ASML Holding (ASML)

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Company Brief & Thesis

ASML operates as the leading supplier of photolithography equipment for the semiconductor industry, enabling the production of advanced microchips used in applications such as high-performance computing, artificial intelligence, and 5G technology. ASML's dominance in the industry, which according to Fitch is around 90% of market share, is driven by its technological innovation, strategic partnerships with major chipmakers like TSMC and Intel, and its extensive investment in research and development, ensuring it remains at the forefront of semiconductor manufacturing advancements.

If designing microchips is a painting, ASML has relationships with the best painters to provide the best brushes and paint.

Thesis: ASML’s importance in the semiconductor industry in supplying the foundries of TSMC, Intel, Samsung and pretty much every other company in the industry, gives them a super wide economic MOAT, which in turn gives them bargaining power in selling equipment to the most powerful companies in the world. The recent drop in their stock price, mainly related to the ban on Chinese sales by the Biden administration, left them at a reasonable price for purchase, especially now that the chip industry might be growing all around the world.

Company Dive In

ASML 's operations are primarily centered around two key segments: Deep Ultraviolet (DUV) lithography and Extreme Ultraviolet (EUV) lithography. DUV systems remain crucial for mass semiconductor production, while ASML’s EUV technology, in which it holds a near-monopoly, is essential for manufacturing cutting-edge chips with nanometer-scale features. They also provide assistance services and maintenance to their machines, comprising around 20% of their revenue

ASML's Deep Ultraviolet (DUV) lithography, representing around a quarter of the company’s revenue, systems utilize light sources with wavelengths of 193 nanometers, typically half the size of a bacteria, to pattern intricate features onto silicon wafers, forming the foundation of microchips. These systems are essential for high-volume manufacturing of advanced logic and memory chips, serving as the workhorse of the semiconductor industry, enabling the production of microchips in bulk, though not the most specialized ones.

Company Dive In

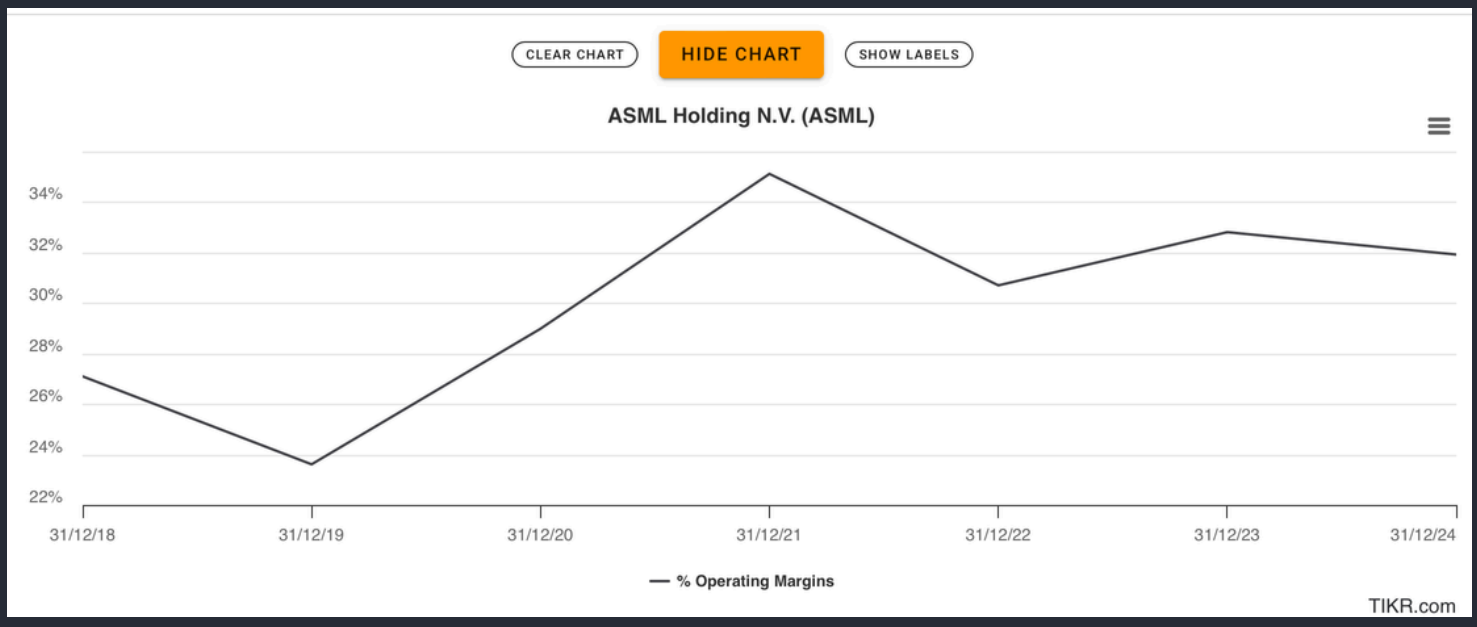
In the third quarter of 2024, ASML reported total net sales of EUR 5 billion, of DUV machines. This, however, is a decrease compared to the same period last year. The company faced challenges related to severe export restrictions to China, which meant they weren't able to sell a great amount of machines in inventory and terminate contracts.

