

Regional Industry Focus

Regional Technology

Refer to important disclosures at the end of this report

DBS Group Research . Equity

2 Jan 2024

2024 outlook – A year of optimism

- Memory segment thrives during upcycles in the semiconductor industry, followed by equipment makers, supported by improving macro picture
- Uneven recovery path, with downstream players to benefit from 2H24; demand for PCs and mobiles are emerging from a trough; anticipate slower growth for automotive and stable for servers
- Pick [MU](#), [LRCX](#), [KLA](#), [AMAT](#) for exposure to memory segment and equipment makers
- "Chip" bargains – [VMS](#), [Luxshare](#); Riding on semiconductor recovery – [UMSH](#), [FRKN](#); Proxies to Apple supply chain - [Luxshare](#), [BYDE](#); Smartphone premiumization - [Xiaomi](#)

Strong semiconductor growth in 2024; memory and equipment makers to lead. We expect strong growth for the semiconductor industry in 2024 and 2025, after a weak 2023, with further improvement for global shipments. The memory segment - **Micron (MU)**, is expected to lead this recovery, while equipment makers – **Lam Research (LRCX)**, **KLA Corp (KLA)**, **Applied Materials (AMAT)** generally excel during upcycles. Technology stocks tend to outperform during Fed-rate pause, with projected revenue growth of c.21.8% over the next four quarters, vs c.5% for the broader market. Outsourced semiconductor assembly and test (OSATs) and downstream players, on the other hand, should recover from 2H24 onwards.

No straight path out of the woods. PC and mobile segments have started to emerge from the trough since 1Q23. Both segments are projected to deliver shipment growth of c.5% y-o-y in 2024, after declining by 10%-15% in 2023. The server market should fare much better in terms of value, driven by higher ASP and shipment growth related to strong demand for higher end GPU servers on the back of the AI drive, while growth for the automotive segment could slow.

Looking for "chip" bargains? Singapore and HK/China valuations still lag the PHLX Semiconductor Index (SOX), which was boosted by AI. Stocks trading at inexpensive PE valuations are **Venture (VMS)** (-2SD) and **Luxshare** (-1.5SD). Luxshare and **BYD Electronic** are proxies to the Apple supply chain while **Xiaomi** is benefitting from smartphone premiumization. **UMS** and **Frencken (FRKN)** are our picks to ride on the semiconductor recovery. Most of our ASEAN coverage are beneficiaries of the China +1 strategy while Chinese companies are also looking to diversify out of China.

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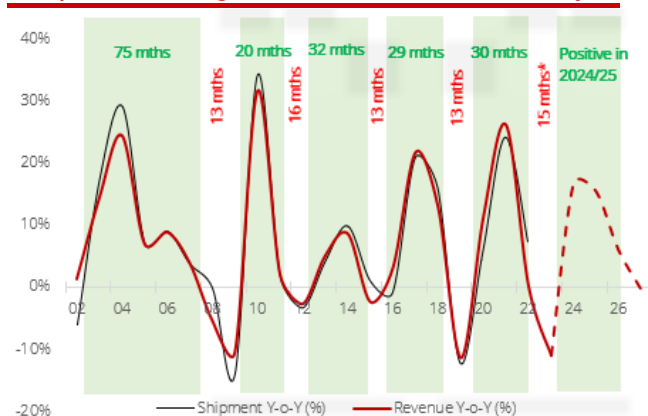
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STOCKS

	Price LCY	Mkt Cap US\$m	12-mth		Rating
			Target Price LCY	Performance (%) 3 mth 12 mth	
Asia					
BYD Electronic	36.60	10,555	48.00	0.9 47.6	BUY
Frencken Group	1.35	437	1.60	23.9 45.2	BUY
Luxshare Precision Industry	34.45	34,323	55.00	11.3 2.8	BUY
UMS Holdings	1.34	681	1.55	3.1 12.7	BUY
Venture Corp	13.61	2,999	15.10	10.4 (20.2)	BUY
Xiaomi Corp	15.60	49,813	21.00	38.9 50.7	BUY
Global					
Applied Materials	162.07	135,564	186.00	17.1 66.8	BUY
Lam Research	783.26	104,072	927.00	25.0 86.2	BUY
KLA Corp	581.30	79,693	657.00	26.7 53.0	BUY
Micron Technology	85.34	94,936	97.80	25.4 68.5	BUY

Source: DBS Bank, DBS HK, Bloomberg Finance L.P.
Closing price as of 29 Dec 2023

The peak and trough of the semiconductor industry



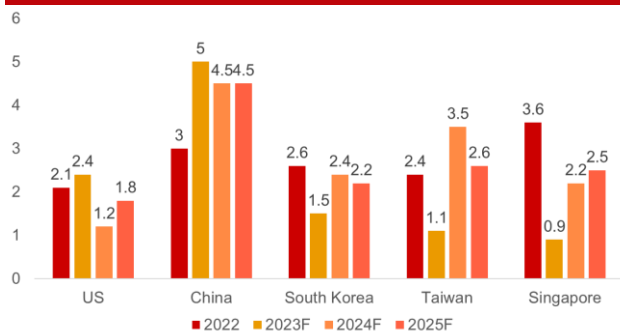
* as at October 2023

Source: SIA, CEIC; Gartner, DBS Bank

Macro – Outlook is improving

Stronger year awaits. Bellwether technology countries like South Korea and Taiwan are expected to post stronger GDP growth come 2024, on the back of improving exports and cyclical recovery in the semiconductor and electronics sectors. Singapore shares a similar story, as recovery in manufacturing sector is anticipated to pick up throughout the year.

DBS Economists' GDP forecast (%)

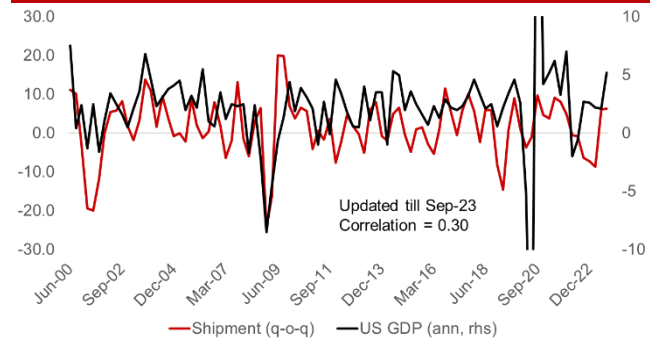


Source: DBS Bank, CEIC

Investment as a co-driver. A pickup in investments in the manufacturing sector is a strong second wind to recovery. DBS Economists see a potential cyclical rebound in manufacturing investment in South Korea as manufacturing capacity utilization rates are around 70% and fast-approaching pre-Covid levels of 75%. Positive momentum for private investment in Taiwan is also expected, following an intense destocking in 2023.

Macro-backdrop remains constructive. A recovery should strengthen amid a favourable macro environment i.e., soft-landing scenario as the base case for the US (and global economy) as well as a stabilizing China economy. The backdrop of no-recession (moderating but positive economic growth) in the US underpins the positive momentum for global semiconductor shipments, given that both tend to move in tandem directionally – and considering the nascent stage of shipment recovery thus far.

Q-o-Q change in global semiconductor shipment vs Quarterly US annualised GDP growth (%)

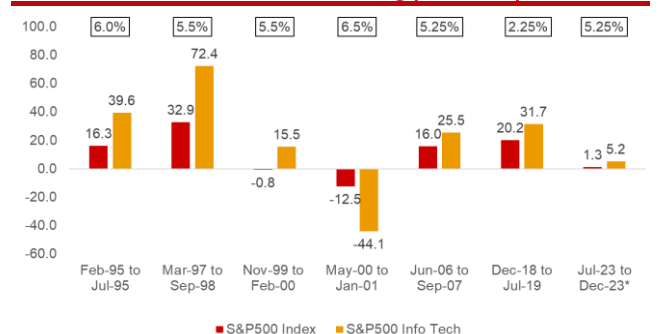


Source: DBS Bank, SIA, CEIC, Bloomberg Finance L.P.

A full-stop to Fed's hiking cycle. Amidst the volatility and chatters on interest rates in recent periods, the key takeaway is that the Fed is done with its hiking cycle. While some market participants are expecting a rate cut as early as March, DBS Economists' base case scenario is for an extended Fed pause at 5.25-5.5%, followed by measured 2x50bps rate cuts in 2H24 (50bps cut in each of 3Q and 4Q24).

Outperformance during Fed pause. Previous instances of a Fed pause have proven to be positive for markets, especially the tech sector. Looking back on the past 6 post-hike pauses, it is evident the tech sector frequently outperformed the broader market during such periods. The performance from July's Fed pause suggests that this time should be no different, with tech sector likely to pull ahead of markets, again.

S&P500 vs Info Tech returns during past Fed pauses (%)



Source: DBS Bank, Bloomberg Finance L.P.

Note: Prevailing Fed Fund rates in boxes above charts

*Performance for period between 27-Jul to 1-Dec

2024 outlook – A year of optimism

2023 themes still in vogue. We might have only caught earlier glimpses of the major themes of AI and industry recovery in 2023, which should manifest fully in 2024. Themes which we had identified earlier have played out and should continue to pan out – but not without their nuances.

Taking stock of our views in 2023 and implications for 2024

Our views in 2023	Implications for 2024
Mar: 2023 inflection; gradual recovery from 2H23 with recovery to firm and accelerate in 2024
Mar: Autos & industrials as the bright spots but may lag other sectors at the cusp of recovery
Jun: Fast-growing AI benefits entire value chain yet it pays to be selective as competition heats up
Sep: Memory bottoming and lead recovery in 2H23 driven by conventional and AI memory segments

Source: DBS Bank

7-Dec: [Light at the end of the tunnel?](#)

20-Mar: [Positioning ahead of anticipated recovery in 2H23](#)

25-Jun: [Heading to the right side of U-shaped recovery](#)

15-Sep: [Place your chips to ride on recovery wave](#)

How our views in 2023 have played out. In our 2022 tech sector outlook, we expressed optimism of a recovery in 2023 post the peak of the rate hike cycle. The PHLX Semiconductor Index (SOX) surged 62% in 2023 while the global semiconductor shipments emerged from its trough in February 2023. As of October 2023, we saw further improvement in shipment data, with the eighth consecutive month of positive m-o-m returns, forming the right side of the U-shaped recovery since May 2023. We remain positive that shipment data will trend higher in 2024.

Robust earnings/revenue growth as icing on the cake. Apart from favourable tailwinds, the sector's past pattern of revenue and earnings growth that lead markets/other sectors is another reason that should interest investors. This is underpinned by the robust revenue outlook for the global semiconductor companies that we track, with revenue expected to grow by 21.8% over the next 4 quarters.

