



Technology

Micron Technology, Inc. (NASDAQ:MU)

Recommendation: SELL

Analysts

Kevin Stokes

kkstokes@uiowa.edu

Cameron Smith

cameron-d-smith@uiowa.edu

My Linh Ho

Mylinh-ho@uiowa.edu

Company Overview

With a long history dating back to its founding in 1978, Micron Technology Inc., is a pillar of the semiconductor industry. With its advanced DRAM, NAND, and NOR flash memory technologies, Micron—a company well-known for its expertise in memory and storage solutions—remains at the forefront of the industry. With its products' vital use in computers, servers, cellphones, automotive systems, and IoT devices, the company is well-positioned to benefit from the growing demand for digitalization.

Stock Performance Highlights

| | |
|----------------------------|----------|
| 52-week High | \$130.54 |
| 52-week Low | \$58.03 |
| Beta Value | 1.28 |
| Average Daily Volume (3M) | 21.36 m |
| Average Daily Volume (10D) | 25.81 m |

Share Highlights

| | |
|-----------------------|------------|
| Market Capitalization | \$134.55 b |
| Shares Outstanding | 1.11 b |
| Book Value per share | \$39.63 |
| EPS (TTM) | \$-3.43 |
| P/E Ratio (TTM) | N/A |
| Dividend Yield | 0.38% |
| Dividend Payout Ratio | 31.56% |

Company Performance Highlights

| | |
|---------------|-----------|
| ROA (2023) | 1.70% |
| ROA (2024E) | 1.79% |
| ROE (2023) | -11.69% |
| ROE (2024E) | 3.46% |
| Sales (2023) | \$15.54 b |
| Sales (2024E) | \$24.12 b |

Financial Ratios

| | |
|---------------------|------|
| Current Ratio (MRQ) | 3.74 |
| Debt to Equity | 0.30 |

Investment Thesis

We recommend a SELL rating for Micron, as it is currently overvalued by 20.4% to 35.4% according to our estimates. Despite the potential for strong future growth, geopolitical tensions are likely to impede this progress, leading analysts to overestimate its market valuation.

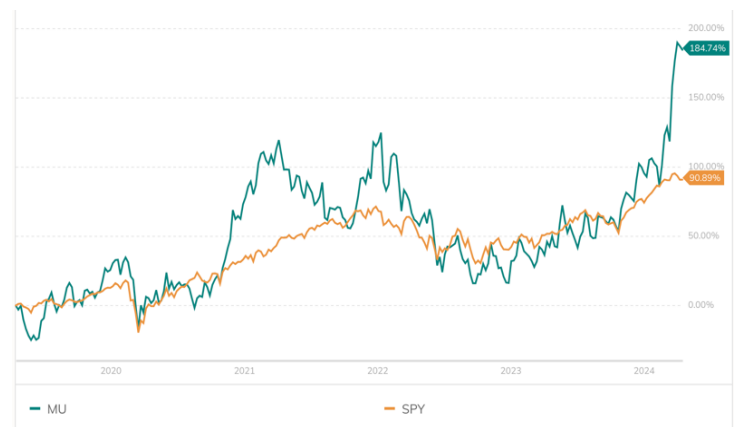
Drivers of Thesis:

- Micron is trading at very high multiples relative to peers
- Further policy changes from China could negatively impact Micron's revenue and manufacturing capabilities.
- We believe analysts have overestimated Micron's growth in some key areas leading to the stock trading at a premium.

Risks to Thesis:

- Memory chips are going to be in high demand with AI trends fueling growth opportunities for Micron.
- Micron has been a leader in memory chip innovation, being the first to market with its HBM 3E chip.
- Micron's last three quarters show a strong recovery from 2023 and high revenue growth across all its business segments.

Five Year Stock Performance



Source: *Portfolios Lab*²

Company Analysis

Company Overview

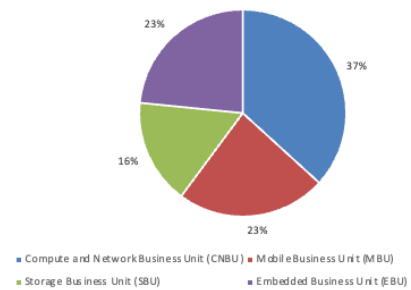
Micron Technology, Inc. is a leading global provider in the semiconductor sector specializing in advanced memory and storage solutions and is headquartered in Boise, Idaho. The company's product portfolio includes memory technologies, including dynamic random-access memory (DRAM), DRAM modules, managed NAND, ultra-bandwidth solutions, NAND flash, NOR flash, multichip packages, 3D XPoint memory, and memory cards. Micron serves data center, mobile, client, industrial, consumer, automotive, graphics, and networking markets. The company markets its products and solutions through independent sales representatives, retailers, and distributors. It has a business presence across North America, Asia-Pacific, and Europe. The corporate strategy of Micron Technology is centered on making large R&D investments to drive innovation in memory and storage solutions. The company wants to become more widely recognized in the world market and diversify into more types of products that cover a larger spectrum of memory technologies. Moreover, Micron prioritizes supply chain optimization, strategic acquisitions, and increased sustainability initiatives to support growth and resilience in the highly competitive semiconductor industry.¹

Revenue Analysis

Micron's 2023 total revenue was \$15.54 billion, down approximately 50% from 2022. The make-up of their revenue comes from two main types of memory solution products, DRAM, NAND flash memory, and other (primarily NOR)⁵

Revenue comes from different business segments, which Micron sells too. Micron's revenue comes from the Compute and Networking Business Unit (CNBU), Mobile Business Unit (MBU), Embedded Business Unit (EBU), and Storage Business Unit (SBU).³

2023 Revenue Breakdown by Business Unit



Source: *Micron 10-K*³

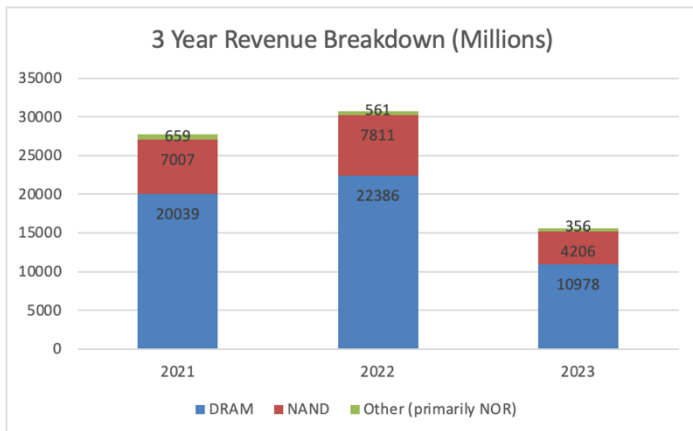
Compute and Networking Business Unit (CNBU): CNBU sells memory chips to clients, cloud servers, enterprise, graphics, and networking markets. The memory chips sold in this unit are primarily for PCs, cloud servers, enterprise data centers, and networking infrastructure.³ With the rise of AI, we forecast this segment to be the most significant revenue growth for Micron over the years. According to Global Market Insights, data center networking will grow by 12% CAGR by 2032.⁴ This growth is driven by cloud computing, AI applications, and 5G networks. Due to this demand, the company is positioned to see rapid growth with HBM, DDR5, and data center SSDs.

Mobile Business Unit (MBU): MBU primarily sells memory and storage to mobile Original Equipment Manufacturers (OEMs) for smartphones and mobile devices. These products are sold to OEMs who put these chips in their devices.³ OEMs have begun to incorporate generative AI-based functionality. AI-enabled smartphones and devices are expected to drive growth in demand for both DRAM and NAND flash products. Micron will benefit from this demand as companies like Apple will need memory chips from them.

Storage Business Unit (SBU): SBU sells hard drives and other storage solutions to enterprise, cloud, and consumer clients. These customers typically use these products in their data centers. AI servers and large language models will see huge increases in storage demand.³ This demand will primarily affect Micron's NAND flash product revenue.

Embedded Business Unit (EBU): EBU sells memory and storage products to the automotive, industrial, and consumer markets. S&P Global Mobility estimates Micron's automotive revenue to grow 20-24% CAGR to \$11.6 by 2026.⁶ The report emphasizes three main trends in the industry: Cars are becoming fully autonomous and estimates three million fully autonomous cars, more connectivity with different

vehicles connecting to each other, and zonal architectures of vehicles. All these trends will require high-performance low-power chips to accommodate these shifts in the industry.⁶



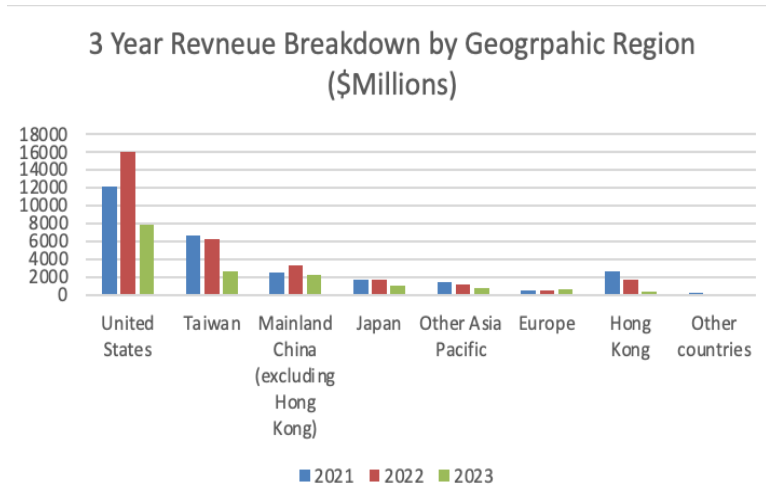
Source: *FactSet*⁵

DRAM: DRAM (Dynamic Random Access Memory) is a type of volatile memory that stores data within a device. It is commonly used for memory in computers and other devices due to its speed and efficiency in handling large amounts of temporary data quickly. The DRAM segment had growth rates of 38% in 2021, 12% in 2022, and -51% in 2023. The loss in revenue in 2023 can be attributed to DRAM product prices falling 57% in 2023.⁷ Another factor was a decline in China sales after China’s Cyberspace Administration (CAC) decision to ban Micron from selling to China businesses.³ DRAM sales are poised to increase, fueled by demand across its different business units. We expect DRAM to recover in 2024 strongly. In the first two quarters of FY 24, Micron has already reported \$7.6 billion in DRAM revenue.⁸ They also projected Q3 total revenue to be \$6.6 billion.⁸ Because of this we projected DRAM sales for 2024 to be over \$17 billion for our model. All business segments they market to are seeing significant growth in DRAM products.⁸ We expect DRAM products will be the leading growth driver for Micron in the future.

NAND: NAND flash is a type of non-volatile memory that stores data. It is used primarily in solid-state drives, USB flash drives, and memory cards for reliable storage that retains data without power. NAND flashes declined by 46% in 2023. The decline in NAND Flash revenue again can be seen from the fall in demand that led to NAND prices falling by 55%.³ In Micron’s first two quarters of FY 2024 we have already seen recovery. In the past two quarters it has been \$2.8 billion.⁸ Because of this, we forecast NAND sales to be \$6.6 billion in 2024.

NOR: NOR Flash is also a type of non-volatile memory. It is used for storing firmware and boot code in embedded systems where fast read speeds are essential. NOR and other revenue decreased by 41% in 2023. We expect Micron to have higher demand for its other NAND and DRAM products and little growth in this revenue segment.³

Revenue by geographic Region:



Source: *Micron 10-K*³

In 2023, China sales declined 38.9% from 2022. The decline was because of the CAC’s decision to ban Micron products from being sold in China.³ We forecast this will continue to impact Micron’s revenues going into 2024.

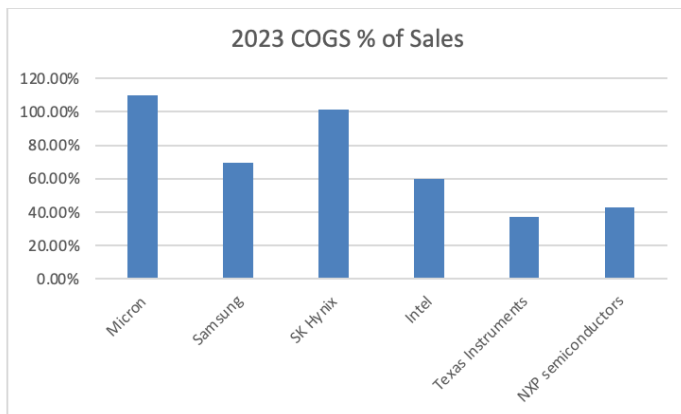
Micron is headquartered in the US, using the US dollar to account for revenues. Due to only half of Micron’s revenue coming from the US, the company is exposed to multiple currency risks. Micron uses derivative instruments to hedge its risks and mitigate currency risks.³

Expense Analysis

Micron’s operating expenses include cost of goods sold, R&D, and SG&A. We view COGS and R&D as significant costs for semiconductor companies.

Cost of Goods Sold

Cost of goods sold (COGS) is the biggest expense on Micron’s income statement. As a percentage of sales, it was over 109%. The high COGS was again due to Micron’s poor performance in 2023. Through 2019-2022, Micron averaged a cost of revenue of 60.22%.

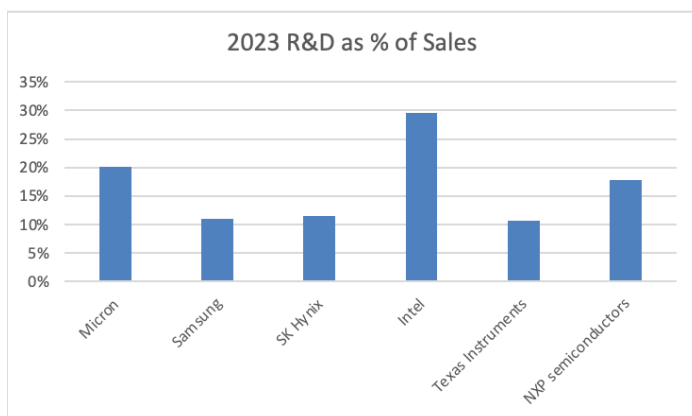


Source: *S&P Global*⁹

The average among these peers (excluding Micron) was 62.27%. Micron’s historical average of COGS as a percentage of sales is right around the industry average. We forecasted COGS by taking a 5-year historical average as a percentage of sales. We believe that Micron will return to its normal COGS of around 60% as its inventory levels have improved, and prices for memory chips have rebounded.

