

Next in Tech: Navigating the Semiconductor Industry

Kicking A\$\$ets
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Philadelphia, March 6, 2021



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Table of Abbreviations

Abbreviation	Explanation
SCM	Supply Chain Management
IPU	Integrated Processing Unit
GPU	Graphics Processing Unit
OEM	Original Equipment Manufacturer
IC	Integrated Circuit
SemiCon	Semiconductor
COGS	Cost of Goods Sold
YoY	Year-over-Year
Semi-C	Enterprise, Embedded, and Semi-Custom
dGPU	Discrete GPU
mm	Million
B	Billion
AR	Augmented Reality
VR	Virtual Reality
SoC	System on a Chip
CPU	Central Processing Unit
Comm(s)	Communications
NTM	Next Twelve Months
LTM	Last Twelve Months

Abbreviation	Explanation
P/E	Price to Earnings (ratio)
EV/EBITDA	Enterprise Value to EBITDA (ratio)
EBITDA	Earnings before Interest, Taxes, Depreciation, and Amortization
M&A	Mergers and Acquisitions
FY	Fiscal Year
ASIC	Application-Specific Integrated Circuit
AI	Artificial Intelligence
AWS	Amazon Web Services
CAGR	Compound Annual Growth Rate
R&D	Research and Development
GHG	Greenhouse Gas
HPC	High-Performance Computing
TSMC	Taiwan Semiconductor Manufacturing Company
SDK	Software Development Kit
TSP	Tensor Streaming Processor
S&P	Standard and Poor's
~	Approximately

Executive Summary

Nvidia's Course of Action



Executive Summary

Should Nvidia acquire Advanced Micro Devices (AMD)?

Nvidia should **NOT** acquire AMD



- The market **overvalued** AMD by 33.4%
- The lofty industry premium rate does not justify the **little synergies that result post acquisition**
- The debt resulting from the acquisition will only **lead to a destruction of wealth** because of a hefty premium from AMD **not wanting to sell**

Nvidia should acquire MediaTek



- The Market **fairly values** MediaTek
- MediaTek's corporate strategy, brand portfolio, and operational business segments **closely align with Nvidia**
- New and upcoming technology like the NeuroPilot **feature furthers AI development**
- After analysis of synergies and debt financing, **this transaction is feasible**

A close-up photograph of a person's hand holding a dark blue pen. The hand is positioned as if it is about to write or has just finished writing. The background is a light-colored grid notebook, which provides a subtle texture and pattern to the overall image.

I. Industry Overview

**Defining and Shaping the
Industry**

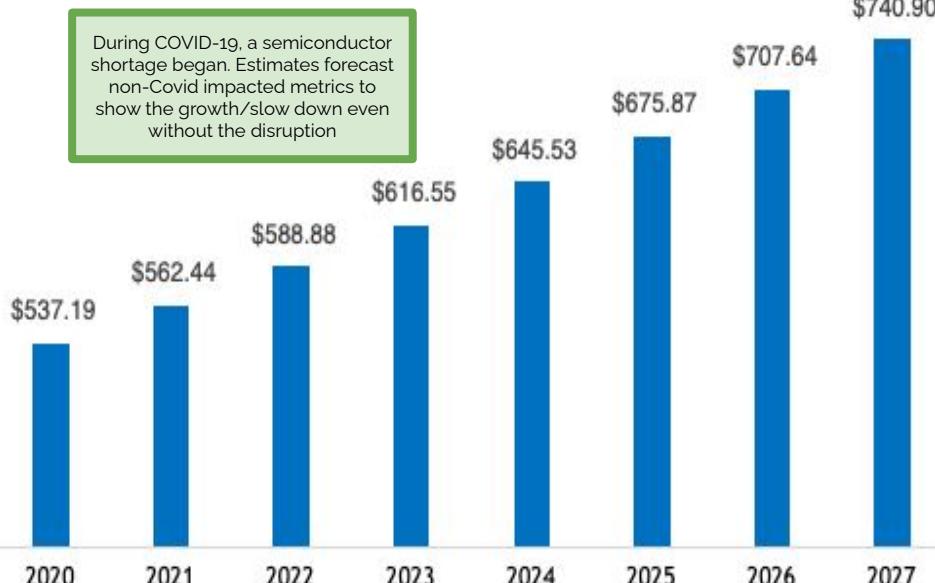


The Semiconductor Industry Overview

A CAGR of 4.7% indicates Semiconductors are expected to grow to a market value of \$700B+ by 2027, but the growth rate year-over-year is seeing slow-downs

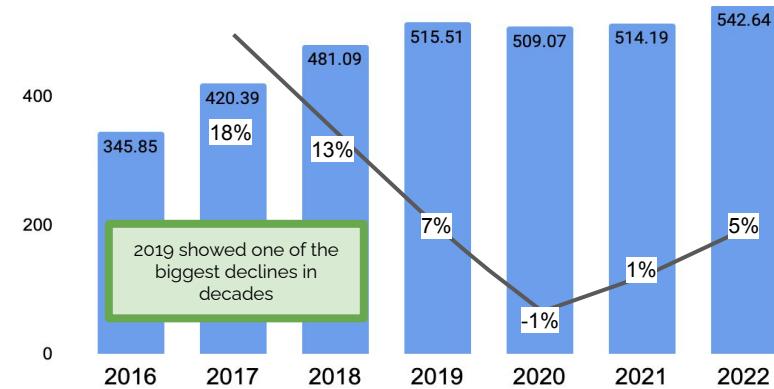
As technology advances, the need for SemiCons increases, causing growth

Global Market Value of the Semiconductor Industry, 2019-2027, USD Billion
FY2020



...but the present growth rate for Semiconductor sales decreases

Global Semiconductor Sales Revenue, 2016-2022, USD Billions



Industry Trends

Moore's Law- speed and capabilities of computers doubles every two years which means the transistors in a microchip increase. Companies like Intel that enjoy a premium valuation may get crushed when they can no longer continue to deliver. 2019 showed this when Moore's Law finally slowed

System on a chip (SoC)- an IC that integrates all or most components of a computer. Significantly reduces waste, energy, and space of larger systems as they are integrated in portable systems like tablets and smartphones.

Source: (Deloitte, 2019), (Rotman, 2020), (World Semiconductor Trade Statistics, 2020)

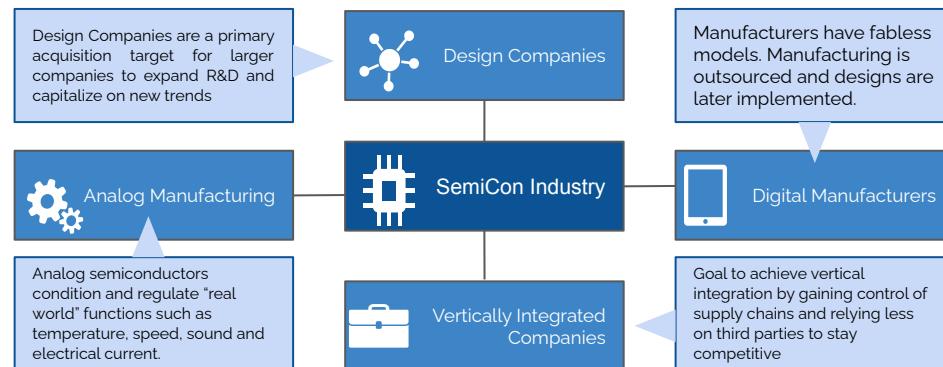


Specializations within the Industry and Regional Insights

Semiconductor vertically-integrated companies comprise the greatest market share and have the advantage as R&D costs correlate with increases in revenue margins.

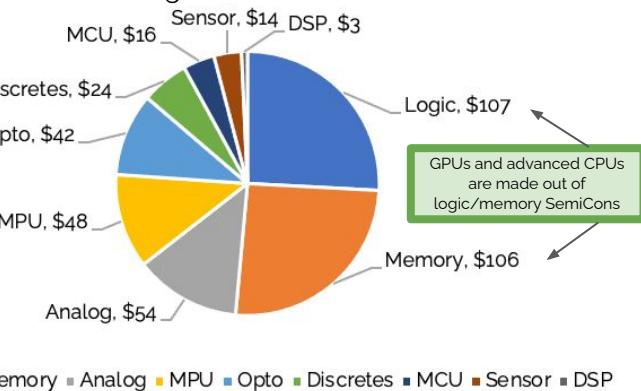
Large SemiCon companies outsource manufacturing to focus on R&D dev

Semiconductor Industry Segmentation



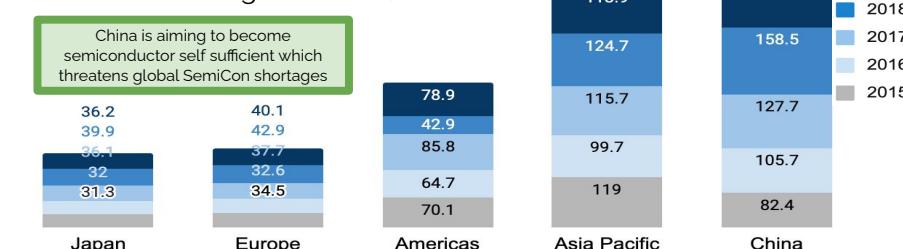
...and innovation in the Memory and Logic space continues to rise

2019 SemiCon Product Segment Sales Revenue, USD Billions



China and Asia Pacific currently hold the greatest revenue of SemiCons

Semiconductor Regional Sales, USD Billion



...but US Companies have heavily settled in Asian Markets

Semiconductor Market Share by Geographic Region, FY2020



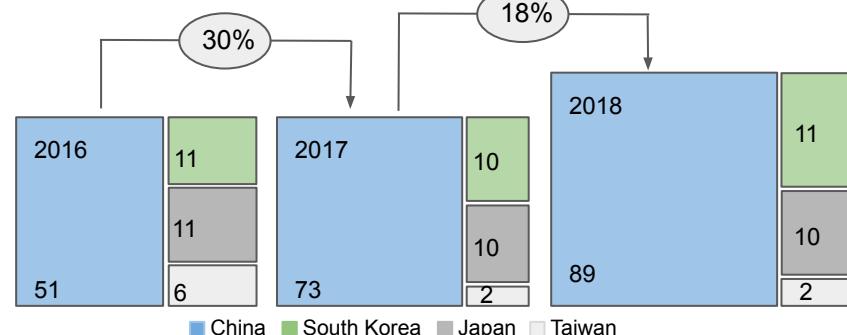


China's Semiconductor Threat

As China expands SemiCon manufacturing capabilities, the country chases 'technology independence', holding consequences for US market share and revenue

The phases of China's Semiconductor growth are picking up

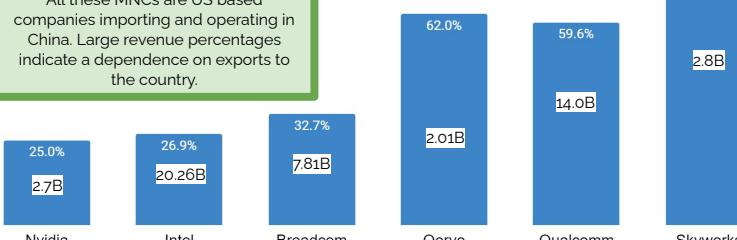
Domestic M&A Volume Growth- East Asia, 2014-2018



...therefore companies depend on China for large revenue %

Semiconductor MNC Revenue From China, FY2020

All these MNCs are US based companies importing and operating in China. Large revenue percentages indicate a dependence on exports to the country.



