

2024 High Conviction: TSMC (2330-TT) is perfectly poised for Revenue and FCF growth acceleration

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Executive Summary

- TSMC looks set for a significant recovery in top-line growth in 2024F, driven by continued faster-than-expected demand for its 3nm volume production leading to significantly improved overall ASP.
- This should be supported by a concurrent improvement in the inventory cycle at major clients, helping recover TSMC’s utilisation back to historic norms.
- Lower capital intensity, improving internal inventory levels, and accelerating top-line growth should all combine to drive record levels of Free Cash Flow generation during 2024F.

By-line

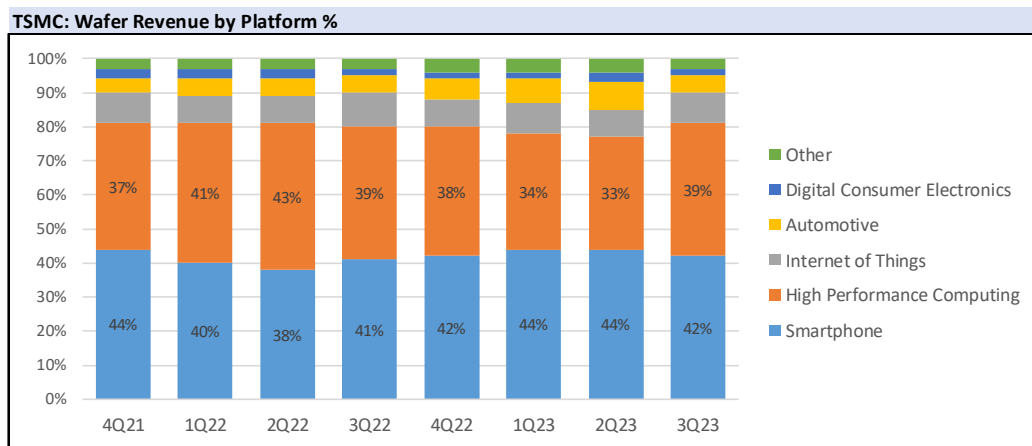
In this insight, we analyse TSMC, the world’s largest dedicated integrated circuit foundry’s, revenue growth outlook, capital expenditure cycle, capital allocation, and current valuation level.

Detail

TSMC (2330-TT) is the world’s largest dedicated integrated circuit (IC) foundry, with nearly 60% global revenue share. Following a challenging 2023, TSMC is perfectly positioned for a significant recovery in top-line growth in 2024F, driven by continued faster-than-expected demand for TSMC’s 3nm volume production leading to significantly improved overall ASP, and improvement in the inventory cycle at major clients which should help TSMC’s utilisation level recover back to historic norms. Given that we have reached the peak of the Capex cycle, along with normalisation in its internal working capital, and with revenue growth set to accelerate, we are likely to see a significant net cash build-up over the next few years which is likely to support higher-than-expected dividends and increased optionality. In this insight, we analyse TSMC’s revenue growth outlook, capital expenditure cycle, capital allocation, and current valuation level.

