

# China Technology

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## Implications of global SPE leaders 3Q22 results on semi industry outlook

ASML and LAM announced solid 3Q22 revenue/earnings (+6%/21% QoQ, +10%/16% QoQ) last week, and guided conservative 2023 outlook due to US's new semi export controls to China and customer demand weakness on macro concerns, esp. memory segment. Regarding new US export restrictions, LAM expected revenue impact of US\$2-2.5bn (12-15% of sales) in 2023, and ASML estimated indirect impact of 5% on its backlog in 2023 as DUV systems for mature nodes can still be shipped to China. Regarding business outlook, LAM guided 20% WFE market decline in 2023 due to industry slowdown, while ASML expected limited impact given strong backlog for advanced nodes and capacity expansion. In our view, US's recent export controls and US Chips Act will accelerate localization of semi equipment/foundries in China given supply chain safety. Despite recent macro weakness and inventory correction, we believe Chinese semi localization remains the structural growth driver in the long run.

- **Impact on ASML/LAM from new US export restrictions to China.** LAM estimated total revenue impact from the new US restrictions to be in the range of US\$2-2.5bn in 2023 (12-15% of revenue). ASML expected limited direct impact on 2023 shipment, while indirect impact due to inability of other equipment suppliers would be around 5% of its backlog in 2023. In addition, the new regulations do not directly change US export controls on lithography equipment, and ASML can continue to ship all non-EUV lithography systems to China out of Netherlands. Also, ASML's business in China is mainly directed at mature nodes, which is not impacted by new export control.
- **Conservative 2023 outlook on end-demand weakness and new China export regulations.** LAM guided global WFE (wafer fab equipment) market of US\$90bn in 2022 and expect to decline 20% YoY in 2023, mainly due to new US export restrictions to China and end-demand weakness, especially memory segment. ASML expected uncertainty on customer capex spending due to inflation, consumer confidence and recession concerns, but 2023 shipment demand is still well above their build and shipment capacity in 2023, which is supported by largest-ever backlog of over EUR38bn. Almost 85% of backlog is for EUV and immersion for advanced nodes and related to wafer capacity expansions.
- **Supply chain safety and ongoing China-US tensions to accelerate semiconductor localisation.** Given ongoing export restrictions by the US, Chinese foundries are actively partnering with Chinese, European and Japanese equipment manufacturers to build non-US production lines for 28nm and above processes. For Chinese foundries, we believe US's new export controls will boost localization of Chinese semi equipment and increase demand for domestic foundries with mature nodes. Overall, we believe domestic semiconductors leaders will benefit from these trends, including fabless (Willsemi, Maxcend, SG Micro, 3Peak), IDM/foundry (SMIC, Huahong Semi, Wingtech), equipment players (Naura, ASM Pacific).

### Valuation Table

Name	Ticker	Mkt Cap	Price	P/E (x)		P/B (x)	ROE
		(US\$ mn)	(LC)	FY22E	FY23E	FY22E	FY22E
SMIC	981 HK	15,783	15.6	8.7	10.6	0.76	10.3
Hua Hong Semi	1347 HK	2,949	17.7	7.9	8.4	0.94	12.1

Source: Company data, CMBIGM estimates

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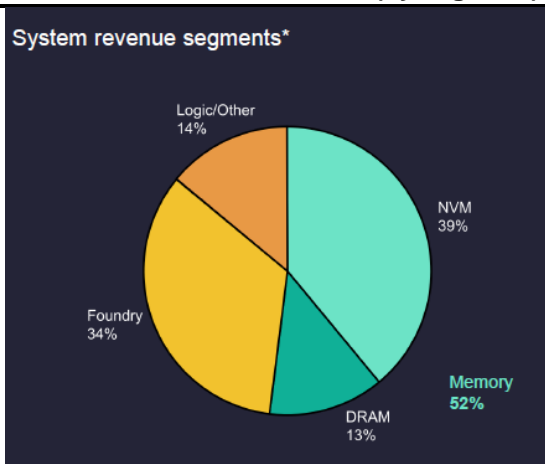
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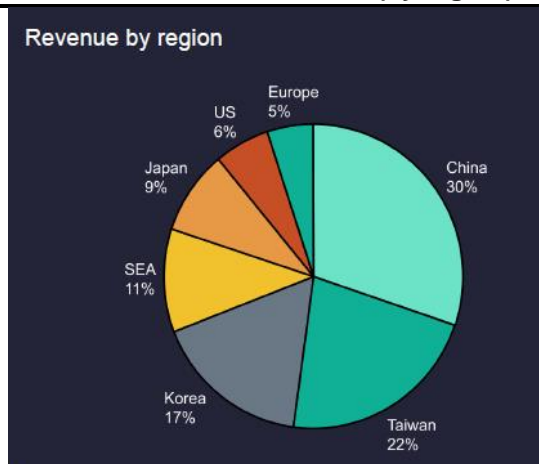
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Figure 1: LAM: 3Q22 revenue mix (by segment)



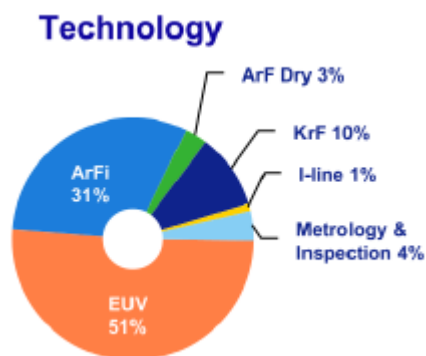
Source: LAM, CMBIGM estimates

Figure 2: LAM: 3Q22 revenue mix (by region)



