UBS Global I/O Semiconductors

Foundry: Much larger N2 TAM and faster A14 expansion; mature foundry upcycle underway

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N2 demand inflection larger than expected

Our proprietary bottoms-up N2 foundry TAM analysis points to substantially larger demand of 320kwpm by 2028E, versus our prior estimate of approximately 230kwpm a year ago. The increase is driven primarily by stronger server CPU demand and accelerating AI compute deployments, particularly as a growing number of ASIC programs ramp into volume production alongside GPUs over the next several years. At the same time, we expect Intel to migrate a larger portion of its PC CPU production to 18A as execution improves. As a result, we estimate server CPUs and accelerators will account for 54% of N2 foundry demand by 2028, up from our previous estimate of 44%, while PCs should contribute 19% and smartphones/tablets 26%. (See Figure 6-Figure 7). The larger N2 opportunity supports robust revenue growth for TSMC through 2028-29E as the industry's major foundry supplier, even as competition from Samsung Foundry, Intel, and Terafab increases modestly.

Further acceleration of N3/2 expansion; quicker A14 capacity build-up

To meet the larger **N2** demand outlook, we raise our estimate for industry N2 capacity at end-2028 to 312kwpm, up from 230kwpm previously. We forecast TSMC's N2 capacity reaching 210kwpm in 2028, versus our prior estimate of 160kwpm. Intel should also scale capacity more aggressively, exceeding 60kwpm in 2028E for internal CPU production, compared with our previous forecast of 40kwpm. Meanwhile, strengthening cloud AI demand in 2027-28E is pushing our industry **N3** capacity forecast to 290-300kwpm by 2028, up from 270kwpm previously, driven entirely by faster expansion at TSMC. TSMC's **A14** node remains on track for mass production in 2028, supported by steady R&D progress and growing customer engagement. Industry feedback suggests TSMC is pulling forward its expansion schedule, targeting approximately 60kwpm of A14 capacity in 2028 when the node enters mass production, based on UBSe. Reflecting the more aggressive leading-edge expansion, we raise our TSMC capex forecast to US$90bn in 2027 and US$105bn in 2028, up from US $63bn this year. See our Q326 earnings preview.

Mature foundry: favorable supply/demand and pricing outlook in 2027-28

We were early in advocating the anti-consensus view of a mature foundry upcycle, driven by an industry-wide supply and resource reallocation. Utilization and pricing trends have continued to improve throughout 2026, and we expect more meaningful earnings upside in 2027-28. Our updated analysis suggests 8-inch foundry utilization could rise to 95% in 2027, up from 85% in 2026, supported by growing server PMIC demand. While 12-inch 28/40nm demand may face near-term headwinds from weaker smartphone and consumer demand, we still expect utilization to improve to 88% in 2027 from 84% in 2026, supported by modest capacity growth. We also believe competitive behaviour from Chinese foundries should remain rational into 2027, as major players increasingly prioritize capital allocation toward leading-edge technologies.

Stock recommendations

We reiterate Buy on TSMC and expect further upward revisions to Street revenue, EPS and capex estimates for 2027-28. Within mature foundry, UMC remains our top pick, as it should be a major beneficiary of overflow from larger foundries, with additional upside from silicon photonics and advanced packaging. We also like PSMC and SMIC. We remain Neutral on GlobalFoundries, Vanguard and Hua Hong. See Figure 1 for valuation details.

This report has been prepared by UBS Securities Pte. Ltd., Taipei Branch. **ANALYST CERTIFICATION AND REQUIRED DISCLOSURES, INCLUDING INFORMATION ON THE QUANTITATIVE RESEARCH REVIEW PUBLISHED BY UBS, BEGIN ON PAGE 8.**

