

DBS Group Research . Equity

6 Jul 2022

H: BUY (Initiating Coverage)

Last Traded Price (H) (5 Jul 2022):HK\$17.60(HSI : 21,853)
Price Target 12-mth (H):HK\$21.50 (22.2% upside)

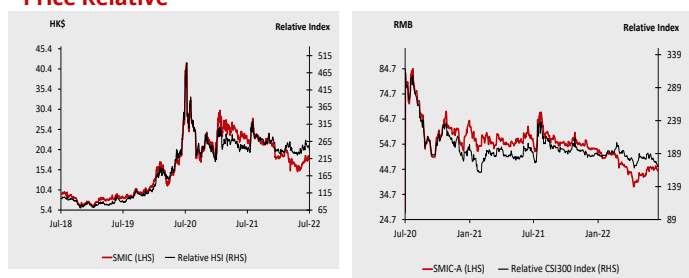
A: SELL (Initiating Coverage)

Last Traded Price (A) (5 Jul 2022):RMB44.30(CSI300 Index : 4,490)
Price Target 12-mth (A):RMB25.80 (41.8% downside)

Analysts

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Price Relative



Forecasts and Valuation (H Shares)

FY Dec (US\$m)	2021A	2022F	2023F	2024F
Turnover	5,443	8,206	9,404	10,309
EBITDA	3,597	4,867	5,115	5,100
Pre-tax Profit	1,840	2,816	2,973	3,017
Net Profit	1,702	2,337	2,468	2,504
Net Pft (Pre Ex) (core profit)	1,702	2,337	2,468	2,504
Net Profit Gth (Pre-ex) (%)	137.8	37.3	5.6	1.5
EPS (US\$)	0.21	0.29	0.31	0.32
EPS (HK\$)	1.68	2.31	2.44	2.48
Core EPS (US\$)	0.21	0.29	0.31	0.32
Core EPS (HK\$)	1.68	2.31	2.44	2.48
EPS Gth (%)	90.5	37.3	5.6	1.5
Core EPS Gth (%)	90.5	37.3	5.6	1.5
Diluted EPS (HK\$)	1.68	2.31	2.44	2.48
DPS (HK\$)	0.00	0.00	0.00	0.00
BV Per Share (HK\$)	17.04	19.71	22.50	25.32
PE (X)	10.5	7.6	7.2	7.1
CorePE (X)	10.5	7.6	7.2	7.1
P/Cash Flow (X)	5.9	4.7	4.2	4.1
P/Free CF (X)	nm	nm	5.6	nm
EV/EBITDA (X)	5.7	4.6	3.5	3.4
Net Div Yield (%)	0.0	0.0	0.0	0.0
P/Book Value (X)	1.0	0.9	0.8	0.7
Net Debt/Equity (X)	CASH	CASH	CASH	CASH
ROAE (%)	10.6	12.6	11.6	10.4
Earnings Rev (%):		New	New	New
Consensus EPS (US\$)		0.21	0.19	0.20
Other Broker Recs:		B:25	S:3	H:10

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

Focus on mature node to sustain high utilisation

- Leading foundry player in China with a worldwide market share of 5.4%
- Focusing on the mature niche (28-90nm) process, we expect revenue to increase at a CAGR of 23% in FY21-FY24, supported by localisation trend
- We forecast FY22/23 earnings to be 40%/66% higher than consensus due to a higher fab utilisation rate
- Initiate coverage with BUY and TP of HK\$21.50 on improving ROE and undemanding valuation

China's no.1 chip foundry company rides on the semiconductor localisation trend. Microcontroller unit "MCU" and auto chip localisation is expected to support SMIC's revenue to grow at a CAGR of 24% in FY21-24 VS global foundry market CAGR of 8% in FY21-26.

Our forecasted revenue is 8%/10% higher and earnings are 40%/65% higher than the consensus in FY22/23F. While the market is concerned about increasing overall foundry capacity in 2022, we forecasted 5.3%/5.8% higher utilisation rate than the market consensus in FY22/23F due to strong mature node foundry demand especially for MCUs and auto chips in China.

Downstream customers started investing in auto and MCU chips, signalling strong foundry demand in the future. 73% of MCU vendors have significant capex for auto chip and MCU projects ranging from Rmb65.5m to Rmb3.7bn in 2021. 82% have increased their R&D expenses by over 40% y-o-y in FY21, as indicated by the demand analysis done on lower stream clients.

Valuation:

We set our TP at HK\$21.50 based on a 1.1x FY22F PB, in line with the historical average. The re-rating will be driven by a stronger ROE over the next two years.

Key Risks to Our View:

A more tightened technology ban from western countries, further material cost surges, and unexpected further weakening of demand for consumer electronics.

At A Glance

Issued Capital (m shrs)	7,904
Mkt Cap (HKm/US\$m)	139,110 / 17,728
Major Shareholders (%)	
Datang Telecom Tech & Industry Holdings	16.0
China Integrated Circuit Industry Inv Fund	10.3
Free Float (%)	73.7
3m Avg. Daily Val. (US\$m)	56.09
GICS Industry: Information Technology / Semiconductors & Semiconductor	

SMIC

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SMIC

Investment Summary

Founded in 2000 and listed in 2004, Semiconductor Manufacturing International Corporation (SMIC, 981 HK) is the largest wafer foundry company in China and ranked fifth in terms of revenue in the world (market share of 5.4% in 2021). It possessed the most advanced chip foundry technology in Mainland China that can perform commercial chip fabrication of process nodes ranging from 0.35 μ m to 14nm. The wafers it produces are used in a wide range of applications in smartphones (29%), IoT (19%), consumer electronics (23%), and others (34%) like automotives.

The technology ban from the US has limited SMIC's ability to acquire certain US technology required to produce semiconductors with advanced technology nodes of 10nm or below. However, SMIC still achieved significant growth due to strong local demand for all applications during the chip shortage and sustainable capacity expansion.

Strong demand from lower stream customers. We have performed a demand analysis on 11 listed MCU design companies in China. This showed that a number of downstream customers started investing in auto and MCU chips since 2021. 72.7% recorded significant capital expenditure on either auto chip or MCU projects, with amounts ranging from Rmb65.5m to Rmb3.7bn. 81.8% have increased their R&D expenses by over 40% y-o-y in FY21. Therefore, we predict that chip foundries catering to the above applications will continue to face growing demand in the coming two to three years as a result of the chip localisation trend in China. SMIC is expected to be one of the major beneficiaries in this backdrop, based on:

1. MCU exposure amid accelerating localisation in China.

The current rate of China's self-sufficiency in overall semiconductors is c.15%, while that of MCUs was only about 6% in 2020. There is ample room for localisation and growth of the MCU sector in China. The slow process of localisation of MCUs in China is accelerating, due to 1) the prolonged foundry shortage, which is urging end-customers to seek local MCU supply; 2) the higher urgency in localisation, as Europe, Japan, and US vendors have prioritised local customers under the foundry constraints; and 3) local foundries having the advantage of being closer to downstream hardware manufacturers and therefore riding on the growth in IoT.

SMIC has product technology fully covering the 28nm to 65nm process nodes required for MCU foundries and is the only mainland foundry capable of handling 28nm or above. SMIC has just completed the 40 nm eFlash development and possessed the technology of 0.13 μ m and 55nm low-power eFlash which is an indispensable part of the MCU for IoT applications in smart homes and smart cities. We believe SMIC's 40nm platforms will gradually mature and that it will continue to ride on the trend of MCU foundry localisation.

2. Well prepared for the strong automotive application trend.

There is ample room for growth alongside the auto chips localisation in China, given that its self-sufficiency rate is only c.5%. The increasing penetration of EVs spurred by favourable policies from the central government and the level up in autonomous driving are expected to sustain the local demand for auto chip foundry. Major fabless players like GigaDevice and Sino Wealth Electronic are actively filling the gap by launching their new auto MCUs and will launch mass production in 2022.

SMIC has been actively developing its auto chip platform since acquiring LFoundry in Italy in 2016. It adheres to the IATF 16949 quality management system and AEC-Q100 stress test qualification requirements across its mature process nodes and has received recognition from various famous automotive customers through VDA 6.3 audits.

3. SMIC has an aggressive expansion plan on mature nodes,

which is expected to triple its 12-inch foundry capacity in 2025. The current capacity expansion pipeline is c.471k wafers up to 2025, representing a 72.6% capacity growth in the coming three years.

The new Beijing and Shenzhen 12-inch fabs are expected to commence production by the end of 2022, while the new Shanghai fab is expected to start production before 2025. All three new 12-inch fabs are supposed to be fully utilised in 2025 and the new capacity will be mainly for foundries of process nodes above 28nm. Following its capacity expansion in mature processes, we expect SMIC to be well positioned for the auto chip and MCU trend.

We expect foundry revenue from 28nm to 90nm process nodes to increase at a CAGR of 23.3% in FY21-FY24 (VS global foundry market CAGR of 7.9% in FY21-26), accounting for 76.4% of revenue in FY24.

Forecast 37.3%/5.6% earnings growth for FY22/23F. We forecast 7.5%/10.1% higher revenue than the market consensus, as we are more bullish on mature node foundry demand and the utilisation rate of the fabs. We forecasted 5.3%/5.8% higher utilization rate than the market consensus. This leads to FY22 and FY23 earnings coming in at 40.0% and 65.9% higher than the market consensus.