Source: (Deloitte, 2019), (PricewaterhouseCoopers , 2016)

Executive Summary

Industry Overview

Company Analysis

Financial Analysis

Acquisition Feasibility

Alternative Solution

Conclusion

...and China consumes more than 50% of all SemiCons manufactured

Semiconductor Market Share by Region, 2015-219



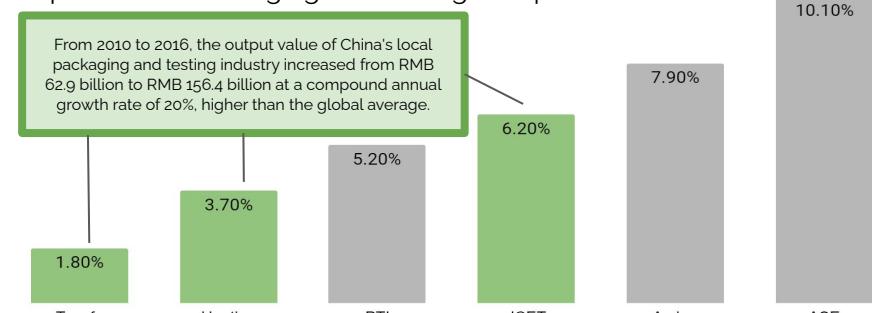
China has been responsible for derailing many international company's domestic acquisitions like NXP and ARM

Rest of World
Americas
China

Currently, domestic manufacturers are only capable of meeting 30% of in house demand. China's government is pushing champions to increase capabilities

Around 10% of Semiconductor manufacturing operates in China

Top SemiCon Packaging and Testing Companies



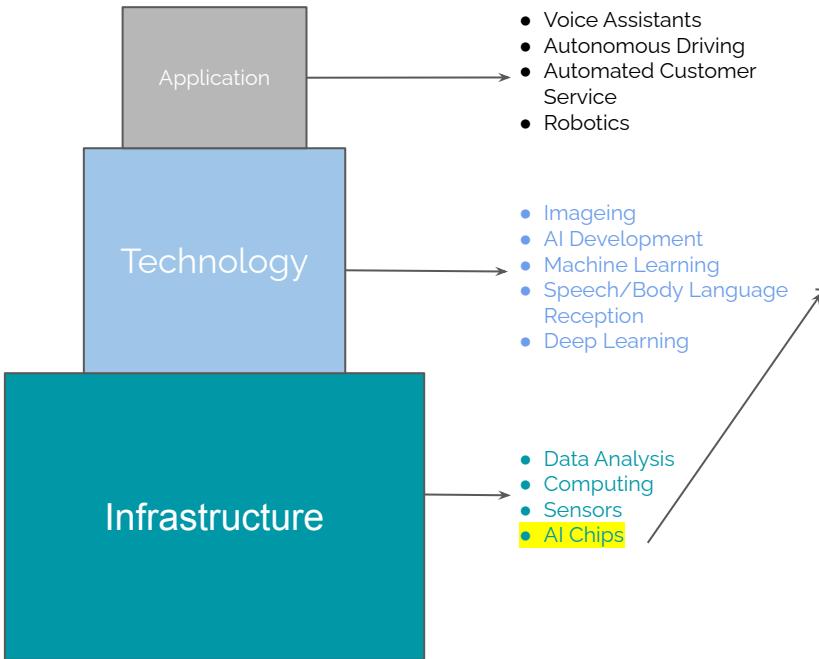
AI is Changing the Semiconductor Industry

Companies are Moving to Become More Specialized to Innovate



Segments of the AI Industry- where SemiCon Companies operate

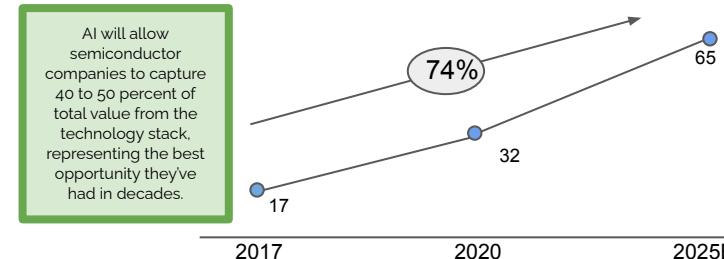
Technology companies are hopping on the AI Chip trend



Source: (Alam, 2020), (McKinsey & Company, 2019), (Deloitte, 2019)

The AI Industry is only expected to exponentially grow YoY

Global Estimated Size of SemiCon Market, USD Billions



Cloud-based AI chips are the most promising segment

AI Chip market further segmented into cloud and edge

Deployment

- 1 Cloud Based
- 2 Networking Edge

Application Market Potential (2022) CAGR

Application	Market Potential (2022)	CAGR
Training	17 B	~55%
Infer	7 B	~85%
Edge	Security	~40%
	AV	~43%
Cloud	Phones	~60%

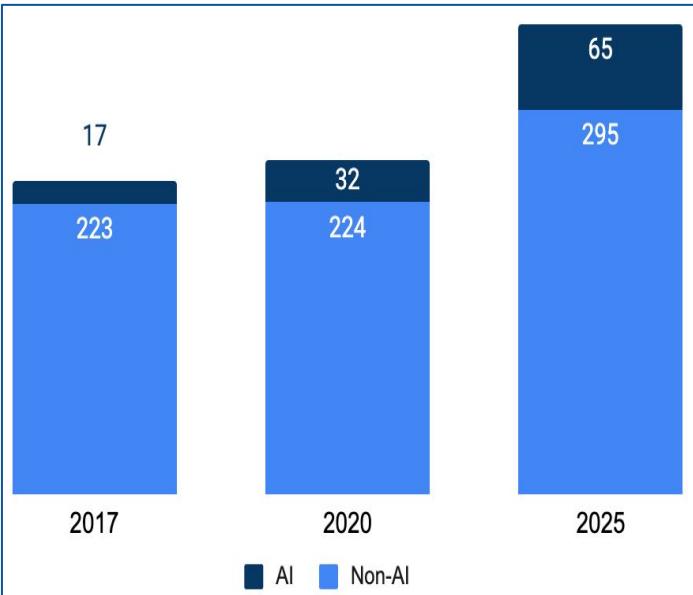
AI Acceleration

The Future of AI Will Disrupt Current Chip Trends

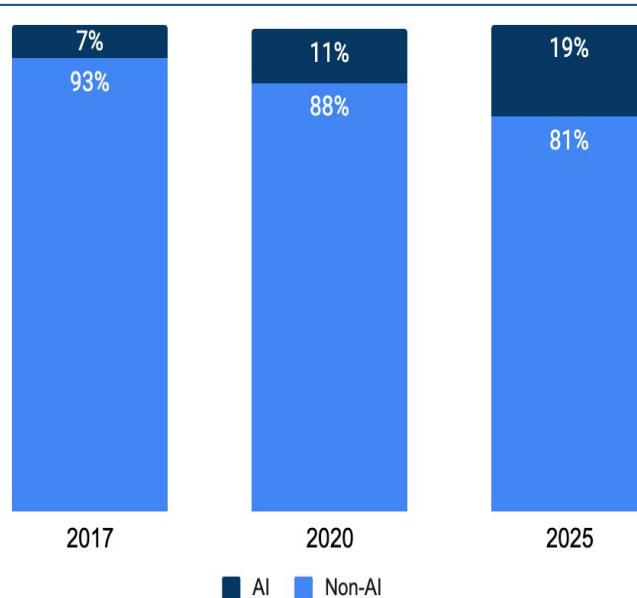


AI Semiconductor related growth is expected to be 5x more than the rest of the market

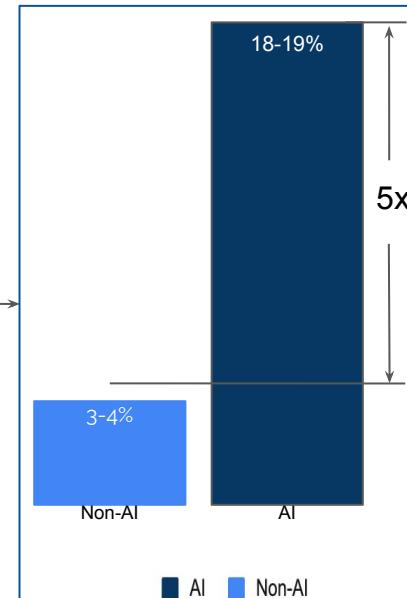
AI Semiconductor Total Available Market, USD Billions



AI Semiconductor Total Available Market Percent



Estimated AI Semiconductor Market CAGR



Hardware serving as the differentiator in AI, greater demand for chips and also greater prospects for profits from developing novel technologies such as workload specific AI accelerators. AI-related semiconductors will see **growth of more than 18 percent annually over the next few years**

Next-gen accelerator architectures which increase computational efficiency or facilitate the transfer of large data sets through memory and storage offer performance improvement so great that customers would be willing to pay.

Increased expenditure of AI in every business segment has presented the opportunity for **enhanced growth, demonstrating field disruption** and change.

Source: (Accenture, 2019), (McKinsey & Company, 2019)

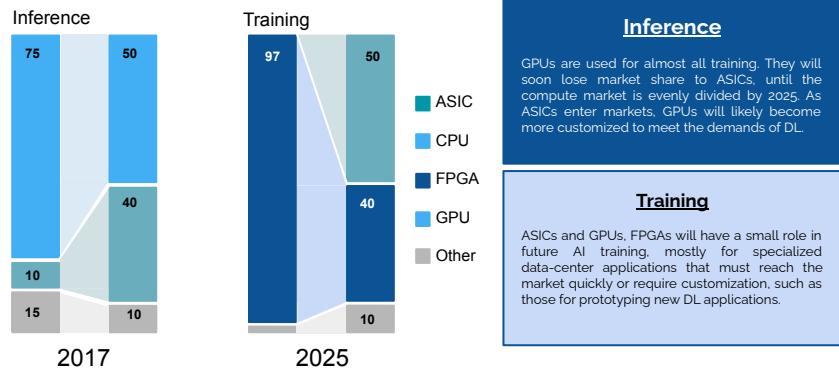
AI Industry Implications

How a Shift in Trends Creates an Innovative Environment for Companies

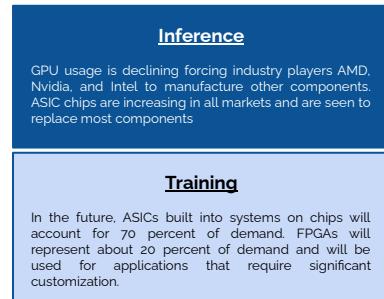


Infrastructure components for data centers and edge are shifting

Predicted Change in Data Center Architecture Percent, 2017-2025



Edge Architecture Percent Change

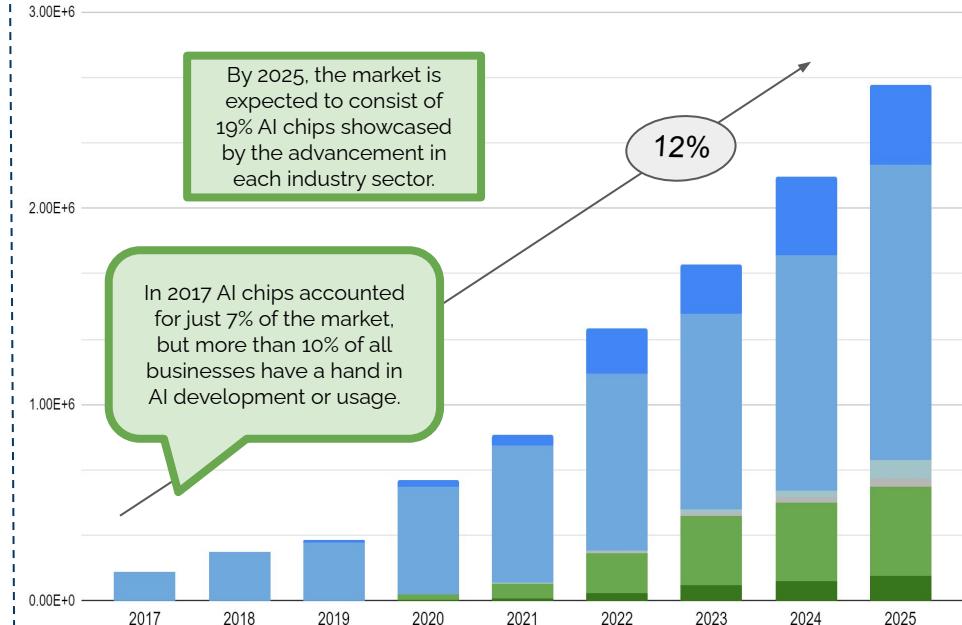


Source: (Deloitte, 2020), (McKinsey & Company, 2019)

Companies are finding new industries to implement AI Chips

AI Edge Device Shipments by Segment, USD Millions, 2017-2025

■ PCs/Tablets ■ Mobile Phones ■ HMDs ■ Drones ■ Smart Speakers ■ Automotive





II. Company Analysis

1

NVIDIA

2

AMD

3

STRATEGIC FIT



II. Company Analysis

1

NVIDIA

2

AMD

3

STRATEGIC FIT

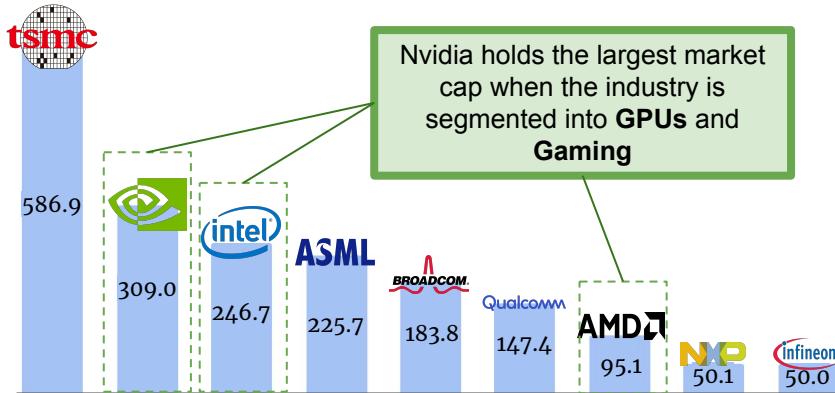
Nvidia Overview

Nvidia has a Significant Hold on the GPU and Gaming Industry



Nvidia is growing at a larger rate compared to rival industry competitors

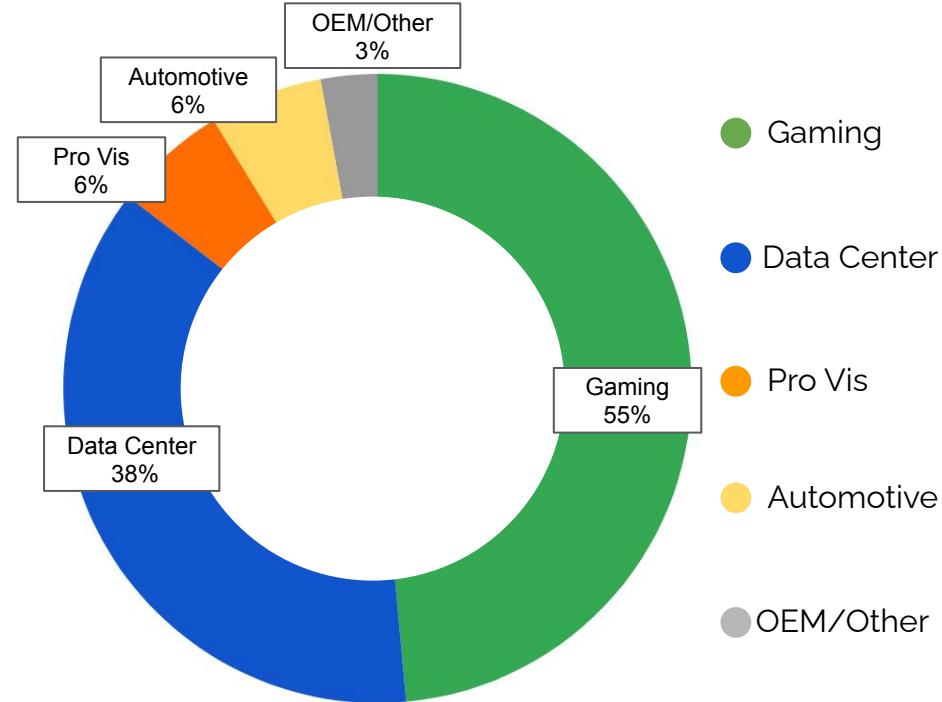
Market Cap of Semiconductor Manufacturers, USD Billion, FY2020



