

Technology

ASML Holding (XNAS:ASML)

Recommendation: Buy

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Company Overview

ASML Holding NV (ASML) is the premier producer of key manufacturing equipment used in the production of microprocessing chips. Recognized predominately for their EUV lithography machinery capable of producing chips with advanced computing capacity, ASML's core operations consist of the development, production, sales, and servicing of advanced semiconductor equipment systems. Founded on April 1st, 1984 in The Netherlands, the firm has remained headquartered in Veldhoven despite their successful efforts in expanding their production within the world's strongest economic centers within the past two decades.

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Stock Performance Highlights

52-week High	\$881.12
52-week Low	\$363.15
Beta	1.18
Average Daily Volume	1.29 m

Share Highlights

Market Capitalization	\$229.8 b
Shares Outstanding	403.5 m
EPS (FY '22 though Q3)	\$9.70
P/E Ratio	38.3
Dividend Yield	1.0%
Dividend Payout Ratio	42.12%

Company Performance Highlights

ROA	17.35%
ROE	33.87%
Sales (FY '22 total at time of model)	\$15.04 b

Financial Ratios

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Current Ratio	
Debt to Equity	17

Current Price \$589.03 Target Price \$641.97

Investment Thesis

We recommend a strong BUY rating for ASML Holding due to their monopolistic market position enabled through their unique ability to produce EUV lithography systems, strong long-term growth estimation for the semiconductor industry, and the firm's strong position to profit off global megatrends within the technology sector.

Thesis Drivers:

- Broader scale of 5G, AI, Cloud computing, among other innovative technological products require micro processing chips with increased computing capacity, which is enabled through the EUV lithography only ASML can produce.
- ASML is one of the world's largest suppliers of DUV lithography systems, a cheaper alternative to their EUV systems, allowing the firm to still produce sales when core chip-producers reduce capital expenditures (reflected through strong FY '22 Q3 earnings).
- ASML's unmatched pricing power as the sole producer of EUV lithography systems will enable the firm to boost long-term margins, optimizing the amount of value created at each level of forecasted revenue growth.

YTD Stock Performance



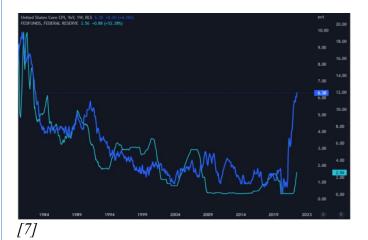
Executive Summary

The recommendation we make for the ASML stock as of November 14th, 2022 is **BUY.** We strongly believe that even of the recent spike in the price of ASML that brought it to \$577.82, the stock is currently undervalued due to the potential for sustainable long-term growth and ASML's position to recognize significant profit's as a result of broader trends within the technology sector that will increase the demand for their EUV lithography equipment.

Economic Outlook

Fed Funds Rate

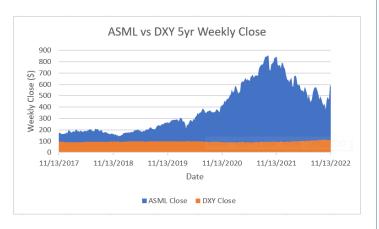
Over the past year, The Federal Reserve increased the federal funds rate four times, currently sitting at 3.75%. The federal budget began raising rates to attempt to control inflation. We live in inflationary periods due to monetary stimulus over the past two years. Government spending is expected to increase in 2023; we are expected to see nearly 400 billion in total USD spending. We estimate the Fed will maintain the current rate for the rest of the year with a small probability of raising another 25 basis points.



This chart measures the CPI and the Fed funds rate over many years. Over the past decade, both have been trending downward. Over the past two years, inflation rates have strongly correlated with the federal funds rate. This is no surprise in how they connect, although it is worth noting the direct correlation. Purchasing power has increased as the Fed raises rates, causing the dollar to strengthen.

Dollar Strength

The DXY (US Dollar Index) is commonly used to measure the US dollar against other significant currencies. The US dollar has appreciated this year compared to other currencies. This is because of the monetary policy the FED instituted to help fight High inflation. The index is currently measured at 107, the highest since the 2000s. Due to monetary policy changes over the past year, The dollar has been performing well. Many other currencies worldwide suffer from high inflation, as we previously stated. We created a graph to show the relationship between dollar strength and ASML stock price:



Over the past five years, the USD has stayed relatively constant, with the recent increase in the past year. Looking at the overall relationship, this has adverse effects on companies such as ASML because of their International presence. Foreign customers will pay less for our Goods. We estimate the index will come down to sturdy rates of around \$100 during the middle of 2024. We expect the economy to strengthen quicker than many analysts recommend. This is because countries with other currencies will be forced to combat the inflationary problems that the US had tackled right from the get-go.

Unemployment rate

Over the last 6 months unemployment is decreasing, which is a good thing for the economy. More people are actively looking for jobs than they were during the pandemic. As a result, we are almost back to prepandemic unemployment rates. This helps our bullish case as ASML recruits thousands of workers worldwide, mainly in the US. ASML reached an all-time high of 30,000 employees during the pandemic growing month over month. [1]

U3, Jan. 2009-2022

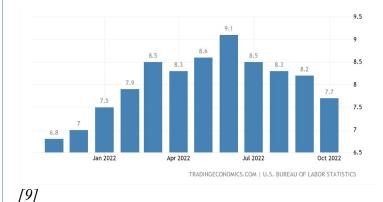
Unemployment Rate (seasonally adjusted)



[8]

Inflation

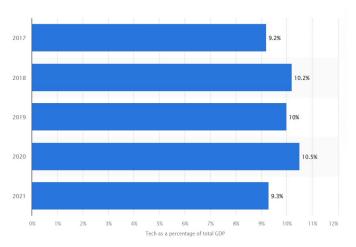
As large amounts of stimulus had been released into the economy, we have seen inflation increase. Inflation has damaged the goods sector causing everything to have a higher cost. We are witnessing this stimulus flow into the service as part of the market. ASML provides machines that allow companies to expand operations in building semiconductor chips. Inflation may have halted this growth slightly due to ASML producing a good, but the EUV machines provide internal operating services to other businesses such as TSMC, Samsung, etc. As a result, we have begun seeing disinflation that has been leveled out by major demands in the service side of products.



GDP

Recently we have seen GDP increases corresponding with decreasing inflation rates. This recent phenomenon contradicts the historical relationship these core economic variables have had with one another. There is much talk about a potential

recession due to companies importing or exporting irregular amounts, but our view is that there will not be a significant recession. As countries open and return to pre-pandemic levels, we see the economy, as well as many other factors such as imports, exports, unemployment, Durable goods, and purchasing power of the dollar, continue to increase. When we analyze the overall environments of imports/exports we associate that with rather correlated supply/demand. ASML currently has a backlog of orders and is now able to export every order. This shows major strength how the company is having rather positive problems due to companies losing sales and not selling enough. ASML contributes to the global supply chain by shipping billions of dollars' worth of goods to foreign countries.

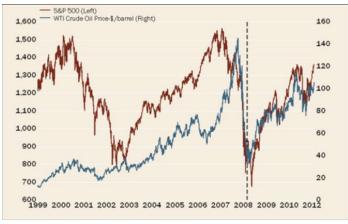


[10]

Energy

Energy plays a crucial factor in the economy. All the goods around the world rely on energy to get them from one place to another. When energy prices rise, there is direct correlation between the price of goods. From 2014 to 2020 there was a significant build-up in shale production, growing at any price level, causing prices to have cratered. This was unhealthy growth. We expect Energy prices to grow at half the rate they did at pre-pandemic levels. We hope to see half a million to 1 million barrels released daily, which is slower than the levels during the pandemic. But this growth rate is more constant and safer. Due to ASML Having to ship its products worldwide, we hope Energy prices stay low to allow a lower Transportation price. However, we are skeptical about the current energy situation. OPEC Is looking to expand oil production to over 1 million daily barrels.

With ExxonMobil and its Partners finding a new body of oil in Guyana, we expect production to increase and revenue to shift into the hand of a country that has been struggling for years. The US shale path is naturally going to grow. Constraints currently limit the US oil field service sector since exploration producers have cut back capital investment.



[11]

Industry Analysis & Outlook

Semiconductor Industry Description

The Semiconductor Industry is defined as the aggregate of all companies engaged in the design and production of semiconductors and semiconductor devices, such as integrated circuits and transistors.

Within the Semiconductor industry, ASML's machinery is used predominantly in the mass-production of micro-chips with integrated circuit patterns, which are sketched using ASML's DUV & EUV lithography systems. It is important to note that ASML's primary customers are chipmaking firms, which also operate within the semiconductor industry.

ASML operates within the sub-industry classified as "Semiconductor Manufacturing Equipment and Services". Their main competitors within the sub-industry are: ASM International, BE Semiconductor, RoodMicrotec, VAT Group, Soitec, & Technoprobe.

Firms within this sub-industry produce revenue through the sales and servicing of the semiconductor machinery they produce. Firms differentiate themselves through the capabilities of their machinery to produce more efficient micro processing chips, which will become an even bigger determinant of firm

value as innovative technological products increasing require chips with advanced computing capacity.

Despite the abundance of empirical evidence that the demand for micro processing chips and semiconductor technology will experience significant growth as the result of technological innovation and global megatrends (EV's, Cloud Computing, etc.) [2], the cyclical nature of the industry has been a cause of concern for investors. As the production of core inputs used in micro processing expand into new markets, we anticipate the industry to become much-less volatile.

Comparable metrics to sub-industry competitors

	Price	Mkt Cap (B)	PE (NTM)	PEG (NTM)	ROE (%)	EPS YoY (%)
ASML Hold NY Reg	576.44	229.8	31.8	1.3	57.0	75.2
ASM International	262.19	12.8	20.4	1.4	12.5	80.7
BE Semiconductor Inds	64.71	5.2	24.8	6.9	44.5	110.3
RoodMicrotec	0.22	0.0			58.4	
VAT Group	314.64	9.4	34.0	3.2	46.1	67.3
Soitec	159.34	5.7	21.4	0.7	22.4	172.3
Technoprobe	7.44	4.5	25.5	1.3	24.1	5.4

[6]

Industry Trends & Growth Projections

In the most recent annual report generated by ASML, they projected the Semiconductor Industry to be worth \$667 billion by 2025, representing a CAGR of 7.4% from 2020. In their projection of long-term growth, they anticipated the industry to be worth \$941 billion by 2030, reflecting their belief that the industry will recover strongly from the recent regression spurred by the global supply-chain shortage. [5]

On Oct. 7th, the US Dept. of Commerce released new rules prohibiting US-based companies from exporting advanced semiconductor technology to China. This policy reflects the US's broader strategy to strengthen their position within the global semiconductor market. According to the Semiconductor Industry Association (SIA), China accounts for 35% of all global sales of finished chips to electronic companies, many of which have large manufacturing operations within China. [3]

The US also recently passed the "US Chips and Science Act", which will allocate \$52 billion towards the development of chip manufacturing facilities on US soil. This move reflects the urgency and importance the US (and other major global powers) are placing on investment into

infrastructure that positions them to profit off the momentous anticipated growth of the industry [2].

Porter's Five Forces Analysis

Threat of New Entrants (Low)

The significant amount of up-front capital expenditures, alongside investment into R&D, required to establish a firm capable of producing semiconductor machinery at scale functions as a large barrier to entry for firms looking to enter the market. Additionally, government requirements within the industry require strict licensing and legal requirements to be met before a company can start selling, which is also a significant characteristic that weakens the threat of new firms entering the market.