Figure 1: Valuation table

Company name	Ticker	Rating	Mkt cap (US$m)	PT (LC)	Price (LC)	P/E (x)		P/BV (x)		ROE (%)		EPS growth (%)		
						2027E	2028E	2027E	2028E	2027E	2028E	2027E	2028E	2030E
Global Foundries	GFS O	Neutral	25,795	55.00	46.47	18.4	14.7	2.0	1.9	11.2	13.3	29.9	25.3	19.1
Hua Hong	1347 HK	Neutral	24,460	148.00	110.40	97.3	63.9	3.0	2.9	3.2	4.3	44.0	39.3	18.1
PSMC	6770 TW	Buy	9,546	100.00	72.00	7.4	6.4	2.2	1.8	33.7	31.4	33.6	16.7	3.3
SMIC	0981 HK	Buy	65,188	102.40	63.80	34.9	26.0	2.3	2.1	6.7	8.4	49.5	34.6	34.2
TSMC	2330 TW	Buy	2,014,659	3,650.00	2,475.00	16.6	12.2	6.1	4.4	42.7	42.1	36.6	35.9	24.5
UMC	2303 TW	Buy	60,851	230.00	154.00	19.4	12.9	3.7	3.2	19.9	26.9	2.8	50.8	13.6
Vanguard	5347 TWO	Neutral	9,992	168.00	170.50	20.3	14.9	3.2	2.8	16.3	20.1	32.4	36.1	15.7
Average - Foundry						**30.6**	**22.4**	**3.2**	**2.7**	**19.1**	**20.9**			
Average - Trailing-edge foundry						**33.0**	**24.1**	**2.7**	**2.5**	**15.2**	**17.4**			

Source: UBS estimates, ISFG. Note: above data priced as of 24 Sep, 2026 except for GFS priced as of 23 Sep, 2026.

Figure 2: Changes to our estimates

	New			Old			Difference		
Industry capacity (kwpm)	**2026E**	**2027E**	**2028E**	**2026E**	**2027E**	**2028E**	**2026E**	**2027E**	**2028E**
N2 (including 18A)	111	200	312	114	190	230	-3%	5%	36%
N3	224	283	293	215	262	270	4%	8%	9%
N5	284	305	307	274	305	305	4%	0%	1%
N10/N7	295	262		278	247		6%	6%	
12" 55-90nm	1,567	1,737		1,549	1,684		1%	3%	
Industry utilisation (%)	**2026E**	**2027E**		**2026E**	**2027E**		**2026E**	**2027E**	
28/40nm	84.3%	88.1%		82.2%	85.1%		3%	3%	
8" process	85.4%	95.1%		84.1%	91.0%		1%	5%	