ASML's Extreme Ultraviolet (EUV) lithography technology employs light with a wavelength of just 13.5 nanometers—nearly in the x-ray spectrum—to print extremely fine features on silicon wafers. This is crucial for producing cutting-edge microchips with higher transistor densities, supporting the innovation in high-performance computing, artificial intelligence, and advanced consumer electronics. ASML's EUV systems gives them almost a perfect monopoly in the industry, where no other company's machine ir so precise

Company Dive In

ASML's projections indicate continued strong demand for EUVs, which have been the main driver for growth in the company. They've reported 8.9 Billion EUR sales for these machines in 2024, about 30% of their annual revenue, but poised to grow their share of the pie as EUVs become industry standard. The more they are, the bigger ASML's monopoly

ASML's services segment offers support to help their clients maximize the performance and longevity of its lithography systems. Financially, the services segment is a significant contributor to ASML's overall revenue, representing around 20.6% of the total revenue. This reflects a steady demand for maintenance and upgrade services, providing ASML with a recurring revenue source even if the demand for new machines diminishes.



Opportunities

ASML holds an absolute monopoly on extreme ultraviolet (EUV) lithography, giving ASML a strategic advantage that chip manufacturers such as TSMC, Intel, and Samsung are entirely dependent on. The complexity of EUV machines, which involve high-powered lasers, mirrors, and thousands of highly specialized components, creates an insurmountable barrier to entry for competitors. This exclusivity allows ASML to dictate pricing and maintain its dominance in the semiconductor equipment industry.

ASML's dominance is further reinforced by its massive investment in research and development. The company has spent decades refining EUV technology, mastering the complex of these machines, which consist of over thousands of super precise parts, which makes it practically impossible for a new player to enter the market. Even if a competitor attempted to develop EUV lithography today, it would take decades of R&D, supply chain coordination, and know-how to match ASML's level of expertise.

Opportunities

The semiconductor industry is in a technological arms race right now, especially with the rise of Chinese LLMs such as deepseek, with companies having to buy more chips to train their models. The only way to produce these cutting-edge chips is by using ASML's EUV machines, ensuring that every major chipmaker must rely on ASML to remain competitive. This will likely translate to increasing demand for ASML's equipment.

Governments worldwide are investing heavily in domestic semiconductor production. The U.S. CHIPS Act, for example, is empowering new fabrication plants to be built in the US, such as TSMC's in Arizona or Intel's in Ohio. Every new fabrication plant requires its lithography machines from ASML.

ASML's machines are in such high demand that the company currently has a backlog of around €36 billion, meaning chipmakers often wait years to receive their orders. Due to the sheer complexity of these machines, which sell at prices from 200M to 350M USD, ASML can only manufacture a limited number of EUV systems per year, leading to constrained supply even as demand skyrockets, meaning that they can comfortably raise prices and still expect to sell in high amounts, increasing their revenue.

Risks

The Dutch government, under pressure from the United States, has restricted ASML from selling its most advanced EUV lithography machines to China, essentially eliminating that marketplace. China accounted for more than 20% of ASML's sales in 2023, making it a crucial source of revenue. While ASML still sells older DUV lithography machines to China, additional restrictions could significantly reduce revenue from one of its largest markets. This is the main reason why the company had diminished revenue in 2024 and why the stock was down when every other chip-related company went up. But American demand, and other countries', are still in an AI arms race with China, especially now with DeepSeek AI, which is why I believe other geographies will offset this China ban