S&P500 sub-sectors – 2024 Earnings/Revenue growth (%)

Sector	Earnings growth	Revenue growth
Healthcare	19.5	5.5
Comms Svcs.	16.1	6.4
Info Tech	14.9	8.5
Industrials	11.1	4.8
Cons. Disc.	11.1	6.8
S&P 500	11.1	4.9
Utilities	8.2	2.7
Financials	5.9	3.8
Cons. Staps	5.2	2.5
Energy	4.0	1.7
Materials	2.0	1.4
Real Estate	-0.2	6.3

Source: DBS Bank, IBES, Bloomberg Finance L.P.

Certain boats have been lifted to higher levels amid the rising tide. It pays to be selective amidst the ongoing industry recovery as well as intensifying competition and monetization of AI-related chips/demand in 2024. The pipeline is already looking busy for the latter: Market leader **NVDA** looks to cement its position with the recent unveiling of top-of-the-line H200 AI-chips, while **AMD** and **INTC's** first foray into AI-chips should hit the ground in the upcoming year. Moreover, the trend of monetization of AI-demand should continue to play out, taking the cue from guidance by **AVGO** and **MRVL** of significant AI-related revenue in the coming quarters.

How to position in 2024? Examining past industry upcycles and considering consensus' forward-looking estimates provide valuable guidance instructive for our views on the various sub-sectors:

#1) Worst is over for memory. There is ample room for further recovery in 2024. Considering consensus forecasts for the largest pure-memory players in the market (SK Hynix, Micron), analysts now expect to see a sequential pick-up in revenue that is ahead of the semiconductor industry, but still below the pre-COVID peak. More importantly, the growth momentum is underpinned by recovery in conventional DRAM and NAND segments, and higher demand for memory employed for AI-work (e.g., High-Bandwidth Memory, Double Data Rate 5).

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#2) Equipment makers to surprise and lead this upcycle.

The historical precedence of share prices outperformance amongst semiconductor equipment makers during periods of shipment upcycles is expected to remain consistent this time as well. Underpinned by ongoing developments, e.g., AI-boom and industry recovery, these should also translate

positively to increased wafer fabrication equipment (WFE) spending. We think that there is potential for positive upside surprises to current consensus' revenue estimates, considering the accelerating industrial policies, CAPEX aimed at securing onshore chip production and ongoing adoption of "China+1" strategy.

Change in quarterly revenue – Actual and consensus outlook

		Q-6	Q-5	Q-4	Q-3	Q-2	Q-1	Latest Q	Q+1	Q+2	Q+3	Q+4	Q+5	Q+6	
MU	Memory	194.2	215.5	165.7	101.9	92.1	93.6	100.0	113.3	122.5	141.4	166.3	182.2	186.0	Outperformers ↑
AVGO	Enterprise	87.2	91.1	96.1	95.9	94.0	95.5	100.0	127.6	131.2	136.0	144.1	144.6	143.4	
MRVL	Enterprise	102.0	106.9	108.4	100.0	93.2	94.5	100.0	100.1	97.0	102.0	110.5	118.9	120.0	
NVDA	Consumer	45.7	37.0	32.7	33.4	39.7	74.5	100.0	111.4	116.9	124.8	135.5	141.9	138.8	
AMD	Consumer	101.5	112.9	95.9	96.5	92.3	92.4	100.0	105.6	99.0	106.7	119.2	127.0	120.8	
QCOM	Consumer	128.8	126.1	131.4	109.1	107.0	97.4	100.0	109.4	107.0	105.4	113.4	118.6	116.4	
INTC	Consumer	129.6	108.2	108.3	99.2	82.7	91.5	100.0	107.1	100.5	104.6	111.3	116.4	108.3	
LRCX	Equipment	116.6	133.1	145.7	151.6	111.1	92.1	100.0	106.4	107.5	109.9	114.9	120.7	127.1	
ASML	Equipment	53.0	81.4	86.6	96.4	101.1	103.4	100.0	103.6	93.0	97.6	106.0	112.3	114.9	
TER	Equipment	107.3	119.5	117.5	104.0	87.8	97.3	100.0	96.1	88.9	105.3	112.8	113.5	113.0	
KLAC	Equipment	95.5	103.7	113.7	124.5	101.5	98.3	100.0	102.7	103.3	104.7	106.3	108.9	111.4	
AMAT	Equipment	92.9	97.0	100.4	100.2	98.6	95.6	100.0	96.6	92.4	94.9	100.9	104.3	106.2	Underperformers ↓
TSM	Foundries	101.7	105.1	117.1	115.3	96.8	90.7	100.0	111.4	104.9	112.1	128.3	136.4	127.2	
GFS	Foundries	104.8	107.6	112.0	113.4	99.4	99.6	100.0	100.1	96.2	98.9	104.9	109.9	106.9	
TXN	Analog	108.2	115.0	115.6	103.0	96.6	100.0	100.0	91.0	90.4	96.1	103.2	102.5	103.0	
ADI	Analog	109.4	114.5	119.6	119.6	120.1	113.3	100.0	92.0	87.6	91.7	96.7	97.2	100.6	
Best quarter ←								→ Worst quarter							

Source: DBS Bank, Visible Alpha. Data accurate as of 8 December 2023.

#3) Analog's resilience losing shine, for now. The resilience of analog and industrial-focused chipmakers – which had worked in their favour during the industry downturn – is less appealing against a backdrop of faster growth/recovery.

#4) AI to scale new heights. The consistent push towards AI-innovation as well as wider industry recovery provide a strong second leg to the ongoing AI-boom. Optimism for a sustained AI-boom is exemplified in the above-trend revenue forecast for AI-related names, e.g., NVDA, AMD, TSMC, ASML, MRVL, AVGO (includes acquisition of VMware).

Sub-segment average share price performances during past 3 shipment upcycles (%)

Shipment Trough Date	Periods after trough	Change in Shipment	Foundries	Memory	Enterprise	Consumer	Equipment	Analog
Feb-09	+8mth: Oct-09	56%	34.1	110.9	82.8	57.3	69.3	50.5
	+14mth: Apr-10	68%	38.2	190.4	175.1	125.2	110.8	70.9
Apr-19	+8mth: Dec-19	11%	27.8	27.9	2.7	28.9	40.1	5.6
	+14mth: Jun-20	6%	20.8	22.5	19.6	55.9	58.9	6.6
Apr-20	+8mth: Dec-20	15%	74.1	57.0	69.5	57.6	71.0	38.1
	+14mth: Jun-21	30%	95.4	77.4	96.8	82.1	133.5	61.4
Feb-23	+8mth: Oct-23	17%	3.5	15.7	23.1	33.9	7.6	-15.7
	+14mth: Apr-24	??	??	??	??	??	??	??

Source: DBS Bank, SIA, CEIC, Bloomberg Finance L.P.

Note: Changes in shipment and share prices based on levels as of trough period

Latest global semiconductor shipment release in Oct-23 shows that we are currently in the 8th month into the upcycle, with Feb-23 as trough

End Market Demand - Uneven recovery path

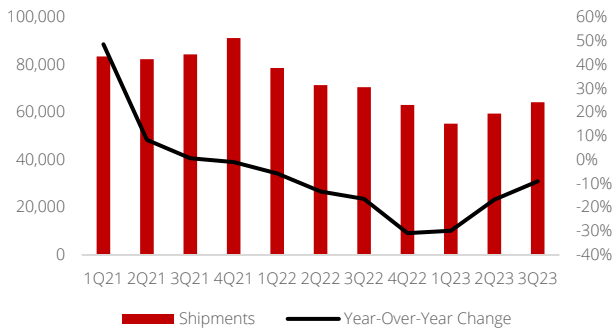
Uneven recovery path. The PC and mobile segments appear poised for a recovery as shipments show signs of emerging from a slump in 1Q23. Both segments are projected to deliver shipment growth of c.5% y-o-y in 2024, after declining by 10%-15% in 2023. Although there has been a decline in shipments, the **server** market is expected to perform significantly better in terms of value, driven by higher ASP and robust shipment growth particularly in the higher-end GPU servers on the back of increasing demand and adoption of AI technologies. Growth in the **automotive** segment is expected to experience a slowdown in 2024, on the back of reduced shipment resulting from a potential economic slowdown, mitigated to some extent by higher component content and value.

PC – the market has bottomed

Global PC shipments registered eight straight quarters of y-o-y declines since 4Q21. However, as highlighted in our June 2023 report – [Technology: Heading to the right side of U-shaped Recovery](#), the decline appears to have bottomed out in 1Q23, and has continued to register improvements on a q-o-q basis, up 7.7% q-o-q in 2Q23, and 7.9% higher in 3Q23.

With inventory destocking underway, we can expect further improvements in PC shipment.

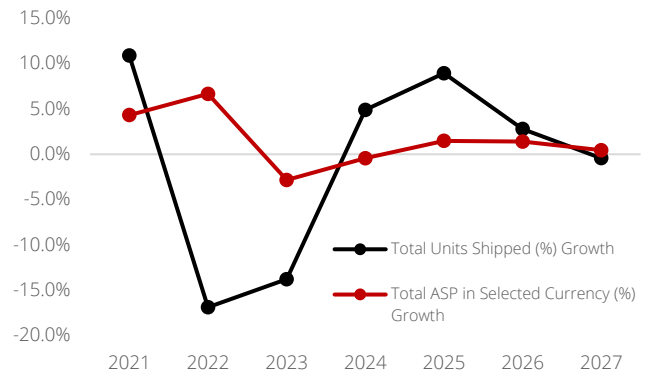
PC shipment decline has bottomed



Source: Gartner, Inc., Market Share Alert: Preliminary, PCs, Worldwide, 3Q23, 9 October 2023

On a y-o-y basis, PC shipment is expected to register 4.9% y-o-y growth in 2024, after two consecutive years of decline of 16.9% y-o-y in 2022 and 13.8% in 2023. Average selling price (ASP) is expected to be stable, as the supply chain has normalized post the COVID pandemic.

PC Shipment vs ASP (Y-o-Y Growth)

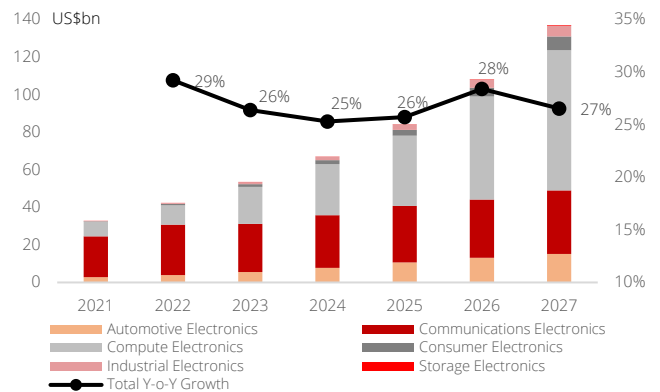


Source: Gartner, Inc., Forecast: PCs, Worldwide, 2021-2027, 3Q23 Update, 28 September 2023

AI – shining bright

In addition to fuelling the growth of data center AI semiconductor revenue, generative AI is anticipated to generate substantial longer-term revenue by enabling the integration of AI into PCs, smartphones, edge devices, and endpoint devices. AI semiconductor revenue is projected to register consistent y-o-y growth of 20+% p.a. over the next few years, and a CAGR of 27% during 2021-2027, vs 4.2% for the overall semiconductor industry.

