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Implications of NVIDIA upside on the semiconductor and hardware supply chain

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NVIDIA's share price higher following strong upside, again led by data center. NVIDIA's share price was up 6% after hours following +229% YTD performance after another strong beat and raise. F2Q24 (ending July) sales were US$13.5bn, +88% QoQ/+101% YoY, GM of 71.2% and EPS of US$2.70, above street estimated sales of US$11.2bn, GM of 70.1% and pro-forma EPS of US$2.08. F3Q (ending Oct) sales were guided to be US$16bn, with a 72.5% GM, above street's US$12.6bn and 70.6%.

- **The following are key updates and implications for the semiconductor chain.**
  1. Data center strong upside. F2Q data center sales were US$10.3bn, +141% QoQ/+171% YoY, above street's US$8.0bn. Data center compute sales nearly tripled YoY, led by HGX for Gen AI/ LLM, while networking almost doubled YoY from its InfiniBand networking attach. Growth was led by cloud service providers (over 50% of mix) and consumer internet (next highest %) over enterprise/ HPC (~25%). US led growth while China was within 20-25% of data center sales, with mgmt noting near-term it could shift if the US implements further restrictions. NVIDIA noted largest growth by far was from ASPs shifting up to HGX systems over single GPUs, though with some growth from L40S (GPUs without CoWoS and less HBM for fine-tuning models). Software revenue is now "hundreds of millions per year".
  2. Gaming slightly higher. F2Q gaming sales were US$2.5bn, +11% QoQ/+22% YoY, above street's US$2.4bn from RTX40 series ramp-up in desktop and laptops, with the company seeing a return to growth for this market after the sharp 2022 correction.
  3. Pro Vis (workstations) rebounding from a low base. F2Q Pro Vis sales were US$379mn, +28% QoQ/-24% YoY, vs. street's US$320mn with some rebound on 3D collaboration/Omniverse and new workloads using LLMs and Gen AI.
  4. Automotive/robotics below on lower China EV units. F2Q sales were US$253mn, -15% QoQ/+15% YoY, below street's US$309mn with lower sequential sales from auto in China, though up YoY on NVIDIA Drive SoC ramps into EV.
  5. Outlook stronger. NVIDIA's guided F3Q upside at US$16bn would be led by data center AI, with some growth from gaming and Pro Vis. Mgmt did not quantify supply increase or guidance for further out quarters but reaffirmed optimism in its Computex keynote about opportunity to upgrade US$1tn of installed compute to address accelerated computing and Gen AI.
  6. Product updates. NVIDIA's L40S GPU is not supply-constrained and it is shipping to leading server makers to accelerate visual compute and AI training/inference. GH200 combining ARM CPU with H100 GPU is now available in OEM servers and being shipped for multiple supercomputers and designed into 5G telco platforms. The GH200 Gen 2 system with HBM3e memory will be shipped in C2Q24, according to mgmt, and will have GGX-GH200 with 256GH chips linked with Google, Meta and MSFT with first access. The Bluefield 3 DPU is being qualified with multiple OEMs and ramping with CSPs/consumer internet.
  7. Inventory days lowered sharply. Inventory was US$4.3bn, down from US$4.6bn, lowering inventory days from 165 to 97 on much higher sales. (Company release)

- **CS view on semiconductors – NVIDIA approaching 10% of TSMC sales, AI on track to ramp up to low-teen contribution.** We estimate TSMC content supplying 4nm GPU die, CoWoS interposer and processing, switching and Mellanox content represent about 8% of NVIDIA's data center revenue, with a higher share of the gaming split could allow the total NVIDIA business to approach 10% of TSMC's revenue. Together with accelerator supply to Google, Amazon, Alibaba, Tesla, AMD and start-ups, AI should grow from TSMC's disclosed 6% in 2023 to 10% as soon as 2024 on the near-term surge and low-mid teen contribution in a few years.
  CoWoS supply with partners should catch-up by 2H24. We expect CoWoS from TSMC approaching 12k at year-end and 24k by end-2024, with fewer constraints in 2H24, factoring in enough lead time on equipment (3-4 quarters on long lead time items) plus interposer supply alternatives from Samsung (4-5k) and UMC (6k), and even Intel is now developing capabilities and back-end support with Amkor doing interposer processing and die attach for about 6-8k and ASE doing final on-substrate processing. We would reassess risk once supply catches up to demand if any overbooking comes off at that stage in mid-2024. With TSMC's stock at ~15x P/E on ongoing inventory depletion and some geopolitical discount, the stock is reasonable, in our view, factoring in share being intact in the coming two years, pricing in holding firm to manage rising cost pressures and less inventory headwinds by 2024. (Randy Abrams)