Research and Development

Micron’s second biggest expense is their R&D. For 2023, R&D expense was \$3.16 billion. The expense remained almost unchanged from 2022, as R&D was \$3.14 billion. R&D is very important for Micron to make sure it continues innovating to produce the most efficient chips.



Source: *S&P Global*⁹

Capital Expenditures Analysis

Micron Technology's capital expenditures (CapEx) are primarily directed toward building and replacing its manufacturing facilities, purchasing new machinery, and implementing cutting-edge semiconductor production processes. These expenditures help

purchase superior manufacturing equipment and build and upkeep fabrication facilities. Micron's CapEx. In 2021, capex was \$10 billion, 2022 was \$12 billion, and 2023 was \$7.6 billion.³ Micron announced in 2023 that it would cut CapEx because of the oversupply of chips. The oversupply was hurting their profit margins, and to reduce the stress Micron had to cut CapEx. Going into 2024 Micron has already given guidance that their CapEx will be between \$7.5-\$8.0 billion.¹⁰ Micron has also announced it will be investing \$100 billion over the next 20 years in new fabrication facilities in the US.³ In our model, we estimated \$7.75 billion for 2024 capital expenditures. With the investment in new facilities, we forecast that capital expenditures to increase by \$500 million yearly. Investment in new facilities in the US will give Micron more control over its supply chain and diversify risk away from Taiwan.

Capital Structure

Micron’s projects are mainly financed with their equity and reinvesting retained earnings. However, the company still takes on debt for its investments. In 2021, their D/E ratio was 0.15, 2022 was 0.14 and 2023 was 0.30. Micron has a long-term debt rating of BBB- by Standard and Poor’s. This rating was recently downgraded in 2024 from BBB.⁹ Below is a table that compares Micron’s debt rating to similar firms.

| Ticker | MU | 005930-KR | 00660-KR | INTC | TXN | NXPI |
|-----------------------|------|-----------|----------|------|-----|------|
| Long term debt rating | BBB- | AA- | BBB- | A | A+ | BBB+ |

Source: *S&P Global*⁹

Micron has \$278 million in debt while having \$8.5 billion in cash. While Micron has a low credit rating, we still forecast that it will have enough cash to cover its future debt obligations. Below is their long-term debt maturity schedule.

Maturities of Notes Payable

As of August 31, 2023, maturities of notes payable by fiscal year were as follows:

| | | |
|---|----|--------|
| 2024 | \$ | 107 |
| 2025 | | 695 |
| 2026 | | 1,659 |
| 2027 | | 1,780 |
| 2028 | | 1,493 |
| 2029 and thereafter | | 6,450 |
| Unamortized issuance costs, discounts, and premium, net | | (35) |
| Hedge accounting fair value adjustment | | (100) |
| | \$ | 12,049 |

Source: *Micron 10-K*³

SWOT Analysis

Strengths

Micron’s biggest strength is its research and development capability. Micron continues to make

innovative products with key characteristics that make it better than its competition. Micron often focuses on delivering higher capacity, higher density, and better energy-efficient memory than competitors' chips. For example, Micron was the first company to sell its HBM3E memory before its competitors. According to Micron, this product will fuel AI innovation with 30% lower power consumption than the competition.¹¹ The company has developed superior 3D NAND technology, which increases storage capacity without increasing the chip's physical size.¹¹

Micron also excels in terms of process technology and manufacturing scale. Micron's extensive worldwide production network enables it to manufacture memory chips in large quantities, resulting in cost savings. In addition, Micron is a firm believer in quality and dependability, offering memory solutions that pass tough industry requirements after extensive testing. This is crucial for usage like automotive or industrial ones where memory failure can have serious repercussions.¹²

Weaknesses

One of Micron's weaknesses is their product diversification. The company relies heavily on the memory chip market. The market for memory chips is very volatile and can have demand and price fluctuations. As seen in Micron's 2023 performance this was directly correlated as demand for memory products fell and Micron was forced to sell their products at lower prices.³ These price fluctuations could continue to be a weakness for Micron in the coming years.

Opportunities

The AI movement is going to spark demand and growth for Micron. The markets that Micron sells to are all integrating more advanced AI applications into more markets. The automotive sector is one of the biggest opportunities for Micron as cars are starting to become more autonomous. Software footprints in high-end vehicles are projected to significantly increase, expanding from 100 million lines of code in today's models to one billion lines in the coming years.⁶ These cars will need more memory storage solutions to keep up with all sorts of advanced technology. In addition, PC and smartphone OEMs are integrating AI into their devices as well. These companies will also need more memory capacity and fast data processing speeds, which creates more opportunities to increase market share and grow revenue.¹³

Threats

The biggest threat that Micron faces is geopolitical tensions between the US and China. China ruled that some of Micron's products pose a national security risk to China. As a result, Micron reported in their 10-k that China represented a quarter of their revenue, and that the ruling resulted in half of China's revenue decreasing.³ Micron also reported that the ban may further continue to impact China sales. With the US also putting export controls on semiconductors, this poses a risk to all of Micron's products being banned to sell to China. The impact to Micron's revenue could decrease double digits which poses a significant risk to their business.

Industry Analysis

Overview

The semiconductor industry is made up of businesses that design, manufacture, and sell semiconductors. Semiconductors are small chip devices that are used in many devices. Semiconductors are found in devices such as smartphones, computers, automobiles, and much more. There are a variety of different types of semiconductors that serve different applications for devices. The semiconductor manufacturing process is very complex and includes over 1,000 steps. For this reason, the industry is made up of businesses that specialize in just designing chips (fabless), solely manufacturing (foundry), or doing both. Below are some of the main types of semiconductors made in the industry.

Graphic Processing Units (GPUs): GPUs are specialized hardware designed to accelerate rendering of images, animations, and video for the display. They function by rapidly manipulating and altering memory to create frames for output to a display device, essential for games, simulations, and 3D applications.

Memory Chips: Memory chips are used as internal storage areas for smartphones, computers, automobiles, and many other devices. Their primary role is to hold data and for other semiconductor components to access that data.

Microprocessor (CPU): Microprocessors act as the brain for computers. They are mostly found in computers, smartphones, tablets, and computer servers.

System on chips (SoC): SoCs integrate all components of a computer or other electronic system onto a single chip. They are found in modern

electronic systems, including smartphones, tablets, and some embedded systems.

Commodity ICs: Commodity ICs are very basic chips that you find in the industrial industry. They can be found in things like microwaves, TVs, toothbrushes, etc.

Analog Chips: Analog chips are integral in devices like smartphones, audio equipment, and automotive systems. They are mostly used in sensors.

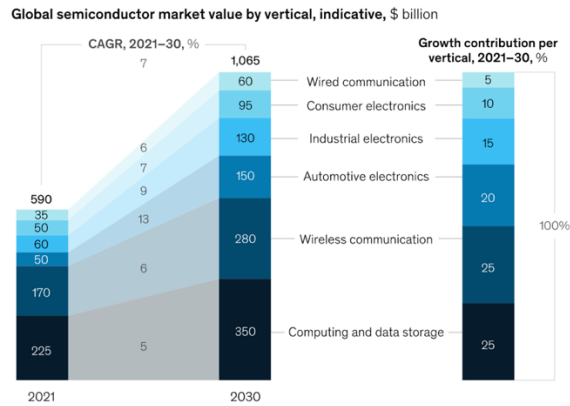
While these encompass most chips sold in the industry there are also niche and custom chips sold in this industry as well.¹⁴

For this industry analysis we will not only focus on semiconductors but also the memory chip market that Micron operates in. Companies in the industry make money by selling chips and components, licensing technology, foundry services and R&D services. Semiconductor companies differentiate themselves through technological innovation, specialized product offerings, and excellence in manufacturing processes. Customers value chips that offer high bandwidth, high speed, power efficiency, high capacity, and size of chips.

Industry Trends

Artificial Intelligence and Growth Projections

One of the biggest technological changes in this industry has been the integration of artificial intelligence. The need for semiconductors has surged because of the rapid growth of AI, which is widely used in data processing, machine learning, and pattern recognition. High-performance computing and specialist AI chips are becoming more and more necessary as AI algorithms become more complicated, which is changing the semiconductor industry and creating new market opportunities. The amount of data processed and stored by AI applications is massive. This will lead to an increased semiconductor demand across different areas such as smartphones, PCs, data centers, and automotives. For this reason, semiconductor companies are increasing R&D spend to create innovative chips that meet the demands of AI technologies.¹⁵



Source *McKinsey* ¹⁶

McKinsey projects that by 2030 the semiconductor market will grow to over \$1 trillion. Based on growth in these markets, we expect Micron to capitalize as Micron tailors its memory and storage products to all these markets.¹⁶

Government and regulatory changes

Another trend affecting the semiconductor industry is the geopolitical trends with certain countries. Since 2018, the China and the US have been in a trade war regarding semiconductors. The two world leaders are competing for technological supremacy and economic security. In October of 2022, the Department of Commerce Bureau put further restrictions on export controls to ban the US selling high-end semiconductor chips, technology, manufacturing equipment, and know-how to China.¹⁷ In addition, in August of 2023 Biden signed an executive order restriction on outbound investments in semiconductors, quantum information, and AI to foreign "countries of concern," including China.¹⁸ This trade war has exposed Micron to significant risk as about 25% percent of their revenue comes from China.³ In May of 2023 China's government deemed that Micron's products as a security risk and banned microns from selling to Chinese companies.³ Micron has suffered decreases in revenue because of these government restrictions. While US based semiconductor companies can position themselves well to sell in the US, these companies will lose out on sales and profits abroad in China. While current bans only affect advanced chip makers this conflict can spill into the entire industry. China currently consumes 50% of the semi-conductor market.¹⁹ Further escalations could significantly affect semiconductor companies if more restrictions were to occur.

In addition to this conflict, the growing tensions between Taiwan and China have caused many of the

semiconductor companies to diversify their manufacturing out of the region. Currently Taiwan Semiconductor Manufacturing Company (TSMC) produces 90% of the advanced global chip manufacturing. Many governments have provided incentives for companies to invest manufacturing plants in their home country in efforts to achieve more diversification from Taiwan. Companies such as TSMC, Intel, Samsung, and Micron are all spending billions to create new fabrication plants outside Taiwan.²⁰ Micron is spending \$100 billion over 20 years in the US to create new fabrication centers in New York and Arizona. This diversification will help mitigate the risk exposure it has in China.²¹

Competition and Peer Comparison

The two primary types of memory chips are Dynamic Random Access Memory (DRAM) and NAND flash. DRAM is a volatile type of memory storage that loses its memory when turned off. NAND flash memory keeps its memory whether turned on or off and acts as storage. With Micron operating in the memory chip space, there are only a few direct competitors. Micron's biggest competitors in the memory chips space are Samsung and SK Hynix both based in South Korea. All three of these companies make up over 90% of DRAM market share in the memory chip space.²² In the NAND flash space these firms combined for over 60% of market share in 2023.²³ Some other players in the NAND flash space are Western Digital Corporation (WDC) and Kioxia.

Micron is an integrated device manufacturer. This means that it designs, manufactures, and sells its chips to its customers. While it does outsource some manufacturing processes, it is relatively small compared to fabless companies. Samsung and SK Hynix also have an integrated device manufacturer (IDM) business model which is the same as Micron. The two companies also sell memory chips that directly compete with Micron. Because of the few competitors we decided to also compare Micron's metrics to other IDMs of relative size. We decided to include Intel (INTC), Texas Instruments (TXN), and NXP semiconductors (NXPI) in our comparisons. While these firms might directly compete to Micron's products, they have similar business models and relatively similar size to Micron.

Below is a table that represents comparison of Micron's metrics to other players in the industry.

| Company: | Ticker | Market Cap (B\$) | Revenue (2023) (B\$) | Gross Margin | Net Income (B\$) |
|--------------------|----------|------------------|----------------------|--------------|------------------|
| Micron | MU | \$ 138 | \$ 15.5 | 30.00% | \$ (5.8) |
| Samsung | 005930- | \$ 407 | \$ 198.3 | 36.60% | \$ 11.1 |
| SK Hynix | 00660-KR | \$ 95 | \$ 25.1 | 28.31% | \$ (7.0) |
| Intel | INTC | \$ 153 | \$ 54.2 | 59.96% | \$ 4.4 |
| Texas Instruments | TXN | \$ 151 | \$ 17.5 | 37% | \$ 6.4 |
| NXP semiconductors | NXPI | \$ 60 | \$ 132.8 | 43% | \$ 3.7 |

Source: *FactSet*⁵

As you can see Micron and SK Hynix have massive losses in 2023. The two companies solely sell memory chips and demand for these chips went down. This led to a decrease in selling prices for memory chips and the two companies as well as Samsung lost billions of dollars. DRAM and NAND prices fell by 57% and 55% during the year.⁷ While Samsung lost billions of dollars as well, their product diversification allowed them to remain profitable.

Although Micron does not have a P/E ratio due to their negative EPS we compared them to other firms in the industry based on R&D as a percentage of sales, P/S, P/B, and EV/EBITDA multiples.

| Company: | Ticker | P/S | P/B | EV/EBITDA | R&D % of Sales |
|--------------------|-----------|------|------|-----------|----------------|
| Micron | MU | 8.43 | 2.97 | 62.76 | 20.04% |
| Samsung | 005930-KR | 2.05 | 1.62 | 10.64 | 10.94% |
| SK Hynix | 00660-KR | 3.79 | 2.42 | 27.23 | 11.44% |
| Intel | INTC | 2.82 | 1.45 | 18.86 | 29.56% |
| Texas Instruments | TXN | 8.64 | 8.91 | 18.13 | 10.63% |
| NXP semiconductors | NXPI | 4.51 | 6.80 | 13.68 | 17.77% |

Source: *S&P Global*⁹

As you can see, Micron's relative multiples are high compared to the group. Particularly with EV/EBITDA and P/S multiples.