Threat of Substitute Products/Services (Low)

Specifically related to ASML, it took decades of investment into research and industry-leading technology before their EUV lithography systems came to fruition. The financial backing needed to sustain the development and maintenance of their products acts as a large barrier to entry, and even firms with similar financial backing would demand a significant amount to develop a competing product.

Bargaining Power of Customers (Low)

There are significantly more chip producers than companies producing chip-making equipment, therefore weakening the bargaining power of customers within the industry. Specifically related to ASML, their three largest customers (TSMC, Samsung, & Intel) all rely solely on ASML for the EUV lithography needed to produce their most advanced chips. This enables ASML to possess strong pricing power on their most expensive product line. [4]

Bargaining Power of Suppliers (Low)

There are vastly more firms supplying the essential inputs needed to produce Semiconductor Machinery than there are firms producing

Semiconductor Machinery, therefore weakening the suppliers pricing power. This dynamic is significantly more pronounced in ASML's case, as they have insulated themselves from supplychain risk through acquiring a significant portion of their key suppliers (most recently Berliner Gas in 2020). It is also paramount to note that the inputs the suppliers provide are standardized and have low switching costs, which are two additional variables that weaken the bargain power of suppliers within the industry. [3]

Rivalry Among Existing Firms (Low-Moderate)

The broader Semiconductor industry is highly competitive and saturated, driving down prices and spurring product differentiation (most notably among chipmakers). When independently analyzing the semiconductor manufacturing equipment sub-industry however, there is far less competition. As we have previously stated, there is no competing firm within the industry able to produce the EUV lithography machines ASML is able to produce. With that being said, ASML still experiences competition within the market for the DUV product lines. Much of the risk ASML would hypothetically incur through the existence of competing firms producing equipment powered through DUV technology is eliminated since 96% of the machines ever sold are still working to this day, making the market for their refurbished machinery quite lucrative (most of which is DUV machinery).

Company Analysis

ASML is the premier supplier to the semiconductor industry. Specifically, the firm provides the world's top chipmakers with machinery, hardware, and services to mass produce the most advanced patterns of integrated circuits. Most notably, ASML's EUV product line has enabled the production of the most powerful & energy-efficient microchips known to man.

As of FYE '21, ASML's EUV product line is their largest source of revenue, accounting for 33.8% of their sales mix. The firm's net system

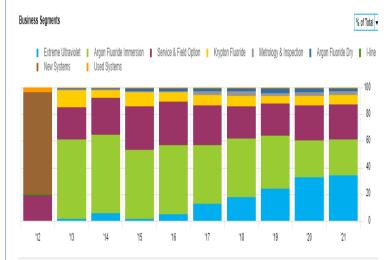
sales are classified into two categories: Logic & Memory. [5]

Headquartered in Veldhoven, Netherlands, ASML is a multinational firm with offices across Europe, the US and Asia. In their most recent annual report, they reported having over 37,500 employees.

Revenue Analysis

In FYE '21, ASML posted a staggering annual revenue figure of 21.8 billion, a 36.91% YOY increase that put a ribbon on a decade characterized by significant revenue growth, specifically in the sales of their EUV Lithography systems.

ASML generates revenue through the sales of their six different lines of semiconductor manufacturing equipment, alongside the servicing of their existing products for their customers. ASML has also historically produced a portion of their revenue through refurbishing and selling preexisting machinery, although this has accounted for a decreasing portion of their sales mix over the past decade.



[6]

Reflected through the figure above, ASML's EUV product line has increasingly accounted for a larger portion of their sales over the past decade. The increase in the sales of EUV lithography machines, which is ASML's most expensive product, is the largest component explaining the

revenue growth ASML has experienced over the last decade.

In their 2021 annual report [5], ASML emphasized their focus on producing a faster delivery for their EUV lithography systems. In an attempt to reflect this initiative, ASML has been shipping out its systems at a faster pace (and recognizing revenue later) in an attempt to tackle the ongoing chip shortage instead of waning demand for their systems. ASML estimates that the value of these expedited shipments will lead to delayed revenue recognition worth 2.2 billion in 2023 [5].

As a result of ASML's investment into more efficient production of their expensive EUV systems, and the presence of competitors in the production of their other machinery, we anticipated a more stable growth rate (4%) for the sales of their other products within our forecasts. This reflects the broader narrative that the key driver in the market value ASML is poised to capture will be due to the increasing demand for their EUV Lithography systems.

Expense Analysis

ASML's most impactful expense category comes from their cost of goods sold (COGS). From 2011-2021, COGS accounted for an average of 55.66% of ASML's total annual revenue. This figure may rightfully concern investors initially, although this figure is quite average for the capital-intensive semiconductor industry. As ASML advances their ability to produce and distribute their EUV products at-scale, we forecast economies of scale resulting in COGS accounting for a decreasing % of sales over the forecasted period (Reaching a 45% CV at FY '27 in our model).



Research and Development also accounts for a significant portion of the expenses ASML have incurred historically. The R&D expenses for the

FQ ending on September 30th, 2022, were 825 million, a 14.89% increase YOY.

In the short term (the next 2-3 years), we expect ASML to retain a high-level of investment into R&D due to the anticipated influx of demand from chipmakers as they attempt to capitalize on global megatrends dependent on their output. As chipmakers are tasked with supporting applications and end markets that are increasingly complex (EV's, autonomous robotics, etc.), we anticipate ASML will need to retain intensive investment into R&D to meet the more complex and time-sensitive demands of chipmakers.

Margin & Profit Analysis

Gross profit as a percentage of net sales increased from 48.6% in 2020 to 52.7% in 2021. Reflecting a broader trend of the increasing margin's the firm has realized over the last decade. In ASML's 2021 annual report [3], they attributed their sustainable improvement in realized margins to their emphasis on investment into making the production of their core products more efficient, environmentally sustainable, and cost-effective.

As we isolate and analyze the core drivers of ASML's forecasted value, it's a promising indication that ASML's EUV systems attained a 50% system gross margin in 2021, and the firm's management has expressed an emphasis on increasing the profitability of these systems as a mechanism to provide value to both customers and shareholders.

Capital Expenditures

Capital expenditures (defined as purchases of property, plant and equipment in ASML's annual report) for 2021, 2020 and 2019 amounted to €900.7 million, €962.0 million and €766.6 million, respectively. The capital expenditures in 2021 slightly decreased compared to 2020 and relate to the expansion and upgrades of facilities, prototypes, evaluation and training systems.

Capital Structure

ASML's management holds two firm values regarding the capital structure of the firm:

- Maintain a capital structure that targets a solid investment grade credit rating (Current Moody's rating: A2/Stable).
- Provide a sustainable dividend per share that will grow over time, paid semi-annually, while returning excess cash to shareholders through share buybacks or capital repayment. [5]

ASML ending FY '21 with a Debt/Equity ratio of 46.8%, far surpassing the five-year moving average of 32.9%. The drastic short-term increase of debt as a % of total capital can be explained through the 8.6 billion spent on share buybacks in 2021, which was the start of the three-year share buyback program meant to return capital to shareholders.

Management's Financial Performance KPI's

As potential investors, it is important to understand what key metrics the firm's management uses to measure financial performance, as this gives clear indication as to what management feels are the key drivers of firm growth and value. In ASML's 2021 annual report [3], they created a condensed table to illustrate the core line items they analyze as a proxy for the overall operational performance of their firm. These line items are organized into three different categories: Sales, Profitability, & Liquidity.

Sales: Simple right? Any individual with a beginner's business acumen could logically assume the ability of a firm to sell their product would be a good indication of the health of their firm. In ASML's case, however, the importance of this metric has key intricate details we must understand as we evaluate their revenue growth over the past decade. As reflected through the revenue decomposition our group modeled, ASML's core revenue is produced through the sales of their six main product lines. ASML's management assesses sales performance through the % of their sales that come from their EUV lithography systems. The demand for these systems is strong and are forecasted to significantly increase in the short-term, therefore the sales figures for these systems serve as a good indication of the firm's ability to service this demand.

Profitability: ASML's operational profitability is measured through the annual performance of three-line items: Gross Profit, Income from Operations, & Net Income. All three of these figures saw a significant increase from 2020-2021, reflecting ASML's continuous advancement towards improving their operational profitability and cost efficiency.

Liquidity: ASML's management measures the firm's liquidity through four-line items: Cash and Cash Equivalents, Short-term Investments, Net Cash provided by operating activities, and Free cash flow. In their 2021 annual report, ASML's management exclaimed that they believe Free cash flow is an important liquidity metric to all their investors as it reflects the available capital that could fund acquisitions, repay debt, and most importantly return money to shareholders [3].

Catalysts for Growth

Short-term:

Geopolitical conflict and supply chain disruptions resulted in many of ASML's core customers cutting back on spending, reflecting a broader economic downtown that led to poor financial performance across the technology sector. From a short-term perspective, ASML merely needs to "weather the storm" until market conditions increase, as ubiquitous need for their chip-making technology will inevitably drive demand as foundries return to previous levels of production.

ASML's Q3 Earnings report provoked investor optimism as it reflected ASML is already recovering from the economic downturn experienced in the first half of 2022. In the Q3 Earnings report, ASML reported net sales of 5.77 billion euros and gross margins of 51.8%, soundly beating guidance and analyst projections.

ASML's strong Q3 performance reflects that amidst the diverging demand dynamics within each product segment, the overall demand for their systems remains strong. As a result, ASML has made additional investment into the

development of both their DUV and EUV product segments, as their inverse demand dynamic will hedge the overall risk of revenue decline amidst economic uncertainty.

Long-term:

Lithography is at the heart of the semiconductor industry, and ASML's ability to continue to innovate and meet the growing needs of broader trends within the technology sector positions the firm to capture an immense amount of value in a sustainable, long-term manner.

Global megatrends such as SaaS, Big Data, and AI have already imposed a ubiquitous impact on the way business is conducted globally, and the foundries that are able to create the most advanced chips capable of powering this technology will be the firms capturing a portion of all revenue created in our increasing interconnected world.

ASML's prerogative within this dynamic is quite simple: maintain their position as the manufacturer of the most advanced machinery needed to create these chips.

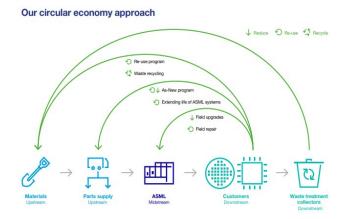


[5]

Beyond their ongoing investment into the development and efficiency of these products, ASML has also implemented a managerial framework to measure their sustainability efforts through ESG KPI's, sending the message they intend to provide value for all stakeholders.

ASML's sustainability approach, although wildly detailed and intricate, can best be incapsulated by their "circular economy" approach. Using this operational framework, they utilize components of previously existing systems within the

development of new products (essentially outlining their refurbishing efforts).



As previously stated within our report, ASML anticipates the Semiconductor industry to be worth \$667 billion by 2025, and \$941 billion by 2030. These estimates, although seemingly aggressive, are largely consistent with estimates produced by analysts. This is due to the dependency on semiconductor inputs in the development of nearly every major technological development in the market today. Through ASML's initiatives to sustainably boost margins in the sales of their premier value producing segments, to promote environmentally conscious production, and to strategically merge and acquire with the core suppliers of their machinery inputs, we strongly believe ASML is poised to continue to be a major player in the pivotal semiconductor industry and realize sustainable growth long-term.