- **CS view on Taiwan IC design service sector: prefer Alchip over GUC.** NVIDIA's strong outlook, led by data center AI, supports our view that Taiwan IC design service sector should benefit and we maintain Outperform on Alchip given its strong design and turnkey pipeline through 2024, even with a modest QoQ decline in 3Q23E following Amazon's demand pull-in through 1H23 partially offsetting NRE milestone growth. The company has other projects ramping up at US hyperscalers (e.g. e-reader, voice assistant, data center, AI chipsets) and China start-up companies (GPU and AI chipsets meeting US regulation) and initial NRE contribution from advanced automotive applications, while the supply tightness of TSMC's existing CoWoS capacity and yield loss during technology migration should also keep its customers' turnkey visibility firm and support its business outlook in 2024, with its 80%+ HPC exposure, and a valuation re-rating (current 35x/26x 2023/24E EPS vs. its 15-45x range). For GUC, while it is growing its data center/networking switch and AI exposure to ~30-40% of its sales in combination by taking more NRE projects, valuation is already stretched, in our view, at the high end of its range (50x/39x 2024/25E EPS vs. its 20-50x range) even factoring in a ~20-30% CAGR through 2025. (Haas Liu/Randy Abrams)

- **CS view on cloud ODMs: accelerating data-center adoption of AI a key driver of earnings upside.** In F2Q, NVIDIA's sales were up 88% QoQ and 101% YoY to a record level of US$13.51bn, which is over 20% above its guidance of US$11bn, with primary support from also record-high revenue in data center for up 141% QoQ and 171% YoY to US$10.32bn, making up 76% of its total sales, as NVIDIA highlighted accelerating demand and adoption by CSPs and large internet customers of its HGX platforms, especially in the US (vs China staying within historical range of 20-25% of data-center sales) to power generative AI and LLMs.
  Given extended visibility into next year from escalated industry demand, NVIDIA guided for its sales to up further to US$16bn at the mid-point, implying 18% QoQ expansion at the mid-point, driven again mainly by data center with also support from continued supply increase and reducing cycle times based on its expectations for improving supply each quarter through next year. Additionally, it is also ramping up latest adjacent products, including L40S GPU for fine-tuning pre-trained models without supply limitation near-term designed for high-volume data-center scale out; GH200 Grace Hopper Superchip in full production with availability from this current quarter; GGX-GH200 for rollout by end of the year; and the launch of Spectrum X as an accelerating network platform to optimize Ethernet AI workloads, etc. Lastly, it does not expect data center GPU export restriction to China to create meaningful impact on its P/L in the near term, given the strength of demand it is seeing currently, but does highlight its concerns that the overall TAM could be lower in the long term.
  Strong AI demand outlook positive for Taiwan serve/networking ODMs. We believe NVIDIA's strong F3Q outlook, led by data center AI, supports our view that cloud ODMs should benefit from AI server ramp-up from later in 3Q, with improving visibility into next year, despite ongoing capex budget prioritization by US hyperscalers by shifting their investment toward AI infrastructure from general compute. This is also evidenced in Quanta's recent guidance upward revision with 2023 cloud server sales now expected to grow at a double-digit YoY rate (from prior single-digit rate YoY), as a result of AI server ramp-up, as well as its leading position in AI server projects with 40-45% share, versus 25-30% for FII and Inventec, and 5-10% for Wiwynn. NVIDIA's comment on continued supply increase and reducing cycle time is also consistent with our observation on foundry's backend capacity ramp-up, as well as our checks on Wistron's strong HGX shipment growth in 2H23. Overall, we expect cloud ODMs' sales to decline 1% YoY in 2023E, before returning to positive growth trajectory for +32%/+24% YoY in 2024/25E, on better supply of AI GPUs, catch-up of new GPU platform, and enterprise demand recovery.
  Prefer leading ODMs, Chroma and Lotes. Within our sector coverage, we continue to prefer leading cloud ODMs led by Quanta, which could take advantage of the AI infrastructure spending take-off with its technology leadership and diversified customer base. We also like Accton for its ability to capture growth in AI/ML-driven 400G/800G network upgrades and new AI smartNIC/server business ramp-up. We believe Wistron should benefit as the main ODM partner for NVIDIA's DGX/HGX baseboard and system assembly, as it has secured multi-year/generation projects at NVIDIA with potential ~25% profit contribution in 2024-25E on a much higher margin profile, despite the business being only ~5% of total sales. We also believe Chroma would be a major beneficiary on AI chipset ramp-up, given its leading positing for System Level Testers (SLT) for chipset vendors including NVIDIA, AMD, Marvell, with a 70% ASP hike for next-gen platform on more critical thermal control and heat dissipation. Lastly, we expect the long-term story on Lotes to be intact with AI rather as a complementary driver for growing CPU TAM, aside from more premium interconnect spec upgrade. We are Neutral on Wiwynn given slower progress in AI training and fair valuation; and Underperform on ASRock/MiTAC given unconvincing stock runs, as we believe the ultimate take-off on AI infrastructure will take longer, potentially from later in 2024 at the earliest, given their scale disadvantages and customer portfolio make-up. (Jerry Su/Harvie Chou)

