global back-end semiconductor production equipment (SPE) market



Source: VLSI Research, DBS HK

Company overview

Company background. Founded in 1975 and listed in 1988, ASM Pacific Technology (ASMPT) is the world's largest back-end semiconductor production equipment (SPE) supplier, with 30% market share.

ASMPT expanded into surface mount technology (SMT, a technology of mounting integrated circuit [IC] onto printed circuit boards [PCBs]) through acquisition of through acquisition of Siemens's SMT business in 2011 and DEK in 2015. ASMPT is the world's second largest SMT equipment supplier, with 22% market share.

Milestones

Year	Milestones
1975	The company was founded
1988	Listed on Hong Kong Stock Exchange
2011	Expanded into surface mount technology (SMT) equipment business through acquisition of Siemens's placement machine business in 2011
2015	It further expanded its surface mount technology (SMT) equipment business through acquisition of DEK, a printing machine supplier

Source: Company, DBS HK

ASMPT has 12 manufacturing facilities and 10 R&D centres across China, Singapore, Malaysia, Germany, Holland, Portugal, the UK, and the US.

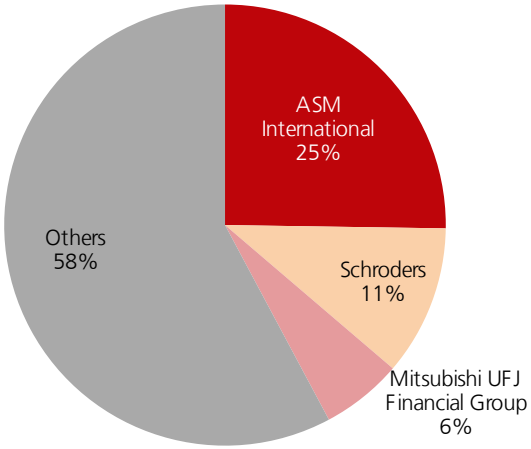
Major manufacturing facilities and R&D centres

Source: Company, DBS HK

Patrick Lam (林師龐) is the co-founder and ex-CEO of the company. ASM International (ASM NA), the world's leading front-end semiconductor production equipment (SPE) supplier, provided initial funding for ASMPT. WaiKwong Lee (李偉光) was the second CEO after Patrick Lam's retirement. Robin Gerard CherTat Ng (黃梓達) is current CEO after retirement of WaiKwong Lee, with Orasa Livasiri as current Chairman.

ASM International is the largest shareholder with a 25% stake. Schroders and Mitsubishi UFJ Financial Group are the second and third largest shareholders with 11% and 6% stakes respectively.

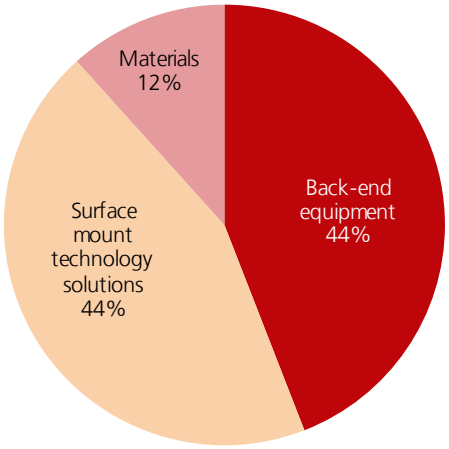
Shareholder structure



Source: Company, DBS HK

Product mix. (1) Semi solutions, (2) Materials, (3) Surface mount technology (SMT) solutions accounted for 44%, 12%, and 44% of FY19 revenues respectively.

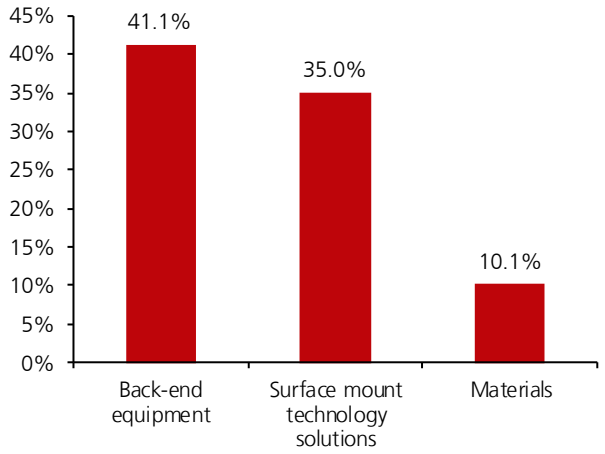
Revenue mix (FY19)



Source: Company, DBS HK

Semi solutions and SMT solutions commanded higher gross profit margin (GPM) of 35-41% in FY19, while materials had a lower GPM of 10%. By contribution (1) Semi solutions, (2) Materials and (3) SMT solutions, accounted for 52%, 3%, and 44% of FY19 gross profit respectively.

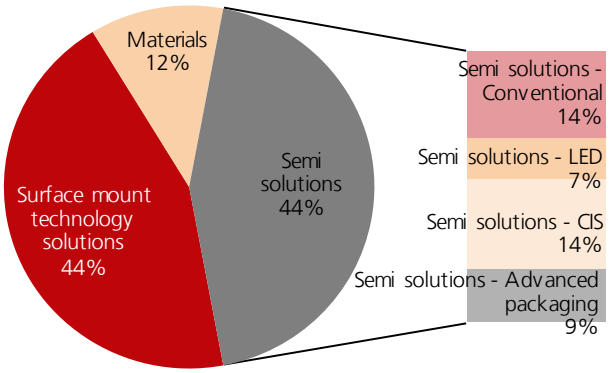
Segmental gross profit margin (FY19)



Source: Company, DBS HK

(1) Semi solutions (previously classified as back-end equipment, 44% of FY19 revenue, 52% of gross profit). Within ASMPT's semi solutions business, we estimate that conventional semi solutions comprised 21% of segmental revenue, CMOS image sensors (CIS) 32%, LED 15%, advanced packaging 20% in FY19.

Revenue mix (FY19)



Source: Company, DBS HK

(i) CMOS image sensors (CIS, 14% of FY19 revenue). The increasing adoption of multi cameras, which allows smartphone cameras to deliver image quality close to digital single-lens reflex (DSLR) cameras. This will lead to higher volumes of CMOS image sensors (CIS) and related back-end SPE.

(ii) LED (7% of FY19 revenue). The increasing adoption of mini-LED will drive volume of LED chips and related back-end SPE. Mini-LED is defined as LED chip sizes ranging between 100-300 μm versus LCD's >300 μm. Compared to LCD, mini-LED backlighting LCD can improve the display performance of smart devices. Compared to OLED, the benefits of mini-LED backlighting LCD is lower costs, longer life span, and potential power-savings. Apple will likely adopt mini-LED backlighting LCD for its iPad and Macbook in 2020F, which will potentially help mini-LEDs to move to mass volume technology. Large numbers of mini-LEDs (i.e. 10,000+ of LEDs per backlight unit [BLU]) is used as the light source in mini-LED backlight LCD, which is far above from just LCD (i.e. 30-100 units of LEDs per BLU). This will lead to volume uplift of LED chips and related back-end SPE.

Global IC sales and semiconductor capex

Display type	Traditional LCD	Mini-LED backlighting LCD	OLED
Light source	LED backlight (edge-emitting)	Mini-LED backlight (direct-emitting)	OLED self-emissive
LED chip size	300μm+	100-300μm	N.A.
Number of LEDs	Few (i.e. tablet/NB size: 30-100 units in backlight)	More (i.e. tablet/NB size: 10,000+ units in backlight)	N.A.
HDR effect	Low	Mid-high	High
Cost	Low	Mid-high	High
Life of display	Long	Long	Shorter
Power consumption	High	Low	Low

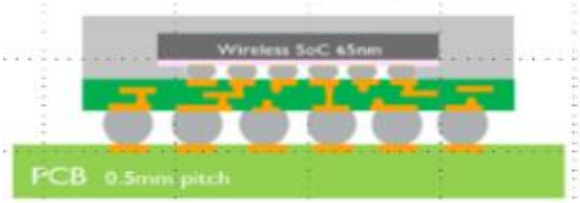
Source: Company, DBS HK

(iii) Advanced package (9% of FY19 revenue). Advanced package (i.e. Fan-Out Wafer Level Package) is another new driver of this segment. Fan-Out Wafer Level Package can bond integrated circuits (ICs) directly without using a substrate, versus Wire-Bond / Flip Chip bonding ICs that have to use a substrate This provides a small package with higher input / output to achieve higher computing performance, which is positive for use in mobile devices (i.e. 5G smartphones and IoT devices) as well as high performance computing applications (i.e. servers for data centres). Advanced package related back-end SPE have high ASP and thus margins.

