

Technology

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Global foundry 3Q23 Wrap: consumer/smartphone/PC recovery; upcycle and growth in 2024

Major global semi foundries (TSMC/UMC/VIS/GF/SMIC/HH) reported in-line 3Q23 results but mixed 4Q23 outlook with shipment/ASP pressure and lower GPM given weak broad-based recovery, low UTR, depreciation and higher utility costs. Looking into 2024, most fabs expected 2024 to be a year of growth driven by consumer/smartphone/PC recovery despite automotive inventory correction. Overall, we expect global foundry industry to return to positive growth in 1H24. For stocks, we believe industry recovery and robust HPC/AI demand in 2024 will be positive to TSMC (2330 TT) for technology leadership, SMIC (981 HK) for localization, and Hua Hong (1347 HK) for leading specialty process.

- **Mixed 4Q23 outlook with lower GPM on weak demand recovery, low UTR and depreciation.** Most foundries posted QoQ growth on revenue in 3Q23 (TSMC/UMC/VIS/SMIC/Globalfoundries +13.7%/1.4%/7.1%/3.9%/0.4%), except Hua Hong Semi (-10% QoQ) on ASP decline. For 4Q23 revenue, while TSMC and SMIC guided QoQ revenue growth on shipment increase driven by smartphone & PC inventory restocking, UMC/VIS/Globalfoundries/Hua Hong guided QoQ revenue drop on shipment/ASP decline. For GPM in 4Q23, most foundries guided lower GPM for various factors. TSMC expected mixed GPM for higher costs from leading nodes (esp. N3). VIS guided QoQ GPM decline due to weak macro, slow demand recovery and less customer orders. Globalfoundries believes cost efficiencies and customer order adjustment benefits were already reflected in 3Q GPM and such benefits will subside into 4Q leading to flattish 4Q GPM.
- **Widely anticipated 2024 as a year of growth for consumer/smartphone/PC recovery.** Looking into 2024, most fabs expected revenue growth driven by consumer/PC/smartphone demand recovery and inventory restocking. However, some fabs (e.g. UMC/SMIC/HH) expressed concerns on higher automotive inventory. **Outlook for 8/12-inch capacity is mixed.** 1) UMC expected 8-inch UTR to be under pressure on weak demand and intensified competition while 12-inch UTR to be stable. 2) SMIC expected 8-inch UTR improvement driven by some 8-inch products, such as fast charging/PMIC/Bluetooth/Wifi. 3) Hua Hong/SMIC expected 8/12-inch ASP to be under pressure. 4) VIS believes 8-inch recovery in 2024 will depend on market condition but expects UTR to be better than 2023.
- **CAPEX plan: Overseas fab remains conservative in 2024; Chinese fabs raised capex for capacity expansion.** For overseas fabs, UMC maintained 2023 capex unchanged and VIS trimmed 2023 capex by 10% for on-going inventory correction. TSMC tightened up 2023 capex and guided flattish capex in 2024 and declining capacity intensity in next few years. Globalfoundries expected material CAPEX reduction in 2024 given focus shift to free cash flow generation. For domestic fabs, SMIC revised up 2023 capex to US\$7.5bn given geopolitical tension for capacity expansion, and Hua Hong guided FY24E capex to be US\$2.05-2.1bn (vs. US\$1.13bn in 2023) mainly for 12-inch fabs' capacity expansion (US\$2bn).

Valuation Table

Name	Ticker	Mkt Cap (US\$ mn)	Price (LC)	P/E (x)		P/B (x)		ROE
				FY23E	FY24E	FY23E	FY23E	
SMIC	981 HK	30970	21.5	25.2	26.7	1.08		4.5
Hua Hong Semi	1347 HK	5497	18.1	15.2	26.4	0.66		5.9
TSMC	2330 TT	473213	577	18.3	15.4	4.29		25.3
UMC	2303 TT	19771	50.0	10.5	11.2	1.81		17.7

Source: Company data, CMBIGM estimates

China Technology Sector

Alex NG

(852) 3900 0881

alexng@cmbi.com.hk

Hanqing LI

lihanqing@cmbi.com.hk

Related Reports:

