

Semi

Global SME investment set to accelerate on tech advancements, China localization; Initiate Naura w/ BUY

SME (semiconductor manufacturing equipment) is a cyclical industry. According to SEMI, the sector's sales reached US\$106bn in 2023, making up ~20% of total semiconductor market sales (US\$527bn). The market is expected to grow 3% in 2024 and rebound significantly by 18% in 2025 (per SEMI). The decline in the overall semi sector was less than expected in 2023 thanks to the enormous demand for GenAI GPUs. For 2024, we believe healthy recovery in memory demand and anticipation of launches of a series of edge computing-enabled electronic devices should support the growth of the SME sector. We assume semi equipment spending to resume double-digit growth in 2025.

Geopolitical tensions forced major economies to build localized semi capacity to enable control on supply chain. Since 2019, a series of US sanctions on Chinese technology firms and tightened restrictions on China's access to advanced semiconductor technologies have forced China to seek self-reliance in semiconductor industry. Hundreds of billions of yuan has been invested and local chip makers are rushing to find domestic alternatives. A positive flywheel is forming, and domestic equipment firms have seen a boost in revenue and net profits.

As the largest equipment manufacturer in China with the broadest product offerings, Naura is fostering its leading position in China. Naura has strong collaboration with almost all domestic chipmakers as a variety of its products have been installed and operated at their fabs. The company's solid balance sheet (>RMB 10bn in cash) and diverse talent pool give it the financial power and R&D capability needed for sustained progress.

- We initiate coverage on Naura Technology (002371 CH) with a BUY rating and TP at RMB405. Naura is a China-based leading semiconductor equipment manufacturer which mainly engages in the R&D, production, sales, and technical services of process equipment including etching, film deposition, cleaning, and furnace. It has announced strong preliminary 2023 and 1Q24 results recently. Naura's 2023 revenue and net profit were RMB22.1bn (50% YoY growth) and RMB3.9bn (66% YoY growth), respectively. For 1Q24, the company projected its revenue to increase by 40%-61% to RMB5.4-6.2bn and net profit to rise by 76%-103% to RMB1.0-1.2bn. Solid results were due to stellar demand and market share gains. Naura signed RMB30bn of new orders in 2023, of which 70%+ were for semiconductor equipment.
- We consider multiple tailwinds are propelling Naura to see continued strong revenue and net profit growth in the years ahead: 1) improving capital spending on equipment from clients that are embracing the GenAI demand and recovery seen in memory products; 2) consistent government policy on self-sufficiency in semi creating opportunities for home-grown companies to gain market share by filling the void left by foreign peers who are pulling out of China amid US export controls (current market share was only 6% for Naura by our estimate; 3) as the largest semi equipment manufacturer by sales with the broadest product offerings in China, we believe Naura has the financial flexibility and R&D capability to deliver more new products to enhance its leading position in the market.

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- **Initiate Naura (002371 CH) with a BUY rating and TP at RMB405**, based on 39x 2024E P/E, ~15% higher than 2-year historical average forward P/E. We forecast Naura's total revenue to grow at a CAGR of 30.6% over FY23-26E and reach RMB49bn in FY26E. We feel comfortable with the valuation as 1) Naura's domestic peers also trade at 39x 2024E P/E and 2) we estimate its 2024 EPS to grow by 41.0% YoY, suggesting PEG is slightly lower than one.

Valuation Table

Name	Ticker	Rating	Mkt Cap (US\$mn)	Price (LC)	Upside/Downside	P/E (x)		EPS (US\$)	
						FY24E	FY25E	FY24E	FY25E
NAURA	002371 CH	BUY	22,198	305.0	32.8%	29.4	21.2	1.43	1.98
AMEC	688012 CH	NR	11,606	134.3	NA	41.9	32.2	0.45	0.58
ACMR	688082 CH	NR	4,907	81.4	NA	31.8	24.8	0.36	0.46
ASML	AMSL US	NR	360,253	901.6	NA	44.2	28.2	20.28	31.84
Applied Materials	AMAT US	NR	160,563	193.2	NA	23.4	20.2	8.26	9.57

Source: Bloomberg, CMBIGM estimates

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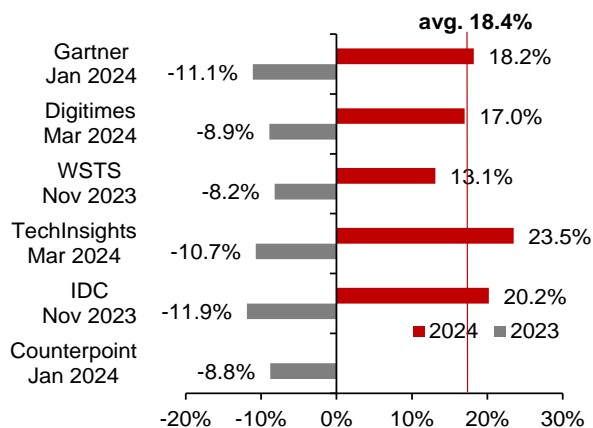
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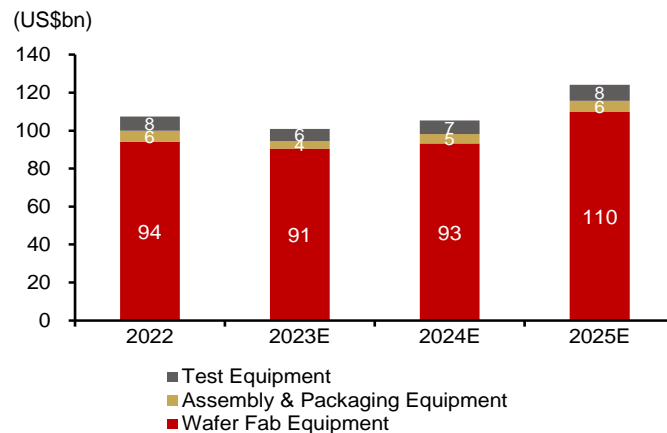
Focus Charts

Figure 1: 2024 worldwide semiconductor sales growth forecasts



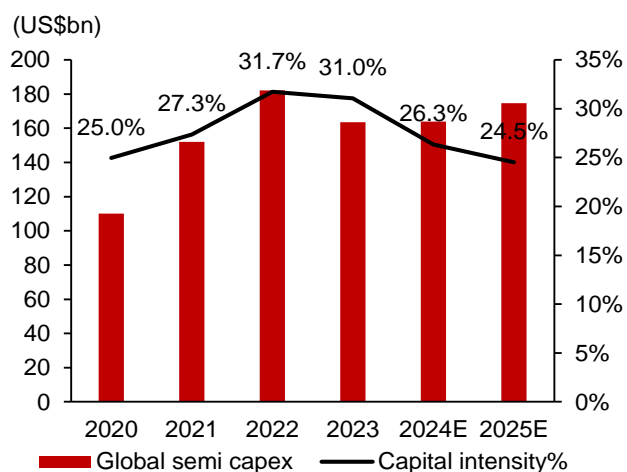
Source: WSTS, SIA, TechInsights, IDC, Gartner, CMBIGM

Figure 2: Semiconductor equipment sales by segment



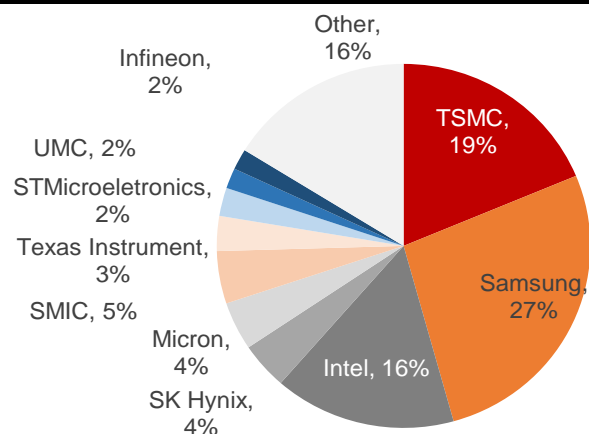
Source: SEMI, CMBIGM

Figure 3: Worldwide semiconductor capex (2020-2025E)



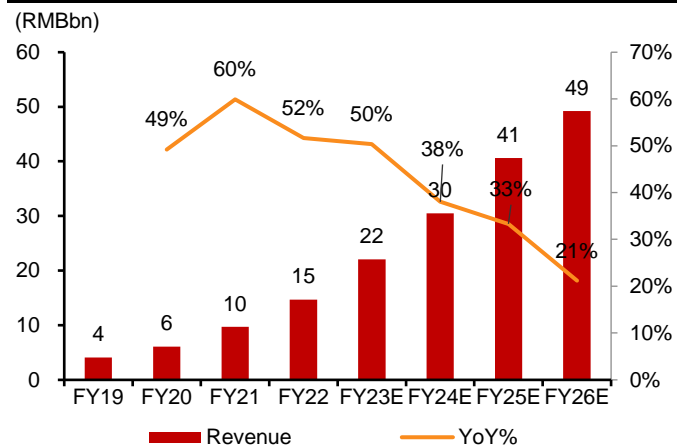
Source: Company data, Gartner, Bloomberg, CMBIGM

Figure 4: Global semi capex breakdown: top 10 accounted for 84% of the total in 2023



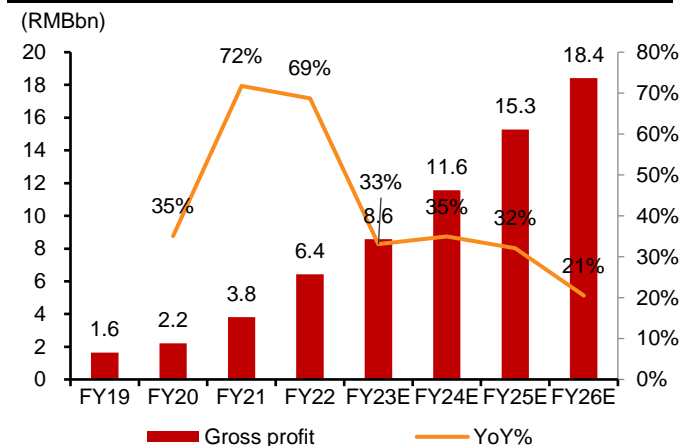
Source: Company data, Gartner, Bloomberg, CMBIGM

Figure 5: Naura's revenue and growth



Source: Company data, CMBIGM estimates

Figure 6: Naura's gross profit and growth



Source: Company data, CMBIGM estimates

Investment Summary

Semiconductor manufacturing equipment (SME) is used to produce semiconductor devices. It includes wafer fab equipment, assembly/packaging equipment and test equipment. According to SEMI, **the sales of SME reached US\$106bn in 2023**, making up ~20% of total semiconductor market sales (US\$527bn).

SME is a cyclical industry, which can be influenced by macroeconomic conditions, technological advancements, industry capex, etc.. The market is expected to grow 3% in 2024 and rebound significantly by 18% in 2025 (per SEMI). The decline was less than expected in 2023 thanks to the enormous demand for GenAI GPUs. For 2024, healthy recovery in memory demand and anticipation of launches of a series of edge computing-enabled electronic devices should support the growth of the SME sector. In 2025, we expect semi equipment spending to resume double-digit growth.

We recommend the SME sector, as we believe the sector is well positioned to ride the tailwinds of 1) increasing equipment needs from ongoing technological advancement, 2) capacity expansion on AI investment and memory demand recovery, and 3) new project rollouts due to semi localization.

