

# Micron Technology, Inc. (NYSE : MU) – LONG

Henry McKinney, Analyst, Golden Flyer Investment Fund  
February 16, 2022



## Key Metrics

Intrinsic Value Estimate: \$130.00  
Price (February 22nd, 2022): \$90.57  
52 Week Range: \$65 - \$98  
Shares Outstanding (B): 112  
Market Cap (B): 107.5  
ROIC 23.35%

## TTM Ratio Highlights

Price/EPS: 12x  
EV/EBIT: 6.61x  
ROE: 14.1%

- PM: 21.1%
- TAT: 0.49
- Leverage: 1.36x

## LTM Financials

Revenue Growth 34.24%  
Gross Profit Margin: 46.38%  
EBITDA Margin: 56.46%  
EBIT Margin 34.72%  
Net Income 30.00%  
EPS Growth 144.30%

## Executive Summary and Recommendation

Micron Technology, Inc. (MU) is one of the world's largest semiconductor manufacturers. It supplies semiconductor chips for an array of technological uses from data centers, PCs, and graphics, to mobile and intelligent devices like smart homes. Approximately 70% of Micron's revenues came from cloud server and mobile device clients. Geographically, approximately 43% of revenues came from the U.S. and 24% came from Taiwan, for a total of 67%. I believe Micron is undervalued because the market **(1) has been overlooking it for higher growth peers, (2) underestimates Micron's future earning's potential and, (3) fails to recognize Micron's strategic industry positioning.** Through my research, I've arrived at a conservative 12-month price target of **\$130.00**, representing a **31%** potential upside from the closing price of \$90.57 on February 22, 2022; I recommend a maximum buy stake of 5%.

Figure 1) L6Y Revenue Growth

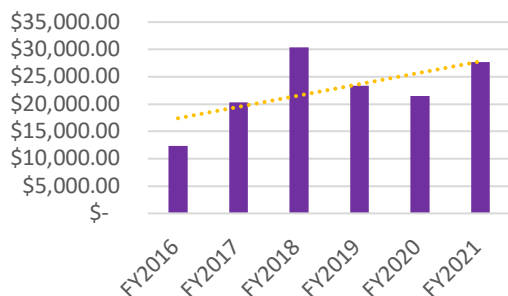
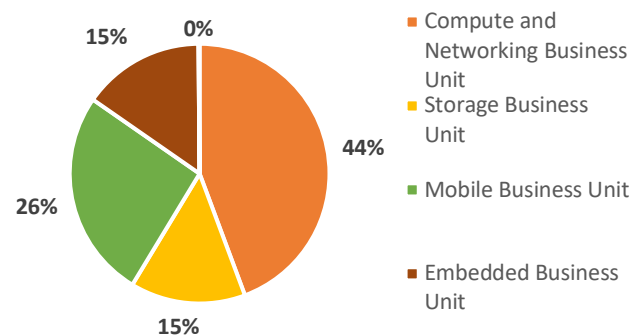


Figure 2) Revenue by Business Segment



## Company Overview

Micron manufactures and designs semiconductor chips, vital for memory and storage solutions in an array of technologies across industries. Headquartered in Boise, Idaho, the company has more than 44 years industry experience. Many of Micron's operations occur internationally in countries such as Taiwan, Singapore, Japan, China, India, and Malaysia. Micron has three primary end markets: 1) Data Center which encompasses IT enterprises, 2) PC and Graphics which encompasses computer visuals and processing, and 3) Mobile and Intelligent Edge which encompasses 5G and smart devices, automotive, and industrial IoT. In FY2021 Micron did \$27B in revenues.