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2. AMD 3Q23: PC recovery, smooth ramp-up of MI300 Series and AI PC opportunities- 2 Nov 2023 ([link](#))
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6. TSMC 3Q23: cycle nearing the bottom; Positive on smartphone/PC supply chain -24 Oct 2023 ([link](#))
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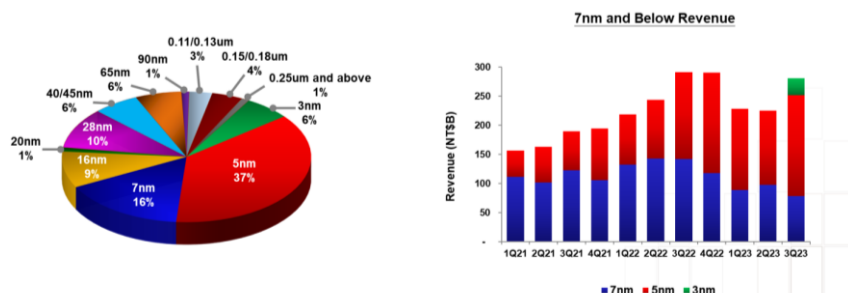
Figure 1: Global semi foundry: 3Q23 results and 4Q23 guidance

Company	1Q22	2Q22	3Q22	4Q22	1Q23	2Q23	3Q23	4Q23E Guidance	FY24E Guidance	Comment/Outlook
Rev QoQ Growth										
TSMC	11.3%	3.5%	11.3%	-1.0%	-16.2%	-6.2%	13.7%	up 8.8-13.4%		* 3Q: strong ramp of 3nm and higher demand for 5nm, partially offset by customers' ongoing inventory adjustment * 3Q: Smartphone/HPC/IoT QoQ recovery * 2023: 4Q guidance implies 2023 sales down 6% YoY, vs prior guidance of down 10% YoY * 2024: <u>a growth year</u> but too early to call it sharp rebound
UMC	6.6%	8.1%	1.4%	-12.7%	-17.7%	3.8%	1.4%	down ~5% QoQ		* 3Q: strong computing/communication, better product mix and favorable FX * 4Q: shipment down ~5% QoQ but flatish ASP; rush orders in 4Q reflecting inventory recovery * 2024: auto inventory correction into 2024; industrial better than auto given broad applications; Expect shipment YoY growth when cycle recovers in 2024
Vanguard	5.2%	7.9%	-15.6%	-30.3%	-11.9%	20.4%	7.1%	down YoY		* 3Q: shipment up ~5% QoQ, ASP down 1% QoQ due to minor increase in demand * 4Q: shipment down 8-10% YoY; ASP down 0-2% QoQ on slow demand recovery; Cautious in customers' order placement
Global Foundries	5.0%	2.7%	4.1%	1.3%	-12.4%	0.2%	0.4%	down 1.46% to up 1.24% QoQ	YoY growth recovery	* 3Q: shipment down 10% YoY; ASP down 2% YoY on product mix change * 2023: stable ASP QoQ and flat to slightly up YoY in ASP * 2024: <u>return to YoY growth</u> driven by inventory restocking, global demand recovery, esp consumer-centric markets
SMIC	15.8%	7.8%	3.7%	-11.8%	-13.2%	6.7%	3.9%	up 1-3% QoQ		* 3Q: driven by wafer shipment (+9.5% QoQ) * 2024: <u>stable foundry market</u> ; mature process lacks growth momentum; smartphone/consumer flattish; <u>8-inch flattish</u>
Hua Hong Semi	11.8%	8.9%	5.0%	3.8%	-3.6%	0.1%	-10.0%	down 20.8% - 12.0%		* 3Q: rev below consensus due to lower ASP * 4Q: rev below consensus mainly on ASP decline
Gross Margin										
TSMC	55.6%	59.1%	60.4%	62.2%	56.3%	54.1%	54.3%	51.5-53.5%	LT GPM of 53%+	* 3Q: above high-end of guidance, for higher UTR & favorable FX, partially offset by margin dilution from N3 ramp * 2024: Leading nodes (e.g. N3) GPM challenging to reach corp avg due to higher costs; Mature nodes GPM - corp avg. as focus on specialty technology
UMC	43.4%	46.5%	47.3%	42.9%	35.5%	36.0%	35.9%	low-30% range	under pressure	* 3Q GPM: above consensus due to better product mix * 2024 GPM: <u>under pressure</u> given headwinds in utility cost & depreciation; Expect stable ASP, cost reduction, specialty higher mix to offset depreciation
Vanguard	48.4%	50.0%	45.0%	39.2%	30.0%	30.0%	26.5%	22-24%		* 3Q: in-line but decline QoQ, given ASP slight decline and higher manufacturing cost * 4Q: QoQ decline on weak macro, slow demand recovery and cautious on customer demand and orders