Wire-Bond / Flip Chip versus Advanced package (i.e. Fan-Out Wafer Level Package)

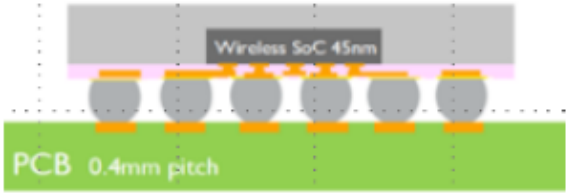
Wire-Bond / Flip Chip

Wire-Bond / Flip Chip bonding integrated circuit (IC) using a substrate



Advanced package (i.e. Fan-Out Wafer Level Package)

Fan-Out Wafer Level Package bond integrated circuit (IC) directly without using a substrate



Source: Company, DBS HK

Customers:

(i) Outsourced semiconductor assembly and test (OSAT) customers, such as ASE (3711 TT), Amkor (AMKR US), JCET (600584 CH), Powertech (6239 TT), Tongfu Microelectronics (002156 CH), Tianshui Huati (002185 CH), United Test and Assembly Center, King Yuan (2449 TT), Chipbond (8150 TT), etc.

(ii) LED package customers, such as Nichia, Osram (OSR GY), Lumileds, MLS (002745 CH), Seoul Semiconductor (046890 KS), Samsung LED, Everlight (2393 TT), Cree (CREE US), LG Innotek, Nationstar (002449 CH), etc.

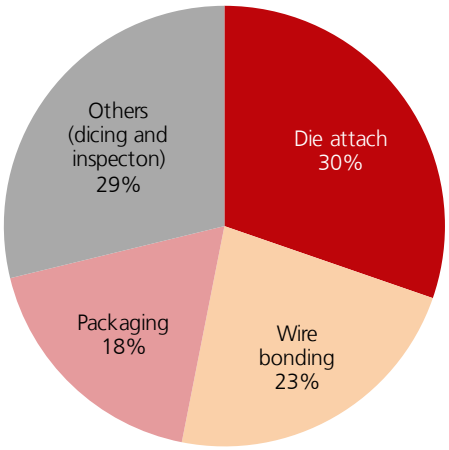
(iii) Camera module customers: O Film (002456 CH), Sunny Optical (2382 HK), LG Innotek (011070 KS), Q Technology (1478 HK), Semco (009150 KS), etc.

Competitors: ASMPT the world's largest back-end semiconductor production equipment (SPE) supplier (30% market share in 2019), followed by Disco (6146 JP, 23%), BE Semiconductor (BESI NA, 18%), Kulicke & Soffa (KLIC US, 13%), and Cohu (COHU US, 10%).

Back-end SPE mainly includes dicers & grinders, die bonders & wire bonders, and test handlers. Disco focuses on dicers & grinders. ASMPT, BE Semiconductor and Kulicke & Soffa, focus on die bonders & wire bonders. Cohu focuses on test handlers.

Therefore, only BE Semiconductor and Kulicke & Soffa are ASMPT's direct competitors. Compared with BE Semiconductor and Kulicke & Soffa, which are leaders in the die bonders and wire bonders segments respectively, ASMPT is dominant in both die bonders and wire bonders, hence enabling it to offer integrated solutions.

Global back-end SPE market composition (2019)



Source: VLSI Research, DBS HK

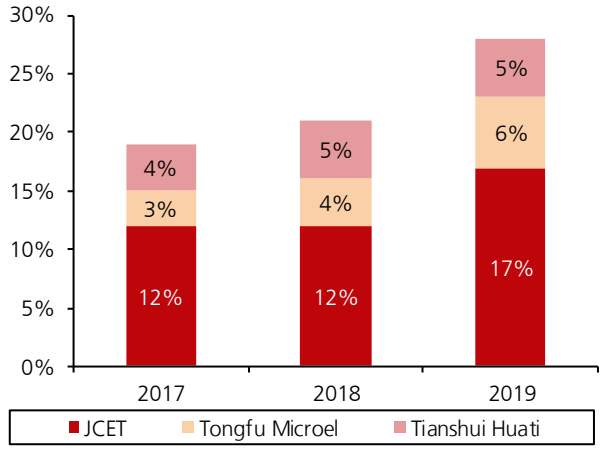
Top players of core back-end SPE subsegment markets (2019)

Dicers	#1 Disco, #2 Tokyo Seimitsu
Grinders	#1 Disco, #2 Tokyo Seimitsu
Die bonders	#1 ASMPT, #2 BE Semiconductor
Wire bonders	#1 Kulicke & Soffa, #2 ASMPT
Encapsulation	#1 Towa, #2 ASMPT
Test handlers	#1 Cohu, #2 Tech Wing

Source: VLSI Research, DBS HK

We expect ASMPT, as a dominant back-end SPE supplier in China, to have a deeper presence within China's OSAT customer base such as JCET (600584 CH), Tongfu Microelectronics (002156 CH), Tianshui Huati (002185 CH). This is because China has been increasing its supply chain localisation, especially in the semiconductor sub-segment, and OSAT and back-end SPE are easier sectors to start, given relatively narrower technology gap with overseas players compared to foundries and front-end SPE.

China's outsourced semiconductor assembly and test (OSAT) market share



Source: Trendforce, DBS HK

(2) Materials (12% of FY19 revenue, 3% of gross profit). Materials sold are leadframes which is a component in semiconductor packages. Customers are similar to its Semi solutions business, and sales are highly correlated with Semi solutions business.

(3) Surface mount technology (SMT) solutions (44% of FY19 revenue, 44% of gross profit). ASMPT expanded into surface mount technology (SMT) equipment business through the acquisition of Siemens's placement machine business (which places the components [i.e. integrated circuit] onto printed circuit boards) in 2011, and DEK, a printing machine company (which prints solder paste onto printed circuit boards) in 2015.

Customers: Hon Ha (2317 TT) is the division's largest customer. Other customers are other original equipment manufacturer (OEM) / electronics manufacturing services (EMS) providers, such as Pegatron (4938 TT), Flextronics (FLEX US), Jabil (JBL US), Wistron (3231 TT), Sanmina (SANM US), Celestica (CLS CN), Kinpo (2312 TT), Universal Scientific Industrial (601231 CH), Venture (VMS SP), Wingtech (600745 CH), and LCT (LCT SP), etc.

Competitors: ASMPT is the world's second largest SMT equipment supplier, with 22% market share. Major competitors to ASMP's SMT business are Panasonic (6752 JP) and Fuji (6134 JP). For smartphone EMS, ASMPT and Panasonic dominate in Apple's related supply chain names (i.e. Hon Hai), while Fuji dominates in Android smartphones' supply chain names. Panasonic dominates in PC EMS.

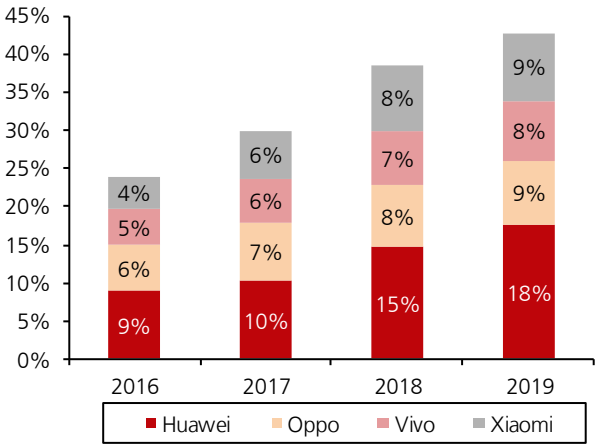
Major SMT equipment suppliers to OEM/EMS companies

OEM/EMS companies	Major SMT equipment suppliers
Hon Hai	ASMPT, Panasonic
Samsung Mobile	Fuji
Oppo / Vivo	Fuji, ASMPT
Pagatron	Panasonic
Wistron	Panasonic
Quanta	Panasonic
Compal	Panasonic
Inventec	Panasonic

Source: DBS HK

Similar to back-end SPE market, we expect ASMPT, as a Chinese SMT supplier, to gain market share with China's OEM / EMS providers, such as Wingtech (600745 CH), Huaqin, LCT (LCT SP) and China's smartphone vendor, such as Huawei, Oppo, Vivo, and Xiaomi (1810 HK), on the back of increasing supply chain localisation in China.