## Investment Thesis

### 1. Micron is a value play in a growing industry.

Over the past five years, we have seen the stocks of companies like Nvidia (NVDA) and Advanced Micro Devices (AMD) 10x in value while Micron has humbly grown 4x. AMD and NVDA's moves can be justified by their high trailing revenue CAGRs (98% for AMD and 48% for NVDA), their high ROIC (both upwards of 40%), and their high profit margins (both upwards of 20% or more). Additionally, over the past five years Micron's EPS has had a CAGR of 3.9%. However, the market has become overexuberant on the peers mentioned, and has completely overlooked Micron's fundamentals. Micron's P/E has traded for around 12, more than half the industry average of ~25, and its ROIC is moving towards the 20% mark. In short, its current stock price is a discount to its intrinsic value, even for its L5Y of earnings. Over the next 5 years, the market still has not priced in its potential growth.

### 2. Micron is poised to see explosive growth over the next five years.

Micron is positioned to benefit from the global supply chain shortage that's hitting the chip market. In addition to a shortage, the industry is expected to see explosive growth through at least 2027. The semiconductor space operates in ebbs and flows. Currently, the industry is in a large supply ebb. However, demand is stronger than ever. The industry saw annual revenues above \$500b for the first time in 2021. With an influx of cloud services, EV's, smart devices, and increased need for data storage and processing, the semiconductor space is a critical piece to the supplying the world's digital transition. The WSJ estimates that before 2030 industry revenues will top \$1t annually. Moreover, Refinitiv Smart Data estimates that the industry's base 5-year earnings CAGR will be ~15%. Micron should be able to amply

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mitigate normal supply chain bottle necks as they are currently stocking inventory and predicting that the second half of 2022 brings a strong uptick in demand. As of now, the market is pricing Micron to only grow at 8% annually, I see anywhere from 15%-18% over the next 5 years which should pull the stock price to new highs.

## 3. Micron is strategically positioned to maneuver chip shortage.

Micron is a low leverage, cash heavy company in an expanding industry. Micron's continuous investment in R&D is paying off as its ROIC is steadily increasing. Moreover, the company is spending \$150B over the next decade to increase chip output. Micron is increasing inventories, and as of Q1 2022, Micron's TTM average inventory days is at 109. This is crucial in an environment where many American businesses have come down to only as little as a forty-day supply of chips. Micron's solid supply should strengthen its credibility with customers. Since ~75% of revenues come from volume-based annual agreements, these relationships are key to success in the industry. That should enable Micron to gain crucial market share during the next 3-5 years as the industry is sees its highest growth ever.

## Key Risks and Assessments

### 1. Macroeconomic and Beta risk

Micron's stock price has underperformed its American peers in the past five years. Because of this, it's traded at depressed multiples. However, in the past year, the stock saw an upward price movement of ~40% over six months. Many of its peers could be considered overvalued, and many equities outside of the sector are trading at steep multiples. Additionally, interest rates are low, and the CPI is running at its hottest in recent years at 7.5% (January 2022). The federal reserve is planning to hike rates in March and end economic stimulus. If they aren't careful, they could shock the market and Micron' stock, with a beta of 1.19, could see a steep decline. **Probability:** 5% **Valuation Impact:** ~ -30%

### 2. Supply Chain Issues Hit Micron

As of now Micron is increasing its inventories in preparation for increased demand volume starting in the second half of 2022. Many countries including Russia and Ukraine have necessary input materials such as industrial gasses crucial to the creation of the silicon wafers. These wafers which are disks containing a multitude of chips, take about two to three months to make. After being made the chips need to be tested, cleaned, a repackaged. The consequences of these events can push production times back by months and have the potential to eat away at margins. **Probability:** 10% **Valuation Impact:** ~ -15%

#### Bull

**Probability 25%**

Major risks subside and the semiconductor industry grows at 14% per year. Micron's revenue grows between industry pace and 20% over next three-five years.

**12 month target: \$150**

#### Scenario Analysis

#### Base

**Probability 50%**

Anticipated risks occur, but Micron. navigates supply issues, minimizing damage. Revenues grow at CAGR of 14% annually in line with the industry.

**12 month target \$130**

#### Bear

**Probability 25%**

Anticipated risks occur. Initial magnitude severely damages equity market price. Re-evaluation of the industry and micron supply chain necessary to gauge new growth prospects.