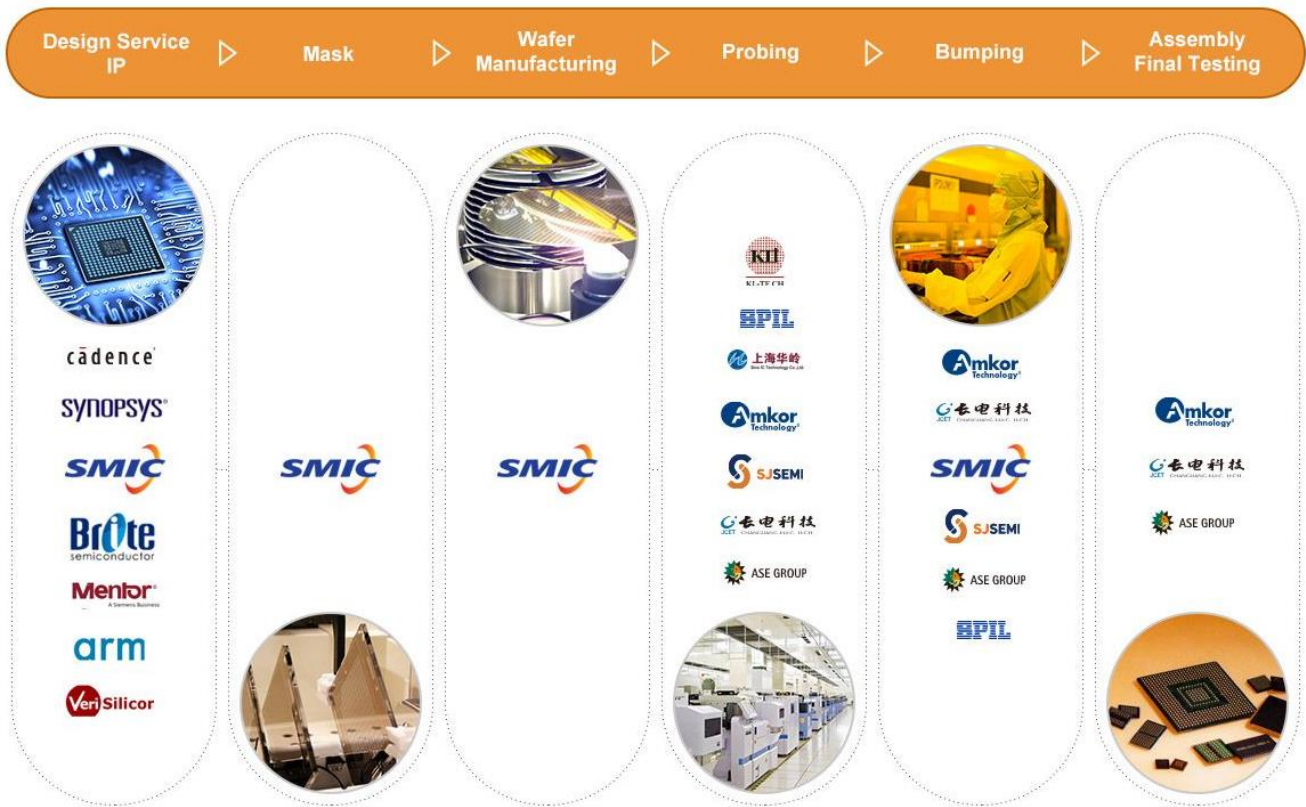
Initiate cover with BUY rating.

We initiate coverage on SMIC with a BUY rating due to (1) growing demand for MCUs and the acceleration of auto chip localisation, (2) shipment volume growth due to aggressive capacity expansion, and (3) an undemanding valuation.

SMIC is currently trading at a 0.9x FY22F PB, below its historical average (1.09x) because of the slowing growth in the advance logic chip foundry. We set our TP at HK\$21.50 based on a 1.1x FY22F PB, in line with the historical average. The re-rating will be driven by a stronger ROE over the next two years.

SMIC

Fig. SMIC's one-stop foundry solution



Source: Company Data, DBS Bank

SMIC

Valuation & Peer Comparison

We initiate coverage on SMIC with a BUY rating due to (1) the growing demand for MCUs and accelerating auto chip localisation, (2) shipment volume growth via aggressive capacity expansion, and (3) an undemanding valuation of a 0.90x FY22 PB.

SMIC is currently trading well below its five-year historical average (1.09x) because of slowing growth in the advanced logic chip foundry.

We set our TP at HK\$21.50 based on a 1.1x FY22F PB, in line with the historical average. We expect a re-rating will be driven by stronger growth and ROE from its aggressive expansion in mature node capacity in the coming few years.

SMIC's FY22F PB is also at a 61.3% discount to the median of its peers (1.99x), mainly because of concerns surrounding restrictions in growth due the technology ban on advanced node equipment.

Peer comparison

Company Name	Code	Currency	Target		Recom	Mkt Cap US\$m	Fiscal Yr	PE		Yield		P/Bk		EV/EBITDA		ROE		
			Price Local\$	Price Local\$				22F x	23F x	22F %	23F %	22F x	23F x	22F x	23F x	22F %	23F %	
Mature node foundries																		
Semicon.Mnfg.Intl.*	981	HK	HKD	17.6	21.50	BUY	26,155	Dec	7.6	7.2	0.0	0.0	0.9	0.8	4.6	3.5	12.6	11.6
Semicon.Mnfg.Intl. Corp. 'A'*	688981	CH	CNY	44.3	25.80	SELL	26,155	Dec	22.4	21.2	0.0	0.0	2.6	2.3	10.9	10.2	12.6	11.6
Hua Hong Semiconductor*	1347	HK	HKD	26.15	58.90	BUY	4,338	Dec	12.3	9.4	0.0	2.9	1.4	1.0	6.5	4.8	11.7	13.6
Globalfoundries	GFS	US	USD	40.57	n.a.	NR	21,898	Dec	18.0	17.2	0.0	0.0	1.7	1.4	9.1	7.4	12.1	13.9
Tower (Tae)	TSEM	US	ILS	162.2	n.a.	NR	5,044	Dec	20.6	17.4	n.a.	n.a.	2.7	2.4	n.a.	n.a.	n.a.	n.a.
Pwrchpsm.Mnfg.	6770	TT	TWD	39	n.a.	NR	4,702	Dec	6.2	7.4	5.5	3.4	1.7	1.5	4.5	4.9	35.5	23.5
United Micro Eltn.	2303	TT	TWD	38.9	n.a.	NR	16,293	Dec	5.8	7.0	10.1	10.6	1.5	1.5	3.0	3.3	26.5	20.4
Db Hitek	000990	KS	KRW	48800	n.a.	NR	1,671	Dec	3.7	3.6	1.0	1.1	1.2	1.0	n.a.	n.a.	41.9	30.4
Advanced node foundry																		
Samsung Electronics	005930	KS	KRW	57200	n.a.	NR	298,859	Dec	8.3	7.8	2.8	3.1	1.2	1.0	2.7	2.5	14.2	13.7
Taiwan Semicon.Mnfg.	2330	TT	TWD	446	n.a.	NR	388,059	Dec	13.5	12.3	2.8	2.9	4.4	3.4	9.4	8.1	34.7	30.9

Source: Thomson Reuters, *DBS HK

SMIC**Key Risks****Widening technology ban on China**

Theoretically, the current technology ban on SMIC mainly focuses on items required to produce semiconductors with advanced technology nodes of 10nm or below. However, there is news of the US Commerce Department considering expanding the ban on US companies, preventing them from selling advanced chip-making equipment to China. If the ban is extended to chip-making equipment that applies to nodes above 10nm, it will significantly harm SMIC's mature node foundry business, which is its main growth driver in the current chip localisation in China. If the ban on chip equipment expands to those applicable for process nodes ranging from 28nm to 90nm, there will be a 76.4% impact on revenue.

Commodity price surges boosted material costs

The cost of commodities such as steel, noble gas, aluminium, silicon, and fuel have increased significantly due to the Russia-Ukraine war and supply chain constraints. Noble gas, steel, aluminium, and silicon account for the majority of raw material cost in chip foundry.

As the geopolitics between NATO and Russia is still full of uncertainty, prolonged geopolitical and commodity price disorders will increase the silicon wafer cost and raw material cost for manufacturing, e.g., neon gas cost, in SMIC's chip foundries. This will erode its gross margins if there is a lag in transferring the cost to end customers.

Further weakening demand from consumer electronics

Global smartphone shipment volume has been on a decline since 2H2021 due to weak consumer sentiment due to the geopolitical conflict in Europe and lockdowns in China.

Despite SMIC seeing a growing share of revenue from chips for other applications, smartphone chip revenue accounts for c.1/3 of total revenue. Smartphone and smart device shipment volume is expected to continue to be sluggish in 2022. If consumer sentiment sees a further weakening due to intensified geopolitical instability and potential lockdowns in China caused by the outbreak of a new COVID variant, the decline in smartphone applications will finally erode the overall growth in chips.

SMIC

SWOT Analysis

Strengths	Weaknesses
<ul style="list-style-type: none"> • Mainland China's largest wafer foundry with the world's third-largest mature node capacity (c.11% market share) • Foundry capable of producing the most advanced technology process node (14nm) in China • Frontrunner advantage in China, and with national support • Consistently high R&D expenditure and innovation to sustain long-term growth 	<ul style="list-style-type: none"> • Lagging progress in eFlash technology development, coming alongside its peers • Seven to eight years behind leading players like TSMC and Samsung in advanced process node technology
Opportunities	Threats
<ul style="list-style-type: none"> • Localisation in China spurred by the ban on US chip technology exports to China • Policy support, like the potential extension of corporate income tax exemptions from the China central government • Acceleration of MCU localisation in China by narrowing the gap between local vendors and foreign vendors • Auto chip demand driven by increasing penetration of EV and autonomous driving, especially in China 	<ul style="list-style-type: none"> • Weak semiconductor demand from smartphones due to negative consumer sentiment • Prolonged technology ban from the US to restrict the items required by foundries of 10nm nodes or below • Shrinking demand for semiconductors due to potential slowdown in global economies • Logistics constraints due to potential intensification of COVID-19 lockdown measures in China

Source: DBS HK

SMIC

Critical Factors

The critical factors for SMIC are 1) wafer foundry capacity, 2) wafer ASP, and 3) average utilisation rate of fabs.

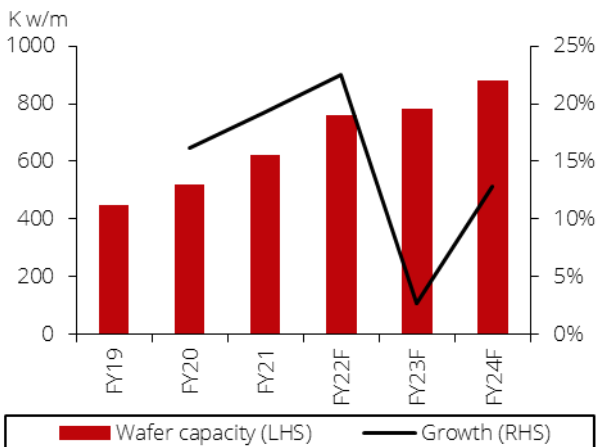
1) Wafer foundry capacity

The capacity of a foundry is the key proxy of its revenue in a supply-driven market. As there is a global shortage of chips, the higher the foundry capacity, the higher the sales shipment volume.