- **First, technological advancement ultimately drives up equipment demand.** As technology advances, the space between transistors narrows, which implies greater device complexity, requires more sophisticated machines, and involves an increasing number of processing steps. The smaller the process node, the more etching and deposition steps are required. According to SEMI and AMEC (688012 CH), producing 7/10nm IC necessitates 100+ etching steps, which is 2x the 50 steps required for 20nm production. In addition, CMP processing steps will increase from 10 times for 180nm production to 20 times for 10nm. This will substantially drive the demand for semi equipment.
- **Second, SME is forecasted to rebound on surging GenAI investment and recovering memory demand in 2024.** According to WSTS, global semi sales declined by 8.2% YoY to US\$527bn in 2023. Although we expect the down cycle to be a little longer, AI seems to be driving an upswing. Semi industry is expected to grow 18% in 2024 (avg. estimate of multiple industry forecasts). On the capex side, SK Hynix and Micron are projected to increase spending by 37%/16% this year, to ramp up production for HBM (high-bandwidth memory) as their capacity is fully booked in 2024. This leads to increasing demand for equipment. Consequently, based on ASML's 1Q24 results, memory dominates in the company's bookings, which accounted for 60% of the order value.
- **Third, semi localization needs and government subsidies support the soaring spending in key regions.** The growth of capex and equipment billings remains robust in China and the US, despite an overall decline of 1.3% globally in 2023. China led the spending at US\$36bn (29.5% increase) in 2023. North America came in fourth place, with a 15.1% rise. To secure semiconductor supply chain safety, governments subsidize companies to build redundant fab capacity as geopolitical risks intensify. The subsidies of China and the US are expected to reach US\$50bn and US\$39bn (post-CHIPS Act), respectively, Japan has also subsidized the semiconductor industry for a total of JPY3.9tn (US\$25.7bn) over the past three years, equivalent to 0.71% of its GDP, per Digitimes.

As the key beneficiaries to ride these tailwinds, **we recommend the semiconductor equipment suppliers.** We expect the **current market leaders will maintain their leading position**, while **Chinese suppliers will deliver a higher growth rate on market share gains as they meet urgent self-reliance needs influenced by geopolitics.**

We think Applied Materials (AMAT US), ASML (ASML US), Lam Research (LAM US), Tokyo Electron (8035 JT) and KLA (KLA US), Naura (002371 CH), AMEC (688012 CH) and ACM Research (688082 CH) will be the key beneficiaries. **Among the Chinese suppliers, we favor Naura (002371 CH).**

We consider multiple tailwinds are propelling Naura to see continuous strong revenue and net profit growth in the years ahead: 1) improving capital spending on equipment from clients that are embracing the GenAI demand and recovery seen in consumer electronics; 2) consistent government policy on self-sufficiency in semi creates opportunities for home-grown companies to gain market share by filling the void left by foreign peers who are pulling out of China amid US export controls (current market share was only 6% for Naura by our estimate); 3) as the largest semi equipment manufacturer by sales with the broadest product offerings in China, Naura has the financial flexibility and R&D capability to deliver more new products to enhance its leading position in the market.

Initiate coverage on Naura (002371 CH) at BUY, with TP of RMB405, based on 39x 2024E P/E, ~15% higher than 2-year historical average forward P/E. We forecast Naura's total revenue to grow at a CAGR of 30.6% over FY23-26E and reach RMB49bn in FY26E. We feel comfortable with the valuation as 1) Naura's domestic peers also trade at 39x 2024E P/E and 2) we estimate its 2024 EPS to grow at 41.0%, suggesting PEG is slightly lower than one.

SME market expected to rebound by a modest 3% YoY in 2024, then grow 18% YoY to US\$124bn in 2025

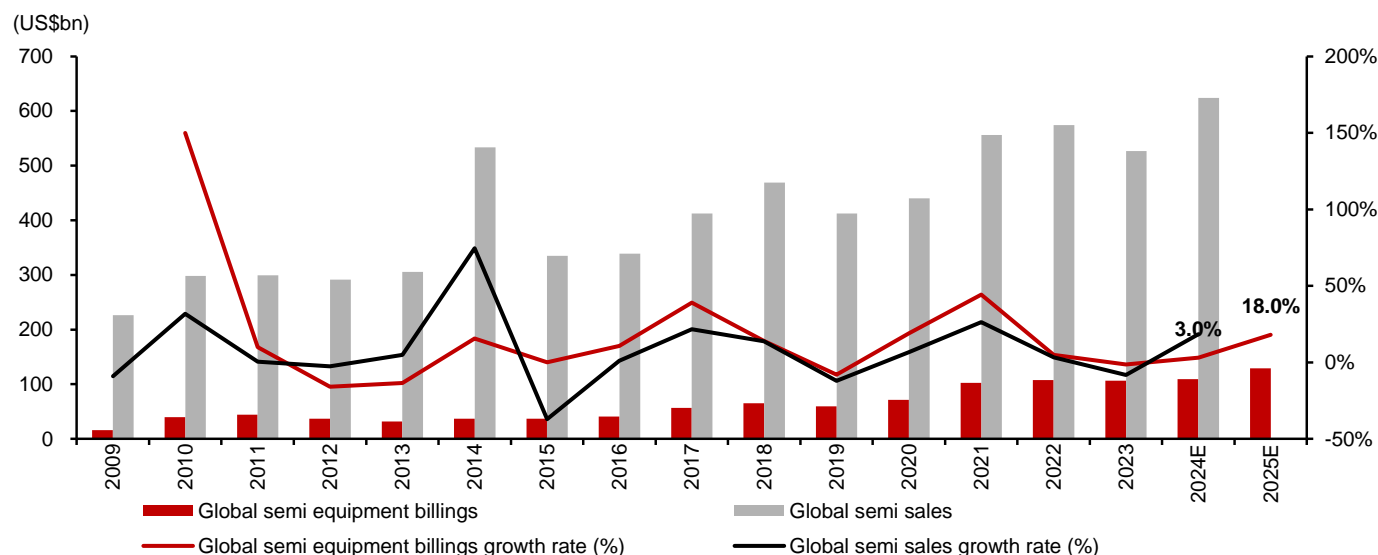
SME sector is cyclical and expected to rebound

Semiconductor manufacturing equipment (SME) is used to produce semiconductor devices. It includes wafer fab equipment, assembly/packaging equipment and test equipment. According to SEMI, the sales of SME reached US\$106bn in 2023, which was around 20% of total semiconductor market sales (US\$527bn).

Semiconductors are a cyclical industry, so is SME. Demand from end markets will have major influence on fab's utilization rate and spending decisions, which ultimately impacts the semi equipment suppliers' revenue. As a result, **these two markets follow a similar trend** (Figure 7).

According to WSTS, global semi sales declined 8.2% YoY to US\$527bn in 2023 after low-single-digit growth in 2022, due to a slowdown in enterprise and consumer spending, prolonged inventory digestion, price erosion, etc. **SME sales had a similar but milder decline (-1%) in 2023, after a slightly higher increase of 5% in 2022.**

Figure 7: Global semiconductor equipment billings vs. global semiconductor sales



Source: WSTS, TechInsights, IDC, Gartner, Digitimes, Counterpoint, SEMI, CMBIGM

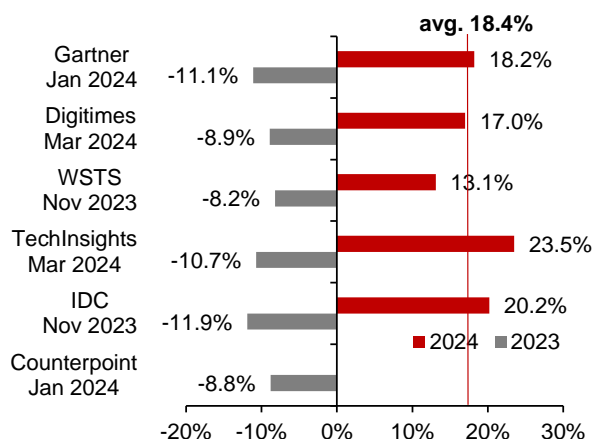
Although we expect the down cycle to be a little longer, AI seems to be driving an upswing. According to SEMI ([link](#)), electronics sales rose by 1% YoY in 4Q23, the first increase since mid-2022, and are projected to rise by 3% in 1Q24. IC sales saw a 10% YoY jump in 4Q23 due to seasonality, improved demand and normalized inventories. Capex and fab utilization rates are expected to mildly recover starting in 1Q24 after significant declines in 2H23. Memory capex is projected to grow by 9% QoQ and 10% YoY in 1Q24, while non-memory capex is expected to increase by 16% in the same period. Fab utilization rates improved from 66% in 4Q23 to 70% in 1Q24.

For full-year 2024, the semi industry is expected to witness a substantial growth rebound, with an average growth forecast of 18%, based on multiple forecasts (Figure 8). It will be largely driven by investments in AI infrastructure and recovery of memory markets (also partially AI-related).

Similarly, the semiconductor equipment market is expected to rebound as well, with a milder growth rate of 3% in 2024 and a significant rate of 18% in 2025, according to SEMI. ([link](#))

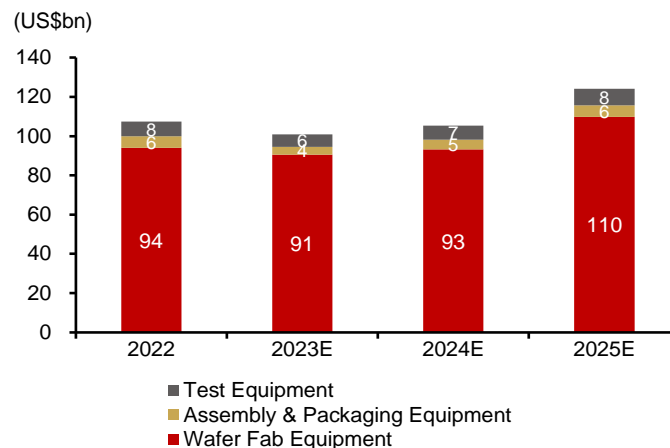
A higher SME sales growth coming later next year may be due to limited memory capacity addition and the slowdown of mature capacity expansion in 2024. Once there is a clearer timeline of recovery, semi equipment spending is expected to resume 18% growth in 2025E, driven by capacity expansion on increasing orders and new project rollouts (a result of semi localization).

Figure 8: 2024 worldwide semiconductor sales forecasts



Source: WSTS, SIA, TechInsights, IDC, Gartner, CMBIGM

Figure 9: Semiconductor equipment sales by segment



Source: SEMI, CMBIGM

We favor the semiconductor equipment suppliers as we believe they are well positioned to ride the tailwinds. We expect the **current market leaders will maintain their leading position**, while **Chinese suppliers will deliver a higher growth rate on market share gains** as they meet urgent self-reliance needs influenced by geopolitics.





Recommend SME on tech advancement, soaring AI demand, memory recovery, semi localization

We recommend the semiconductor manufacturing equipment sector, as we believe the sector is well positioned to ride the tailwinds of 1) increasing equipment needs from ongoing technological advancement, 2) capacity expansion on AI investment and memory demand recovery, and 3) new project rollouts due to semi localization.