China's smartphone vendor market share



Source: IDC, DBS HK

Critical Factors

(1) Semi solutions revenue. ASMPT's semi solution business contributed 44% of FY19 revenue and 52% of gross profit. Key indicators of this segment: (i) Size of global back-end semiconductor production equipment (SPE) market, and (ii) ASMPT's market share. We expect ASMPT's semi solutions revenue to decline 4% y-o-y in FY20F amid COVID-19 situation and rebound 32% in FY21F.

(i) Global back-end SPE market. ASMPT's semi solutions revenue is highly correlated with global back-end semiconductor production equipment (SPE) market. Sales trend in the global back-end SPE market has been substantially below IC sales trend (in terms of units) during 2018-2019, after overinvestments during 2016-2017. From our channel checks with back-end outsourced semiconductor assembly and test (OSAT) providers, we understand they have been operating at a high utilisation rate of c.90% in 2Q20 and 2H20 on the back of c.10-20% sales growth in 1H20. Accelerating electronics sales (i.e. smartphones, IoT, and automotive) and rising IC dollar content per device amid 5G upcycle will create an even larger capacity shortfall in 2021F. This would rekindle OSAT capex and back-end SPE market growth. Transition to new technology (i.e. advanced packaging) should rekindle the replacement cycle in 2021, as OSAT providers had adopted a wait and see strategy to time the onset of replacement demand post 4G era during 2018-2020. VLSI Research estimates global back-end SPE market to outperform IC sales growth of 15% and stage strong 27% rebound in FY21F, after declining 8% y-o-y in FY20F.

(ii) ASMPT's market share / supply chain localisation. ASMPT's market share gain is a long-term structural driver of its semi solutions business. ASMPT's market share rose from 24% in 2015 to 30% in 2019, growing with China's outsourced semiconductor assembly and test (OSAT) customers, such as JCET (600584 CH), Tongfu Microelectronics (002156 CH), Tianshui Huati (002185 CH). This is because China has been increasing its supply chain localisation, especially in the semiconductor sub-segment, and OSAT and back-end SPE are easier sectors to start, given relatively narrower technology gap with overseas players compared to foundries and front-end SPE. We expect ASMPT's market share to continue to expand from 30% in FY19 to 33% in FY22F. However, the health of the global back-end SPE market is a more critical driver of its share price performance, as benefits from ASMPT's market share gains has not been able to offset the impact of a market downcycle.

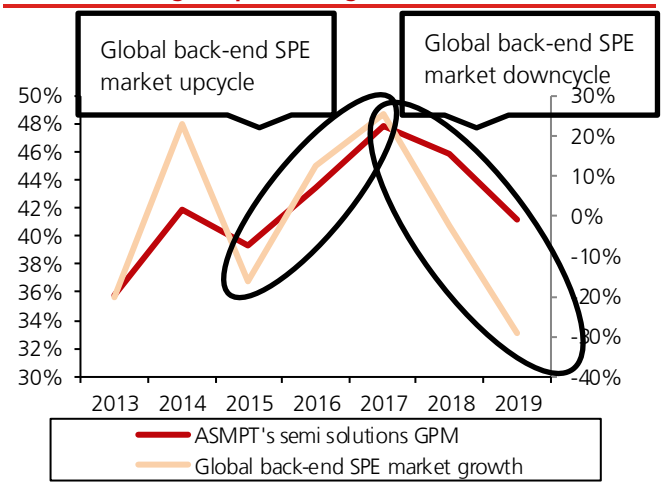
(2) Semi solutions gross profit margin (GPM). Key indicators of this segment: (i) Scale depending on whether the global back-end SPE market is on an upcycle or downcycle, and (ii) Product mix change.

(i) Scale depending on whether the global back-end SPE market is on an upcycle or downcycle. Semi solutions' gross profit margin (GPM) ranged between 39.4% and 47.9% during 2015-2019, which saw both an upcycle and downcycle.

(ii) Product mix change. Semi solutions' GPM ranged between 39.4% and 47.9% during 2015-2019, higher than 35.8% and 41.9% during 2013-2014, which was the previous downcycle and upcycle respectively. This was due to increasing product mix of higher-margin active alignment equipment for dual camera modules, led by accelerating adoption of dual cameras by smartphones during 2016-2017.

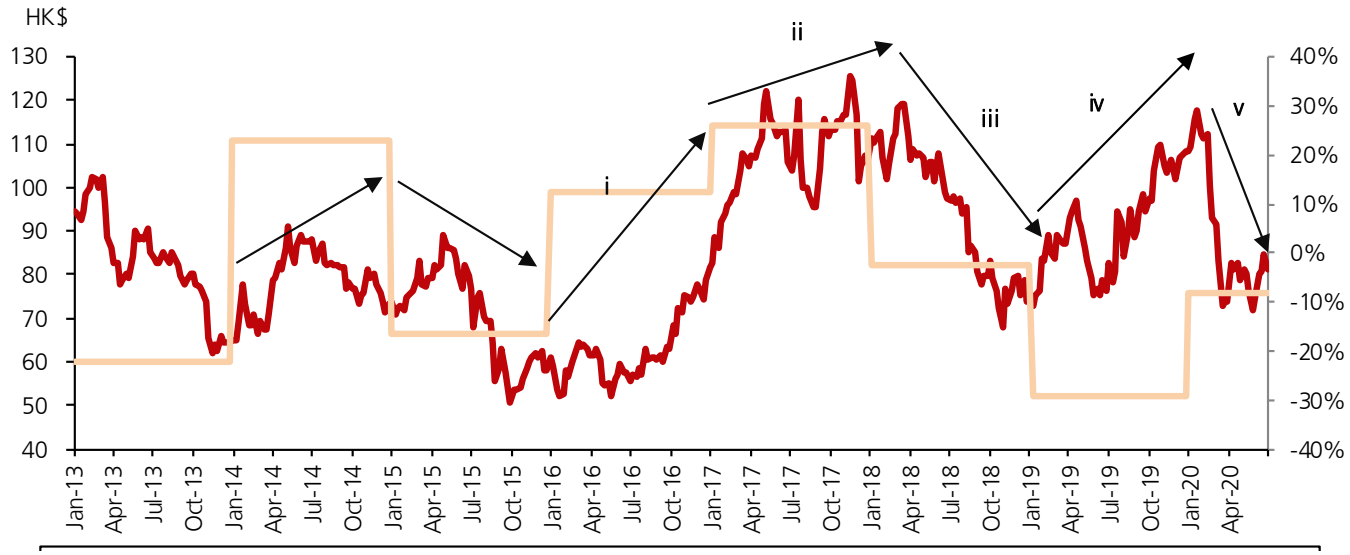
We forecast segmental GPM to improve from 41.1% in FY19 to 42.0% in FY20F and 43.5% in FY21F, amid back-end SPE market upcycle starting from FY21F, as well as product upgrades to higher-margin advanced packaging equipment.

Semi solutions gross profit margin (GPM)



Source: Company, DBS HK

ASMPT's share price performance



ASMPT's share price performance correlates with global back-end semiconductor production equipment (SPE) market as seen during 2016-2020.

(1) Global back-end SPE sales outperformed IC sales (in terms of units) during 2016-2017, driven by (a) demand for CMOS image sensor (CIS) equipment, led by accelerating adoption of dual cameras by smartphones since 2016, and (b) demand for memory equipment, led by evolving memory technology (i.e. 3D NAND) and lower yield rate in 2016, coupled with an increase in memory dollar content per device. .

(i) ASMPT's share price climbed 39% in 2016 when global back-end SPE market rebounded by 13% y-o-y in 2016.

(ii) ASMPT's share price rose 33% in 2017 when global back-end SPE market expanded by 26% y-o-y in 2017.

(2) After over-investments during 2016-2017, memory oversupply issues started to surface during 2018-2019. Global back-end SPE sales trend underperformed IC sales trend during 2018-2019.

(iii) ASMPT's share price fell 32% in 2018 even as global back-end SPE market declined by a slower 3% y-o-y in 2018.

(iv) ASMPT's share price rose 48% in 2019 despite global back-end SPE market declining by 29% y-o-y in 2019. However, the market had anticipated the 2019 contraction and the rise in share price was driven by 2020 5G upcycle. The global back-end SPE market is projected to rebound by 9% y-o-y in 2020F and 18% in 2021F, led by accelerating electronics sales (i.e. PCs & tablets, smartphones, Internet of Things [IoT], automotive, industrial devices, and servers) and higher IC dollar content per device with 5G upcycle.