**6 month target \$66  
12 month target \$94**

Figure 3) Risk Matrix

Red -Most  
Impact

Yellow-Med  
impact

Green- Least  
Impact

Nat Gas Shortage	Rate Hike Market	War Related Supply Issues	Loss of Major Customer
Innovation Failure	Govts Fund Competitors	DRAM Price Instability	
Mobile Sales Slow		Chinese Free Market Restrictions	

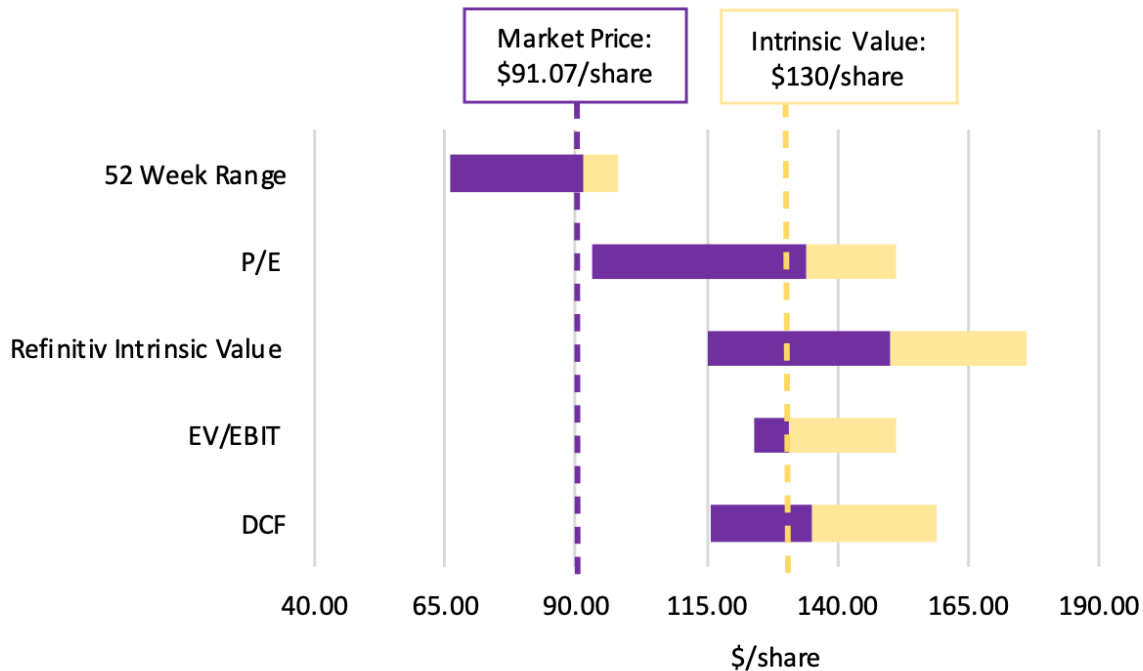
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## Valuation

### Valuation: Micron Technologies Inc (February 22nd, 2022)



## DCF Sensitivity Analysis

		Revenue Growth Rate				
		12.00%	13.00%	15.00%	17.0%	18.00%
WACC	10.40%	139	140	143	146	147
	11.00%	131	132	135	137	139
	11.32%	127	128	131	133	135
	12.00%	120	121	123	126	127
	12.40%	116	117	120	122	123

## Comparable Multiples Analysis:

Current Multiples		EV/EBITDA		EV/EBIT		Price/Earnings	
Peer Group	# of peers	Average	Median	Average	Median	Average	Median
US Based	7	21.8	13.6	27.8	19.1	31.9	22.8
International	3	17.6	17.6	23.9	23.9	26.7	26.7
<b>Forecast Multiple</b>		<b>7.5</b>		<b>12.0</b>		<b>15.0</b>	
Metric 2022		<b>19471</b>		<b>12043</b>		<b>8.4</b>	
EV * Multiple		146035		144512			
Market cap		147635		146112			
<b>Share Price 2022</b>		<b>132</b>		<b>131</b>		<b>126</b>	