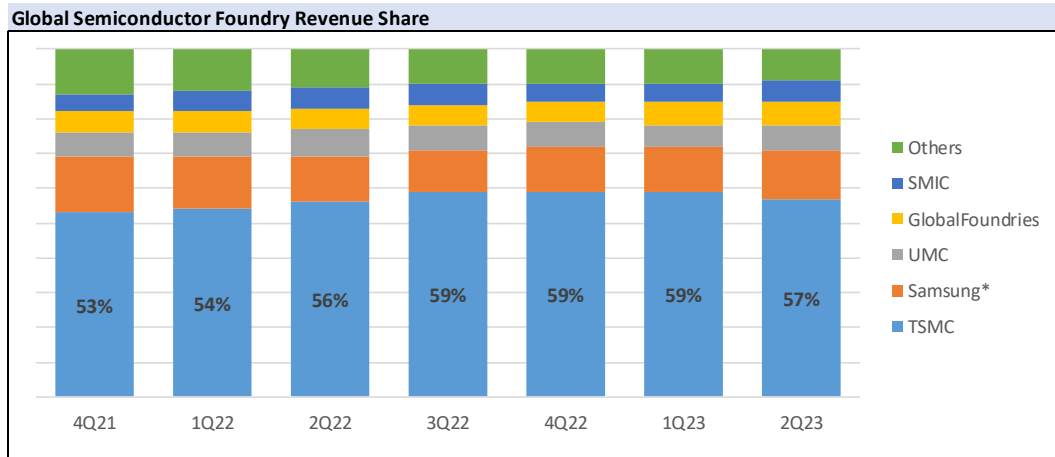
Company Overview

TSMC created the semiconductor Dedicated IC Foundry business model when it was founded in 1987. In 2022, TSMC served 532 customers and manufactured 12,698 products for various applications covering a variety of end markets including high-performance computing (HPC), smartphones, the Internet of Things (IoT), automotive, and digital consumer electronics. Smartphones have historically been the key growth driver for the company, but HPC is supplanting this. HPC technology innovation enables broad artificial intelligence (AI) and 5G applications, accelerating digital transformation and semiconductor growth. Emerging AI and 5G applications such as connected devices, smart cars, virtual reality/augmented reality, and intelligent manufacturing require extensive data analysis. The result is unprecedented demand for computing power in cloud data centres and communication infrastructure.



Source: Company data

The annual capacity of the manufacturing facilities managed by TSMC, and its subsidiaries should exceed 16 million 12-inch equivalent wafers by the end of 2023. These facilities include four 12-inch wafer GIGAFAB fabs, four 8-inch wafer fabs, and one 6-inch wafer fab – all in Taiwan – as well as one 12-inch wafer fab at a wholly owned subsidiary, TSMC Nanjing Company Limited, and two 8-inch wafer fabs at wholly owned subsidiaries, WaferTech in the United States and TSMC China Company Limited. In December 2022, TSMC announced that, in addition to TSMC Arizona’s first fab, which is scheduled to begin production of 4-nanometer (N4) process technology in the first half of 2025, it has also started the construction of a second fab which is scheduled to begin production of 3-nanometer (N3) process technology in 2026. At the same time, TSMC continues to execute its plan for a fab in Kumamoto, Japan, with production targeted by late 2024. Given its sustained leadership in technology, capacity, and yield, TSMC has managed to maintain a nearly 60% global logic semiconductor foundry revenue share.