(3) Global back-end SPE sales recovery in 2020F is not expected to pan out as earlier anticipated due to COVID-19 outbreak. However, supply-demand dynamics of outsourced semiconductor assembly and test (OSAT) providers is estimated to be tight in 2020F. Therefore, back-end SPE sales is estimated to stage a strong rebound in 2021F, led by accelerating electronics sales and higher IC dollar content per device as the 5G upcycle will create an even larger capacity shortfall.

(v) ASMPT's share price declined 30% in 2020 as global back-end SPE market is estimated to decline by 8% y-o-y in 2020 but rebound by 27% y-o-y in 2021.

Source: Thomson Reuters, DBS HK

Financials

Revenue. We expect ASMPT's revenue to decline by 3% y-o-y in FY20F and rebound 20% in FY21F.

Key assumptions

	FY18	FY19	FY20	FY21F	FY22F
Revenue (HK$ m)					
Semi solutions	9,260	7,003	6,718	8,870	9,861
Materials	2,255	1,853	1,866	2,149	2,256
Surface mount technology solutions	8,036	7,027	6,802	7,454	8,490
Total	19,551	15,883	15,386	18,472	20,607
Growth (y-o-y)					
Semi solutions	7%	-24%	-4%	32%	11%
Materials	5%	-18%	1%	15%	5%
Surface mount technology solutions	19%	-13%	-3%	10%	14%
Total	12%	-19%	-3%	20%	12%
Gross profit margin (GPM)					
Semi solutions	45.8%	41.1%	42.0%	43.5%	45.0%
Materials	11.5%	10.1%	9.0%	10.0%	10.0%
Surface mount technology solutions	36.5%	35.0%	32.5%	31.3%	30.0%
Total	38.0%	34.8%	36.5%	40.7%	40.7%

Source: Company, DBS HK

(1) Semi solutions (44% of FY19 revenue, 52% of gross profit). We expect ASMPT's semi solutions revenue to decline 4% y-o-y in FY20F and rebound 32% in FY21F.

ASMPT's semi solutions revenue is correlated to the global back-end semiconductor production equipment (SPE) market. The sales trend in the global back-end SPE market has been substantially below IC sales trend (in terms of units) during 2018-2019, after a period of overinvestments during 2016-2017. From our checks with back-end outsourced semiconductor assembly and test (OSAT) providers, we understand they have been operating at a high utilisation rate of c.90% in 2Q20 and 2H20 on the back of c.10-20% sales growth in 1H20. Accelerating electronics sales (i.e. smartphones, IoT, and automotive) and higher IC dollar content per device on the 5G upcycle will create an even larger capacity shortfall in 2021F, which would rekindle higher capex by OSAT players and spur back-end SPE market growth. Transition to new technology (i.e. advanced packaging) should rekindle the replacement cycle in 2021, as OSAT providers had adopted a wait and see strategy to time the onset of replacement demand post 4G era during 2018-2020. Research estimates global back-end SPE market to outperform IC sales growth of 15% and stage a strong rebound of 27% in FY21F, after declining 8% y-o-y in FY20F.

We expect ASMPT's market share to expand from 30% in FY19 to 33% in FY22F, as it makes inroads into China's OSAT customer base, such as JCET (600584 CH), Tongfu Microelectronics (002156 CH), Tianshui Huati (002185 CH). This is because China has been increasing its supply chain localisation, especially in the semiconductor sub-segment, and OSAT and back-end SPE are easier sectors to start, given relatively narrower technology gap with overseas players compared to foundries and front-end SPE.

Semi solutions revenue

HK$ m	FY18	FY19	FY20	FY21F	FY22F
Global back-end SPE market	33,454	23,340	21,784	28,008	30,342
y-o-y	-3%	-29%	-8%	27%	0%
ASMPT's market share	28%	30%	31%	32%	33%
ASMPT's back-end equipment revenue	9,260	7,003	6,718	8,870	9,861
y-o-y	-4%	32%	11%	0%	0%

Source: Company, DBS HK

(2) Materials (12% of FY19 revenue, 3% of gross profit). We expect ASMPT's material revenue to grow a marginal 1% y-o-y in FY20F in FY20F and 15% in FY21F.

ASMPT's material revenue is correlated with global IC sales. Global IC sales is estimated to also grow by 1% in 2020F, as increasing IC dollar content per 5G device versus 4G device offsets electronic sales decline. Global IC sales is expected to stage a strong rebound at 15% in 2021F, driven by continuous demand for PCs and cloud from increasing remote learning / working and other online activities as well as recovery of smartphones, IoT, and automotive with 5G ramp-up.

(3) Surface mount technology (SMT) solutions (44% of FY19 revenue, 44% of gross profit). We expect ASMPT's surface mount technology solutions (SMT) revenue to decline 3% y-o-y in FY20F and rebound by 10% in FY21F.

ASMPT's SMT solution revenue is correlated with capital expenditure (capex) of original equipment manufacturer (OEM) / electronics manufacturing services (EMS) providers. We refer to the top 10 OEM / EMS providers, where capex is estimated to decline by 11% in FY20F, but rebound 2% in FY21F. 5G smartphones' ramp up with more content inside 5G smartphones (i.e. RF ICs and PMICs) will lead OEM / EMS providers to upgrade their SMT equipment to cater to 5G smartphones in 2021-2022F.

We expect ASMPT's market share to be grow from 18% in FY19 to 23% in FY22F, with growing Chinese OEM / EMS providers, such as Wingtech (600745 CH), Huaqin, LCT (LCT SP).

Surface mount technology (SMT) solution revenue

HK$ m	FY18	FY19	FY20	FY21F	FY22F
Top 10 OEM / EMS suppliers' capex	38,024	38,890	34,803	35,455	37,733
y-o-y	17%	2%	-11%	2%	6%
ASMPT's market share	21%	18%	20%	21%	23%
ASMPT's SMT revenue	8,036	7,027	6,802	7,454	8,490
y-o-y	19%	-13%	-3%	10%	14%

Source: Company, DBS HK

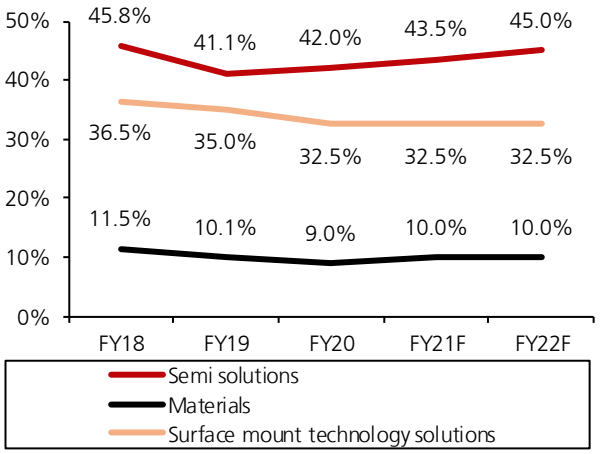
Gross profit margin. We expect ASMPT's gross profit margin (GPM) to increase from 34.8% in FY19 to 36.0% in FY20F and 40.8% in FY21F, amid product mix upgrades to advanced packaging and back-end semiconductor SPE market upcycle starting from FY21F.

(1) Semi solutions. We forecast segmental GPM to improve from 41.1% in FY19 to 42.0% in FY20F and 43.5% in FY21F, amid product mix upgrades to advanced packaging and back-end semiconductor SPE market upcycle starting from FY21F.

(2) Materials. We forecast segmental GPM to decrease from 10.1% in FY19 to 9.0% in FY20F amid COVID-19, but rebound to 10.0% in FY21F, due to operating leverage on a larger scale.

(3) Surface mount technology (SMT) solutions. We expect segmental GPM to increase from 35.0% in FY19 to 32.5% in FY20F amid COVID-19, and stay at 32.5% in FY21F, due to low margins from growing Chinese OEM / EMS customers.

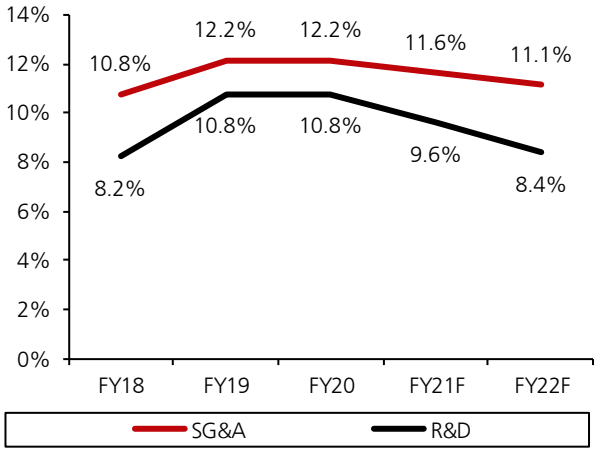
Gross profit margin



Source: Company, DBS HK

Operating expenses. We expect operating expenses as a percentage of revenue to be stable at 22.9% in FY20F, but decline to 21.2% in FY21F, due to operating leverage on a recovering scale.