Nvidia holds the largest market cap when the industry is segmented into **GPUs and Gaming**

In 2021 Gaming consists of 55% of Nvidia's Revenue Stream

Nvidia Revenue Breakdown, 2021



Nvidia Industry Partners

SONY



TOYOTA



Microsoft

Nintendo®



Walmart

Source: (CNN, 2021), (Companies Market Cap, 2021), (Nvidia, 2021)

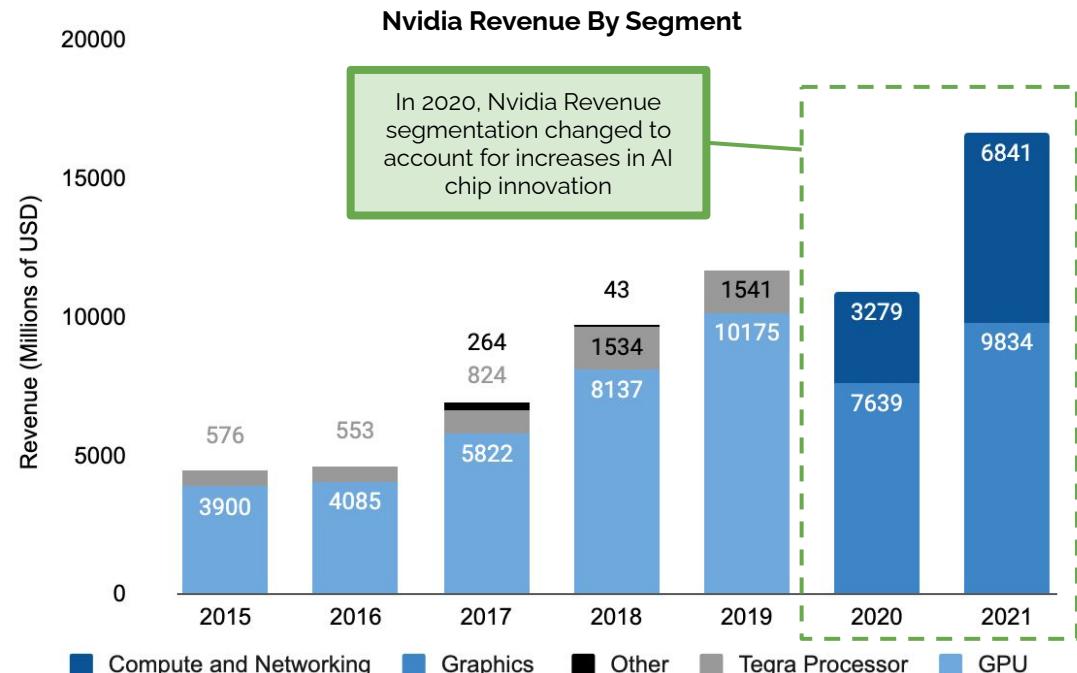
Nvidia's Current Business Targets

Nvidia Switches Operations Category on it's Primary Revenue Streams



Before 2020: Graphic Processing Units+Tegra Processors=Nvidia's Gaming Presence

Post 2020: Graphics+Compute & Networking=Nvidia's Overall Presence



Source: (Nvidia, n.d.), (Pirzada, 2019), (Statista, 2021)

Nvidia's entry into the AI chip space opened up new markets

1

Compute and Networking

- Data Center Platforms**- accelerated computing platform, integrated across hardware and software
- AI Systems**- across various industries to increase data drivenness
- Autonomous Vehicles**- NVIDIA DRIVE: an open AV development platform for collaboration and innovation
- Robotics**- Development with AI technology, impact through deployment into GPU-accelerated applications

2

Graphics

- Specialized Gaming Markets**- a primary revenue driver and most interaction with consumer base for gaming
- GeForce Series**- the top brand of GPUs and the main product in the discrete GPU market
- Cloud Based Visuals**- GPU accelerated solutions available through all top cloud platforms (AWS, GCloud)
- Virtual Computing**- enables data centers to accelerate server virtualization with the latest NVIDIA data center GPUs

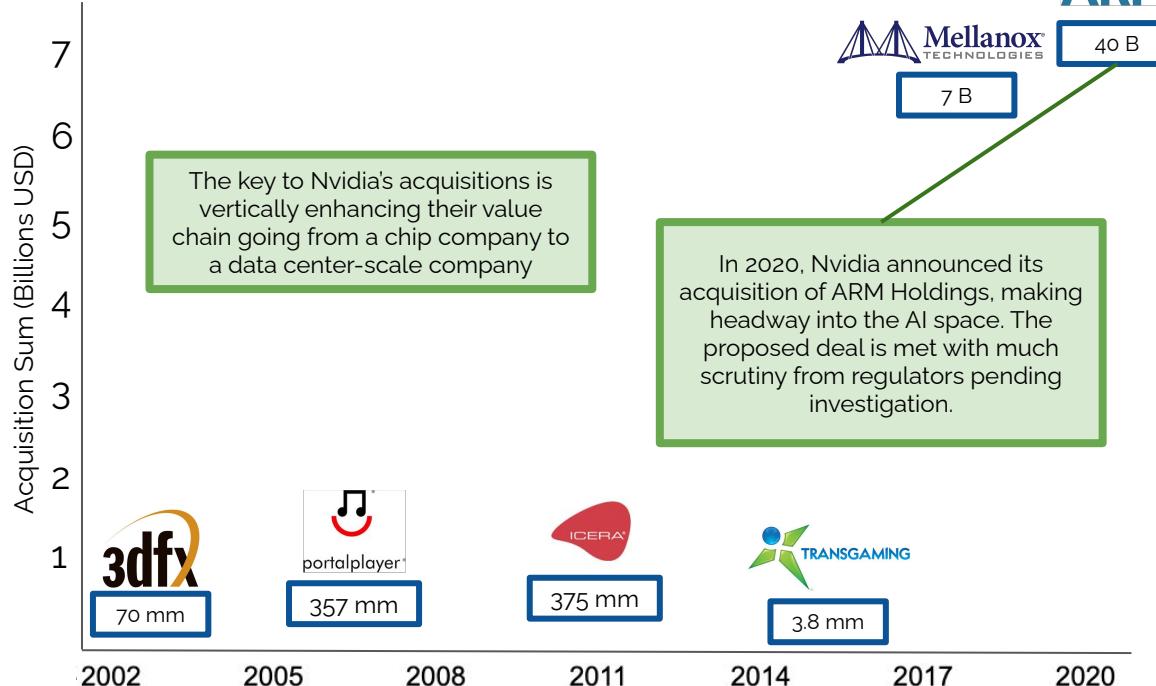
Nvidia's Past Acquisitions

Nvidia has a History of Buying Competition and New Technology



Nvidia's Prime Acquisitions Lead to Control over the GPU Space

Nvidia's Major Acquisitions and Mergers 2002-2020



Source: (Crunchbase, 2021), (Reif, 2020)

Nvidia's Two Types of Acquisitions

Innovation Expansion and Staying Ahead of Trends

Innovation leads to the growth of new markets for company expansion. Sector growth leads to increased opportunities.

PortalPlayer: lead to expansion in the portable gaming market

Icera: lead to new OEM customer markets in mobile computing

Transgaming: lead to cloud integration in telecom space and corp expansion into Canada

Operational Efficiency and Increasing Competitiveness

Strategic implementation of acquisition resources places increased efficiency in supply chain.

3dfx: lead to IP rights obtainment and increasing SCM capabilities

Mellanox: technology protection from Intel and accelerating systems

ARM Holdings: pending deal. Leads to dominance in AI capabilities

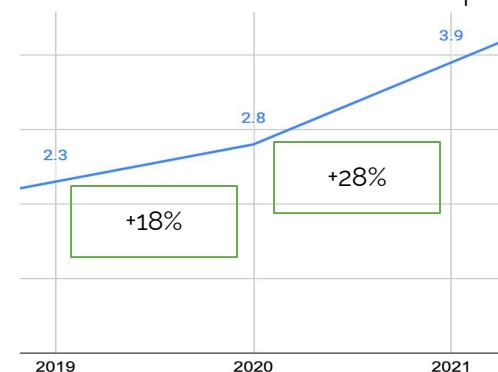
Nvidia's Capabilities and Strengths

Nvidia is Positioned to Remain an Industry leader with Innovation Expansion



Nvidia remains a figurehead in product development and design

Nvidia's Past and Forecasted R&D Expenses, USD Billion



- Research and Development growth rate more than **doubled since 2018** (1.8B)
- **High R&D spending in Machine Learning and AI chip innovation**
- Company **acquisitions increase R&D** capabilities

... as well as enhancing projects with other key industry players

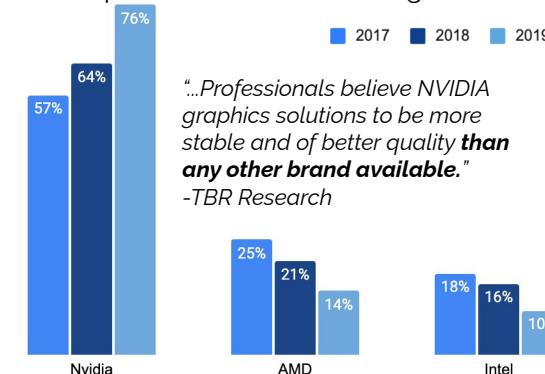
Nvidia's partnerships simplify technological architecture



Source: (Nvidia, 2021), (Statista, 2018), (Statista, 2021)

...which lead to brand recognition preference among consumers

PC Graphics Card Market Among Gamers on Stream

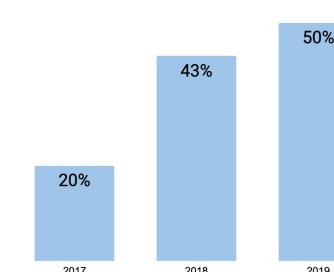


“...Professionals believe NVIDIA graphics solutions to be more stable and of better quality **than any other brand available.**”
-TBR Research

- **Customer and brand loyalty** remain at the crux of Nvidia's relationships and sales drivers
- **Customer integration in all aspects of the supply chain.** Ex: customer quality engineering and customer program management

...and still remains sustainably responsible in its Supply Chain

Year Over Year Percent Decrease in Pallet Usage



- Commitment to sustainability from **company projects to subcontractor logistics**
- Application of material labels to **100% of packages to encourage recycling**
- Configuration of packaging to **reduce pickups/deliveries**

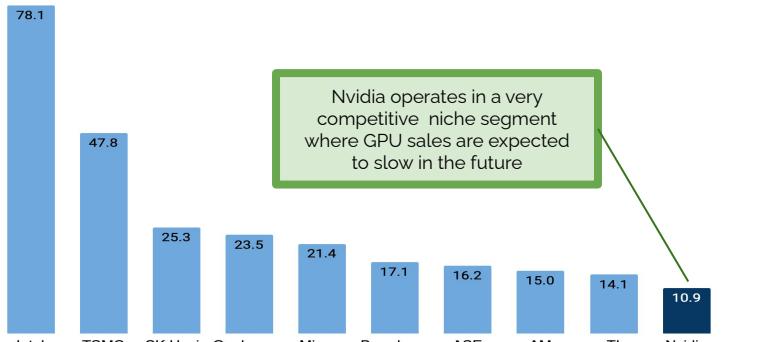
Nvidia's Primary Challenges and Opportunities