Valuation Analysis

Valuation Methodology

[5]

To properly value ASML, we gathered historical information regarding financial performance, through which we analyzed to identify trends and forecast future potential for value creation. Additionally, we also diligently researched key economic indicators which ASML's past performance reflected sensitivity towards to account for potential risks within our forecasts. We will also offer explanation as to the logic behind the assumptions made within the

calculations of our models, so the reader can better comprehend the implications we believe current events can have on ASML's future performance and give clarity to our group's strong belief in the stock as an attractive potential investment. To determine the intrinsic price per share we constructed Economic Profit, Discounted Cash Flow, Relative P/E, & Dividend Discount Models. All assumptions made within these models were determined using the economic, industry, and company research summarized above.

Economic Profit Model (EP)

The Economic Profit Valuation Model is a pivotal reflection of why we feel ASML is an attractive investment. This is because the core mathematical underpinning of the model reflects the firm's ability to produce ROIC, which is essential for creating value at the high levels of growth we forecast in our model. We forecasted ASML's annual economic profit until 2031 and discounted these values back to the present day at the weighted average cost of capital (11.86%). After summing the PV of these estimates, we added the invested capital figure from the last FYE alongside other non-operating assets (Short-term Investments & Equity and Other Investments). Once subtracting non-operating liabilities, we arrived at a value of equity equaling 240,681.56 (in millions). When dividing by the 406.67 shares outstanding and make the mid-year adjustment, we arrived at an implied price of 641.98, implying ASML's market price is selling at a 11.24% discount.

Discounted Cash Flow Model

For our DCF Valuation Model, we discounted the FCF for each of the ten forecasted years in our model to arrive at the total value of our operating assets. Once making non-operating adjustments and adjusting our implied price to the date of our model, we arrive at an implied price of 641.97, equivalent to the price produced through our EP model.

Fundamental P/E (DDM) Valuation Model

Our group also ran a Discounted Dividend Model, to compute the implied price based upon the ideology that the value of the asset is the equivalent of the present value of expected future dividend payments. Our group started by discounting all forecasted annual dividend payments by the cost of equity to arrive that their cumulative present value. After computing that figure, we multiplied the P/E multiple for the CV year (2031) by the forecasted EPS for the CV year to arrive at the future forecasted stock price at time=2031. We discounted this price (632.86) back to the present day (230.48) and added this figure to the sum of all PVs of future dividends. Using the valuation method, our group arrived at an implied price of 278.56, a price significantly lower than that produced by the DCF and EP models. This discrepancy is not concerning to our group, as the lower implied price can be explained through the high cost of equity for the firm due to their historical volatility (measured by the beta), producing a larger input into the CAPM calculation. The low forecasted dividend inputs also reflect our projection that ASML will reinvest most of their earnings into continuous growth, as we forecast the firm will retain a healthy ROIC within our model.

Relative Valuation Model

Given the discrepancy in the size of all the competing firms within the Semiconductor Manufacturing sub-industry, we used Applied Materials Inc, Lam Research Corp, KLA Corp & Tokyo Electron Ltd per Bloomberg guidance on the most appropriate comparable firms in the estimate of ASML's intrinsic value. We choose to use the P/E and EV/EBITA multiples from 2022E and 2023E for our inputs within this model. This specific model producing discrepant out puts, with the P/E producing a 215.94 relative value in 2022 and a 173.04 relative value in 2023, and the EV/EBITDA multiple producing a 372.39 relative value in 2022 and a 344.14 value in 2023. We understand the results of this model do not reflect the narrative of our report; however, we feel the key variables contributing towards our optimistic outlook on ASML are not reflected through relative valuation methods, specifically given ASML's most significant characteristic is their

monopolistic position within the semiconductor manufacturing sub-industry.

WACC

A critical input in our models, our weighted average cost of capital was calculated as follows. At FYE '21, the MW of Equity was 234.4 billion, accounting for 99.76% of the MV of ASML. The MV of Debt was 553.4 million, accounting for the remaining 0.24% of ASML's MV. Given the significant amount of Equity within the capital structure and the mathematic mechanics of the WACC calculations, our WACC of 11.86% is nearly identical to ASML's cost of equity.

Cost of Equity

We calculated ASML's cost of equity through taking ASML's beta, the risk-free rate (10-year treasury yield), and the equity risk premium at the date of the model and input these figures into the CAPM formula. These inputs produced a cost of equity at 11.88%, which was the most significant input into ASML's WACC used in our model.

Cost of Debt

We calculated ASML's cost of debt through taking their pre-tax cost of debt (5.03%), and the marginal tax produced within the model. Through multiplying the pre-tax cost of debt figure by (1-marginal tax rate), we were able to arrive at a cost of debt of 3.80% for ASML.

Sensitivity Analysis

Beta vs. Risk-Free Rate

We chose to build a table to measure the price's sensitivity to changes in the risk-free rate and beta to analyze how heavily these CAPM inputs influence the intrinsic value we calculated in our DCF and EP Models. The accommodation for the risk of the firm (measured by the firm's beta) produced by the CAPM expected returns higher cost of capital, meaning that we would apply a

higher discount to future cash flows within our valuation models. This mathematic relationship is reflected within the sensitivity table displayed below.

for WACC also increased the implied stock price, revealing the two mechanisms in which ASML can provide long-term, sustainable value to shareholders.

			- 10	sk-Free Nate			
641.98	3.60%	3.70%	3.80%	3.90%	4.10%	4.20%	4.30%
1.54	651.83	656.43	661.10	665.82	670.60	675.45	680.36
1.53	643.28	647.78	652.33	656.94	661.61	666.34	671.13
1.52	634.94	639.33	643.77	648.28	652.83	657.45	662.13
1.51	626.79	631.08	635.42	641.98	644.27	648.77	653.34
1.50	611.05	615.14	619.28	623.48	627.73	632.02	636.38
1.49	603.44	607.44	611.49	615.59	619.74	623.94	628.19
1.48	596.00	599.92	603.88	607.88	611.94	616.04	620.20

			Fore	ecasted CV R	OIC		
641.98	40.46%	41.46%	42.46%	43.46%	44.46%	45.46%	46.46%
12.46%	590.05	590.75	591.41	592.05	592.65	593.23	593.78
12.26%	605.81	606.53	607.22	607.88	608.51	609.11	609.68
12.06%	622.31	623.06	623.78	624.46	625.11	625.73	626.33
11.86%	639.60	640.38	641.13	641.98	642.51	643.16	643.78
11.66%	657.75	658.56	659.33	660.07	660.77	661.44	662.09
11.46%	676.80	677.64	678.44	679.21	679.94	680.64	681.31
11.26%	696.82	697.70	698.54	699.34	700.10	700.83	701.52

Beta vs Equity Risk Premium

We ran a sensitivity table using the ERP in relation to Beta to analyze how the corresponding price sensitivity in the model related to that of the table using risk-free rate changing in larger intervals. We feel this sensitivity analysis methodology produced valuable insights, as we predict more fluctuation of the risk-free rate in comparison to ERP in the near future (due to volatile interest rates resulting from fed policy).

				ERP			
641.98	5.15%	5.20%	5.25%	5.30%	5.35%	5.40%	5.45%
1.54	646.73	651.14	655.60	660.12	664.69	669.33	674.02
1.53	640.23	644.60	649.03	653.51	658.05	662.64	667.30
1.52	633.86	638.19	642.58	647.02	651.52	656.08	660.69
1.51	627.60	631.89	636.25	641.98	645.11	649.63	654.21
1.50	621.45	625.71	630.02	634.39	638.82	643.30	647.83
1.49	615.40	619.63	623.91	628.24	632.63	637.07	641.57
1.40	600.47	612.66	617.00	622.20	626.55	620.06	625.42

CV Growth of NOPLAT vs. Dividend Yield

When controlling for the dividend yield within this sensitivity analysis, we could isolate that increases to our forecasted CV growth of NOPLAT would boost ASML's implied stock price, which is what we expected as the NOPLAT is the numerator in the ROIC equation and therefore increases in NOPLAT increase ROIC. When controlling for forecasted CV NOPLAT growth, we observed that decreasing the dividend yield slightly boosts ASML's implied stock price. The limited impact dividend yield had on the stock price could also have resulted due to the small adjustments we made to their actual dividend yield within the analysis.

CIT T	DO	IC vs	W W 7	
	$\boldsymbol{\nu}$	WYC.	1 3 3 4 / /	
. v		11. VS	_ VV /-	

Beta

Throughout our report, we have elaborated comprehensively on the variables, factors, and assumptions which we feel make ASML an extremely attractive investment. In this sensitivity table, we ran a sensitivity test on changes in the primary driver of value: the ability to produce a healthy return on invested capital. Given the sensitivity test was ran against corresponding changes in WACC, the other input used to calculate economic profit, the relationship between the two variables produced changes in ASML's implied price in a predictable and logical fashion. When controlling for ROIC, decreased WACC boosted ASML's stock price (and viceversa). While increasing ROIC when controlling

1.98 2.70%		CV Growth of NOPLAT											
2.70%	2.80%	2.90%	3.00%	3.10%	3.20%	3.30%							
630.17	633.55	637.00	640.54	644.15	647.85	651.63							
630.64	634.02	637.48	641.02	644.63	648.33	652.12							
631.11	634.50	637.96	641.50	645.12	648.82	652.61							
631.59	634.97	638.43	641.98	645.60	649.30	653.09							
6 632.06	635.45	638.91	642.45	646.08	649.79	653.58							
632.53	635.92	639.39	642.93	646.56	650.27	654.07							
633.00	636.39	639.86	643.41	647.04	650.76	654.56							
	6 630.17 6 630.64 6 631.11 6 631.59 6 632.06	6 630.17 633.55 6 630.64 634.02 6 631.11 634.50 6 631.59 634.97 6 632.06 635.45 6 632.53 635.92	6 630.17 633.55 637.00 6 630.64 634.02 637.48 6 631.11 634.50 637.96 6 631.59 634.97 638.43 6 632.06 635.45 638.91 6 632.53 635.92 639.39	6 630.17 633.55 637.00 640.54 6 630.64 634.02 637.48 641.02 6 631.11 634.50 637.96 641.50 6 631.59 634.97 638.43 641.98 6 632.06 635.45 638.91 642.45 6 632.53 635.92 639.39 642.93	630.17 633.55 637.00 640.54 644.15 630.64 634.02 637.48 641.02 644.63 631.11 634.50 637.96 641.50 645.12 631.59 634.97 638.43 641.98 645.60 632.06 635.45 638.91 642.45 646.08 632.53 635.92 639.39 642.93 646.56	6 630.17 633.55 637.00 640.54 644.15 647.85 630.64 634.02 637.48 641.02 644.63 648.33 6 631.11 634.50 637.96 641.50 645.12 648.82 631.59 634.97 638.43 641.98 645.60 649.30 632.06 635.45 638.91 642.45 646.08 649.79 632.53 635.92 639.39 642.93 646.56 650.27							

CV Growth of NOPLAT vs. Forecasting Marginal Tax Rate

Similar to our last sensitivity analysis outlined above, the relationship between implied stock price and NOPLAT growth retains a strong positive correlation. Given NOPLAT reflects the cash available to all investors after making taxadjustments, we must analyze the forecasted

marginal tax rate's impact on price when keeping NOPLAT constant. Illustrated by the results of the table pictured below, adjustments in the forecasted marginal tax rate have an extremely weak positive correlation with implied stock price.