Operating expenses as % of revenue



Source: Company, DBS HK

Net profit. We expect ASMPT's net profit to grow 27% in FY20F and 139% in FY21F, amid back-end semiconductor SPE market upcycle starting from FY21F.

Valuation & Peer Comparison

Based on our earnings estimates, ASMPT is trading at 14x FY21F PE and 2.6x P/BV.

Trading at average valuation to other back-end semiconductor production equipment (SPE) companies. ASMPT is trading at average valuations when compared to other back-end semiconductor production equipment (SPE) companies' 10-24x FY21F PE and 1-4x P/BV. We highlight that ASMPT is the world's leading back-end semiconductor production equipment (SPE) supplier. While peers are leading in just one of the sub-segments (i.e. dicers & grinders, die bonders & wire bonders, and test handlers), ASMPT is dominant in both die bonders & wire bonders, hence enabling it to offer integrated solutions. Hence, ASMPT should trade at the average of its peers' valuation range at the very least.

Trading close to historical trough. ASMPT's FY21F PE and P/BV trading multiples are close to -1SD below the 5-year averages on concerns over slow back-end SPE sales in 2020 amid COVID-19 outbreak.

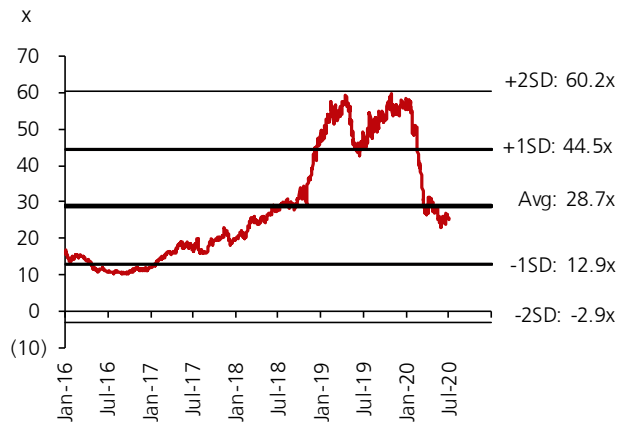
We believe ASMPT's P/BV multiples displays higher correlation to the global back-end SPE cycle compared to its PE multiples. For example, 2018 was a down cycle in the global back-end SPE market, but its PE was rising (price was dropping but forecast earnings were declining faster), while P/BV multiple was going down. Therefore, we believe P/BV is a more appropriate valuation methodology for cyclical sectors such as back-end semiconductor production equipment (SPE) companies like ASMPT.

P/BV valuation trend: (1) ASMPT's P/BV multiple increased from 2.6x in 1Q16 to 4.4x in 4Q17. Global back-end SPE sales have outperformed IC sales (in terms of units) during 2016-2017, driven by demand for CMOS image sensor (CIS) equipment, led by accelerating adoption of dual cameras by smartphones since 2016. (2) ASMPT's P/BV multiple declined from 4.4x in 4Q17 to 2.6x in 2Q19. After overinvestments during 2016-2017, global back-end SPE sales have underperformed IC sales since 2018. (3) ASMPT's P/BV multiple rebounded from 2.6x in 2Q19 to 4.0x in 4Q19, in anticipation of global back-end SPE sales recovery in 2020F and 2021F, with accelerating electronics sales (i.e. PCs & tablets, smartphones, Internet of Things [IoT], automotive, industrial devices, and servers) and higher IC dollar content per device driven by 5G upcycle. (4) ASMPT's P/BV declined from 4.0x in 4Q19 to 2.2x in 2Q20. Global back-end SPE sales recovery in 2020F has not panned out as per expectations amid COVID-19 outbreak.

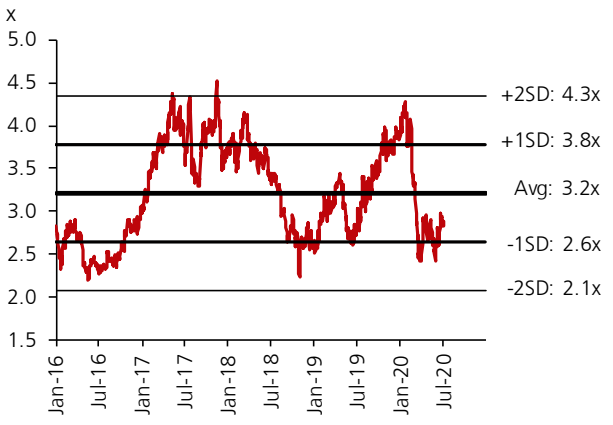
However, we believe ASMPT's share price, which has fallen c.30% YTD, has priced in concerns over slower back-end SPE sales in 2020. ASMPT's P/BV multiple deserves to rebound to 4x, underpinned by a strong rebound of back-end SPE sales in 2021F. Supply-demand dynamics in the outsourced semiconductor assembly and test (OSAT) segment is estimated to be tight in 2020F. Hence, accelerating electronics sales and higher IC dollar content per device led by 5G upcycle in 2021F will create an even larger capacity shortfall.

We initiate coverage on ASMPT with a BUY call and a target price of HK$118 based on 4x FY21F P/BV, pegged to its upcycle valuation during 2016-2020.

PE chart



PB chart



Source: Thomson Reuters, DBS HK

Industry peers

Company Name	Code	Currency	Price Local$	Mkt Cap US$m	Fiscal Yr	PE 20F x	PE 21F x	Yield 20F %	Yield 21F %	P/Bk 20F x	P/Bk 21F x	EV/EBITDA 20F x	EV/EBITDA 21F x	ROE 20F %	ROE 21F %
Back-end equipment suppliers															
Asm Pacific Tech.*	522 HK	HKD	88.60	4,674	Dec	45.9	19.2	2.7	2.7	3.2	3.0	17.2	9.7	6.8	16.0
Disco#	6146 JP	JPY	26,700	8,943	Mar	30.5	25.5	1.7	2.0	3.9	3.6	16.3	13.5	13.4	14.9
Tokyo Seimitsu#	7729 JP	JPY	3,475	1,348	Mar	15.4	12.0	2.2	2.8	1.3	1.2	6.6	5.4	8.0	10.1
BE Semiconductor	BESI NA	EUR	39.37	3,545	Dec	34.0	22.7	2.7	3.7	9.9	8.4	18.6	13.7	28.7	39.1
Kulicke & Soffa Inds.	KLIC US	USD	21.21	1,324	Sep	27.5	12.7	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Towa#	6315 JP	JPY	1,398	325	Mar	20.0	11.4	1.1	1.1	1.2	1.1	9.0	6.8	5.5	10.1
Cohu	COHU US	USD	16.87	704	Dec	93.7	14.5	0.4	0.0	1.6	1.6	14.3	7.8	2.1	12.4
Techwing	089030 KS	KRW	18,100	292	Dec	11.1	6.8	1.4	1.4	1.7	1.4	5.2	3.9	16.7	23.0
Average						**34.8**	**15.6**	**1.7**	**2.0**	**3.3**	**2.9**	**12.5**	**8.7**	**11.6**	**17.9**
SMT equipment suppliers															
Fuji#	6134 JP	JPY	1,872	1,703	Mar	15.4	11.3	2.2	2.6	1.0	0.9	4.2	3.6	7.4	8.4
Panasonic#	6752 JP	JPY	974	22,231	Mar	16.7	11.6	2.9	3.0	1.1	1.0	4.7	4.0	7.5	9.1
Average						**25.1**	**13.5**	**2.0**	**2.3**	**2.1**	**1.9**	**8.3**	**6.2**	**9.5**	**13.1**

 # FY20: FY21; FY21: FY22

*Source: Thomson Reuters, *DBS HK*

Environmental, Social & Governance (ESG)

Environmental: Environmental management. ASMPT is ISO 14001 certified yearly for its environmental management system at its main business locations in China (including Hong Kong), Germany, United Kingdom, Singapore, and Malaysia. The ISO 14001 standard specifies the requirements for an environmental management system that the company can use to enhance its environmental performance, fulfill its compliance obligations and achieve its environmental objectives.

Social: Employee engagement, diversity and inclusion. Hardware companies rely on their talents, especially research and development teams, to develop technology capabilities. ASMPT adopted "Share Award Scheme" starting from 1990, to align the interests of the company and its employees, motivate and retain existing talents and attract new talents as well.