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## APPENDIX

### Proforma Income Statement:

Income Statement	FY2016	FY2017	FY2018	FY2019	FY2020	FY2021	FY2022E	FY2023E	FY2024E	FY2025E	FY2026E	Assumptions
Revenue	12,399	20,322	30,391	23,406	21,435	27,705	32,692	38,576	44,363	50,574	57,148	Industry Growth, Guidance, Refinitiv Estimates
Revenue Growth %	-23.4%	63.9%	49.5%	-23.0%	-8.4%	29.3%	18.0%	18.0%	15.0%	14.0%	13.0%	15.6% CAGR
COGS	9,894.0	11,886	12,500	12,704	14,883	17,233	17,000	20,060	23,069	26,298	29,717	
COGS % of Sales	79.8%	58.5%	41.1%	54.3%	69.4%	62.2%	52.0%	52.0%	52.0%	52.0%	52.0%	
Gross Profit	2,505.0	8,436.0	17,891	10,702	6,552.0	10,472	15,692	18,517	21,294	24,275	27,431	
Gross Profit Margin %	20.2%	41.5%	58.9%	45.7%	30.6%	37.8%	48.0%	48.0%	48.0%	48.0%	48.0%	Fixed
SG&A	2,276.0	2,567.0	2,954.0	3,277.0	3,481.0	3,557.0	3,649	3,875	4,055	4,236	4,426	
SG&A % of Sales	18.4%	12.6%	9.7%	14.0%	16.2%	12.8%	11.2%	10.0%	9.1%	8.4%	7.7%	
% Growth	6.8%	12.8%	15.1%	10.9%	6.2%	2%	2.6%	6.2%	4.6%	4.5%	4.5%	Guidance, Refinitiv Estimates
EBITDA	3,208	9,730	19,586	12,730	8,630	13,077	19,471	23,143	26,533	30,684	35,197	
Depreciation	2,860.0	3,760.0	4,660.0	5,340.0	5,570.0	6,199.0	7,429	8,502	9,294	10,644	12,191	Guidance, Refinitiv Estimates
%Growth	11%	32%	24%	13%	-2%	-10%	19.8%	14.4%	9.3%	14.5%	14.5%	
Amortization	117.0	106.0				82.00						
%Growth	2%	39%	64%	23%	-95%	-7%	42.3%	192.3%				
EBIT	231.0	5,864.0	14,926	7,390.0	3,060.0	6,796.0	12,043	14,642	17,239	20,039	23,006	
EBIT Margin %	1.9%	28.9%	49.1%	31.6%	14.3%	24.5%	37%	38%	39%	40%	40%	
Interest Expense	-419.0	-634.0	-297.0	68.00	-88.00	-64.00	-360	-111	-156	-173	-200	Guidance FY 2022, LSY Average 2023 and beyond
Other Expenses	-93	-34		-410	11	-514	-15					
Pretax Income	-281.0	5,196.0	14,307	7,048.0	2,983.0	6,218.0	11,667.7	14,530.8	17,083.7	19,866.5	22,805.7	
Taxes	19	114	342	703	280	394	2,275	3,051	3,588	4,172	4,789	
Tax Rate	6.8%	-2.2%	-2.4%	-10.0%	-9.4%	-6.3%	19.50%	21.0%	21.0%	21.0%	21.0%	
Net Income	-300.0	5,082.0	13,965	6,345.0	2,703.0	5,824.0	9,392.5	11,479.3	13,496.1	15,694.6	18,016.5	
Profit Margin %	-2.4%	25.0%	46.0%	27.1%	12.6%	21.0%	28.7%	29.8%	30.4%	31.0%	31.5%	
Change in Working Capital	125.0	-1,037.0	-1,657.0	729.0	-487.0	-370.0	-422.1	-732.6	400.5	-251.4	-194.5	Guidance FY 2022, LSY Average 2024 and beyond
Capex	5,817.0	4,734.0	8,879.0	9,780.0	8,223.0	10,030	11,000	12,000	13,000	13,000	13,000	Guidance and Analyst expectations
Free Cash Flows	(2,484)	3,959	9,050	3,679	(80)	2,677	5,774	7,359	10,346	13,260	17,213	EBIT-Taxes+D&A-Capex-ΔNonCashNWC
Present Value FCFs							1,119.0	1,119.0	1,119.0	1,119.0	1,119.0	
Number of Shares	1,040.0	1,112.0	1,161.0	1,106.0	1,113.0	1,119.0						
EPS	-0.29	4.57	12.03	5.74	2.43	5.20	8.39	10.26	12.06	14.03	16.10	
EPS Growth %	-112.2%	-1684.3%	163.2%	-52.3%	-57.7%	114.3%	61.3%	22.2%	17.6%	16.3%	14.8%	