Global Foundries	24.2%	27.0%	29.4%	29.6%	28.0%	28.8%	28.6%	28%		* 3Q: driven by manufacturing cost efficiencies and successful resolution of customer volume adjustments * 4Q: some benefits (cost efficiencies, customer volume adjustments) to subside and already reflected in guidance
SMIC	40.7%	39.4%	38.9%	32.0%	20.8%	20.3%	19.8%	16-18%		* 3Q: in-line on ASP decline due to higher commodity sales mix * 4Q: GPM QoQ decline due to depr from capacity expansion
Hua Hong Semi	26.9%	33.6%	37.2%	38.2%	32.1%	27.7%	16.1%	2-5%		* 3Q: impact from ASP and UTR decline * 4Q: miss by 15.2pts due to: 1) ASP decline drag GPM by 7-8pts; 2) inventory write-down drag GPM by 4pts
Utilization										
TSMC	NA	NA	NA	NA	NA	NA	Higher UTR	NA		* 3Q: PC/smartphone demand stabilized; auto inventory adjustment in 2H23; 7nm UTR impacted by major customer product delay * 2024: 7/6nm UTR will return to healthy level over next several years given specialty demand from consumer, RF, connectivity, etc
UMC	103.8%	103.7%	102.3%	90.0%	70.0%	71.0%	67.0%	low-60% range	YoY recovery	* 4Q: 8-inch UTR under pressure on weak demand and intense competition; stable 12-inch UTR * 2024: expect UTR to grow YoY when cycle recovers
Vanguard	NA	NA	NA	NA	50.0%	50.0%	NA	mid-SD decline QoQ		* 4Q: UTR to decline by mid-single digit QoQ (4-6%) on inventory correction * 2024: 8-inch recovery depends on market conditions; 2024 better than 2023
Global Foundries	NA	NA	NA	95.0%	85.0%	85.0%	Lower UTR	low to mid 80s for full year		* 2H23: lower UTR consistent with inventory trend * 2023: low-to-mid 80s due to prevailing demand and elevated inventory level
SMIC	100.4%	97.1%	92.1%	79.5%	68.1%	78.3%	77.1%	-		* 3Q: better UTR on 8-inch product, e.g. fast charging/ PMIC/Bluetooth/Wifi demand recovery * 4Q: commodity UTR in-line with market; 8-inch UTR now at 50-70% and not much chg.
Hua Hong Semi	106.0%	109.7%	110.8%	103.2%	103.5%	102.7%	86.8%	-		* 4Q: UTR to improve gradually
CAPEX										
TSMC	9,356	7,392	8,753	10,757	9,940	8,170	7,100	-	To level off in next few years	* 2023: tighten up with US\$32bn (70% adv. tech, 20% specialty tech, 10% adv. packaging & testing) * 2024&onwards: capex to level off, capacity intensity down in next few years
UMC	386	370	739	1,148	998	820	570	-		* 2023: capex of US\$3bn remain unchanged * 2024: capacity expansion on track, P6 ramp up; 12-inch capacity to reach 32k by Sep.2024
Vanguard	187	232	146	70	94	51	43	-		* 60% for 5th fab, facilities and capacity; 25% for equipment bottleneck removal; 15% for routine maintenance * 2023: capex cut by 10%, cautious view on inventory correction entering weak season * Capacity expansion by 6-7% YoY in 2023
Global Foundries	612	812	613	991	853	400	323	-	Material YoY reduction	* 2023: Capex US\$2bn remain unchanged * 2024: Material YoY CAPEX reduction to deliver significant YoY free cash flow generation
SMIC	869	1,672	1,822	1,987	1,259	1,732	2,135	2375		* 2023: Capex revised up to US\$7.5bn (vs. prior flattish YoY) for obtaining equipment under geopolitical tensions and ensure capacity ramp-up on track
Hua Hong Semi	124	112	429	331	217	165	194	555	US\$2.05-2.1bn	* 2023: Capex US\$1.13bn (US\$130mn for three 3 8-inch fabs, US\$1bn for two 12-inch fabs) * 2024: Capex US\$2.05-2.1bn (US\$50-100mn for 8-inch fabs, US\$2bn for 12-inch fabs)