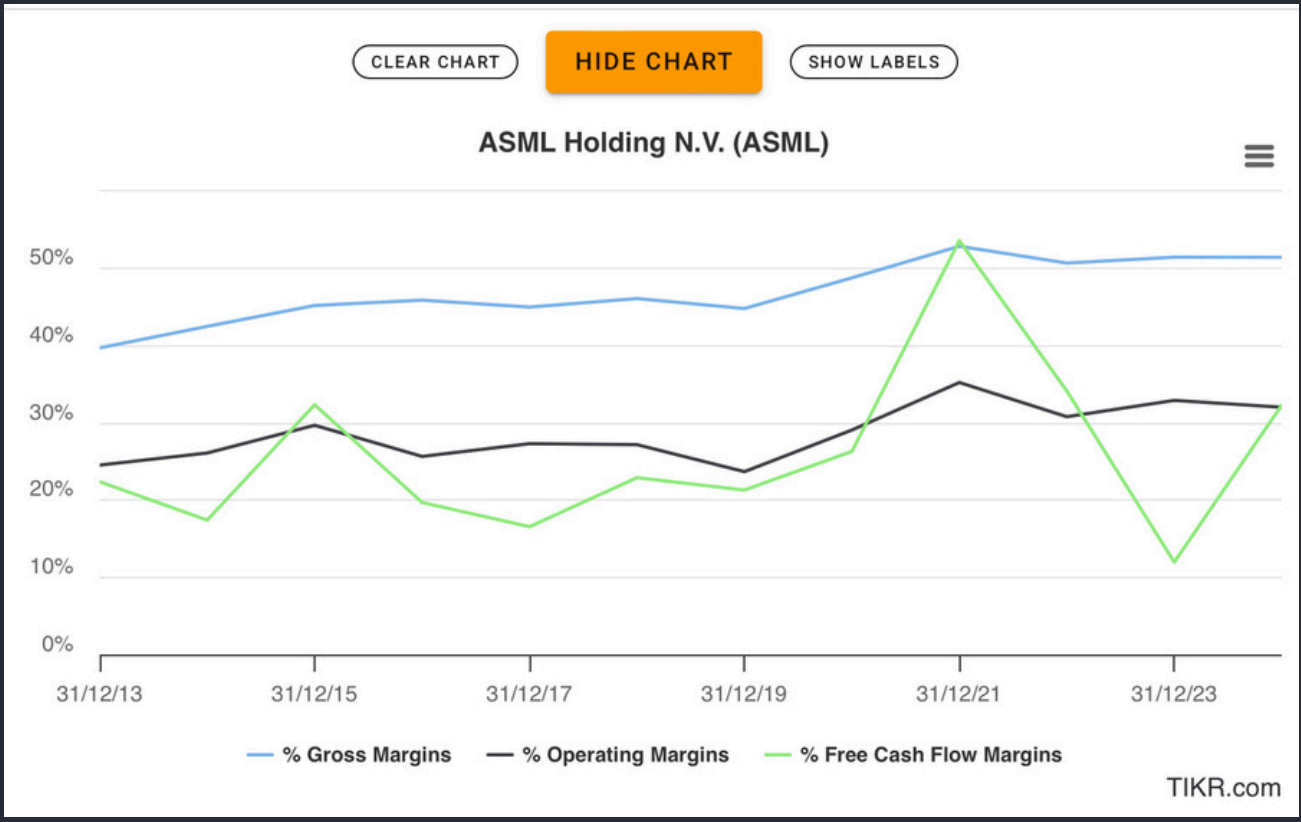
Another problem would be their customer base. ASML relies heavily on a small number of key customers, particularly TSMC, Intel, and Samsung, which together account for the majority of its revenue. If any of these companies cut capital expenditures or delay fab expansions, ASML could see a sharp decline in orders. However, considering their over 30 Billion EUR backlog of orders, I believe this to be a manageable risk. For now, tailwinds for chip manufacturing are way too strong for fabs to stop producing suddenly.

Risks

Finally, new technology could be a risk for the company. ASML currently has a monopoly on EUV lithography, the risk of disruptive technologies could erode its dominance over time. One of the most notable threats is Nanoimprint Lithography (NIL), an alternative semiconductor manufacturing technology developed by Canon. While NIL is still in its early stages, any breakthrough could reduce the necessity for ASML’s high-cost EUV machines. However, this type of technology is still very experimental and hasn’t achieved the level of precision of EUVs, which means that the market is at least a few years away from stop depending on ASML. Not to say that with the amount of R&D and expertise ASML has, I doubt they couldn't adapt to this new market better than any other company.

Multiples and Margins

Gross Margin: 51%
Operating Margin: 31.9%
Net Income Margin: 26.8%
Free Cash Flow (FCF) Margin: 32%



The company has very high margins due to the monopolistic position it holds in the industry which allows them to charge high prices. Free cas flow and net income are also very healthy andmore than offsets its very high R&D costs. It's debt situation is very much under control and very healthy considering their backlog of orders.

Multiples and Margins

Fair Value

To calculate ASML's fair price, let's assume the following statistics:

Revenue Growth: 10%
Free Cash Flow Margin: 30%
P/FCF: 35x
Period: 5 Years
Shares outstanding change per year: 0.0%

Revenue in 5 years: $47 Billion
Free Cash Flow in 5 Years: $14 Billion
Market Capitalization in 5 years: $526 Billion
Compounded annual return rate: 12.6%

ASML is a fantastic company that has the monopoly in an industry with the strongest tailwinds of the past years. Its competitive advantage is the reason why I believe they will keep growing revenues, FCF and perhaps even having multiple expansions (though I didn't price this in the calculation). At the price it trades right now, it offers great returns and a perfect opportunity to profit from the AI and chip boom.