## WACC Calculation

Equity value	107499
Debt value	7022
Cost of Debt	0.2%
Tax rate	6.3%
10y Treasury	1.90%
Beta	1.18
Market Return	10.5%
Cost of Equity	12.05%

E / D +E	94%
D / D+E	6%

WACC	11.32%
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## Discounted Cash Flow Full

### Assumptions pt1

Growth rate	3.0%
EV/EBITDA Multiple	5.00x
Cost of Debt	0.23%
Tax Rate	6.2%
10y Treasury	1.90%

### Assumptions pt2

Beta	1.18
Market Return	11.3%
Equity value	107499
Debt value	7022

Period	0	1	2	3	4	5
<b>Free Cash Flows</b>						
EBIT	6,796	12,043	14,642	17,239	20,039	23,006
(Tax)	394	2,275	3,051	3,588	4,172	4,789
D&A	6,281	7,429	8,502	9,294	10,644	12,191
CapEx	10,030	11,000	12,000	13,000	13,000	13,000
ΔNon-cash Work.						
Capital (inc) / dec	(370)	(422)	(733)	401	(251)	(194)
<b>FCF</b>		<b>5,774</b>	<b>7,359</b>	<b>10,346</b>	<b>13,260</b>	<b>17,213</b>

### WACC

Cost of Equity	12.05%
D/D+E	6%
E/D+E	94%
<b>WACC</b>	<b>11.32%</b>

### Terminal Value

EBITDA	35196.9
Exit Multiple	
(EV/EBITDA)	5
<b>Terminal Value</b>	<b>175,985</b>
Perpetuity Growth	3.0%
<b>Terminal Value</b>	<b>213097</b>
<b>Choose Cell H81, H83, or Average of both</b>	<b>194,541</b>

Discounting	1	2	3	4	5
Discount Factor	0.90	0.81	0.72	0.65	0.58
PV of FCF	5,187	5,939	7,500	8,635	10,069
PV of TV					113,801
<b>Enterprise Value</b>	<b>151,131</b>				

### Enterprise Value to Equity Value

Cash & Equivalents	8,633.0
Marketable Securities	0
Short term Debt	
Long term Debt	7022
<b>Equity Value</b>	<b>152,742</b>

Shares Outstanding	1,134
<b>Implied Share Price</b>	<b>\$135</b>

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## Sensitivity Analysis

Variable Tables (Affected by above inputs)

15.6% 5Y Avg.  
Base Case  
Revenue Growth

		Perpetuity Growth Rate				
		2.0%	2.5%	3.00%	3.5%	4.0%
WACC	10.40%	139	143	147	152	158
	11.00%	132	135	139	143	148
	11.32%	128	131	135	138	143
	12.00%	122	124	127	130	134
	12.40%	118	120	123	126	129

Base Case 5  
EV/EBITDA

Base Case 3%  
Perpetuity  
Growth TV

		Revenue Growth Rate				
		12.00%	13.00%	15.00%	17.0%	18.00%
WACC	10.40%	139	140	143	146	147
	11.00%	131	132	135	137	139
	11.32%	127	128	131	133	135
	12.00%	120	121	123	126	127
	12.40%	116	117	120	122	123