Porters Five Forces

Competitive Rivals: HIGH

The semiconductor industry is an extremely competitive landscape. Companies constantly try to innovate to bring the best chip products to market. Competition is driven by customers wanting the most advanced high-powered chips. The demand for these chips has risen substantially for these memory chips due to AI computing and software. These companies spend billions of dollars in R&D to produce the most advanced chips for their customers. In Micron's case, there are only a few big competitors, such as Samsung and SK Hynix. To keep up with the competition, Micron will have to continue making innovative memory chips to gain market share. Although some memory chips have similar applications, these memory chips tend to be specialized for their customers. However, customers can likely turn to other competitors and have them make custom chips for

them as well. This also intensifies competition for customers.

Threats of New Entrants: LOW

The threat of potential new entrants is very low in this industry. Building infrastructure and manufacturing sites for semiconductors costs billions of dollars to establish. It can cost companies \$10-\$20 billion to establish a semiconductor manufacturing facility, and it can take three to five years to finish construction.²⁴ The industry is dominated by only a handful of companies with substantial capital and infrastructure already in place. For these reasons, starting a company in this space would be difficult.

Bargaining Power of Suppliers: HIGH

In the semiconductor industry, the supplier bargaining power is high. Only a few suppliers of certain earth materials used to make semiconductors. In addition, there are no substitutes for the materials needed for semiconductors. Suppliers of silicon wafers, chemicals and gasses, and advanced manufacturing equipment are concentrated with only a few big suppliers of these necessary components. Because of this, suppliers can more easily set prices and quantities they want to sell. For Micron, this could hurt profit margins if they cannot buy from another supplier offering lower prices.

Bargaining Power of Buyers: HIGH

The bargaining power of buyers in this industry is high. Buyers of semiconductors typically buy in large quantities in the form of contracts. Because of this format, buyers can negotiate with suppliers about the price they pay. The large quantities OEMs buy make companies like Micron dependent on their sales. For Micron, the high bargaining power of buyers allows customers to demand favorable terms in their contracts with them. This could lead Micron to have to sell their products at lower prices.

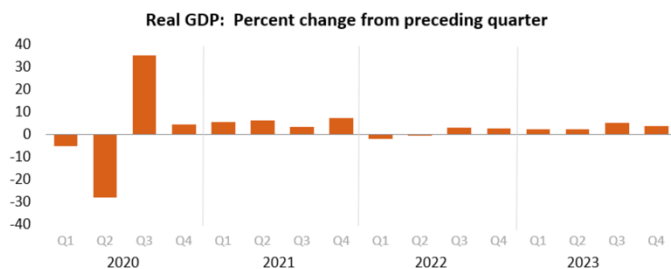
Threats of Substitute Products: LOW

The threat of substitute products is low for semiconductors. In this industry, there is no current substitution for semiconductors. Semiconductors are very customized for specific products. Designing and developing advanced semiconductors takes years, so the number of substitutes for this product would be low. A low number of substitutions gives Micron a competitive edge over its competitors.

Economic Analysis

Real GDP

The real GDP is the market value of all goods and services within a country, adjusted for inflation. real GDP is crucial for the technology sector as it reflects economic health, influencing investment, consumer spending, and business expansion.²⁵ A growing real GDP boosts demand for technology products and services, encourages innovation, and enhances global competitiveness in the technology sector. In the past, technology companies tended to do very well in periods when real GDP was growing. Despite high-interest rates, real GDP in the US had moderate real GDP growth, increasing by 2.5%.



Source: *Bureau of Economic Analysis*²⁶

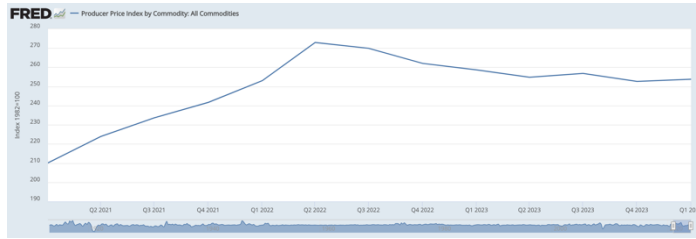
In 2024, we believe real GDP will remain at moderate growth, increasing 1.5-2.0%. This is due to a slowdown in consumer spending and the economy's cooling after high-interest rates.

For our long-term forecast, we believe we were impacted by the Fed's rate cuts. Lowering interest rates will lower borrowing costs, which, in turn, will encourage borrowing. The encouraged borrowing will likely increase consumer spending and boost investments, fueling the economy. We forecast the Fed to begin cutting rates in September of 2024. We believe that in 2025, real GDP will increase by 3.00% and stabilize at that rate for the coming years. Since semiconductor companies are a very cyclical industry, this growth in real GDP will help bolster investments and demand for semiconductors.

Producer Price Index

PPI is a group of indexes that measure the average change over time in selling prices received by US producers in a given period. If the inflation of producers' selling prices rises faster than the rate of consumer inflation, corporate profits tend to be squeezed. The PPI of all commodities has been

decreasing since Q2 of 2022, from 272 to 253 in Q1 of 2024.



Source: *FRED*²⁷

This high PPI will cause higher materials and manufacturing costs for tech companies. Semiconductors use materials like silicon, copper, and germanium. The cost of these materials can significantly impact a semiconductor business. We forecast that the PPI will slowly rise as inflation decreases over the next year. The high PPI will negatively affect Micron's profit margins in the short term with a higher manufacturing cost. As the PPI comes down with inflation, technology companies' margins will benefit in the long term.

Unemployment

The unemployment rate is a significant indicator for the technology sector. After high unemployment rates during COVID-19, the rate has come down to 3.8% as of March 2024.



Source: *FRED*²⁸

Low unemployment can both positively and negatively affect tech companies. On one hand, wage pressures increase because of a limited supply of workers, which leads to lower competition. There is also a smaller talent pool of skilled workers that companies like Micron need to innovate. On the other hand, low unemployment numbers can lead to an increase in consumer spending, which positively affects tech companies.

We forecast that the unemployment rate will be 4.00%—4.30% in 2024 after the economy slows down. In the years after that, we believe it will continue to hover around 4 percent. These low

employment numbers could lead to layoffs for Micron if wage compensation increases.

Interest Rates

The Federal Funds rate determines the rate at which banks overnight lend to one another. The Fed raised rates to fight inflation and has since held them at a target range of 5.25-5.50 percent. High federal funds rate increases have increased treasury borrowing costs.



Source: *FRED*²⁹

The 10-year treasury yield has increased because of the high Federal Funds Rate. This will increase the cost of capital as high treasury yields result in higher corporate bond yields for businesses. The higher cost of capital will likely decrease consumer spending and corporate financing strategies. For Micron, this could negatively impact industries such as consumer electronics and automotive to which they sell.

We predict that treasury yields will likely decrease when the federal funds rate decreases. In the coming months, we expect the economy to slow down. We estimate that the Federal Reserve will begin cutting rates in September 2024 with a target range of 5.00% - 5.25%. By the end of 2025, we expect the target rate to decrease by 4.00-4.25%. While these rate cuts will help decrease the cost of capital, the treasury yield will remain high for Micron, and it will have a more challenging time financing its capital expenditures growth.

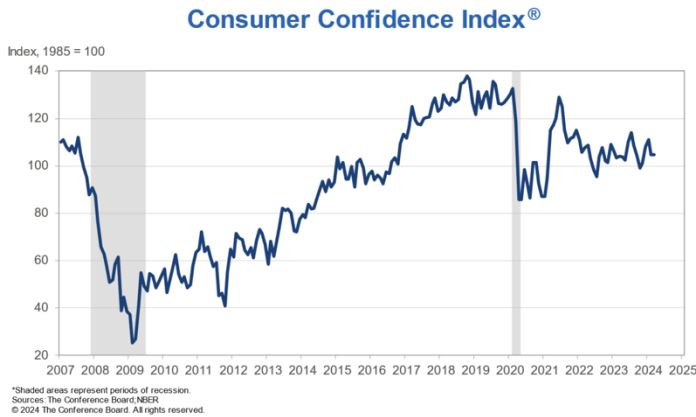


Source: *FRED*³⁰

Consumer Confidence Index

The Consumer Confidence Index reflects the level of optimism or pessimism that consumers feel about the overall state of the economy. The Conference Board

measures the index by having 5,000 households take a survey about the economy. A higher Consumer Confidence Index typically increases consumer spending and stock performance. The index was 104.7 in March, essentially unchanged from a downwardly revised 104.8 in February.



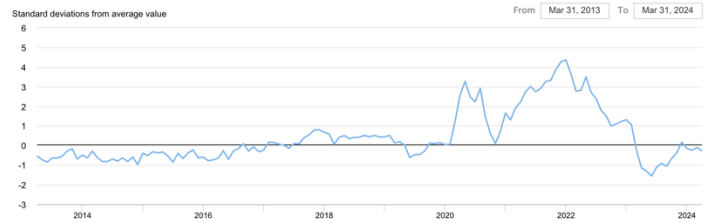
Source: *The Conference Board* ³¹

Compared to historical levels, the Consumer Confidence Index is high. However, consumer confidence has still not reached its pre-pandemic levels. We believe the Consumer Confidence Index will remain relatively unchanged in the Q2 of 2024. However, in 2025, we believe rate cuts will help bolster consumer confidence and bring it back to pre-pandemic levels. For Micron we forecast this will positively impact Micron's revenue in 2025. Demand for semiconductors will increase, and Micron will make selling their products at higher prices easier.

The Supply Chain

The supply chain is critical for the technology sector, particularly semiconductor companies. Many technology companies depend on key semiconductors to go into their devices. Disruptions in the supply chain can slow the production of numerous electronic devices, including smartphones, computers, and cars. This can have negative impacts on revenue and earnings losses. ³²

The Global Supply Chain Pressure Index (GSCPI) is a crucial metric developed by the Federal Reserve Bank of New York to measure the intensity of disruptions in global supply chains. In March of 2024, the average standard deviations from the average supply chain value decreased to -0.27 from the February reading of -0.11.



Source: *Federal Reserve Bank of New York* ³³

This chart shows supply chain pressures have decreased substantially since 2022. Supply chain disruptions have recovered due to COVID-19-related disruptions recovering. However, pressures have increased back to zero standard deviations and remained close to zero since November 2023. Micron recovered since the chip shortage after missing hundreds of millions in revenue. In addition, Micron and other semiconductor companies are improving the supply chain by building more fabrication and Assembly and Testing (AT) centers to increase their capacity. We forecast that supply chain pressures will continue to remain low in 2024. This will allow Micron to help meet product demand and maintain good relationships with their customers.

Valuation Methodology

DCF and Economic Profit analysis

With our DCF and EP model, we calculated an intrinsic value share price of \$113.69. We believe this share price most accurately affects the value of a current Micron share today. In our models, we projected all financial statements, NOPLAT, and invested capital in our firm.

Revenue Assumptions

For our revenue growth projections, we closely aligned them with the FactSet consensus. While we do believe the growth of Micron's revenue will be strong, we believe that analysts are overestimating Micron's growth in 2025. We agreed with revenue growth reaching over 50% in 2024; however, we forecasted that much of this is attributed to memory prices rebounding from last year and Micron fixing their inventory balances. We project Micron to have substantial revenues but think China's sales declines will impact their revenue further. In 2025, we decreased Micron's revenue from consensus to 36%, which is still strong growth. We will expect strong growth, but less than what analysts are projecting.

Cost of Goods Sold

Micron's COGS as a percentage of sales ranged from 30% to 40% from 2019-2022. In 2023, it was 59.2%, which was higher due to memory chip price fluctuations. We projected COGS by taking the average of the past five years as a percentage of sales and multiplying it by our revenue forecasts.

R&D Expense

Micron typically has an R&D expense that stays around 10% of sales, although 2023 was at 20%. Since R&D can vary based on technological advancements, we decided to tie it directly to sales. We projected R&D by taking the average past five years' R&D as a percentage of sales and multiplying it by our revenue forecasts.

Cost of Equity

We applied the CAPM model to estimate Micron's cost of equity, selecting the yield of the US 10-year Treasury bond as our risk-free rate. We incorporated Aswath Damodaran's implied market risk premium for April 2024. Additionally, we used the 5-year monthly raw beta for Micron from Bloomberg as our beta value. Using these inputs, we determined that Micron's cost of equity is 9.91%.

WACC

For our WACC, we calculated the cost of equity to be 9.91% and the after-tax cost of debt to be 4.21% for Micron. Micron has a capital structure of 90.38% equity and 9.62% debt. With these inputs, we were able to calculate WACC for Micron. We used the WACC to discount all our projected cash flows to today to compute the present value. This ultimately gave us an intrinsic value of \$113.69 per share.

Relative Valuation Analysis

For our relative valuation, we computed a share price of 29.49 for 2024 and 63.36 for 2025. The companies we included were all IDMs in the semiconductor industry. The companies were Samsung, SK Hynix, Intel, Texas Instruments, and NXP semiconductors. Micron has no current P/E ratio due to negative earnings last year. For 2024 the recovery for Micron, we forecast Micron 2024 to be 1.39 and increase to 4.15 in 2025. While we project Micron's EPS will increase substantially in future years, Micron's price is currently trading at very high P/E ratios on bullish future earnings. We believe that the stock is currently overvalued based on these valuation multiples, as we believe the market has priced in overestimated gains. Because of the negative performance in 2023, we are

putting more emphasis on our DCF and EP valuations but still factor these multiples into our sell rating.

Dividend Discount Model

Our dividend discount model calculated a share price of \$75.25. Micron started its dividend and share repurchase program in 2021. We projected 3% share repurchase growth and an increase of one cent per year for dividends. Based on this valuation method, Micron's shares are overvalued. However, we are emphasizing DCF/EP valuation models for Micron shares.