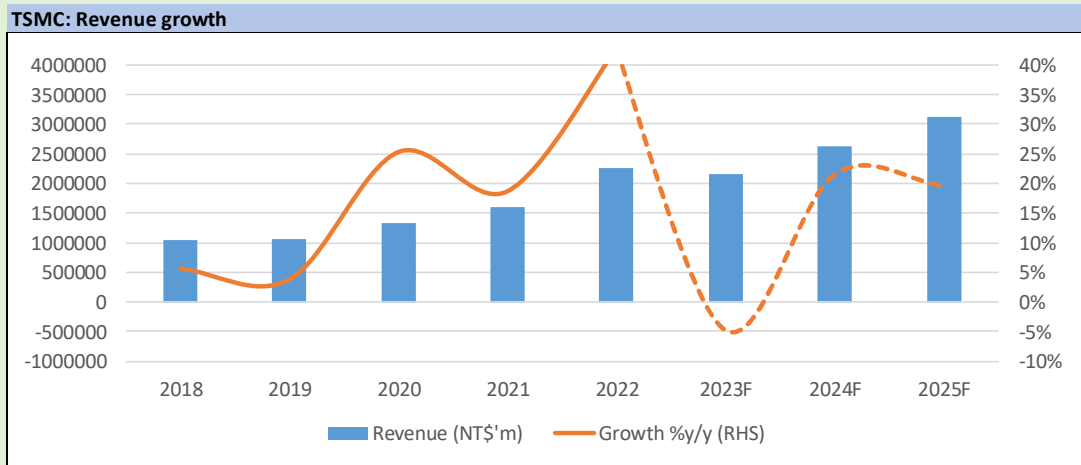


Source: Counterpoint

* Samsung Foundry includes foundry service for its internal logic IC business

Revenue Growth Outlook

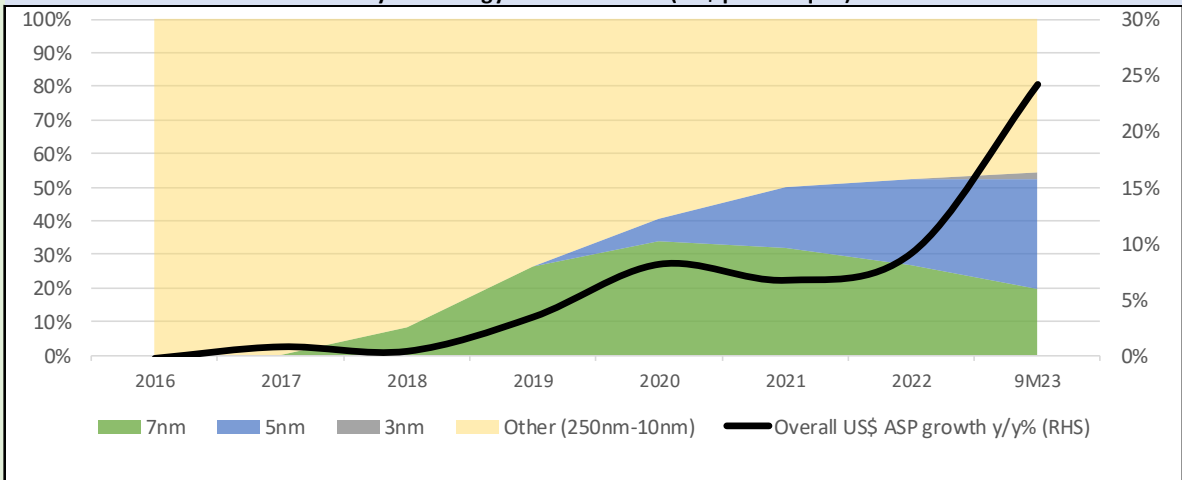
Following a purple patch of revenue growth from 2020 to 2022, which saw 19% compound annual growth (CAGR) in NT\$ revenue, TSMC’s growth has contracted during 2023 due to overall global macroeconomic pressure and geopolitical uncertainty which led to dampened end-customer demand, especially in the smartphone market, and significant inventory adjustment at major customers. TSMC expects that fabless semiconductor inventory (at clients) reduced during 3Q2023. However, due to persistent weaker overall macroeconomic conditions and slower demand recovery in China, their customers have remained cautious in their inventory control and TSMC expects the inventory digestion to continue during 4Q2023. TSMC is likely to finish 2023F with a 3-5%/y local currency revenue decline.



Source: Company data, my estimates

The year-on-year revenue decline has, however, very likely already troughed during 3Q 2023. Following -10%/y/y revenue growth reported for both 2Q2023 and 3Q2023, 4Q2023 revenue growth has been guided at -4.0% at the mid-point. October 2023 already witnessed a 16%/y/y growth in monthly revenue and TSMC is observing early signs of demand stabilisation in the PC and smartphone end markets which should support fabless semiconductor inventory to further reduce. 2024F looks set for a significant recovery in top-line growth driven by continued faster-than-expected demand for TSMC's N3 volume production leading to significantly improved overall ASP, and improvement in the inventory cycle at major clients which should help TSMC's utilisation level recover back to historic norms.

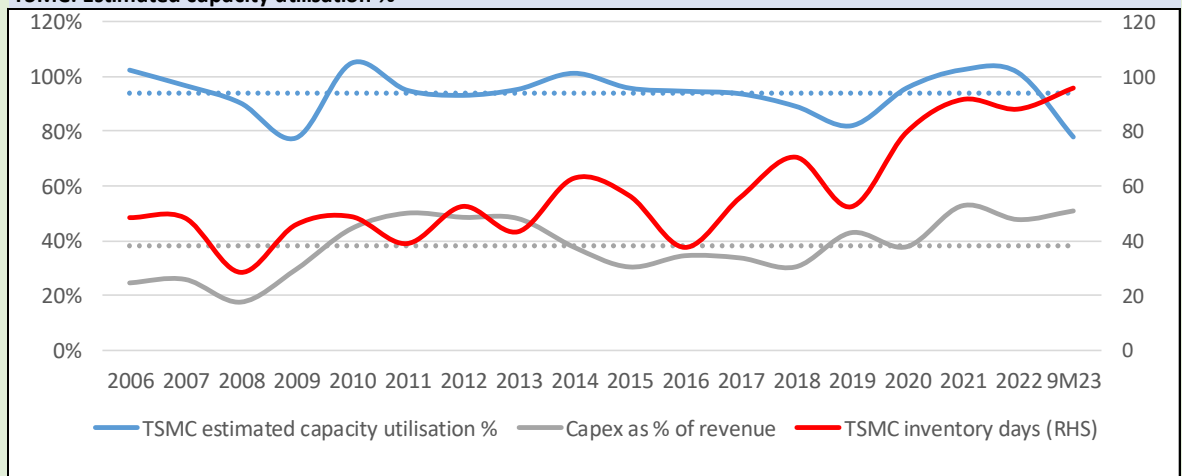
TSMC: Wafer revenue contribution by technology and Overall ASP (US\$ per 8" equiv)



Source: Company data

In the 10 years between 2009 and 2018, TSMC's overall US\$ ASP growth has averaged merely 1.3% per year. With the advent of what it calls advanced technologies (nodes at 7nm or below) since the back half of 2018, we have witnessed a significant increase in pricing. This also bears witness to TSMC's growing pricing power at more advanced nodes. TSMC's 3nm technology (N3) demand has already been better than expected. N3 is already in volume production and has witnessed a strong ramp-up in 2H2023 driven by HPC and smartphone applications. In fact, this has been the leading reason why TSMC management increased its implied revenue growth guidance for 4Q2023 from ~-10% to ~-4% over the past three months or so. N3 contributed 6% to its revenue in 3Q23, its first contribution, and is expected to contribute as much as 12% during 4Q23, and significantly more during 2024F supported by robust demand from multiple customers, which should support growth in overall ASP.