Source: UBS estimates

Figure 3: Our updated overall foundry industry capacity forecasts

Period-end capacity (kwpm)	2019	2020	2021	2022	2023	2024	2025	2026E	2027E
Overall foundry industry capacity (kwpm)									
FinFET	**424**	**547**	**686**	**720**	**840**	**904**	**1,035**	**1,155**	**1,296**
YoY	*39%*	*29%*	*25%*	*5%*	*17%*	*8%*	*14%*	*12%*	*12%*
Mature 12"	**1,124**	**1,364**	**1,554**	**1,758**	**1,940**	**2,174**	**2,413**	**2,676**	**2,879**
YoY		*21%*	*14%*	*13%*	*10%*	*12%*	*11%*	*11%*	*8%*
8"	**2,762**	**2,786**	**2,995**	**3,227**	**3,370**	**3,416**	**3,459**	**3,449**	**3,337**
YoY		*1%*	*8%*	*8%*	*4%*	*1%*	*1%*	*0%*	*-3%*
Total foundry capacity (12" equivalent kwpm)	**2,776**	**3,150**	**3,572**	**3,913**	**4,278**	**4,597**	**4,986**	**5,364**	**5,658**
YoY		*13%*	*13%*	*10%*	*9%*	*7%*	*8%*	*8%*	*5%*
Non Chinese foundry capacity (kwpm)									
FinFET		**535**	**670**	**704**	**824**	**883**	**1,014**	**1,118**	**1,230**
YoY			*25%*	*5%*	*17%*	*7%*	*15%*	*10%*	*10%*
Mature 12"		**1,078**	**1,155**	**1,267**	**1,332**	**1,411**	**1,476**	**1,523**	**1,502**
YoY			*7%*	*10%*	*5%*	*6%*	*5%*	*3%*	*-1%*
8"		**2,144**	**2,213**	**2,339**	**2,394**	**2,400**	**2,413**	**2,403**	**2,291**
YoY			*3%*	*6%*	*2%*	*0%*	*1%*	*0%*	*-5%*
Total non China foundry capacity (12" equiv)		**2,566**	**2,809**	**3,010**	**3,220**	**3,361**	**3,562**	**3,710**	**3,750**
YoY			*9%*	*7%*	*7%*	*4%*	*6%*	*4%*	*1%*
Major Chinese foundry capacity (kwpm)									
FinFET		**12**	**16**	**16**	**16**	**21**	**21**	**36**	**66**
YoY			*32%*	*0%*	*0%*	*30%*	*0%*	*70%*	*83%*
Mature 12"		**286**	**399**	**491**	**607**	**763**	**938**	**1,153**	**1,377**
YoY			*39%*	*23%*	*24%*	*26%*	*23%*	*23%*	*19%*
8"		**642**	**782**	**888**	**977**	**1,016**	**1,046**	**1,046**	**1,046**
YoY			*22%*	*14%*	*10%*	*4%*	*3%*	*0%*	*0%*
Total major China foundry capacity (12" equiv)		**584**	**763**	**903**	**1,058**	**1,236**	**1,424**	**1,654**	**1,908**
YoY			*31%*	*18%*	*17%*	*17%*	*15%*	*16%*	*15%*
Chinese foundry as % of industry capacity									
FinFET		2%	2%	2%	2%	2%	2%	3%	5%
Mature 12"		21%	26%	28%	31%	35%	39%	43%	48%
8"		23%	26%	28%	29%	30%	30%	30%	31%
Total China foundry capacity as % of industry		**19%**	**21%**	**23%**	**25%**	**27%**	**29%**	**31%**	**34%**

Source: Company data, UBS estimates

Figure 4: Our updated leading-edge foundry capacity forecasts

Period-end capacity (kwpm)	2019	2020	2021	2022	2023	2024	2025	2026E	2027E
FinFET foundry capacity (kwpm)									
TSMC	235.0	280.0	335.0	405.0	445.0	470.0	570.0	650.0	740.0
Samsung Foundry	80.0	120.0	160.0	175.0	180.0	190.0	193.0	215.0	255.0
Intel	81.3	111.0	151.3	100.3	175.3	199.5	225.6	232.5	205.9
UMC	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	13.0
GlobalFoundries	22.0	22.0	22.0	22.0	22.0	22.0	22.0	18.0	16.0
China	3.0	11.0	15.0	15.0	15.0	20.0	21.3	36.3	66.3
Total FinFET supply	**424.3**	**547.0**	**686.3**	**720.3**	**840.3**	**904.5**	**1,035.0**	**1,154.8**	**1,296.2**
YoY	*39%*	*29%*	*25%*	*5%*	*17%*	*8%*	*14%*	*12%*	*12%*

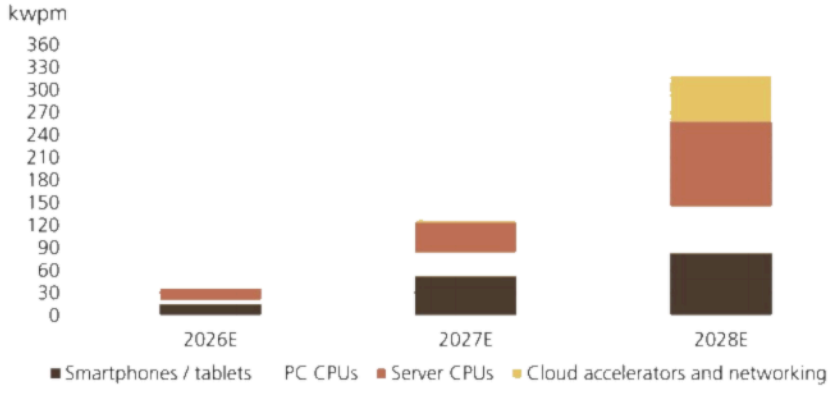
Source: Company data, UBS estimates Note: Our Intel estimates are based on wafer output.