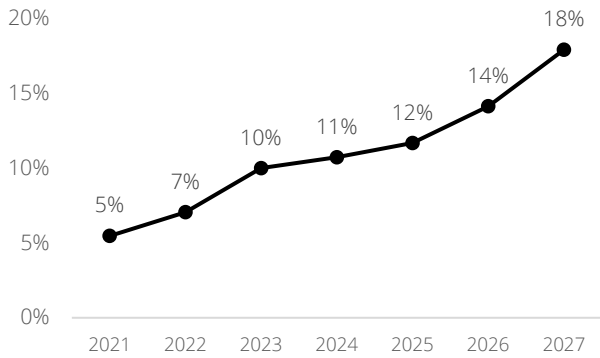
AI semiconductor revenue by electronic equipment category



Sources: Gartner, Inc., Forecast: AI Semiconductors, Worldwide, 2021-2027, 17 October 2023

With a much faster growth pace, AI semiconductor revenue is expected to account for 18% of the total semiconductor revenue by 2027, from 10% in 2023.

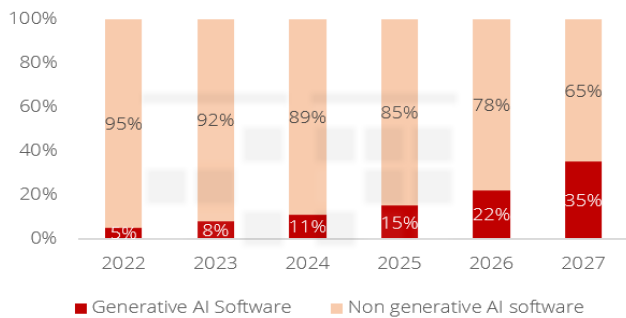
% of AI semiconductor revenue



Sources: Gartner, Inc., Forecast: AI Semiconductors, Worldwide, 2021-2027, 17 October 2023

Generative AI (GenAI) software spend is expected to reach 35% of AI software spend in 2027, from 8% currently. Growth in GenAI software spend spiked, almost doubling during 2023, due to the hype around AI assistant chatbot tools driving the increasing adoption. Growth is expected to remain strong at c.80% during 2024-2027.

Generative AI Forecast Spend vs Non generative AI Spend



Source: Gartner, Inc., Forecast Analysis: Artificial Intelligence Software, 2023-2027, Worldwide, 7 November 2023

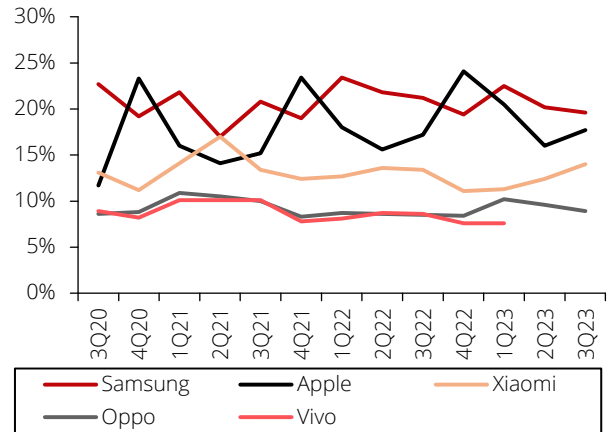
Mobile – emerging from the slump

As in the PC market, global mobile shipment appears to have bottomed out in 1Q23, with a lower quarterly y-o-y decline. On an annual basis, global shipment of mobile phones is projected to decline 9.6% y-o-y in 2023. The premium segment is expected to hold up better, demonstrating greater resilience to the weaker economy. Shipment is expected to recover by 4.9% in 2024 and 5.8% in 2025, according to Gartner.

The total global shipment-seemed to have bottomed out in 3Q23, and we expect the recovery to accelerate, with a projected growth of 4.5% in 2024. This growth will be driven by handset replacements that typically occur three years after the last peak. Consumer sentiment should gradually improve, supporting the demand momentum generated by flagship models such as Huawei's P/Mate-60

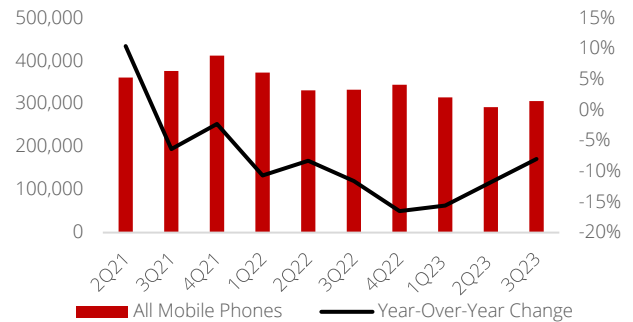
series and Xiaomi 14 in China, along with the iPhone 15 series. We expect Android and iPhone shipments to increase by 4.4% and 5% y-o-y respectively in 2024, fuelled by the handset replacement cycle. We anticipate demand along the smartphone supply chain to resume as well.

Global smartphone market share trend



Source: IDC, DBS HK

Global mobile shipment bottomed in 1Q23



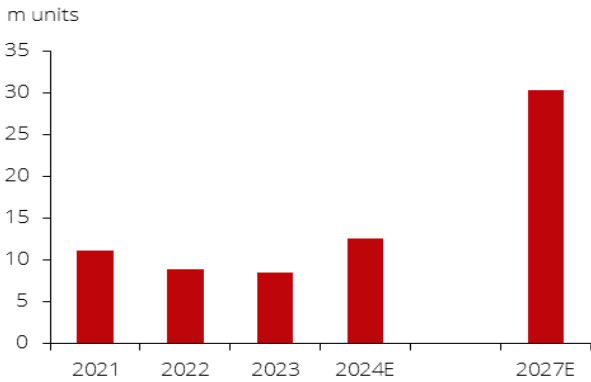
Sources: Gartner, Inc., Forecast: PCs, Tablets and Mobile Phones, Worldwide, 2021-2027, 3Q23 Update, 29 September 2023

XR devices – becoming more significant.

Following the announcement of Apple's first XR headset, the 'Vision Pro,' set to launch in 2024, tech giants like Samsung and Huawei have announced plans to join the XR hype by introducing their own high-end standalone mixed-reality headsets. Apple's entry into the XR hardware market is expected to continue attracting other consumer electronics vendors to invest and expand in this sector. The penetration of XR headsets will increase as the upgraded functionality of XR devices draws consumers' attention. AR/VR headsets are projected to rebound strongly in 2024 after a slow year in 2023. We predict the XR hardware market will grow by approximately 63% y-o-y in 2024, with its size forming about 3.1% of the global smartphone market. Industry research firm IDC expects global AR/VR headset shipments to grow at a CAGR of 34.4% from 2023 to 2027. This growth is anticipated to

boost demand along the XR supply chain, and the contribution of XR-related business in the smartphone supply chain players is expected to expand from 2024.

Global AR and VR headsets shipment trend

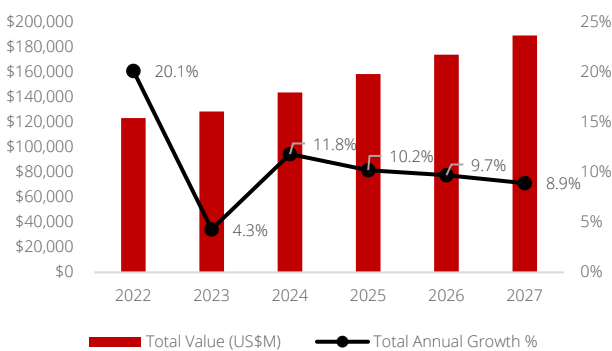


Source: IDC, DBS HK

Datacenter – displaying more resilience

Although there has been a decline in shipment, the server market is expected to perform significantly better compared to other device markets in terms of value. This is mainly driven by higher ASP growth due to a higher proportion of GPU server shipments on the back of increasing demand and adoption of AI technologies. According to IDC, the server market is projected to register a CAGR of 5.9% over the next five years, on the back of the replacement cycle and the tech transition to new platforms, with additional investments in new development themes such as GPUs for AI.

Worldwide server market value (US\$m)

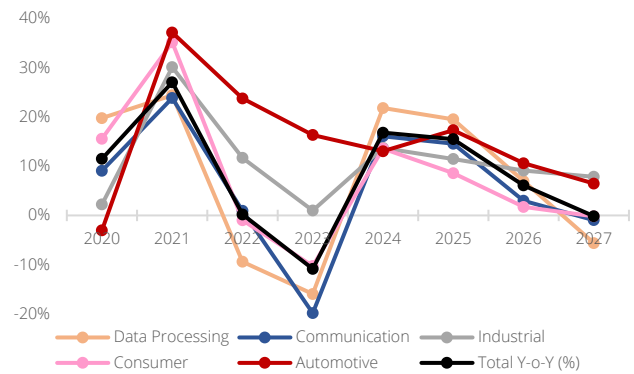


Source: IDC, DBS Bank

Automotive – Slower growth, but still solid

Though revenue growth for the overall automotive segment is expected to ease to 13.0% y-o-y in 2024 from 16.3% in 2023, it is still solid. The penetration of NEVs (New Energy Vehicles) has reached a relatively high level in China (over 35%). The growth in NEV shipments is expected to slow down to approximately 20% y-o-y in 2024, compared to c.30% in 2023. This slowdown is attributed to the expiry of nationwide NEV purchase subsidies. However, demand for electronic auto components will be driven more by an increase in the dollar value of these components per vehicle (due to specification upgrades and vehicle parts electrification) than by shipment growth. We expect those suppliers that are continuously enriching their auto product portfolios to capitalize on the growth momentum in China's EV market.