Technological advancement requires more sophisticated machines and an increasing number of processing steps

The semiconductor industry never stops advancing. The current production technology is 3nm process and may advance to 2nm process in 2025, according to TSMC's advanced tech roadmap. As technology advances, the space between transistors narrows. This shrinkage allows packing more transistors into the same area, enhancing chip performance and energy efficiency. However, **achieving chip miniaturization leads to greater device complexity, requires more sophisticated machines and involves an increasing number of steps.**

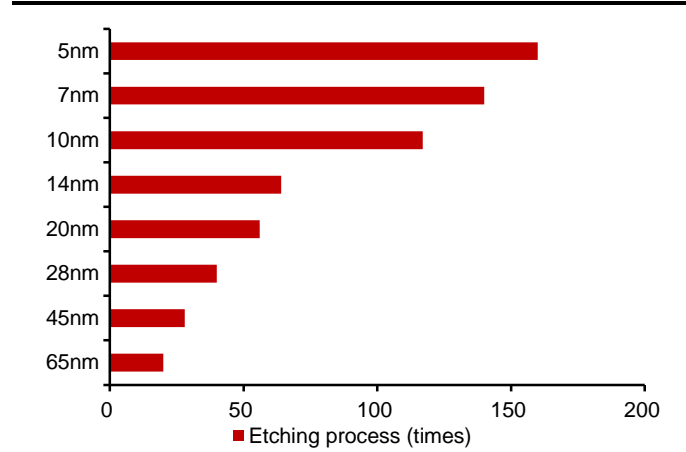
Figure 10: Advanced process roadmap of major foundries

	2020	2021	2022	2023	2024E	2025E	2026E	Beyond
	5nm 6nm	N5P	N4 N3	N4P		N2 (GAA)	N2P (GAA)	A14 (GAA)
	6nm 5nm	4nm	3GAE		3GAP	SF2	SF2P	SF1.4
	i10	i7	i4	i3	20A 18A			
		N+1	N+2	Development temporarily stopped due to equipment constraints				

Source: TrendForce, SEMI, CMBIGM

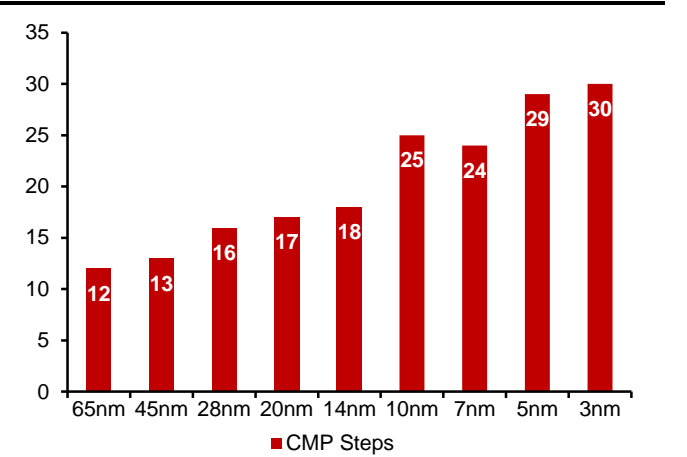
In the production of integrated circuits with advanced nodes from 7nm to 28nm, the resolution of DUV lithography machines is limited by the wavelength of light, setting a maximum limit on lithographic resolution. Therefore, wafer fabs need to utilize both etching and deposition equipment, using multi-patterning techniques to achieve smaller dimensions. The smaller the process node, the more etching and deposition steps are required. According to the SIA, producing 7nm IC necessitates 140 etching steps, which is 2.5x the 40 steps required for 28nm production. In addition, CMP processing steps will increase from 10 times for 180nm production to 20 times for 10nm. From 2D NAND to 3D NAND, CMP steps will also double.

Figure 11: Advanced nodes demand more etching steps



Source: SIA, CMBIGM

Figure 12: Total CMP steps at different logic nodes

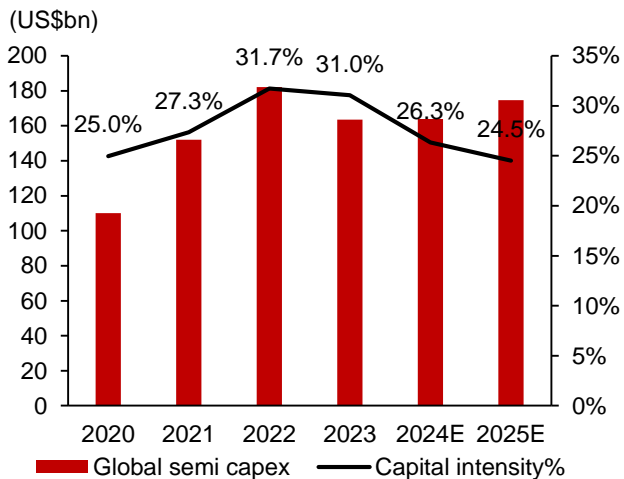


Source: Anji Technology company filings, CMBIGM

SME is forecasted to rebound on surging GenAI investment and recovering memory demand in 2024

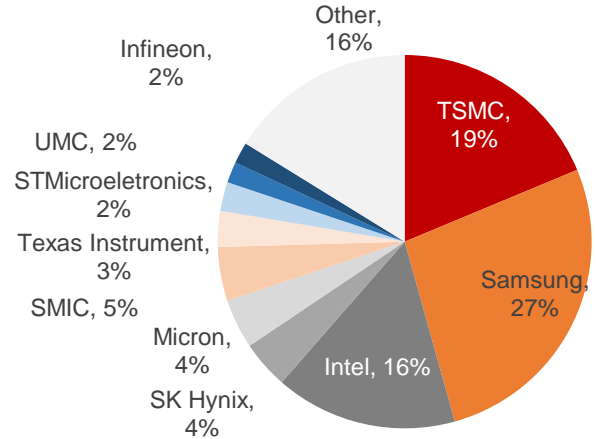
Semi industry is expected to witness a substantial growth rebound of 18% in 2024 (avg. estimate of multiple industry forecasts). As for global semi capex, Gartner predicts a similar level of spending in 2024 before resuming growth of 6.6% in 2025.

Figure 13: Worldwide semiconductor capex (2020-2025E)



Source: Company data, Gartner, Bloomberg, CMBIGM

Figure 14: Global semi capex breakdown: top 10 accounted for 84% of the total in 2023



Source: Company data, Gartner, Bloomberg, CMBIGM

In 2024, we think the majority of global semi capex expansion will come from memory/HBM giants (i.e., SK Hynix, Micron, and Samsung Electronics), the key beneficiaries of surging demand for AI infrastructure. According to TrendForce, HBM supply bit growth is projected to be 260% in 2024. By the end of 2024, revenue contribution from HBM is expected to reach 20.1% of total DRAM industry, up from 8.4% in 2023.

HBM suppliers are all expanding aggressively to increase production and invest in R&D, to secure clients' orders and snap up market share. According to Bloomberg, SK Hynix and Micron are projected to increase their capex by 37%/16% this year, to ramp up production for HBM as the capacity is fully booked in 2024.

This leads to increasing demand for memory production equipment, especially for HBM. Consequently, based on ASML's 1Q24 results, memory dominates the company's bookings, accounting for 60% of the order value.

Figure 15: SK Hynix and Micron's capex to increase by 37%/16% on capacity expansion

US\$bn	2020	2021	2022	2023	2024E	2025E
SK Hynix	9	11	15	6	9	11
...yoy%	-28.7%	28.8%	34.4%	-54.0%	37.1%	23.8%
...capex as % of revenue	31.6%	29.4%	42.5%	27.2%	20.1%	20.2%
Micron	9	11	11	7	8	10
...yoy%	-0.1%	17.1%	6.6%	-37.6%	16.4%	27.5%
...capex as % of revenue	40.9%	35.6%	41.4%	43.4%	29.2%	27.1%

Source: Company data, Bloomberg, CMBIGM

Semi localization needs and government subsidies support the soaring spending in key regions

In 2023, global sales of semiconductor manufacturing equipment slightly declined by 1.3% to US\$106.3bn from 2022's peak of US\$108bn. China led the spending at US\$36bn with a 29.5% increase, followed by South Korea and China's Taiwan region with a 7.3% and 26.8% decline, respectively. North America came in the fourth place, with a 15.1% rise. Europe experienced a modest 3% uptick, while sales in Japan and the Rest of the World fell by 5% and 38.6%, respectively.

Figure 16: Semi equipment sales YoY growth by region

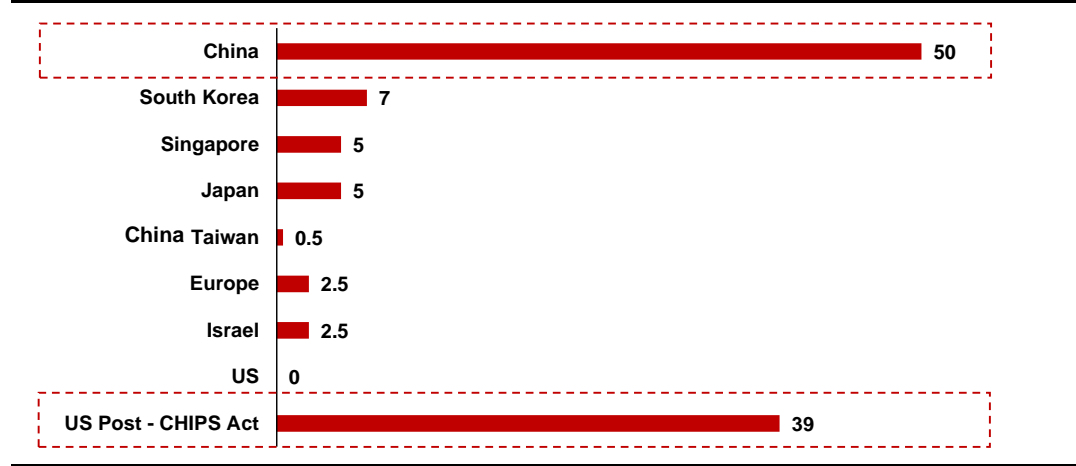
Global Semi Equip. billings	2019	2020	2021	2022	2023
(US\$bn)					
China, excluding Taiwan	13	19	30	28	37
yoy%		39.2%	58.2%	-4.6%	29.5%
South Korea	10	16	25	22	20
yoy%		61.3%	55.3%	-13.9%	-7.3%
Taiwan region	17	17	25	27	20
yoy%		0.2%	45.4%	7.5%	-26.8%
North America	8	7	8	10	12
yoy%		-19.9%	16.5%	37.6%	15.1%
Japan	6	8	8	8	8
yoy%		20.9%	2.9%	7.1%	-5.0%
Europe	2	3	3	6	6
yoy%		15.8%	23.1%	92.9%	3.0%
Rest of the world	3	2	4	6	4
yoy%		-1.6%	79.0%	33.8%	-38.6%
Total semi equip. billings	60	71	103	108	106
yoy%		19.1%	44.2%	4.9%	-1.3%

Source: SEMI, CMBIGM

It is clear that the growth of semi equipment billings in China and North America remains robust (+29.5%/15.1% in 2023), driven by semi localization needs and supported by government subsidies. To support semi localization, both China and US governments subsidize or plan to subsidize local semi companies to expand capacities, increase R&D, etc. The subsidies of these two countries are expected to be US\$50bn and US\$39bn (post-CHIPS Act), ranked top globally, according to SIA. Japan has also subsidized the semiconductor industry for a total amount of JPY3.9tn (US\$25.7bn) over the past three years, equivalent to 0.71% of its GDP, per Digitimes.