Figure 5: N2 foundry capacity forecasts

Period-end capacity (kwpm)	2025	2026E	2027E	2028E
2nm				
TSMC	40.0	90.0	140.0	210.0
Samsung Foundry	3.0	10.0	25.0	40.0
Intel	4.0	11.0	35.0	61.7
Total wafer supply	**47.0**	**111.0**	**200.0**	**311.7**
YoY		*136%*	*80%*	*56%*

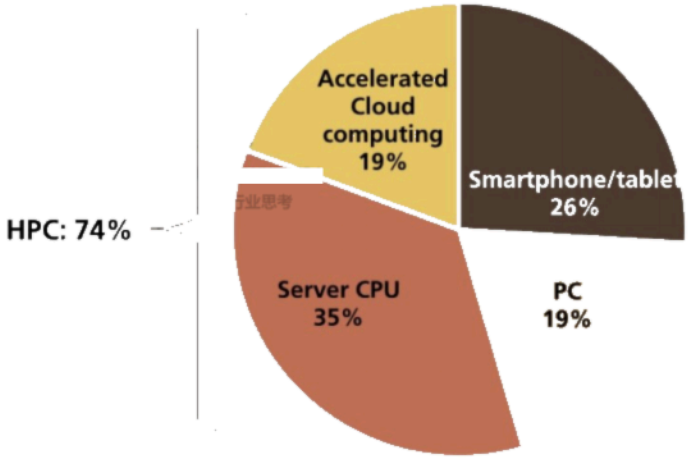
Source: Company data, UBS estimates

Figure 6: Quantifying N2 demand opportunities for foundry



Source: Company data, UBS estimates

Figure 7: N2 foundry demand by application (2028E)



Source: Company data, UBS estimates

Figure 8: Our updated supply-demand model for 12" 28/40nm foundries

(kwpm 12")	2019	2020	2021	2022	2023	2024	2025	2026E	2027E
Demand									
OLED driver ICs	38	37	51	50	59	81	98	102	108
WiFi SoC	92	105	128	138	145	151	161	159	167
MCU - Auto	17	14	18	25	32	31	41	48	51
MCU - General purpose & IoT	21	22	50	64	73	74	88	100	100
TV SoC	114	109	98	88	80	82	82	80	79
STB SoC	20	21	21	19	17	18	19	19	20
RF Transceivers for 4G / Legacy	19	15	12	8	7	6	6	5	5
SSD controllers	15	18	21	20	20	19	19	20	21
Others	195	254	312	326	238	266	320	368	404
Total 12" wafer demand	**533**	**603**	**727**	**762**	**709**	**775**	**892**	**959**	**1,020**
Demand growth		*13.1%*	*20.6%*	*4.8%*	*-6.9%*	*9.3%*	*15.1%*	*7.5%*	*6.4%*
Supply									
TSMC	305	318	335	365	385	395	425	430	380
UMC	87	94	106	116	131	153	158	168	183
SMIC	50	50	60	61	71	110	135	165	200
HLMC	20	40	40	40	45	45	45	65	75
Samsung Foundry	60	60	60	60	60	60	60	60	60
GlobalFoundries	70	70	74	105	126	145	169	196	209
Qingdao SiEn	0	0	0	5	10	10	10	10	10
XMC	0	0	5	10	10	10	10	10	10
Hua Hong	0	0	0	0	0	0	0	5	10
Powerchip	0	0	0	0	0	0	0	0	0
Vanguard	0	0	0	0	0	0	0	0	5
Total 12" wafer supply	**592**	**632**	**680**	**762**	**838**	**928**	**1,012**	**1,109**	**1,142**
Supply growth		*6.9%*	*7.5%*	*12.2%*	*9.9%*	*10.8%*	*9.0%*	*9.6%*	*2.9%*
Supply vs Demand	**11.0%**	**4.9%**	**-6.5%**	**0.1%**	**18.2%**	**19.8%**	**13.5%**	**15.7%**	**11.9%**
Implied 28/40nm industry utilisation	**89.0%**	**95.1%**	**106.5%**	**99.9%**	**81.8%**	**80.2%**	**86.5%**	**84.3%**	**88.1%**