Sensitivity Analysis

CV EPS Growth and Cost of Equity (DDM)

The two most significant factors when creating the dividend discount model leading to a projected implied stock price are the cost of equity and the CV of earnings per share growth. The CV of earnings per share growth is crucial to calculating the intrinsic share price. It greatly affects the continuing value, which makes up about 99% of Micron's intrinsic value in the dividend discount model. With our assumption that the CV of EPS growth will be at 4.00% and the cost of equity will be at 9.62%, the intrinsic share price is \$81. Keeping the cost of equity, the same and moving the CV of EPS growth down to 3.40%, the intrinsic share price moves to \$78, and moving the growth up to 4.30% moves the intrinsic price to \$83. Conversely, keeping the CV of EPS growth the same, moving the cost of equity down to 9.32% will move the intrinsic price to \$84, and moving the cost of equity up to 9.92% will move the intrinsic share price to \$75. With our cost of equity ranging from 9.32% to 9.92% and the CV of EPS growth ranging from 3.40% to 4.30%, we believe these are attainable marks for Micron, which we have modeled in our analysis. Based on these assumptions, the estimated stock price is \$73-\$89.

| | | CV EPS Growth | | | | | | |
|----------------|-------|---------------|-------|-------|-------|-------|-------|-------|
| | | 80.82 | 3.40% | 3.60% | 3.80% | 4.00% | 4.10% | 4.20% |
| Cost of Equity | 9.32% | 83.55 | 84.70 | 85.93 | 87.26 | 87.96 | 88.68 | 89.44 |
| | 9.42% | 81.56 | 82.64 | 83.79 | 85.02 | 85.67 | 86.35 | 87.06 |
| | 9.52% | 79.64 | 80.65 | 81.72 | 82.87 | 83.48 | 84.11 | 84.77 |
| | 9.62% | 77.79 | 78.73 | 79.73 | 80.81 | 81.37 | 81.96 | 82.57 |
| | 9.72% | 76.00 | 76.88 | 77.82 | 78.82 | 79.35 | 79.89 | 80.46 |
| | 9.82% | 74.27 | 75.09 | 75.97 | 76.90 | 77.40 | 77.91 | 78.43 |
| | 9.92% | 72.60 | 73.37 | 74.19 | 75.06 | 75.52 | 75.99 | 76.48 |

Risk Free Rate and CV NOPLAT Growth

We utilized the risk-free rate and the CV of NOPLAT growth to assess the impact of fluctuations in these factors on a corporation like Micron, whose profit

growth has fluctuated over the years. Our analysis revealed a substantial decrease in intrinsic share price as the risk-free rate escalates and a notable increase as the rate declines. This trend likely holds across the broader market: heightened risk-free rates prompt investors to seek safer investment avenues such as government bonds, which could hurt companies like Micron, which is more susceptible than larger corporations with more steady profit growth. Micron's unpredictable NOPLAT growth gives investors a degree of uncertainty, which could amplify risks. This analysis gains significance given the current high risk-free rates (4.63% as of 4/15/24). Regarding the CV of NOPLAT growth, an increase corresponds to a rise in intrinsic share price, while a decrease results in a decline. Based on our sensitivity analysis of these variables, we estimate the stock price to range between \$102 and \$129.

| | | Risk Free Rate | | | | | | | |
|------------------|-------|----------------|--------|--------|--------|--------|--------|--------|-------|
| | | 113.69 | 3.95% | 4.05% | 4.15% | 4.25% | 4.35% | 4.45% | 4.55% |
| CV NOPLAT Growth | 4.70% | 118.03 | 115.05 | 112.20 | 109.47 | 106.85 | 104.34 | 101.92 | |
| | 4.80% | 119.64 | 116.57 | 113.63 | 110.81 | 108.11 | 105.52 | 103.04 | |
| | 4.90% | 121.34 | 118.16 | 115.12 | 112.22 | 109.43 | 106.77 | 104.21 | |
| | 5.00% | 123.13 | 119.84 | 116.69 | 113.69 | 110.82 | 108.07 | 105.43 | |
| | 5.10% | 125.02 | 121.60 | 118.35 | 115.24 | 112.27 | 109.43 | 106.72 | |
| | 5.20% | 127.00 | 123.46 | 120.08 | 116.87 | 113.80 | 110.86 | 108.06 | |
| | 5.30% | 129.10 | 125.42 | 121.91 | 118.58 | 115.40 | 112.36 | 109.47 | |

WACC and CV NOPLAT Growth

We chose to analyze the CV of NOPLAT growth and WACC as they are the primary components of DCF valuation. Given that the continuing value of NOPLAT growth largely influences DCF valuation, we aimed to assess the sensitivity of these variables and their impact on our valuation framework. We set the CV of NOPLAT growth at 5% based on Micron's growth prospects and the steady semiconductor demand. Micron's forecasted cash flows over the projection period and the CV of NOPLAT growth are discounted by the WACC. Our analysis revealed a sizable amount of sensitivity from our valuation model to these two factors.

We tested the WACC within the range of 8.80% to 9.40% and the CV of NOPLAT growth from 4.70% to 5.30%. Our findings indicated that as the CV of NOPLAT growth increased, so did the intrinsic stock price, while an increase in the WACC led to a decrease in the intrinsic stock price. Our valuation model showed a high sensitivity to these variables, resulting

in an intrinsic stock price between \$101 and \$130.

| | | CV NOPLAT Growth | | | | | | | |
|------|-------|------------------|--------|--------|--------|--------|--------|--------|-------|
| | | 105.69 | 4.70% | 4.80% | 4.90% | 5.00% | 5.10% | 5.20% | 5.30% |
| WACC | 8.80% | 119.08 | 120.72 | 122.46 | 124.29 | 126.21 | 128.24 | 130.39 | |
| | 8.90% | 115.72 | 117.26 | 118.88 | 120.57 | 122.36 | 124.24 | 126.23 | |
| | 9.00% | 112.53 | 113.96 | 115.47 | 117.05 | 118.71 | 120.46 | 122.30 | |
| | 9.10% | 109.48 | 110.82 | 112.23 | 113.70 | 115.25 | 116.87 | 118.58 | |
| | 9.20% | 106.57 | 107.82 | 109.14 | 110.51 | 111.95 | 113.47 | 115.06 | |
| | 9.30% | 103.79 | 104.96 | 106.19 | 107.47 | 108.82 | 110.23 | 111.71 | |
| | 9.40% | 101.13 | 102.23 | 103.37 | 104.57 | 105.83 | 107.14 | 108.52 | |

Beta and Equity Risk Premium

In our analysis of the discounted cash flow analysis and the dividend discount model, we identified beta and equity risk premium as important factors in valuation. We conducted a sensitivity test to measure the sensitivity of Apple's intrinsic share value to changes in these metrics affecting the cost of equity. Our analysis revealed that reducing the beta to 0.94 elevated Apple's intrinsic value to \$152, indicating reduced risk. Conversely, raising it to 1.54 resulted in downside risk, causing the intrinsic share value to fall to \$79. Similarly, decreasing the equity risk premium to 4.03% suggests decreased risk to Apple's cash flows, boosting the intrinsic share value to \$116. An increase of 4.63% leads to a decline in price to \$97. These adjustments significantly impact the discounted cash flow model, indicating a large amount of volatility in the intrinsic value if these metrics are altered.

| | | Beta | | | | | | | |
|---------------------|-------|--------|--------|--------|--------|--------|-------|-------|------|
| | | 105.69 | 0.94 | 1.04 | 1.14 | 1.24 | 1.34 | 1.44 | 1.54 |
| Equity Risk Premium | 4.03% | 166.85 | 146.19 | 129.66 | 116.14 | 104.89 | 95.39 | 87.25 | |
| | 4.13% | 161.58 | 141.58 | 125.57 | 112.47 | 101.56 | 92.34 | 84.45 | |
| | 4.23% | 156.60 | 137.22 | 121.70 | 108.99 | 98.40 | 89.45 | 81.79 | |
| | 4.33% | 151.89 | 133.09 | 118.03 | 105.69 | 95.41 | 86.71 | 79.26 | |
| | 4.43% | 147.43 | 129.18 | 114.55 | 102.56 | 92.57 | 84.11 | 76.86 | |
| | 4.53% | 143.19 | 125.46 | 111.24 | 99.59 | 89.86 | 81.64 | 74.58 | |
| | 4.63% | 139.16 | 121.93 | 108.10 | 96.75 | 87.29 | 79.28 | 72.41 | |

Cost of Equity and Pre-Tax Cost of Debt

When evaluating Micron's stock, it's important to consider the dynamics of its cost of equity and pre-tax cost of debt, as these factors significantly influence our cash flow discount rate. These shape our valuation methodologies, particularly the DCF and DDM. We gained insights into the stock's intrinsic value through sensitivity testing of these variables against our discounted cash flow valuation. Our analysis indicates that a downward adjustment of the cost of equity to 9.02% has minimal impact, lowering the intrinsic price by less than a dollar. Similarly, an increase in the cost of equity to 10.22% has little effect, raising the value by less than a dollar. Adjusting the pre-tax cost of debt also produces marginal effects on the intrinsic share price, with no significant alterations in its value. This shows the strength of the semiconductor industry and Micron's business in debt-related parameters and that

the demand for the products will continue to be strong.

| | | Cost of Equity | | | | | | | |
|---------------------|-------|----------------|--------|--------|--------|--------|--------|--------|--------|
| | | 105.69 | 9.02% | 9.22% | 9.42% | 9.62% | 9.82% | 10.02% | 10.22% |
| Pre-tax Cost of ebt | 4.68% | 106.64 | 106.67 | 106.70 | 106.73 | 106.77 | 106.80 | 106.83 | |
| | 4.88% | 106.32 | 106.36 | 106.39 | 106.42 | 106.45 | 106.49 | 106.52 | |
| | 5.08% | 106.01 | 106.04 | 106.08 | 106.11 | 106.14 | 106.17 | 106.21 | |
| | 5.38% | 105.55 | 105.58 | 105.61 | 105.65 | 105.68 | 105.71 | 105.74 | |
| | 5.58% | 105.24 | 105.28 | 105.31 | 105.34 | 105.37 | 105.40 | 105.44 | |
| | 5.78% | 104.94 | 104.97 | 105.00 | 105.04 | 105.07 | 105.10 | 105.13 | |
| | 5.98% | 104.64 | 104.67 | 104.70 | 104.73 | 104.77 | 104.80 | 104.83 | |

Citations

1. “Micron Technology Inc: Overview.” *Global Data*, <https://www.globaldata.com/company-profile/micron-technology-inc/>
2. “Mu vs. Spy - ETF Comparison Tool.” *PortfoliosLab*, portfolioslab.com/tools/stock-comparison/MU/SPY.
3. “Micron Technology Inc. 10-K.” *SEC.gov*, <https://www.sec.gov/ix?doc=/Archives/edgar/data/723125/000072312523000054/mu-20230831.htm>
4. “Data Center Networking Market.” *Global Market Insights*, <https://www.gminsights.com/industry-analysis/data-center-networking-market>
5. *FactSet*, <https://www.factset.com/>
6. Jacobs, Chris “New research shows cars need more memory than a rocket.” *Micron*, December 2023, <https://my.micron.com/about/blog/applications/automotive/new-research-shows-cars-need-more-memory-than-a-rocket>
7. “Memory pricing set to take off in 2H-2023.” *Yole Group*, 7 June 2023, <https://www.yolegroup.com/strategy-insights/memory-pricing-set-to-take-off-in-2h-2023/>
8. “Micron Technology Inc. 10-Q.” *SEC.gov*, <https://www.sec.gov/ix?doc=/Archives/edgar/data/723125/000072312524000007/mu-20240229.htm>
9. *S&P Global Capital IQ Pro*, <https://www.spglobal.com/marketintelligence/en/solutions/sp-capital-iq-pro>
10. “Micron Technology, Inc. Fiscal Q2 2024 Earnings Call Prepared Remarks.” *Micron*, <https://investors.micron.com/static-files/1a8d6c22-3b89-4806-930c-d30cbcd270d5>
11. “Micron Technology High-bandwidth memory.” *Micron*, https://www.micron.com/products/memory/hbm/hbm3e?gad_source=1&gclid=CjwKCAjwoPOwBhAeEiwAJuXRhwOCZLNgR9GLL8K_yS7sHS_OBk23zhlQegCvJ2wAxTSUQeS7P4SDzBoC6n4QAvD_BwE
12. “Quality at Micron Technology Inc.” *Micron*, <https://www.micron.com/about/company/quality>
13. Batra, Gaurav, et al. “Artificial-Intelligence Hardware: New Opportunities for Semiconductor Companies.” *McKinsey & Company*, 2 Jan. 2019, www.mckinsey.com/industries/semiconductors/our-insights/artificial-intelligence-hardware-new-opportunities-for-semiconductor-companies.
14. Team, The Investopedia. “The Main Types of Chips Produced by Semiconductor Companies.” *Investopedia*, www.investopedia.com/ask/answers/042115/what-are-main-types-chips-produced-semiconductor-companies.asp.
15. “How Will the Rise of AI Affect the Semiconductor Industry.” *Flying Technology*, 1 March 2024, <https://www.linkedin.com/pulse/how-rise-ai-affect-semiconductor-industry-flykingtech-6epdc/>
16. Industry analysis chart “A gen AI risk assessment.” *McKinsey*, 10 April 2024, <https://www.mckinsey.com/featured-insights/sustainable-inclusive-growth/chart-of-the-day/a-gen-ai-risk-assessment>
17. “What They Are Reading in the States: Syracuse Post-Standard: Biden: Micron’s Computer Chip Deal in Syracuse Area ‘Another Win for America.’” *The White House*, 5 Oct. 2022, www.whitehouse.gov/briefing-room/statements-releases/2022/10/05/what-they-are-reading-in-the-states-syracuse-post-standard-biden-microns-computer-chip-deal-in-syracuse-area-another-win-for-america/.
18. Howell, Thomas, et al. “Balancing the Ledger: Export Controls on U.S. Chip Technology to China.” *CSIS*, 21 Feb. 2024, <https://www.csis.org/analysis/balancing-ledger-export-controls-us-chip-technology-china>
19. Araya, Daniel. “Will China Dominate the Global Semiconductor Market?” *Centre for International Governance Innovation*, 8 Jan. 2024, www.cigionline.org/articles/will-china-dominate-the-global-semiconductor-market/.