Nvidia is 10th in Comparable Companies, Yet Depends on Several Contingencies

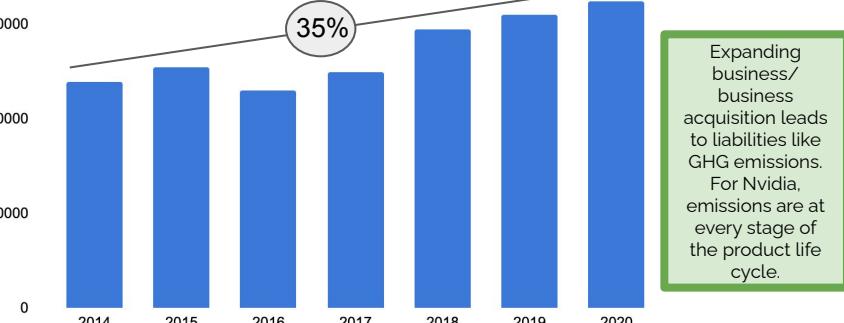
Nvidia is 10th in Revenue compared to other Semicon companies

FY2020 Revenues of Top 10 Semiconductor Manufacturers, USD Bn

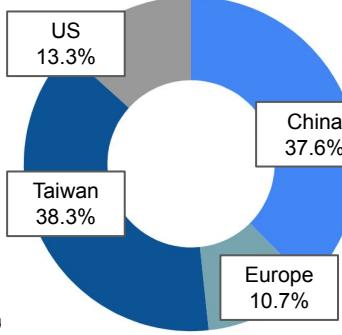
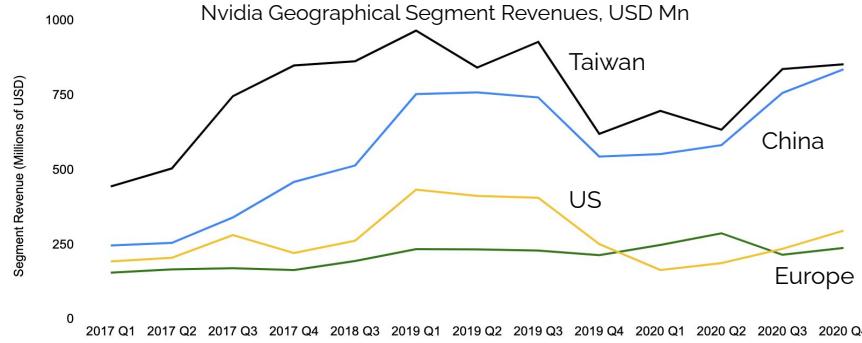


...but even without market dominance, environmental concerns rise

Nvidia Greenhouse Gas Emissions, Metric Tons of Carbon Dioxide (CO₂)



GPU sales could keep declining amid US-China relations



For every 1% drop in China revenue growth, Nvidia total revenue growth will drop 1.5% because of the correlated growth across the revenue segments.

While Nvidia holds unique positions in niche markets, its supply chain relies on Chinese consumers. The country threatens to be self-sustaining in the semiconductor industry, currently supplying 30% of chips domestically.

Source: (Ma, 2019), (McKinsey & Company, 2019), (Nvidia, 2019)



II. Company Analysis

2

AMD

3

STRATEGIC FIT

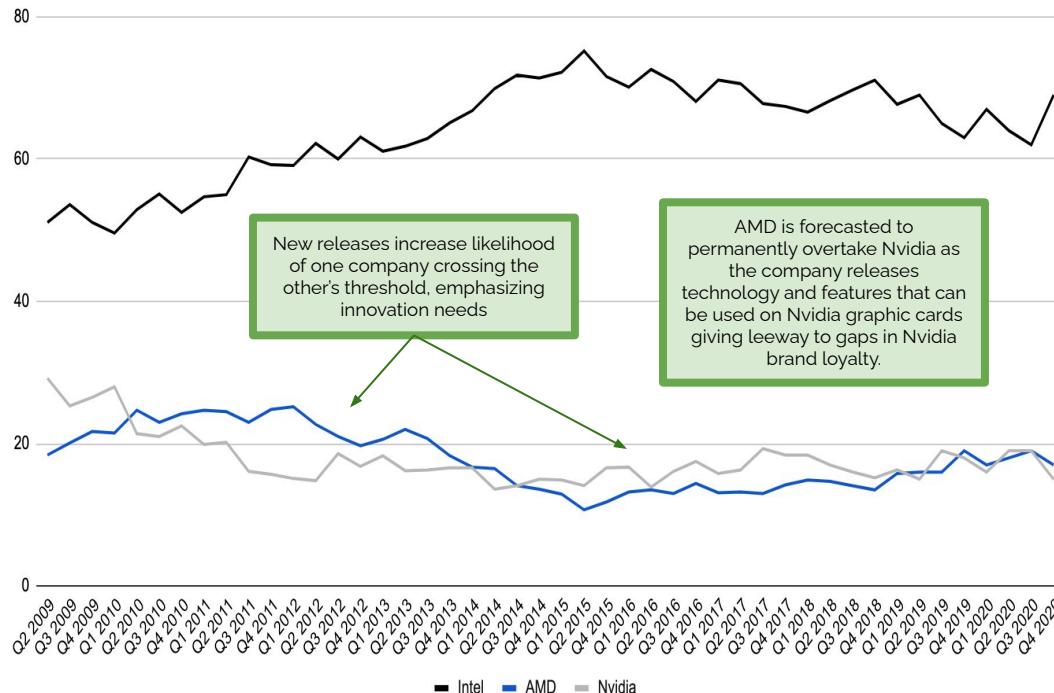
Advanced Micro Devices versus Competitors

AMD is Encroaching on its GPU Competition with Nvidia and Intel



AMD outperforms Nvidia approximately half of the time in PC GPUs

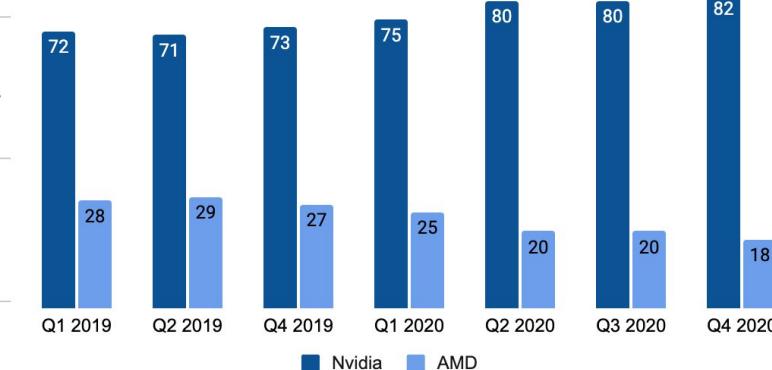
Percentage of PC GPU Shipment Share By Vendor, Q2 2009-Q4 2020



Source: (Jon Peddie Research, 2021)

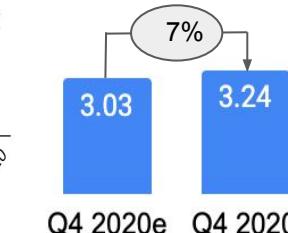
...yet Nvidia outperforms in a two company controlled segment

Percentage of PC dGPU Shipment Share, Q1 2019-Q4 2020



...but sales are forecasted to grow in 2021-2022 for Team Red

AMD FY 2020 Q4 Revenue, Actual vs Expected, billions of USD



- AMD continuously **outperforms** analysts' expected earnings sometimes by **13% at a time**
- Introduction of new product at **lower prices compared to competitors** drives revenue and demand

Advanced Micro Devices Project and Market Expansion

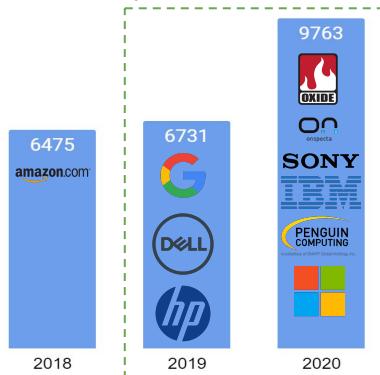
AMD is Partnering with Industry Players to Increase Processor Sales



Company partnerships were key in AMD's 2020 revenue all time high

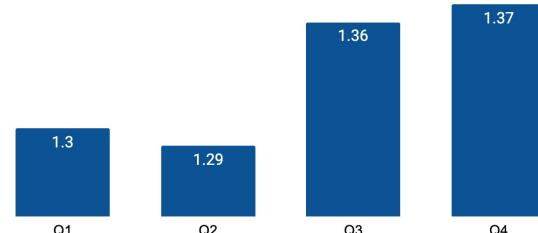
AMD YoY Revenue, USD Millions and Company Partnerships

Increases in revenue and company partnership portfolios are directly correlated, driving innovation. AMD's hopeful \$22.5B in revenue will rely on external collaborations



AMD's current asset turnover ratio is 0.82 higher than SemiCon avg

AMD Asset Turnover Ratio by 2020 Quarter



AMD shows efficiency in revenue and asset generation allowing for more investments and R&D growth.

AMD favorable in collaboration, having deep customer relationships

AMD Company Customers, 2020



Source: (Athow, 2020), (Khaveen Investments, 2021), (Tech Power Up, 2020), (Zafar, 2020)

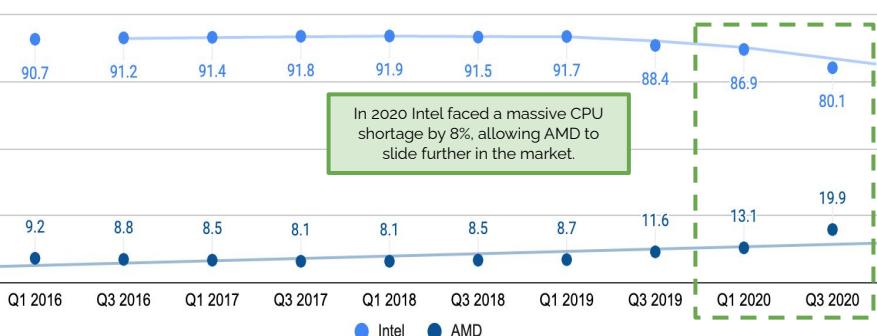


AMD Took Advantage of COVID-19 Markets and Continued to Grow

AMD's Revenue up by 45% by the End of Q4 in 2020, Promising Growth

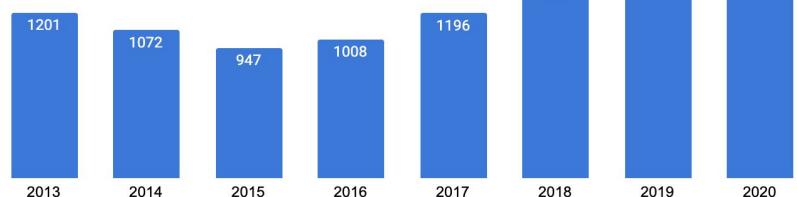
In 2020, AMD crept on Intel's CPU laptop market share by almost 10%

Percentage Distribution of Laptop CPUs Worldwide, Q1 2016-Q3 2020



Research and Development expenditures climbed 22% by 2020 Q4

AMD R&D Expenditures, 2013-2020, USD Millions



Source: (Advanced Micro Devices, 2021), (PassMark, 2020), (Primate Labs, 2021)

Executive Summary

Industry Overview

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Acquisition Feasibility

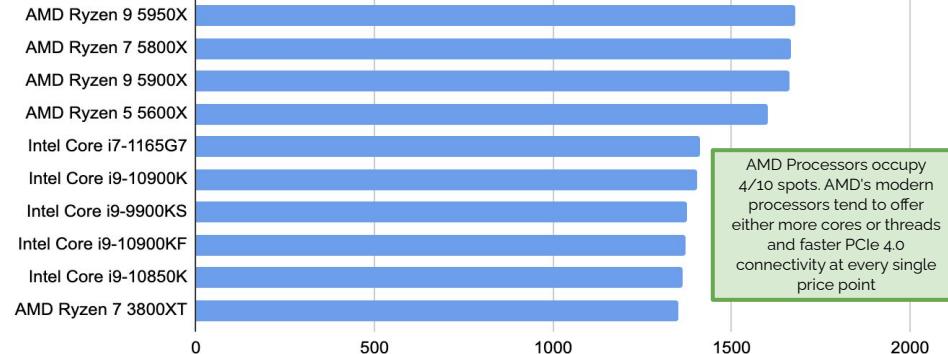
Alternative Solution

Conclusion

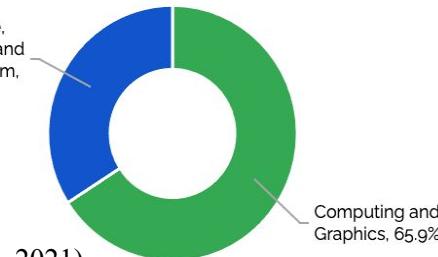
23

...and scalability did not affect quality as AMD leads SCP performance

Leading single-core processors (SCP) by Geekbench, January 2021



Business Segment by % Revenue



For every 1% drop in China revenue growth, Nvidia total revenue growth will drop 1.5% because of the correlated growth across the revenue segments.