According to AMEC's prospectus, it was estimated that the investments in large-scale advanced integrated circuit production lines could reach US\$10bn in 2021, more than 75% of which are spent on semiconductor equipment purchases. As a result, **these sovereign-backed projects will substantially increase the billings of semiconductor equipment.**

Figure 17: Semiconductor manufacturing subsidies by region (US\$bn, 2023)



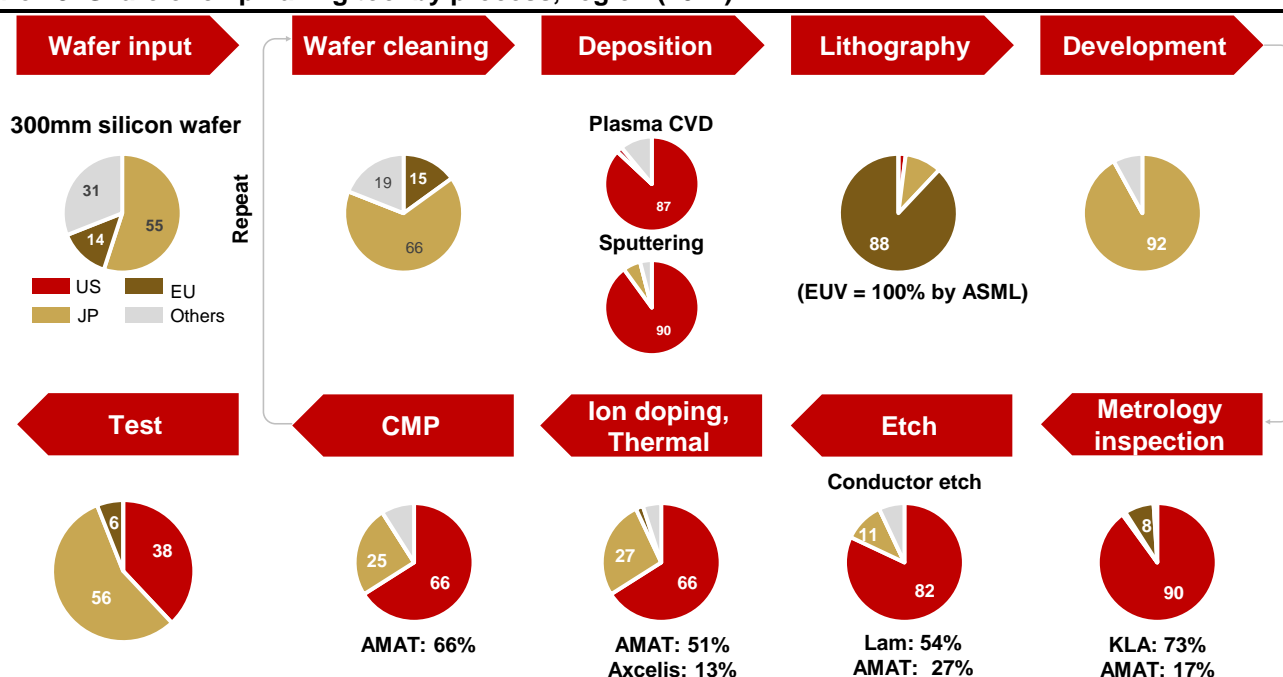
Source: SIA, Association for Advancing Automation

The semiconductor equipment suppliers are the key beneficiaries to ride these tailwinds

Current market leaders are expected to maintain their leading position

The US, Japan, and Europe dominated the chipmaking tool market by most processes in 2022. Below is a detailed share breakdown by geography.

Figure 18: Share of chipmaking tool by process, region (2022)



Source: Company data, Bloomberg, CMBIGM estimates

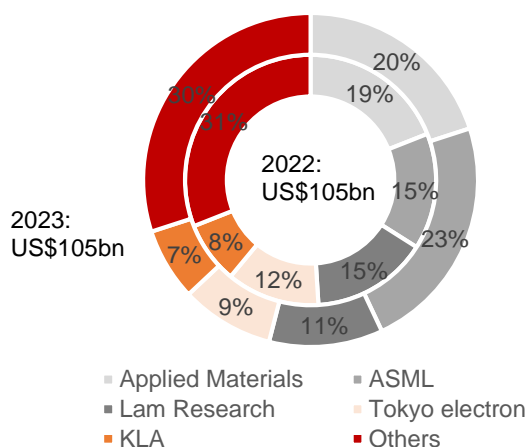
- **Wafers:** Japan dominates the global market with a 55% share, followed by the EU and other countries.
- **Cleaning:** Japan also leads in cleaning technologies, taking up approximately 66% of the global market, with the EU trailing behind.
- **Deposition:** The US holds the global majority in deposition technologies, especially in plasma CVD and sputtering. Notable American companies include **Applied Materials (AMAT US)** and **Lam Research (LRCX US)**.
- **Lithography:** This market is highly concentrated, with **ASML (ASML NA)** nearly monopolizing it with an 88% share, while smaller competitors like **Nikon** and **Canon** from Japan hold minor positions.
- **Development:** **Tokyo Electron (8035 JP)** of Japan captures a significant 90% of the global market for development equipment.
- **Metrology Inspection:** The US is a major player in metrology equipment, with leading firms such as **KLA (KLAC US)** and **Applied Materials (AMAT US)**.
- **Etching:** The US leads in etching equipment globally, featuring prominent companies like **Lam Research (LRCX US)** and **Applied Materials (AMAT US)**.
- **Ion Doping:** The US dominates in Ion Implantation equipment, with principal companies including **Applied Materials (AMAT US)** and **Axcelis (ACLS US)**. Japan also maintains a considerable share, highlighted by **SMIT (6302 JP)**.
- **CMP (Chemical Mechanical Polishing):** **Applied Materials (AMAT US)** from the US holds a dominant 66% of the global market, followed by Japan with 25%.

- **Testing:** Japan leads in semiconductor testing equipment, with major companies like Advantest (6857 JP) and Shikino (6614 JP). The US follows with players such as **Keysight Technologies (KEYS US)** and **Teradyne (TER US)**.

Current leaders in semi equipment market are Applied Materials, ASML, Lam Research, Tokyo Electron and KLA, with 20%/23%/11%/9%7% market share in 2023, respectively. The five leaders accounted for a total share of 70% in 2023.

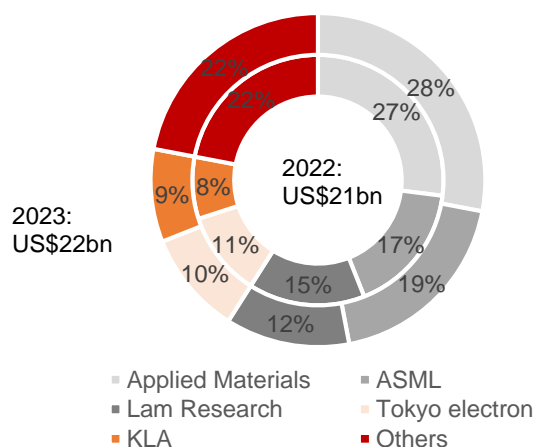
These suppliers benefited from technological advancement and geopolitical risks. According to Yole, ASML's share increased meaningfully from 15% in 2022 to 23% in 2023, as advanced logic and DRAM manufacturers gave the priority to purchasing patterning equipment. Applied Materials' market share also expanded by 1% on a broader product portfolio that supports the other manufacturing process of chips.

Figure 19: WFE revenue: 2022 vs. 2023



Source: Yole, CMBIGM

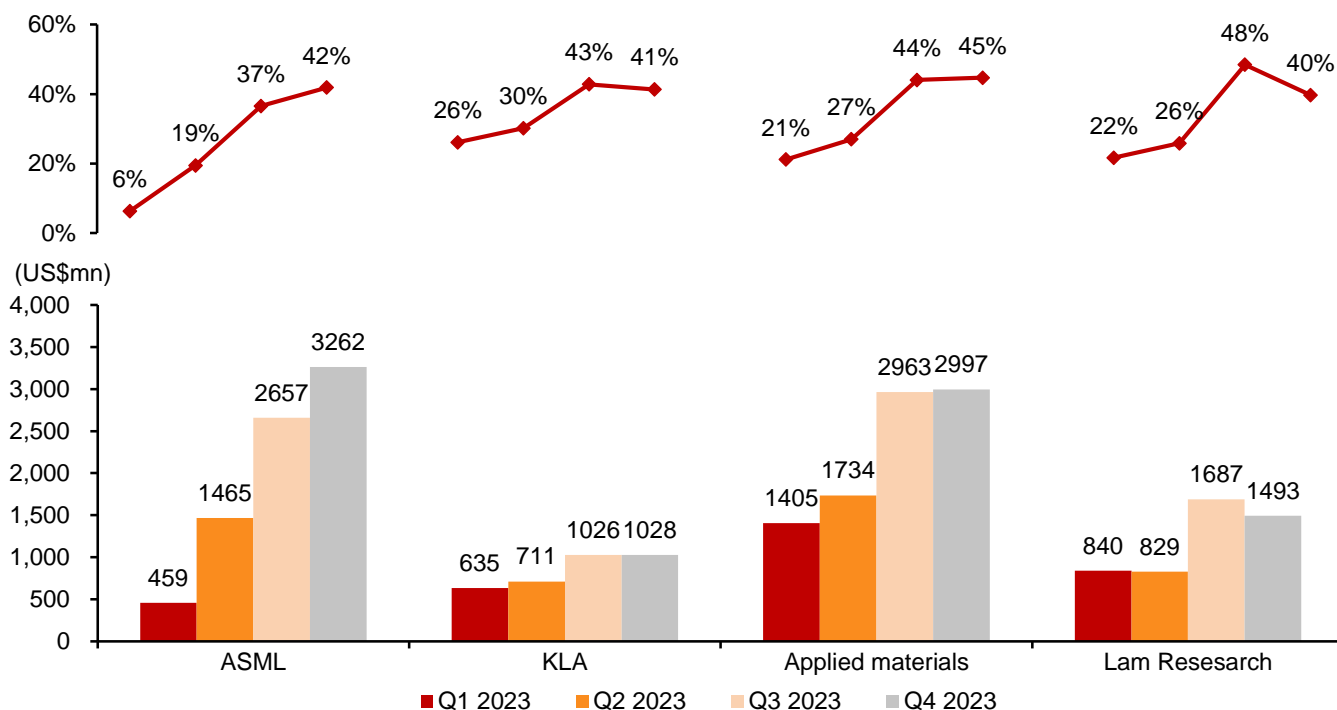
Figure 20: Service and support revenue: 2022 vs. 2023



Source: Yole, CMBIGM

In addition, their revenue from China increased significantly and now accounts for 40%+ of their total revenue. **We expect these market leaders to maintain their leading positions as technological advancement continues and geopolitical risk persists.**

Figure 21: Revenue breakdown by geography and China revenue contribution (as a % of total revenue)



Source: Company data, Bloomberg, CMBIGM

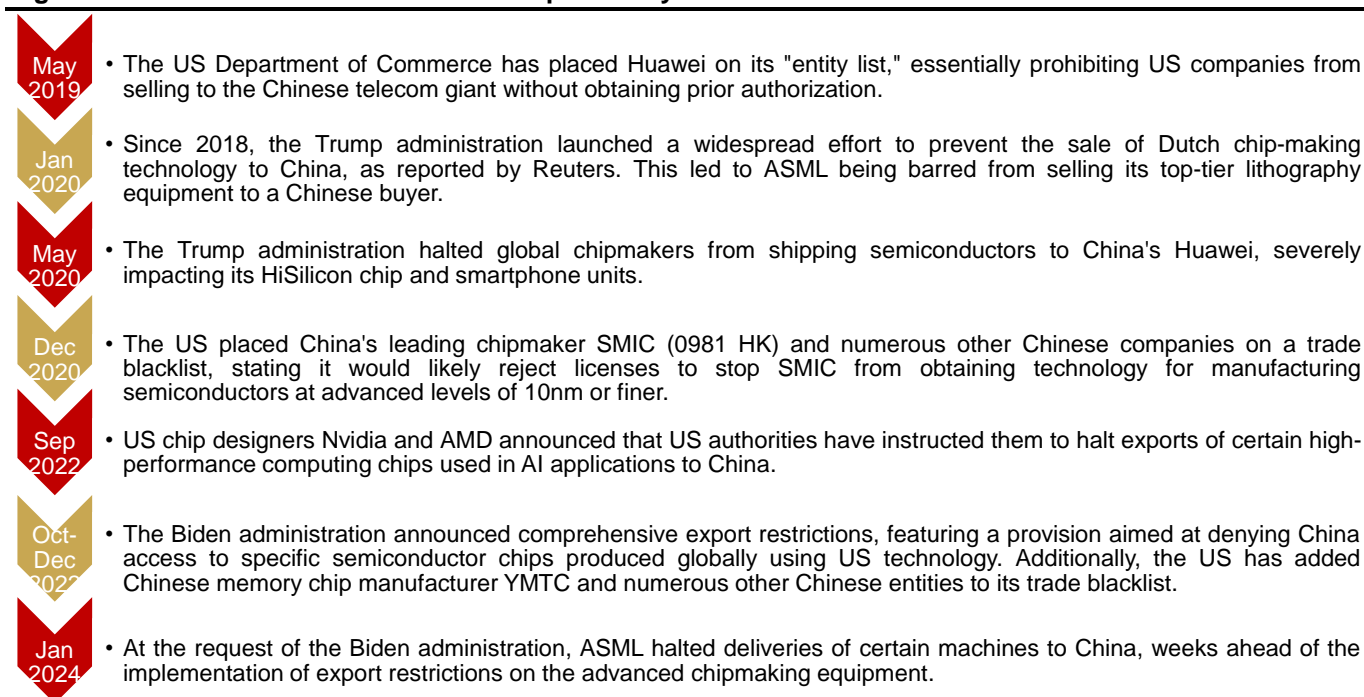
China suppliers: ride the tailwinds of soaring domestic demand, driven by capacity expansion, new project rollouts and self-reliance needs

China is the largest semi equipment market with 29.5% growth in terms of equipment billings despite a 1% decline worldwide

China leads equipment spending at US\$37bn with a 29.5% increase in 2023. China's expenditure accounted for 35% of total semi equipment billings worldwide in 2023, 9% higher than 2022. This is a result of the intensified geopolitical tensions, which has reversed the globalization trend of semi supply chain.