CV Growth of NOPLAT

641.98	2.70%	2.80%	2.90%	3.00%	3.10%	3.20%	3.30%
27.48%	631.62	635.00	638.47	642.01	645.63	649.33	653.13
26.48%	631.61	634.99	638.46	642.00	645.62	649.32	653.12
25.48%	631.60	634.98	638.45	641.99	645.61	649.31	653.10
24.48%	631.59	634.97	638.43	641.98	645.60	649.30	653.09
23.48%	631.58	634.96	638.42	641.97	645.59	649.29	653.08
22.48%	631.57	634.95	638.41	641.95	645.58	649.28	653.07
21.48%	631.56	634 94	638.40	641.94	645.57	649.27	653.06

Marginal Tax Rate

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Important Disclaimer

This report was created by students enrolled in the Applied Equity Valuation (FIN:4250) class at the University of Iowa. The report was originally created to offer an internal investment recommendation for the University of Iowa Krause Fund and its advisory board. The report also provides potential employers and other interested parties an example of the students' skills, knowledge and abilities. Members of the Krause Fund are not registered investment advisors, brokers or officially licensed financial professionals. The investment advice contained in this report does not represent an offer or solicitation to buy or sell any of the securities mentioned. Unless otherwise noted, facts and figures included in this report are from publicly available sources. This report is not a complete compilation of data, and its accuracy is not guaranteed. From time to time, the University of Iowa, its faculty, staff, students, or the Krause Fund may hold a financial interest in the companies mentioned in this report.

Revenue Decomposition

Fiscal Years Ending Dec. 31	2019	2020	2021	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E	2031E
				Sales		Sales	Sales	Sales	Sales	Sales	Sales	Sales	Sales
		Sales Revenue	Sales Revenue		Sales Revenue	Revenue	Revenue	Revenue	Revenue	Revenue	Revenue	Revenue	Revenue
	(Millions)	(Millions)	(Millions)	(Millions)	(Millions)	(Millions)	(Millions)	(Millions)	(Millions)	(Millions)	(Millions)	(Millions)	(Millions)
Total	13,230	15,935	21,817	24,250	26,705	28,999	31,248	33,723	36,451	39,459	42,782	46,456	50,522
Growth Rate	2.46%	20.45%	36.91%	11.15%	10.13%	8.59%	7.76%	7.92%	8.09%	8.25%	8.42%	8.59%	8.75%
Net System Sales Per Technology													
EUV	3,134	5,089	7,428	9,285	11,142	12,813	14,415	16,217	18,244	20,524	23,090	25,976	29,223
Growth Rate	41.30%	62.38%	45.96%	25.00%	20.00%	15.00%	12.50%	12.50%	12.50%	12.50%	12.50%	12.50%	12.50%
ArFi	5,269	4,465	5,862	6,096	6,340	6,594	6,858	7,132	7,417	7,714	8,023	8,343	8,677
Growth Rate	-7.09%	-15.26%	31.29%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%
Service & Field Option	3,161	4,174	5,680	5,907	6,143	6,389	6,645	6,911	7,187	7,474	7,773	8,084	8,408
Growth Rate	-0.22%	32.05%	36.08%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%
KrF	761	1,154	1,562	1,624	1,689	1,757	1,827	1,900	1,976	2,055	2,138	2,223	2,312
Growth Rate	-25.02%	51.64%	35.36%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%
Metrology & Inspection	307	399	607	631	657	683	710	739	768	799	831	864	899
Growth Rate	-23.25%	29.97%	52.13%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%
ArF Dry	449	487	510	530	552	574	597	620	645	671	698	726	755
Growth Rate	38.58%	8.46%	4.72%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%
I-Line	149	167	168	174.72	181.71	188.98	196.54	204.40	212.57	221.08	229.92	239.12	248.68
Growth Rate	28.45%	12.08%	0.60%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%
Historical Segments:													
New Systems													
Old Systems													
Net System Sales Per End-Use:													_
Logic	9,261	11,155	15,272	16,975	18,694	20,299	21,874	23,606	25,515	27,622	29,948	32,519	35,366
Memory	3,969	4,781	6,545	7,275	8,012	8,700	9,374	10,117	10,935	11,838	12,835	13,937	15,157
Geographic Composition of Sales	224	200	F.4.F	606	660	725	704	0.43	044	000	4.070	4 4 6 4	4 363
Japan South Koroo	331	398	545 7.207	606	668	725	781	843	911	986	1,070	1,161	1,263
South Korea	4,419	5,322	7,287	8,099	8,920	9,686	10,437	11,264	12,175	13,179	14,289	15,516	16,875
Singapore	93	112	153	170	187	203	219	236	255	276 15 547	299 16.856	325	354 10.006
Taiwan	5,213	6,278	8,596	9,554	10,522	11,426	12,312	13,287	14,362	15,547	16,856 6 161	18,304	19,906
China United States	1,905	2,295 1,354	3,142 1,854	3,492 2,061	3,846 2,270	4,176 2,465	4,500 2,656	4,856 2,866	5,249 3,098	5,682 3,354	6,161 3,636	6,690 3 040	7,275 4 204
Other	1,125 146	1,334 175	1,854 240	2,061 267	2,270 294	2,465 319	2,030 344	2,800 371	3,098 401	3,354 434	3,636 471	3,949 511	4,294 556
Total	13,230	15,935	21,817	24,250	26,705	28,999	31,248	33,723	36,451	454 39,459	42,782	46,456	50,522
ı Ulai	15,250	15,955	21,81/	24,230	20,703	20,333	31,248	33,723	30,431	<i>33,433</i>	42,/82	40,430	30,322

☆ASML Holding NV (XNAS:ASML)

ASML

Income Statement (

All figures in millions of U.S. Dollar except per share items.)

Fiscal Years Ending Dec. 31	2019	2020	2021	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E	2031E
Sales	13,229.5	15,935.1	21,997.9	21 621 1	26 705 1	30,000,0	24 240 4	22 722 2	26 450 6	20.450.4	42 702 2	46.456.2	F0 F22 F
Cost of Goods Sold (COGS) incl. D&A	7,484.9	8,377.4	10,590.8	21,621.1 10,560.7	26,705.1 14,864.2	28,999.0 15,224.5	31,248.1 15,624.0	33,723.3 16,018.5	36,450.6 16,402.8	39,459.4 17,756.7	42,782.3 19,252.0	46,456.3 20,905.3	50,522.5 22,735.1
COGS excluding D&A	6,991.6	7,835.7	10,390.8	9,994.9	13,812.4	14,998.8	16,162.0	17,442.2	18,852.9	20,409.1	22,127.7	24,028.0	26,131.1
Depreciation & Amortization Expense	493.3	541.7	537.3	565.8	646.7	668.0	698.0	736.6	783.7	839.6	904.4	978.5	1,062.4
					591.5	611.0	638.4	673.7	716.9	768.0	827.2	895.0	971.8
Depreciation	364.1	400.9	380.1	400.3									
Amortization of Intangibles	129.2	140.8	157.2	165.5	126.2	123.6	121.0	118.5	116.1	113.6	111.3	109.0	106.7
Gross Income	5,744.7	7,557.7	11,407.1	11,060.4	11,840.9	13,774.5	15,624.0	17,704.7	20,047.8	21,702.7	23,530.3	25,550.9	27,787.4
SG&A Expense (subtract)	2,621.1	2,939.1	3,681.2	4,080.8	5,030.6	5,292.3	5,546.5	5,901.6	6,378.9	6,905.4	7,486.9	8,129.8	8,841.4
Research & Development	2,063.7	2,358.5	2,873.5	3,164.5	3,837.3	4,059.9	4,296.6	4,552.6	4,920.8	5,327.0	5,775.6	6,271.6	6,820.5
Other SG&A	557.4	580.6	807.7	916.3	1,193.3	1,232.5	1,249.9	1,348.9	1,458.0	1,578.4	1,711.3	1,858.3	2,020.9
EBIT (Operating Income)	3,123.6	4,618.6	7,725.9	6,979.6	6,810.3	7,395.3	7,968.8	8,600.0	9,295.6	10,062.9	10,910.3	11,847.2	12,884.2
Nonoperating Income - Net	13.0	9.6	264.4	244.3	259.2	281.5	303.3	327.4	353.8	383.0	415.3	451.0	490.4
Nonoperating Interest Income	13.0	9.6	11.8	7.0	56.6	61.5	66.3	71.5	77.3	83.7	90.7	98.5	107.1
Other Income (Expense) (add)	13.0	9.6	264.4	244.3	259.2	281.5	303.3	327.4	353.8	383.0	415.3	451.0	490.4
Interest Expense	41.0	49.4	64.5	55.3	57.6	60.1	62.6	65.2	67.9	70.8	73.7	76.8	80.0
Gross Interest Expense (subtract)	41.0	49.4	64.5	55.3	57.6	60.1	62.6	65.2	67.9	70.8	73.7	76.8	80.0
Pretax Income	3,095.6	4,578.8	7,925.8	7,168.5	6,941.7	7,538.0	8,122.6	8,766.0	9,475.0	10,257.1	11,120.8	12,075.8	13,132.8
Income Taxes (subtract)	214.6	628.7	1,207.3	1,070.9	1,699.5	1,845.4	1,988.6	2,146.1	2,319.6	2,511.1	2,722.6	2,956.4	3,215.2
Equity in Earnings of Affiliates (add)	20.4	101.0	235.3	262.1									
Net Income	2,901.4	4,051.1	6,953.8	6,359.8	5,312.4	6,858.2	8,329.7	9,919.2	11,635.2	12,598.4	13,662.4	14,838.9	16,141.2
Per Share													
Basic Shares Outstanding (Weighted)	420.8	418.3	409.8	411.0	433.9	460.8	471.7	469.0	466.5	464.2	462.2	460.3	458.6
Total Shares Outstanding	419.8	416.5	402.6	419.3	448.4	473.2	470.3	467.7	465.3	463.1	461.2	459.4	457.8
EPS	6.9	9.7	16.9	15.7	12.2	14.9	17.7	21.2	24.9	27.1	29.6	32.2	35.2
Dividends per Share	2.2	2.8	5.1	3.9	3.0	3.7	4.4	5.2	6.2	6.7	7.3	8.0	8.7
Effective Tax Rate	6.9%	13.6%	15.6%	15.3%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%	25.0%