Source: Company announcement, Bloomberg, CMBIGM

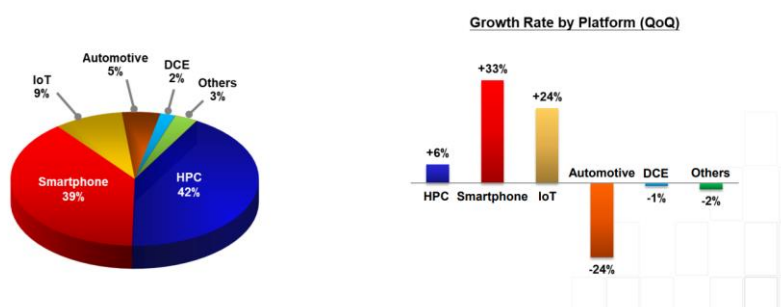
TSMC/ UMC 3Q23 results:

Figure 2: TSMC: revenue by technology in 3Q23



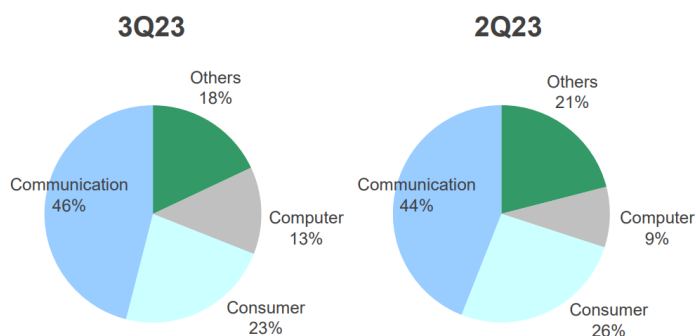
Source: Company data, CMBIGM estimates

Figure 3: TSMC: revenue by platform in 3Q23



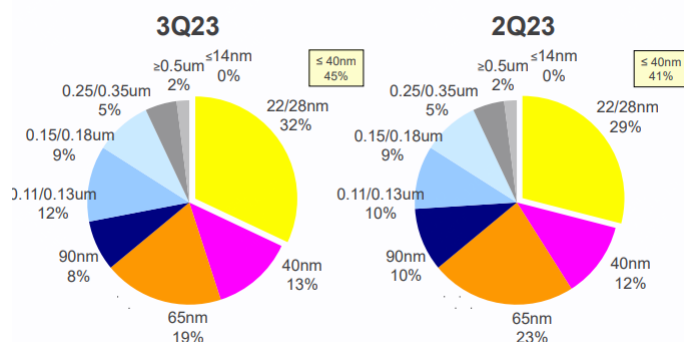
Source: Company data, CMBIGM estimates

Figure 4: UMC: revenue by application in 3Q23



Source: Company data, CMBIGM estimates

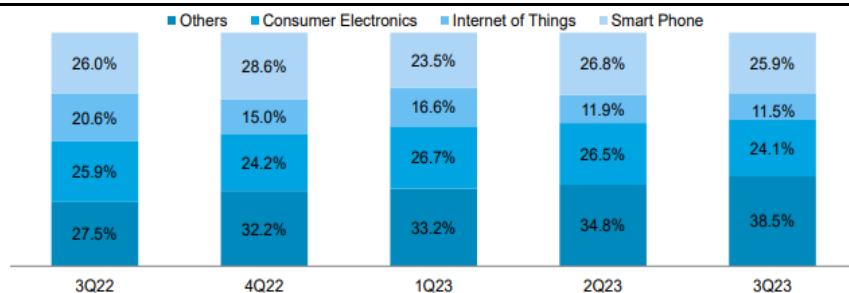
Figure 5: UMC: revenue by technology in 3Q23



Source: Company data, CMBIGM estimates

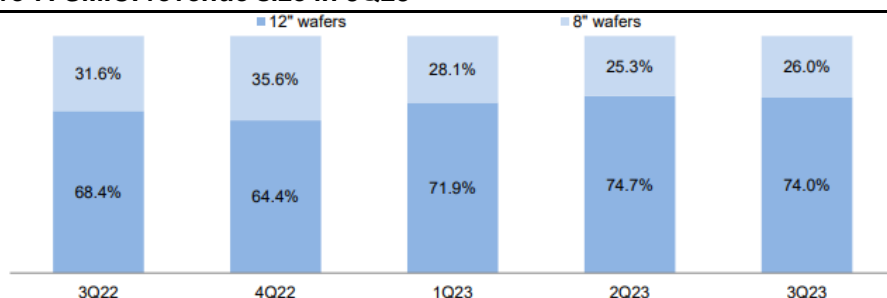
SMIC/ Hua Hong 3Q23 results:

Figure 6: SMIC: revenue by application in 3Q23