Geopolitical tensions have forced major economies to build localized semi capacity to enable their control on supply chain. Since 2019, a series of US sanctions on Chinese technology firms and tightened restrictions on China's access to advanced semiconductor technologies have forced China to seek self-reliance in semiconductor industry. Hundreds of billions of yuan has been invested and local chip makers are rushing to find domestic alternatives. **A positive flywheel is forming, and domestic equipment firms have seen a boost in revenue and net profits.** ([link](#))

Figure 22: Tech sanctions on China in the past few years



Source: Public info, CMBIGM

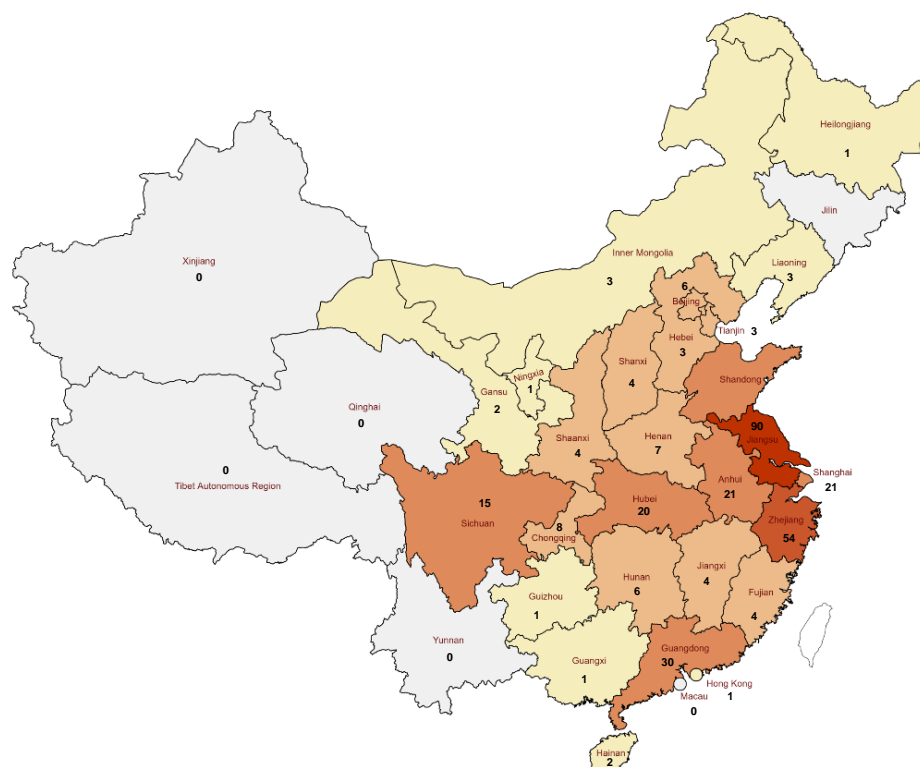
China regional investments are accelerating

According to TrendForce's latest report ([link](#)), China's semi equipment industry is making progress but still faces challenges. While domestic equipment covers many manufacturing stages, such as **cleaning, and etching, with notable achievement in areas like CMP, thermal processing, and deposition**, Chinese equipment manufacturers still lag in key stages, such as lithography.

China currently operates 44 fabs, with 22 under construction and plans for an additional 10. By end-2024, China is expected to establish 32 large-scale fabs focusing on mature processes. TrendForce predicts that during 2023-2027, global mature process (28nm and above) and advanced process (16nm and below) will maintain a ratio of approximately 7:3. China, while driven by localization policies and subsidies, is expected to increase the proportion of mature process capacity from 29% to 33% by 2027, with SMIC, Hua Hong Semiconductor, and Nexchip leading the production capacity expansion.

In 2023, despite global industry challenges, China's semiconductor sector demonstrated significant growth with a 14% YoY surge in chip manufacturing equipment imports, totaling nearly US\$40bn. Notably, imports from the Netherlands in January-February 2024 soared by 256.1% YoY, with a total of 32 systems imported. This indicates robust growth from the prior year, albeit with a decline from the previous quarter.

Figure 23: China's semi projects (2023)



Source: TrendForce, CMBIGM

Note: the calculation for fabs exclude those in the Taiwan region

Competitive landscape

Figure 24: Product offerings of Chinese semiconductor equipment manufacturers

Process	Ingot		Front-end														Back-end			
Equipment Types	Silicon	Sic	Etching	Cleaning	Deposition			Thermal Processing		Lithography		Ion Implantation	CMP	Photoresist Stripping	Front-End Test		Test			Advanced Packaging
Company /Subdivision Equipment				Cleaning Machine	PVD	CVD	ALD	Oxidation Furnace	RTP Equipment	Coating & Developing	Lithography Machine	Ion Implantation Machine	CMP Equipment	Photoresist Stripping Machine	Inspection	Measurement	Test Machine	Sorting Machine	Probe Station	
Naura	√	√	√	√	√	√	√	√												√
Jingsheng Mechanical & Electrical	√	√				√														
AMFE			√			√	√													
ACM Research				√			√	√		√			√							
PNC Process Systems				√																√
Hwatsing Technology													√							
Piotech						√	√													
Changchuan Technology																	√	√	√	√
KINGSEMI			√	√						√				√						
Xinyichang Technology																				
Skyverse Technology															√	√				
Huafeng Test & Control Technology																	√			
Crystal Growth & Energy Equipment	√	√																		
E-town Semiconductor			√						√					√						
SMEE											√									

Source: TrendForce, CMBIGM

Naura Technology (002371 CH)

Capitalizing on tailwinds for long-term dominance

Chinese SME suppliers are set to grow their market share by advancing in R&D and initiating new projects, fuelled by the country's focus on tech independence. Key domestic beneficiaries of this trend include Naura (002371 CH), AMEC (688012 CH), and ACM Research (688082 CH), with Naura standing out as our top pick. We Initiate Naura (002371 CH) at BUY, with TP of RMB405, based on 39x 2024E P/E, ~15% higher than 2-year historical average forward P/E.

- **Several key factors are going to drive robust revenue and profit growth for Naura in the coming years:** 1) Enhanced capex from clients capitalizing on GenAI demand and the resurgence in consumer electronics demand; 2) Consistent governmental policies promoting semi self-sufficiency, providing domestic players opportunities to capture market share; 3) As the leading semi equipment manufacturer in China with the most comprehensive product offerings, Naura leverages its financial strength and R&D capabilities to innovate and strengthen its market dominance.
- **The SME sector is cyclical, with US\$106bn in sales in 2023, about 20% of the total semi market sales.** Despite a minimal YoY decline in 2023, SME growth is expected at 3% in 2024 and a significant 18% in 2025 according to SEMI, supported by recovery in memory tech and new launches of edge computing devices, with spending projected to return to double-digit growth by 2025.
- **Geopolitical tensions and US sanctions since 2019 have driven major economies, including China, to enhance local semi production to secure supply chains.** This push towards self-reliance has spurred significant investment, with Chinese chipmakers accelerating the development of domestic alternatives, boosting revenue and profits for local SME firms.
- **We initiate coverage on Naura (002371 CH) at BUY, with TP of RMB405, based on 39x 2024E P/E, ~15% higher than 2-year historical average forward P/E.** We forecast Naura's total revenue to grow at a CAGR of 30.6% over FY23-26E and reach RMB49bn in FY26E. We feel comfortable with the valuation as 1) Naura's domestic peers also trade at 39x 2024E P/E and 2) we assume its 2024 EPS to grow by 41.0%, suggesting PEG is slightly lower than one.

Earnings Summary

(YE 31 Dec)	FY22A	FY23A	FY24E	FY25E	FY26E
Revenue (RMB mn)	14,688	22,079	30,477	40,625	49,229
YoY growth (%)	51.7	50.3	38.0	33.3	21.2
Gross margin (%)	43.8	38.8	37.9	37.6	37.4
Net profit (RMB mn)	2,353	3,899	5,499	7,618	9,461
YoY growth (%)	118.4	65.7	41.0	38.5	24.2
EPS (Adjusted) (RMB)	4.46	7.36	10.37	14.37	17.85
ROE (%)	12.8	18.0	21.0	23.6	23.6

Source: Company data, Bloomberg, CMBIGM estimates

BUY

Target Price RMB405.00
Up/Downside 32.8%
Current Price RMB304.98

China Semi

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Stock Data

Mkt Cap (RMB mn)	161,729
Avg 3 mths t/o (RMB mn)	1,643.05
52w High/Low (RMB)	349.48/ 213.42
Total Issued Shares (mn)	530

Source: FactSet

Shareholding Structure

Beijing Sevenstar Huadian Technology Group	33.6%
Beijing Electronics Holding Co Ltd	9.4%

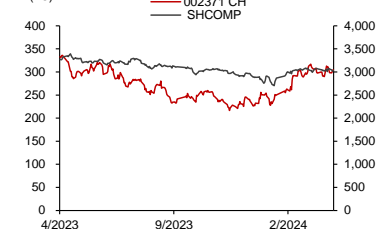
Source: Bloomberg

Share Performance

	Absolute	Relative
1-mth	-3.1%	-2.3%
3-mth	21.1%	11.1%
6-mth	29.1%	25.6%

Source: FactSet

12-mth Price Performance (LC)



Source: FactSet

Initiate coverage on Naura Technology (002371 CH) with BUY and TP of RMB405

Investment thesis

We expect Chinese SME suppliers to increase their market share as they advance in R&D and roll out new projects in response to the country's push for technological self-reliance. We identify Naura (002371 CH), AMEC (688012 CH), and ACM Research (688082 CH) as the principal domestic beneficiaries of these trends, with Naura standing out as our top pick.

We consider multiple tailwinds are propelling Naura to see continuous strong revenue and net profit growth in the years ahead: 1) improving capital spending on equipment from clients that are embracing the GenAI demand and recovery seen in consumer electronics; 2) consistent government policy on self-sufficiency in semi creates opportunities for home-grown companies to gain market share by filling the void left by foreign peers who are pulling out of China amid US export controls (current market share was only 6% for Naura, per our estimate); 3) as the largest semi equipment manufacturer by sales with the broadest product offerings in China, Naura has the financial flexibility and R&D capability to deliver more new products to enhance its leading position in the market.