Balance Sheet

Total Substitution 1,540 1,549	Fiscal Years Ending Dec. 31	2019	2020	2021	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E	2031 E
Case Substriem investments	Assets													
Carb Copy Send Se		5,296.0	8.995.0	8.632.0	8,180.2	16,470.8	24,844.0	31,682.6	39,379.8	48,405.5	58,255.4	68,921.0	80,475.5	93,013.2
Institution														85,047.8
Short Fine Review Review 1,000 1,078 1,020 1,078 1,079 1,079 1,079 1,077 1	•		•	•	•			•		•	•	•	•	7,965.4
			•				•	•	•	•	•	•		11,394.3
Check personater 1,194.0 1,981						3,893.8		4,556.2	4,917.1	5,314.8	5,753.5	6,238.0	6,773.7	7,366.6
Marche M	Other Receivables				1,723.6	2,128.9	2,311.8	2,491.1	2,688.4	2,905.9	3,145.7	3,410.6	3,703.5	4,027.7
Description Sept	Inventories										14,693.6	15,931.0		
Man	Other Current Assets	604.0	502.0	654.0	979.3	1,078.5	1,171.1	1,262.0	1,361.9	1,472.1	1,593.6	1,727.8	1,876.2	2,040.4
Mathematics 1,000	Total Current Assets	13,617.0	19,491.0	20,686.0	23,448.8	33,516.4	43,353.7	51,627.8	60,904.9	71,671.4	83,441.8	96,228.4	110,127.9	
Content Cont	Net Property, Plant & Equipment	2,608.0	3,445.0	3,579.0	3,831.4	3,957.4	4,135.2	4,363.8	4,643.3	4,974.2	5,358.2	5,797.2	6,294.2	6,852.7
Machine Mach	Property, Plant & Equipment - Gross	5,194.0	6,567.0	6,573.0	7,225.7	7,943.2	8,732.0	9,599.1	10,552.3	11,600.1	12,752.0	14,018.3	15,410.3	16,940.5
Change C	Operating Lease Right-of-Use Assets	231.0	220.0	181.0										
Total Log-Torm Investments	Accumulated Depreciation	2,586.0	3,122.0	2,994.0	3,394.3	3,985.8	4,596.8	5,235.2	5,909.0	6,625.8	7,393.8	8,221.1	9,116.1	10,087.9
Check Chec	Other Property, Plant & Equipment	600.0	713.0	647.0										
Internation 6,237.0 6,247.0 6,243.0 6,085 5,072.8 5,188.8 5,172.8 5,083.8 5,172.8 5,278.8 5,278.8 5,179.8 5,283.8 5,193.8 5,092.5	Total Long-Term Investments	1,599.0	1,673.0	1,513.0	1,513.0	1,513.0	1,513.0	1,513.0	1,513.0	1,513.0	1,513.0	1,513.0	1,513.0	1,513.0
South Sout	Other Long-Term Investments	116.0	151.0	54.0										
Defended Passers 1200 12820 10820 917.5 917.5 917.5 918.5 946.8 948.8 312.2 196.6 97.3 91.7 10.044	Intangible Assets	6,337.0	6,947.0	6,263.0	6,098.5	5,972.3	5,848.8	5,727.8	5,609.3	5,493.2	5,379.6	5,268.3	5,159.3	5,052.5
Defended 1,00	Goodwill	5,097.0	5,664.0	5,181.0	5,181.0	5,181.0	5,181.0	5,181.0	5,181.0	5,181.0	5,181.0	5,181.0	5,181.0	5,181.0
The Purple of	Other Intangible Assets	1,240.0	1,283.0	1,083.0	917.5	791.3	667.8	546.8	428.3	312.2	198.6	87.3	(21.7)	(128.5)
Part	Deferred Tax Assets	500.0	822.0	1,249.0	446.8	551.9	599.3	645.8	697.0	753.3	815.5	884.2	960.1	1,044.1
Targible Office Asserts 1,000 1,	Other Assets	740.0	985.0	1,087.0	1,172.2	1,447.9	1,572.2	1,694.2	1,828.4	1,976.2	2,139.4	2,319.5	2,518.7	2,739.2
Liabilities & Sharoholders' Equity Current	Deferred Charges	719.0	967.0	929.0										
Current Curr	Tangible Other Assets	22.0	18.0	159.0										
Current Curr	Total Assets	25,401.0	33,363.0	34,377.0	43,595.8	54,114.9	64,244.7	72,856.5	82,535.6	93,770.4	106,078.4	119,475.8	134,063.9	149,969.4
Current Curr	Liabilities & Shareholders' Equity													
ST Debt & Curr. Portion LT Debt 120 160 629 1715 2118 2300 2478 2674 2891 3129 3393 3384 400.6 4														
Account Payable 1,192.0 1,686.0 2,407.0 2,103.2 2,316.2 2,515.1 2,710.2 2,924.9 3,161.4 3,422.4 3,710.6 4,09.2 4,381.9 Income Tax Payable 3,941.0 6,183.0 10,607.0 7,643.4 9,40.6 10,251.5 11,046.6 11,921.7 12,885.8 13,349.5 15,124.2 16,423.0 17,860.4 Account Payable 3,941.0 6,183.0 10,607.0 7,643.4 9,40.6 10,251.5 11,046.6 11,921.7 12,885.8 13,349.5 15,124.2 16,423.0 17,860.4 Account Payable 3,941.0 6,183.0 10,607.0 10,607.0 Total Current Liabilities 3,941.0 6,183.0 10,607.0 13,986.0 10,165.5 12,147.2 13,125.5 14,097.6 15,181.0 16,384.7 17,719.7 19,199.2 20,838.8 22,656.1 Long-Term Debt 3,662.0 5,864.0 4,768.0 4,488.0 5,640.8 7,001.8 8,312.5 9,426.8 10,679.1 12,132.8 13,725.3 15,458.7 17,346.3 Provision for Risks & Charges 2,073.0 2,163.0 3,820.0 2,291.2 2,830.0 3,073.0 3,311.4 3,573.7 3,862.7 4,181.5 4,533.7 4,923.0 5,533.9 Other Liabilities (excl. Deferred Income) 98.0 156.0 151.0 Deferred Tax Liabilities 11,267.0 16,399.0 22,848.0 17,579.2 21,473.3 24,662.1 26,982.0 29,611.0 32,545.9 35,873.8 39,539.5 43,564.7 47,986.7 Equity 14,135.0 16,965.0 11,532.0 14,420.3 17,308.5 19,779.2 19,77		62.0	76.0	629.0	171 5	211 Ω	230.0	247.8	267.4	280 1	312 0	330 3	368 /	400.6
Property														
Chief Current Liabilities 3,941.0 6,183.0 10,607.0 7,643.4 9,440.6 10,251.5 11,046.6 11,921.7 12,885.8 13,949.5 15,124.2 16,423.0 17,860.4	•				•	•		· · · · · · · · · · · · · · · · · · ·	•	•	•	•		•
Accrued Payroll Miscellaneous Current Liabilities 3,941.0 6,183.0 10,607.0 1,986.0 13,986.0 10,165.5 12,147.2 13,125.5 14,097.6 15,181.0 16,384.7 17,719.7 19,199.2 20,838.8 22,656.1 Long-Term Long-Term Debt 3,662.0 5,864.0 4,768.0 4,448.0 5,640.8 7,001.8 8,312.5 9,426.8 10,679.1 12,132.8 13,725.3 15,458.7 17,346.3 Provision for Risks & Charges	·													
Miscellaneous Current Liabilities 3,941.0 6,183.0 10,697.0 13,986.0 13,986.0 13,986.0 13,986.0 13,185.5 12,147.2 13,125.5 14,097.6 15,181.0 16,384.7 17,719.7 19,199.2 20,838.8 22,656.1		3,541.0	0,183.0	10,007.0	7,043.4	3,440.0	10,231.3	11,040.0	11,321.7	12,003.0	13,545.5	13,124.2	10,423.0	17,800.4
Total Current Liabilities	·	3 9/11 0	6 183 0	10 607 0										
Long-Term Debt 3,662.0 5,864.0 4,768.0 4,448.0 5,640.8 7,001.8 8,312.5 9,426.8 10,679.1 12,132.8 13,725.3 15,458.7 17,346.3				•	10.165.5	12.147.2	13.125.5	14.097.6	15.181.0	16.384.7	17.719.7	19.199.2	20.838.8	22.656.1
Congress		3,203.0	0,000.0	10,500.0	10)103.3	12,147.2	10,120.0	14,037.10	13,101.0	10,00417	17,713.7	13)133.1	20,000.0	22,030.1
Provision for Risks & Charges 2	-	3.662.0	5.864.0	4.768.0	4.448.0	5.640.8	7.001.8	8.312.5	9.426.8	10.679.1	12.132.8	13.725.3	15.458.7	17.346.3
Deferred Tax Liabilities 263.0 292.0 274.0 674.5 855.4 1,061.8 1,260.5 1,429.5 1,619.4 1,839.8 2,081.3 2,344.2 2,630.4					1,110.0	3,010.0	7,002.0	0,012.0	3) 120.0	10,073.1	12,132.0	13), 23.3	13, 13017	17,010.0
Other Liabilities 2,073.0 2,163.0 3,820.0 2,291.2 2,830.0 3,073.0 3,311.4 3,573.7 3,862.7 4,181.5 4,533.7 4,923.0 5,353.9 Other Liabilities (excl. Deferred Income) 98.0 156.0 151.0 151.0 1,975.0 2,006.0 3,668.0 17,579.2 21,473.3 24,262.1 26,982.0 29,611.0 32,545.9 35,873.8 39,539.5 43,564.7 47,986.7 Equity Common Equity 14,135.0 16,965.0 11,532.0 14,420.3 17,308.5 19,779.2	•	263.0		274.0	674.5	855.4	1.061.8	1.260.5	1.429.5	1.619.4	1.839.8	2.081.3	2.344.2	2.630.4
Other Liabilities (excl. Deferred Income) 98.0 156.0 151.0 Deferred Income 1,975.0 2,006.0 3,668.0 Total Liabilities 11,267.0 16,399.0 22,848.0 17,579.2 21,473.3 24,262.1 26,982.0 29,611.0 32,545.9 35,873.8 39,539.5 43,564.7 47,986.7 Equity Common Equity 1,4135.0 16,965.0 11,532.0 14,420.3 17,308.5 19,779.2 19,77									•	•	•	•		
Deferred Income 1,975.0 2,006.0 3,668.0		•			_,	_,555.5	3,073.0	3,622.	3,373.7	3,332	.,	.,,555	.,525.5	5,555.5
Fotal Liabilities 11,267.0 16,399.0 22,848.0 17,579.2 21,473.3 24,262.1 26,982.0 29,611.0 32,545.9 35,873.8 39,539.5 43,564.7 47,986.7 Equity Common Equity 14,135.0 16,965.0 11,532.0 14,420.3 17,308.5 19,779.2 <th></th>														
Equity Common Equity 14,135.0 16,965.0 11,532.0 14,420.3 17,308.5 19,779.2		<u> </u>	•	•	17.579.2	21.473.3	24.262.1	26.982.0	29.611.0	32.545.9	35.873.8	39.539.5	43.564.7	47.986.7
Common Equity 14,135.0 16,965.0 11,532.0 14,420.3 17,308.5 19,779.2 29,748.5 37,90.3 379.0 <t< th=""><th></th><td></td><th></th><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>10,00 111</td><td>11,0001</td></t<>													10,00 111	11,0001
Common Equity 14,135.0 16,965.0 11,532.0 14,420.3 17,308.5 19,779.2 29,748.5 37,90.3 379.0 <t< th=""><th>Equity</th><td></td><th></th><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>	Equity													
Retained Earnings 10,690.0 13,131.0 9,458.0 14,247.6 18,287.1 23,490.5 29,748.5 37,201.5 45,944.5 55,412.0 65,679.7 76,832.3 88,964.4 Other Appropriated Reserves 311.0 220.0 379.0		14.135.0	16.965.0	11.532.0	14.420.3	17.308.5	19.779.2	19.779.2	19.779.2	19.779.2	19.779.2	19.779.2	19.779.2	19.779.2
Other Appropriated Reserves 311.0 220.0 379.0 <t< th=""><th></th><th></th><th>•</th><th>•</th><th>•</th><th>•</th><th>•</th><th>•</th><th>•</th><th>•</th><th>•</th><th>•</th><th>•</th><th>· · · · · · · · · · · · · · · · · · ·</th></t<>			•	•	•	•	•	•	•	•	•	•	•	· · · · · · · · · · · · · · · · · · ·
Treasury Stock (1,145.0) (1,056.0) (2,755.0) (3,030.2) (3,333.0) (3,666.0) (4,032.3) (4,435.1) (4,878.2) (5,365.6) (5,901.7) (6,491.3) (7,139.8) (•	•		· · · · · · · · · · · · · · · · · · ·	•	•	•	•		379.0
Total Equity 14,135.0 16,965.0 11,532.0 26,016.6 32,641.6 39,982.6 45,874.5 52,924.6 61,224.5 70,204.6 79,936.2 90,499.2 101,982.7														
	·													
Total Liabilities & Shareholders' Equity 25,402.0 33,364.0 34,380.0 43,595.8 54,114.9 64,244.7 72,856.5 82,535.5 93,770.4 106,078.4 119,475.7 134,063.9 149,969.4	Total Liabilities & Shareholders' Equity		·	·										149,969.4