SMIC's capacity has been consistently expanding since 2019. Total capacity increased significantly by 16.1% to 520.8k in FY20 and 19.2% to 621.0k w/m in FY21. We expect the capacity expansion to continue in the coming three years under their aggressive expansion schedule for 12-inch facilities. We expect total capacity to increase from 621.0k w/m in FY21 to 1,120.0k w/m in FY25 at a CAGR of 15.9% in FY21-25F, driven by the expansion of its 12-inch capacity at a rate of 24.6% in FY21-25F.

We expect sustainable capacity expansion will continue to boost SMIC's wafer shipment of sales in the coming five years. We expect SMIC's wafer shipment volume to grow from 6,747k in FY21 to 9,489k in FY24 at a CAGR of 12.0%.

SMIC's wafer capacity growth

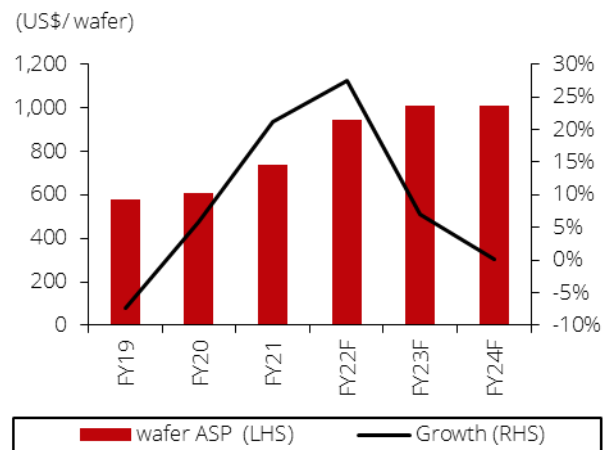


Source: Company data, DBS HK

2) Wafer ASP

The average selling price of wafers is a key component of the revenue of a foundry. Due to the global chip shortage, the prices of both 8-inch and 12-inch wafers have been on a hike for the past two years. SMIC's overall wafer ASP increased 5.9% to US\$609.8 in FY20 and 21.1% to US\$738.4 in FY21. We expect raw material costs to hike due to commodity inflation caused by the Russia-Ukraine war, and expect the persistent chip shortage, especially in mature node chips, to continue. These support the wafer price surge by transferring the cost increase to customers in the coming two years. We expect SMIC's wafer ASP to grow 27.5% to US\$941.5 in FY22F and 6.9% to US\$1,006.9 in FY23F, and be flat in FY24F due to the resolution of the chip shortage in mature node products.

SMIC's wafer ASP



Source: Company data, DBS HK

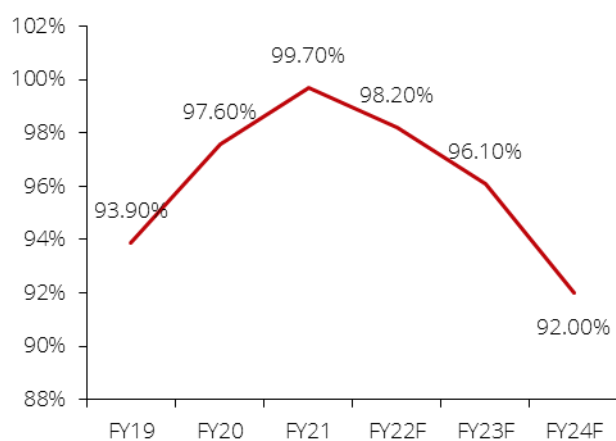
SMIC**3) Average utilisation rate of fabs**

The average utilisation rate of fabs is a proxy of the demand of wafer products and the resultant efficiency in ramping up the incremental capacity of a foundry.

Where we differ: 5.3%/5.8% higher utilization rate

We expect the average utilisation rate to be maintained at a high level of 98% and 96% in FY22 and FY23, 5.3%/5.8% higher fab utilization rate than the market consensus, despite the scheduled significant capacity expansion in the coming four years and the market 's concerned about increasing overall foundry capacity in 2022. This is due to strong mature node foundry demand and limited mature node foundry capacity. The chip shortage in mature node chips would not be resolved any time soon on the back of the strong demand from the automotive market and IoT penetration.

We also expect a smooth ramping up of incremental capacity in the coming three years, according to SMIC's successful track record. We expect the utilisation rate to return to a normal level of 92% in FY24 when the chip shortage starts easing.

SMIC's fab utilisation rate

Source: Company data and DBS HK

SMIC

Financials

Revenue: After strong growth of 25.4% in FY20 and 39.3% in FY21 driven by the chip shortage, we expect SMIC's FY22/23/24F revenue to grow by 50.8%/14.6%/9.6%, mainly due to a strong boost from the demand of MCUs and auto chips, and its aggressive capacity expansion in 12-inch foundry facilities.

Segmental breakdown (US\$m)

FY Dec	2020A	2021A	2022F	2023F	2024F
Revenues (US\$ m)					
Wafer revenue	3,475	4,982	7,636	8,743	9,558
Mask making, testing, others	432	461	571	661	751
Total	3,907	5,443	8,206	9,404	10,309
Gross margin (US\$ m)					
Wafer revenue	730	1,470	2,832	2,920	2,876
Mask making, testing, others	191	206	246	278	319
Total	921	1,676	3,077	3,197	3,196
Margins (%)					
Wafer revenue	21.0	29.5	37.1	33.4	30.1
Mask making, testing, others	44.1	44.7	43.0	42.0	42.5
Total	23.6	30.8	37.5	34.0	31.0

Source: Company, DBS HK

Wafer foundry revenue: SMIC's wafer foundry revenue increased significantly by 19.9% in FY20 and 43.4% in FY21, driven by its continued capacity expansion and strong semi demand during the pandemic. We forecast a significant FY22 revenue y-o-y growth of 53.2% due to the high utilisation rate and wafer ASP hike in the backdrop of the chip shortage. Growth will slow down to 14.5% in FY23 and 9.3% in FY24 due to a slowdown in the price hikes and an edging down of utilisation because we expect the shortage of certain chip types to start easing.

Fluctuating gross profit margin: The gross margin increased from 20.6% in FY19 to 30.8% in FY21, which is attributable to the ASP hike and ramping up of the utilisation rate through incremental capacity. We expect the gross margin to continue to increase to 37.1% in FY22 due to the ASP

hike and higher utilisation rate. It will then lower to 33.4% in FY23 and 30.1% in FY24 due to the edging down of utilisation, improving foundry supply in some chip types, and increases in manufacturing cost, like raw material cost and labour cost.

Declining operating expenses-to-sales ratio: The operating expenses/sales ratio significantly decreased from 31.1% in FY19 to 17.3% in FY21 due to economies of scale. We expect the operating expenses/sales ratio to continue to decrease from 17.3% in FY21 to 11.9% in FY24, as we expect the R&D research maintain at the range around US\$ 600 to 700m and ratio to decline as a result of cost efficiencies via economies of scale as a result of further expansions.

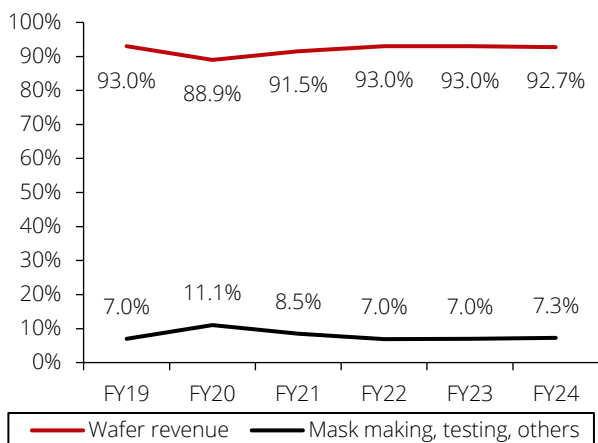
Increasing net financing income: SMIC has maintained net finance income during FY19 to FY21 ranging from 2.1% to 2.5% of sales. We expect the finance cost to remain stable in FY22 to FY24 due to an expectedly stable amount of total debt on the back of strong operating cash inflow from the foundry business. We expect net finance income to range from 1.0% to 2.3% of sales during FY21 to FY24, backed by higher finance income.

Fluctuating net cash flow. Net cash flow has been fluctuating in FY19 to FY21. It increased significantly from US\$437.9m to US\$75.9bn in FY20 due to the A-share listing. It decreased to an outflow of US\$1.2bn in FY21 due to strong investment. We expect net cash inflow to range from US\$1.1bn to US\$4.9bn in FY22 to FY24 due to strong cash inflow from operating activities.

Strong balance sheet: The group had total debt of US\$6.78bn and net cash of US\$5.73bn as of Dec 2021. SMIC's historical capital expenditure primarily included investment in foundry facilities, patents, and technology. Net capital expenditure decreased from US\$57.9bn to US\$40.4bn in FY21, mainly due to a slight slowdown in investment into foundry capacity compared with that of FY20.

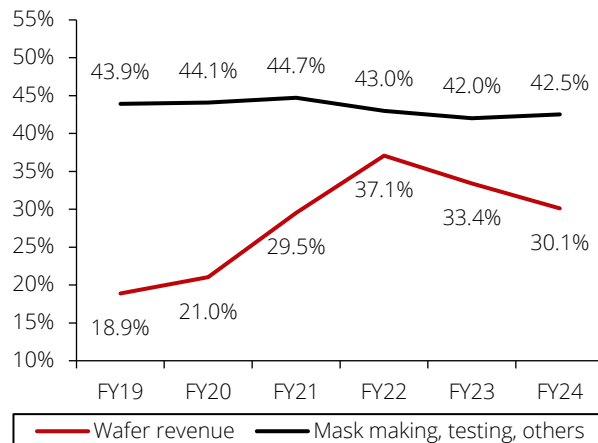
SMIC

Revenue of the business segments



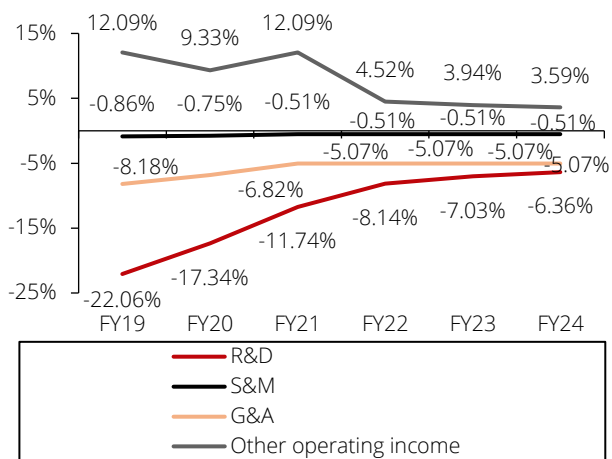
Source: Company data and DBS HK

Gross margins of the business segments



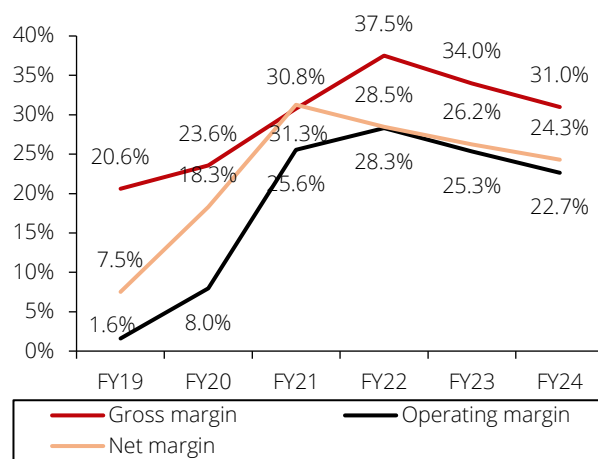
Source: Company data and DBS HK

Opex as a % of revenue



Source: Company data and DBS HK

Margin trend



Source: Company data and DBS HK

SMIC**Environment, Social, & Governance (ESG)****Adhering to independent innovation**

SMIC attaches much importance to innovation, which is an important part of corporate culture. They have established a sound internal management system for innovation, and they encourage continuous innovation in R&D, productivity improvement, and work process optimisation.