20. Tobin, Meaghan. “Economy vs. environment: Some Taiwanese consider cashing in their chips.” *The Washington Post*, 9 Oct. 2023, <https://www.washingtonpost.com/world/2023/10/09/taiwan-tsmc-chip-manufacturer-fab/>
21. “What They Are Reading in the States: Syracuse Post-Standard: Biden: Micron’s computer chip deal in Syracuse area ‘another win for America.’” *The White House*, 5 October 2022, <https://www.whitehouse.gov/briefing-room/statements-releases/2022/10/05/what-they-are-reading-in-the-states-syracuse-post-standard-biden-microns-computer-chip-deal-in-syracuse-area-another-win-for-america/>
22. Alsop, Thomas. “DRAM Manufacturer Market Share by Quarter 2023.” *Statista*, 8 Jan. 2024, www.statista.com/statistics/271726/global-market-share-held-by-dram-chip-vendors-since-2010/.
23. “NAND Flash Market Landscape to Change?” *TrendForce Insights*, 14 Mar. 2024, www.trendforce.com/news/2024/03/14/news-nand-flash-market-landscape-to-change/.
24. “Who’s Going to Pay for American-Made Semiconductors?” Built In, builtin.com/hardware/american-made-semiconductor-costs.
25. “Gross Domestic Product, Fourth Quarter and Year 2023 (Third Estimate), GDP by Industry, and Corporate Profits.” Bureau of Economic Analysis <https://www.bea.gov/news/2024/gross-domestic-product-fourth-quarter-and-year-2023-third-estimate-gdp-industry-and>
26. “Gross Domestic Product.” *U.S. Bureau of Economic Analysis*, [https://www.bea.gov/data/gdp/gross-domesticproduct#:~:text=Real%20gross%20domestic%20product%20\(GDP,percent%20in%20the%20third%20quarter](https://www.bea.gov/data/gdp/gross-domesticproduct#:~:text=Real%20gross%20domestic%20product%20(GDP,percent%20in%20the%20third%20quarter)
27. “Producer Price Index by Commodity: All Commodities.” *FRED*, 11 Apr. 2024, fred.stlouisfed.org/series/PPIACO#0.
28. “Unemployment Rate.” *FRED*, 5 Apr. 2024, fred.stlouisfed.org/series/UNRATE.
29. “Market Yield on U.S. Treasury Securities at 10-Year Constant Maturity, Quoted on an Investment Basis.” *FRED*, 19 Apr. 2024, fred.stlouisfed.org/series/dgs10.
30. “Federal Funds Target Range - Upper Limit.” *FRED*, 16 April 2024, <https://fred.stlouisfed.org/series/DFEDTARU>
31. “US Consumer Confidence Little Changed in March.” *The Conference Board*, 26 March 2024, <https://www.conference-board.org/topics/consumer-confidence>
32. Mayer, Marina. “Supply Chain Delays Cause Some Companies 15% Loss in Revenue.” *Supply and Demand Chain*, 12 April 2023, <https://www.sdcexec.com/sourcing-procurement/erp/news/22820454/anvyl-supply-chain-delays-cause-some-companies-15-loss-in-revenue-study>
33. “Global Supply Chain Pressure Index.” *Federal Reserve Bank of New York*, March 2024, <https://www.newyorkfed.org/research/policy/gscpi#/interactive>
34. Nellis, Stephen. “Micron kicks off dividend payments, shifts to 'opportunistic' share buybacks” *Reuters*, August 2 2021, <https://www.reuters.com/technology/micron-declares-quarterly-dividend-10-cents-2021-08-02/>

Important Disclaimer

This report was created by students enrolled in the Security Analysis (6F:112) 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.

Micron
Sensitivity Tables

CV EPS Growth

| | 78.32 | 3.40% | 3.60% | 3.80% | 4.00% | 4.10% | 4.20% | 4.30% |
|----------------|-------|-------|-------|-------|-------|-------|-------|-------|
| Cost of Equity | 9.32% | 86.75 | 87.94 | 89.22 | 90.59 | 91.32 | 92.07 | 92.86 |
| | 9.42% | 84.71 | 85.83 | 87.02 | 88.31 | 88.98 | 89.69 | 90.42 |
| | 9.52% | 82.75 | 83.80 | 84.91 | 86.11 | 86.74 | 87.40 | 88.08 |
| | 9.62% | 80.86 | 81.84 | 82.88 | 84.00 | 84.59 | 85.20 | 85.83 |
| | 9.72% | 79.03 | 79.95 | 80.92 | 81.96 | 82.51 | 83.08 | 83.67 |
| | 9.82% | 77.27 | 78.12 | 79.03 | 80.00 | 80.52 | 81.05 | 81.60 |
| | 9.92% | 75.56 | 76.36 | 77.21 | 78.12 | 78.59 | 79.09 | 79.60 |

CV NOPLAT Growth

| | 109.99 | 4.70% | 4.80% | 4.90% | 5.00% | 5.10% | 5.20% | 5.30% |
|------|--------|--------|--------|--------|--------|--------|--------|--------|
| WACC | 8.80% | 123.92 | 125.64 | 127.44 | 129.34 | 131.35 | 133.46 | 135.69 |
| | 8.90% | 120.43 | 122.03 | 123.71 | 125.48 | 127.34 | 129.30 | 131.37 |
| | 9.00% | 117.11 | 118.60 | 120.17 | 121.81 | 123.54 | 125.36 | 127.28 |
| | 9.10% | 113.94 | 115.33 | 116.79 | 118.33 | 119.94 | 121.63 | 123.41 |
| | 9.20% | 110.91 | 112.21 | 113.58 | 115.01 | 116.51 | 118.08 | 119.74 |
| | 9.30% | 108.01 | 109.23 | 110.51 | 111.85 | 113.24 | 114.71 | 116.25 |
| | 9.40% | 105.24 | 106.39 | 107.58 | 108.83 | 110.13 | 111.50 | 112.94 |

Risk Free Rate

| | 109.99 | 3.95% | 4.05% | 4.15% | 4.25% | 4.35% | 4.45% | 4.55% |
|------------------|--------|--------|--------|--------|--------|--------|--------|--------|
| CV NOPLAT Growth | 4.70% | 106.31 | 106.31 | 106.31 | 106.31 | 106.31 | 106.31 | 106.31 |
| | 4.80% | 107.49 | 107.49 | 107.49 | 107.49 | 107.49 | 107.49 | 107.49 |
| | 4.90% | 108.71 | 108.71 | 108.71 | 108.71 | 108.71 | 108.71 | 108.71 |
| | 5.00% | 109.99 | 109.99 | 109.99 | 109.99 | 109.99 | 109.99 | 109.99 |
| | 5.10% | 111.33 | 111.33 | 111.33 | 111.33 | 111.33 | 111.33 | 111.33 |
| | 5.20% | 112.74 | 112.74 | 112.74 | 112.74 | 112.74 | 112.74 | 112.74 |
| | 5.30% | 114.22 | 114.22 | 114.22 | 114.22 | 114.22 | 114.22 | 114.22 |

Beta

| | 109.99 | 0.94 | 1.04 | 1.14 | 1.24 | 1.34 | 1.44 | 1.54 |
|---------------------|--------|--------|--------|--------|--------|--------|-------|-------|
| Equity Risk Premium | 4.03% | 172.53 | 151.41 | 134.51 | 120.69 | 109.18 | 99.44 | 91.11 |
| | 4.13% | 167.14 | 146.70 | 130.33 | 116.93 | 105.76 | 96.32 | 88.23 |
| | 4.23% | 162.05 | 142.24 | 126.37 | 113.37 | 102.53 | 93.36 | 85.51 |
| | 4.33% | 157.24 | 138.02 | 122.62 | 109.99 | 99.47 | 90.56 | 82.92 |
| | 4.43% | 152.67 | 134.02 | 119.06 | 106.79 | 96.55 | 87.89 | 80.46 |
| | 4.53% | 148.34 | 130.22 | 115.67 | 103.74 | 93.79 | 85.35 | 78.12 |
| | 4.63% | 144.22 | 126.60 | 112.45 | 100.84 | 91.15 | 82.94 | 75.89 |

| | |
|--|--|
| | |
| | |

Cost of Equity

| | 109.99 | 9.02% | 9.22% | 9.42% | 9.62% | 9.82% | 10.02% | 10.22% |
|---------------------|--------|--------|--------|--------|--------|--------|--------|--------|
| Pre-tax Cost of ebt | 4.68% | 110.57 | 110.70 | 110.82 | 110.95 | 111.07 | 111.19 | 111.32 |
| | 4.88% | 110.25 | 110.37 | 110.50 | 110.62 | 110.74 | 110.87 | 110.99 |
| | 5.08% | 109.93 | 110.05 | 110.17 | 110.30 | 110.42 | 110.54 | 110.67 |
| | 5.38% | 109.45 | 109.57 | 109.69 | 109.82 | 109.94 | 110.06 | 110.18 |
| | 5.58% | 109.13 | 109.25 | 109.38 | 109.50 | 109.62 | 109.74 | 109.86 |
| | 5.78% | 108.82 | 108.94 | 109.06 | 109.18 | 109.30 | 109.43 | 109.55 |
| | 5.98% | 108.50 | 108.62 | 108.75 | 108.87 | 108.99 | 109.11 | 109.23 |

Micron

Revenue Decomposition

Scale in Millions

| Fiscal Years Ending Aug. 31 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024E | 2025E | 2026E | 2027E | 2028E | 2029E | 2030E | 2031E | 2032E | 2033E |
|------------------------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| DRAM | 15,250 | 14,510 | 20,039 | 22,386 | 10,978 | 17,245 | 23,159 | 27,144 | 30,881 | 34,281 | 37,302 | 40,259 | 43,132 | 45,902 | 48,556 |
| NAND | 6,935 | 6,131 | 7,007 | 7,811 | 4,206 | 6,664 | 9,553 | 10,585 | 11,557 | 12,459 | 13,286 | 14,035 | 14,747 | 15,421 | 16,055 |
| Other (primarily NOR) | 1,216 | 794 | 659 | 561 | 356 | 210 | 233 | 294 | 309 | 324 | 340 | 357 | 375 | 394 | 414 |
| Total | 23,401 | 21,435 | 27,705 | 30,758 | 15,540 | 24,119 | 32,945 | 38,023 | 42,746 | 47,064 | 50,927 | 54,651 | 58,254 | 61,717 | 65,024 |

| | | | | | | | | | | | | | | |
|---------------------------------------|---------------|---------------|---------------|----------------|---------------|---------------|---------------|---------------|---------------|--------------|--------------|--------------|--------------|--------------|
| DRAM Growth % Change | -4.85% | 38.10% | 11.71% | -50.96% | 57.09% | 34.29% | 17.21% | 13.77% | 11.01% | 8.81% | 7.93% | 7.14% | 6.42% | 5.78% |
| NAND Growth % Change | -11.59% | 14.29% | 11.47% | -46.15% | 58.44% | 43.35% | 10.80% | 9.18% | 7.81% | 6.63% | 5.64% | 5.08% | 4.57% | 4.11% |
| Other (primarily NOR) Growth % Change | -34.70% | -17.00% | -14.87% | -36.54% | -41.01% | 10.95% | 26.18% | 5.00% | 5.00% | 5.00% | 5.00% | 5.00% | 5.00% | 5.00% |
| Total | -8.40% | 29.25% | 11.02% | -49.48% | 55.21% | 36.59% | 15.41% | 12.42% | 10.10% | 8.21% | 7.31% | 6.59% | 5.94% | 5.36% |

Micron Technology (MU)

Income Statement

(In Millions)

Fiscal Years Ending Aug. 31

| | 2021 | 2022 | 2023 | 2024E | 2025E | 2026E | 2027E | 2028E | 2029E | 2030E | 2031E | 2032E |
|---|--------------|--------------|----------------|--------------|--------------|--------------|--------------|--------------|---------------|---------------|---------------|---------------|
| Revenue | 27,705 | 30,758 | 15,540 | 24,119 | 32,945 | 38,023 | 42,746 | 47,064 | 50,927 | 54,651 | 58,254 | 61,717 |
| Cost of Goods Sold | 11,068 | 9,744 | 9,200 | 9,890 | 13,508 | 15,591 | 17,527 | 19,298 | 20,882 | 22,409 | 23,886 | 25,306 |
| Depreciation & Amortization | 6,214 | 7,116 | 7,756 | 7,926 | 7,889 | 8,017 | 8,222 | 8,489 | 8,805 | 9,159 | 9,544 | 9,953 |
| Gross Margin (Loss) | 10,423 | 13,898 | (1,416) | 6,303 | 11,547 | 14,415 | 16,997 | 19,277 | 21,241 | 23,083 | 24,824 | 26,458 |
| Selling, General & Administrative | 894 | 1,066 | 920 | 979 | 1,337 | 1,543 | 1,735 | 1,910 | 2,067 | 2,218 | 2,365 | 2,505 |
| Research and Development Expenses (Might want to forecast different) | 2,663 | 3,116 | 3,114 | 3,007 | 4,108 | 4,741 | 5,330 | 5,868 | 6,350 | 6,814 | 7,263 | 7,695 |
| Restructure and Asset Impairments | 488 | 48 | 171 | 153 | 209 | 241 | 271 | 299 | 323 | 347 | 370 | 392 |
| Other operating expense (income), net | 95 | (34) | 124 | - | - | - | - | - | - | - | - | - |
| Operating income (loss) | 6,283 | 9,702 | (5,745) | 2,164 | 5,893 | 7,890 | 9,660 | 11,200 | 12,500 | 13,704 | 14,827 | 15,866 |
| Interest income | 37 | 96 | 468 | 520 | 391 | 504 | 698 | 957 | 1,276 | 1,650 | 2,079 | 2,562 |
| Interest expense | 183 | 189 | 388 | 717 | 466 | 514 | 547 | 581 | 614 | 646 | 679 | 712 |
| Other non-operating income (expense), net | 81 | (38) | 7 | - | - | - | - | - | - | - | - | - |
| Income (loss) before taxes, net income attributable to noncontrolling interest & equity in net income (loss) of equity method investees | 6,218 | 9,571 | (5,658) | 1,967 | 5,818 | 7,879 | 9,811 | 11,576 | 13,162 | 14,708 | 16,226 | 17,716 |
| Income tax provision (benefit) | 394 | 888 | 177 | 429 | 1,268 | 1,718 | 2,139 | 2,524 | 2,869 | 3,206 | 3,537 | 3,862 |
| Equity in net income (loss) of equity method investees | 37 | 4 | 2 | 10 | 14 | 16 | 18 | 19 | 21 | 22 | 24 | 25 |
| Net income (loss) | 5,861 | 8,687 | (5,833) | 1,528 | 4,536 | 6,146 | 7,655 | 9,033 | 10,272 | 11,479 | 12,665 | 13,829 |
| Weighted average shares outstanding - basic | 1,120 | 1,112 | 1,093 | 1,096 | 1,094 | 1,088 | 1,084 | 1,081 | 1,078 | 1,075 | 1,073 | 1,070 |
| Net earnings (loss) per share - basic | 5.23 | 7.81 | (5.34) | 1.39 | 4.15 | 5.65 | 7.06 | 8.36 | 9.53 | 10.67 | 11.81 | 12.92 |
| Total Shares Outstanding | 1,119 | 1,094 | 1,098 | 1,089 | 1,086 | 1,083 | 1,080 | 1,077 | 1,074 | 1,071 | 1,069 | 1,067 |
| Cash Dividends Declared per share | 0.01 | 0.44 | 0.48 | 0.49 | 0.50 | 0.51 | 0.52 | 0.53 | 0.54 | 0.55 | 0.56 | 0.57 |