- **CS view on Asia PC/hardware sector: PC/gaming supply-demand in balance and seeing a normal seasonal ramp.** For gaming, NVIDIA's sales were up 11% QoQ and 22% YoY in F2Q, consistent with normal seasonality, supported by continued GeForce RTX40 series GPU ramp-up in both laptops and desktops for back-to-school and holiday build schedule, particularly for laptops into F3Q. It also highlighted still large upgrade opportunity ahead, as only 47% of its installed base has upgraded to RTX and about 20% has a GPU with a RTX3060 or higher performance.

Gaming recovering after normalization; PCs mild rebound from a low base in 2024. Gaming PC demand saw an uptick in 2Q on inventory replenishment and new RTX4060/4060Ti GPU launches by NVIDIA towards late-2Q should support a seasonal sales recovery in 3Q, according to the company. Nevertheless, the higher interest and inflationary environment remains a headwind for 2H spending, resulting in lower visibility on the supply chain near-term, with customers turning more conservative about managing their inventory. For the PC sector, we expect 2023 shipments to decline by a mid-teen rate YoY, followed by a mid-single rate YoY recovery in 2024 with commercial outgrowing consumer PC.

Lenovo our top PC/hardware pick on diversified compute drivers. Within our coverage, we prefer Lenovo as our top pick given its higher sales exposure in commercial PC (60% for Lenovo vs 20% for Asus and 40% for Acer), while service should retain a double-digit YoY sales growth rate in the medium term, with ~20% OPM, and the server business should swing back to profit in 2H on new AI product take-offs (NVIDIA's Omniverse, L40S OVX, H100/800, etc), with improving general compute demand in CY24. We are Neutral on Micro-Star given softer visibility and limited potential upside near term but would look for a better entry if end-demand sees a faster recovery and/or if gaming refresh accelerates. (Jerry Su/Harvie Chou)

Figure 1: TSMC generating close to 10% of sales from NVIDIA based on guidance/consensus

Annual	CY19 FY20	CY20 FY21	CY21 FY22	CY22 FY23	CY23 FY24	CY24 FY25	CY25 FY26	FY 24 YoY	FY25 YoY
Gaming	$5,518	$7,759	$12,461	$9,067	$10,277	$10,963	$11,749	13%	7%
Professional Visualization	$1,212	$1,053	$2,111	$1,544	$1,567	$1,600	$1,870	2%	2%
Data Center	$2,983	$6,696	$10,616	$15,005	$40,789	$61,183	$73,420	172%	50%
Automotive	$700	$536	$566	$903	$1,145	$1,723	$2,413	27%	50%
OEM and IP	$505	$631	$1,160	$455	$284	$454	$493	-38%	60%
Total	$10,918	$16,675	$26,914	$26,974	$54,063	$75,923	$89,945	100%	40%
GPU Foundry	$2,202	$2,694	$4,339	$3,591	$3,982	$4,422	$4,958	11%	11%
Data Center Foundry	$239	$536	$849	$1,200	$3,263	$4,895	$5,874	172%	50%
TSMC's NVIDIA Sales	$2,075	$2,923	$3,113	$3,354	$6,159	$8,385	$9,748	84%	36%
% of TSMC sales	5.7%	6.1%	5.9%	4.6%	9.0%	10.2%	10.5%		
TSMC's NVIDIA Share	85.0%	90.5%	60.0%	70.0%	85.0%	90.0%	90.0%		
TSMC Sales	$36,356	$47,939	$53,195	$73,541	$68,052	$82,492	$93,069	-7%	21%