TSMC: Estimated capacity utilisation %

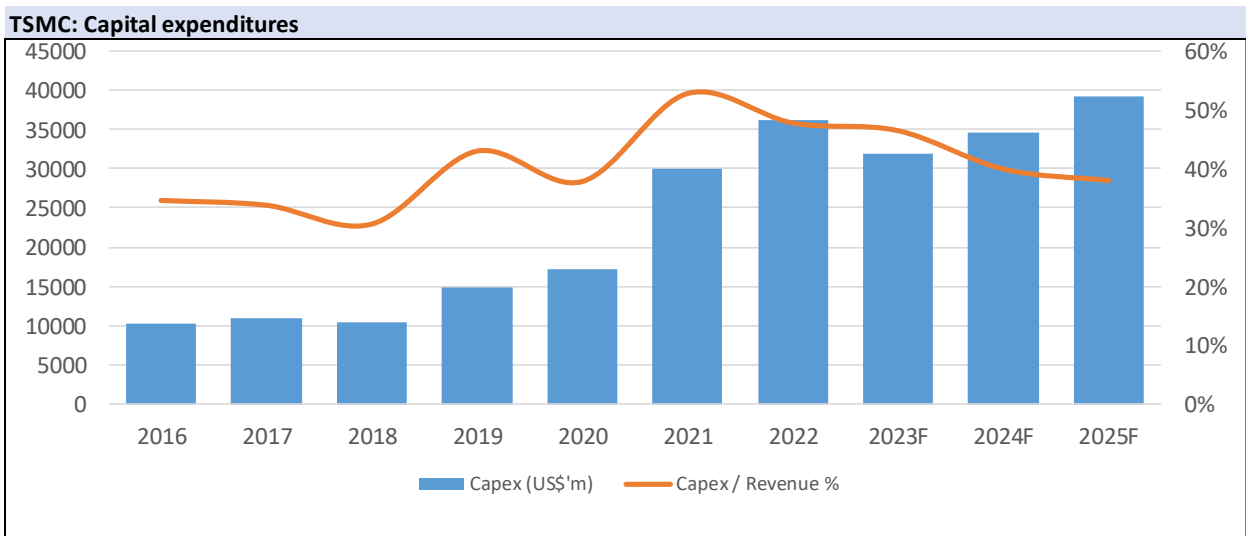


Source: Company data, my estimates

TSMC significantly accelerated its capacity additions between 2021 and 2023, growing its overall capacity by 23%, or a CAGR of 7.2%, to roughly 16 million 12-inch equivalent wafers by the end of 2023F. This rapid expansion, coupled with the overall pullback in demand, has resulted in TSMC’s estimated capacity utilization rates dropping to well below average. This has happened concurrently with a significant increase in TSMC’s inventory levels. This currently puts TSMC in an incredibly favourable position to accelerate revenue as there is much better capacity support to fulfil customer demand and TSMC is primed to draw down its inventory levels.

Capital Expenditure Cycle

Following an accelerated capacity roll-out cycle between 2020 and 2023, TSMC’s capital intensity has reached the peak of the cycle in 1Q2023 and has already started rolling over. That being said, TSMC’s commitment to supporting its client’s growth remains unchanged, despite the near-term inventory cycle. TSMC’s capacity planning remains based on the long-term structural demand trend, working closely with customers as it continues to invest in leading-edge, speciality, and advanced packaging technologies to support long-term growth. What this means is that, although the \$-amount of Capex should continue to grow year-on-year, the level of Capex as a % of revenue is set to normalise back to its long-term historic average of mid-30%.