While Nvidia holds unique positions in niche markets, its supply chain relies on Chinese consumers. The country threatens to be self-sustaining in the semiconductor industry, currently supplying 30% of chips domestically.

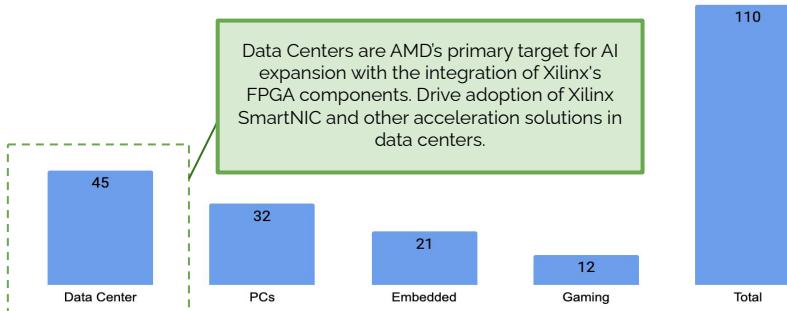


Advanced Micro Devices Capabilities and Strengths

AMD expands industry capabilities through recent acquisition and already encompasses several benefits of smaller scale operations, including price point and supplier streamlining capabilities

AMD's pending Acquisition of Xilinx will increase TAM to \$110B USD

Long Term TAMs with Acquisition by Sector, USD Billions



...and strong success is shown through AMD's supplier relationships

AMD's Suppliers Sales Growth in Q4 2020 by Industry



Source: (Advanced Micro Devices, 2016), (CSI Market, 2020), (Walton, 2021)

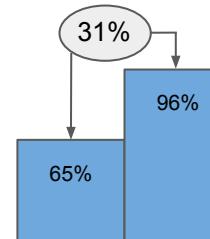
AMD occupies 3/5 spots on the list of best GPUs and beats prices

Prices of Best GPUs, Ranked, 2021



The company is scaling up SCM capabilities while remaining efficient

AMD FY 2020 Q4 Revenue, Actual vs Expected, USD Bn



- AMD continuously **outperforms** analysts' expected earnings sometimes by **13% at a time**
- Introduction of new product at **lower prices compared to competitors** drives revenue and demand

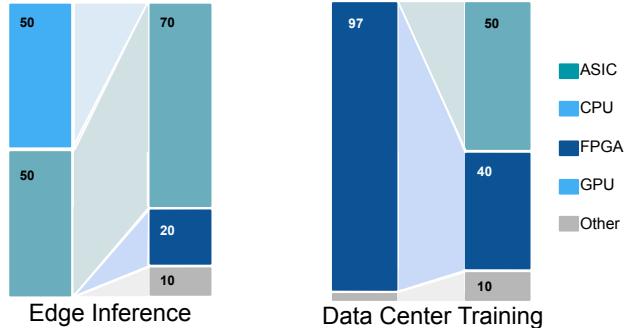
Advanced Micro Devices' Primary Challenges and Opportunities

AMD Operates in Declining Business Segments but can Grow in ASIC Chips



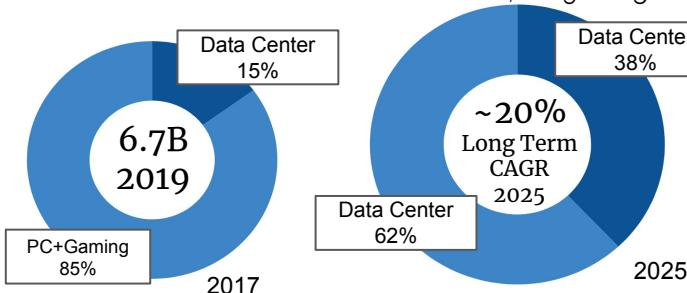
Some AMD core markets are forecasted to decline by 2025 by 55%

Predicted Architecture Percent Change by 2025



...but more expansion in the data center market is profitable

Data Center Growth Percent of Revenue, 2019-2025



Source: (McKinsey & Company, 2019), (Morgan, 2020)

Executive Summary

Industry Overview

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Acquisition Feasibility

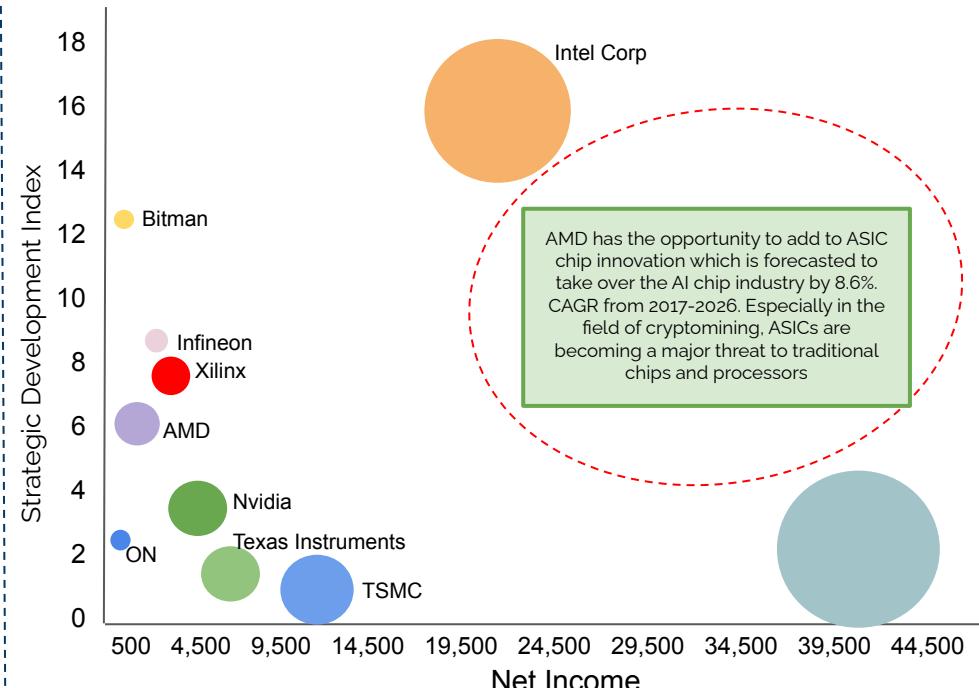
Alternative Solution

Conclusion

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The ASIC chip market is expected to grow to \$24.7 Billion by 2025

ASIC Chip Market Competition Analysis, 2020





II. Company Analysis

1

NVIDIA

2

AMD

3

STRATEGIC FIT

Strategic Fit Between Nvidia and AMD

AMD and Nvidia Current Operations Post-Integration



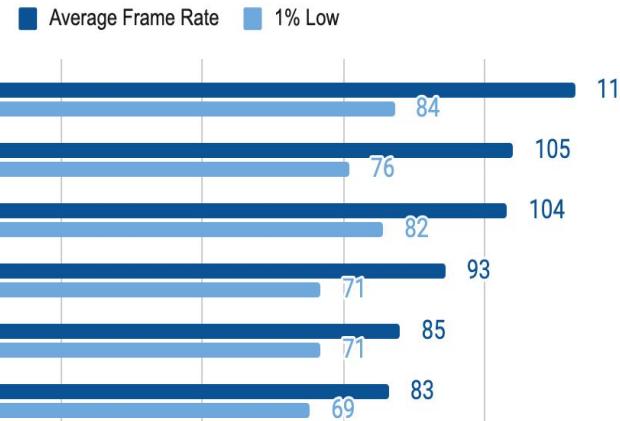
Sales Networks	Research and Development	Production and Network
Market Focus   AMD could assist Nvidia in expanding consumer markets and introduce COGS cost savings.	AI Development   AI resources may make both companies more profitable as innovation accelerates.	Shipping Efficiencies   Sharing suppliers can help achieve sustainability goals for Supply Chains.
Partner Collaboration   Partner program approaches are operated on different scales so potential is limited.	Chip Expansion   Nvidia's approach to R&D is diversified from AMD so integration will be complex.	Production Capacities   Nvidia could help AMD scale production capabilities by scaling supplier networks.

Source: (Dent, 2018), (Ray, 2021), (Reuters, 2020)



Nvidia occupies 4/6 spots for best GPU frames per second

Nvidia's GeForce series is the #1 GPU on the market



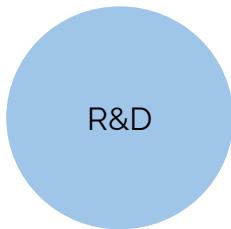
Foreseen Problems with Product Merger

- On average a new product for Nvidia versus AMD is 33% more expensive because of the increased computing power each GPU possesses
- Market research shows buyers are “willing to pay for a high functioning, dependable GPU”
- The technology integrated in each GPU differs and impacts price drivers, efficiency, and compatibility
- Many AMD devices can interact with Nvidia components but not vice versa
- Product merger may also make Nvidia's brand suffer as they compromise the quality and effectiveness of processors to minimize costs

Source: (Advanced Micro Devices, 2021), (Walton, 2020)

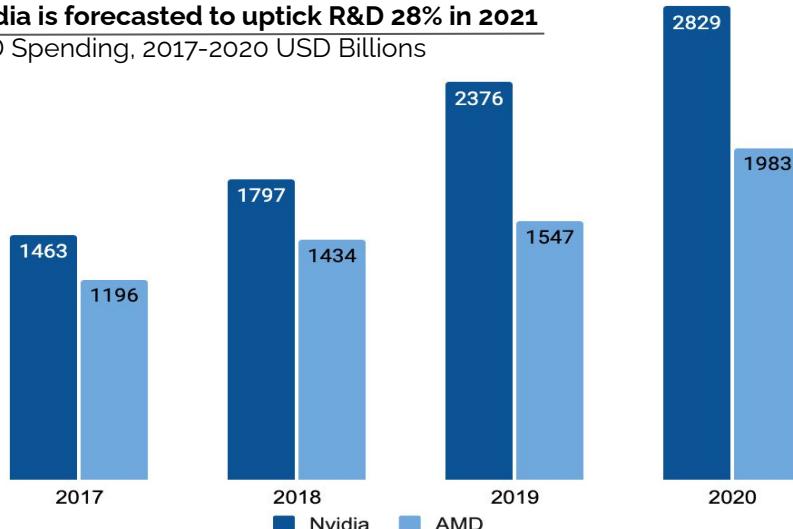
Strategic Fit

Research and Development Differences: Investment Segments Divide



Nvidia is forecasted to uptick R&D 28% in 2021

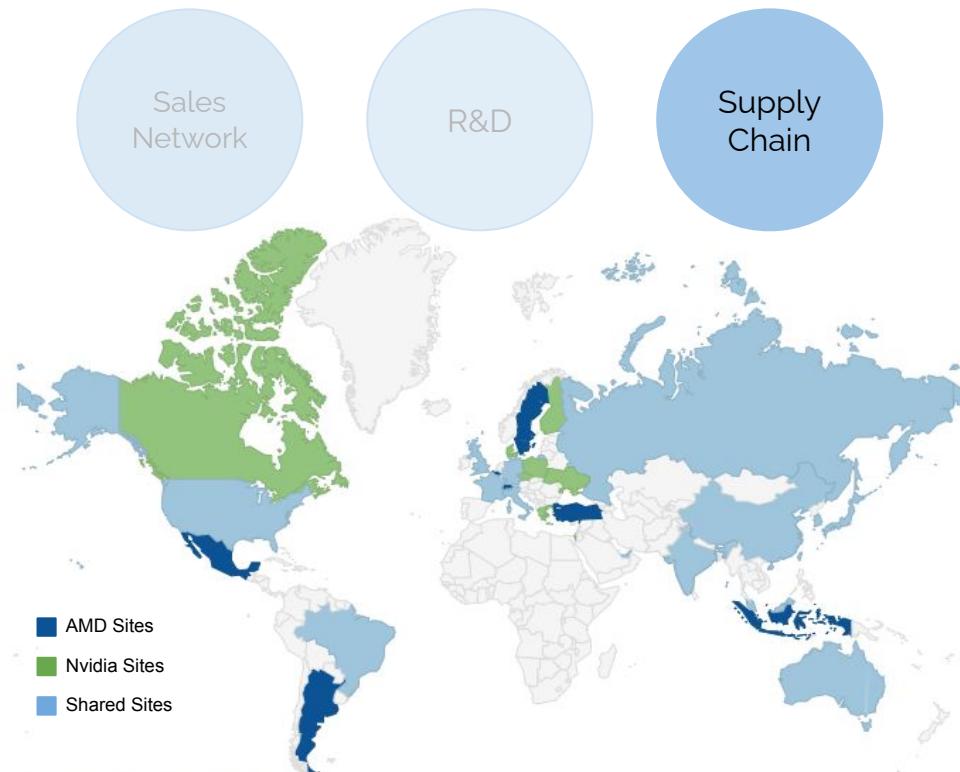
R&D Spending, 2017-2020 USD Billions



Research and Development Focuses

- AMD is keen on improving chip capabilities through HPC, specifically in the growing data center market along with industry expansion
- Nvidia is in the process of investing in new chip development as seen with their 54 billion transistors AI chip released in 2020
- Integration of new devices and AI technology in AMD's sectors may waste Nvidia's resources in getting the company up to speed
- Nvidia's higher R&D spending allows for creation of new computing capabilities while AMD lower expenditures improve existing infrastructure.