SMIC attaches great importance to the protection of intellectual property rights in every link of R&D, production, procurement, and sales to avoid intellectual property risks. They collaborate with appropriate partners to ensure that they do not infringe on others' intellectual property rights during the R&D process.

In 2021, SMIC continued to reinforce independent R&D and increase investment in technological innovation. As of the end of the reporting period, SMIC filed 17,980 patent applications, of which 12,467 were granted. This helps keep its leading position in the semiconductor industry in Mainland China in terms of the number of patents applied for and granted. SMIC adhering to independent innovation will support the development of its foundry business, which requires both technology advancement and technical knowhow.

Aggressive target in tackling climate change

SMIC has formulated a number of targets for effective energy conservation and carbon reduction to actively work towards the national goals of achieving carbon peak by 2030 and carbon neutrality by 2060. By 2030, SMIC targets a 50% reduction in the level of GHG emissions per unit of production and a 30% reduction in the energy consumption per unit of production, compared with 2010 figures. To achieve these targets, SMIC invested nearly Rmb1.1bn in environmental protection in 2021, representing a 21% increase over the previous year.

These targets and measures in energy conservation and carbon reduction help SMIC align its efforts with the direction of the national policy and help sustain its long-term growth in China.

Talent retention

Employees are the crucial assets of a company, and even the country, as the amount and quality of semiconductor talent affects the technology growth of a nation. SMIC makes continued efforts to retain top performers by offering competitive remuneration and benefits, diverse career development paths, corporate culture building activities, etc.

To further enhance the company's long-term incentive mechanism to attract and retain top-tier talent, the company implemented the "STAR market share" incentive

plan in May 2021. The grant recipients include directors, senior management, core technical personnel, middle and senior business management, and technical and business staff who make up the backbone of the company. Good talent retention measures will support SMIC's R&D and growth in the long term.

In 2021, against the backdrop of an increasing overall turnover rate in the IC industry, SMIC's employee turnover rate was around 21.22%.

SMIC

Competitive Landscape

(1) Global foundry market

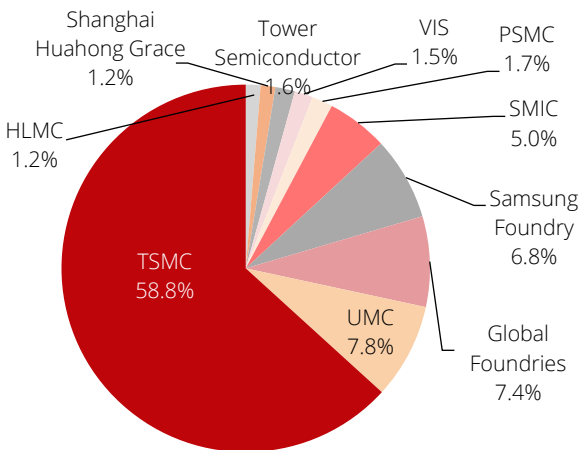
Semiconductor foundry is an extremely concentrated market due to high entry barriers and it is significantly capital intense. The top 10 foundries in the world received 93% of total foundry revenue in 2021 and Taiwan-based foundries held 68.4% of the market share. TSMC maintained its leading position with 56.6% of market share in 2021 while it dominated 97% of the foundry market for 5nm nodes.

The foundry market continued its rapid expansion in 2021. Worldwide semiconductor revenue increased 26.3% y-o-y in 2021 to US\$595bn due to the growing demand for chips in automotive and IoT and telecommunication, and consistent capacity expansion of foundries. Meanwhile, revenue from the top 10 foundries increased 31.0% y-o-y and indicates a more concentrated market.

While TSMC and Samsung have dominated over half of the market, some of the top 10 foundries that focus on mature nodes gained market share in 2021. GlobalFoundries, SMIC, PSMC, Hua Hong Semi, and VIS gained 0.2/0.3/0.5/0.3/0.1ppt y-o-y in market share as the shortage in 8-inch facilities is expected to be least resolved.

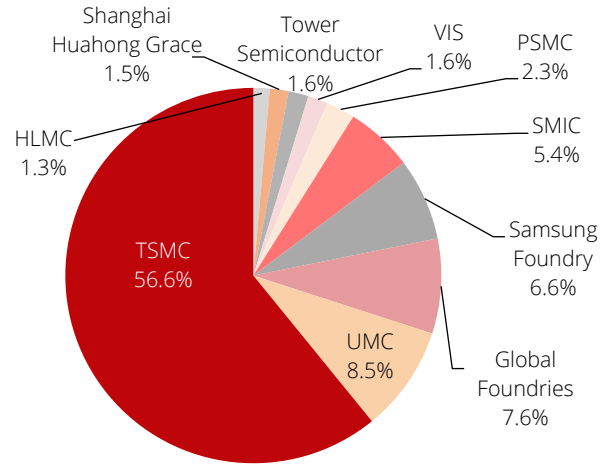
The foundry business is expected to slow in terms of growth compared with 2021, especially in advance logic, due to a slowdown in the consumer-facing markets of 5G phones, game consoles, wireless access points, and wearables, and a relatively rich supply of advance node foundry capacities in 2022.

Revenue share of top 10 foundry players worldwide 2020



Source: Gartner and DBS HK

Revenue share of top 10 foundry players worldwide 2021



Source: Gartner and DBS HK

Revenue share of top five players (by process node)

	TSMC \$56,674	Samsung Foundry \$8,538	UMC \$7,605	Global Foundries \$6,586	SMIC \$5,443
5 nm	10,468	487			
7/10 nm	17,971	2,954			
16/12 nm	7,606	1,759		2,107	354
32/28 nm	6,064	1,596	1,521	1,317	463
40 nm	4,251	470	1,369	856	822
65/90 nm	4,080	811	2,053	1,120	1,763
130/180 nm	5,100	461	1,902	824	1,867
Others	1,134		760	362	174

Source: Gartner and DBS HK

SMIC

Mainland China foundry market

The semiconductor supply and demand dynamics in Mainland China are different from the global view. We expect the technology ban on component and chip-making equipment from the US and the surging demand in auto chips and chips for IoT will support the localisation of chip foundry in China in the coming few years.

The growth will be focused in mature node foundry, as 1) the strong demand for auto chips and chips for IoT, like MCUs and PMICs, mainly relies on process nodes ranging from 28nm to 90nm and 2) the restriction on the import of chip-making equipment, which possess US technology, into China. We expect the growth in mature node foundry to surpass that of advance node foundry in the coming few years.

Competition dynamics in Mainland China

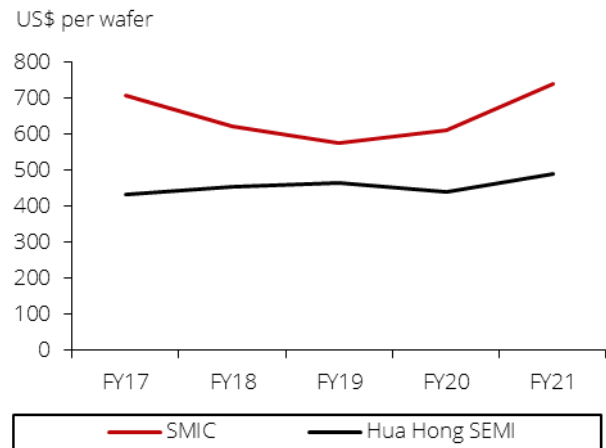
SMIC and Hua Hong Group share over 90% of the local foundry business, in which Hua Hong Group only focuses on the process node range of 45nm/40nm to 0.5µm, and SMIC can mass produce wafers up to 14nm, besides the mature node range.

Due to the restrictions on advance chip-making machines, capacity expansion in China will occur for mature nodes only, mainly 28nm or above, while Hua Hong Semi's capacity expansion will be for process nodes ranging from 45nm/40nm to 90nm in 12-inch facilities. We expect SMIC and Hua Hong Semi's capacities to maintain a robust growth of 22.5% and 25.3% in FY22, respectively.

Improving wafer price

Due to the huge shortage in mature node foundry and growing demand from mature node chip applications, the wafer price for both SMIC and Hua Hong Semi increased 21.1% and 11.7% in FY21, respectively. We expect the SMIC wafer ASP to continue to rise at a faster rate (at 27.5%) than Hua Hong Semi (10.6%) due to a product mix with more advanced node products.

Wafer ASP trends of SMIC and Hua Hong Semi

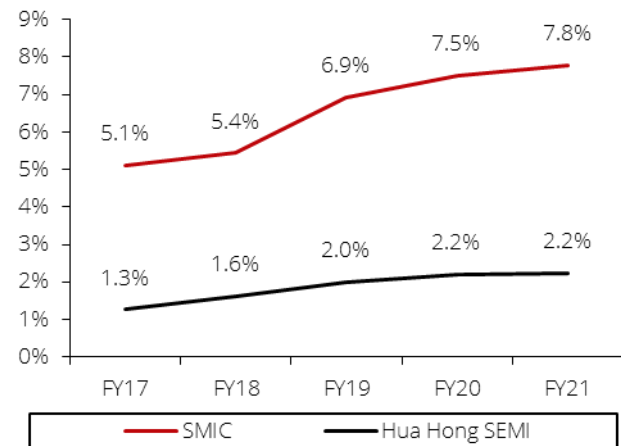


Source: Company data and DBS HK

Increasing market share

We expect SMIC's worldwide market share to grow from 5.4% in 2021 to 7.8% in 2024, given that the chip shortage in mature nodes and applications like automotive to be least to fully resolve. Meanwhile, its market share in China is to remain stable, as SMIC and Hua Hong Semi have similar expected capacity growth rates.