- **SME is a cyclical industry.** The sector sales reached US\$106bn in 2023, ~20% of total semiconductor market sales (US\$527bn). The market is expected to grow 3% in 2024 and rebound significantly by 18% in 2025 (per SEMI). The decline was less than expected in 2023 thanks to the enormous demand for GenAI GPUs. For 2024, healthy recovery in memory demand and anticipation of launches of a series of edge computing-enabled electronic devices should support the growth of the SME sector. And **semi equipment spending is expected to resume double-digit growth in 2025, according to SEMI.**
- **Geopolitical tensions have forced major economies to build localized semi capacity to enable their control on supply chain.** Since 2019, a series of US sanctions on Chinese technology firms and tightened restrictions on China's access to advanced semiconductor technologies have forced China to seek self-reliance in semiconductor industry. Hundreds of billions of yuan have been invested and local chip makers are rushing to find domestic alternatives. **A positive flywheel is forming, and domestic equipment firms have seen a boost in revenue and net profits.**
- **As the largest equipment manufacturer in China with the broadest product offerings, Naura is fostering its leading position in China.** Naura has strong collaboration with almost all local chipmakers as a variety of its products have been installed and operated in chipmakers' fabs. Its solid balance sheet (>RMB10bn in cash) and great talent pool give it the financial power and R&D capability needed to make continuous progress.

Initiate coverage on Naura (002371 CH) at BUY, with TP of RMB405, based on 39x 2024E P/E, ~15% higher than 2-year historical average forward P/E. We forecast Naura's total revenue to grow at a CAGR of 30.6% over FY23-26E and reach RMB49bn in FY26E. We feel comfortable with the valuation as 1) Naura's domestic peers also trade at 39x 2024E P/E and 2) we assume its 2024 EPS grow by 41.0%, suggesting PEG is slightly lower than one.

Company overview

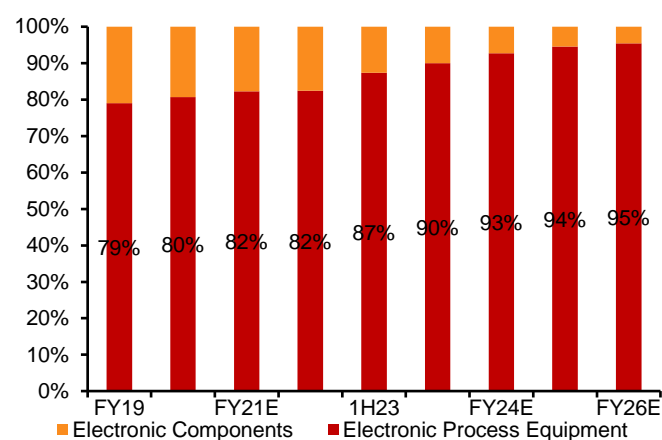
Naura is a China-based leading semiconductor equipment manufacturer which mainly engages in the R&D, production, sales, and technical services of process equipment including etching, film deposition, cleaning, and furnace. The company was established in 2001 and was previously known as Beijing Sevenstar Electronics.

In 2010, Beijing Sevenstar Electronics was listed on the Shenzhen Stock Exchange (Stock code: 002371 CH). In 2016, Beijing Sevenstar Electronics merged with Beijing North Microelectronics to become NAURA Technology Group.

Naura is currently a leading enterprise in high-end process equipment for IC (integrated circuit) in China. Its products span across multiple business segments, including semi equipment, vacuum and lithium battery equipment, and precision electronic components. These products are used in areas such as IC, advanced packaging, semi lighting, 3rd-gen semiconductors, new energy photovoltaics, new display tech, vacuum heat treatment, new energy lithium batteries, etc.

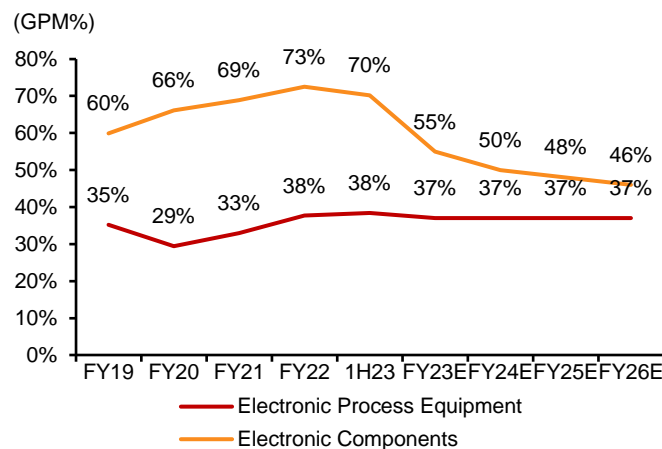
In 2022, 82% of Naura's revenue was generated from Electronic Equipment, with the remaining 18% coming from Electronic Components. Looking ahead, We anticipate that the Electronic Equipment segment will represent an even larger proportion of Naura's total revenue, as China continues to push forward its strategy for semiconductor equipment localization. Additionally, GPM for the Electronic Equipment segment is showing an increasing trend, while it is declining for the Electronic Components segment. This shift is expected to positively impact Naura's performance from a long-term perspective.

Figure 25: Revenue by business segment



Source: Company data, CMBIGM estimates

Figure 26: Gross profit margin by business segment

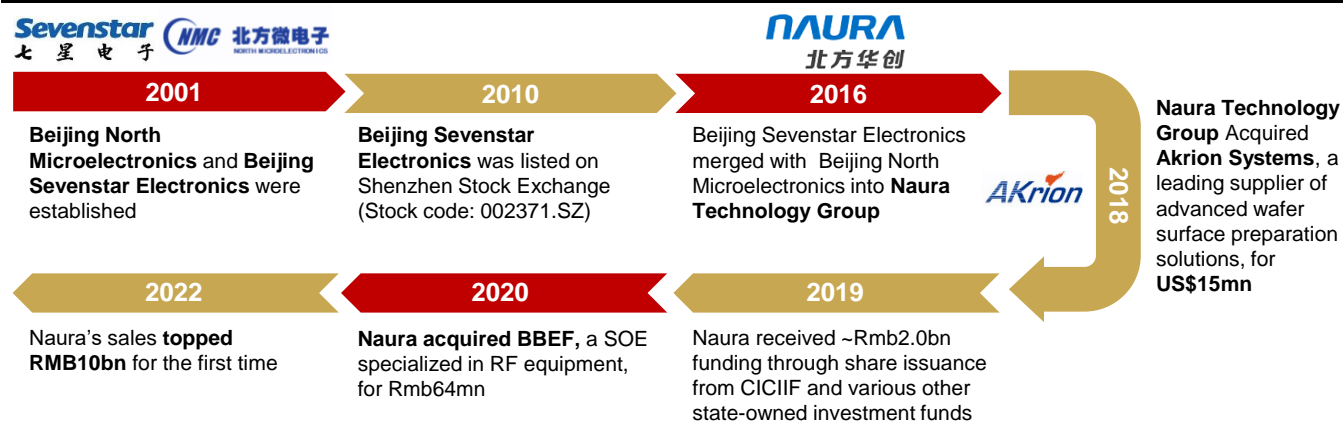


Source: Company data, CMBIGM estimates

Company history

Naura came from the merger of two companies, Beijing North Microelectronics and Beijing Sevenstar electronics, both of which were established in 2001. Beijing Sevenstar Electronics later went public in 2010 and merged with Beijing North Microelectronics in 2016 to become Naura Technology Group.

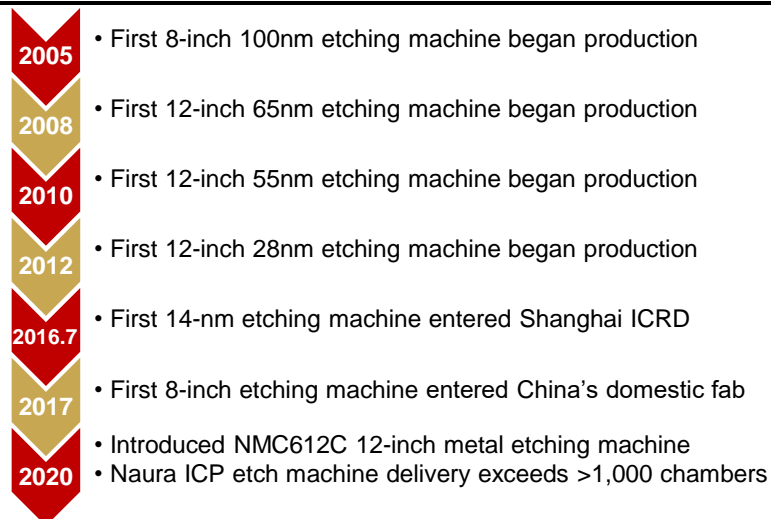
Figure 27: Naura's development history



Source: Company data, CMBIGM

In 2018, Naura acquired Akzion Systems, a top provider of advanced wafer surface preparation solutions for microelectronic device fabrication, for US\$15mn. In 2022, Naura achieved a milestone with total sales surpassing RMB10bn for the first time, showcasing the rapid pace of semiconductor industry localization in China.

Figure 28: Naura's product development milestone

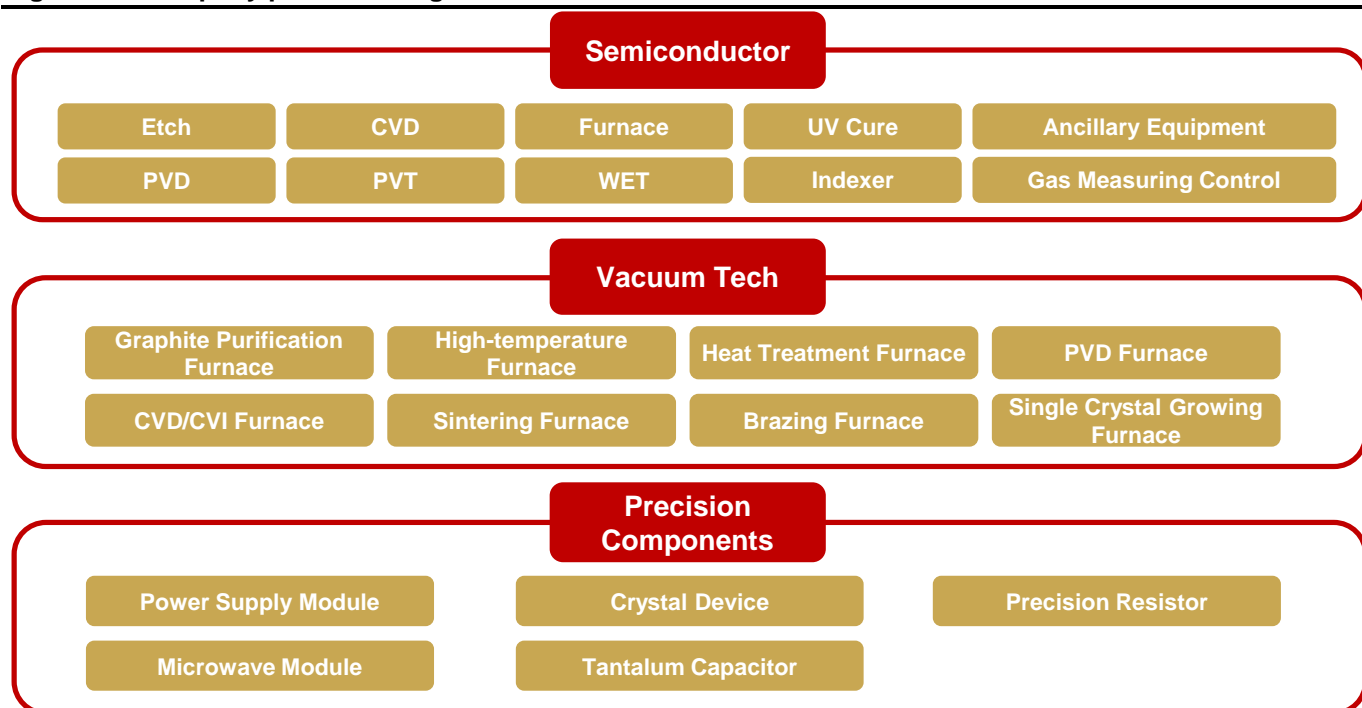


Source: Company data, CMBIGM

Company's main products

Naura offers three primary product lines: Semiconductor, Vacuum Tech, and Precision Components. The **Semiconductor** line is the most diverse, consisting of a wide range of applications such as integrated circuits, advanced packaging, power semiconductors, and new energy photovoltaics. The **Vacuum Tech** line specializes in advanced ceramics and metal heat treatment, among other areas. **Beijing Sevenstar Electronics** plays a crucial role in producing the company's **Precision Components**, which include power modules, crystal devices, precision resistors, and more.