Source: Company data, Gartner, UBS estimates. Note: Expansion tracks of companies not covered (HLMC, and Qingdao SiEn) are based on company news, management comments, or IPO prospectuses.

Figure 9: Our updated supply model for 12" 90/65nm foundries

(kwpm 12")	2019	2020	2021	2022	2023	2024	2025	2026E	2027E
Total 12" 90/65nm foundry wafer supply	**532**	**732**	**875**	**996**	**1,102**	**1,245**	**1,401**	**1,567**	**1,737**
YoY		*38%*	*19%*	*14%*	*11%*	*13%*	*12%*	*12%*	*11%*
Net addition		**200**	**142**	**121**	**106**	**144**	**156**	**166**	**170**
TSMC		235	245	255	255	255	255	255	255
UMC		94	97	99	99	102	104	105	105
Samsung Foundry		75	75	75	75	75	75	75	75
Powerchip		49	58	66	66	72	72	72	72
GlobalFoundries		33	36	36	25	24	28	37	40
Vanguard		0	0	0	0	0	0	0	20
Nexchip		30	70	100	110	140	155	165	165
United Nova Technology (formerly SMEC)		0	0	0	10	20	40	60	85
CanSemi		10	20	36	45	57	65	75	80
CR Micro Foundry		0	0	0	0	0	10	40	65
GTA Semi		0	1	3	15	25	35	50	65
SiEn		0	0	5	20	40	45	52	55
XMC		40	47	50	50	60	75	95	110
SMIC		58	58	78	89	113	137	148	180
Hua Hong		20	60	65	95	95	137	160	185
HLMC		38	38	38	38	38	38	48	50
Others		50	70	90	110	130	130	130	130

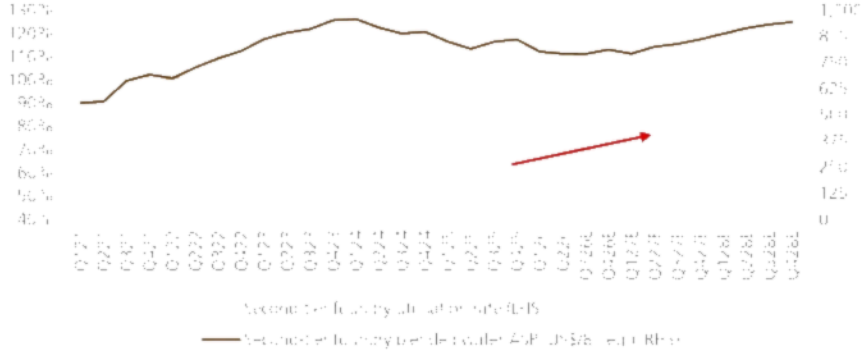
Source: Company data, Gartner, UBS estimates. Note: Expansion tracks of companies not covered (Nexchip, CanSemi, GTA Semi, SiEn and UNT (formerly SMEC), HLMC) are based on company news, management comments, or IPO prospectuses.