Worldwide market shares of Hua Hong Semi and SMIC



Source: Company data and DBS HK

SMIC

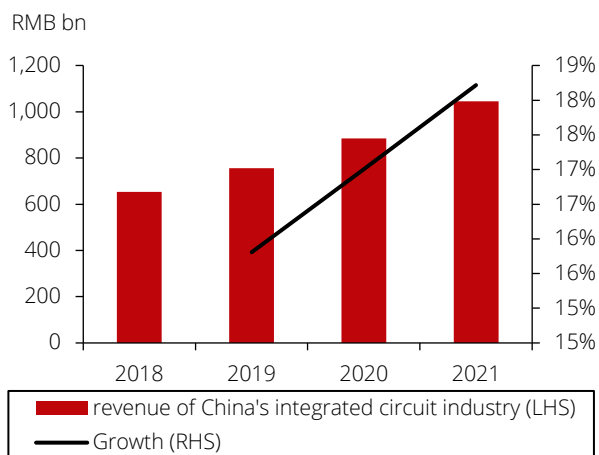
Sector Outlook

China semi localisation

China's IC design industry has grown drastically due to the boost from growing demand from local automotive and IoT and telecommunication applications. The number of Chinese chip design companies jumped to 2,810 in 2021 from 2019's 1,780, according to the China Semiconductor Industry Association. The revenue of China's integrated circuit industry increased from Rmb653bn to Rmb1,046bn in 2018-2021, at a CAGR of 17%. Foundry revenue from China has continuously increased. SMIC's revenue from China increased from 47.3% in FY17 to 64.0% in FY21, while that of Hua Hong Semi increased from 55.3% in FY17 to 73.9% in FY21.

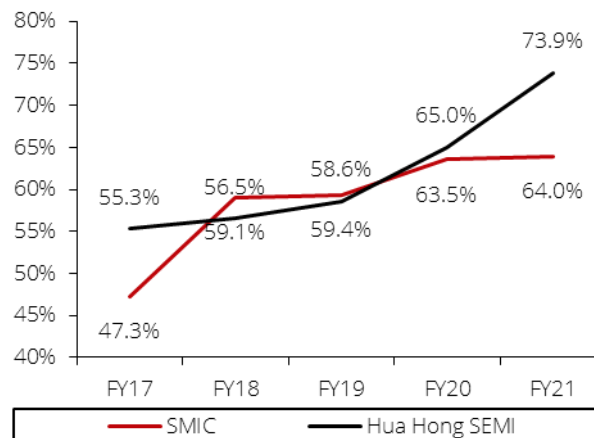
While China has thousands of competitive chip design companies, including Huawei and Oppo and internet giant Tencent, it has only a few major semiconductor foundries, most notably SMIC and Hua Hong Semi. China's self-sufficiency rate for semiconductors is only c.15%. We expect the semi localisation, especially in China's chip foundry, which has capital and policy support from the central government, will be a long-term industrial trend.

Revenue of China's integrated circuit industry



Source: China Semiconductor Industry Association and DBS HK

Revenue from China for the major Chinese foundries



Source: Company data and DBS HK

Foundry growth focused on mature process nodes

1. Current technology ban

The development of advanced process nodes below 14nm in China has been restricted since the implementation of the technology ban by the US Department of Commerce. This prohibits the import of items required to produce semiconductors with technology nodes of 10nm or below, into China. China's chip foundry technology can hardly advance without the supply of EUV lithography machines from equipment suppliers like ASML.

2. Lower geopolitical risks in mature node foundry

The increasing worry of US sanctions will accelerate the localisation of the supply chain of semiconductors. We expect the development of China's semiconductor foundry business will mainly focus on the mature process node (14nm to 0.5µm and above) foundry business, which is subjected to lower geopolitical risks and faces a lower impact on equipment supply.

Growth in mature process foundry

Mature process chips have been mainly manufactured in 8-inch wafer foundries in the past, which were expected to be gradually phased out due to the switch to 12-inch wafers. However, due to surging demand from grooming applications at the end markets like IoT, automotive, and 5G communication. This increased the demand for analog, RF, and MEMS chips that are manufactured at mature node foundries.

Since 2015, there is a global shortage in mature node fab capacity, as many foundry vendors had already migrated their facilities from 8-inch to 12-inch and faced a high barrier for reversal. The pandemic has further worsened the shortage amid a surge in demand for computers and

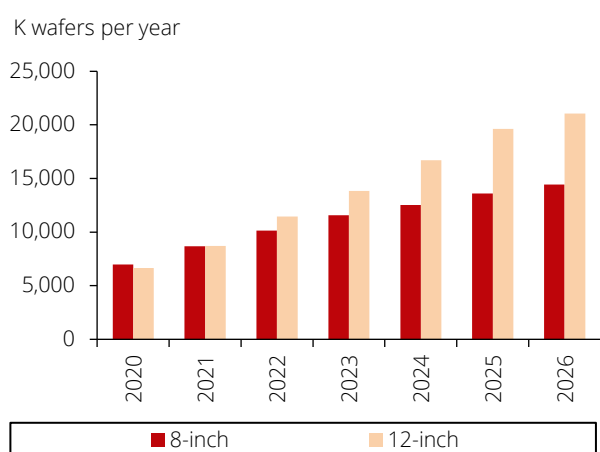
SMIC

smart devices. The rising demand from IoT and automotive in China has further enlarged the application span of the mature node platforms.

Surpassing worldwide growth

The foundry capacity expansion plan by all domestic foundries and the growing demand have been boosting mature node foundry in China since 2020. Gartner suggested that China's mature node foundry capacity will grow at a CAGR of 18% and the shipment volume of that will be growing at a CAGR of c.22.4% from 2021 to 2025, surpassing the worldwide shipment volume CAGR of 9.5%.

Wafer capacity of both 8-inch and 12-inch in China



Source: Gartner and DBS HK

The major type of chips produced in China can be categorised into logic, memory, MCU, analog, discrete, optoelectronics and sensor, connectivity and power management, etc. The growth rates of various chip platforms differ in terms of the semiconductor localisation trend in China.

Logic

The technology ban on HiSilicon of Huawei and the advanced node components on SMIC in 2020 has significantly slowed the advancement of process nodes in logic chips. HiSilicon's shipment of smartphone chips has dropped 96% y-o-y in 9M2021. Other logic chips like Field-Programmable Gate Arrays (FPGAs) and Graphics Processing Units (GPUs) retained strong growth for FY21 but the increments and market share (less than 1%) were negligible in both China and the worldwide semiconductor market. However, logic remained the area with the most intensified capex in 2021 in China, as a breakthrough in the advanced process node has been the strategic focus of the central government.

Memory

The majority of memory chip market sales have been dominated by leading global foundry players like Samsung and Micron. Attributable to the global chip shortage and overseas chip foundry companies prioritising their capacity for local fabless companies during the shortage, is the growing local demand and acceleration in the localisation of chip foundry in 2021. The revenue of DRAM and other memory chips increased 77.5% and 122.5% y-o-y in 2021, respectively. The localisation of NAND has been accelerated since SK Hynix's takeover of Intel's NAND business in China in 2021.

Analog, sensor, and power management chips

Analog chips, sensor chips, and power management ICs have been the most developed semiconductor types in China. They face less risk from the component and equipment supply restrictions, as the foundry mainly relies on mature process nodes, driven by the growing demand for connectivity, and sensors and semiconductors from the penetration of IoT, EV, and autonomous driving. Most of the product types have seen significant growth over the past year. Analog and sensor increased 106.8% and 24.5% y-o-y, while the power management chip has dropped 8.7% y-o-y due to weak smartphone shipments in 2021.

MCU (Microcontroller Unit)

An MCU is an IC that consists of a processor unit, memory modules, communication interfaces, and peripherals, and is used across a broad range of applications, including washing machines, robots, drones, radio, and game controllers. The process nodes for MCU foundry are mainly from 28nm to 65nm. China's self-sufficiency rate in MCU was only c.6% in 2020. There is ample room for localisation of China's MCU.

The progress of localisation has been and is still slow in China among other chip types due to 1) high stickiness, as embedded products requiring corresponding industry certifications hinder frequent changing of the supplier; and 2) less urgency in localisation before, due to lots of foreign players being non-US companies.

Localisation is accelerating due to: 1. Local MCU vendors narrowing the hardware gap with foreign vendors, spurred by foundry constraints in the global supply chain, through sustainable investment in R&D; 2) Europe, Japan, and US vendors prioritising local customers under the foundry constraints; and 3) a strong boost by the strong demand in IoT in China.

SMIC

Major chip types' growth in China in 2021

Chip types	2021 growth
Logic	-71.2%
Opto and sensor	24.8%
Discrete	19.7%
Memory	100.9%
Connectivity	25.9%
Power Management	-8.7%
Analog	106.8%
MCU	86.1%

Source: Gartner and DBS HK

Demand side analysis of lower stream customers

We have performed a demand side analysis of lower stream customers which revealed 72.7% of China and HK-listed MCU design companies have significant capital expenditure or funds raised for either auto chip or MCU R&D and projects with amounts ranging from Rmb65.5m to Rmb3.7bn. 81.8% have increased their R&D expenses by over 40% y-o-y in FY21. Therefore, we predict chip foundries for the above applications will continue to face growing demand in the coming two to three years due to the chip localisation trend in China.

We believe the localisation of MCUs in China will continue in the coming few years. Industrial research suggests that China MCU TAM will grow at a CAGR of 13.8% from 2021 to 2024.