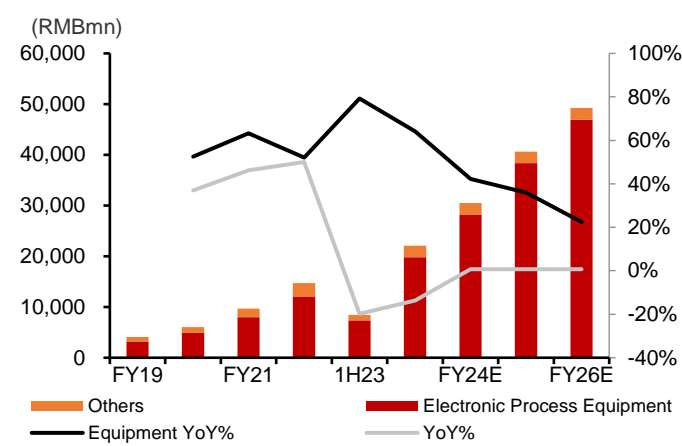
Figure 29: Company product categories



Source: Company data, CMBIGM

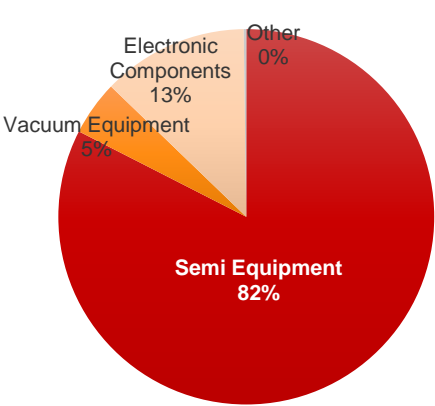
Naura saw its revenue surge by 50.3% YoY in 2023 and net profit increase by more than 65% YoY. The growth is heavily contributed by tech advancements that have expanded the company's market share through a variety of semi equipment. China's semi manufacturers have been compelled to seek domestic solutions, boosting sales for local manufacturers like Naura.

Figure 30: Naura’s revenue by business segment



Source: Company data, CMBIGM estimates

Figure 31: Naura’s revenue breakdown by type of product (1H23)



Source: Company data, CMBIGM

Financial analysis

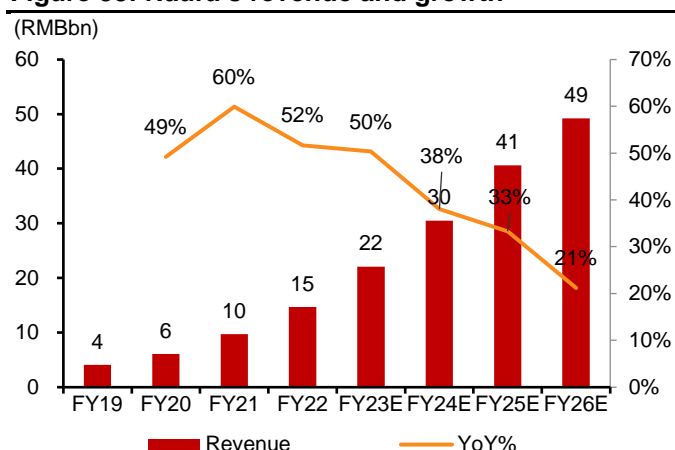
Naura announced strong preliminary 2023 and 1Q24 results recently. Naura's 2023 revenue and net profit were RMB22.1bn (50% YoY growth) and RMB3.9bn (66% YoY growth), respectively. For 1Q24, the company projected that its revenue to increase by 40%-61% to RMB5.4-6.2bn with net profit to rise by 76%-103% to RMB1.0-1.2bn. Solid results were due to stellar demand and market share gains. Naura signed RMB30bn worth of new orders in 2023, of which 70%+ were for semiconductor equipment.

Figure 32: Naura – financial review and forecasts

RMB mn	FY21	FY22	1Q23	2Q23	3Q23	4Q23E	FY23E	FY24E	FY25E	FY26E
Revenue	9,683	14,688	3,871	4,555	6,162	7,491	22,079	30,477	40,625	49,229
... YoY	60%	52%	81%	38%	35%	60%	50%	38%	33%	21%
... QoQ			-17%	18%	35%	22%				
Seasonality			18%	21%	28%	34%				
Cost of sales	(5,867)	(8,250)	(2,277)	(2,580)	(3,921)	(4,734)	(13,512)	(18,913)	(25,351)	(30,816)
Gross profit	3,817	6,438	1,594	1,976	2,241	2,757	8,568	11,564	15,274	18,413
... YoY	72%	69%	67%	26%	19%	35%	33%	35%	32%	21%
GPM (%)	39%	44%	41%	43%	36%	37%	39%	38%	38%	37%
SG&A	(344)	(2,224)	(488)	(546)	(618)	(1,084)	(2,735)	(3,134)	(3,709)	(4,178)
% of revenue	18%	15%	13%	12%	10%	14%	12%	10%	9%	8%
R&D	(1,297)	(1,845)	(367)	(485)	(537)	(899)	(2,288)	(2,892)	(3,692)	(4,436)
% of revenue	13%	13%	9%	11%	9%	12%	10%	9%	9%	9%
Other exp.	422	498	(10)	469	136	295	890	725	804	976
% of revenue	4%	3%	0%	10%	2%	4%	4%	4%	2%	2%
OP	1,236	2,867	729	1,415	1,222	1,069	4,435	6,262	8,677	10,775
... YoY	85%	132%	151%	91%	9%	50%	55%	NA	39%	24%
OPM (%)	13%	20%	19%	31%	20%	14%	20%	21%	21%	22%
Net profit	1,077	2,353	592	1,208	1,085	1,015	3,899	5,499	7,618	9,461
YoY	101%	118%	187%	120%	16%	52%	66%	41%	39%	24%
QoQ			-11%	104%	-10%	-6%				
NPM (%)	11%	16%	15%	27%	18%	14%	18%	18%	19%	19%

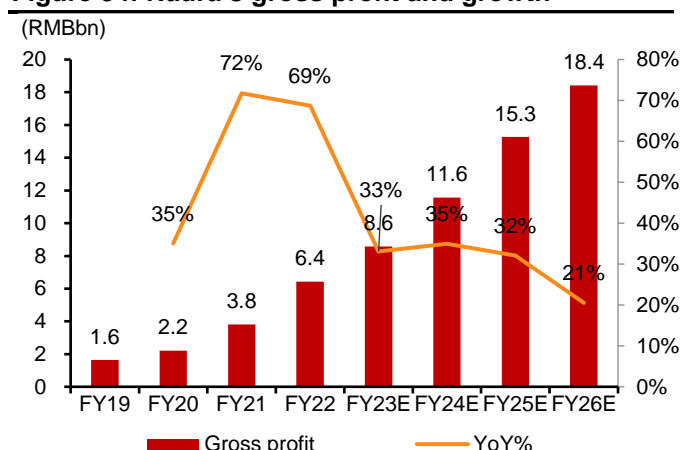
Source: Company data, CMBIGM estimates

Figure 33: Naura's revenue and growth



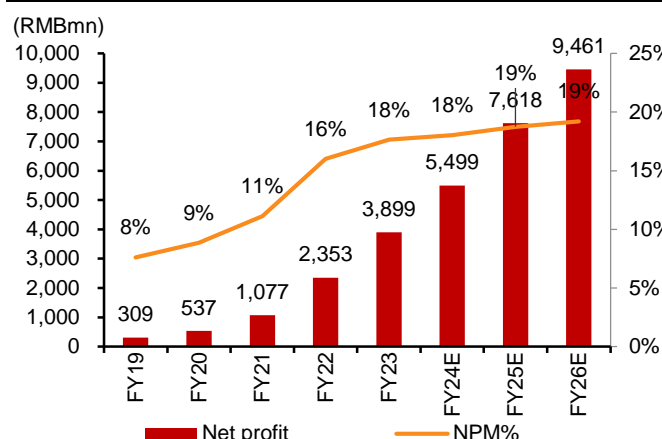
Source: Company data, CMBIGM estimates

Figure 34: Naura's gross profit and growth



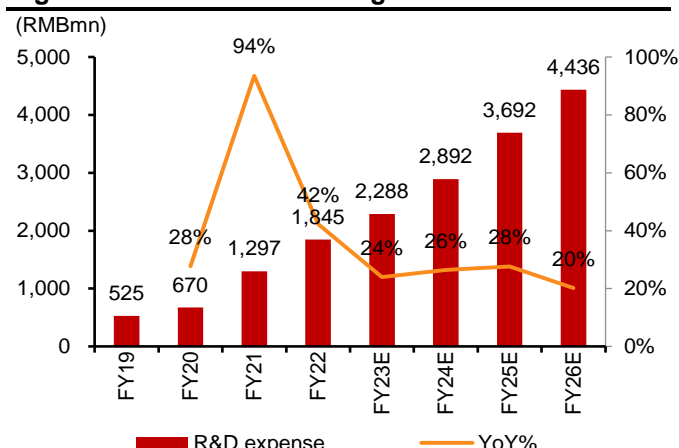
Source: Company data, CMBIGM estimates

Figure 35: Naura's net profit and NPM



Source: Company data, CMBIGM estimates

Figure 36: Naura's R&D and growth



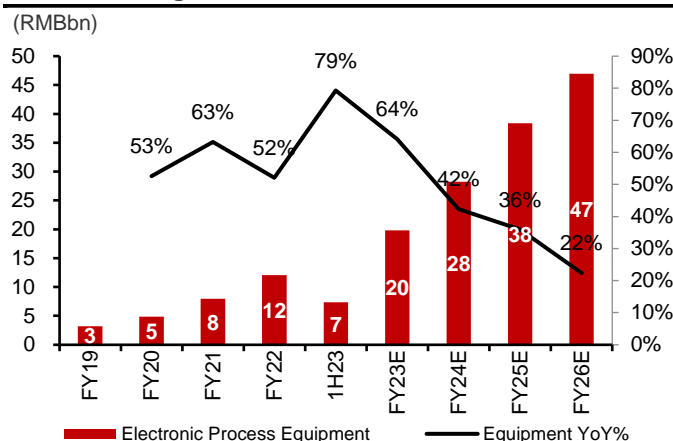
Source: Company data, CMBIGM estimates

Semi equipment has been the main revenue driver for the company's total revenue in the past years, commanding as much as 82.5% of the total revenue generated in 1H23 as well as demonstrating robust growth.