Governance: Board structure. There is room for further improvement in the Board structure. Among the nine-member Board, only four are independent directors. However, there is separation of the Chairman and CEO roles. Orasa Livasiri is Chairman with Robin Gerard CherTat Ng as CEO. A Board led by an independent Chairman should be able to monitor and ensure that the company is run in accordance with the mandate of the company and will of its shareholders.

Management

Board of Directors

Name	Position	Description
Orasa Livasiri	Chairman	- Orasa Livasiri was appointed to the Board as an Independent Non-Executive Director in 1994, became acting Chairman of the Company in 2016. She was appointed as Chairman of the Company in 2017. - She was a practising solicitor for more than 30 years and retired from the profession in 2012.
Robin Gerard Cher-Tat Ng (黃梓達)	Chief Executive Officer	- Mr. Robin Gerard Cher-Tat Ng was appointed Group Chief Executive Officer in 2020. He has been on the Board as an Executive Director since 2011. He was Group Chief Financial Officer from 2010 until his new appointment as Group Chief Executive Officer.
Patricia Pei-Fen Chou (周珮芬)	Chief Financial Officer	- Patricia Pei-Fen Chou was appointed as Chief Financial Officer of the Group in 2020, and subsequently as an Executive Director of the Company in 2020.
Guenter Walter Lauber	Executive Director	- Guenter Walter Lauber is an Executive Vice President of the Group and Chief Executive Officer of the Group's SMT Solutions Segment. He was appointed as Executive Director of the Board in 2020. - He has over 20 years of working experience in the SMT equipment industry. In 2007, he took charge of the SMT business that was subsequently acquired by the Company in 2011.
Benjamin Gek-Lim Loh (卢钰霖)	Non-executive Director	- Benjamin Gek-Lim Loh was appointed as a Non-Executive Director of the Company in 2020. - He is the Chief Executive Officer, President and Chairman of the Management Board of ASM International N.V..
Petrus Antonius Maria van Bommel	Non-executive Director	- Petrus Antonius Maria van Bommel was appointed as a Non-Executive Director of the Company in 2010. - He is the Chief Financial Officer of ASM International. He was appointed as a member of the Management Board of ASM International in 2010 for a period of 4 years and he was reappointed again in May 2018 for a period of 4 years.
Hon-Yee Wong (黄汉仪)	Independent Non-Executive Director	- Hon-Yee Wong was appointed to the Board as an Independent Non-Executive Director in 2012. - He was the Associate Vice President (Knowledge Transfer) at the City University of Hong Kong prior to his retirement in 2014. Prior to joining City University of Hong Kong, he has been involved in high-tech product design and engineering management in industry for 25 years, over 20 of which were spent at Ampex Ferrotec Ltd., a subsidiary of Ampex Corporation in the USA.
Eric Koon-Hung Tang (邓冠雄)	Independent Non-Executive Director	- Eric Koon-Hung Tang was appointed as an Independent Non-Executive Director in 2013. He was formerly an Independent Non-Executive Director of the Company from 2004 to 2007, an Executive Director and the Chief Financial Officer of the Company from 2007 to 2010. - He was also appointed as an Independent Non-Executive Director of EGL Holdings Company Limited (6882 HK) in 2014. He has worked in the fields of manufacturing, banking, and public utilities with some major corporations both in Canada and in Hong Kong.
John Kam-Chong Lok (乐锦壮)	Independent Non-Executive Director	- John Kam-Chong Lok was appointed to the Board as an Independent Non-Executive Director in 2007. - He started his career as an auditor in an international accounting firm and then moved to work for some major financial information companies, including Moneyline Telerate (Hong Kong) Ltd. and Dow Jones Telerate. He is currently a Director of FHL & Partners CPA Limited.

Source: Company, DBS HK

CRITICAL FACTORS TO WATCH

(1) Semi solution business.

ASMPT's semi solutions business contributed 44% of FY19 revenue and 52% of gross profit. Key indicators of this segment: (i) Global back-end semiconductor production equipment (SPE) market, and (ii) ASMPT's market share. We expect ASMPT's semi solutions revenue to decline 4% y-o-y in FY20F and rebound 32% in FY21F.

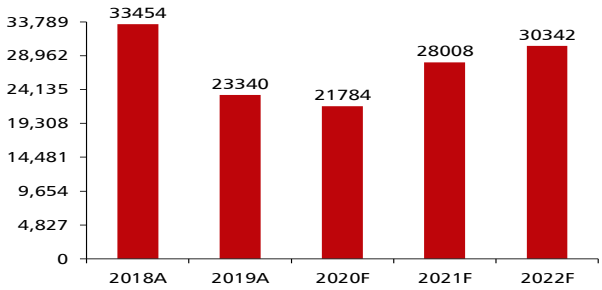
(i) Global back-end SPE market. ASMPT's semi solutions revenue is correlated with global back-end semiconductor production equipment (SPE) market. Global back-end SPE market saw sales trend substantially below IC sales trend (in terms of units) during 2018-2019, after overinvestments during 2016-2017. From our checks with back-end OSAT providers, we understand they have been operating at a high utilisation rate of c.90% in 2Q20 and 2H20 on the back of c.10-20% sales growth in 1H20. Accelerating electronics sales and higher IC dollar content per device on 5G upcycle will create an even larger capacity shortfall in 2021F, which should rekindle OSAT capex and back-end SPE market growth. Transition to new technology (i.e. advanced packaging) should rekindle the replacement cycle in 2021, as OSAT providers had adopted a wait and see strategy to time the onset of replacement demand post 4G era during 2018-2020. VLSI Research estimates global back-end SPE market to outperform IC sales growth of 15% and stage a strong rebound at 27% in FY21F, after declining 8% y-o-y in FY20F.

(ii) ASMPT's market share. ASMPT's market share is long term structural driver of ASMPT's semi solutions business. ASMPT's market share rose from 24% in 2015 to 30% in 2019, growing with China's OSAT customers. This is because China has been increasing its supply chain localisation, especially in the semiconductor sub-segment, and OSAT and back-end SPE are easier sectors to start, given relatively narrower technology gap with overseas players compared to foundries and front-end SPE. We expect ASMPT's market share to continue to grow from 30% in FY19 to 33% in FY22F. However, global back-end SPE market is a more critical factor to dictate share price performance, as ASMPT's market share gains has usually not been able to offset the impact of a market downcycle.

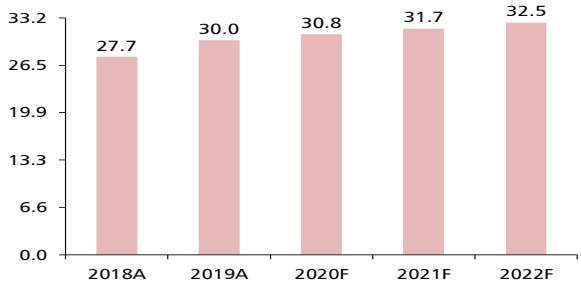
(2) Semi solutions gross profit margin (GPM)

Key indicators of this segment: (i) Scale depending on whether the global back-end SPE market is on an upcycle or downcycle, and (ii) Product mix change. Semi solutions' gross profit margin (GPM) ranged between 41.1% and 47.9% during 2017-2019. We forecast segmental GPM to improve from 41.1% in FY19 to 42.0% in FY20F and 43.5% in FY21F, amid back-end semiconductor SPE market upcycle starting from FY21F, as well as product upgrades to higher-margin advanced packaging.

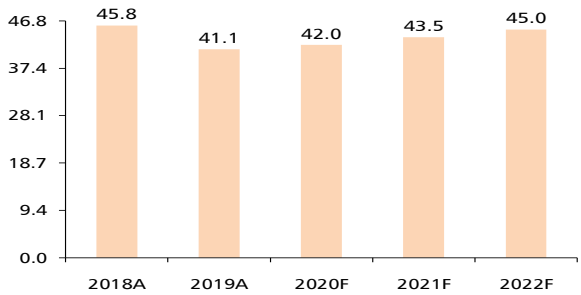
Semi solutions - Global back-end SPE market (HK$ m)



Semi solutions - ASMPT's market share (%)



Semi solutions - Gross profit margin (%)



Source: Company, DBS HK

Balance Sheet:

Improving financials. Operating cash inflows was HK$13,657m in FY19, with net capital expenditure of HK$579m. As of end-Dec-19, ASMPT had total debt of HK$3,232m and cash and bank balance of HK$2,326m. This translated into net debt of HK$906m (Dec-18: HK$1,234m). Accordingly, net debt to equity ratio improved from 10% in Dec-18 to 8% in Dec-19.