Demand analysis of the lower stream clients

MCU or auto chip vendor	Sticker	Fund raising or significant capex committed for either auto chip or MCU R&D and capacity in 2021 to 2022	R&D expenses increased by over 40% y-o-y in FY21	Amount of capex for MCU or auto-related chips (Rmb m)	Increase in R&D expenses
Sino Wealth	300327 CH	No	Yes	NA	53%
GigaDevice	603986 CH	No	Yes	NA	69%
Ingenic Semiconductor	300223 CH	Yes	Yes	1,306.73	56%
Qingdao Eastsoft	300183 CH	No	No	NA	7%
Chipsea	688595 CH	Yes	Yes	932	127%
StarPower Semiconductor	603290 CH	Yes	Yes	3736.44	43%
3Peak	688536 CH	Yes	Yes	392.935	146%
BYD	285 HK	Yes	Yes	2686.47	40%
Will semiconductor	603501 CH	Yes	No	3364	22%
Fudan Micro	688385 CH	Yes	Yes	63.4657	41%
Espressif	688018 CH	Yes	Yes	271.69	41%

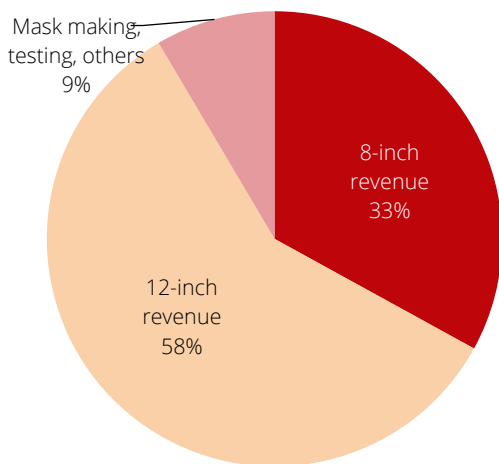
Source: Company data and DBS HK

SMIC

Company Background

Founded in 2000 and listed in 2004, SMIC is the largest semiconductor foundry in China, with a 5.4% global market share in 2021. It provides integrated circuit (IC) manufacturing services and technology process nodes ranging from 0.35µm to 14nm. (1) 8" wafers; (2) 12" wafers; and (3) mask-making, testing, and others accounted for 33.6%, 58.5%, and 8.5% of FY21 gross revenue, respectively. Gao Yonggang, the chief financial officer (CFO) and chairman of SMIC, has more than 30 years of experience in the area of corporate management and served as chief person in charge of finance or corporate in various enterprises like Datang Telecom Group Finance.

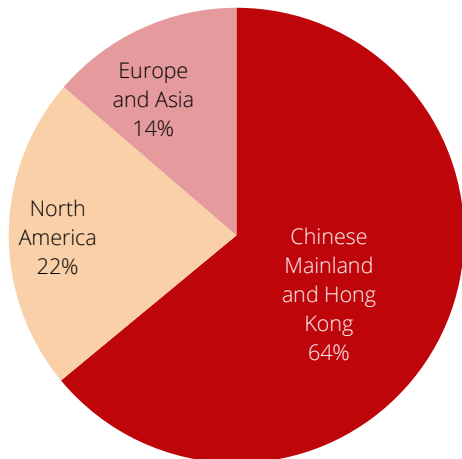
SMIC's revenue share in FY21 (by segment)



Source: Company data and DBS HK

Geographically, SMIC's revenue is mainly generated from China. Mainland China and Hong Kong, North America, Europe, and Asia account for 64.0%, 22.3%, and 13.7% of FY21 revenue, respectively.

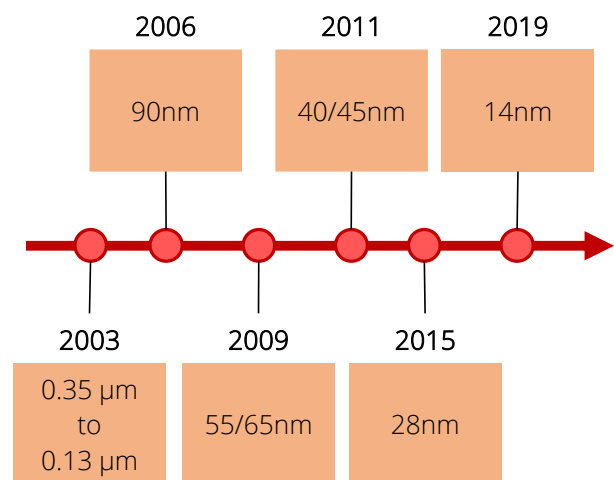
SMIC's revenue share in FY21 (regions)



Source: Company data and DBS HK

SMIC built its own 200mm fab in Shanghai in 2005 and continued its capacity expansion through M&As and organic growth. Its first 12-inch fab commenced production in 2007 in Shanghai. It made a breakthrough in first-generation FinFET technology at 14nm and entered mass production in 2019. It expanded its business to advanced semiconductor packaging and test services by acquisition of STATS ChipPac in Singapore in 2014.

Milestones for SMIC's technology node development



Source: Company Data, DBS Bank

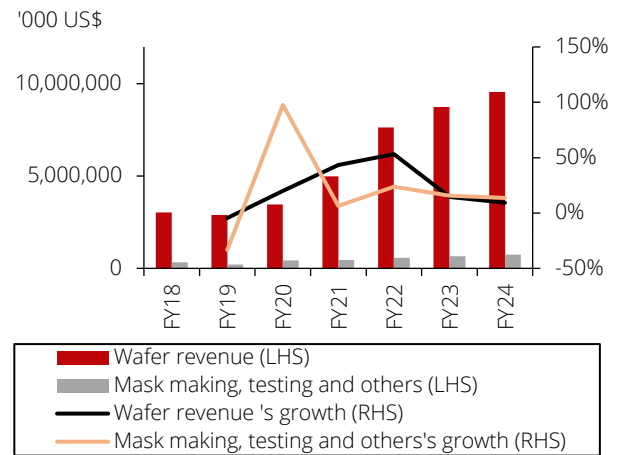
SMIC

IC foundry business

SMIC generates the majority of its revenue from the IC wafer foundry in both 8-inch wafer and 12-inch wafer foundry. Its business involves the manufacturing and sales of wafers out of silicon wafers. It provides wafer fabrication of 8-inch and 12-inch wafers from 0.35µm to 14nm that are used in logic applications. It also provides wafer fabrication for speciality technology like analog & power, IGBT, memory like eNVM and NVM, and mixed signal & RF.

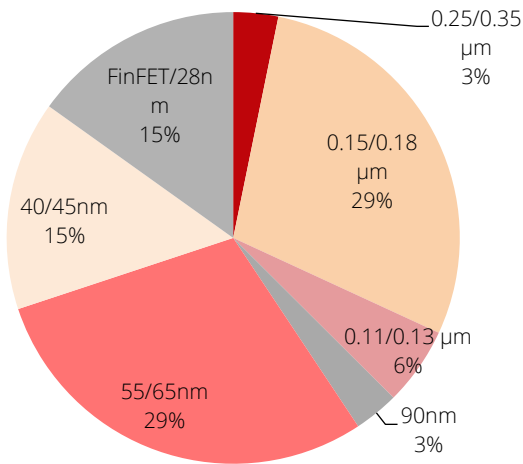
Fabrication is the process of building up layers of interconnected patterns on a silicon wafer which involves hundreds of steps. The key steps include deposition, photoresist, lithography, etch, ionisation, and packaging. The company's revenue comes from the direct sales of wafers and the cost of sales includes direct material, direct labour, and manufacturing expenses.

Wafer & mask-making, testing, and others' revenue and growth



Source: Company data and DBS HK

Wafer revenue share in FY21 (by process node)



Source: Company data and DBS HK

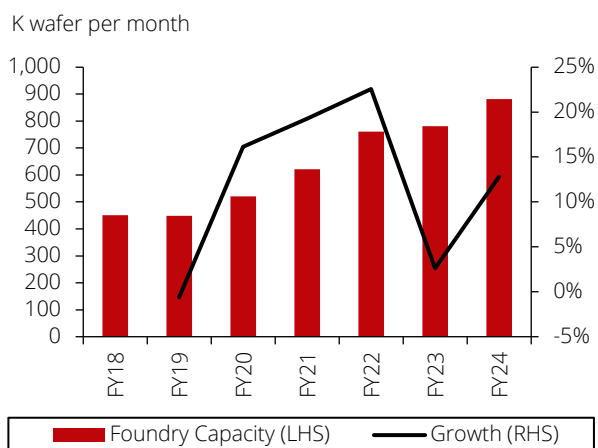
Mask-making, testing, and others' revenue includes service revenue from one-stop support services in design IP, photomask manufacturing, etc. and the direct manufacturing costs and material costs are mainly recorded in the cost of production. It possessed the most advanced photomasking technology to fully cover all its types of foundry process nodes, from 0.35µm to 14nm.

SMIC

Aggressive capacity expansion plan

SMIC has three 8-inch wafer fabrication facilities (fabs) and three 12-inch fabs under construction in Shanghai, Beijing, Tianjin, and Shenzhen. It has an 8-inch foundry capacity of about 345k w/m and 12-inch fab of c.304k w/m. The current capacity expansion pipeline is c.471k w/m up to 2025, representing 72.6% capacity growth over the coming three years. The new Beijing and Shenzhen 12-inch fabs are expected to commence production by the end of 2022, while the new Shanghai fab is expected to start production before 2025. All three 12-inch fabs are supposed to be fully utilised in 2025 and the new capacity will be mainly for foundries of process nodes above 28nm. The expected capex on the new fabs is c.US\$18.8bn, which is co-funded by both SMIC, the IC fund of the central government, and the local government.

SMIC's wafer foundry capacity



Source: Company data and DBS HK

SMIC

Competitive strengths

Leading edge in product range and technology in China

SMIC provides a one-stop solution for foundry which not only includes wafer manufacturing but also design service IP, mask-making, and bumping. In addition, it has the most advanced foundry technology in Mainland China in terms of process nodes and also possesses the widest range of process nodes, which can be used for both logic applications and speciality technology. Besides foundries, it also expanded its service to packaging and testing by operating with outsourced semiconductor assembly and test (OSAT) companies.

Being restrained on the equipment front and thereby in making advancements in the advance logic nodes process, SMIC is trying to keep its competitive edge in advance logic. It has been proactive in the development of the N+1 and N+2 technology, where it is trying to manufacture chips with process nodes lower than 14nm without any advancements in the photolithography machine. The N+1 foundry started mass production in 2021. We expect SMIC to retain its leading position in China foundry, which can hardly be surpassed.