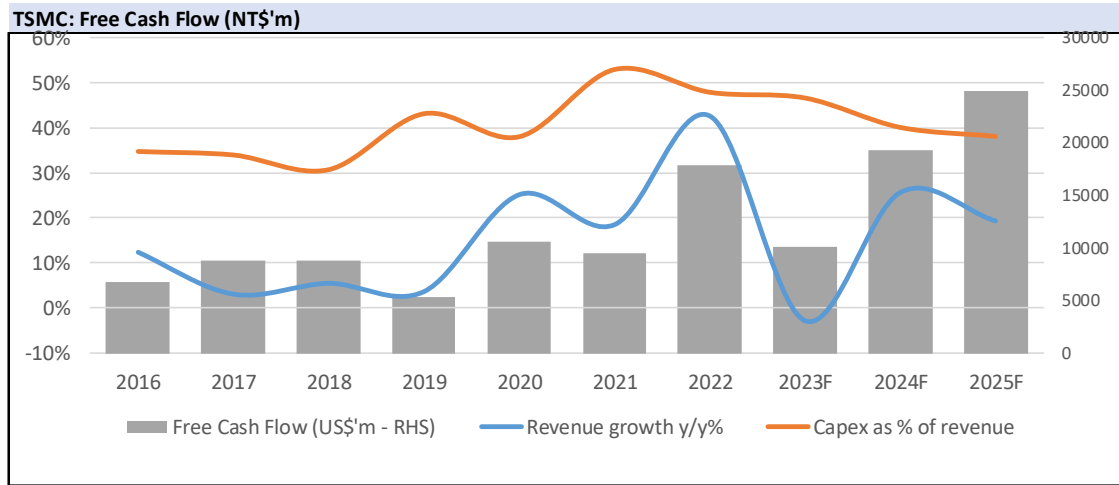


Source: Company data, my estimates

“Now in terms of Capex, what we can see now is that we, in the past few years, have invested very heavily to capture the growth in the next few years. And as we begin to harvest those investments, we expect the increase of our Capex to be levelling off in the next few years. That doesn’t mean the dollar amount is going to reduce; the capital intensity is expected to decline in the next few years.” **Wendell Huang, Vice President-Finance, Chief Financial Officer & Spokesperson, TSMC**

Lower capital intensity, improving internal inventory levels, and accelerating top-line growth should all combine to drive record levels of Free Cash Flow generation during 2024F.

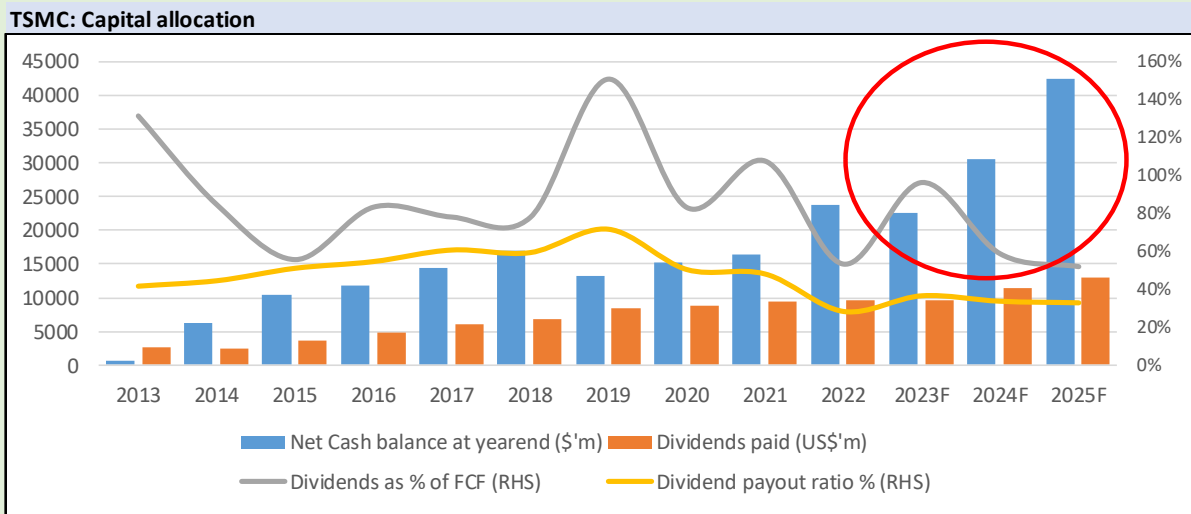
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Source: Company data, my estimates

Capital Allocation

Over the past 10 years, TSMC has spent only 1.4% of its Free Cash Flow on net M&A activity and made virtually no share repurchases, spending 75% on dividend payments. TSMC management has historically advocated for having around \$12bn+ in safety cash on the balance sheet given the cyclicity of the technology industry. Its consistent performance has resulted in a marked increase in net cash on the balance sheet, and a consistently growing dividend payout since 2014, with management opting for a dividend policy that intends to maintain a sustainable cash dividend on both an annual and quarterly basis. Given that we have reached the peak of the Capex cycle, along with normalisation in its internal working capital, and with revenue growth set to accelerate, we are likely to see a significant net cash build-up over the next few years which is likely to support higher-than-expected dividends and increased optionality.