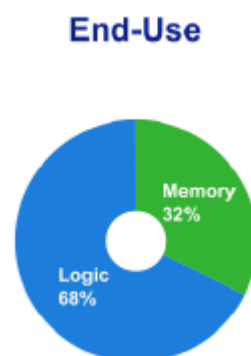
Source: LAM, CMBIGM estimates

Figure 3: ASML: 3Q22 sales mix (by technology)



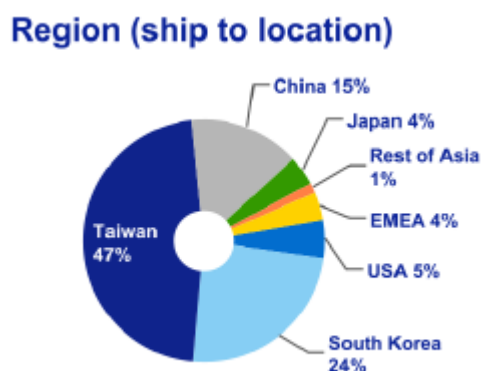
Source: ASML, CMBIGM estimates

Figure 4: ASML: 3Q22 sales mix (by segment)



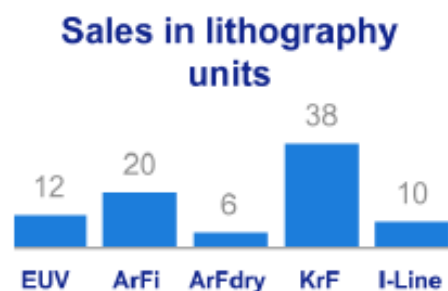
Source: ASML, CMBIGM estimates

Figure 5: ASML: 3Q22 sales mix (by region)



Source: ASML, CMBIGM estimates

Figure 6: ASML: 3Q22 lithography shipment



Source: ASML, CMBIGM estimates

**Figure 7: Timeline of US technology export restrictions to China**

Date	Sanction body	Published documents/Restrictions	Major impact
Jan.2017	PCAST	《Ensuring Long-Term US Leadership in Semiconductors》	The core finding of the report is: only by continuing to innovate at the cutting edge will the US be able to <b>mitigate the threat posed by Chinese industrial policy and strengthen the US economy</b> . Thus, the report recommends and elaborates on a three pillar strategy to:(i) <b>push back against innovation-inhibiting Chinese industrial policy</b> , (ii) improve the business environment for US-based semiconductor producers and (iii) help catalyze transformative semiconductor innovation over the next decade.
Apr.2018	US Department of Commerce	ZTE ban	The US government prohibited ZTE from purchasing sensitive products from US enterprises in the next 7 years; the ban was lifted in July
Aug.2018	US Congress	《National Defense Authorization Act for Fiscal Year 2018》	Prohibit government from procuring Huawei, ZTE, Hikvision and Dahua Technology's <b>production equipment</b>
Aug.2018	US Department of Commerce	44 entities added to the Entity List	Added enterprises include Aerospace Science and Engineering, CETC and its affiliated and subordinates
Sep.2018	US former president Trump	Additional tariff	Impose <b>10% tariff on Chinese goods</b> worth US\$200bn
Nov.2018	US Department of Commerce	Addition of Fujian Jinhua to the Entity List	Restrict exports to Fujian Jinhua Integrated Circuit Company, Ltd. (Jinhua) by adding them to the Entity List (Supplement No. 4 to Part 744 of the Export Administration Regulations (EAR)), because <b>Jinhua poses a significant risk of becoming involved in activities that are contrary to the national security interests of the United States</b> .
May.2019	US Department of Commerce	Huawei and Affiliates added to the Entity List	The designation imposes an export license requirement on <b>all exports, reexports, and transfers of items subject to the US Export Administration Regulations (EAR) to Huawei or the 68 listed affiliates</b> .
May.2020	US Department of Commerce	Restrict Huawei from obtaining foreign made chips developed or produced from US software or technology	Amended the longstanding foreign-produced direct product (FDP) rule to target Huawei's acquisition of semiconductors that are the direct product of certain U.S. software and technology. Amendment further refines the FDP rule by applying the control to transactions: 1) where <b>U.S. software or technology is the basis for a foreign-produced item that will be incorporated into, or will be used in the "production" or "development" of any "part," "component," or "equipment" produced, purchased, or ordered by any Huawei entity on the Entity List</b> ; or 2) when any Huawei entity on the Entity List is a party to such a transaction, such as a "purchaser," "intermediate consignee," "ultimate consignee," or "end-user."
Dec.2020	US Department of Commerce	SMIC added to the Entity list	The Entity List designation limits SMIC's ability to acquire certain U.S. technology by <b>requiring U.S. exporters to apply for a license to sell to the company</b> . Items uniquely required to produce semiconductors at advanced technology nodes— <b>10 nanometers or below</b> —will be subject to a <b>presumption of denial</b> to prevent such key enabling technology from supporting China's military-civil fusion efforts
Aug.2022	US Biden administration	Chips and Science Act	Invests nearly \$250 billion in semiconductor and scientific research and development (R&D).The legislation <b>seeks to return the United States to dominance in chipmaking and to combat supply chain issues that have arisen from the country's decline in science and technology</b> .
Oct. 2022	US Department of Commerce	US new chip export restrictions	First rule: 1) tighten existing restrictions on logic IC of 16nm/14nm or below (FinFET or GAAFET); 2) extends restrictions to memory IC category (DRAM of 18nm or below, and NAND with 128-layer or more); 3) <b>foreign-owned production facilities located in China will need to apply for approval for related equipment on a case-by-case basis</b> ; Second rule: added China's memory chipmaker Yangtze Memory and 30 other Chinese entities to "Unverified list"

Source: US govt., US BIS, CMBIGM

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