	FY20	FY21	FY22	FY23	FY24	FY25	FY26	YoY	YoY
Samsung's NVIDIA Sales	$366	$307	$2,075	$1,437	$1,087	$932	$1,083	-24%	-14%
Samsung's NVIDIA Share	15.0%	9.5%	40.0%	30.0%	15.0%	10.0%	10.0%		

Source: Company data, the BLOOMBERG PROFESSIONAL™ service, Credit Suisse estimates

Figure 2: Rising CoWoS allocation supporting NVIDIA's data center ramp

NVIDIA demand (TSMC)	1Q23	2Q23	3Q23	4Q23	2023	2024
H100 (K)	100	200	300	390	990	2500
H100 TSMC Content (US$)	$822	$822	$822	$822	$822	$822
H100 TSMC Sales (US$mn)	$82	$164	$247	$320	$814	$2,054
A100 (K)	150	300	300	270	1020	1500
A100 TSMC Content (US$)	$546	$546	$546	$546	$546	$546
A100 TSMC Sales (US$mn)	$82	$164	$164	$147	$557	$819
Mellanox/Other Data Center	$225	$293	$322	$354	$1,193	$1,432
Total TSMC Sales	$389	$621	$732	$822	$2,563	$4,305
% of CS TSMC	2.3%	3.9%	4.2%	4.2%	3.6%	5.1%
CoWoS capacity (WPM)	3.1	6.2	7.4	8.1	6.2	12.3

NVIDIA implied builds (NVIDIA)	1Q23	2Q23	3Q23	4Q23	2023	2024
H100 (K)	60	200	300	390	950	2500
H100 NVDA Content (US$)	$26,000	$26,000	$26,000	$26,000	$26,000	$20,000
H100 NVDA Builds (US$mn)	$1,560	$5,200	$7,800	$10,140	$24,700	$50,000
A100 (K)	133	294	300	270	997	1500
A100 NVDA Content (US$)	$13,000	$13,000	$13,000	$13,000	$13,000	$10,000
A100 NVDA Builds (US$mn)	$1,724	$3,823	$3,900	$3,510	$12,957	$15,000
Total NVDA A100/H100 Builds	$3,284	$9,023	$11,700	$13,650	$37,657	$65,000
Mellanox & Other GPUs	$1,000	$1,300	$1,430	$1,573	$5,303	$6,364
NVIDIA data center builds	$4,284	$10,323	$13,130	$15,223	$42,960	$71,364

Source: Company data, the BLOOMBERG PROFESSIONAL™ service, Credit Suisse estimates, Note: Bloomberg consensus for NVIDIA forecasts.

Valuation Methodology and Risks

Target Price and Rating
Valuation Methodology and Risks: (12 months) for ASE Industrial Holdings (3711.TW)

Method: Our Outperform rating and target price of NT$132 for ASE is based on mid-cycle 12x P/E and 2x P/B. We view the stock trading at ~10.4x 2024 P/E and ~5x EV/EBITDA as reasonable, though there are few immediate catalysts amidst a mild 2H and limited exposure to AI. We stay constructive on potential growth recovery in 2024 givern the better competitive landscape following the bifurcation of competition from China peers and merger with SPIL and opportunities to add content with system- and module-level integration across applications.

Risk: Risks to our target price of NT$132 and Outperform rating for ASE include: (1) sharper demand slowdown and inventory correction leading to declining sales and downside to pricing and margins, with a more traditional semiconductor downturn, (2) a rise in competitive pricing from Chinese suppliers, and (3) rising material cost and inflation putting pressure on margins and profitability.

Target Price and Rating
Valuation Methodology and Risks: (12 months) for ASRock Inc. (3515.TW)

Method: We have an UNDERPERFORM rating for ASRock and NT$130.0 target price based on 17x 2024E P/E (price-to-earnings), 1 standard deviation below its historical average, factoring in impact from macro uncertainties to both demand and supply especially to its underperforming server business.