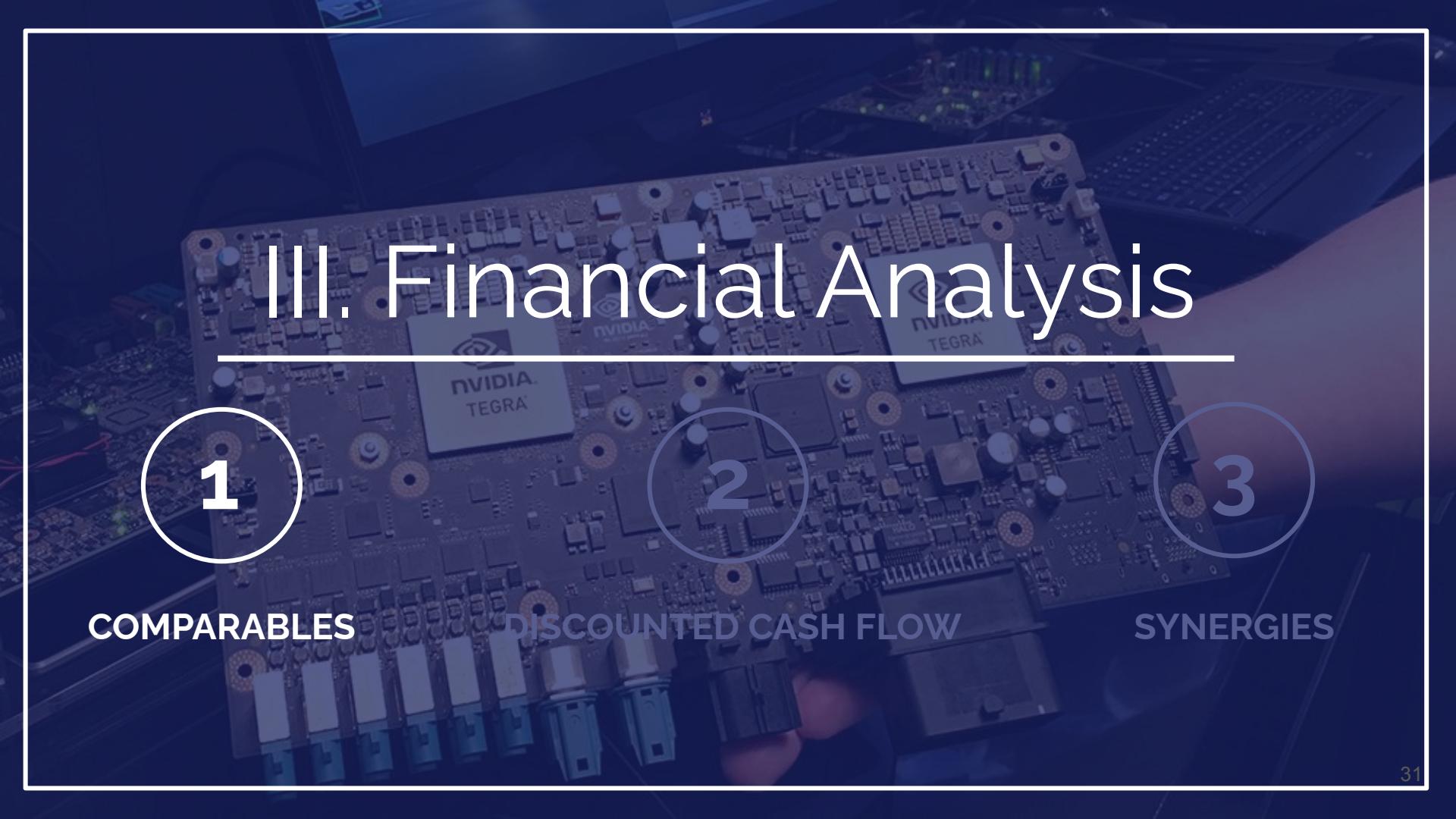
Source: (Advanced Micro Devices, 2021), (Nvidia, 2021)



Source: (Craft Co., 2021), (Nvidia, 2021)

Combining Distribution Networks

- Most semiconductor companies use the same fabless process from the same manufacturer and sourcing basic circuit board components are homogenous
- TSCM supplies most of Nvidia's advanced components and AMD is transitioning more processes to TSCM
- Most Supply Chain expenditures for AMD and Nvidia come from distribution center divisions and the inability to fill a shipping pallet
- Combining operations may prove useful when meeting unexpected demand increases as seen in 2020



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Advanced Micro Devices' Potential Peer Groups

Our Peer Group Segments for AMD Consist of Visualization Graphics, Machine Learning in Data Centers, Cryptomining, and Fabless Manufacturing



Visualization Graphics



Logic: AMD's main revenue driver is GPU sales and have one of the highest GPU presence

Machine Learning in Data Centers



Logic: Future trend and what most AMD R&D expenditure is going towards



Crypto Mining



Logic: Increase in GPU sales used in Bitcoin and Crypto Mining tactics. Possible sector for AMD to explore.

Fabless Manufacturing



Logic: Fabless manufacturing is source of innovation and R&D growth as new designs affect computing power.

Source: (Infront Analytics, 2021), (Investopedia, 2019), (Oh, 2018)

Advanced Micro Devices' Peer Group Segment Relevance Analysis

Based on our Analysis, Fabless Manufacturing should be Discarded

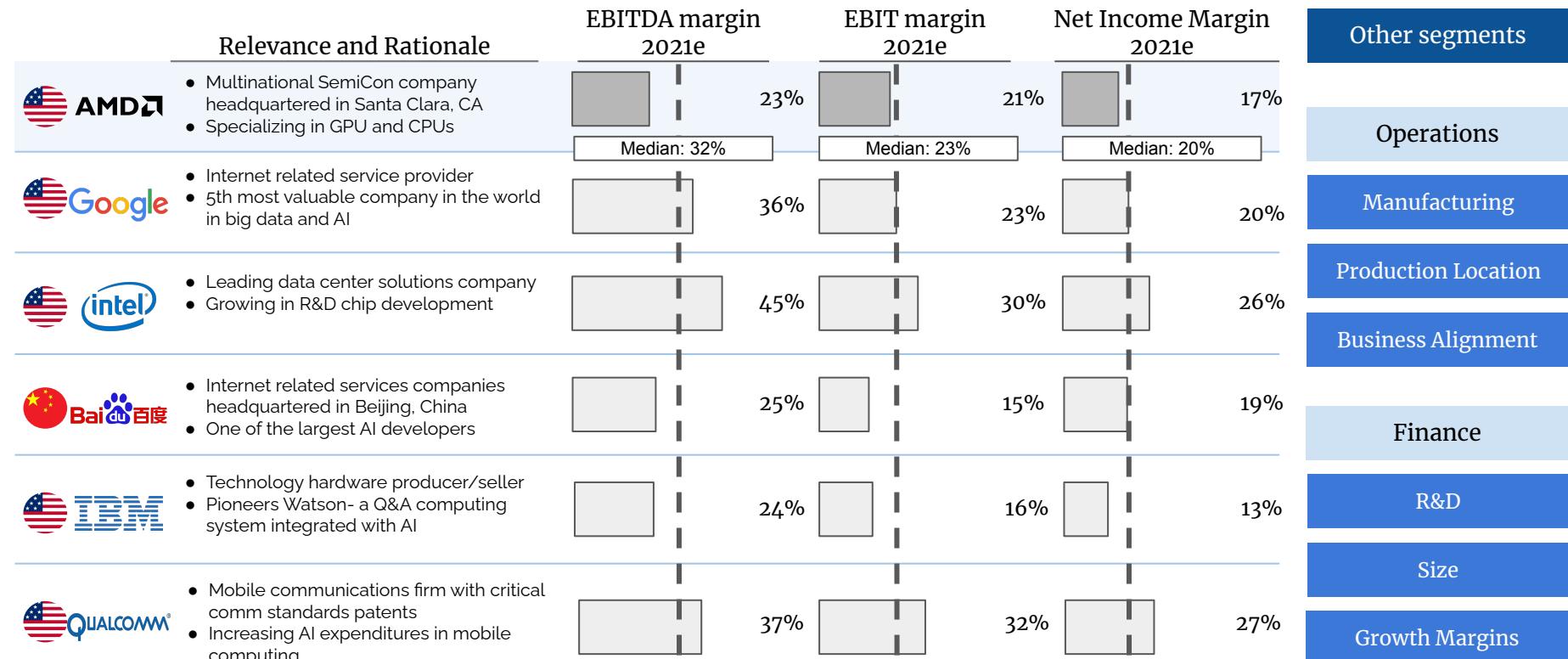


	Market Size	Market Size CAGR	Brand Relevance	Revenue Drivers	Cost Drivers	Retained
Advanced Micro Devices	-	8.93% ('18-'23)	-	<ul style="list-style-type: none"> • Embedded Processors • Semi Custom SoCs • Server Microprocessors • Services 	<ul style="list-style-type: none"> • R&D • Production Capability • SG&A • Licensing 	
Visualization Graphics	\$1.48B ('19)	23.1% ('20-'27)		<ul style="list-style-type: none"> • Embedded Processors • Semi Custom SoCs • Server Microprocessors • Services 	<ul style="list-style-type: none"> • R&D • Production Capability • SG&A • Licensing 	
Machine Learning in Data Centers	\$6.59B ('20)	14.98% ('21-'26)		<ul style="list-style-type: none"> • Embedded Processors • Semi Custom SoCs • Server Microprocessors • Services 	<ul style="list-style-type: none"> • R&D • Production Capability • SG&A • Licensing 	
Crypto Mining	\$790mm ('18)	29.7% ('19-'25)		<ul style="list-style-type: none"> • Embedded Processors • Semi Custom SoCs • Server Microprocessors • Services 	<ul style="list-style-type: none"> • R&D • Production Capability • SG&A • Licensing 	
Fabless Manufacturing	\$127.9B ('20)	7.99% ('18-'22)		<ul style="list-style-type: none"> • Embedded Processors • Semi Custom SoCs • Server Microprocessors • Services 	<ul style="list-style-type: none"> • R&D • Production Capability • SG&A • Licensing 	

Source: (Deloitte, 2019), (Deutsche Bank, 2021), (Infront Analytics, 2021), (Trefis, 2021), (Reuters, 2020)

Advanced Micro Devices' Peer Group Margins Analysis

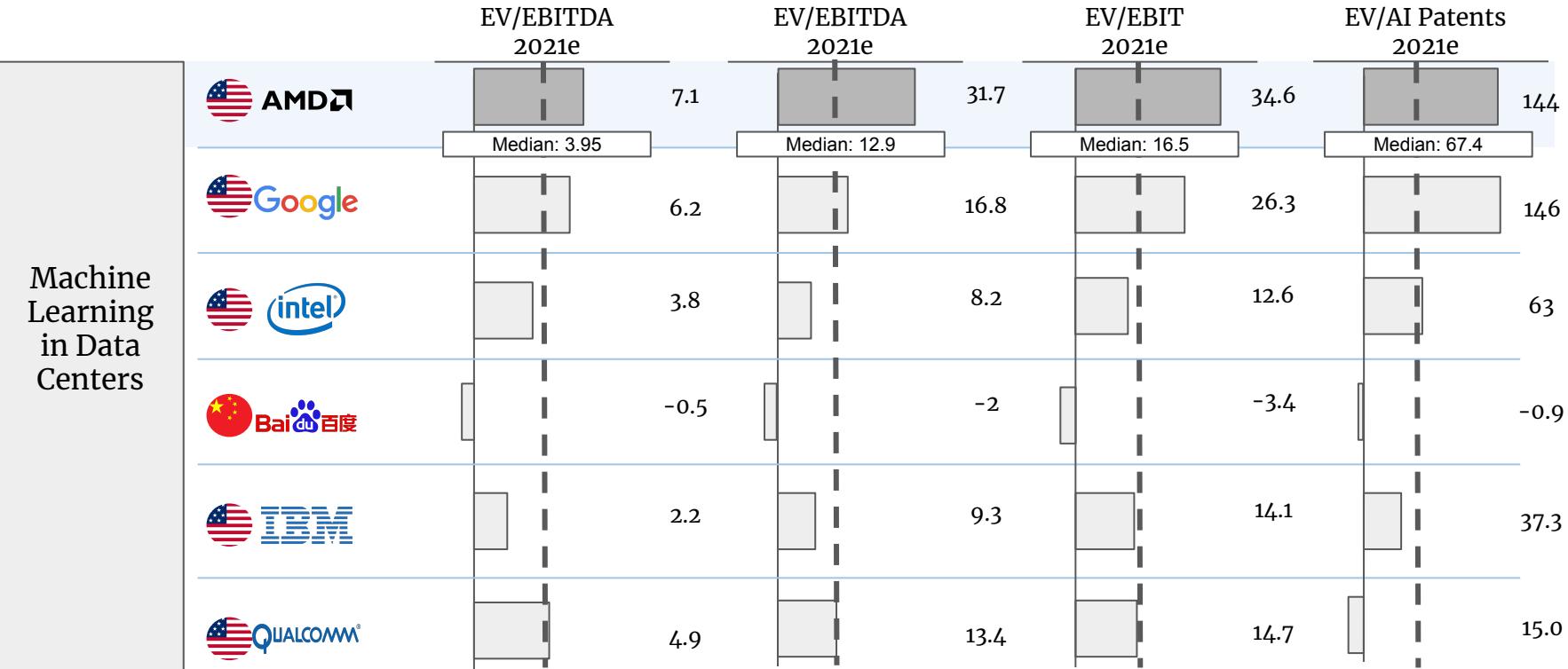
EBITDA, EBIT, and Net Income Margin Projections for 2021