Micron

Balance Sheet

| Fiscal Years Ending Aug. 31 | 2021 | 2022 | 2023 | 2024E | 2025E | 2026E | 2027E | 2028E | 2029E | 2030E | 2031E | 2032E | 2033E |
|--|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|----------------|----------------|----------------|----------------|----------------|
| Assets | | | | | | | | | | | | | |
| Current assets: | | | | | | | | | | | | | |
| Cash & equivalents | 7,763 | 8,262 | 8,577 | 5,902 | 8,068 | 11,869 | 16,952 | 23,242 | 30,642 | 39,125 | 48,692 | 59,321 | 71,008 |
| Short-term investments | 870 | 1,069 | 1,017 | 1,068 | 1,121 | 1,177 | 1,235 | 1,297 | 1,361 | 1,429 | 1,500 | 1,575 | 1,653 |
| Receivables | 5,311 | 5,130 | 2,443 | 4,027 | 5,500 | 6,348 | 7,136 | 7,857 | 8,502 | 9,124 | 9,725 | 10,303 | 10,855 |
| Inventories | 4,487 | 6,663 | 8,387 | 6,746 | 9,215 | 10,636 | 11,957 | 13,165 | 14,245 | 15,287 | 16,295 | 17,263 | 18,188 |
| Other current assets | 502 | 644 | 820 | 560 | 765 | 883 | 992 | 1,092 | 1,182 | 1,268 | 1,352 | 1,432 | 1,509 |
| Total current assets | 19,907 | 21,781 | 21,244 | 18,303 | 24,669 | 30,912 | 38,272 | 46,652 | 55,933 | 66,233 | 77,564 | 89,895 | 103,214 |
| Non-current assets: | | | | | | | | | | | | | |
| Long-term marketable investments | 1,765 | 1,647 | 844 | 886 | 930 | 976 | 1,025 | 1,076 | 1,130 | 1,186 | 1,245 | 1,307 | 1,372 |
| Property, plant & equipment | 33,213 | 38,549 | 37,928 | 37,752 | 38,362 | 39,345 | 40,623 | 42,133 | 43,828 | 45,669 | 47,625 | 49,672 | 51,792 |
| Operating lease right-of-use assets | 551 | 678 | 666 | 663 | 674 | 691 | 713 | 740 | 770 | 802 | 836 | 872 | 909 |
| Intangible assets | 349 | 421 | 404 | 329 | 278 | 231 | 188 | 146 | 104 | 62 | 20 | - | - |
| Deferred tax assets | 782 | 702 | 756 | 728 | 645 | 533 | 394 | 230 | 43 | (166) | (397) | (649) | (921) |
| Goodwill | 1,228 | 1,228 | 1,150 | 1,150 | 1,150 | 1,150 | 1,150 | 1,150 | 1,150 | 1,150 | 1,150 | 1,150 | 1,150 |
| Other noncurrent assets | 1,054 | 1,277 | 1,262 | 1,325 | 1,391 | 1,460 | 1,533 | 1,609 | 1,689 | 1,773 | 1,862 | 1,954 | 2,052 |
| Total non-current assets | 38,942 | 44,502 | 43,010 | 42,833 | 43,430 | 44,387 | 45,626 | 47,084 | 48,714 | 50,476 | 52,341 | 54,307 | 56,354 |
| Total assets | 58,849 | 66,283 | 64,254 | 61,135 | 68,099 | 75,299 | 83,899 | 93,737 | 104,647 | 116,709 | 129,905 | 144,203 | 159,568 |
| Liabilities and shareholder equity: | | | | | | | | | | | | | |
| Current liabilities: | | | | | | | | | | | | | |
| Accounts payable and accrued expenses | 5,325 | 6,090 | 3,958 | 5,374 | 7,340 | 8,471 | 9,524 | 10,486 | 11,346 | 12,176 | 12,979 | 13,750 | 14,487 |
| Current debt | 155 | 103 | 278 | 517 | 706 | 814 | 916 | 1,008 | 1,091 | 1,171 | 1,248 | 1,322 | 1,393 |
| Other current liabilities | 944 | 1,346 | 529 | 757 | 1,033 | 1,193 | 1,341 | 1,476 | 1,598 | 1,714 | 1,827 | 1,936 | 2,040 |
| Total current liabilities | 6,424 | 7,539 | 4,765 | 6,647 | 9,079 | 10,478 | 11,780 | 12,970 | 14,035 | 15,061 | 16,054 | 17,008 | 17,919 |
| Non-current Liabilities: | | | | | | | | | | | | | |
| Long-term debt | 6,621 | 6,803 | 13,052 | 8,144 | 8,856 | 9,358 | 9,878 | 10,402 | 10,920 | 11,448 | 11,983 | 12,523 | 13,064 |
| Noncurrent operating lease liabilities | 504 | 610 | 603 | 602 | 612 | 627 | 648 | 672 | 699 | 728 | 759 | 792 | 826 |
| Noncurrent unearned government incentives | 808 | 589 | 727 | 330 | 330 | 330 | 330 | 330 | 330 | 330 | 330 | 330 | 330 |
| Other noncurrent liabilities | 559 | 835 | 987 | 740 | 1,011 | 1,166 | 1,311 | 1,444 | 1,562 | 1,677 | 1,787 | 1,893 | 1,995 |
| Total non-current liabilities | 8,492 | 8,837 | 15,369 | 9,815 | 10,808 | 11,482 | 12,167 | 12,848 | 13,511 | 14,183 | 14,859 | 15,538 | 16,215 |
| Total liabilities | 14,916 | 16,376 | 20,134 | 16,462 | 19,887 | 21,960 | 23,947 | 25,818 | 27,546 | 29,243 | 30,913 | 32,546 | 34,134 |
| Shareholders' equity: | | | | | | | | | | | | | |
| Common stock | 9,575 | 10,320 | 11,160 | 11,160 | 11,160 | 11,160 | 11,160 | 11,160 | 11,160 | 11,160 | 11,160 | 11,160 | 11,160 |
| Retained earnings | 39,051 | 47,274 | 40,824 | 41,815 | 45,804 | 51,396 | 58,487 | 66,947 | 76,637 | 87,524 | 99,589 | 112,807 | 127,156 |
| Treasury stock | (4,695) | (7,127) | (7,552) | (7,990) | (8,441) | (8,905) | (9,383) | (9,876) | (10,384) | (10,906) | (11,445) | (11,999) | (12,570) |
| Accumulated other comprehensive income (loss) | 2 | (560) | (312) | (312) | (312) | (312) | (312) | (312) | (312) | (312) | (312) | (312) | (312) |
| Total Micron Technology Inc. shareholders' equity (deficit) | 43,933 | 49,907 | 44,120 | 44,673 | 48,212 | 53,339 | 59,952 | 67,919 | 77,101 | 87,466 | 98,992 | 111,656 | 125,434 |
| Total liabilities and equity | 58,849 | 66,283 | 64,254 | 61,135 | 68,099 | 75,299 | 83,899 | 93,737 | 104,647 | 116,709 | 129,905 | 144,203 | 159,568 |

Micron

Historical Cash Flow Statement

| Fiscal Years Ending Aug. 31 | 2019 | 2020 | 2021 | 2022 | 2023 |
|---|-----------------|----------------|-----------------|-----------------|----------------|
| Cash flows from operating activities: | | | | | |
| Net income (loss) | 6,358 | 2,710 | 5,861 | 8,687 | (5,833) |
| Adjustments to reconcile net income (loss) to net cash provided by operating activities: | | | | | |
| Depreciation expense & amortization of intangible assets | 5,424 | 5,650 | 6,214 | 7,116 | 7,756 |
| Provision to write-down inventories to estimate market values | - | - | - | - | 1,831 |
| Stock-based compensation | 243 | 328 | 378 | 514 | 596 |
| Goodwill impairment | - | - | - | - | 101 |
| Restructure and asset impairments | (97) | 40 | 454 | 44 | 11 |
| Loss (gain) on debt repurchases & conversions | 396 | (40) | 1 | 83 | - |
| Change in operating assets and liabilities: | | | | | |
| Receivables | 2,431 | (723) | (1,446) | 190 | 2,763 |
| Inventories | (1,528) | (489) | 866 | (2,179) | (3,555) |
| Accounts payable & accrued expenses | (174) | 725 | 210 | 744 | (2,104) |
| Other | (160) | 40 | (50) | (18) | (7) |
| Net cash flows from operating activities | 13,189 | 8,306 | 12,468 | 15,181 | 1,559 |
| Cash flows from investing activities: | | | | | |
| Expenditures for property, plant & equipment | (9,780) | (8,223) | (10,030) | (12,067) | (7,676) |
| Purchases of available-for-sale securities | (4,218) | (1,857) | (3,163) | (1,770) | (723) |
| Proceeds from maturities of available-for-sale securities | 1,541 | 814 | 1,250 | 1,321 | 1,566 |
| Proceeds from sales of available-for-sale securities | 1,504 | 1,458 | 856 | 294 | 25 |
| Proceeds from sales and maturities of available-for-sale securities | 3,045 | 2,272 | 2,106 | 1,615 | 1,591 |
| Proceeds from government incentives | 748 | 262 | 495 | 115 | 710 |
| Proceeds from sale of Lehi, Utah fab | - | - | - | 888 | - |
| Other | 120 | (43) | 3 | (366) | (93) |
| Net cash flows from investing activities | (10,085) | (7,589) | (10,589) | (11,585) | (6,191) |
| Cash flows from financing activities: | | | | | |
| Proceeds from issuance of debt | 3,550 | 5,000 | 1,188 | 2,000 | 6,716 |
| Repayments of debt | (3,340) | (4,366) | (1,520) | (2,032) | (761) |
| Payments of dividends to shareholders | - | - | - | (461) | (504) |
| Repurchases of common stock - repurchase program | - | - | - | (2,432) | (425) |
| Payments on equipment purchase contracts | (75) | (63) | (295) | (141) | (138) |
| Other cash flows from financing activities | (23) | (118) | 140 | 211 | 95 |
| Net cash flows from financing activities | (2,438) | (317) | (1,781) | (2,980) | 4,983 |
| Effect of changes in currency exchange rates on cash, cash equivalents & restricted cash | 26 | 11 | 41 | (106) | (34) |
| Net increase (decrease) in cash, cash equivalents & restricted cash | 692 | 411 | 139 | 510 | 317 |
| Cash, cash equivalents & restricted cash at beginning of period | 6,587 | 7,279 | 7,690 | 7,829 | 8,339 |
| Cash, cash equivalents & restricted cash at end of period | 7,279 | 7,690 | 7,829 | 8,339 | 8,656 |

Micron

Forecasted Cash Flow Statement

| Fiscal Years Ending Aug. 31 | 2024E | 2025E | 2026E | 2027E | 2028E | 2029E | 2030E | 2031E | 2032E | 2033E |
|---|----------------|----------------|----------------|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Cash, cash equivalents and restricted cash | | | | | | | | | | |
| Operating Activities: | | | | | | | | | | |
| Net income (loss) | 1,528 | 4,536 | 6,146 | 7,655 | 9,033 | 10,272 | 11,479 | 12,665 | 13,829 | 14,968 |
| Add depreciation | 7,926 | 7,889 | 8,017 | 8,222 | 8,489 | 8,805 | 9,159 | 9,544 | 9,953 | 10,381 |
| Changes in Receivables | (1,584) | (1,473) | (848) | (789) | (721) | (645) | (622) | (602) | (578) | (552) |
| Changes in Inventories | 1,641 | (2,469) | (1,420) | (1,321) | (1,208) | (1,081) | (1,042) | (1,008) | (969) | (925) |
| Changes in other current assets | 260 | (205) | (118) | (110) | (100) | (90) | (86) | (84) | (80) | (77) |
| Change in intangible assets | 75 | 51 | 47 | 43 | 42 | 42 | 42 | 42 | 20 | - |
| Change in deferred tax assets | 28 | 83 | 112 | 139 | 164 | 187 | 209 | 231 | 252 | 272 |
| Other non-current assets | (63) | (66) | (69) | (73) | (76) | (80) | (84) | (88) | (93) | (97) |
| Changes in accounts payable | 1,416 | 1,966 | 1,131 | 1,052 | 962 | 861 | 830 | 803 | 771 | 737 |
| Changes in other current liabilities | 228 | 277 | 159 | 148 | 135 | 121 | 117 | 113 | 109 | 104 |
| Change in noncurrent liabilities | (247) | 271 | 156 | 145 | 132 | 119 | 114 | 111 | 106 | 101 |
| Net cash flows from operating activities | 11,207 | 10,860 | 13,313 | 15,113 | 16,854 | 18,511 | 20,116 | 21,727 | 23,320 | 24,912 |
| Investing Activities: | | | | | | | | | | |
| Changes in investments | (93) | (97) | (102) | (107) | (113) | (118) | (124) | (130) | (137) | (144) |
| Change in government incentives | (397) | - | - | - | - | - | - | - | - | - |
| Change in lease ROU assets | 3 | (11) | (17) | (22) | (27) | (30) | (32) | (34) | (36) | (37) |
| Changes in goodwill | - | - | - | - | - | - | - | - | - | - |
| Capital expenditures | (7,750) | (8,500) | (9,000) | (9,500) | (10,000) | (10,500) | (11,000) | (11,500) | (12,000) | (12,500) |
| Net cash flows from investing activities | (8,237) | (8,608) | (9,119) | (9,630) | (10,139) | (10,648) | (11,156) | (11,665) | (12,173) | (12,681) |
| Financing Activities: | | | | | | | | | | |
| Changes in current debt | 239 | 189 | 109 | 101 | 92 | 83 | 80 | 77 | 74 | 71 |
| Changes in long term debt | (4,908) | 712 | 502 | 520 | 524 | 518 | 528 | 535 | 540 | 541 |
| Changes in lease liabilities | (1) | 10 | 16 | 20 | 24 | 27 | 29 | 31 | 33 | 34 |
| Payment of dividends | (537) | (547) | (555) | (564) | (573) | (582) | (591) | (601) | (610) | (619) |
| Repurchases of common stock | (438) | (451) | (464) | (478) | (493) | (507) | (523) | (538) | (555) | (571) |
| Net cash flows from financing activities | (5,646) | (87) | (392) | (401) | (425) | (462) | (477) | (496) | (517) | (544) |
| Net change in cash | (2,675) | 2,166 | 3,801 | 5,083 | 6,290 | 7,401 | 8,483 | 9,566 | 10,630 | 11,687 |
| Beginning Cash and cash equivalents | 8,577 | 5,902 | 8,068 | 11,869 | 16,952 | 23,242 | 30,642 | 39,125 | 48,692 | 59,321 |
| Ending Cash and cash equivalents | 5,902 | 8,068 | 11,869 | 16,952 | 23,242 | 30,642 | 39,125 | 48,692 | 59,321 | 71,008 |