Revenue growth (y-o-y %) for various segments



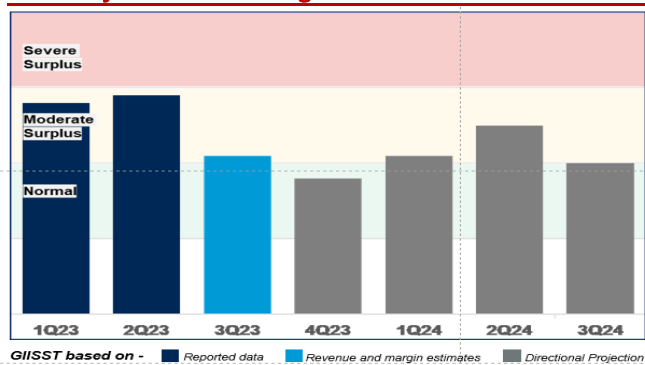
Sources: Gartner, Inc., Semiconductors and Electronics Forecast Database, Worldwide, 3Q23 Update, 4 October 2023

Semiconductor – Gearing up for recovery

Semiconductor on the road to recovery. Global semiconductor shipments in Oct 23 further improved from the low in Feb 23. We expect the semiconductor industry to register strong growth in 2024 and 2025, after a weak 2023. Semiconductor revenue is expected to drop 10.9% y-o-y in 2023 after a flat 2022, and recover strongly by 16.8% in 2024 and 15.5% in 2025, according to Gartner. SEMI expects the rebound in 2024 will persist and extend into 2026. The rebound is expected to be accompanied by wafer shipments reaching new highs and as demand for silicon surges to support artificial intelligence (AI), high-performance computing (HPC), 5G, automotive, and various industrial applications.

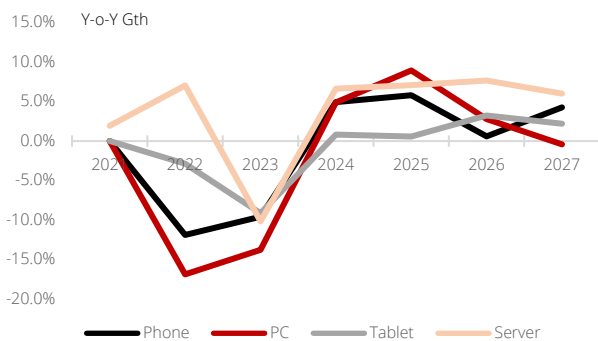
Main inventory obstacle to be resolved soon; demand on the rise. According to the Gartner Inventory Index, the inventory overhang should be cleared by the end of 2023 as the year-end demand will facilitate inventory clearance. In the coming quarters, the inventory index is anticipated to gradually shift towards a more balanced state, as lead time decreases and repricing takes place.

Inventory level normalising



Source: Gartner, Inc., Semiconductor Inventory Analysis, Worldwide, 3Q23 Update, 12 October 2023

Shipments recovering in 2024

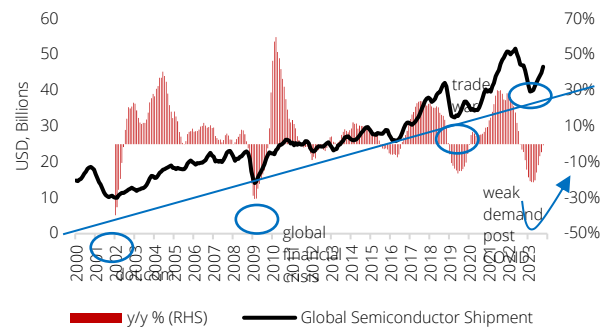


Source: Gartner, Inc., Forecast: PCs, Tablets and Mobile Phones, Worldwide, 2021-2027, 3Q23 Update,, 28 September 2023; Forecast: Servers, All Countries, 2021-2027, 3Q23 Update, 29 September 2023

No straight path ahead. However, the path to recovery is expected to be uneven. Memory segment, the worst hit during the 2022 downturn, is expected to lead the recovery for the semiconductor sector. As demand continues to recover, certain segments, like the non-memory segment (eg Analog), may experience a surplus in 1H24. By 2H24, we should see a more meaningful recovery in demand, and hence, inventory levels to move towards more normalized levels. We anticipate a recovery in shipments across various device markets – PCs, tablets, mobile and servers.

Further down the technology value chain to the backend semiconductor areas like Outsourced semiconductor assembly and test (OSAT) players and downstream plays (including the EMS division), a significant recovery is likely to occur starting from 2H24 onwards.

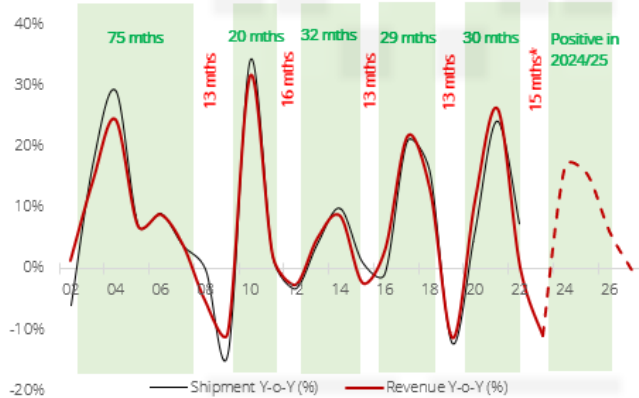
Expect further upside for global semiconductor shipments



Source: SIA, CEIC; DBS Bank

Entering the upcycle, favourable outlook for 2024-2025. If we define a downcycle as periods of negative y-o-y change and an upcycle as positive growth, both global semiconductor shipments and semiconductor revenue indicate that we are on the verge of entering the upcycle. As of October 2023, global shipments eased just 0.7% y-o-y and recorded the eighth consecutive month of positive return on a m-o-m basis. Using historical data as a gauge, the upcycle from the end of 2009 to mid-2022 lasted 20-32 months. A downcycle is usually shorter, at just over a year, between 13-16 months.

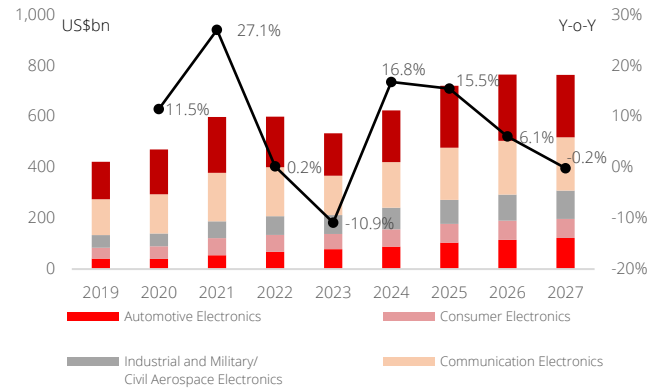
The peak and trough of the semiconductor industry



* as at October 2023
Source: SIA, CEIC; Gartner, DBS Bank

Based on these data, we are positive on the semiconductor industry. Gartner expects semiconductor revenue to decline 10.9% y-o-y in 2023, followed by a strong recovery of 16.8% growth in 2024, and another 15.5% in 2025. This should taper off to a gain of 6.1% in 2026 and -0.2% in 2027.

Semiconductor revenue by end-use industry



Sources: Gartner, Inc., Semiconductors and Electronics Forecast Database, Worldwide, 3Q23 Update, 4 October 2023

Where is the growth coming from?

The memory segment is expected to register the strongest growth of >50% y-o-y in 2024, followed by >10% for the optoelectronics (devices that interact with light) and discrete (single devices with single function e.g. transistors) segments.

Where is the growth coming from?

2023		Devices	2024	
2023 Revenue Growth: -10.9% (-2.1% non-memory)	2023 Share		2024 Share	2024 Revenue Growth: 16.8% (8.4% non-memory)
-1.0%	41.0%	Application-Specific	37.9%	8.1%
-38.8%	16.4%	Memory	23.4%	66.3%
-6.6%	16.3%	Micro components	14.4%	2.8%
-1.9%	7.1%	Optoelectronics	6.7%	11.1%
7.2%	6.7%	Discrete	6.5%	12.4%
-	6.7%	Analog	5.9%	-
-6.2%	3.4%	General-Purpose Logic	3.1%	6.6%
2.0%	2.4%	Non-optical Sensors	2.2%	5.6%

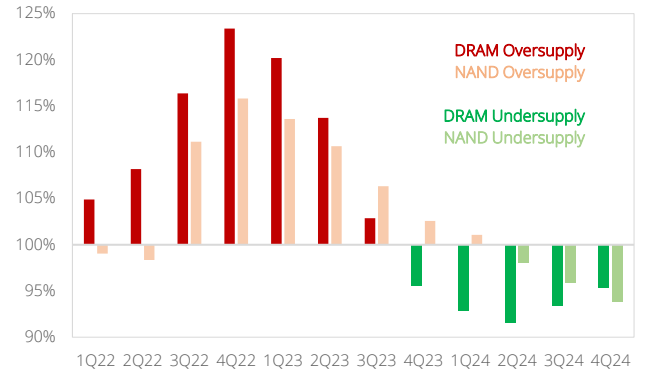
Sources: Gartner, Inc., Semiconductors and Electronics Forecast Database, Worldwide, 3Q23 Update, 4 October 2023

Memory – Full steam ahead

Memory has hit bottom, leading semiconductor sector recovery. Memory chips, which typically account for one-third of total semiconductor revenue, saw the steepest drop in 2022 at 13.7% y-o-y vs. +0.2% for the broader market. For the full year in 2023, memory revenue is expected to plunge 40.6% y-o-y, with the steepest drop seen between 3Q22 and 1Q23, leading the downturn, while non-memory revenue will decline by 3.4%, according to Gartner. Overall, the semiconductor industry is projected to decline by 10.9% y-o-y in 2023 and rebound strongly by 16.8% in 2024 and 15.5% in 2025.

Within memory segment, DRAM to outperform NAND with oversupply resolved by end of 2023, compared to early 2024 for NAND. DRAM is used predominantly for processing data and running applications such as for servers, while xx (NAND) is more for the storage of data, such as for mobiles and PCs/tablets, though both tend to work together in a system. DRAM, which accounts for slightly over 50% (vs. c.40% for NAND) of the total memory market, is expected to reach supply/demand equilibrium towards the end of 2023, slightly earlier than NAND, boosted by demand for data centres led by the AI boom. NAND, on the other hand, is only expected to reach a supply/demand equilibrium at the start of 2024, largely due to persisting weak demand from hyperscale customers and sluggish smartphone and PC sales.

DRAM and NAND supply and demand outlook



Source: Gartner, Inc., Forecast: DRAM Market Statistics, Supply and Demand, Worldwide, 2020-2027, 3Q23 Update; : Forecast: NAND Flash Market Statistics, Supply and Demand, Worldwide, 2020-2027, 3Q23 Update

AI driving demand, especially for servers and data centres. A reason for the faster rate of recovery for the memory vs. non-memory segment could be the AI boom. This is driving demand for servers and data centres, which require a fair amount of memory chips. AI servers have 6x-8x the DRAM content of a regular server and 3x the NAND content. Due to the sudden surge in demand for high-bandwidth memory chips (HBMs) propelled by generative AI, there is currently a shortage of HBMs, as mass production is only expected in 2024, based on our channel checks.

Trade Diversification – Beneficiary of China +1

Geopolitical uncertainties and supply chain resilience drive the need for **China+1 strategy**, a priority for Chinese and foreign companies. The trend of global players expanding their footprint outside China to other parts of Asia will gather pace, on the back of continuing US/China trade war and the need to build a resilient supply chain. Bloomberg Intelligence estimates that 65% of semiconductor suppliers have facilities in China, implying there is significant room for trade diversification out of China.