Source: (Advanced Micro Devices, 2020), (Baidu, 2021), (Evercore ISI, 2021), (J.P. Morgan, 2021), (Morgan Stanley, 2021)

Peer Group Trading Multiples

For Machine Learning in Data Centers



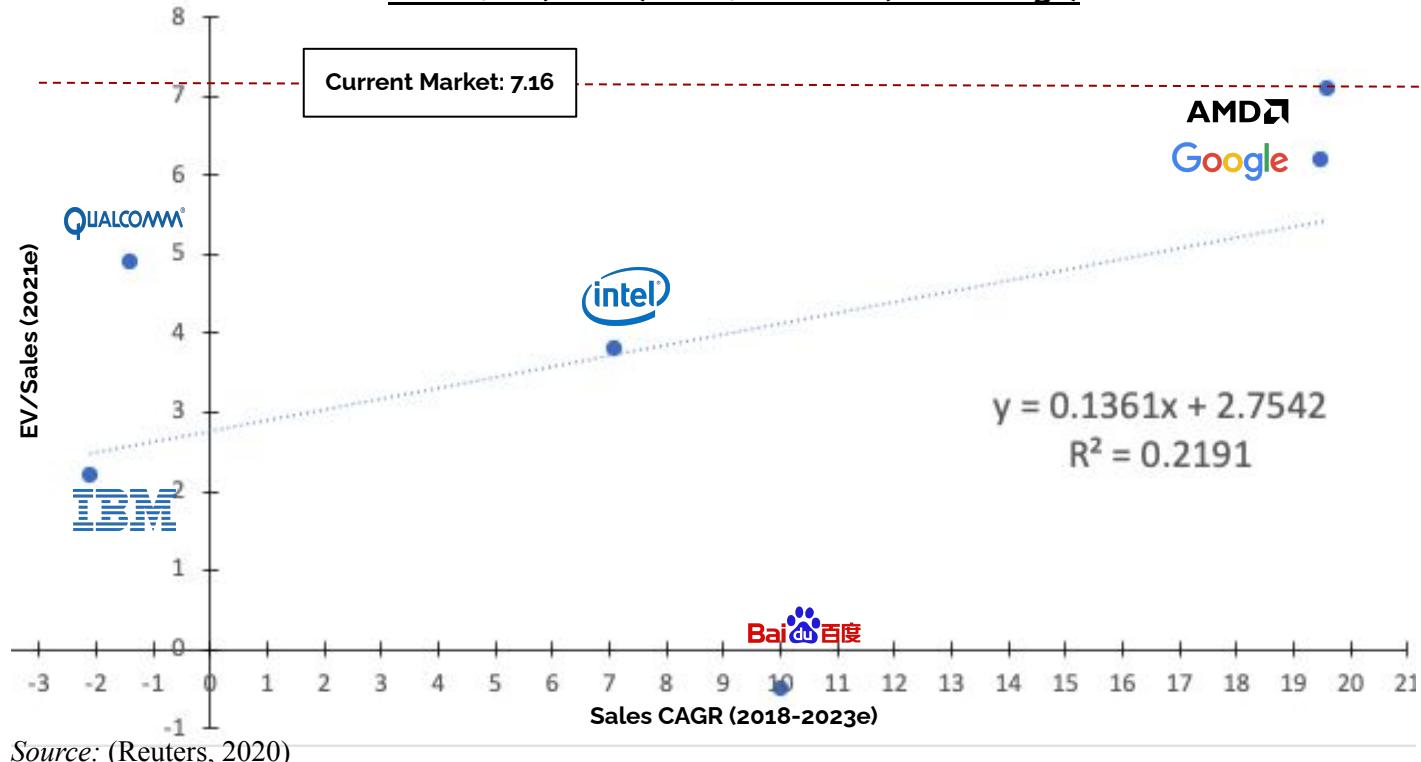
Source: (Advanced Micro Devices, 2020), (Baidu, 2021), (Evercore ISI, 2021), (J.P. Morgan, 2021), (Morgan Stanley, 2021), (Statista, 2019)

EV/Sales vs. Sales CAGR

Multiples and Sales CAGR Comparison amongst AMD's Peer Group



EV/Sales (2021e) vs Sales CAGR (2018-2023e)



Takeaways

AMD's 2021e EV/Sales is at the current market level of 7.16x.

Based on AMD's Sales CAGR (2018-2023e), the Company has a higher revenue growth rate than its peers, with the most comparable firm being Google.

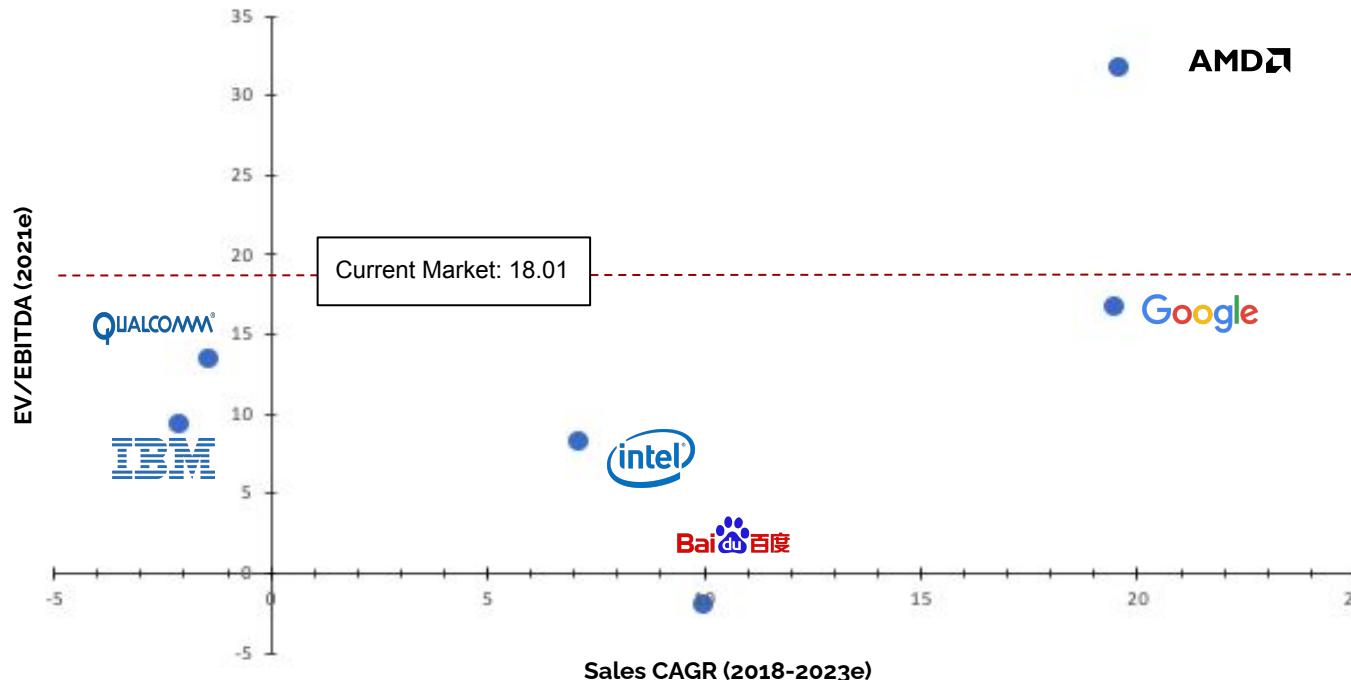
However, AMD's relatively high EV/Sales compared to its peers indicates that the Company is overvalued.

EV/EBITDA vs. Sales CAGR

Multiples and Sales CAGR Comparisons amongst AMD's Peer Group



EV/EBITDA (2021e) vs Sales CAGR (2018-2023e)



Takeaways

AMD's 2021e EV/EBITDA is trading much higher than the current market multiple of 18.01x. Furthermore, all of AMD's peer groups are trading at a multiple below the current market line.

AMD's relatively high EV/EBITDA multiple demonstrates overvaluation of the Company compared to its peer groups and the current market.

On both EV/Sales and EV/EBITDA metrics, AMD is significantly overvalued.

Source: (Reuters, 2020)

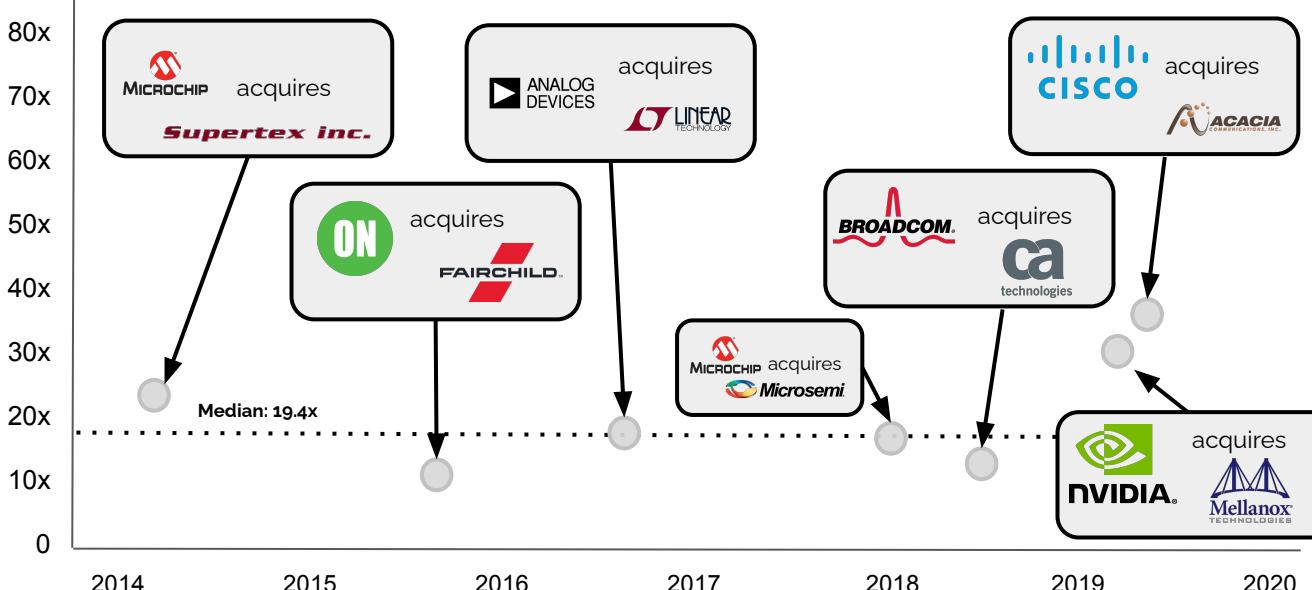
Comparable M&A Transaction Multiples

AI and Machine Learning Semiconductor Development



Past Transaction Multiples: LTM EV/EBITDA

EV/EBITDA



Takeaways

Although comparable EV/EBITDA M&A multiples can give a rough estimation of AMD's value after the potential NVDA acquisition, they are not the most accurate metric because...