Historical Cash Flow Statement

Fiscal Years Ending Dec. 31	2011	2019	2020	2021	2022E
Operating Activities	2011	2013	2020	2021	20221
Net Income / Starting Line \$	2,040.1	\$ 2,901.4	\$ 4,051.1	\$ 6,953.8	\$ 6,414.6
Depreciation, Depletion & Amortization	229.7	493.3	541.7	556.7	567.1
Deferred Taxes & Investment Tax Credit	88.0	(265.0)	(240.9)	(496.0)	(591.6)
Deferred Taxes	88.0	(265.0)	(240.9)	(496.0)	(591.6)
Other Funds	23.2	412.6	317.4	22.2	16.5
Funds from Operations	2,381.0	3,542.2	4,669.3	7,036.8	6,406.7
Changes in Working Capital	498.4	124.9	606.0	5,782.7	5,416.9
Receivables	319.7	(392.1)	(704.4)	(1,433.3)	0, 120.5
Inventories	(384.2)	(453.0)	(805.6)	(571.1)	
Accounts Payable	(175.6)	(13.5)	381.1	849.4	
Other Assets/Liabilities	738.4	891.6	1,680.8	6,526.9	
Net Operating Cash Flow	2,879.4	3,667.1	5,275.3	12,819.5	11,823.6
Investing Activities	2,070.1	3,007.1	3,273.3	12,013.3	11,023.0
Capital Expenditures	(418.5)	(991.5)	(1,140.9)	(1,111.4)	(1,112.8)
Capital Expenditures (Fixed Assets)	(418.5)	(858.0)	(1,096.7)	(1,064.6)	(1,063.9)
Capital Expenditures (Other Assets)	(410.0)	(133.5)	(44.2)	(46.8)	(48.9)
Net Assets from Acquisitions	_	(133.3)	(254.0)	-	(+0.5)
Sale of Fixed Assets & Businesses	_	_	(254.0)	388.9	373.7
Purchase/Sale of Investments		(305.0)	(132.7)	784.5	(193.2)
Purchase of Investments	-	1,445.5	1,682.0	1,374.3	890.5
Sale/Maturity of Investments	_	1,140.5	1,549.3	2,158.8	697.3
Other Funds	_	1.0	(13.9)	(147.0)	(147.2)
Other Uses	-	-	(13.9)	(147.0)	(147.2)
Other Sources	_	1.0	(13.3)	(147.0)	(147.2)
Net Investing Cash Flow	(418.5)	(1,295.5)	(1,541.5)	(85.1)	(1,079.4)
Financing Activities	(410.0)	(1,233.3)	(1,541.5)	(03.1)	(1,073.4)
Cash Dividends Paid	(240.1)	(1,483.8)	(1,215.7)	(1,617.3)	(2,465.3)
Common Dividends	(240.1)	(1,483.8)	(1,215.7)	(1,617.3)	(2,465.3)
Change in Capital Stock	, ,	(428.4)		(1,017.5)	(8,757.1)
Repurchase of Common & Preferred Stk.	(974.1)	(458.9)	(1,376.5)	(10,118.1)	(9,375.3)
Sale of Common & Preferred Stock	47.4	30.4	43.2	57.9	618.2
Proceeds from Sale of Stock	47.4	30.4	43.2	57.9	618.2
Issuance/Reduction of Debt, Net	(3.5)	(4.3)	1,690.6	- -	010.2
Change in Long-Term Debt	(3.5)	(4.3)	(3.8)		
Issuance of Long-Term Debt	(3.3)	- (4.5)	(3.0)		
Reduction in Long-Term Debt	(3.5)	(4.3)	(3.8)		
Change in Other Debt	(0.0)	(4.5)	1,694.3	_	
Repayments of Operating Lease Liabilities			1,054.5	(14.3)	
Other Funds	(208.6)	_	_	(14.3)	_
Other Uses	(208.6)	-	-	-	-
Other Sources	(200.0)	_	_	_	_
Net Financing Cash Flow	(1,379.0)	(1,916.5)	(858.4)	(13,251.2)	(21,826.6)
All Activities	(1,378.0)	(1,510.5)	(030.4)	(13,231.2)	(21,020.0)
Exchange Rate Effect	5.5	5.1	(6.0)	24.0	26.7
	1,087.5	460.2	2,869.4	1,066.6	(1,020.7)
Net Change in Cash Free Cash Flow	2,460.9				
Free Cash Flow per Share	2,460.9 7.4	2,809.1 6.7	4,178.7 10.0	11,754.9 28.6	10,759.7 27.0
·					
Free Cash Flow Yield (%)	13.7	2.3	2.0	3.6	6.0

Forecasted Cash Flow Statement

Fiscal Years Ending Dec. 31	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E	2031E
Net Income (Loss)	6,359.8	5,312.4	6,858.2	8,329.7	9,919.2	11,635.2	12,598.4	13,662.4	14,838.9	16,141.
Adjustments to reconcile net income to net cash provided by operating activities:										
Add: Depreciation & amortization	565.8	646.7	668.0	698.0	736.6	783.7	839.6	904.4	978.5	1,062.4
Allowance for doubtful accounts										
Changes (increases of decreases) in working capital accounts:										
Increase in receivables	(77.4)	(763.3)	(517.3)	(507.2)	(558.2)	(615.1)	(678.6)	(749.4)	(828.6)	(917.1
Increase in inventories	(2,811.9)	(914.4)	(854.2)	(837.5)	(921.7)	(1,015.6)	(1,120.4)	(1,237.4)	(1,368.1)	(1,514.2
Changes in other current assets	(325.3)	(99.2)	(92.6)	(90.8)	(100.0)	(110.1)	(121.5)	(134.2)	(148.4)	(164.2
Changes in deferred tax assets	802.2	(105.1)	(47.4)	(46.5)	(51.2)	(56.4)	(62.2)	(68.7)	(75.9)	(84.0
Changes in accounts payable	(303.8)	213.0	198.9	195.1	214.7	236.5	261.0	288.2	318.6	352.7
Changes in income tax payable	(95.5)	(68.9)	(49.7)	(35.9)	(25.9)	(18.7)	(13.5)	(9.7)	(7.0)	(5.1
Changes in accrued & other liabilities	(2,963.6)	1,797.3	810.9	795.1	875.0	964.2	1,063.6	1,174.7	1,298.8	1,437.5
Changes in deferred tax liabilities	400.5	180.9	206.4	198.8	169.0	189.9	220.4	241.5	262.9	286.2
Changes in provision for risks and charges	-	-	-	-	-	-	-	-	-	-
Net cash flows resulting from Operating activities	1,550.7	6,199.3	7,181.1	8,698.6	10,257.5	11,993.7	12,986.9	14,071.7	15,269.7	16,595.4
Changes in short term investments	(258.8)	(801.6)	(361.6)	(354.6)	(390.2)	(430.0)	(474.4)	(523.9)	(579.2)	(641.1
Changes in gross PPE (CapEx)	(652.7)	(717.5)	(788.8)	(867.1)	(953.2)	(1,047.8)	(1,151.9)	(1,266.3)	(1,392.0)	(1,530.2
Changes in total long-term investments	(032.7)	(717.5)	(700.0)	(007.1)	(333.2)	(1,047.0)	(1,131.3)	(1,200.5)	(1,332.0)	(1,550.2
Changes in other assets	(85.2)	(275.6)	(124.4)	(121.9)	(134.2)	(147.9)	(163.1)	(180.2)	(199.2)	(220.5
Net cash flows from Investing activities	(996.7)	(1,794.7)	(1,274.8)	(1,343.6)	(1,477.6)	(1,625.7)	(1,789.4)	(1,970.3)	(2,170.4)	(2,391.8
	(
Changes in st debt and current portion of It debt	(457.5)	40.3	18.2	17.8	19.6	21.6	23.9	26.4	29.1	32.2
Changes in LT debt	(320.0)	1,192.8	1,361.0	1,310.7	1,114.3	1,252.4	1,453.7	1,592.5	1,733.5	1,887.5
Changes in other liabilities	(1,528.8)	538.8	243.1	238.3	262.3	289.0	318.8	352.1	389.3	430.9
Changes in common equity	2,888.3	2,888.3	2,470.6	-	-	-	-	-	-	-
Dividends paid	(1,570.2)	(1,273.0)	(1,654.8)	(2,071.6)	(2,466.3)	(2,892.2)	(3,130.9)	(3,394.6)	(3,686.3)	(4,009.1
Shares repurchase	(275.2)	(302.7)	(333.0)	(366.3)	(402.9)	(443.1)	(487.4)	(536.1)	(589.6)	(648.5
Net cash flows from Financing activities	(1,263.5)	3,084.4	2,105.1	(871.0)	(1,472.9)	(1,772.3)	(1,822.0)	(1,959.7)	(2,124.0)	(2,307.0
Net Increase (or decrease) in cash, cash equivalents & restricted cash	(709.6)	7,489.1	8,011.5	6,484.0	7,307.0	8,595.7	9,375.6	10,141.7	10,975.3	11,896.0
Cash & Cash Equivalents at the beginning of the period	5,481.0	4,771.4	12,260.5	20,272.0	26,756.0	34,062.9	42,658.6	52,034.2	62,175.9	73,151.
Cash & Cash Equivalents at the end of the period	4,771.4	12,260.5	20,272.0	26,756.0	34,062.9	42,658.6	52,034.2	62,175.9	73,151.2	85,047.8
Cash & Cash Equivalents at the end of the period	4,//1.4	12,200.5	20,272.0	20,730.0	34,002.9	42,030.0	32,034.2	02,173.9	/3,131.2	65,047