Micron

Common Size Balance Sheet

| Fiscal Years Ending Aug. 31 | 2021 | 2022 | 2023 | 2024E | 2025E | 2026E | 2027E | 2028E | 2029E | 2030E | 2031E | 2032E | 2033E |
|---|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| Assets | | | | | | | | | | | | | |
| Current assets: | | | | | | | | | | | | | |
| Cash & equivalents | 28.02% | 26.86% | 55.19% | 35.24% | 35.24% | 35.24% | 35.24% | 35.24% | 35.24% | 35.24% | 35.24% | 35.24% | 35.24% |
| Short-term investments | 3.14% | 3.48% | 6.54% | 4.43% | 3.40% | 3.09% | 2.89% | 2.76% | 2.67% | 2.61% | 2.58% | 2.55% | 2.54% |
| Receivables | 19.17% | 16.68% | 15.72% | 16.69% | 16.69% | 16.69% | 16.69% | 16.69% | 16.69% | 16.69% | 16.69% | 16.69% | 16.69% |
| Inventories | 16.20% | 21.66% | 53.97% | 27.97% | 27.97% | 27.97% | 27.97% | 27.97% | 27.97% | 27.97% | 27.97% | 27.97% | 27.97% |
| Other current assets | 1.81% | 2.09% | 5.28% | 2.32% | 2.32% | 2.32% | 2.32% | 2.32% | 2.32% | 2.32% | 2.32% | 2.32% | 2.32% |
| Total current assets | 71.85% | 70.81% | 136.71% | 75.88% | 74.88% | 81.30% | 89.53% | 99.12% | 109.83% | 121.19% | 133.15% | 145.66% | 158.73% |
| Non-current assets: | | | | | | | | | | | | | |
| Long-term marketable investments | 6.37% | 5.35% | 5.43% | 3.67% | 2.82% | 2.57% | 2.40% | 2.29% | 2.22% | 2.17% | 2.14% | 2.12% | 2.11% |
| Property, plant & equipment (Is this net) | 119.88% | 125.33% | 244.07% | 156.52% | 116.44% | 103.48% | 95.03% | 89.52% | 86.06% | 83.56% | 81.75% | 80.48% | 79.65% |
| Operating lease right-of-use assets | 1.99% | 2.20% | 4.29% | 2.75% | 2.04% | 1.82% | 1.67% | 1.57% | 1.51% | 1.47% | 1.44% | 1.41% | 1.40% |
| Intangible assets | 1.26% | 1.37% | 2.60% | 1.36% | 0.84% | 0.61% | 0.44% | 0.31% | 0.20% | 0.11% | 0.03% | 0.00% | 0.00% |
| Deferred tax assets | 2.82% | 2.28% | 4.86% | 3.02% | 1.96% | 1.40% | 0.92% | 0.49% | 0.08% | -0.30% | -0.68% | -1.05% | -1.42% |
| Goodwill | 4.43% | 3.99% | 7.40% | 4.77% | 3.49% | 3.02% | 2.69% | 2.44% | 2.26% | 2.10% | 1.97% | 1.86% | 1.77% |
| Other noncurrent assets | 3.80% | 4.15% | 8.12% | 5.49% | 4.22% | 3.84% | 3.59% | 3.42% | 3.32% | 3.24% | 3.20% | 3.17% | 3.16% |
| Total non-current assets | 140.56% | 144.68% | 276.77% | 177.59% | 131.83% | 116.74% | 106.74% | 100.04% | 95.65% | 92.36% | 89.85% | 87.99% | 86.67% |
| Total assets | 212.41% | 215.50% | 413.47% | 253.47% | 206.71% | 198.04% | 196.27% | 199.17% | 205.48% | 213.55% | 223.00% | 233.65% | 245.40% |
| Liabilities and shareholder equity: | | | | | | | | | | | | | |
| Current liabilities: | | | | | | | | | | | | | |
| Accounts payable | 19.22% | 19.80% | 25.47% | 22.28% | 22.28% | 22.28% | 22.28% | 22.28% | 22.28% | 22.28% | 22.28% | 22.28% | 22.28% |
| Current debt | 0.56% | 0.33% | 1.79% | 2.14% | 2.14% | 2.14% | 2.14% | 2.14% | 2.14% | 2.14% | 2.14% | 2.14% | 2.14% |
| Other current liabilities | 3.41% | 4.38% | 3.40% | 3.14% | 3.14% | 3.14% | 3.14% | 3.14% | 3.14% | 3.14% | 3.14% | 3.14% | 3.14% |
| Total current liabilities | 23.19% | 24.51% | 30.66% | 27.56% | 27.56% | 27.56% | 27.56% | 27.56% | 27.56% | 27.56% | 27.56% | 27.56% | 27.56% |
| Non-current liabilities: | | | | | | | | | | | | | |
| Long-term debt | 23.90% | 22.12% | 83.99% | 33.76% | 26.88% | 24.61% | 23.11% | 22.10% | 21.44% | 20.95% | 20.57% | 20.29% | 20.09% |
| Noncurrent operating lease liabilities | | | | 2.50% | 1.86% | 1.65% | 1.52% | 1.43% | 1.37% | 1.33% | 1.30% | 1.28% | 1.27% |
| Noncurrent unearned government incentives | 2.92% | 1.91% | 4.68% | 1.37% | 1.00% | 0.87% | 0.77% | 0.70% | 0.65% | 0.60% | 0.57% | 0.53% | 0.51% |
| Other noncurrent liabilities | 2.02% | 2.71% | 6.35% | 3.07% | 3.07% | 3.07% | 3.07% | 3.07% | 3.07% | 3.07% | 3.07% | 3.07% | 3.07% |
| Total non-current liabilities | 30.65% | 28.73% | 98.90% | 40.70% | 32.81% | 30.20% | 28.46% | 27.30% | 26.53% | 25.95% | 25.51% | 25.18% | 24.94% |
| Total liabilities | 53.84% | 53.24% | 129.56% | 68.25% | 60.36% | 57.76% | 56.02% | 54.86% | 54.09% | 53.51% | 53.07% | 52.73% | 52.50% |
| Shareholders' equity: | | | | | | | | | | | | | |
| Common stock | 34.56% | 33.55% | 71.81% | 46.27% | 33.87% | 29.35% | 26.11% | 23.71% | 21.91% | 20.42% | 19.16% | 18.08% | 17.16% |
| Retained earnings | 140.95% | 153.70% | 262.70% | 173.37% | 139.03% | 135.17% | 136.82% | 142.25% | 150.48% | 160.15% | 170.95% | 182.78% | 195.55% |
| Treasury stock | -16.95% | -23.17% | -48.60% | -33.13% | -25.62% | -23.42% | -21.95% | -20.98% | -20.39% | -19.96% | -19.65% | -19.44% | -19.33% |
| Accumulated other comprehensive income (loss) | 0.01% | -1.82% | -2.01% | -1.29% | -0.95% | -0.82% | -0.73% | -0.66% | -0.61% | -0.57% | -0.54% | -0.51% | -0.48% |
| Total Micron Technology Inc. shareholders' equity (deficit) | 158.57% | 162.26% | 283.91% | 185.22% | 146.34% | 140.28% | 140.25% | 144.31% | 151.39% | 160.04% | 169.93% | 180.92% | 192.90% |
| Total liabilities and equity | 212.41% | 215.50% | 413.47% | 253.47% | 206.71% | 198.04% | 196.27% | 199.17% | 205.48% | 213.55% | 223.00% | 233.65% | 245.40% |

Micron
Common Size Income Statement

| Fiscal Years Ending Aug. 31 | 2021 | 2022 | 2023 | 2024E | 2025E | 2026E | 2027E | 2028E | 2029E | 2030E | 2031E | 2032E | 2033E |
|---|-------------|-------------|-------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| Revenue | 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 | 39.9% | 31.7% | 59.2% | 41.0% | 41.0% | 41.0% | 41.0% | 41.0% | 41.0% | 41.0% | 41.0% | 41.0% | 41.0% |
| Depreciation & Amortization | 22.4% | 23.1% | 49.9% | 32.9% | 23.9% | 21.1% | 19.2% | 18.0% | 17.3% | 16.8% | 16.4% | 16.1% | 16.0% |
| Gross Margin (Loss) | 37.6% | 45.2% | (9.1%) | 26.1% | 35.0% | 37.9% | 39.8% | 41.0% | 41.7% | 42.2% | 42.6% | 42.9% | 43.0% |
| Selling, General & Administrative | 3.2% | 3.5% | 5.9% | 4.1% | 4.1% | 4.1% | 4.1% | 4.1% | 4.1% | 4.1% | 4.1% | 4.1% | 4.1% |
| Research and Development Expenses (Might want to forecast different) | 9.6% | 10.1% | 20.0% | 12.5% | 12.5% | 12.5% | 12.5% | 12.5% | 12.5% | 12.5% | 12.5% | 12.5% | 12.5% |
| Restructure and Asset Impairments | 1.8% | 0.2% | 1.1% | 0.6% | 0.6% | 0.6% | 0.6% | 0.6% | 0.6% | 0.6% | 0.6% | 0.6% | 0.6% |
| Other operating expense (income), net | 0.3% | (0.1%) | 0.8% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| Operating income (loss) | 22.7% | 31.5% | (37.0%) | 9% | 18% | 21% | 23% | 24% | 25% | 25% | 25% | 26% | 26% |
| Interest income | 0.1% | 0.3% | 3.0% | 2% | 1% | 1% | 2% | 2% | 3% | 3% | 4% | 4% | 5% |
| Interest expense | 0.7% | 0.6% | 2.5% | 3% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% | 1% |
| Other non-operating income (expense), net | 0.3% | (0.1%) | 0.0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| Income (loss) before taxes, net income attributable to noncontrolling interest & equity in net income (loss) of equity method investees | 22.4% | 31.1% | (36.4%) | 8% | 18% | 21% | 23% | 25% | 26% | 27% | 28% | 29% | 29% |
| Income tax provision (benefit) | 1.4% | 2.9% | 1.1% | 2% | 4% | 5% | 5% | 5% | 6% | 6% | 6% | 6% | 6% |
| Equity in net income (loss) of equity method investees | 0.1% | 0.0% | 0.0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| Net income (loss) | 21.2% | 28.2% | (37.5%) | 6% | 14% | 16% | 18% | 19% | 20% | 21% | 22% | 22% | 23% |

Micron

Weighted Average Cost of Capital (WACC) Estimation

Cost of Equity:

| | |
|-----------------------|--------------|
| Risk-Free Rate | 4.54% |
| Beta | 1.24 |
| Equity Risk Premium | 4.33% |
| Cost of Equity | 9.91% |

Cost of Debt:

| | |
|-------------------------------|--------------|
| Risk-Free Rate | 4.54% |
| Implied Default Premium | 0.84% |
| Pre-Tax Cost of Debt | 5.38% |
| Marginal Tax Rate | 22% |
| After-Tax Cost of Debt | 4.21% |

Market Value of Common Equity:

| | |
|--------------------------|----------------|
| Total Shares Outstanding | 1098 |
| Current Stock Price | \$119.25 |
| MV of Equity | 130,937 |

MV Weights

90.38%

Market Value of Debt:

| | |
|-------------------------|------------------|
| Short-Term Debt | |
| Current Portion of LTD | 278 |
| Long-Term Debt | 13052 |
| PV of Operating Leases | 602 |
| MV of Total Debt | 13,932.14 |

9.62%

Market Value of the Firm

144,869

100.00%

Estimated WACC

9.36%

Micron

Relative Valuation Models

| Ticker | Company | Price | EPS 2024E | EPS 2025E | P/E 24 | P/E 25 | Est. 5yr EPS gr. | PEG 24 | PEG 25 |
|-----------|--------------------|----------|--------------|--------------|--------------|--------------|---------------------|-------------|-------------|
| 005930-KR | Samsung | \$58.99 | 3.52 | \$4.97 | 16.76 | 11.87 | 57.2 | 0.29 | 0.21 |
| 00660-KR | SK Hynix | \$133.72 | \$10.75 | \$16.92 | 12.44 | 7.90 | 4.0 | 3.11 | 1.98 |
| INTC | Intel | \$35.69 | \$1.34 | \$2.24 | 26.63 | 15.93 | 43.1 | 0.62 | 0.37 |
| TXN | Texas Instruments | \$166.33 | \$5.08 | \$6.51 | 32.74 | 25.55 | 10.0 | 3.27 | 2.55 |
| NXPI | NXP semiconductors | \$233.61 | \$13.58 | \$15.45 | 17.20 | 15.12 | 9.2 | 1.88 | 1.65 |
| | | | Average | | 21.16 | 15.28 | | 1.83 | 1.35 |
| MU | Micron | \$119.25 | 1.39 | 4.15 | 85.5 | 28.7 | 10.0 | 8.6 | 2.9 |