Figure 10: Our updated supply/demand model for 8" foundries

(kwpm 8")	2019	2020	2021	2022	2023	2024	2025	2026E	2027E
Demand									
Power ICs	1,446	1,496	1,687	1,521	1,408	1,513	1,662	1,649	1,788
Display driver ICs	198	211	212	190	168	152	147	145	147
MCU - non-auto	349	377	423	387	362	284	269	266	251
Others	875	745	797	877	614	687	825	949	996
Total 8" wafer demand	**2,868**	**2,828**	**3,119**	**2,976**	**2,552**	**2,636**	**2,903**	**3,009**	**3,182**
Demand growth		*-1.4%*	*10.3%*	*-4.6%*	*-14.2%*	*3.3%*	*10.1%*	*3.6%*	*5.8%*
Supply									
TSMC	581	581	581	581	581	581	581	581	511
UMC	313	322	329	341	363	363	367	367	367
Samsung Foundry	250	250	250	250	260	260	260	260	200
Vanguard	211	243	252	270	287	287	293	280	297
SMIC	228	249	318	358	398	398	398	398	398
Hua Hong	178	178	178	178	178	178	178	178	178
PSMC	85	95	110	118	118	123	123	123	123
UNT (formerly SMEC)	5	40	80	100	110	130	160	160	160
GlobalFoundries	142	112	117	122	122	122	122	122	122
Key Foundry / Magnachip Fab 4	82	82	82	82	82	82	82	82	82
Skywater	13	13	13	13	13	13	13	13	13
Dongbu Hitek	119	130	138	151	151	151	151	151	151
TowerJazz	141	141	148	148	148	148	148	148	148
GTA Semi	28	35	48	65	83	100	100	100	100
CSMC	60	122	132	140	140	140	140	140	140
Qingdao SiEn	0	3	9	20	25	25	25	25	25
NSEMII (SMIC Ningbo)	15	15	17	28	43	45	45	45	45
SilTerra	35	35	35	35	41	41	41	41	41
X Fab	86	86	86	86	86	86	86	86	86
Ltoundry	42	42	42	42	42	42	42	42	42
Other	148	12	30	100	100	102	104	106	108
Total 8" wafer supply	**2,762**	**2,786**	**2,995**	**3,227**	**3,370**	**3,416**	**3,459**	**3,449**	**3,337**
Supply growth		*0.9%*	*7.5%*	*7.7%*	*4.4%*	*1.4%*	*1.3%*	*-0.3%*	*-3.2%*
Supply vs Demand	**-3.7%**	**-1.5%**	**-4.0%**	**8.5%**	**32.0%**	**29.6%**	**19.2%**	**14.6%**	**4.9%**
Implied 8" industry utilisation	**103.7%**	**101.5%**	**104.0%**	**91.5%**	**68.0%**	**70.4%**	**80.8%**	**85.4%**	**95.1%**

Source: Company data, Gartner, UBS estimates. Note: Expansion tracks of companies not covered (UNT (formerly SMEC), TowerJazz, Dongbu Hitek, X Fab, Key Foundry, CSMC, L Foundry, SilTerra, GTA Semi, Skywater and Qingdao SiEn) are based on company news, management comments, or IPO prospectuses.

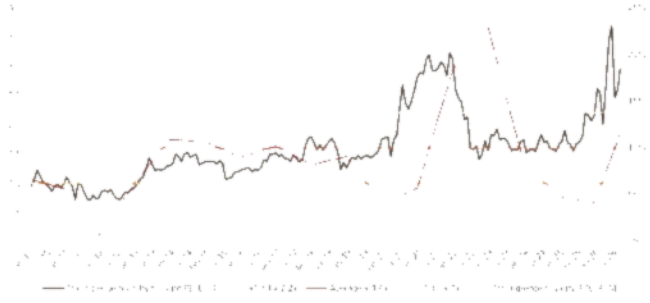
Figure 11: Mature foundry utilisation vs ASP



Source: Company data, UBS estimates. Note: We include UMC, SMIC, PSMC, Vanguard, and Hua Hong in the second-tier foundry analysis.