Risk: Key risks to our UNDERPERFORM rating and NT$130.0 target price for ASRock include: (1) stronger gaming demand in 2023; (2) better traction in server; and (3) faster recovery of enterprise demand momentum.

Target Price and Rating
Valuation Methodology and Risks: (12 months) for Accton (2345.TW)

Method: We rate Accton Outperform with a 12M TP of NT$440, based on 24x 2024 P/E (price-to-earnings), one standard deviation above average, as we believe Accton is the key beneficiary in the ODM Direct trend take-off in switch with widening competitive advantages vs peers, migration to faster speed for switch, and new demand from 5G proliferation and new customers. We believe the improving component supply should help its sales and GM to recover.

Risk: Key risks to our Outperform rating and NT$440 target price for Accton include: (1) weaker-than-expected demand for data centre; (2) slower ramp of 400G data centre switch; (3) market share loss for cloud and enterprise ODM business; (4) slower revenue growth for 5G and telco; and (5) weaker gross margin.

Target Price and Rating
Valuation Methodology and Risks: (12 months) for Acer Group (2353.TW)

Method: We have an Underperform rating and NT$23.0 target price for Acer on 14x forward P/E (0.5-SD below average), vs Acer's average P/E of 18.5x starting 2018, factoring in its higher reliance on consumer/educational PC, smaller revenue scale, and negative operating leverage during a downcycle.

Risk: The key upside risks to our Underperform rating and NT$23.0 12-month target price for Acer include: (1) stronger PC demand; (2) faster relief from macro uncertainties; and (3) better component supplies.

Target Price and Rating
Valuation Methodology and Risks: (12 months) for Alchip Tech (3661.TW)

Method: Our Outperform rating and target price of NT$2,500 for Alchip Tech are based on 36/28x 2024/25E P/E (price-to-earnings), factoring in our expectation for 25% sales CAGR from 2020-24. We believe the long-term valuation should be supported by the company's earnings upside potential from its AI and internet company pipeline offsetting the risk in its China CPU business.

Risk: Risk to our Outperform rating and target price of NT$2,500 for Alchip Tech include: (1) worse macro leads to slower semiconductor investment, (2) delay in timing in AI chipset development, (3) customers acceleration in shifting to the foundry-direct business model, and (4) further restriction from the US to slow China local CPU development.

Target Price and Rating
Valuation Methodology and Risks: (12 months) for Amkor Technology Inc. (AMKR.OQ)

Method: Our Neutral rating and target price of US$30.0 for Amkor Technology is based on 15x 2024E P/E and 5.8x EV/EBITDA, the high-end of history along with the SOX. Upside risks would come from 2024 inventory restocking and HPC/AI upside, while downside risks come from persistent slow consumer/smartphone markets and from a high base and more mild auto growth in 2024.

Risk: Upside/downside risks to our US$30.0 target price and Neutral rating for Amkor Technology include: (1) faster- or slower-than-expected consumer demand and inventory recovery, (2) better- or worse-than-expected automotive and industrials demand resilience, (3) lower- or higher-than-expected cost inflation, and (4) upside or downside to pricing and margins.

Target Price and Rating
Valuation Methodology and Risks: (12 months) for Asustek (2357.TW)

Method: We have a NEUTRAL rating and 12-month target price of NT$360 for Asustek on 13.5x 2024 EPS, 1 standard deviation above its historical average. Although we expect Asus' profitability remains sub-scale due to macro and inventory clearance efforts, the adjustment seems to complete earlier than expected with recovery in sight.

Risk: Key risks to our NEUTRAL rating and NT$360 12-month target price for Asus include: (1) notebook demand and share change would have a major impact on earnings given the revenue contribution; (2) stronger/softer smartphone demand; (3) the size and pace of investments in VR/robotics/5G would impact future earnings growth; and (4) components momentum volatility.

Target Price and Rating
Valuation Methodology and Risks: (12 months) for Chroma (2360.TW)

Method: Our target price of NT$330 for Chroma is based on peak cycle multiple of 26x forward P/E. We rate Chroma Outperform, as we believe its high-power testing know-how and system integration specialties offer higher value-added and should drive its long-term growth.

Risk: Risks that could impede achievement of our NT$330 target price and Outperform rating for Chroma include: (1) slower-than-expected take-off for turnkey products; (2) weaker demand for IC testing equipment; (3) weaker demand for automated equipment for PC/smartphone supply chain; and (4) worse gross margin profile on product mix change.