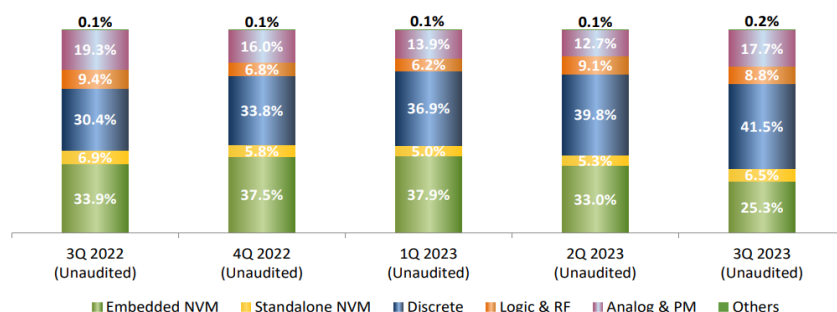
Source: Company data, CMBIGM estimates

Figure 7: SMIC: revenue size in 3Q23



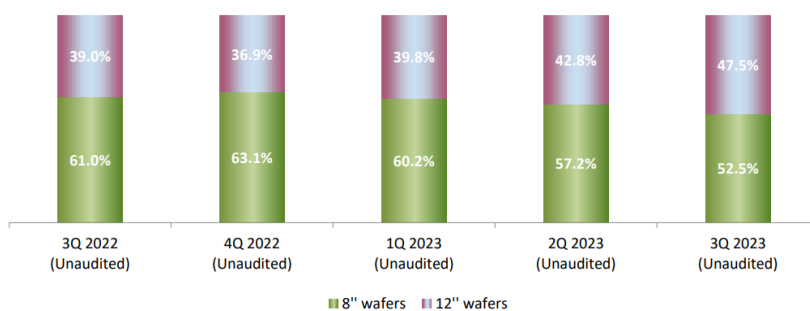
Source: Company data, CMBIGM estimates

Figure 8: Hua Hong Semiconductor: revenue by technology platform in 3Q23



Source: Company data, CMBIGM estimates

Figure 9: Hua Hong Semiconductor: revenue by wafer size in 3Q23



Source: Company data, CMBIGM estimates

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CMB International Global Markets Limited

Address: 45/F, Champion Tower, 3 Garden Road, Hong Kong, Tel: (852) 3900 0888 Fax: (852) 3900 0800

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