Common Size Income Statement

ASML

Fiscal Years Ending Dec. 31	2019	2020	2021	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E	2031E
Sales	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Cost of Goods Sold (COGS) incl. D&A	56.6%	52.6%	48.1%	48.8%	55.7%	52.5%	50.0%	47.5%	45.0%	45.0%	45.0%	45.0%	45.0%
COGS excluding D&A	52.8%	49.2%	45.7%	46.2%	51.7%	51.7%	51.7%	51.7%	51.7%	51.7%	51.7%	51.7%	51.7%
Depreciation & Amortization Expense	3.7%	3.4%	2.4%	2.6%	2.4%	2.3%	2.2%	2.2%	2.2%	2.1%	2.1%	2.1%	2.1%
Depreciation	2.8%	2.5%	1.7%	1.9%	2.2%	2.1%	2.0%	2.0%	2.0%	1.9%	1.9%	1.9%	1.9%
Amortization of Intangibles	1.0%	0.9%	0.7%	0.8%	0.5%	0.4%	0.4%	0.4%	0.3%	0.3%	0.3%	0.2%	0.2%
Gross Income	43.4%	47.4%	51.9%	51.2%	44.3%	47.5%	50.0%	52.5%	55.0%	55.0%	55.0%	55.0%	55.0%
	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
SG&A Expense (subtract)	19.8%	18.4%	16.7%	18.9%	18.8%	18.3%	17.8%	17.5%	17.5%	17.5%	17.5%	17.5%	17.5%
Research & Development	15.6%	14.8%	13.1%	14.6%	14.4%	14.0%	13.8%	13.5%	13.5%	13.5%	13.5%	13.5%	13.5%
EBIT (Operating Income)	23.6%	29.0%	35.1%	32.3%	25.5%	25.5%	25.5%	25.5%	25.5%	25.5%	25.5%	25.5%	25.5%
Nonoperating Income - Net	0.1%	0.1%	1.2%	1.1%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
Nonoperating Interest Income	0.1%	0.1%	0.1%	0.0%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%
Other Income (Expense) (add)	0.1%	0.1%	1.2%	1.1%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
Interest Expense	0.3%	0.3%	0.3%	0.3%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%
Gross Interest Expense (subtract)	0.3%	0.3%	0.3%	0.3%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%
Pretax Income	23.4%	28.7%	36.0%	33.2%	26.0%	26.0%	26.0%	26.0%	26.0%	26.0%	26.0%	26.0%	26.0%
Income Taxes (subtract)	1.6%	3.9%	5.5%	5.0%	6.4%	6.4%	6.4%	6.4%	6.4%	6.4%	6.4%	6.4%	6.4%
Equity in Earnings of Affiliates (add)	0.2%	0.6%	1.1%	1.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Net Income	21.9%	25.4%	31.6%	29.4%	19.9%	23.6%	26.7%	29.4%	31.9%	31.9%	31.9%	31.9%	31.9%

$\stackrel{ ext{ iny matter ASML}}{ ext{ iny MS:ASML}}$

Common Size Balance Sheet

Fiscal Years Ending Dec. 31	2019	2020	2021	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E	2031E
Assets													
Cash & Short-Term Investments	40.03%	56.45%	39.24%	37.83%	61.68%	85.67%	101.39%	116.77%	132.80%	147.63%	161.10%	173.23%	184.10%
Cash Only	29.97%	34.58%	24.92%	22.07%	45.91%	69.91%	85.62%	101.01%	117.03%	131.87%	145.33%	157.46%	168.34%
Total Short Term Investments	10.06%	21.86%	14.32%	15.77%	15.77%	15.77%	15.77%	15.77%	15.77%	15.77%	15.77%	15.77%	15.77%
Short-Term Receivables	24.19%	25.59%	23.56%	24.33%	22.55%	22.55%	22.55%	22.55%	22.55%	22.55%	22.55%	22.55%	22.55%
Accounts Receivables, Net	15.16%	10.98%	16.51%	16.35%	14.58%	14.58%	14.58%	14.58%	14.58%	14.58%	14.58%	14.58%	14.58%
Other Receivables	9.03%	14.62%	7.05%	7.97%	7.97%	7.97%	7.97%	7.97%	7.97%	7.97%	7.97%	7.97%	7.97%
Inventories	34.14%	37.13%	28.27%	41.76%	37.24%	37.24%	37.24%	37.24%	37.24%	37.24%	37.24%	37.24%	37.24%
Other Current Assets	4.57%	3.15%	2.97%	4.53%	4.04%	4.04%	4.04%	4.04%	4.04%	4.04%	4.04%	4.04%	4.04%
Prepaid Expenses	3.16%	2.14%	1.94%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Miscellaneous Current Assets	1.41%	1.01%	1.04%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Total Current Assets	102.93%	122.31%	94.04%	108.45%		149.50%		180.60%	196.63%	211.46%	224.93%	237.06%	
Net Property, Plant & Equipment	19.71%	21.62%	16.27%	17.72%	14.82%	14.26%	13.97%	13.77%	13.65%	13.58%	13.55%	13.55%	
Property, Plant & Equipment - Gross	39.26%	41.21%	29.88%	33.42%	29.74%	30.11%	30.72%	31.29%	31.82%	32.32%	32.77%	33.17%	
Operating Lease Right-of-Use Assets	1.75%	1.38%	0.82%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Accumulated Depreciation	19.55%	19.59%	13.61%	15.70%	14.93%	15.85%	16.75%	17.52%	18.18%	18.74%	19.22%	19.62%	
Buildings	6.33%	6.47%	4.90%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Machinery & Equipment	8.68%	8.65%	5.77%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Leased Property Other Property Plant & Fauirment	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Other Property, Plant & Equipment	4.54%	4.47%	2.94%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Total Long-Term Investments	12.09%	10.50%	6.88%	7.00%	5.67%	5.22%	4.84% 0.00%	4.49% 0.00%	4.15%	3.83%	3.54%	3.26%	2.99%
LT Investment - Affiliate Companies	7.07% 0.88%	6.30% 0.95%	4.61% 0.25%	0.00% 0.00%	0.00% 0.00%	0.00% 0.00%	0.00%	0.00%	0.00% 0.00%	0.00%	0.00%	0.00%	0.00% 0.00%
Other Long-Term Investments	4.15%	3.25%	2.02%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Long-Term Note Receivable Intangible Assets	4.13%	43.60%	28.47%	28.21%	22.36%	20.17%	18.33%	16.63%	15.07%	13.63%	12.31%	11.11%	
Goodwill	38.53%	35.54%	23.55%	23.96%	19.40%	17.87%	16.58%	15.36%	14.21%	13.13%	12.11%	11.11%	
Other Intangible Assets	9.37%	8.05%	4.92%	4.24%	2.96%	2.30%	1.75%	1.27%	0.86%	0.50%	0.20%	-0.05%	-0.25%
Deferred Tax Assets	3.78%	5.16%	5.68%	2.07%	2.07%	2.07%	2.07%	2.07%	2.07%	2.07%	2.07%	2.07%	2.07%
Other Assets	5.59%	6.18%	4.94%	5.42%	5.42%	5.42%	5.42%	5.42%	5.42%	5.42%	5.42%	5.42%	5.42%
Deferred Charges	5.43%	6.07%	4.22%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Tangible Other Assets	0.17%	0.11%	0.72%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Total Assets	•	209.37%				221.54%					279.26%		
	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Liabilities & Shareholders' Equity	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Current													
ST Debt & Curr. Portion LT Debt	0.47%	0.48%	2.86%	0.79%	0.79%	0.79%	0.79%	0.79%	0.79%	0.79%	0.79%	0.79%	0.79%
Accounts Payable	9.01%	10.58%	10.94%	9.73%	8.67%	8.67%	8.67%	8.67%	8.67%	8.67%	8.67%	8.67%	8.67%
Income Tax Payable	0.56%	0.85%	1.56%	1.14%	0.67%	0.44%	0.30%	0.20%	0.13%	0.09%	0.06%	0.04%	0.03%
Other Current Liabilities	29.79%	38.80%	48.22%	35.35%	35.35%	35.35%	35.35%	35.35%	35.35%	35.35%	35.35%	35.35%	
Accrued Payroll	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Miscellaneous Current Liabilities	29.79%	38.80%	48.22%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Total Current Liabilities	39.83%	50.71%	63.58%	47.02%	45.49%	45.26%	45.12%	45.02%	44.95%	44.91%	44.88%	44.86%	44.84%
Long-Term	27.600/	26.000/	24 670/	20 570/	24 420/	24.450/	26.600/	27.050/	20 200/	20 75%	22.000/	22 222/	24.220/
Long-Term Debt	27.68%	36.80%	21.67%	20.57%	21.12%	24.15%	26.60%	27.95%	29.30%	30.75%	32.08%	33.28%	
Long-Term Debt excl Lease Obligations	26.29%	35.74%	21.05%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Capital and Operating Lease Obligations Provision for Picks & Charges	1.38% 0.00%	1.06%	0.62% 0.00%	0.00%	0.00% 0.00%	0.00%	0.00% 0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00% 0.00%
Provision for Risks & Charges Deferred Tax Liabilities	1.99%	0.00% 1.83%	1.25%	3.12%	3.20%	3.66%	4.03%	4.24%	0.00% 4.44%	0.00% 4.66%	0.00% 4.86%	0.00%	0.00% 5.21%
Other Liabilities	1.99%	1.83%	1.25%	3.12% 10.60%	3.20% 10.60%	10.60%	4.03%	4.24% 10.60%	4.44% 10.60%	4.66%	4.86%	5.05% 10.60%	
Other Liabilities Other Liabilities (excl. Deferred Income)	0.74%	0.98%	0.69%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Deferred Income	14.93%	12.59%	16.67%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Total Liabilities	-	102.91%		81.31%	80.41%	83.67%	86.35%	87.81%	89.29%	90.91%	92.42%	93.78%	
	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Equity	2.00/0	2.00/0	2.00/0	2.00/0	2.00/0	2.00/0	2.00/0	2.00/0	2.00/0	2.00/0	2.00/0	2.00/0	2.00/0
Common Equity	106.84%	106.46%	52.42%	66.70%	64.81%	68.21%	63.30%	58.65%	54.26%	50.13%	46.23%	42.58%	39.15%
Retained Earnings	80.80%	82.40%	43.00%	65.90%	68.48%	81.00%	95.20%						
AOCI	2.35%	1.38%	1.72%	1.75%	1.42%	1.31%	1.21%	1.12%	1.04%	0.96%	0.89%	0.82%	0.75%
Treasury Stock	-8.65%	-6.63%	-12.52%	-14.02%	-12.48%	-12.64%	-12.90%	-13.15%	-13.38%	-13.60%	-13.79%	-13.97%	
Total Shareholders' Equity		106.46%	52.42%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Total Equity										177.92%			
Total Liabilities & Shareholders' Equity	192.01%	209.37%	156.29%	201.64%	202.64%	221.54%	233.16%	244.74%	257.25%	268.83%	279.26%	288.58%	296.84%
	-												

Weighted Average Cost of Capital (WACC) Estimation

	Estimated WACC	11.86%
Market Value of the Firm	239,979,074,735.00	100.00%
MV of Preferred	-	0.00%
Price of Pfd. Shares	0	
Total Shares Outstanding	0	
Market Value of Preferred Stock:		
MV of Total Debt	553,400,000.00	0.23%
PV of Operating Leases	13,700,000.00	<u></u>
Long-Term Debt	476,800,000.00	
Short-Term Debt	62,900,000.00	
Market Value of Debt:		
MV of Equity	239,425,674,735.00	99.77%
Current Stock Price	\$589.03	
Market Value of Common Equity: Total Shares Outstanding	406,474,500	MV Weight
Cost of Preferred:	0.00%	
Price of Pfd. Shares	0	
Annual Pfd. Dividend	0	
Cost of Preferred Stock:		
After-Tax Cost of Debt	3.80%	
Marginal Tax Rate	24%	
Pre-Tax Cost of Debt	5.03%	
Implied Default Premium	1.14%	
Cost of Debt: Risk-Free Rate	3.89%	
cost of Equity	11100/0	
Equity Risk Premium Cost of Equity	5.30% 11.88%	
Beta	1.51	
Risk-Free Rate	3.89%	
Cost of Equity:		

Discounted Cash Flow (DCF) and Economic Profit (EP) Valuation Models

Key Inputs:

CV Growth of NOPLAT 3.00%
CV Year ROIC 43.46%
WACC 11.86%
Cost of Equity 11.88%

Fiscal Years Ending Dec. 31	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E	2031E
DCE Model										
DCF Model:	0.620.79	12 642 11	14 192 64	17 500 27	19 602 00	10 201 71	20,907.17	22 661 60	24 611 70	26 770 50
Free Cash Flow (FCF)	9,639.78	13,642.11	14,182.64	17,509.27	18,603.90	19,391.71	20,907.17	22,661.60	24,611.78	26,770.59 417,421.12
Continuing Value (CV)	0 617 02	10,902.94	10 122 20	11 102 00	10,623.30	9,899.26	0 5 41 42	9,245.69	8,976.83	
PV of FCF	8,617.83	10,902.94	10,133.29	11,183.88	10,023.30	9,899.20	9,541.42	9,245.09	8,970.83	152,249.03
Value of Operating Assets:	241,373.49									
Non-Operating Adjustments										
Non operating Assets										
(+)Excess cash	-									
(+)Short term investments	3,150.0									
(+)Equity and other investments	1,513.0									
Non operating liabilities										
(-)ESOP	(449.93)									
(-)Long Term Debt	(4,768.00)									
(-)PV of Operating Leases	-137.0									
Value of Equity	240,681.56									
Shares Outstanding	406.5									
Intrinsic Value of Last FYE	\$ 592.12									
Implied Price as of Today	\$ 641.97									
EP Model:										
Economic Profit (EP)	15,871.22	18,467.31	19,560.15	20,390.15	21,559.17	22,787.76	24,080.12	25,502.68	27,095.01	28,882.33
Continuing Value (CV)	15,071.22	10,407.31	19,500.15	20,330.13	21,333.17	22,707.70	24,000.12	23,302.00	27,055.01	326,038.72
PV of EP	14,188.66	14,759.30	13,975.44	13,024.02	12,310.84	11,632.91	10,989.47	10,404.83	9,882.56	118,918.46
I V OI LI	14,100.00	14,733.30	13,373.44	13,024.02	12,310.04	11,032.31	10,303.47	10,404.03	3,002.30	110,510.40
Total PV of EP	230,086.49									
Invested Capital (last FYE)	11,287.00									
Value of Operating Assets:	241,373.49									
Non-Operating Adjustments										
Non operating Assets										
Excess cash	-									
Short term investments	3,150.00									
Equity and other investments	1,513.00									
Non operating liabilities										
ESOP	(449.93)									
Long Term Debt	(4,768.00)									
PV of Operating Leases	(137.00)									
Value of Equity	240,681.56									
Shares Outstanding	406.47									
Intrinsic Value of Last FYE	592.12									
Implied Price as of Today	641.97									
Model Date	10/30/2022									
Next FYE	12/31/2022									
Lest EVE	12/01/2022									

iviouei Date	10/30/2022
Next FYE	12/31/2022
Last FYE	12/31/2021
Days in FY	365
Days since FYE	303
Elapsed Fraction of FY	0.830
Dividend Yield	1.65%
	<u> </u>

Dividend Discount Model (DDM) or Fundamental P/E Valuation Model

Fiscal Years Ending Dec. 31	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E	2031E
EPS	\$ 15.73	\$ 12.24	\$ 14.88	\$ 17.66	\$ 21.15	\$ 24.94	\$ 27.14	\$ 29.56	\$ 32.24 \$	35.20
Key Assumptions CV growth of EPS CV Year ROE Cost of Equity	9.18% 17.84% 11.88%									
Future Cash Flows P/E Multiple (CV Year) EPS (CV Year) Future Stock Price Dividends Per Share	3.90	3.04	3.69	4.38	5.24	6.18	6.73	7.33	\$ \$ 7.99	17.98 35.20 632.86
Discounted Cash Flows	3.4860908	2.42546	2.63523	2.794603	2.992037	3.153845			2.910944 \$	230.48
Intrinsic Value as of Last FYE Implied Price as of Today	\$ 256.93 \$ 278.56									

$\widehat{\underline{m}}$ ASML Holding NV (XNAS:ASML)

Relative Valuation Models

			EPS	EPS				
Ticker	Company	Price	2022E	2023E	P/E 22	P/E 23	EV/EBITDA 2022E	EV/EBITDA 2023E
AMAT	Applied Materials Inc.	\$88.29	\$7.44	\$6.58	11.87	13.42	11.48	13.43
LRCX	Lam Research Corp.	\$404.78	\$33.12	\$34.57	12.22	11.71	10.84	14.41
KLAC	KLA Corp.	\$316.45	\$21.15	\$24.54	14.96	12.90	12.99	16.75
TEL	Tokyo Electron Ltd.	\$81.20	\$5.12	\$4.40	15.86	18.46	10.41	11.55
				Average:	13.73	14.12	11.43	14.04
盒 <mark>ASM</mark>	 	\$589.03	\$15.73	12.24	37.4	48.1	32.58	24.52

Implied Relative Value:

P/E (EPS22)
P/E (EPS23)
EV/EBITDA 2022E
EV/EBITDA 2023E

\$ 215.94
\$ 172.89
\$ 372.39
\$ 344.14

Key Management Ratios

Fiscal Years Ending Dec. 31	2019	2020	2021	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E	2031E
Liquidity Ratios:													
Current Ratio	2.58	2.41	1.48	2.31	2.76	3.30	3.66	4.01	4.37	4.71	5.01	5.28	5.53
Quick Ratio	1.73	1.68	1.03	1.42	1.94	2.48	2.84	3.18	3.55	3.88	4.18	4.45	4.70
Cash Ratio	1.01	1.11	0.62	0.80	1.36	1.89	2.25	2.59	2.95	3.29	3.59	3.86	4.11
Asset-Management Ratios:													
Total Asset turnover	0.36	0.35	0.43	0.40	0.35	0.32	0.30	0.28	0.27	0.26	0.25	0.24	0.23
Fixed Asset turnover	0.36	0.35	0.43	0.40	0.35	0.32	0.30	0.28	0.27	0.26	0.25	0.24	0.23
AR turnover	4.62	5.79	4.84	4.53	4.72	4.70	4.68	4.69	4.69	4.69	4.69	4.70	4.70
Profitability Ratios:													
Return on Equity	21.15%	26.05%	48.80%	33.87%	18.11%	18.89%	19.40%	20.08%	20.39%	19.17%	18.20%	17.41%	16.77%
Return on assets	11.42%	12.14%	20.23%	14.59%	9.82%	10.68%	11.43%	12.02%	12.41%	11.88%	11.44%	11.07%	10.76%
Net Margin	21.93%	25.42%	31.61%	29.41%	19.89%	23.65%	26.66%	29.41%	31.92%	31.93%	31.93%	31.94%	31.95%
Payout Policy Ratios:													
Dividend Payout Ratio (Dividend/EPS)	32.4%	28.7%	30.0%	24.8%	24.8%	24.8%	24.8%	24.8%	24.8%	24.8%	24.8%	24.8%	24.8%
Operating Efficiency Ratios:													
Receivables Turnover	4.45	4.38	4.75	4.14	4.73	4.62	4.60	4.60	4.61	4.61	4.61	4.62	4.62
Inventory Turnover	1.72	1.61	1.75	1.39	1.57	1.47	1.39	1.32	1.26	1.26	1.26	1.26	1.26

Valuation of Options Granted under ESOP

Ticker	<u></u>	AS:ASML)
Current Stock Price	\$	589.03
Risk Free Rate		3.89%
Current Dividend Yield		1.65%
Annualized St. Dev. of Stock Returns		43.41%

		Average	Average	B-S	Value
Range of	Number	Exercise	Remaining	Option	of Options
Outstanding Options	of Shares	Price	Life (yrs)	Price	Granted
US	35,251	90.36	2.93 \$	480.82 \$	16,949,214
Euro	57,923	87.39	2.81 \$	484.15 \$	28,043,469
Total	93,174 \$	88.51	2.86 \$	509.96 \$	44,992,682

Sensitivity Tables

Beta

	Risk-Free Rate										
641.97	3.60%	3.70%	3.80%	3.90%	4.10%	4.20%	4.30%				
1.54	651.83	656.43	661.10	665.82	670.60	675.45	680.36				
1.53	643.28	647.78	652.33	656.94	661.61	666.34	671.13				
1.52	634.94	639.33	643.77	648.28	652.83	657.45	662.13				
1.51	626.79	631.08	635.42	641.98	644.27	648.77	653.34				
1.50	611.05	615.14	619.28	623.48	627.73	632.02	636.38				
1.49	603.44	607.44	611.49	615.59	619.74	623.94	628.19				
1.48	596.00	599.92	603.88	607.88	611.94	616.04	620.20				

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641.97	5.15%	5.20%	5.25%	5.30%	5.35%	5.40%	5.45%
1.54	646.73	651.14	655.60	660.12	664.69	669.33	674.02
1.53	640.23	644.60	649.03	653.51	658.05	662.64	667.30
1.52	633.86	638.19	642.58	647.02	651.52	656.08	660.69
1.51	627.60	631.89	636.25	641.98	645.11	649.63	654.21
1.50	621.45	625.71	630.02	634.39	638.82	643.30	647.83
1.49	615.40	619.63	623.91	628.24	632.63	637.07	641.57
1.48	609.47	613.66	617.90	622.20	626.55	630.96	635.42

Forecasted CV ROIC

641.97	40.46%	41.46%	42.46%	43.46%	44.46%	45.46%	46.46%
12.46%	590.05	590.75	591.41	592.05	592.65	593.23	593.78
12.26%	605.81	606.53	607.22	607.88	608.51	609.11	609.68
12.06%	622.31	623.06	623.78	624.46	625.11	625.73	626.33
11.86%	639.60	640.38	641.13	641.98	642.51	643.16	643.78
11.66%	657.75	658.56	659.33	660.07	660.77	661.44	662.09
11.46%	676.80	677.64	678.44	679.21	679.94	680.64	681.31
11.26%	696.82	697.70	698.54	699.34	700.10	700.83	701.52

CV Growth of NOPLAT

	641.97	2.70%	2.80%	2.90%	3.00%	3.10%	3.20%	3.30%
	1.95%	630.17	633.55	637.00	640.54	644.15	647.85	651.63
<u> </u>	1.85%	630.64	634.02	637.48	641.02	644.63	648.33	652.12
Yield	1.75%	631.11	634.50	637.96	641.50	645.12	648.82	652.61
Dividend	1.65%	631.59	634.97	638.43	641.98	645.60	649.30	653.09
vide	1.55%	632.06	635.45	638.91	642.45	646.08	649.79	653.58
ō	1.45%	632.53	635.92	639.39	642.93	646.56	650.27	654.07
	1.35%	633.00	636.39	639.86	643.41	647.04	650.76	654.56

CV Growth of NOPLAT

Aarginal Tax Rate

641.97	2.70%	2.80%	2.90%	3.00%	3.10%	3.20%	3.30%
27.48%	631.62	635.00	638.47	642.01	645.63	649.33	653.13
26.48%	631.61	634.99	638.46	642.00	645.62	649.32	653.12
25.48%	631.60	634.98	638.45	641.99	645.61	649.31	653.10
24.48%	631.59	634.97	638.43	641.98	645.60	649.30	653.09
23.48%	631.58	634.96	638.42	641.97	645.59	649.29	653.08
22.48%	631.57	634.95	638.41	641.95	645.58	649.28	653.07
21.48%	631.56	634.94	638.40	641.94	645.57	649.27	653.06

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