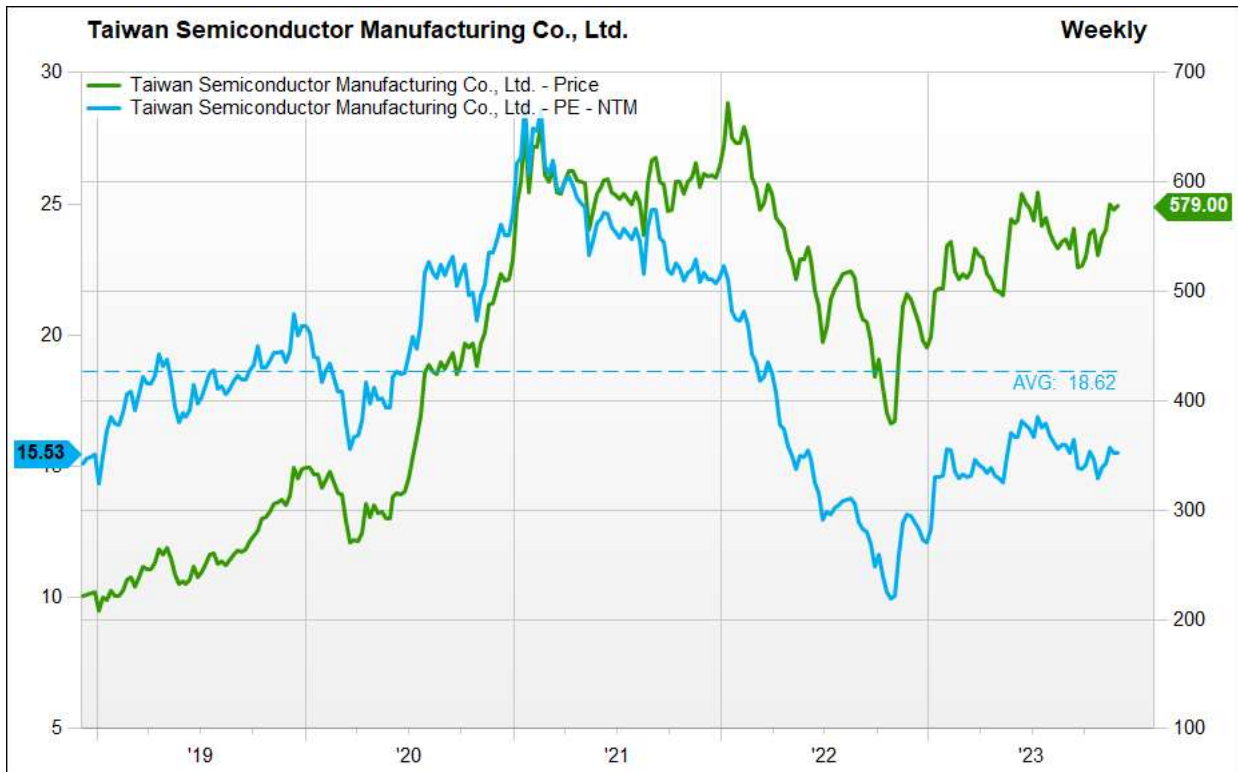


Source: Company data, my estimates

Valuation

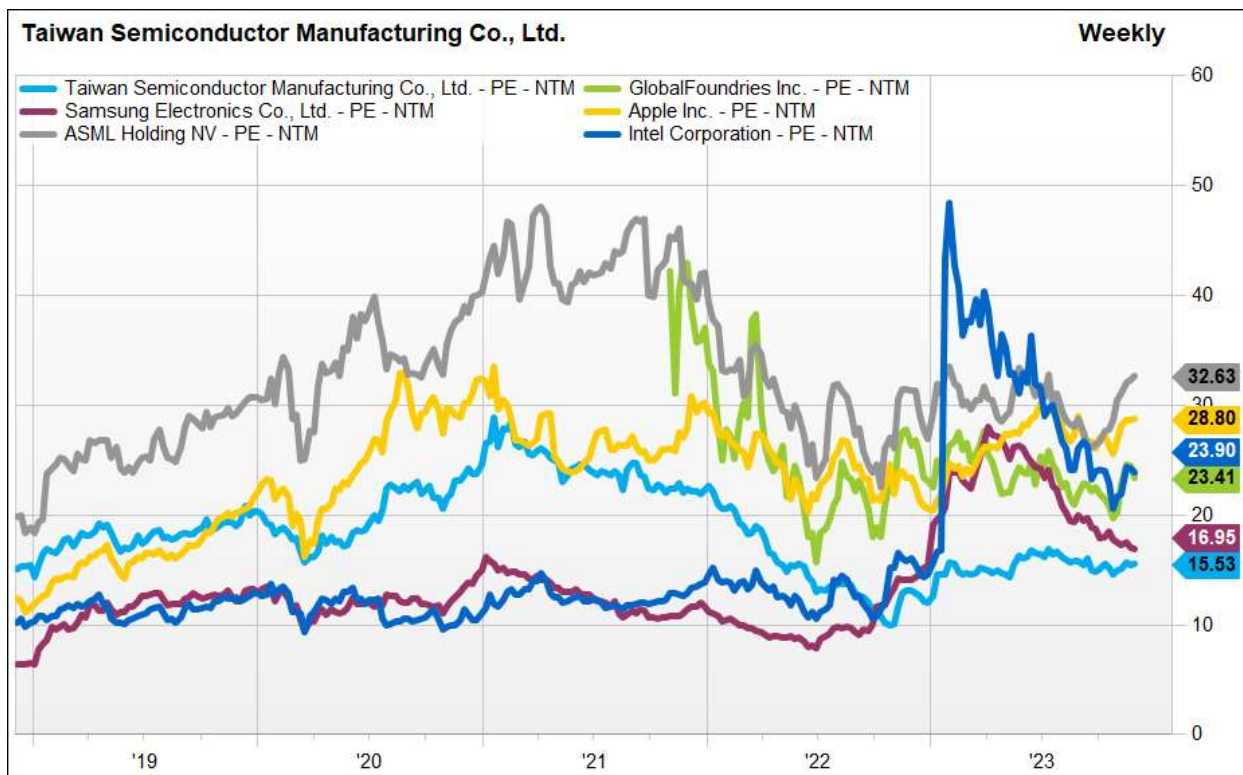
TSMC currently trades on a 15.5x NTM PE ratio which is at a discount to its 5-year historic average trading