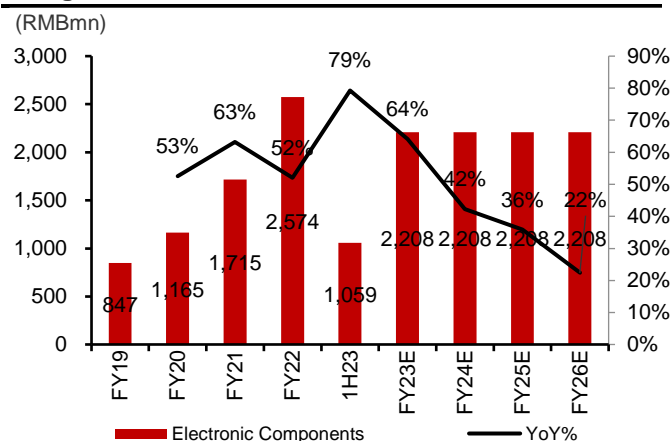
Figure 37: Naura's revenue breakdown by product segment

(RMBmn)	1H21	FY21	1H22	FY22	1H23	FY23E	FY24E	FY25E	FY26E
Semi equipment	2,495	7,121	3,871	11,433	6,953	18,752	27,135	37,265	45,855
YoY%	90.8%	71.4%	55.1%	60.6%	79.6%	64.0%	44.7%	37.3%	23.1%
%	69.2%	73.5%	71.1%	77.8%	82.5%	84.9%	89.0%	91.7%	93.1%
Vacuum equipment	330	828	229	651	396	1,082	1,082	1,082	1,082
YoY%	-22.0%	15.9%	-30.7%	-21.3%	72.8%	66.1%	0.0%	0.0%	0.0%
%	9.2%	8.5%	4.2%	4.4%	4.7%	4.9%	3.5%	2.7%	2.2%
Electronic Process Equipment	2,826	7,949	4,100	12,084	7,349	19,833	28,217	38,347	46,936
YoY%	63.8%	63.2%	45.1%	52.0%	79.3%	64.1%	42.3%	35.9%	22.4%
%	78.3%	82.1%	75.3%	82.3%	87.2%	89.8%	92.6%	94.4%	95.3%
Electronic Components	773	1,715	1,334	2,574	1,059	2,208	2,208	2,208	2,208
YoY%	75.4%	47.2%	72.5%	50.1%	-20.6%	-14.2%	0.0%	0.0%	0.0%
%	21.4%	17.7%	24.5%	17.5%	12.6%	10.0%	7.2%	5.4%	4.5%
Other	9	20	10	29	19	38	53	70	85
YoY%	-15.5%	-9.3%	11.0%	47.6%	83.4%	29.8%	38.0%	33.3%	21.2%
%	0.3%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%
Total revenue	3,608	9,683	5,444	14,688	8,427	22,079	30,477	40,625	49,229
YoY%	66%	60%	51%	52%	55%	50.3%	38.0%	33.3%	21.2%

Source: Company data, CMBIGM estimates

Figure 38: Naura's Electronic Process Equipment revenue and growth


Source: Company data, CMBIGM estimates

Figure 39: Naura's Electronic Components revenue and growth


Source: Company data, CMBIGM estimates

Valuation and risks

Initiate coverage on Naura (002371 CH) with BUY and TP at RMB405, based on 39x 2024E P/E, ~15% higher than 2-year historical average forward P/E. We forecast Naura's total revenue to grow at a **CAGR of 30.6% over FY23-26E** and **reach RMB49bn in FY26E**. We feel comfortable with the valuation as 1) Naura's domestic peers also trade at around 39x 2024E P/E and 2) we assume its 2024 EPS to grow by 41.0%, suggesting PEG is slightly lower than one.

Potential risks: 1) slower-than-expected semiconductor localization, and 2) greater competition from overseas and domestic peers than we expect.

Figure 40: Peers comparison

Company	Ticker	Mkt Cap US\$(mn)	Price (LC)	P/E (x)		P/B (x)		ROE (%)		EPS (US\$)	
				FY24E	FY25E	FY24E	FY25E	FY24E	FY25E	FY24E	FY25E
ASML	ASML NA	365,815	913.40	44.8	28.7	22.2	18.2	50.0	66.1	20.36	31.84
Applied Materi	AMAT US	166,088	209.48	24.2	20.9	9.0	8.1	39.1	39.4	8.26	9.57
Lam Research	LRCX US	119,600	963.23	31.2	25.2	14.4	12.8	45.4	50.2	29.26	36.27
KLA	KLAC US	89,116	693.31	28.7	23.5	29.3	21.0	98.3	92.6	22.93	28.02
Axcelis	ACLS US	3,316	104.32	14.4	11.7	-	-	22.8	22.5	7.07	8.66
Teradyne	TER US	15,614	104.93	35.0	21.7	6.6	5.6	18.9	27.4	2.92	4.71
Peers Avg.				29.7	21.9	16.3	13.1	45.7	49.7	15.1	19.8
Peers Median				30.0	22.6	14.4	12.8	42.2	44.8	14.3	18.8
AMEC	688012 CH	11,812	143.59	42.5	32.7	4.4	3.9	10.5	12.2	0.45	0.58
KINGSEMI	688037 CH	2,055	96.15	39.8	27.0	5.5	4.7	14.1	16.9	0.38	0.56
Piotech	688072 CH	4,716	177.91	38.9	27.2	6.6	5.4	16.4	18.7	0.64	0.92
ACMR	688082 CH	4,936	79.92	32.0	25.0	4.8	3.9	15.4	16.6	0.36	0.46
Peers Avg.				38.3	28.0	5.3	4.5	14.1	16.1	0.5	0.6
Peers Median				39.4	27.1	5.2	4.3	14.7	16.8	0.4	0.6
Advantest	6857 JP	28,444	5715.00	64.1	40.6	10.4	9.3	17.3	24.2	0.58	0.92
SMIT	6302 JP	3,650	4612.00	12.5	10.9	0.9	0.8	7.1	7.7	2.42	2.78
Tokyo Electr	8035 JP	112,176	37660.00	49.9	37.8	10.3	9.0	21.5	25.4	4.76	6.29
Nikon	7731 JP	3,490	1526.50	18.8	16.9	0.9	0.8	4.6	4.8	0.53	0.59
Canon	7751 JP	37,871	4421.00	14.3	13.7	1.2	1.2	8.8	9.0	1.98	2.07
Peers Avg.				31.9	24.0	4.7	4.2	11.9	14.2	2.1	2.5
Peers Median				18.8	16.9	1.2	1.2	8.8	9.0	2.0	2.1

Source: Bloomberg, CMBIGM

Note: Data as of 16 April, 2024

Financial Summary

INCOME STATEMENT	2021A	2022A	2023E	2024E	2025E	2026E
YE 31 Dec (RMB mn)						
Revenue	9,683	14,688	22,079	30,477	40,625	49,229
Cost of goods sold	(5,867)	(8,250)	(13,512)	(18,913)	(25,351)	(30,816)
Gross profit	3,817	6,438	8,568	11,564	15,274	18,413
Operating expenses	(2,580)	(3,571)	(4,132)	(5,301)	(6,597)	(7,638)
Selling expense	(84)	(135)	(156)	(182)	(222)	(245)
Admin expense	(1,193)	(1,421)	(1,789)	(2,069)	(2,521)	(2,841)
SG&A expense	(512)	(802)	(946)	(1,065)	(1,188)	(1,336)
R&D expense	(1,297)	(1,845)	(2,288)	(2,892)	(3,692)	(4,436)
Others	507	633	1,046	907	1,026	1,221
Operating profit	1,236	2,867	4,435	6,262	8,677	10,775
Other income	18	14	9	0	0	0
Other expense	(2)	(27)	(0)	0	0	0
Pre-tax profit	1,253	2,854	4,445	6,262	8,677	10,775
Income tax	(59)	(313)	(426)	(600)	(831)	(1,032)
After tax profit	1,193	2,541	4,019	5,663	7,846	9,743
Minority interest	116	188	120	164	228	283
Net profit	1,077	2,353	3,899	5,499	7,618	9,461

BALANCE SHEET	2021A	2022A	2023E	2024E	2025E	2026E
YE 31 Dec (RMB mn)						
Current assets	22,323	31,117	41,963	51,673	66,654	80,116
Cash & equivalents	9,031	10,261	13,990	16,597	22,467	27,912
Restricted cash	37	173	46	46	46	46
Account receivables	1,899	2,995	4,385	5,301	6,719	8,117
Inventories	8,035	13,041	18,425	23,029	28,784	33,693
Prepayment	658	1,551	1,295	1,787	2,382	2,887
Other current assets	2,368	2,705	3,418	4,414	5,623	6,706
Contract assets	296	391	404	497	632	755
Non-current assets	8,732	11,434	14,211	17,498	21,271	24,921
PP&E	2,423	2,484	2,904	3,540	4,367	5,325
Right-of-use assets	68	147	145	149	158	162
Intangibles	2,063	2,003	2,900	3,789	4,687	5,537
Goodwill	17	18	28	28	28	28
Other non-current assets	4,162	6,782	8,235	9,992	12,032	13,869
Total assets	31,054	42,551	56,174	69,171	87,925	105,037
Current liabilities	11,268	15,770	22,372	28,175	37,240	42,247
Short-term borrowings	0	227	45	97	163	222
Account payables	3,499	5,592	6,994	8,551	10,896	12,744
Other current liabilities	2,723	2,752	4,317	5,400	6,794	8,057
Contract liabilities	5,046	7,198	11,016	14,126	19,387	21,225
Non-current liabilities	2,588	6,797	9,856	11,777	14,173	17,297
Long-term borrowings	0	3,740	5,874	6,897	7,996	9,937
Bond payables	0	0	0	0	0	0
Other non-current liabilities	2,588	3,057	3,982	4,880	6,177	7,359
Total liabilities	13,856	22,567	32,228	39,953	51,412	59,544
Share capital	526	529	530	530	530	530
Retained earnings	2,924	5,159	8,823	13,931	20,998	29,696
Other reserves	13,448	14,058	14,235	14,235	14,235	14,235
Total shareholders equity	16,898	19,746	23,588	28,696	35,763	44,461
Minority interest	301	238	358	522	749	1,032
Total equity and liabilities	31,054	42,551	56,174	69,171	87,925	105,037

CASH FLOW	2021A	2022A	2023E	2024E	2025E	2026E
YE 31 Dec (RMB mn)						
Operating						
Profit before taxation	1,193	2,541	4,019	5,663	7,846	9,743
Depreciation & amortization	460	552	525	720	904	1,130
Change in working capital	(3,133)	(4,424)	(3,823)	(3,949)	(4,932)	(4,461)
Others	703	603	4,359	3,567	6,167	2,688
Net cash from operations	(777)	(728)	5,080	6,000	9,984	9,100
Investing						
Capital expenditure	(447)	(1,409)	(3,374)	(4,165)	(4,862)	(5,066)
Acquisition of subsidiaries/ investments	0	0	0	0	0	0
Others	0	(14)	233	260	337	422
Net cash from investing	(447)	(1,423)	(3,141)	(3,904)	(4,525)	(4,644)
Financing						
Dividend paid	(114)	(241)	(381)	(580)	(773)	(1,031)
Net borrowings	(602)	3,453	1,991	1,075	1,165	2,000
Proceeds from share issues	8,497	157	175	0	0	0
Others	(101)	(24)	3	0	0	0
Net cash from financing	7,680	3,345	1,788	495	392	969
Net change in cash						
Cash at the beginning of the year	2,578	9,031	10,261	13,990	16,597	22,467
Exchange difference	(4)	37	1	16	18	20
Others	6,457	1,194	3,728	2,591	5,851	5,425
Cash at the end of the year	9,031	10,261	13,990	16,597	22,467	27,912

Source: Company data, CMBIGM estimates. Note: The calculation of net cash includes financial assets.

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