Frontrunner advantage in China and with national support

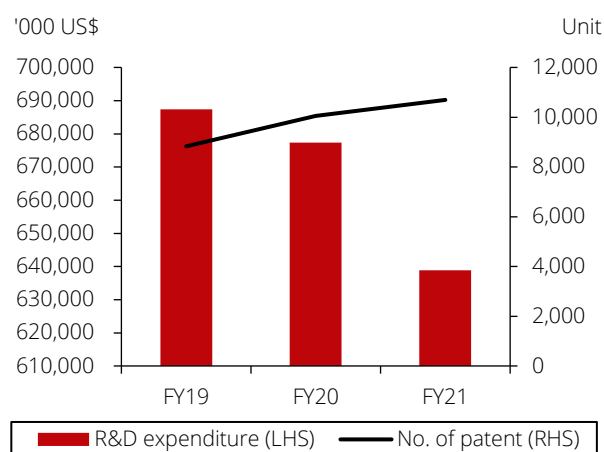
SMIC has always been the frontrunner in chip foundry development in China. It is the only foundry in China that can manufacture 14nm chips. With a high demand from the increased number of local Chinese fabless companies, SMIC has been enjoying the frontrunner advantage in China and thereby strong growth.

SMIC is getting the most support from the Chinese central government, as well as local government, alongside the growth of China's electronics industry. As the support towards semiconductor localisation in China has been escalated to the national strategic level, we expect SMIC to continue to receive capital support and policy support such as investment from the national IC fund and income tax exemptions.

Consistently high R&D expenditure and innovation

To keep its competitive edge in China, SMIC has had very stable R&D expenditure of over US\$600m per year for the past four years. Its invention patents have increased from 8,834 in FY19 to 10,698 in FY21. We expect this sustained devotion to R&D will support SMIC's leading position in China and help it ride on the semi localisation.

SMIC's R&D expenditure and no. of patents



Source: Company data and DBS HK

SMIC

Management & Strategy

Management Composition.

SMIC's board comprises experts and experienced executives with extensive experience in international leading chip foundries. The company's top management committee consists of 10 people, most of whom are highly educated in the semiconductor field and possess incomparable expertise in the industry.

Key Management Team

Name	Position	Background and Experience
Gao Yonggang	Chairman and chief financial officer	<ul style="list-style-type: none"> - Has more than 30 years of experience in the area of corporate management and served as chief person in charge - Was the chief accountant of the China Academy of Telecommunications Technology, and the chairman of Datang Telecom Group Finance Co., Ltd. - Is currently a director of JCET Group Co., Ltd. (600584), and an independent director of iRay Technology Company Limited (688301)
Zhao Haijun	Executive director and co-chief executive officer	<ul style="list-style-type: none"> - Has 29 years of experience in semiconductor operations and technology development - Served as the chief operating officer and executive vice president of the company, and general manager of SMIC from 2010 to 2016 - Also served as an independent director on the board of directors of Zhejiang Juhua Co., Ltd.
Liang Mong Song	Co-chief executive officer	<ul style="list-style-type: none"> - Has been engaged in the semiconductor industry for over 35 years, mainly involving memory and FinFET logic process technology developments. He owns over 450 patents and has published over 350 technical papers - Graduated with a PhD degree in electrical engineering from the Department of Electrical Engineering and Computer Sciences at the University of California, Berkeley - 17-year tenure at TSMC and time at South Korean giant Samsung
Zhou Meisheng	Executive vice president of technology research and development	<ul style="list-style-type: none"> - Served in Lam Research China as regional CTO and has successively worked in Chartered Semiconductor Manufacturing, Taiwan Semiconductor Manufacturing Co., Ltd. ("TSMC"), UMC, and GlobalFoundries - Holds BSc and MSc degrees from Fudan University China, and a PhD in Chemistry from Princeton University
Zhang Xin	Senior vice president in operation & engineering	<ul style="list-style-type: none"> - Serving successively in a high profile in GFS and TSMC as a senior VP in operations and engineering of the company - Joined the company in April 2010 and successively served as the senior director of advanced manufacturing technology and senior vice president of operations & engineering - Holds Bachelor's and Master's degrees in radio electronics and engineering from Tsinghua University, and is chairman of the Zhong Guan Cun Integrated Circuit Industry Association and Zhong Guan Cun Integrated Circuit Materials Technology Industry Alliance

Source: Company data and DBS HK

SMIC

CRITICAL FACTORS TO WATCH

Critical Factors

1) Wafer foundry capacity

The capacity of a foundry is the key proxy of its revenue in a supply-driven market. As there is a chip shortage, the higher the foundry capacity, the higher the sales shipment volume. SMIC's capacity has been in consistent expansion since 2019. Total capacity increased significantly by 16.1% to 520.8k w/m in FY20 and 19.2% to 621.0k w/m in FY21. We expect the capacity expansion to continue in the coming three years under their aggressive expansion schedule for 12-inch facilities. We expect total capacity to increase from 621k w/m in FY21 to 1,120k w/m at a CAGR of 15.9% in FY21-25F, driven by the expansion of 12-inch capacity at a rate of 24.6% in FY21-25F.

2) Wafer average selling price

The average selling price (ASP) of wafers is another proxy for the revenue of a foundry. Due to the global chip shortage, chip wafer prices have been on a hike for the last two years. SMIC's overall wafer ASP increased 5.9% to US\$609.8 in FY20 and 21.1% to US\$738.4 in FY21. We expect the raw material hike due to commodity inflation caused by the Russia-Ukraine war and persistent chip shortage, especially in mature node chips, to continue. This can support the wafer price surge by transferring the cost increase to customers in the coming two years. We expect SMIC's wafer ASP to grow 27.5% to US\$941.5 in FY22F and 6.9% to US\$1,006.9 in FY23F, and be flat in FY24F due to the resolution of the chip shortage in mature node products.

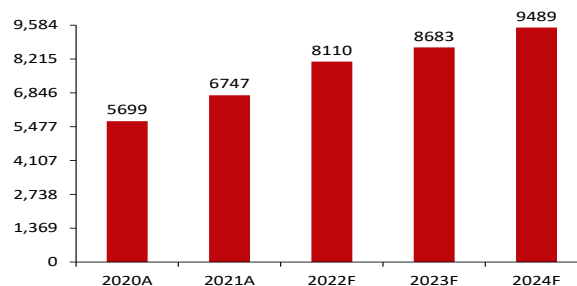
3) Average utilisation rate of fabs

The average utilisation rate of fabs is a proxy of the demand of wafer products and the resultant efficiency in ramping up the incremental capacity of a foundry.

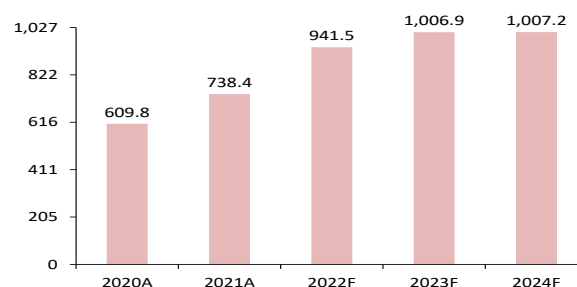
We expect the average utilisation rate to be maintained at a high level of 98% and 96% in FY22 and FY23, 5.3%/5.8% higher fab utilization rate than the market consensus, despite the scheduled significant capacity expansion in the coming four years and the market 's concerned about increasing overall foundry capacity in 2022. This is due to strong mature node foundry demand and limited mature node foundry capacity. The chip shortage in mature node chips would not be resolved any time soon on the back of the strong demand from the automotive market and IoT penetration.

We also expect a smooth ramping up of incremental capacity in the coming three years, according to SMIC's successful track record. We expect the utilisation rate to return to a normal level of 92% in FY24 when the chip shortage starts easing.

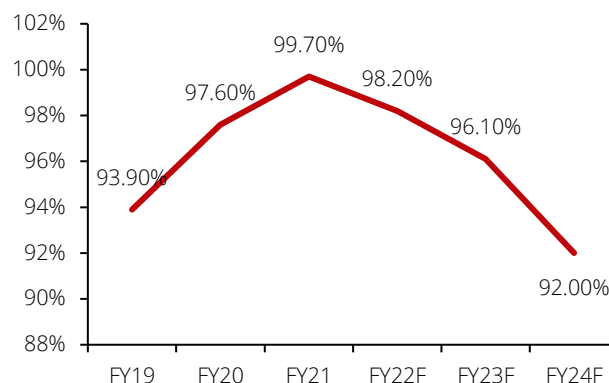
Wafer foundry capacity



Wafer ASP



Utilisation rate



Source: Company, DBS HK

SMIC

Balance Sheet:

The group had total debt of US\$6.78bn and net cash of US\$5.73bn as of Dec 2021. SMIC's historical capital expenditure primarily included investment in foundry facilities, patents, and technology. Net capital expenditure decreased from US\$57.9bn to US\$40.4bn in FY21, mainly due to a slight slowdown in investment into foundry capacity compared with that of FY20.

Share Price Drivers:

MCU and auto chip exposure during accelerating localisation. We expect the revenue to be 8%/10% higher than the market consensus, leading to 39%/64% higher earnings in FY22/23F, as we forecasted 5.3%/5.8% higher utilisation rate than the market consensus in FY22/23F due to strong mature node foundry demand especially for MCUs and auto chips in China.

Strong demand from lower stream customers. 73% of MCU vendors have significant capex for auto chip and MCU projects, and 82% have increased their R&D expenses by over 40% y-o-y in FY21, as indicated by our demand analysis of lower stream clients, thereby proving solid demand.