Target Price and Rating
Valuation Methodology and Risks: (12 months) for Foxconn Industrial Internet (601138.SS)

Method: We have a NEUTRAL rating on FII. We believe FII will stay as the core profit generator of Hon Hai, driven by strong momentum in cloud/AI business with further upside from share gains but view limited earnings upside to drive further re-rating after shares outperformed by +58% year-to-date. Our TP of Rmb15.8 is based on 13x FY24 P/E, in-line with its historical average, to reflect its solid position in cloud/AI/network, but lower GM given new investments and heavier pricing pressure from its top customer.

Risk: Risks to our NEUTRAL rating and TP of Rmb15.8 for FII include: (1) any changes to Apple product demand, given FII's 20-30% revenue exposure to that customer; (2) better or worse RMB/USD trend, as most of its revenue is dominated by RMB and USD; (3) faster or slower than expected progress in installing BEACON in Hon Hai's factories; (4) slower or faster than expected market share loss or weaker-than-expected demand in server, networking and telecom business; and (5) Shanghai stock market multiple fluctuations.

Target Price and Rating
Valuation Methodology and Risks: (12 months) for GUC (3443.TW)

Method: Our Neutral rating and target price of NT$1550 for GUC are based on 40x 2024-25E (price-to-earnings), vs. its 20-45x range. We believe the company's share is fairly valued at the upper half of its historical range, factoring in its opportunity in 5G and AI, although the timing of the project ramp-up for meaningful revenue contribution and profitability remains uncertain.

Risk: Downside risks to our Neutral rating and target price of NT$1550 for GUC include: (1) worse-than-expected demand slowdown and inventory correction leading to worse-than-expected impact on sales, pricing and margins in a traditional semiconductor downcycle, (2) timing uncertainty in AI chipset development, and (3) customers shift to a foundry-direct business model. Upside risks for GUC include: better semiconductor demand and higher visibility on AI and 5G projects.

Target Price and Rating
Valuation Methodology and Risks: (12 months) for Hon Hai Precision (2317.TW)

Method: We have a Neutral rating on Hon Hai Precision. We believe it is well positioned in cloud and 5G, but we see growing earnings risks given intensifying iOS competition and auto contribution is unlikely to materialize near-term. Our NT$120 target price is based on 10x 2024 EPS (earnings per share), vs. its historical average trading P/E (price-to-earnings) of 13x.

Risk: Risks to our Neutral rating and NT$120 target price for Hon Hai Precision include: (1) the impact from rising China labour costs being bigger than expected; (2) the potential of key clients cutting orders due to labour events, or potential orders being stronger than expected due to PC product cycles and devices, including tablets and smartphones; (3) a change in Hon Hai's relationship with Apple, its largest customer in revenue contribution terms; (4) slowdown in 5G infrastructure build and 5G smartphone launch; and (5) slower or stronger demand due to escalating or less trade war tension.

Target Price and Rating
Valuation Methodology and Risks: (12 months) for Inventec Co Ltd (2356.TW)

Method: We rate Inventec Neutral with a 12-month target price of NT$56.0 based on 14x forward P/E (price-to-earnings), 1 standard deviation above its past three-year average. We like Inventec as we believe it will be the key beneficiary on resilient hyperscalers' capex spending in 2023 which could help offset downside from potentially slower PC; however, macro has resulted in softer momentum near-term on limited upsides from the current level.

Risk: The risks to our Neutral rating and NT$56.0 target price for Inventec include: (1) PC share gain or loss and overall market momentum; (2) stronger- or weaker-than-expected IAC momentum; (3) currency impact on the data-centre business; and (4) higher- or lower-than-expected production cost.

Target Price and Rating
Valuation Methodology and Risks: (12 months) for Lenovo Group Ltd (0992.HK)

Method: We have a HK$9.5 12-month target price for Lenovo based on 10x forward GAAP EPS (earnings per share), its historical average. We expect better PC shipments growth in the next few years after the recent stabilization, along with the service business take-off, to drive stronger earnings recovery, while its ISG business should also ride a structure lift from AI market take-off.

Risk: Risks to our OUTPERFORM rating and HK$9.5 price target for Lenovo include: (1) slower-than-expected cost savings in both the mobile and data centre businesses; (2) slower-than-expected growth in data centre; (3) Lenovo Mobile Business Group slowdown; and (4) mobile market share loss.