Chinese suppliers are also adopting the China +1 approach to meet the diversification requirements of their clients.

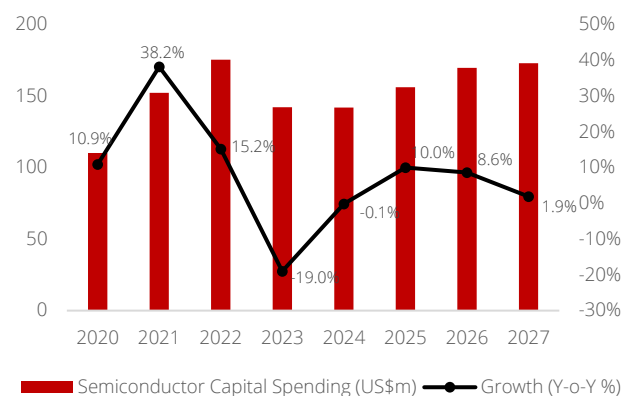
Based on our research on major hardware firms, more than half plan to expand overseas in 2023-24, with an ultimate target of having 30%-50% overseas capacity. The primary driver for overseas expansion has transitioned from cost reduction to catering to diversification requirements.

Cost savings will also boost margins in the long run. As suppliers expand overseas to align with their sales exposure in international markets, cost advantages would gradually kick in. For instance, our scenario analysis indicates potential savings of 7% in factory depreciation and 43% in labour costs by shifting capacity to Vietnam. Labour-intensive manufacturing stands to experience better margin enhancement as overseas capacity ramps up.

By swiftly integrating themselves into the supply chain, Chinese suppliers can secure a larger portion of product shipments and new product introductions from international clients. As Chinese suppliers establish stronger relationships, they provide tech giants with enhanced flexibility to navigate geopolitical risks and ensure consistent production. Meanwhile, the first movers might also benefit from cost savings sooner, with their early access to cheaper manufacturing.

Capital spending to resume growth in 2025. Given that the demand for major applications such as PCs, smartphones, tablets and consumer electronics has dropped significantly on the back of the high inflation with consumers extending the lifetime of products and delaying upgrades, capital spending in 2023 is expected to decline 19% y-o-y. Capital spending is likely to be flat in 2024 as companies adjust to the improving demand outlook, and growth is expected to resume in 2025/2026.

Semiconductor capital spending



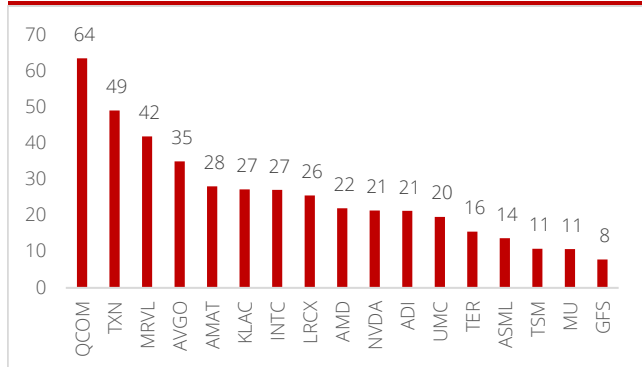
Source: Gartner, Inc., Forecast: Semiconductor Capital Spending, Wafer Fab Equipment and Capacity, Worldwide, 3Q23 Update, 5 October 2023

Within our ASEAN coverage, most companies are expanding their manufacturing footprints outside China. With their key production facilities outside China, mainly in Malaysia, they could emerge as significant beneficiaries of the increasing adoption of a China+1 strategy to mitigate geopolitical risks and enhance supply chain resilience. (Please refer to table on Stocks in our coverage – manufacturing footprint – page 12).

Taking reference to key global semiconductor companies, most derive about 20% to 30% of their total revenue from China. With the intensifying geopolitical tension, these companies may be looking to diversify out of China and ASEAN companies with production facilities outside China could benefit.

Some of these companies already have production facilities in Asia and are looking to expand capacity or diversify their capacity. These include companies like **Applied Materials**, **GlobalFoundries** and **Micron** in Singapore, and **Lam Research**, **Intel** and **Texas Instruments** in Malaysia. The latest is **Nvidia**, which is considering significant investments in Singapore, riding on Singapore's plan to position as a leading AI hub. It has also been reported that Nvidia plans to build an AI-ecosystem in Japan.

Revenue % from China



*Based on latest available historical data
Source: Refinitiv

Stocks in our coverage – manufacturing footprint

Company	Manufacturing footprint									
	China	Malaysia	Singapore	Thailand	Vietnam	India	Other ASEAN	USA	Europe	Others
Singapore										
AEM	🏠	🏠	🏠		🏠		🏠		🏠	
Aztech	🏠	🏠	🏠							
Frencken	🏠	🏠	🏠					🏠	🏠	
Grand Venture	🏠	🏠	🏠							
Nanofilm	🏠		🏠		🏠	🏠				
UMS	🏠	🏠	🏠							
Venture	🏠	🏠	🏠					🏠		
Thailand										
Delta (TH)				🏠			🏠		🏠	
Hana	🏠			🏠		🏠	🏠	🏠		🏠
K.C.E.				🏠		🏠				
SVI				🏠			🏠		🏠	
HK/China										
ASMPT	🏠	🏠	🏠						🏠	
BYDE	🏠	🏠			🏠	🏠			🏠	
Hua Hong	🏠									
Lenovo	🏠					🏠	🏠	🏠	🏠	🏠
Luxshare	🏠				🏠	🏠				
SMIC	🏠				🏠	🏠				
Sunny Optical	🏠				🏠	🏠				
Xiaomi	🏠	🏠				🏠	🏠		🏠	🏠
Q Tech	🏠			🏠						

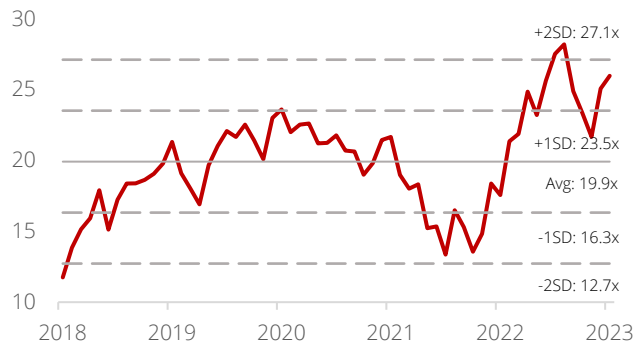
🏠 Main manufacturing location;

Source: Company, DBS Bank

Valuation - Asia still cheaper vs SOX

SOX PE near 5-year high. The SOX Index has recovered from the low in October and is up c.66% YTD. Its PE valuation has surged to near +2SD of its 5-year average, driven by the AI-rally. PE valuation also rose over the last two months of 2023 in anticipation of earlier-than-expected rate cuts in 2024.

5-year consensus forward PE – SOX Index

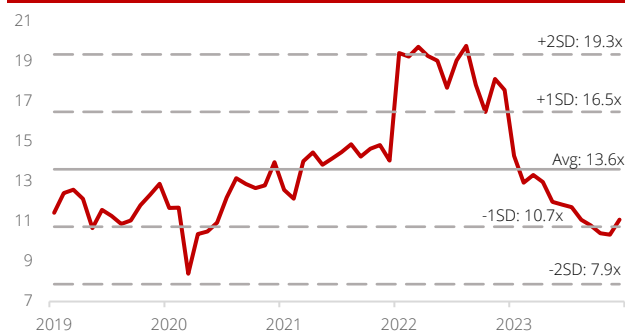


Source: DBS Bank, Bloomberg Finance L.P.

Singapore

Singapore's tech sector PE appears inexpensive, mainly due to Venture. The PE valuation for Singapore Tech remains attractive at c.11x, at -1SD of its 4-year average. We have upgraded Venture to BUY from HOLD back in September based on the stock's attractive PE valuation. The stock has since recovered from its trough valuation of below -2SD and now trades near the -2SD of its 5-year average.

5-year sector forward PE (x)* – Singapore



Source: DBS Bank, Bloomberg Finance L.P.

*Market cap weighted

If we exclude Venture (largest stock in terms of market cap), which accounts for c.60% weightage in our technology portfolio, the forward PE of c.15x is above the +1SD of its 5-year average, while AEM trades at above the average PE level.

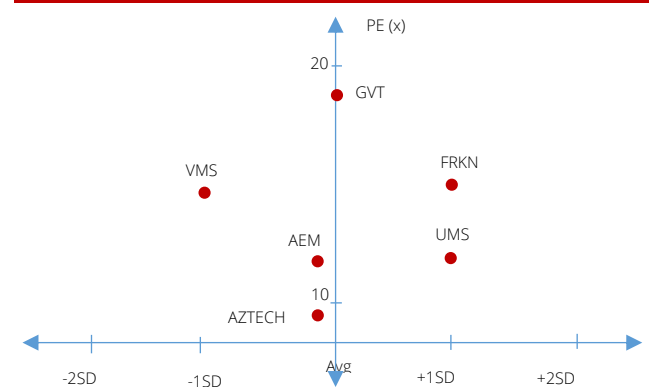
5-year sector forward PE (x)* – Singapore ex-Venture



Source: DBS Bank, Bloomberg Finance L.P.

*Market cap weighted

Target price pegging



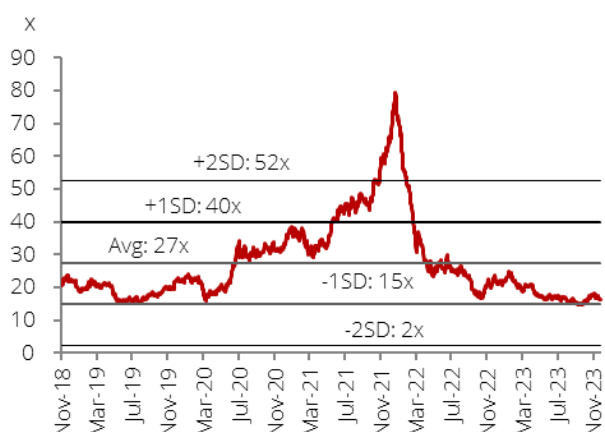
Source: DBS Bank, Bloomberg Finance L.P.

China/HK

Hong Kong tech stocks' valuations are attractive. The technology sector in Hong Kong has been sluggish in 2H23. The current trailing PE ratio is approximately 16x, c.1 SD below the 5-year historical average. PE valuations have oscillated between 14.7x to 18.2x, primarily influenced by the prolonged recovery of end-market demand. Notably, the recovery pace of smartphone supply chain players has outpaced that of China's semiconductor players such as chip foundries. This difference is partly due to improving sentiment in the smartphone sector, driven by the buzz generated by flagship models that have effectively re-engaged customer interest in the market.