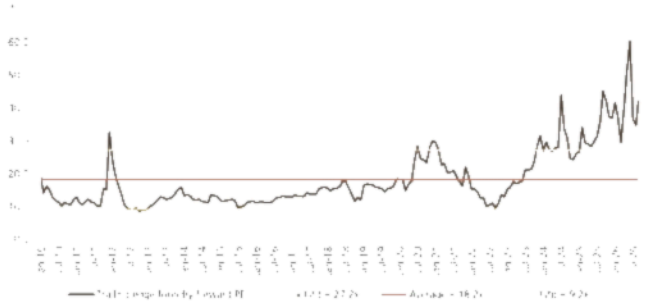
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Figure 12: Trailing-edge foundry sector P/BV (x) versus ROE



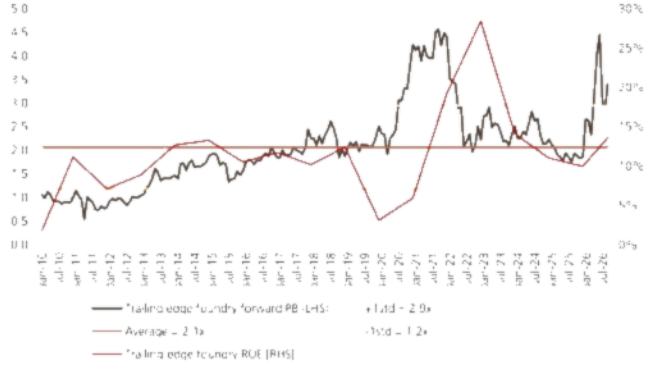
Source: Company data, LSEG, UBS estimates

Figure 13: Trailing-edge foundry sector PE (x)



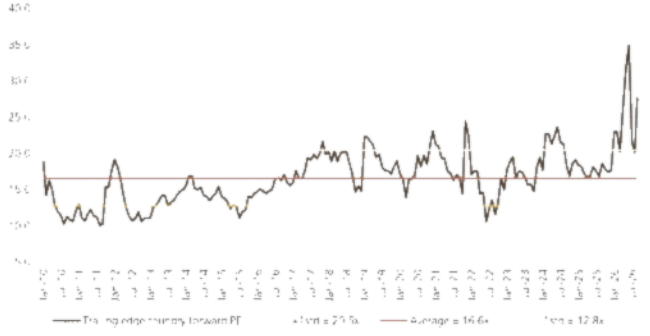
Source. Company data, LSEG, UBS estimates

Figure 14: Trailing-edge foundry sector P/BV (x) versus ROE (exclude SMIC, Hua Hong, PSMC)



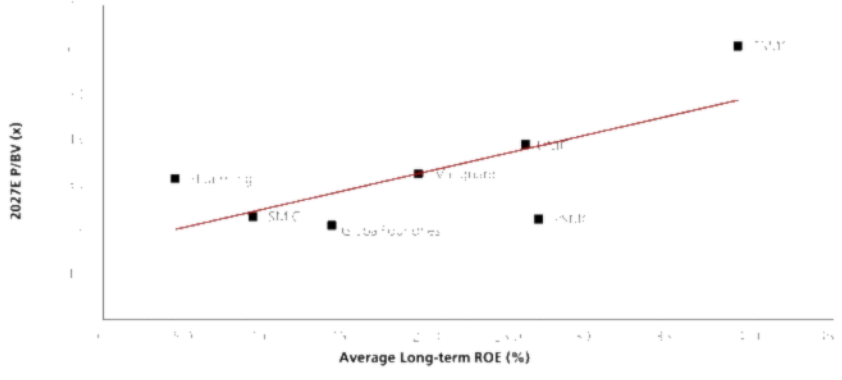
Source: Company data, LSEG, UBS estimates

Figure 15: Trailing-edge foundry sector P/E (x) (exclude ex. SMIC, Hua Hong, PSMC)



Source. Company data, LSEG, UBS estimates

Figure 16: Foundry 2027E P/BV versus average 2027-29E ROE



Source: Company data, LSEG, UBS estimates. Note: Priced as of 22 Sep 2026.

Valuation Method and Risk Statement

The semiconductor industry is cyclically sensitive to the economy and so upside and downside risks relate to macro drivers. Other, semiconductor capital equipment specific downside risks include the rapid loss of market share due to product timing/performance , design or distribution. The supply chain companies into the handset industry also operate in a highly cyclical market both from macro concerns and inventory cycles within the supply chain. These companies also operate in a highly competitive environment with product innovation and R&D investments critical to success.