

ASML: THE FUTURE IS AI

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INVESTMENT VIEWS
FROM OUR PARTNERS
AT WALTER SCOTT

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KEY POINTS

1 We believe ASML's innovative lithography technology is central to semiconductors that power the global artificial intelligence (AI) revolution.

2 ASML expects AI-related demand to grow rapidly.

3 We expect ASML to continue to build on its unique position in the semiconductor supply chain.

In November, I was in the Dutch town of Veldhoven to hear the management team at ASML brief investors on the company's long-term strategy. The update came at an opportune moment. The previous month, ASML's third-quarter results had triggered volatility across the semiconductor sector, with its own share price falling 16% in the process.¹

The catalyst for the sell-off was the announcement of a more moderate growth outlook for 2025 and a decline in quarterly orders for ASML's lithography machines. Understanding why this news should have sparked such widespread volatility requires some context.

No ASML, No AI?

Spun out of Dutch electronics giant Philips in the 1980s, ASML is the dominant player for advanced microchip lithography,² the process of transferring patterns onto silicon wafers using light. Importantly, the company holds a monopoly position³ in the most advanced iteration of the technology, extreme ultra-violet (EUV).

Capable of producing incredibly small and complex patterns, EUV allows manufacturers such as Taiwan Semiconductor Manufacturing Company (TSMC) and Intel to compress more transistors on a single semiconductor. Without it, securing the massive computational power demanded by AI chips would be extremely challenging. ASML is one of the few companies that can reasonably claim to be indispensable to the AI revolution.

Reflecting its linchpin status in the global semiconductor supply chain, the company's fortunes are often viewed as a barometer for the wider industry. They are also increasingly parsed for clues to the health of AI-related demand. October's news was clearly interpreted by some investors as a worrying indicator for both ASML and for others in the semiconductor ecosystem.

¹ Yahoo! Finance UK, October 2024. ² Morningstar, "ASML is the Leader in EUR Lithography and has Rosy Growth Prospects in our View." ³ CNBC, "ASML is the only company making \$200 million machines needed to print every advanced microchip. Here's an inside look."

A Question of Time

We took a more sanguine view, seeing little of long-term concern in the results. Quarterly orders, generally lumpy at ASML, are a poor gauge of the company's progress, in our view. Furthermore, the downward tweak to the 2025 outlook reflected three factors that we believe were more about timing than any structural decline in demand.

First, Samsung and Intel, both major customers of ASML, have been deferring capital expenditure (capex) due to the ongoing struggles of their semiconductor foundry businesses. Both are suffering from low production yields and a lack of customer interest in their efforts.

The result is a deferral of capex and a requirement for less leading-edge lithography equipment over the next few quarters. TSMC, ASML's largest customer, is the likely beneficiary of this and could ultimately replace demand should Samsung and Intel fail to sort out their challenges.

Second, demand for dynamic random access memory (DRAM) and NAND memory has been more sluggish than expected. Reflecting this, some of the main industry players such as Micron, Samsung, and Hynix have deferred spending by a few quarters to manage the slower than expected upturn in demand. All have new fabrication plants