Key Risks:

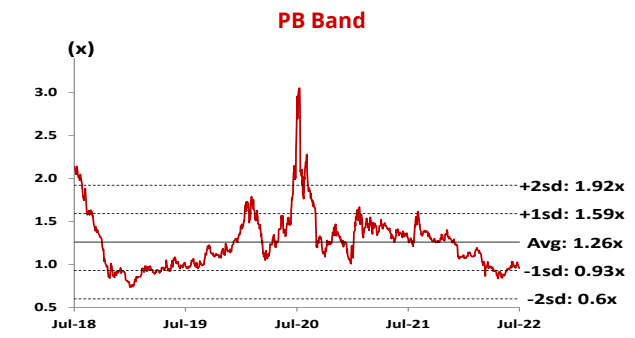
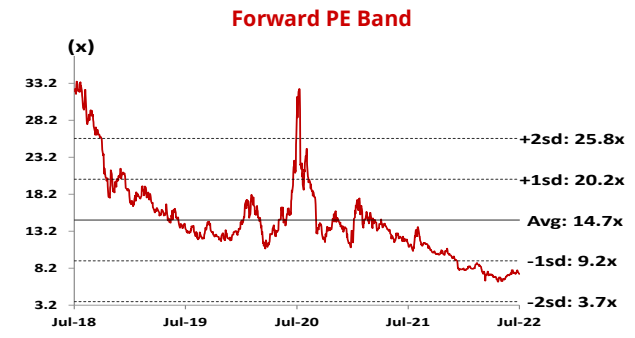
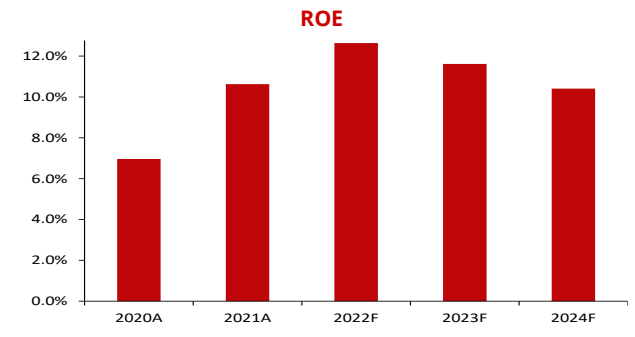
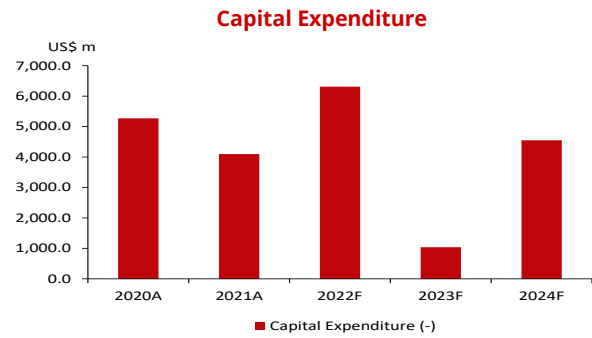
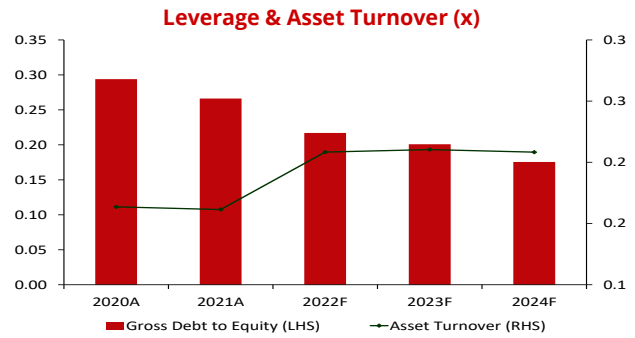
Widening technology ban from western countries, further material cost surges, and an unexpected further weakening of demand from consumer electronics.

Environmental, Social, & Governance:

SMIC adhering to independent innovation supports the development of its foundry business, which requires both technology advancement and technical knowhow. It is also proactive in tackling climate change and talent retention.

Company Background

Founded in 2000 and listed in 2004, SMIC is the largest semiconductor foundry in China, with a 5.4% global market share in 2021. It provides integrated circuit (IC) manufacturing services covering technology process nodes ranging from 0.35µm to 14nm. (1) 8" wafers, (2) 12" wafers, and (3) mask-making, testing, and others accounted for 33.6%, 58.5%, and 8.5% of FY21 gross revenue, respectively. Gao Yonggang is the chief financial officer (CFO) and chairman of SMIC.



Source: Company, DBS HK

SMIC

Key Assumptions

FY	2020A	2021A	2022F	2023F	2024F
Wafer Shipment (K 8-inch wafer equivalents)	5,698.6	6,747.2	8,110.0	8,683.1	9,489.1
Wafer ASP (US\$)	609.8	738.4	941.5	1,006.9	1,007.2
Utilization rate (%)	97.6	99.7	98.2	96.1	92.0
Gross Margin (%)	23.6	30.8	37.5	34.0	31.0

Source: Company, DBS HK

Segmental Breakdown (US\$ m)

FY Dec	2020A	2021A	2022F	2023F	2024F
Revenues (US\$ m)					
Wafer revenue	3,475	4,982	7,636	8,743	9,558
Mask making, testing, others	432	461	571	661	751
Total	3,907	5,443	8,206	9,404	10,309
Gross margin (US\$ m)					
Wafer revenue	730	1,470	2,832	2,920	2,876
Mask making, testing, others	191	206	246	278	319
Total	921	1,676	3,077	3,197	3,196
Margins (%)					
Wafer revenue	21.0	29.5	37.1	33.4	30.1
Mask making, testing, others	44.1	44.7	43.0	42.0	42.5
Total	23.6	30.8	37.5	34.0	31.0

Source: Company, DBS HK

Income Statement (US\$ m)

FY Dec	2020A	2021A	2022F	2023F	2024F
Revenue	3,907	5,443	8,206	9,404	10,309
Cost of Goods Sold	(2,986)	(3,767)	(5,129)	(6,206)	(7,113)
Gross Profit	921	1,676	3,077	3,197	3,196
Other Opng (Exp)/Inc	(609)	(284)	(755)	(815)	(860)
Operating Profit	312	1,392	2,323	2,382	2,336
Other Non Opg (Exp)/Inc	140	83	140	163	159
Associates & JV Inc	187	253	253	253	253
Net Interest (Exp)/Inc	98	113	100	174	269
Dividend Income	0	0	0	0	0
Exceptional Gain/(Loss)	0	0	0	0	0
Pre-tax Profit	737	1,840	2,816	2,973	3,017
Tax	(68)	(65)	(356)	(376)	(381)
Minority Interest	46	(73)	(123)	(130)	(132)
Preference Dividend	0	0	0	0	0
Net Profit	716	1,702	2,337	2,468	2,504
Net Profit before Except.	716	1,702	2,337	2,468	2,504
EBITDA	1,953	3,597	4,867	5,115	5,100
Growth					
Revenue Gth (%)	25.4	39.3	50.8	14.6	9.6
EBITDA Gth (%)	58.2	84.2	35.3	5.1	(0.3)
Opg Profit Gth (%)	524.5	345.8	66.9	2.6	(2.0)
Net Profit Gth (%)	204.9	137.8	37.3	5.6	1.5
Margins & Ratio					
Gross Margins (%)	23.6	30.8	37.5	34.0	31.0
Opg Profit Margin (%)	8.0	25.6	28.3	25.3	22.7
Net Profit Margin (%)	18.3	31.3	28.5	26.2	24.3
ROAE (%)	7.0	10.6	12.6	11.6	10.4
ROA (%)	3.0	5.0	5.9	5.5	5.1
ROCE (%)	1.3	4.4	5.7	5.2	4.6
Div Payout Ratio (%)	0.0	0.0	0.0	0.0	0.0
Net Interest Cover (x)	NM	NM	NM	NM	NM

Source: Company, DBS HK

SMIC

Balance Sheet (US\$ m)

FY Dec	2020A	2021A	2022F	2023F	2024F
Net Fixed Assets	12,629	14,815	18,979	17,698	19,903
Invts in Associates & JVs	1,472	1,877	1,877	1,826	1,855
Other LT Assets	2,047	4,202	4,195	4,199	4,189
Cash & ST Invts	12,745	12,498	13,641	18,493	21,406
Inventory	799	1,194	1,800	2,062	2,261
Debtors	1,024	1,259	1,898	2,175	2,384
Other Current Assets	604	267	267	267	267
Total Assets	31,321	36,111	42,657	46,720	52,267
ST Debt	1,355	1,128	1,408	1,625	1,614
Creditors	1,830	2,853	3,685	4,141	4,655
Other Current Liab	708	473	565	586	581
LT Debt	5,018	5,645	5,339	5,303	5,324
Other LT Liabilities	728	574	571	571	571
Shareholder's Equity	15,175	17,150	19,835	22,642	25,488
Minority Interests	6,507	8,288	11,255	11,852	14,033
Total Cap. & Liab.	31,321	36,111	42,657	46,720	52,267
Non-Cash Wkg. Capital	(111)	(606)	(284)	(222)	(324)
Net Cash/(Debt)	6,371	5,726	6,894	11,565	14,468
Debtors Turn (avg days)	88.5	76.5	70.2	79.0	80.7
Creditors Turn (avg days)	322.4	450.3	400.7	367.2	337.2
Inventory Turn (avg days)	155.7	191.6	183.5	181.2	165.7
Asset Turnover (x)	0.2	0.2	0.2	0.2	0.2
Current Ratio (x)	3.9	3.4	3.1	3.6	3.8
Quick Ratio (x)	3.5	3.1	2.7	3.3	3.5
Net Debt/Equity (X)	CASH	CASH	CASH	CASH	CASH
Net Debt/Equity ex MI (X)	CASH	CASH	CASH	CASH	CASH
Capex to Debt (%)	82.7	60.5	93.5	15.0	65.6
Z-Score (X)	NA	NA	NA	NA	NA

Source: Company, DBS HK

Cash Flow Statement (US\$ m)

FY Dec	2020A	2021A	2022F	2023F	2024F
Pre-Tax Profit	737	1,840	2,816	2,973	3,017
Dep. & Amort.	1,313	1,869	2,151	2,317	2,353
Tax Paid	(103)	(147)	(356)	(376)	(381)
Assoc. & JV Inc/(loss)	(187)	(253)	(253)	(253)	(253)
(Pft)/ Loss on disposal of FAs	23	(341)	(140)	(163)	(159)
Chg in Wkg.Cap.	(18)	114	(322)	(62)	101
Other Operating CF	(103)	(71)	(134)	(216)	(295)
Net Operating CF	1,660	3,012	3,763	4,220	4,383
Capital Exp.(net)	(5,271)	(4,097)	(6,311)	(1,039)	(4,549)
Other Invts.(net)	(2,005)	(2,912)	0	0	0
Invts in Assoc. & JV	(54)	218	253	303	223
Div from Assoc & JV	0	0	0	0	0
Other Investing CF	258	135	175	204	185
Net Investing CF	(7,071)	(6,655)	(5,883)	(531)	(4,140)
Div Paid	0	0	0	0	0
Chg in Gross Debt	2,568	326	(26)	182	10
Capital Issues	7,527	6	325	325	325
Other Financing CF	2,610	2,025	2,964	657	2,336
Net Financing CF	12,704	2,357	3,263	1,164	2,670
Currency Adjustments	294	41	0	0	0
Chg in Cash	7,588	(1,245)	1,143	4,852	2,913
Opg CFPS (US\$)	0.26	0.37	0.51	0.54	0.54
Free CFPS (US\$)	(0.57)	(0.14)	(0.32)	0.40	(0.02)

Source: Company, DBS HK

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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

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