Over the past seven years, the sector's PE valuation has consistently remained within 1 SD of its mean. Within this framework, stocks like BYD Electronic, Luxshare Precision, and Xiaomi offer compelling value, trading below the sector's average PE.

5-year sector forward PE (x)* – Hong Kong



Source: DBS HK, Bloomberg Finance L.P.
*Market cap weighted

5-year sector forward PE (x)* – Thailand ex-DELTA



Source: DBSVTH, Bloomberg Finance L.P.
*Market cap weighted

Thailand

Thailand's tech PE is still lofty, boosted by Delta Electronics (Thailand). The PE valuation for Thailand's tech sector is now at 39x, or +0.7SD of its 5-year average. The elevated PE was largely due to heavyweight Delta Electronics (Thailand), as its market capitalization forms 88% of the sector's market capitalization and trades at a lofty 47x PE. The key reasons for DELTA trading at such a high PE are (i) it has the highest exposure to the growing EV segment, (ii) its strong growth outlook, and (iii) its low free float of only 22%.

5-year sector forward PE (x)* – Thailand



Source: DBSVTH, Bloomberg Finance L.P.
*Market cap weighted

If we exclude DELTA, which has a c.88% weightage in the sector's market capitalization, the sector is trading at a forward PE of c.19.3x, which is close to its 5-year average PE of 19.7x.

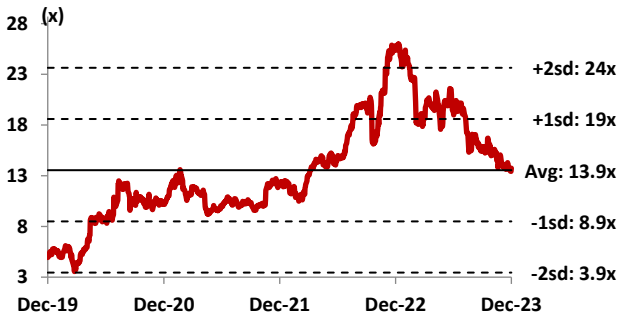
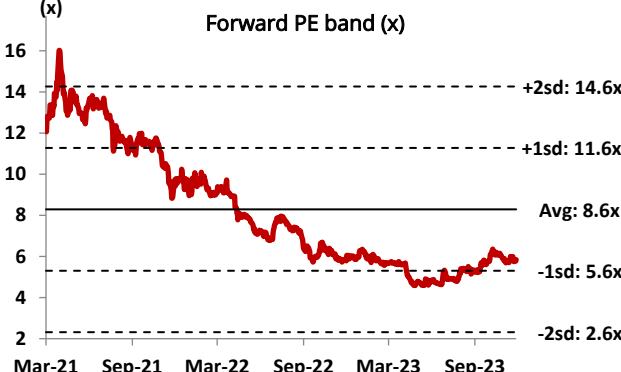
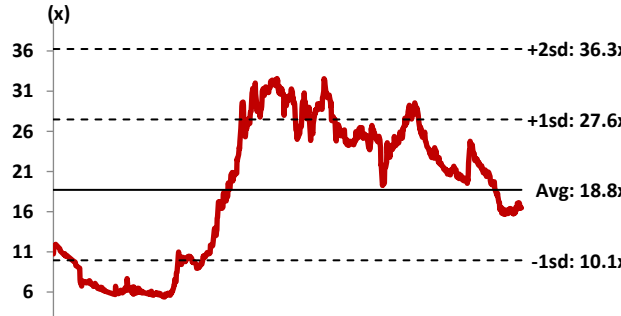
Target price pegging

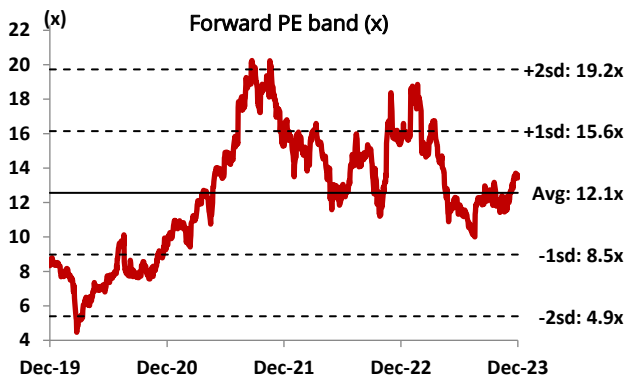
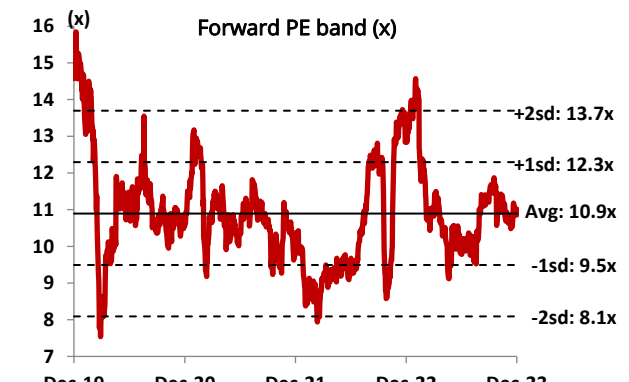
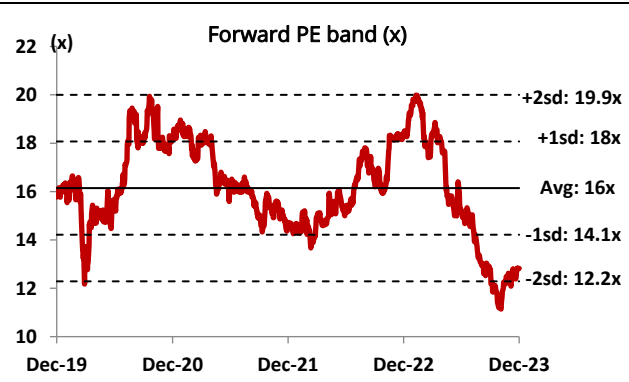
Stock	Price (Bt)	12-mth TP (Bt)	Upside	Basis for TP
DELTA	81.00	74.00	-9%	based on 43x PE, in line with average
HANA	46.75	49.00	5%	based on 18x PE, in line with average
KCE	54.50	53.00	-3%	based on 28x PE, in line with average
SVI	7.05	6.10	-13%	based on 12x PE, in line with average

Source: DBSVTH, Bloomberg Finance L.P.


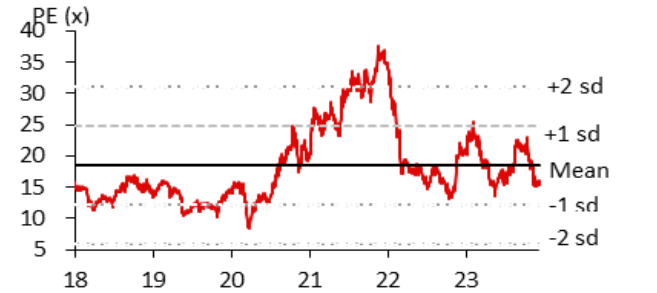

Valuation Charts

Singapore


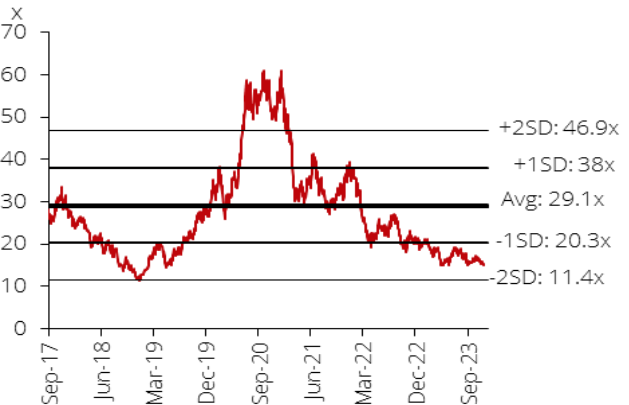

<p>AEM (HOLD, TP: S\$3.00)</p> <ul style="list-style-type: none"> • Worst is likely over, but recovery could be delayed till late 2024. • We do not expect a ramp-up in new generation equipment as the capability requirements for the next two to three years have been met. • Reiterate long-term positive view on AEM for its technological superiority in the systems-level test segment and unique Test 2.0 approach. <p>Please refer to our Insights Direct Platform for details: AEM Holdings Ltd</p>	<p style="text-align: center;">Forward PE band (x)</p>  <p style="text-align: right;">+2sd: 24x +1sd: 19x Avg: 13.9x -1sd: 8.9x -2sd: 3.9x</p> <p style="text-align: center;">Dec-19 Dec-20 Dec-21 Dec-22 Dec-23</p> <p style="text-align: center;"><i>Source: DBS Bank, Bloomberg Finance L.P.</i></p>
<p>Aztech (BUY; TP: S\$1.25)</p> <ul style="list-style-type: none"> • Revenue supported by orderbook while margins remain healthy. • Expect order momentum to remain healthy, translating to revenue growth of 14% in FY24F and 10% in FY25F. • New plant (accounts for c.35% of total area) to service existing customers and target new ones looking to expand out of China. <p>Please refer to our Insights Direct Platform for details: Aztech Global Ltd</p>	<p style="text-align: center;">Forward PE band (x)</p>  <p style="text-align: right;">+2sd: 14.6x +1sd: 11.6x Avg: 8.6x -1sd: 5.6x -2sd: 2.6x</p> <p style="text-align: center;">Mar-21 Sep-21 Mar-22 Sep-22 Mar-23 Sep-23</p> <p style="text-align: center;"><i>Source: DBS Bank, Bloomberg Finance L.P.</i></p>
<p>Grand Venture (BUY; TP: S\$0.60)</p> <ul style="list-style-type: none"> • Industry emerging out of a chip glut but pronounced uptick for GVT likely delayed till 2H24. • Still a promising grand venture, as the long-term semiconductor uptrend remains intact. • Healthy demand for life sciences; aerospace up and coming; diversification a good counterbalance. <p>Please refer to our Insights Direct Platform for details: Grand Venture Technology Ltd</p>	<p style="text-align: center;">Forward PE band (x)</p>  <p style="text-align: right;">+2sd: 36.3x +1sd: 27.6x Avg: 18.8x -1sd: 10.1x -2sd: 1.3x</p> <p style="text-align: center;">Mar-21 Sep-21 Mar-22 Sep-22 Mar-23 Sep-23</p> <p style="text-align: center;"><i>Source: DBS Bank, Bloomberg Finance L.P.</i></p>