range. The current level has also proven to be a good entry point in 2019, 2020, and 2022.

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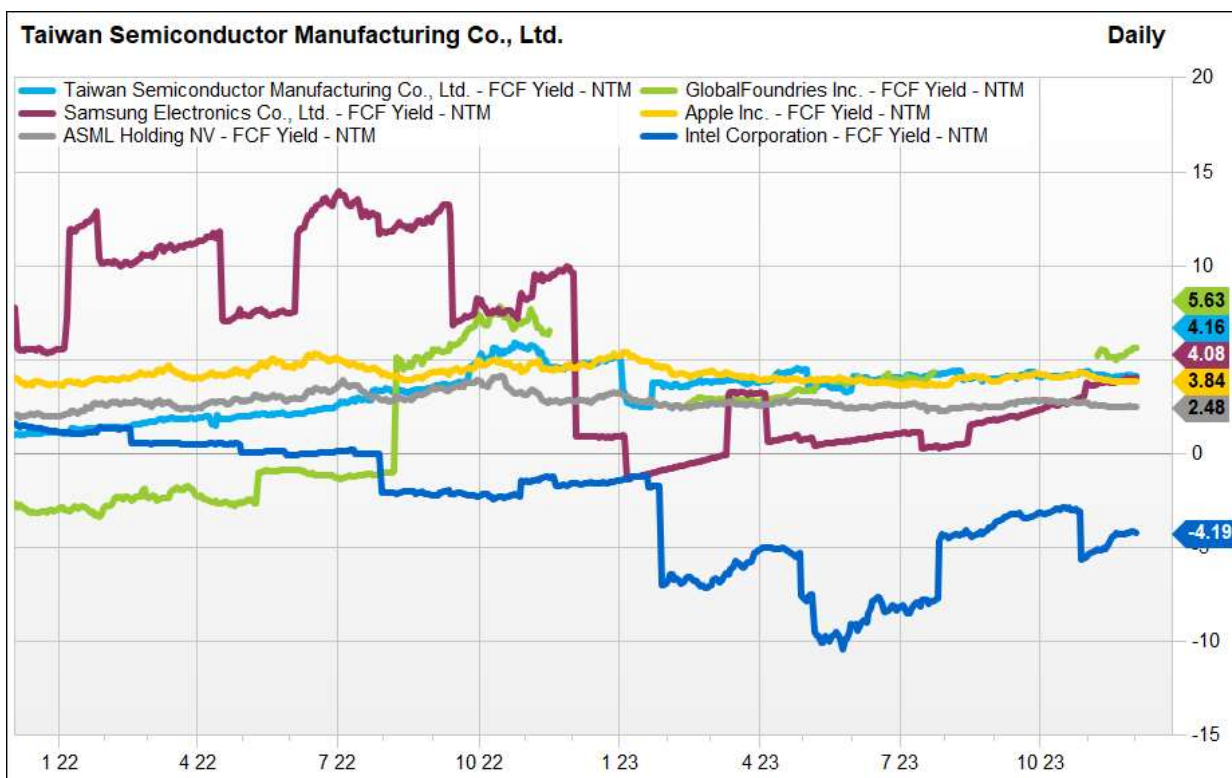
Source: FactSet financial data and analytics