Share Price Drivers:

Back-end SPE investment upcycle starting from 2021F. From our channel checks with back-end outsourced semiconductor assembly and test (OSAT) providers, we understand they have been operating at a high utilisation rate of c.90% in 2Q20 and 2H20 on the back of c.10-20% sales growth in 1H20. Accelerating electronics sales and increasing integrated circuit (IC) dollar content per device led by the 5G upcycle will create an even larger capacity shortfall in 2021F, rekindling OSAT capex and back-end SPE market growth. Coupled with market share gains amid supply chain localisation in China, we expect ASMPT's semi solutions revenue to stage a strong rebound of 32% in FY21F, after declining 4% y-o-y in FY20F.

Key Risks:

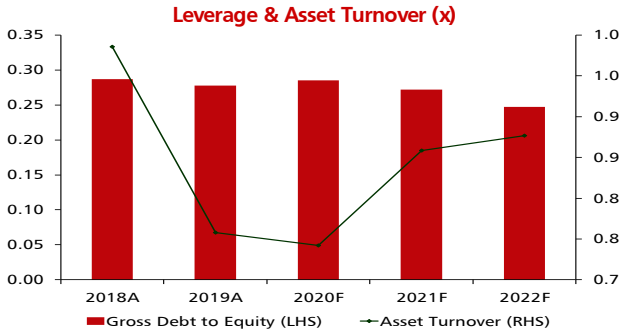
Slowdown in SPE market, led by slowdown in global electronic sales. Global electronic sales may further slow if first time buying and replacement cycle is further delayed in the event the global COVID-19 contagion lasts beyond 2Q20. This may further slowdown IC sales and semiconductor capex, and SPE market.

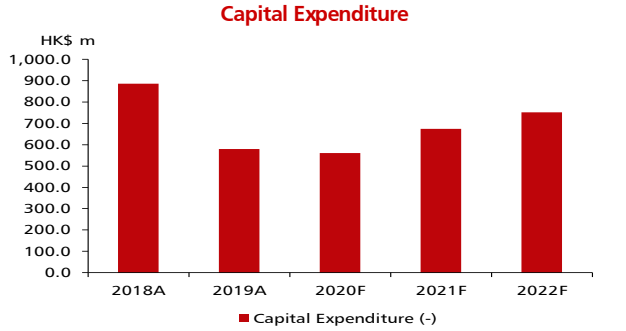
Environmental, Social, Governance:

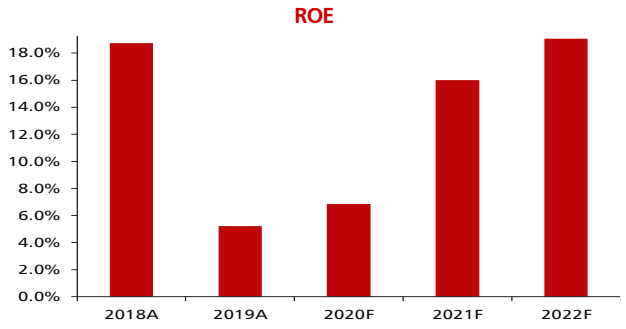
Hardware companies rely on their talents, especially research and development teams, to develop technology capabilities. ASMPT adopted "Share Award Scheme" starting from 1990, to align the interests of the company and employees, motivate and retain existing talents and attract new talents as well.

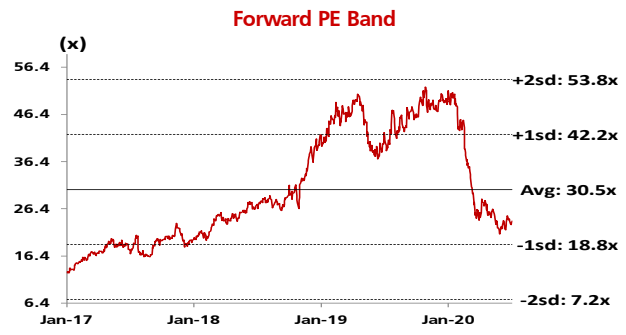
Company Background

Founded in 1975 and listed in 1988, ASM Pacific Technology (ASMPT) is the world's leading back-end semiconductor production equipment (SPE) supplier, with 30% market share. ASMPT expanded into surface mount technology (SMT) equipment business in 2011, and is the world's second largest SMT equipment supplier, with 22% market share. (1) Semi solutions, (2) Materials, (3) SMT solutions accounted for 44%, 12%, and 44% of FY19 revenues respectively. ASM International (ASM NA), which is the world's leading front-end SPE supplier, is the largest shareholder with a 25% stake.









Source: Company, DBS HK

Key Assumptions

FY Dec	2018A	2019A	2020F	2021F	2022F
Semi solutions - Global back-end SPE market (HK$ m)	33,454.0	23,340.0	21,784.0	28,008.0	30,342.0
Semi solutions - ASMPT's market share (%)	27.7	30.0	30.8	31.7	32.5
Semi solutions - Gross profit margin (%)	45.8	41.1	42.0	43.5	45.0

Source: Company, DBS HK

Segmental Breakdown (HK$ m)

FY Dec	2018A	2019A	2020F	2021F	2022F
Revenues (HK$ m)					
Semi solutions	9,260	7,003	6,718	8,870	9,861
Surface mount technology solutions	8,036	7,027	6,802	7,454	8,490
Materials	2,255	1,853	1,866	2,149	2,256
Total	**19,551**	**15,883**	**15,386**	**18,472**	**20,607**
Gross profit (HK$ m)					
Semi solutions	4,245	2,881	2,821	3,858	4,438
Surface mount technology solutions	2,934	2,457	2,183	2,883	3,205
Materials	259	187	605	887	986
Total	**7,437**	**5,524**	**5,609**	**7,628**	**8,629**
Gross profit Margins (%)					
Semi solutions	45.8	41.1	42.0	43.5	45.0
Surface mount technology solutions	36.5	35.0	32.1	38.7	37.7
Materials	11.5	10.1	32.4	41.3	43.7
Total	**38.0**	**34.8**	**36.5**	**41.3**	**41.9**

Source: Company, DBS HK

Income Statement (HK$ m)

FY Dec	2018A	2019A	2020F	2021F	2022F
Revenue	19,551	15,883	15,386	18,472	20,607
Cost of Goods Sold	(12,114)	(10,359)	(9,777)	(10,844)	(11,979)
Gross Profit	**7,437**	**5,524**	**5,609**	**7,628**	**8,629**
Other Opng (Exp)/Inc	(4,284)	(4,262)	(4,154)	(4,547)	(4,668)
Operating Profit	**3,152**	**1,262**	**1,455**	**3,081**	**3,961**
Other Non Opg (Exp)/Inc	18	39	37	45	50
Associates & JV Inc	0	0	0	0	0
Net Interest (Exp)/Inc	(178)	(215)	(215)	(222)	(227)
Dividend Income	0	0	0	0	0
Exceptional Gain/(Loss)	(19)	(110)	(110)	(110)	(110)
Pre-tax Profit	**2,973**	**976**	**1,168**	**2,794**	**3,674**
Tax	(761)	(353)	(380)	(910)	(1,196)
Minority Interest	(4)	(3)	(4)	(9)	(12)
Preference Dividend	0	0	0	0	0
Net Profit	**2,207**	**619**	**784**	**1,876**	**2,466**
Net Profit before Except.	2,226	729	894	1,985	2,575
EBITDA	3,742	1,921	2,120	3,754	4,659
Growth					
Revenue Gth (%)	11.6	(18.8)	(3.1)	20.1	11.6
EBITDA Gth (%)	0.9	(48.6)	10.3	77.1	24.1
Opg Profit Gth (%)	(0.9)	(60.0)	15.3	111.8	28.5
Net Profit Gth (%)	(21.6)	(71.9)	26.6	139.2	31.5
Margins & Ratio					
Gross Margins (%)	38.0	34.8	36.5	41.3	41.9
Opg Profit Margin (%)	16.1	7.9	9.5	16.7	19.2
Net Profit Margin (%)	11.3	3.9	5.1	10.2	12.0
ROAE (%)	18.8	5.2	6.8	16.0	19.1
ROA (%)	11.1	3.0	3.8	8.7	10.5
ROCE (%)	15.5	4.8	5.9	12.2	14.6
Div Payout Ratio (%)	49.6	131.6	124.4	52.0	39.5
Net Interest Cover (x)	17.7	5.9	6.8	13.9	17.4

Source: Company, DBS HK

Interim Income Statement (HK$ m)