Target Price and Rating
Valuation Methodology and Risks: (12 months) for Lotes Co.,Ltd. (3533.TW)

Method: We have an Outperform rating for Lotes and NT$900.0 target price based on 17x 2024 P/E (price-to-earnings), 1 standard deviation above the historical average, as we believe Lotes to be a key beneficiary from positive cloud cycle next few years, given its major breakthrough at Intel Sapphire Rapids platform, while also having stable shares at AMD. In addition, we believe it will continue to retain solid positioning in computing, providing the required cash flow for its new business ramps into auto.

Risk: Key risks to our Outperform rating and NT$900.0 target price for Lotes include: (1) delaying new server platforms ramp and/or capex spending push-off by hyperscalers; (2) raw materials pricing hikes; (3) slower computing demand into 2023; and (4) exacerbating components constraints.

Target Price and Rating
Valuation Methodology and Risks: (12 months) for MiTAC Holdings Corporation (3706.TW)

Method: We have an Underperform rating on MiTAC Holdings Corporation with NT$31.4 target price based on 16x forward P/E (price-to-earnings), 10% discount to leading cloud ODMs or 0.5 standard deviation above its past average, as we expect it to remain in a more disadvantageous position on lower scale vs leading ODMs in terms of components sourcing, despite the increasing workload shift to the cloud and AI take-off which should benefit MiTAC as a result of its exposure to key hyperscalers in the US. We also expect its MDT business to see better recovery from a lower base along with auto market demand, but ongoing macro complications will remain key swing factors.

Risk: Key risks to our Underperform rating and NT$31.4 target price for MiTAC Holdings Corporation include: (1) better cloud momentum; (2) improving auto demand; and (3) higher contribution from its key non-operational equity investment entities.

Target Price and Rating
Valuation Methodology and Risks: (12 months) for Micro-Star International Co., Ltd (2377.TW)

Method: We have a NEUTRAL rating and a 12-month target price of NT$185 for Micro-Star International (MSI). Our TP is based on 14x 2024E P/E, 2 standard deviation (SD) above its average of 11x, versus 1 SD above for peer Asus, as MSI's PC business (NB and desktop, combined 50% of sales) is seeing a faster recovery vs industry given its focus on gaming PC. Our NEUTRAL rating is based on limited gaming demand visibility to support more meaningful top-line and earnings upside.

Risk: Key risks to our NEUTRAL rating and NT$185 target price for Micro-Star International Co., Ltd. include the following: (1) better-/worse-than-expected gaming personal computer momentum; (2) better-/worse-than-expected new graphics processing unit demand; (3) better-/worse-than-expected do-it-yourself market demand; and (4) higher/lower component costs.

Target Price and Rating
Valuation Methodology and Risks: (12 months) for Quanta Computer (2382.TW)

Method: We have an Outperform rating for Quanta because we see its cloud data centre sales accelerating along with 5G take-off, leveraging its long experience and design know-how. Its diversified customer base should also provide more stable profitability growth. Our target price of NT$260.0 is based on 18x 2025 P/E, peak cycle multiple.

Risk: Downside risks to our Outperform rating and NT$260.0 target price for Quanta include the following: (1) worse-than-expected notebook/Apple Macbook and Watch/server and data centre demand and share gains; and (2) currency and macro impact on non-operating income.

Target Price and Rating
Valuation Methodology and Risks: (12 months) for Taiwan Semiconductor Manufacturing (2330.TW)

Method: We have an Outperform rating for TSMC and a target price of NT$670 based on 18x 2024 P/E, in line with its past 5-year average. While 2H23 sales/GMs may be disappointing, though not shocking factoring in headwinds of high semiconductor inventory and soft demand ex AI/Apple ramps, we expect opportunities beyond this year's drags, with the stock at a 30-40% discount to SOX and likely better growth for 2024 from leaner channel and high share continuing on advanced nodes.

Risk: Risks that could impede achievement of our NT$670 target price and Outperform rating for TSMC would include fiercer-than-expected competition from Samsung and Intel, and a sharper demand slowdown and inventory correction leading to declining sales and downside to pricing and margins, with a more traditional semiconductor downturn.