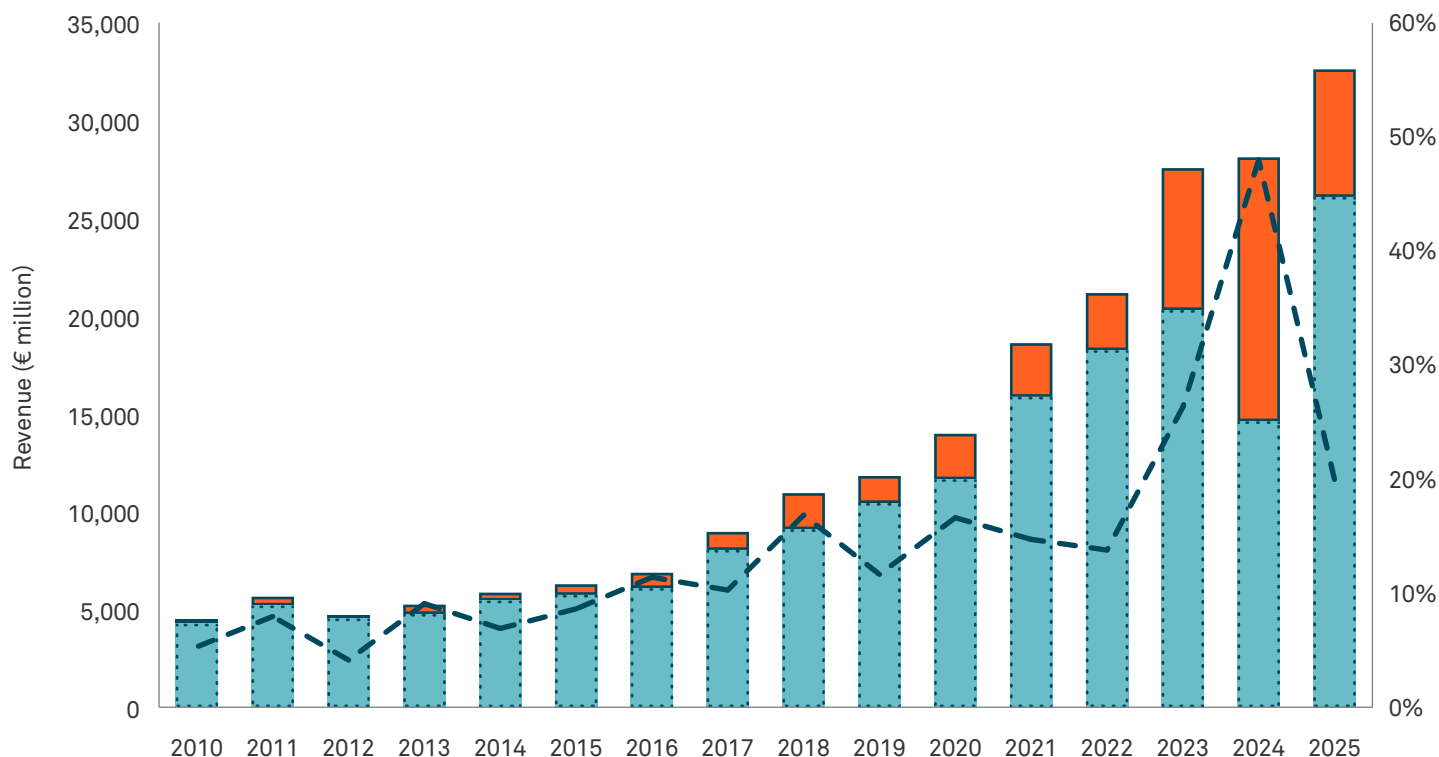
under construction, which will require ASML's technology, so we are confident that this investment will happen. The only question concerns timing.

Finally, demand from China is normalizing. Having made an outsized contribution this year, the country's share of overall sales should fall back to a more normal 20% next year. This reversion is simply happening a little earlier than expected.

BACK TO NORMALITY

China's contribution to ASML revenues

■ Non-China (left axis) ■ China (left axis) - - - China contribution (%) (right axis)



Sources: ASML, Walter Scott Q3 2024.

To 2030 And Beyond

If some investors did have questions about ASML's long-term growth trajectory, November's investor day⁴ should have gone a long way to answering them. Led by new CEO Christophe Fouquet, management outlined a convincing roadmap for growth for the next five years and beyond.

The Big Picture

In 2022, ASML set out expectations for the semiconductor market to be worth over US\$1 trillion by 2030, a compound annual growth rate of 9%. Two years later, this is still the company's base case. Growth expectations remain on track. What has changed, however, are the drivers of that growth.

AI to the Fore

The big change to ASML's growth projections is the contribution from AI-related demand. The servers, storage

and datacenters segment, which is the main beneficiary of the growth in AI, is now expected to account for ~40% of total 2030 demand, a significant increase from 2022 estimates. Summing up this step-change, Mr. Fouquet quipped, "We see our society going from chips everywhere to AI chips everywhere."

Interestingly, these estimates appear conservative when compared to those recently issued by other industry players AMD and Nvidia. Should their more ambitious forecasts prove correct, that would constitute considerable upside for ASML's 2030 guidance.

Mainstream Markets Slowing But Still Growing

Alongside this AI-driven growth, ASML revised down the 2030 growth forecasts for what it calls its "mainstream markets." To a degree this was expected. With the semiconductor industry only just starting to emerge from its worst cyclical downturn since the global financial

crisis, demand from end markets such as PCs, smartphones and automotives has been sluggish. These markets will likely still grow, many at a healthy pace, but their overall contribution could be lower going forward.