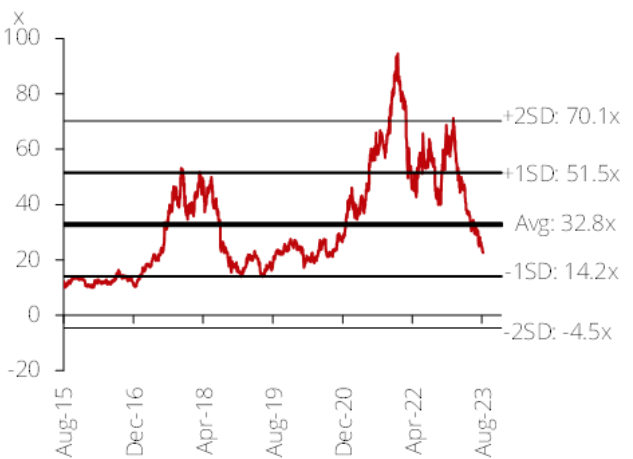
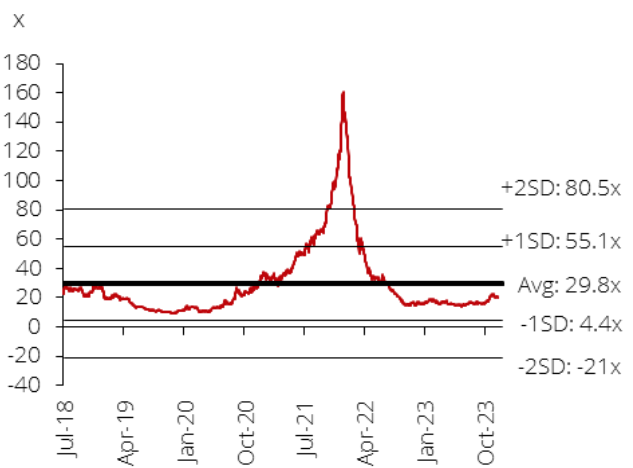
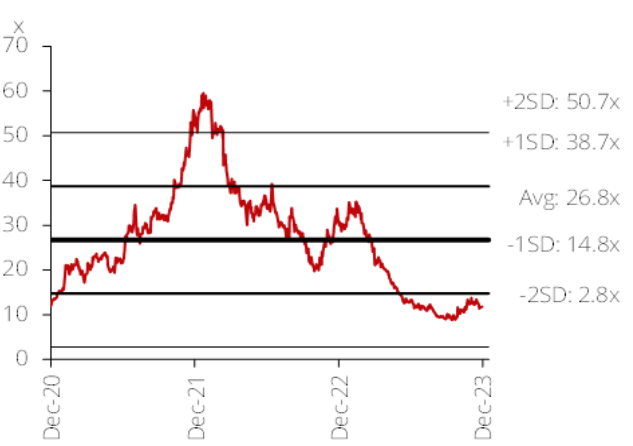
<p>Frencken (BUY; TP: S\$1.33)</p> <ul style="list-style-type: none"> • Outlook and margins improving, with key semiconductor segment expected to see further improvement. • Well positioned for recovery, supported by sound balance sheet and diversified portfolio. • Raised TP to S\$1.60, pegged to a higher PE of 15.6x (vs 13x previously), +1SD from its four-year average, on improving outlook <p>Please refer to our Insights Direct Platform for details: Frencken Group Ltd</p>	 <p>Source: DBS Bank, Bloomberg Finance L.P.</p>
<p>UMS (BUY; TP: S\$1.55)</p> <ul style="list-style-type: none"> • Semiconductor industry recovery intact; upcycle to continue through 2026. • Beneficiary of trade diversification especially with completion of the new plant which accounts for c.40% of total floor area. • UMS remains our top pick, with two key customers in the equipment making space, which tends to lead during upcycles. <p>Please refer to our Insights Direct Platform for details: UMS Holdings Ltd</p>	 <p>Source: DBS Bank, Bloomberg Finance L.P.</p>
<p>Venture (BUY; TP: S\$15.10)</p> <ul style="list-style-type: none"> • Attractive valuations at -2SD of its 4-year historical mean PE. • 3Q23 could be the worst quarter, expect q-o-q improvement for 4Q and a better 2024 vs 2023. • Various NPIs in different domains in the pipeline, to be rolled out in 2024. <p>Please refer to our Insights Direct Platform for details: Venture Corporation Ltd</p>	 <p>Source: DBS Bank, Bloomberg Finance L.P.</p>

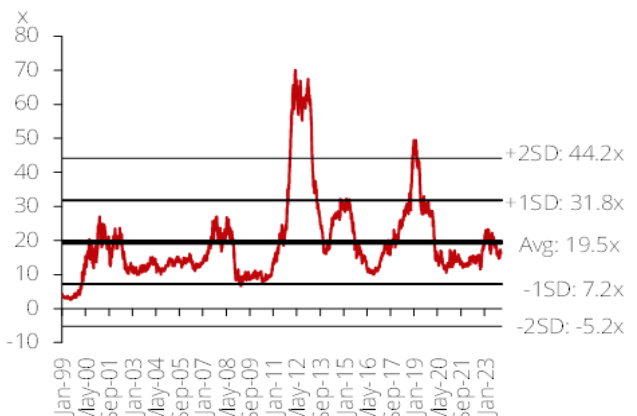
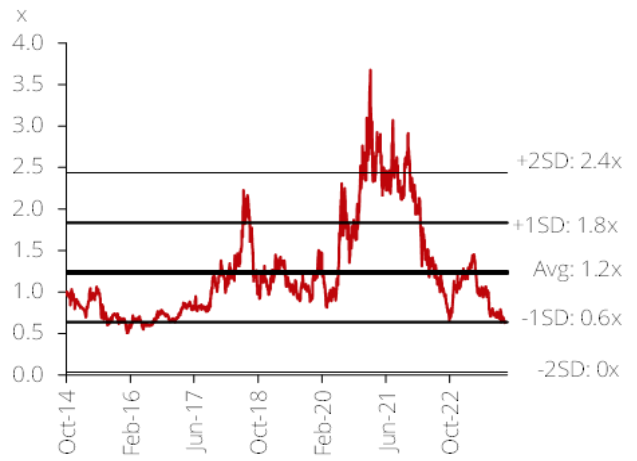
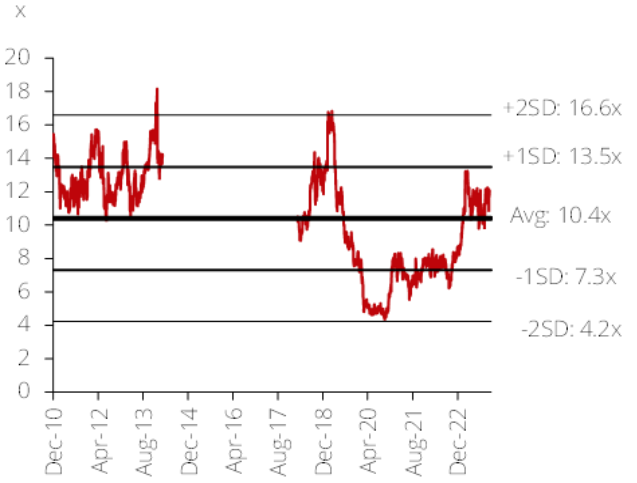
Thailand

<p>Delta Electronics (Thailand) (FV; TP: Bt74.00)</p> <ul style="list-style-type: none"> EV power sales to remain a key growth driver. Target EV power sales to jump to US\$2bn in the next few years from US\$605m in 2022 Valuation still stretched at 47x 2024 PE. <p>Please refer to our Insights Direct Platform for details: Delta Electronics (Thailand) PCL.</p>	<p>DELTA- PE Band</p>  <p>Source: DBSVTH, Bloomberg Finance L.P.</p>
<p>Hana Microelectronics (HOLD; TP: Bt49.00)</p> <ul style="list-style-type: none"> While the EMS outlook is firm, the OSAT business remains weak and we do not expect to see a rebound until 2Q24 amid China slowdown Expect its Korean subsidiary Power Master Semiconductor to breakeven at EBITDA level in 2H24 Stock offers 5% upside to our Bt49 TP based on 18x PE, in line with historical average <p>Please refer to our Insights Direct Platform for details: Hana Microelectronics PCL.</p>	<p>HANA - PE Band</p>  <p>Source: DBSVTH, Bloomberg Finance L.P.</p>
<p>K.C.E. Electronics (BUY; TP: Bt53.00*)</p> <ul style="list-style-type: none"> The worst is over Better demand outlook for 2024 and 2025 and margins should widen New plant in Rojana Industrial Park to boost capacity by 28% (1st phase) in 2025 <p>Please refer to our Insights Direct Platform for details: K.C.E. Electronics PCL.</p> <p>*TP under review</p>	<p>KCE- PE Band</p>  <p>Source: DBSVTH, Bloomberg Finance L.P.</p>
<p>SVI PCL (FV; TP: Bt6.10)</p> <ul style="list-style-type: none"> A sharp drop in revenue from two major customers a key concern Weak demand to last until 1H24 We rate the stock Fully Valued with a TP of Bt6.10, based on 12x PE, in line with historical average. <p>Please refer to our Insights Direct Platform for details: SVI PCL.</p>	<p>SVI- PE Band</p>  <p>Source: DBSVTH, Bloomberg Finance L.P.</p>

China/ Hong Kong

<p>BYDE (BUY, TP: HK\$48.00)</p> <ul style="list-style-type: none"> Capitalising on parent company BYD's strong NEV shipments in China, with the auto electronics segment projected to deliver robust growth, contributing notably to its revenue. Penetration in the iPhone value chain is accelerating, benefiting from the shift of Apple's orders to Mainland China and strong shipments of Apple products Parent company's rising EV sales and an increase in the average dollar value of automotive electronics per NEV to drive re-rating <p>Please refer to our Insights Direct Platform for details: BYD Electronic International Co Ltd</p>	<p>BYDE – PE Band</p>  <p>Source: DBS HK, Bloomberg Finance L.P.</p>
<p>Luxshare (BUY; TP: RMB55.00)</p> <ul style="list-style-type: none"> Riding on Apple's phenomenal XR headsets in the long run, with targets for market share of XR headsets to reach 37% in 2025 and sales at c.US\$64bn in 2030 Expect net profit to grow by 36%/21% in FY24/25F. Our net profit forecasts are higher than consensus, driven by more optimistic projections for iPhone assembly revenue More significant share of iPhone shipments to drive re-rating <p>Please refer to our Insights Direct Platform for details: Luxshare Precision Industry Co Ltd</p>	<p>Luxshare – PE Band</p>  <p>Source: DBS HK, Bloomberg Finance L.P.</p>
<p>SMIC – H (BUY; TP: HK\$23.30)</p> <ul style="list-style-type: none"> To ride on localisation of mature node wafers in China in the long run Earnings expected to decline in FY23F due to its exposure to IoT-related products' logic foundry space amid consumer electronics downturn Higher-than-expected utilisation rate to drive a re-rating and allay market concerns on increasing the overall foundry capacity supply in 2024. <p>Please refer to our Insights Direct Platform for details: Semiconductor Manufacturing International Corp</p>	<p>SMIC – PB Band</p>  <p>Source: DBS HK, Bloomberg Finance L.P.</p>