15.6% 5Y Avg.  
Base Case  
Revenue growth

		EV/EBITDA				
		4.15	4.575	5	5.75	6
WACC	10.40%	139	143	147	154	156
	11.00%	131	135	139	146	148
	11.32%	127	131	135	142	144
	12.00%	120	123	127	134	136
	12.40%	116	119	123	129	132

## Industry Multiples Analysis

US Peers		EV/EBITDA						EV/EBIT			Price/Earnings				EV/Sales			Dividend Yield %	Price/Book	Intrinsic Value Estimate
Identifier (RIC)	Company Name	Price (2-16-21)	Mkt Cap (USDm)	EV (USDm)	LTM	Current	NTM	LTM	Current	NTM	LTM	Current	NTM	LTM	Current	NTM	Current	Current	Current	
WDC.OQ	Western Digital	55.87	17,482.71	22,259.71	5.92	11.03	4.47	9.80	21.94	6.47	7.01	26.42	6.36	1.22	1.18	1.01	0.0%	1.46	0.47	
MU.O	Micron Techn	96.00	107,498.60	104,940.60	6.61	6.26	7.50	10.50	11.98	12.00	12.90	14.40	16.00	3.51	3.54	2.83	0.4%	2.34	0.56	
QCOM.O	Qualcomm In	173.00	194,971.00	199,411.00	13.37	13.57	10.77	18.79	15.77	12.10	18.02	17.01	14.27	5.41	5.53	4.38	1.6%	17.17	0.90	
INTC.OQ	Intel Corp	48.44	197,199.24	206,887.24	6.51	6.45	7.27	9.83	9.88	12.43	8.86	10.56	13.60	2.77	2.62	2.83	3.0%	2.07	0.75	
AMD.OQ	Advanced Mic	121.47	197,676.02	194,381.02	39.34	42.84	23.44	47.63	47.63	25.01	43.38	56.80	29.85	11.05	11.83	7.48		19.56	2.16	
TXN.OQ	Texas Instrum	166.17	153,465.82	151,467.82	15.05	17.26	13.43	19.09	19.09	15.10	20.17	22.80	18.19	8.17	8.26	7.48	2.8%	11.52	1.02	
NVDA.OQ	NVIDIA Corp	264.95	662,375.00	654,021.00	47.64	55.12	38.70	74.03	68.12	43.01	67.94	75.32	51.00	24.50	26.94	20.13	0.1%	27.86	2.73	
Average					19.21	21.79	15.08	27.10	27.77	18.02	25.47	31.90	21.32	8.09	8.56	6.59	0.01	11.71	1.23	
Median					13.37	13.57	10.77	18.79	19.09	12.43	18.02	22.80	16.00	5.41	5.53	4.38	0.01	11.52	0.90	

International Peers		EV/EBITDA						EV/EBIT			Price/Earnings				EV/Sales			Dividend Yield %	Price/Book	Intrinsic Value Estimate
Identifier (RIC)	Company Name	Price (2-16-21)	Mkt Cap (USDm)	EV (USDm)	LTM	Current	NTM	LTM	Current	NTM	LTM	Current	NTM	LTM	Current	NTM	Current	Current	Current	
GFS.OQ	Globalfoundri	55.17	29,341.93	28,415.93	15.93	20.73	10.61		27.81		28.31	4.63	4.32	3.81			3.65	1.61		
005930.KS	Samsung Elect	62.50	419,536.57		4.95		3.30		6.64	12.37		10.60	1.22	1.52	1.03	2.0%	1.74	0.58		
2330.TW	Taiwan Semic	23.20	601,602.71	585,131.54	16.87	14.49	11.60	23.91	23.91	18.47	27.59	26.73	21.03	9.83	10.04	7.85	1.7%	7.57	1.06	
Average					12.58	17.61	8.50	23.91	23.91	17.64	19.98	26.73	19.98	5.23	5.30	4.23	0.02	4.32	1.08	
Median					15.93	17.61	10.61	23.91	23.91	18.47	19.98	26.73	21.03	4.63	4.32	3.81	0.02	3.65	1.06	