Target Price and Rating
Valuation Methodology and Risks: (12 months) for United Microelectronics (2303.TW)

Method: Our Outperform rating and a target price of NT$60 for United Microelectronics is based on a multiple to 15x 2024 P/E, in-line with mid-cycle valuation. The stock at 11x earnings and 7% cash yield (NT$3.50 payout) remains reasonable, with 28nm improvement helping offset mature node discounting to keep blended pricing firmer in this cycle, providing support to the stock though catalysts are limited into a sluggish sales outlook.

Risk: Downside risks to our NT$60 target price and Outperform rating for the stock could be sharper demand slowdown and inventory correction leading to declining sales and downside to pricing and margins, with a more traditional semiconductor downturn and more supply risk by 2023 that could drive a price downturn.

Target Price and Rating
Valuation Methodology and Risks: (12 months) for Wistron (3231.TW)

Method: We have a OUTPERFORM rating and 12-month target price of NT$152.0 for Wistron based on 16.5x 2H24-1H25 earnings per share on peak cycle multiple as we believe ramp of AI server and cloud data-centre should drive its margin/earnings expansion.

Risk: Risks to our OUTPERFORM rating and 12-month target price of NT$152.0 for Wistron include the following: (1) the profitability Wistron is able to generate on iPhone assembly, which also goes hand-in-hand with units and volumes; (2) notebook order loss to other ODMs; (3) softer demand and share loss of AI server; and (4) LCM business may be outdated as all iPhone moves to OLED in the long term.

Target Price and Rating
Valuation Methodology and Risks: (12 months) for Wiwynn Corporation (6669.TW)

Method: We have a Neutral rating for Wiwynn Corporation and a NT$1.900 target price based on 18x average 2024-25 P/E (price-to-earnings), 1.5 standard deviation above its historical trading average of 14x in a range of 8-23x, as we believe Wiwynn is a key beneficiary of the increasing workload shift to the cloud given its leading share among key US hyperscalers. In addition, we expect Wiwynn to see further sales uplift from a new hyperscale client ramp as impacts from Covid-19 gradually subside, and growing traction with AI infrastructure in the next few years. However, most upside potential is likely priced in.

Risk: Key risks to our Neutral rating and NT$1,900 target price for Wiwynn Corporation include: (1) stronger/weaker capex outlook by two key customers due to softer macro; (2) higher/lower key components pricing could lead to changes in profit margin; and (3) new business ramp-up progress.

Companies Mentioned *(Price as of 23-Aug-2023)*

ASE Industrial Holdings (3711.TW, NT$109.5)

ASRock Inc. (3515.TW, NT$250.0)
Accton (2345.TW, NT$468.0)
Acer Group (2353.TW, NT$37.7)
Advanced Micro Devices, Inc. (AMD.OQ, $109.43)
Alchip Tech (3661.TW, NT$2390.0)
Alibaba Group Holding Limited (BABA.N, $89.84)
Alibaba Group Holding Limited (9988.HK, HK$87.3)
Alphabet (GOOGL.OQ, $132.37)
Amazon com Inc. (AMZN.OQ, $135.52)
Amkor Technology Inc. (AMKR.OQ, $26.57)
Asustek (2357.TW, NT$414.5)
Chroma (2360.TW, NT$280.0)
Foxconn Industrial Internet (601138.SS, Rmb21.34)
GUC (3443.TW, NT$1465.0)
Hon Hai Precision (2317.TW, NT$106.5)
Intel (INTC.O, $33.98)
Inventec Co Ltd (2356.TW, NT$59.2)
Lenovo Group Ltd (0992.HK, HK$7.73)
Lotes Co.,Ltd. (3533.TW, NT$829.0)
Marvell Technology, Inc. (MRVL.OQ, $61.5)
Meta Platforms, Inc. (META.OQ, $294.24)
MiTAC Holdings Corporation (3706.TW, NT$44.0)
Micro-Star International Co., Ltd (2377.TW, NT$171.5)
Microsoft (MSFT.OQ, $327.0)
NVIDIA Corporation (NVDA.OQ, $471.16)
Quanta Computer (2382.TW, NT$262.0)
Samsung Electronics (005930.KS, W67,100)
Taiwan Semiconductor Manufacturing (2330.TW, NT$552.0)
Tesla (TSLA.OQ, $236.86)
United Microelectronics (2303.TW, NT$43.4)
Wistron (3231.TW, NT$127.5)
Wiwynn Corporation (6669.TW, NT$1770.0)

Disclosure Appendix

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