<p>Sunny Optical (BUY; TP: HK\$79.00)</p> <ul style="list-style-type: none"> • Penetration into the iPhone value chain is progressing • Vehicle lens shipment growth momentum maintained, with revenue share from vehicle products expected to increase to 19% in FY25 from 12% in FY22, driven by rising penetration of EV and autonomous driving • Expect a solid earnings rebound of 139% y-o-y in FY24, based on the company's progressive development in EV components and increased shipments from iPhone and Samsung <p>Please refer to our Insights Direct Platform for details: Sunny Optical Technology Group Co Ltd</p>	<p>Sunny Optical – PE Band</p>  <p>Source: DBS HK, Bloomberg Finance L.P.</p>
<p>Xiaomi (BUY; TP: HK\$21.0)</p> <ul style="list-style-type: none"> • Well positioned for further growth in FY24F led by growing market share in overseas markets, thus reducing its reliance on the Chinese market. • Smartphone premiumisation and solid internet service growth poised to enhance overall margins • Strong shipment growth momentum from an early flagship launch. Anticipate smartphone shipments to surpass competitors and strong sales in 4Q23 and 2024 <p>Please refer to our Insights Direct Platform for details: Xiaomi Corp</p>	<p>Xiaomi – PE Band</p>  <p>Source: DBS HK, Bloomberg Finance L.P.</p>
<p>Q Tech (BUY; TP: HK\$4.12*)</p> <ul style="list-style-type: none"> • Shipment growth riding on high-potential clients like Oppo and Vivo • Expect improving consumer sentiment to boost F24F topline growth to 21% • Expect earnings to decline 10% in FY23F, due to prolonged ASP pressure on modules and margin compression caused by intensifying competition <p>Please refer to our Insights Direct Platform for details: O Technology (Group) Co Ltd</p> <p>*TP under review</p>	<p>Q Tech – PE Band</p>  <p>Source: DBS HK, Bloomberg Finance L.P.</p>

<p>ASMPT (HOLD; TP: HK\$71.00)</p> <ul style="list-style-type: none"> • Industry headwinds to persist at least until 4Q23 as clients have become more pessimistic on their 2024 outlook • Reversion of book-to-bill ratio back to over 1x in 2024 to drive re-rating • Well positioned to benefit from accelerated adoption of thermocompression bonding (TCB). <p>Please refer to our Insights Direct Platform for details: ASMPT Ltd</p>	<p>ASMPT – PE Band</p>  <p>Source: DBS HK, Bloomberg Finance L.P.</p>
<p>Hua Hong (HOLD; TP: HK\$22.00)</p> <ul style="list-style-type: none"> • End-market demand and product ASP to take longer-than-expected to recover • Growing automotive applications continue to boost mature foundry business • Robust capacity expansion at the Wu Xi fab to support future growth over the next three years <p>Please refer to our Insights Direct Platform for details: Hua Hong Semiconductor Ltd</p>	<p>Hua Hong – PB Band</p>  <p>Source: DBS HK, Bloomberg Finance L.P.</p>
<p>Lenovo (HOLD; TP: HK\$9.00)</p> <ul style="list-style-type: none"> • Project the services business' operating profit to grow 19%/33% in FY3/24F and FY3/25F on the back of a strong industry trend, and boost the group's margins • Weak demand in PC end-market may persist longer than expected, delaying the resumption of shipment growth to end-2024 • Expect earnings growth of 36% and 38% in FY3/25F and FY3/26F led by hardware business recovery after an 8.3% decline in FY3/24F, driven by a new commercial PC replacement cycle <p>Please refer to our Insights Direct Platform for details: Lenovo Group Ltd</p>	<p>Lenovo – PE Band</p>  <p>Source: DBS HK, Bloomberg Finance L.P.</p>

Key data – Asia

Company	Price 27 Dec	12-mth Target Price	12-mth Target Return	Mkt Cap (US\$m)	Rcmd	PER 23E (x)	PE 24F (x)	PE 25F (x)	EPS Gth 23F (%)	EPS Gth 24F (%)	Div Yld 23E (%)	P/BV 23E (x)	ROE 23E (%)
Singapore													
AEM Holdings	3.42	3.00	-12%	798	HOLD	78.0	14.3	10.1	-68.4	83.4	0.3	2.1	2.8
Aztech	0.93	1.25	35%	542	BUY	7.1	6.2	5.7	50.6	14.2	7.0	2.2	32.7
Frencken	1.37	1.60	17%	442	BUY	22.6	13.4	11.5	-50.1	68.5	1.3	1.4	6.3
Grand Venture	0.54	0.60	11%	138	BUY	29.2	16.5	11.9	-52.8	76.9	0.7	1.5	5.2
UMS Holdings	1.32	1.55	18%	669	BUY	14.7	11.1	10.1	-38.6	32.8	3.8	2.4	17.0
Venture Corp	13.65	15.10	11%	3,001	BUY	14.7	12.9	12.0	-26.9	13.7	5.5	1.4	9.4
Nanofilm	0.88	0.83	-6%	434	FV	116.3	21.2	14.7	-88.6	448.0	0.2	1.4	1.2
Average						40.4	13.7	10.9	-39.3	105.4	2.7	1.8	10.7
Thailand													
Delta Electronics Thai	91.25	74.00	-19%	3,292	FV	60.4	52.7	n.a.	24.0	19.5	0.5	16.6	30.6
Hana Microelectronics	52.25	49.00	-6%	1,216	HOLD	20.6	19.5	n.a.	-11.5	1.7	1.9	1.4	7.8
KCE Electronics *	54.25	53.00	-2%	1,855	BUY	35.5	28.8	24.5	-22.1	23.6	2.9	4.7	13.3
SVI PCL	6.95	6.10	-12%	433	FV	15.5	13.8	n.a.	-45.6	12.8	2.0	2.1	14.1
Average						33.0	28.7	24.5	-13.8	14.4	1.9	6.2	16.4
Hong Kong / China													
ASM Pacific	74.00	71.00	-4%	3,911	HOLD	25.2	15.4	11.4	-50.5	61.8	3.4	1.9	7.6
BYD Electronics	34.00	48.00	41%	10,013	BUY	17.9	12.9	10.0	97.2	37.9	1.1	2.5	14.7
Hua Hong	17.96	22.00	22%	2,994	HOLD	14.7	15.2	11.9	-54.2	-3.7	0.0	0.7	6.2
Lenovo	10.68	9.00	-16%	16,589	HOLD	11.0	16.3	12.0	-20.1	-32.3	3.5	3.0	30.4
Luxshare	32.61	55.00	69%	32,343	BUY	21.6	16.0	14.1	9.6	33.8	0.5	4.3	22.4
Q Tech *	4.13	4.12	0%	627	BUY	29.1	10.6	6.9	-10.3	175.0	0.0	0.9	3.2
SMIC	19.74	23.30	18%	30,140	BUY	19.1	17.0	12.2	-42.2	12.6	0.0	1.0	5.3
Sunny Optical	69.25	79.00	14%	9,728	BUY	45.8	19.2	12.1	-34.1	114.4	0.7	3.0	6.8
Xiaomi	16.32	21.00	29%	42,509	BUY	23.3	21.8	16.7	207.0	8.4	0.0	2.3	10.5
Average						22.8	15.9	12.1	13.9	44.8	0.9	2.1	11.2

Source: DBS Bank, DBS HK, DBSVTH; Refinitiv * target price under review

Key data – Global

Company	Price (LCY)	Mkt Cap (US\$)	EPS (US\$)		Earnings Gth (%)		EBITDA Margin (%)		P/E (x)		P/BV (x)		Net Debt/ Equity (x)
			FY1	FY2	FY1	FY2	FY1	FY2	FY1	FY2	FY1	FY2	
Foundry													
TSMC	592.00	478,248.8	0.99	1.17	-18.7	18.4	68.0	68.2	18.6	15.7	4.4	3.7	-0.2
GLOBALFOUNDRIES	61.99	34,292.8	2.19	2.24	-17.1	3.5	36.2	37.0	28.3	27.7	3.2	2.7	0.0
IDM													
INTEL CORP	50.50	212,908.0	0.95	1.89	-50.5	101.5	22.1	30.4	53.0	26.8	2.0	1.9	0.1
TEXAS INSTRUMENT	170.81	155,130.3	7.04	6.59	-25.9	-7.2	48.8	48.5	24.3	25.9	9.4	8.8	0.0
ANALOG DEVICES	198.87	98,691.6	7.04	8.73	2.1	22.6	55.0	57.0	28.2	22.8	2.9	2.8	0.2
MICRON TECH	87.06	96,106.3	(0.42)	6.63	n.m.	n.m.	33.1	47.3	-	13.1	2.2	2.0	0.1
Fabless													
NVIDIA CORP	492.79	1,217,191.3	12.29	20.50	600.6	66.3	62.4	62.7	40.1	24.0	27.7	14.5	-0.1
BROADCOM INC	1131.89	529,883.6	46.57	55.51	61.7	19.5	57.8	60.8	24.3	20.4	15.6	-	1.0
QUALCOMM INC	145.46	161,897.0	9.29	10.40	43.8	11.6	35.8	36.3	15.7	14.0	6.4	5.2	0.2
ADV MICRO DEVICE	143.41	231,678.7	2.65	3.73	226.5	41.3	23.9	27.9	54.1	38.4	4.2	4.1	-0.1
MARVELL TECHNOLO	61.15	52,864.2	1.51	2.01	-900.7	35.8	33.4	37.4	40.4	30.4	3.4	3.4	0.2
Equipment Makers													
ASML HLDG(USD)	762.68	303,364.5	20.75	21.09	36.5	0.4	35.2	35.4	36.2	35.7	22.1	19.6	-0.4
ASML HLDG (EUR)	683.60	293,124.3	20.71	20.89	20.9	0.0	35.1	35.3	35.1	34.8	20.4	18.5	-0.3
APPLIED MATERIAL	164.28	136,527.7	7.71	8.99	-7.3	14.6	29.9	31.1	21.3	18.3	8.2	7.6	-0.1
LAM RESEARCH	795.71	104,868.2	28.14	35.37	-18.4	23.3	31.3	32.9	28.3	22.5	12.8	12.4	0.0
KLA CORP	591.37	80,386.3	23.49	26.54	-6.4	9.6	43.0	43.6	25.2	22.3	23.9	22.1	0.9
TERADYNE INC	110.35	16,870.2	2.87	3.72	-34.8	26.6	24.4	27.6	38.5	29.7	7.1	7.0	-0.3

Update: 26 December 2023

Source: DBS Bank; DBS HK, DBSVTH, Refinitiv

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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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