Challenges Bring Opportunities

The transformative potential of AI hardly needs reiterating. By some estimates, it will add between \$6 and \$13 trillion dollars to global GDP by 2030.⁵ If AI is to deliver on this promise, however, Mr. Fouquet stressed that "major, major innovation" is required.

The challenge for the semiconductor industry is how to deliver the highest possible computing power and transistor density at the lowest possible cost and with the lowest possible CO₂ emissions. If this is going to happen, we expect semi manufacturers to step up investment in ASML's EUV technology. As a consequence, demand for EUV should comfortably outstrip the 9% growth rate of the wider chip market.

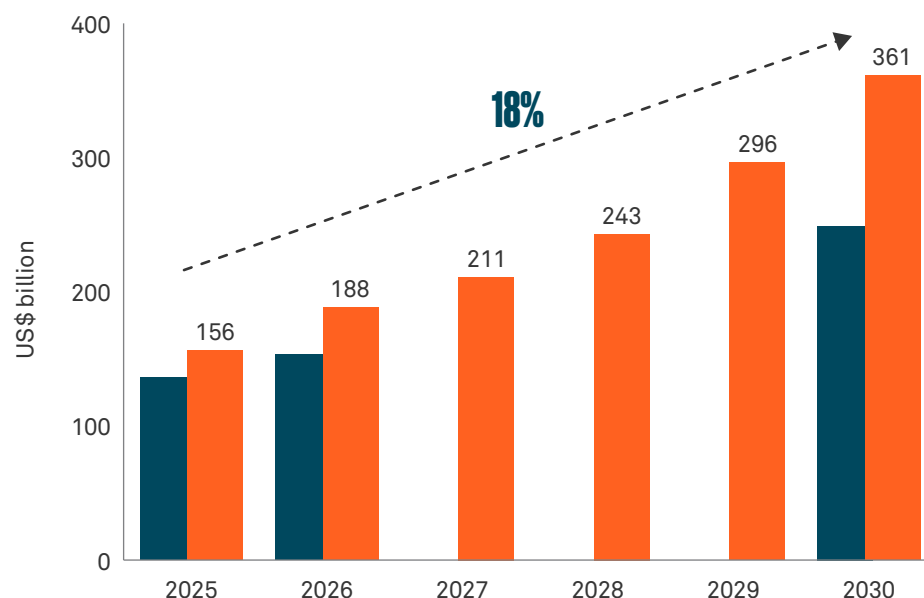
Perpetual Innovation

From its earliest days in a "leaky shed" next to a Philips' office in Eindhoven, ASML has been a relentless innovator. Since the commercial release of the first EUV machine in 2018, the company has overseen a quarter-on-quarter improvement in the technology's productivity and availability (the length of time the machine is in operation). From producing less than 140 wafers per hour in 2018, these workhorses of the semiconductor manufacturing process now churn out more than 220.⁶ That figure is expected to increase again to 250 with the release of the NXD:4000F machine in 2027.⁷

ONWARDS AND UPWARDS

AI-related demand growth (US\$ billion)

■ Capital Markets Day 2022 ■ Capital Markets Day 2024



Source: ASML projections. Projections are estimates and not guaranteed.

⁴ An event where ASML informs shareholders, analysts and other stakeholders about their long-term strategy and financial model.

⁵ ASML. ⁶ Ibid. ⁷ Ibid.

Conviction Remains High

ASML's roadmap for growth validated our long-term investment case for the company. With its mission-critical technology and deep competitive moat, we believe the company should remain both an enabler and a beneficiary of one of the most exciting structural trends in the global economy.

As a vital but niche role in the semiconductor ecosystem, ASML styles itself "the most important tech company you've never heard of." As the business builds on its unique position and as AI launches the next chapter in the industry's remarkable growth story, there appears, in our view, little chance of that importance diminishing soon.

Artificial intelligence (AI) refers to computer systems that can perform tasks typically requiring human intelligence, such as visual perception, speech recognition, decision-making, and language translation.

Capital expenditure (capex) are investments made by a company to acquire, maintain, or upgrade tangible assets like property, plant, or equipment that are expected to provide benefits over an extended period.

Compound annual growth rate (CAGR) is the mean annual growth rate of an investment over a period longer than one year.

Dynamic random access memory (DRAM) is a common type of random access memory (RAM) that is used in PCs, workstations, and servers.

Gross domestic product (GDP) is the total market value of the goods and services produced by a country's economy during a specified period of time.

NAND is a type of flash memory that stores data in arrays of memory cells using floating gate transistors.

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