TSMC is also trading at a significant discount to the likes of [ASML \(ASML-NA\)](#), one of its largest suppliers, [Apple \(AAPL-US\)](#), its largest customer, and its main competitors, [Samsung Electronics \(005930-KR\)](#), [Intel \(INTC \(US\)\)](#), and [GlobalFoundries \(GFS-US\)](#).



Source: FactSet financial data and analytics

Given that our investment theses centres around an acceleration in Free Cash Flow generation, it is also interesting to note that with TSMC trading on a NTM Free Cash Flow Yield of 4.16%, based on consensus estimates, TSMC is also trading at a discount to most of its peers, customers, and suppliers.



Source: FactSet financial data and analytics

Company	MCAP US\$m	P/E		Earnings growth		DY		ND/ EBITDA	ROE		Capex/ Sales
		Dec-24	Dec-25	Dec-24	Dec-25	Dec-23	Dec-24		Dec-23	Dec-24	
Taiwan Semiconductor Manufacturing C	476 266	15.2	12.3	19%	24%	2.0%	2.3%	0.3	23.5%	23.5%	49%
Intel Corporation	186 474	23.1	16.8	103%	38%	1.6%	1.2%	0.8	3.8%	7.5%	39%
Samsung Electronics Co., Ltd.	373 394	16.2	11.4	181%	42%	2.0%	2.0%	1.2	3.0%	7.9%	17%
Average		18.2	13.5	101%	34%	1.9%	1.8%	0.2	10.1%	13.0%	35%
FOUNDRIES											
GlobalFoundries Inc.	30 039	23.8	17.1	5%	40%	0.0%	0.0%	0.1	10.4%	10.3%	38%
United Microelectronics Corp.	19 683	10.9	9.5	-5%	15%	6.7%	6.2%	0.8	17.4%	15.7%	29%
Semiconductor Manufacturing Internatir	32 178	27.2	19.0	2%	43%	0.0%	0.0%	0.0	3.9%	3.8%	87%
Average		20.7	15.2	1%	33%	2.2%	2.1%	0.3	10.6%	9.9%	51%
CUSTOMERS											
Apple Inc.	2 961 244	26.7	24.3	9%	10%	0.5%	0.6%	0.5	141.3%	127.7%	3%
NVIDIA Corporation	1 181 179	23.4	20.0	69%	17%	0.0%	0.0%	0.4	69.4%	64.1%	7%
QUALCOMM Incorporated	140 004	12.2	11.2	12%	9%	2.6%	2.7%	0.4	40.3%	38.0%	4%
Advanced Micro Devices, Inc.	197 107	32.4	24.4	42%	33%	0.0%	0.0%	0.4	7.9%	11.0%	2%
MediaTek Inc	48 521	17.1	14.6	22%	18%	6.4%	5.4%	1.1	17.7%	20.6%	2%
Marvell Technology, Inc.	47 954	24.0	19.0	52%	26%	0.4%	0.4%	1.6	8.6%	12.8%	4%
Average		22.6	18.9	34%	19%	1.7%	1.5%	0.1	47.5%	45.7%	4%
SUPPLIERS											
ASML Holding NV	277 376	31.6	22.8	1%	39%	1.0%	1.1%	0.5	63.1%	56.5%	6%
Applied Materials, Inc.	123 857	16.7	14.7	16%	14%	0.8%	0.9%	0.1	36.6%	35.6%	4%
Lam Research Corporation	93 624	20.3	17.2	26%	18%	1.1%	1.2%	0.1	42.1%	46.3%	3%
Tokyo Electron Ltd.	76 568	27.9	21.9	28%	28%	1.4%	1.8%	0.7	18.7%	21.4%	3%
KLA Corporation	74 374	20.7	17.7	13%	17%	1.0%	1.1%	0.6	93.7%	94.3%	3%
Average		23.5	18.8	17%	23%	1.1%	1.2%	0.2	50.8%	50.8%	4%

Source: FactSet financial data and analytics

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