Implied Relative Value:

| | | |
|-------------|----|-------|
| P/E (EPS24) | \$ | 29.49 |
| P/E (EPS25) | \$ | 63.36 |
| PEG (EPS24) | \$ | 25.57 |
| PEG (EPS25) | \$ | 56.06 |

Micron

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

Key Inputs:

| | | |
|---------------------|--------|----------------|
| CV Growth of NOPLAT | 5.00% | Need to Assume |
| CV Year ROIC | 16.51% | |
| WACC | 9.36% | |
| Cost of Equity | 9.91% | |

| Fiscal Years Ending Aug. 31 | 2024E | 2025E | 2026E | 2027E | 2028E | 2029E | 2030E | 2031E | 2032E | 2033E |
|-----------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|-----------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|

DCF Model:

| | | | | | | | | | | |
|-----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|---------|
| Free Cash Flow (FCF) | 1,777 | (242) | 2,803 | 4,074 | 5,236 | 6,291 | 7,144 | 7,955 | 8,730 | 9,462 |
| Continuing Value (CV) | | | | | | | | | | 214,079 |
| PV of FCF | 1,625 | (203) | 2,143 | 2,848 | 3,347 | 3,678 | 3,819 | 3,888 | 3,902 | 95,679 |

| | |
|----------------------------------|---------------|
| Value of Operating Assets: | 120,727 |
| Non-Operating Adjustments | |
| Excess Cash | 4,403 |
| Investments | 1,861 |
| Other non current assets | 1,262 |
| Value of Debt | (13,932) |
| Value of Equity | 114,321 |
| Shares Outstanding | 1,098 |
| Intrinsic Value of Last FYE | 104.12 |
| Implied Price as of Today | 109.99 |

EP Model:

| | | | | | | | | | | |
|-----------------------|---------|---|-------|-------|-------|-------|-------|-------|-------|---------|
| Economic Profit (EP) | (2,647) | 7 | 1,173 | 2,239 | 3,114 | 3,799 | 4,406 | 4,940 | 5,404 | 5,797 |
| Continuing Value (CV) | | | | | | | | | | 132,938 |
| PV of EP | (2,420) | 6 | 897 | 1,565 | 1,991 | 2,221 | 2,355 | 2,415 | 2,415 | 59,415 |

| | |
|----------------------------------|---------------|
| Total PV of EP | 70,860 |
| Invested Capital (last FYE) | 49,867 |
| Value of Operating Assets: | 120,727 |
| Non-Operating Adjustments | |
| Excess Cash | 4,403 |
| Investments | 1,861 |
| Other non current assets | 1,262 |
| Value of Debt | (13,932) |
| Value of Equity | 114,321 |
| Shares Outstanding | 1,098 |
| Intrinsic Value of Last FYE | 104.12 |
| Implied Price as of Today | 109.99 |

Micron

Key Management Ratios

| <i>Fiscal Years Ending Aug. 31</i> | 2019 | 2020 | 2021 | 2022 | 2023 | 2024E | 2025E | 2026E | 2027E | 2028E | 2029E | 2030E | 2031E | 2032E | 2033E |
|---|--------|--------|--------|--------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| Liquidity Ratios: | | | | | | | | | | | | | | | |
| Quick Ratio (LA/CL) | 1.24 | 1.23 | 1.34 | 1.24 | 2.01 | 1.05 | 1.01 | 1.25 | 1.54 | 1.89 | 2.28 | 2.69 | 3.13 | 3.58 | 4.05 |
| Current Ratio (CA/CL) | 2.58 | 2.71 | 3.10 | 2.89 | 4.46 | 2.75 | 2.72 | 2.95 | 3.25 | 3.60 | 3.99 | 4.40 | 4.83 | 5.29 | 5.76 |
| Cash Ratio (Cash/CL) | 1.12 | 1.15 | 1.21 | 1.10 | 1.80 | 0.89 | 0.89 | 1.13 | 1.44 | 1.79 | 2.18 | 2.60 | 3.03 | 3.49 | 3.96 |
| Asset-Management Ratios: | | | | | | | | | | | | | | | |
| Total Asset Turnover (Rev/Assets) | 1.42 | 1.19 | 1.39 | 1.41 | 0.73 | 1.32 | 1.34 | 1.23 | 1.12 | 1.01 | 0.91 | 0.83 | 0.75 | 0.69 | 0.63 |
| Receivable Turnover (Rev/Avg. AR) | 5.40 | 6.03 | 6.01 | 5.89 | 4.10 | 7.46 | 6.92 | 6.42 | 6.34 | 6.28 | 6.23 | 6.20 | 6.18 | 6.16 | 6.15 |
| Day in Receivable Turnover (365/RT) | 67.64 | 60.51 | 60.75 | 61.95 | 88.94 | 48.95 | 52.77 | 56.87 | 57.57 | 58.14 | 58.62 | 58.86 | 59.05 | 59.23 | 59.39 |
| Financial Leverage Ratios: | | | | | | | | | | | | | | | |
| Debt/Equity | 0.16 | 0.17 | 0.15 | 0.14 | 0.30 | 0.19 | 0.20 | 0.19 | 0.18 | 0.17 | 0.16 | 0.14 | 0.13 | 0.12 | 0.12 |
| Debt/Total Assets | 0.12 | 0.12 | 0.12 | 0.10 | 0.21 | 0.14 | 0.14 | 0.14 | 0.13 | 0.12 | 0.11 | 0.11 | 0.10 | 0.10 | 0.09 |
| Debt to Captial (TD)/(TD + TSE) | 0.15 | 0.16 | 0.15 | 0.14 | 0.21 | 0.16 | 0.18 | 0.17 | 0.17 | 0.16 | 0.15 | 0.14 | 0.13 | 0.12 | 0.11 |
| Profitability Ratios: | | | | | | | | | | | | | | | |
| Return on Equity (NI/Beg TSE) | 19.17% | 7.55% | 15.03% | 19.77% | -11.69% | 3.46% | 10.15% | 12.75% | 14.35% | 15.07% | 15.12% | 14.89% | 14.48% | 13.97% | 13.41% |
| Gross Profit Margin (Rev-COGS/Rev)*100 | 45.73% | 30.57% | 37.62% | 45.18% | -9.11% | 26.13% | 35.05% | 37.91% | 39.76% | 40.96% | 41.71% | 42.24% | 42.61% | 42.87% | 43.03% |
| Return on Assets (Net Income/Total Assets) | 2.28% | 2.07% | 1.90% | 1.68% | 1.70% | 1.79% | 1.61% | 1.44% | 1.29% | 1.15% | 1.03% | 0.92% | 0.83% | 0.74% | 0.67% |
| Payout Policy Ratios: | | | | | | | | | | | | | | | |
| Dividend Payout Ratio (Dividend/EPS) | - | - | 0% | 5.63% | -8.99% | 35.15% | 12.05% | 9.02% | 7.37% | 6.34% | 5.67% | 5.15% | 4.74% | 4.41% | 4.14% |
| Total Payout Ratio ((Divs. + Repurchases)/NI) | - | - | 0% | 22.69% | 1.35% | -6.50% | -2.12% | -1.47% | -1.12% | -0.89% | -0.73% | -0.60% | -0.49% | -0.40% | -0.32% |
| Total Retention Ratio (1- Payout Ratio) | - | - | 0% | 77.31% | 98.65% | 106.50% | 102.12% | 101.47% | 101.12% | 100.89% | 100.73% | 100.60% | 100.49% | 100.40% | 100.32% |

Micron

Present Value of Operating Lease Obligations

(in millions)

| Fiscal Years Ending Aug. 31 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024E | 2025E | 2026E | 2027E | 2028E | 2029E | 2030E | 2031E | 2032E | 2033E |
|---|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|---------------|---------------|---------------|---------------|---------------|
| Year 1 | 37.0 | 54.0 | 70.0 | 68.0 | 66.0 | 62.0 | 59.2 | 56.1 | 53.3 | 50.6 | 48.1 | 45.7 | 43.4 | 41.2 | 39.1 | 37.2 |
| Year 2 | 43.0 | 64.0 | 69.0 | 69.0 | 80.0 | 77.0 | 81.7 | 82.7 | 85.7 | 87.7 | 90.4 | 92.8 | 95.5 | 98.1 | 100.9 | 103.7 |
| Year 3 | 50.0 | 63.0 | 65.0 | 61.0 | 70.0 | 76.0 | 84.9 | 93.4 | 103.6 | 114.5 | 126.8 | 140.2 | 155.1 | 171.6 | 189.9 | 210.0 |
| Year 4 | 50.0 | 59.0 | 55.0 | 50.0 | 67.0 | 76.0 | 94.0 | 111.5 | 135.1 | 161.9 | 195.1 | 234.4 | 282.1 | 339.3 | 408.2 | 491.0 |
| Year 5 | 45.0 | 53.0 | 47.0 | 47.0 | 64.0 | 74.0 | 93.2 | 112.5 | 138.8 | 169.3 | 207.8 | 254.2 | 311.5 | 381.4 | 467.2 | 572.2 |
| Thereafter | 391.0 | 459.0 | 401.0 | 372.0 | 463.0 | 453.0 | 503.5 | 526.2 | 567.3 | 602.3 | 644.4 | 686.7 | 733.3 | 782.3 | 835.0 | 891.0 |
| Total Minimum Payments | 616.0 | 752.0 | 707.0 | 667.0 | 810.0 | 818.0 | 916.5 | 982.3 | 1083.8 | 1186.3 | 1312.4 | 1454.1 | 1621.0 | 1814.0 | 2040.3 | 2305.1 |
| Less: Cumulative Interest | 188.9 | 224.1 | 199.8 | 183.3 | 223.1 | 215.9 | 237.6 | 248.1 | 268.4 | 288.0 | 313.3 | 341.7 | 375.7 | 415.3 | 462.1 | 517.2 |
| PV of Minimum Payments | 427.1 | 527.9 | 507.2 | 483.7 | 586.9 | 602.1 | 678.9 | 734.2 | 815.3 | 898.3 | 999.2 | 1112.4 | 1245.3 | 1398.7 | 1578.2 | 1787.9 |
| Implied Interest in Year 1 Payment | | 23.0 | 28.4 | 27.3 | 26.0 | 31.6 | 32.4 | 36.5 | 39.5 | 43.9 | 48.3 | 53.8 | 59.8 | 67.0 | 75.3 | 84.9 |
| Pre-Tax Cost of Debt | 5.38% | 5.38% | 5.38% | 5.38% | 5.38% | 5.38% | 5.38% | 5.38% | 5.38% | 5.38% | 5.38% | 5.38% | 5.38% | 5.38% | 5.38% | 5.38% |
| Years Implied by Year 6 Payment | 8.7 | 8.7 | 8.5 | 7.9 | 7.2 | 6.1 | 5.4 | 4.7 | 4.1 | 3.6 | 3.1 | 2.7 | 2.4 | 2.1 | 1.8 | 1.6 |
| Expected Obligation in Year 6 & Beyond | 45 | 53 | 47 | 47 | 64 | 74 | 93 | 113 | 139 | 169 | 208 | 254 | 312 | 381 | 467 | 572 |
| Present Value of Lease Payments | | | | | | | | | | | | | | | | |
| PV of Year 1 | 35.1 | 51.2 | 66.4 | 64.5 | 62.6 | 58.8 | 56.2 | 53.2 | 50.6 | 48.0 | 45.6 | 43.3 | 41.2 | 39.1 | 37.1 | 35.3 |
| PV of Year 2 | 38.7 | 57.6 | 62.1 | 62.1 | 72.0 | 69.3 | 73.6 | 74.4 | 77.1 | 79.0 | 81.4 | 83.6 | 86.0 | 88.4 | 90.9 | 93.4 |
| PV of Year 3 | 42.7 | 53.8 | 55.5 | 52.1 | 59.8 | 64.9 | 72.5 | 79.9 | 88.6 | 97.9 | 108.3 | 119.8 | 132.6 | 146.6 | 162.2 | 179.5 |
| PV of Year 4 | 40.5 | 47.8 | 44.6 | 40.5 | 54.3 | 61.6 | 76.2 | 90.4 | 109.5 | 131.3 | 158.2 | 190.1 | 228.8 | 275.1 | 331.0 | 398.1 |
| PV of Year 5 | 34.6 | 40.8 | 36.2 | 36.2 | 49.2 | 56.9 | 71.7 | 86.6 | 106.8 | 130.3 | 159.9 | 195.6 | 239.7 | 293.5 | 359.5 | 440.3 |
| PV of 6 & beyond | 235.4 | 276.5 | 242.4 | 228.2 | 288.8 | 290.5 | 328.7 | 349.8 | 382.7 | 411.8 | 445.8 | 480.0 | 517.1 | 555.9 | 597.4 | 641.3 |
| Capitalized PV of Payments | 427.1 | 527.9 | 507.2 | 483.7 | 586.9 | 602.1 | 678.9 | 734.2 | 815.3 | 898.3 | 999.2 | 1112.4 | 1245.3 | 1398.7 | 1578.2 | 1787.9 |

Micron*Valuation of Options Granted under ESOP*

| | |
|--------------------------------------|----------|
| Current Stock Price | \$119.25 |
| Risk Free Rate | 4.25% |
| Current Dividend Yield | 0.48% |
| Annualized St. Dev. of Stock Returns | 40.00% |

| Range of Outstanding Options | Number of Shares | Average Exercise Price | Average Remaining Life (yrs) | B-S Option Price | Value of Options Granted |
|------------------------------|------------------|------------------------|------------------------------|------------------|--------------------------|
| Range 1 | 10,000 | 5.00 | 2.24 | \$ 113.43 | \$ 1,134,287 |
| Range 2 | 20,000 | 9.00 | 5.40 | \$ 109.05 | \$ 2,181,075 |
| Range 3 | 30,000 | 10.00 | 4.35 | \$ 108.48 | \$ 3,254,365 |
| Range 4 | 20,000 | 12.00 | 6.40 | \$ 106.56 | \$ 2,131,159 |
| Range 5 | 20,000 | 15.00 | 8.24 | \$ 104.30 | \$ 2,085,991 |
| Range 6 | | | | \$ | - |
| Range 7 | | | | \$ | - |
| Range 8 | | | | \$ | - |
| Range 9 | | | | \$ | - |
| Total | 100,000 | \$ 10.70 | 5.54 | \$ 110.81 | \$ 10,786,877 |