FY Dec	2H2017	1H2018	2H2018	1H2019	2H2019
Revenue	9,337	9,616	9,934	7,275	8,608
Cost of Goods Sold	(5,602)	(5,704)	(6,410)	(4,743)	(5,616)
Gross Profit	**3,736**	**3,912**	**3,525**	**2,532**	**2,992**
Other Oper. (Exp)/Inc	(2,096)	(2,039)	(2,245)	(2,040)	(2,223)
Operating Profit	**1,639**	**1,873**	**1,279**	**493**	**769**
Other Non Opg (Exp)/Inc	30	43	(25)	4	(75)
Associates & JV Inc	0	0	0	0	0
Net Interest (Exp)/Inc	(79)	(81)	(97)	(128)	(87)
Exceptional Gain/(Loss)	0	0	(19)	0	0
Pre-tax Profit	**1,591**	**1,835**	**1,138**	**369**	**607**
Tax	(275)	(437)	(178)	(190)	(163)
Minority Interest	7	4	1	1	(4)
Net Profit	**1,323**	**1,402**	**961**	**179**	**440**
Net profit bef Except.	1,323	1,402	980	179	440
Growth					
Revenue Gth (%)	N/A	17.5	6.4	(24.4)	(13.3)
Opg Profit Gth (%)	N/A	21.6	(22.0)	(73.7)	(39.9)
Net Profit Gth (%)	N/A	(6.1)	(27.4)	(87.2)	(54.2)
Margins					
Gross Margins (%)	40.0	40.7	35.5	34.8	34.8
Opg Profit Margins (%)	17.6	19.5	12.9	6.8	8.9
Net Profit Margins (%)	14.2	14.6	9.7	2.5	5.1

Source: Company, DBS HK

Quarterly Income Statement (HK$ m)

FY Dec	1Q2019	2Q2019	3Q2019	4Q2019	1Q2020
Revenue	3,660	3,615	4,159	4,449	3,380
Cost of Goods Sold	(2,420)	(2,323)	(2,714)	(2,902)	(2,247)
Gross Profit	**1,240**	**1,292**	**1,445**	**1,547**	**1,133**
Other Oper. (Exp)/Inc	(1,001)	(1,039)	(1,096)	(1,127)	(988)
Operating Profit	**239**	**253**	**349**	**420**	**145**
Other Non Opg (Exp)/Inc	30	(26)	38	(113)	(17)
Associates & JV Inc	0	0	0	0	0
Net Interest (Exp)/Inc	(87)	(41)	(42)	(45)	(40)
Exceptional Gain/(Loss)	0	0	0	0	0
Pre-tax Profit	**183**	**186**	**345**	**262**	**89**
Tax	(75)	(116)	(123)	(40)	(63)
Minority Interest	2	(1)	1	(5)	(2)
Net Profit	**110**	**69**	**223**	**216**	**24**
Net profit bef Except.	110	69	223	216	24
EBITDA	227	227	387	307	128
Growth (QoQ)					
Revenue Gth (%)	(23.2)	(1.2)	15.1	7.0	(24.0)
EBITDA Gth (%)	(37.0)	(15.9)	70.6	(20.6)	(58.3)
Opg Profit Gth (%)	(42.7)	5.8	37.9	20.3	(65.4)
Net Profit Gth (%)	(69.2)	(36.9)	221.6	(3.1)	(89.1)
Growth (YoY)					
Revenue Gth (%)	(15.8)	(31.4)	(19.5)	(6.7)	(7.6)
EBITDA Gth (%)	(63.8)	(80.6)	(53.2)	(28.2)	(52.5)
Opg Profit Gth (%)	(65.5)	(78.5)	(59.5)	0.6	(39.3)
Net Profit Gth (%)	(82.2)	(91.1)	(63.0)	(39.5)	(78.6)
Margins					
Gross Margins (%)	33.9	35.7	34.7	34.8	33.5
Opg Profit Margins (%)	6.5	7.0	8.4	9.4	4.3
Net Profit Margins (%)	3.0	1.9	5.4	4.9	0.7

Source: Company, DBS HK

Balance Sheet (HK$ m)

FY Dec	2018A	2019A	2020F	2021F	2022F
Net Fixed Assets	2,850	2,916	2,952	3,094	3,289
Invts in Associates & JVs	0	0	0	0	0
Other LT Assets	3,057	4,548	4,428	4,314	4,205
Cash & ST Invts	2,253	2,330	2,684	2,906	3,649
Inventory	6,542	6,291	5,938	6,586	7,275
Debtors	6,325	4,710	4,563	5,478	6,111
Other Current Assets	48	50	50	50	50
Total Assets	**21,075**	**20,846**	**20,615**	**22,428**	**24,578**
ST Debt	3,011	510	494	593	662
Creditors	3,165	2,670	2,520	2,795	3,088
Other Current Liab	1,616	1,252	1,535	2,065	2,351
LT Debt	474	2,722	2,722	2,722	2,722
Other LT Liabilities	648	2,059	2,059	2,059	2,059
Shareholder's Equity	12,168	11,628	11,277	12,177	13,668
Minority Interests	(7)	3	7	16	28
Total Cap. & Liab.	**21,075**	**20,846**	**20,615**	**22,428**	**24,578**
Non-Cash Wkg. Capital	8,133	7,129	6,495	7,254	7,997
Net Cash/(Debt)	(1,232)	(902)	(532)	(409)	265
Debtors Turn (avg days)	115.6	126.8	110.0	99.2	102.6
Creditors Turn (avg days)	113.6	109.4	103.5	95.0	94.8
Inventory Turn (avg days)	188.3	240.5	243.9	223.7	223.3
Asset Turnover (x)	1.0	0.8	0.7	0.9	0.9
Current Ratio (x)	1.9	3.0	2.9	2.8	2.8
Quick Ratio (x)	1.1	1.6	1.6	1.5	1.6
Net Debt/Equity (X)	0.1	0.1	0.0	0.0	CASH
Net Debt/Equity ex MI (X)	0.1	0.1	0.0	0.0	CASH
Capex to Debt (%)	25.4	17.9	17.4	20.3	22.2
Z-Score (X)	NA	NA	NA	NA	NA

Source: Company, DBS HK

Cash Flow Statement (HK$ m)

FY Dec	2018A	2019A	2020F	2021F	2022F
Pre-Tax Profit	2,973	976	1,168	2,794	3,674
Dep. & Amort.	572	621	627	628	649
Tax Paid	(761)	(353)	(380)	(910)	(1,196)
Assoc. & JV Inc/(loss)	0	0	0	0	0
(Pft)/ Loss on disposal of FAs	0	0	0	0	0
Chg in Wkg.Cap.	(959)	2,414	634	(759)	(743)
Other Operating CF	0	0	0	0	0
Net Operating CF	**1,824**	**3,657**	**2,049**	**1,754**	**2,383**
Capital Exp.(net)	(887)	(579)	(561)	(674)	(751)
Other Invts.(net)	(1,556)	(17)	18	18	18
Invts in Assoc. & JV	0	0	0	0	0
Div from Assoc & JV	0	0	0	0	0
Other Investing CF	(8)	(1,582)	0	0	0
Net Investing CF	**(2,450)**	**(2,178)**	**(543)**	**(656)**	**(734)**
Div Paid	(1,095)	(815)	(975)	(975)	(975)
Chg in Gross Debt	1,246	(253)	(16)	99	69
Capital Issues	(322)	(344)	(160)	0	0
Other Financing CF	(11)	7	0	0	0
Net Financing CF	**(183)**	**(1,404)**	**(1,151)**	**(876)**	**(907)**
Currency Adjustments	0	0	0	0	0
Chg in Cash	(809)	75	354	222	742
Opg CFPS (HK$)	6.87	3.06	3.48	6.18	7.69
Free CFPS (HK$)	2.32	7.57	3.66	2.66	4.01

Source: Company, DBS HK

DBS HK recommendations are based on an Absolute Total Return* Rating system, defined as follows:

STRONG BUY (>20% total return over the next 3 months, with identifiable share price catalysts within this time frame)

BUY (>15% total return over the next 12 months for small caps, >10% for large caps)

HOLD (-10% to +15% total return over the next 12 months for small caps, -10% to +10% for large caps)

FULLY VALUED (negative total return, i.e., > -10% over the next 12 months)

SELL (negative total return of > -20% over the next 3 months, with identifiable share price catalysts within this time frame)

**Share price appreciation + dividends*

Completed Date: 6 Jul 2020 19:02:45 (HKT)
Dissemination Date: 6 Jul 2020 19:35:38 (HKT)

Sources for all charts and tables are DBS HK unless otherwise specified.

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