1. Sizes of the targeted companies in comparable transactions can vary significantly
2. Premiums paid to acquire these target companies could vary greatly in the case of AMD/NVDA
3. Synergies also differ on a case to case basis, as each company has its own unique offerings

Source: (Capital IQ, 2021), (Reuters, 2020)

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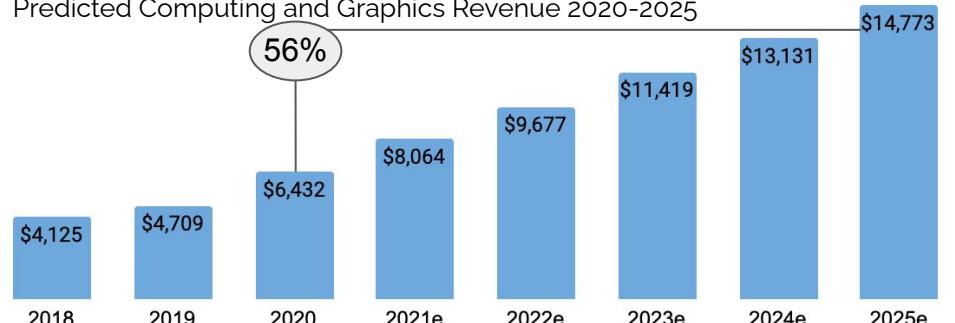


Revenue Breakdown

Business Segment Revenue Growth Projections through 2025

Segment Revenue is expected to grow by 56% between 2020-2025

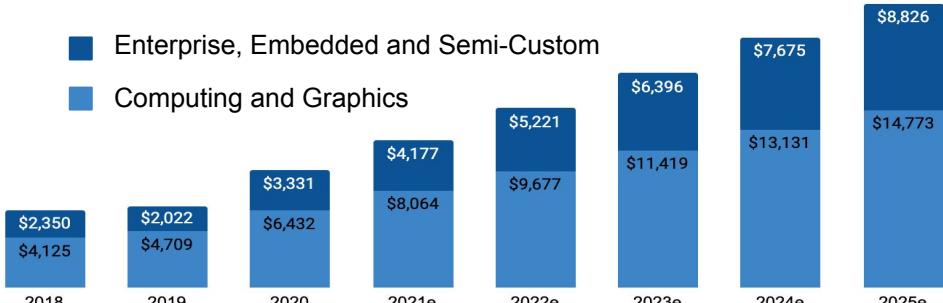
Predicted Computing and Graphics Revenue 2020-2025



Combined Revenue is expected to grow by 56% between 2020-2025

Predicted Total Revenue 2020-2025

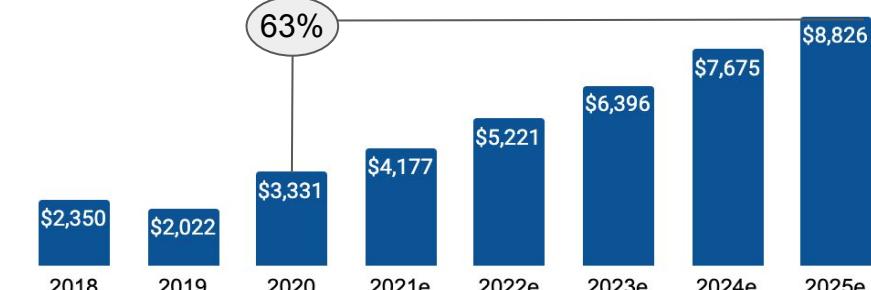
- Enterprise, Embedded and Semi-Custom
- Computing and Graphics



Source: (Reuters, 2020), (Witkowski, 2021), (WSTS, 2020)

Semi-C Revenue is expected to grow by 63% between 2020-2025

Predicted Enterprise, Embedded and Semi-Custom Revenue 2020-2025



Revenue Breakdown

Both Segment and Total Revenue Forecasts Trend Upward

- Each segment's revenue forecasts demonstrate steady upward growth through 2025, resulting in cumulative revenue increases
- These trends demonstrate continued demand for AMD's product and service lines for years to come
- Computing and Graphics segment is expected to exhibit higher total sales, generating an estimated \$14,773 in 2025
- Semi-C segment is expected to grow at an accelerated rate while contributing adequate revenue to AMD, with an estimated \$8,826 in sales for year 2025

Discounted Cash Flow (Part 1)

Valuation of AMD



Discounted Cash Flow (\$ in Millions Except Per Share Data)		2018	2019	2020	2021e	2022e	2023e	2024e	2025e
Revenue		\$6,475.0	\$6,731.0	\$9,763.0	\$12,240.8	\$14,897.8	\$17,814.3	\$20,806.2	\$23,598.9
EBITDA		1,158.0	1,435.0	2,323.0	2,756.7	3,544.2	4,192.7	4,844.1	5,554.2
EBIT		451.0	631.0	1,369.0	1,425.1	1,925.6	2,321.3	2,607.6	3,027.6
Income Tax Benefit (Expense)		(60.0)	(47.0)	941.0	(296.6)	(401.9)	(485.3)	(545.5)	(633.8)
Net Operating Profit After Tax (NOPAT/EBIAT)		391.0	584.0	2,310.0	1,128.5	1,523.7	1,836.0	2,062.1	2,393.8
YoY % Growth			49.4%	295.5%	(51.1%)	35.0%	20.5%	12.3%	16.1%
(+) Depreciation		707.0	768.0	912.0	1,292.2	1,554.7	1,801.3	2,157.2	2,431.9
(+) Amortization		0.0	36.0	42.0	39.4	63.9	70.1	79.4	94.7
(+) Stock-Based Compensation		137.0	197.0	274.0	320.3	414.6	487.3	564.2	647.4
(-) Capital Expenditures		(1,055.0)	(1,268.0)	(1,553.0)	(1,836.1)	(2,085.7)	(2,315.9)	(2,496.7)	(2,595.9)
(Increase)/Decrease in Net Working Capital		175.4	(335.0)	(701.0)	118.5	(499.7)	(429.7)	(222.3)	(416.3)
Unlevered Free Cash Flow		355.4	(18.0)	1,284.0	1,062.8	971.6	1,449.1	2,143.7	2,555.6
YoY % Growth			(105.1%)	(7233.3%)	(17.2%)	(8.6%)	49.2%	47.9%	19.2%
Full-Year Discount					0.81	1.81	2.81	3.81	4.81
Mid-Year Discount					0.41	1.31	2.31	3.31	4.31
Discount Factor					0.97	0.92	0.86	0.81	0.76
Present Value of Future Free Cash Flow					1,035.5	893.3	1,249.8	1,734.3	1,939.2
YoY % Growth					(13.7%)	39.9%	38.8%	11.8%	

Source: (Capital IQ,2020)

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Discounted Cash Flow (Part 2)

WACC Calculation



WACC Assumptions

Beta	1.10
Risk-Free Rate	1.55%
Equity Risk Premium (ERP)	4.63%
Pre-Tax Cost of Debt	1.23%
Effective Tax Rate	21.00%
Cost of Preferred Stock	0.00%

Cost of Debt Calculation

Cost of Debt	
Pre-Tax Cost of Debt	1.23%
Tax Rate	21.00%
After-Tax Cost of Debt	0.97%

Cost of Equity Calculation

Cost of Equity	
Risk-Free Rate	1.55%
Equity Risk Premium (ERP)	4.63%
Beta	1.10
Cost of Equity	6.64%

Total Capitalization

Capitalization	\$ Amount	% Weight	Cost%
Market Value of Debt	\$531	0.6%	0.97%
Market Value of Equity	\$94,786	99.4%	6.64%
Market Value of Preferred	\$0	0.0%	0.00%
Total Capitalization	\$95,317		6.61%

WACC Sensitivity Analysis

Debt To Total Capital	Pre-Tax Cost of Debt				
	1.13%	1.18%	1.23%	1.28%	1.33%
(9.4%)	7.19%	7.18%	7.18%	7.17%	7.17%
(4.4%)	7.47%	7.47%	7.46%	7.46%	7.45%
0.6%	7.47%	7.47%	7.46%	7.46%	7.45%
5.6%	7.19%	7.18%	7.18%	7.17%	7.17%
10.6%	6.61%	6.61%	6.61%	6.61%	6.61%

WACC = 6.61%

- The Weighted Average Cost of Capital (WACC) represents return to lenders and shareholders.
- AMD's WACC of 6.61% represents the required rate of return (discount rate) necessary for DCF analysis.
- Furthermore, it indicates that the Company must pay investors an average of \$0.0661 for every \$1 received in funding.

Source: (Capital IQ,2020)



DCF Sensitivity Analysis

Exit Multiple and Perpetual Growth Rate (PGR) Method

Exit Multiple Method

Calculation of Implied EBITDA Multiple

Exit Multiple Method	
Terminal Year EBITDA	\$5,554.2
Exit Multiple	20.0 x
Terminal Value	\$111,084.8
PV of Terminal Value	81,637.2
PV of Stage 1 Cash Flows	6,852.2
Implied Enterprise Value:	88,489.4
(+) Cash & Equivalents	1,595.0
(-) Preferred Stock	0.0
(-) Total Debt	(531.0)
(-) Non-Controlling Interests	0.0
Implied Equity Value:	89,553.4
Diluted Shares Outstanding	1,207.0
Implied Share Price:	\$74.20
% Return:	(5.5%)

Implied EBITDA Multiple

18.3 x



Exit Multiple Method is used to calculate the terminal value of the Company's FCFs, under the assumption that business value will be determined at the end of the projection period.

Perpetual Growth Rate (PGR) Method

Calculation of Implied Terminal Growth Rate

Perpetuity Growth (PGR) Method	
Terminal Year FCF	\$2,555.6
PGR	4.00%
Terminal Value	\$101,778.6
PV of Terminal Value	74,798.0
PV of Stage 1 Cash Flows	6,852.2
Implied Enterprise Value	\$81,650
(+) Cash & Equivalents	1,595.0
(-) Preferred Stock	0.0
(-) Total Debt	(531.0)
(-) Non-Controlling Interests	0.0
Implied Equity Value	\$82,714.2
Diluted Shares Outstanding	1,207.0
Implied Share Price	\$68.53
% Return	(12.7%)

→ Implied Terminal Growth Rate

4.2%

Exit Multiple Implied Share Price

	18.0x	19.0x	20.0x	21.0x	22.0x
5.61%	\$77.48	\$77.48	\$77.48	\$77.48	\$77.48
6.11%	\$75.82	\$75.82	\$75.82	\$75.82	\$75.82
6.61%	\$74.20	\$74.20	\$74.20	\$74.20	\$74.20
7.11%	\$72.62	\$72.62	\$72.62	\$72.62	\$72.62
7.61%	\$71.08	\$71.08	\$71.08	\$71.08	\$71.08

Perpetual Growth Rate Method assumes a constant rate of cash flow generation into perpetuity.

Perpetual Growth Rate Implied Share Price

	3.50%	3.75%	4.00%	4.25%	4.50%
Weighted Average Cost of Capital	5.61%	\$86.52	\$97.46	\$111.79	\$131.39
	6.11%	\$69.71	\$76.56	\$85.03	\$95.77
	6.61%	\$58.32	\$62.98	\$68.53	\$75.25
	7.11%	\$50.09	\$53.45	\$57.34	\$61.92
	7.61%	\$43.87	\$46.39	\$49.26	\$52.56

Source: (Capital IQ, 2020)

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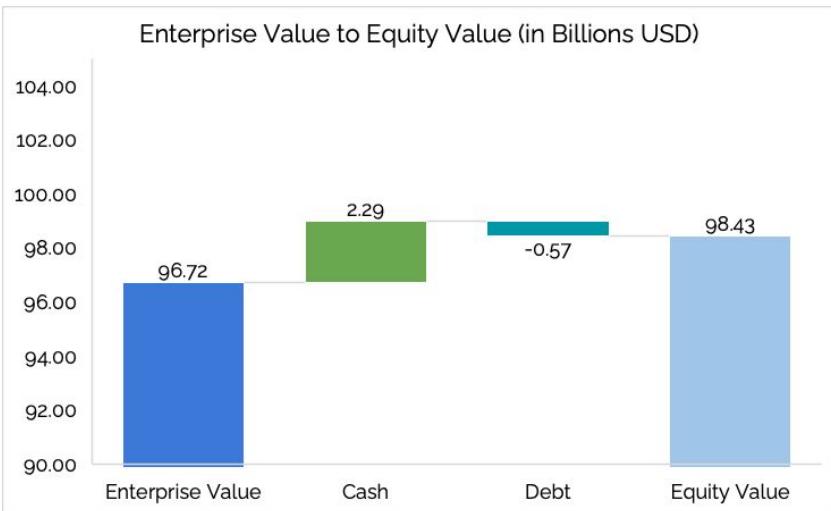
Fair Enterprise Value Determination

Enterprise to Equity Value Bridge and Football Field EV Range



Enterprise to Equity Value Bridge

Waterfall Chart (in billions of USD)

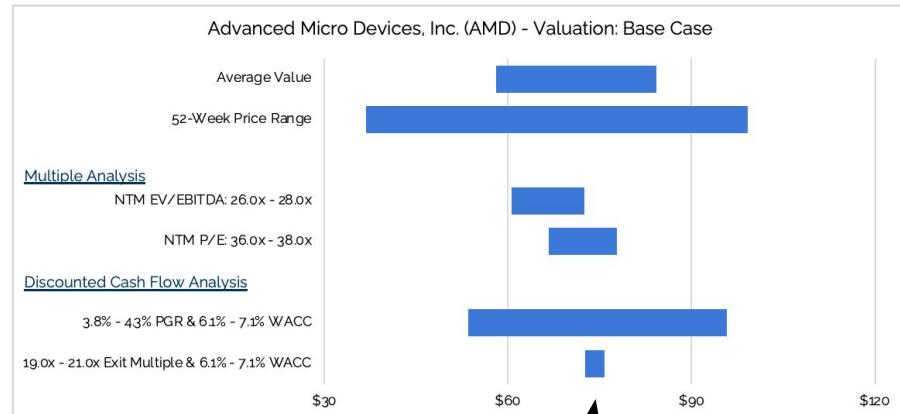


Enterprise Value (2020A): \$96.72B
+ Cash and ST Investments: \$2.29B
- Total Debt: \$0.57B

Equity Value: \$98.43B

Football Field

Fair Enterprise Value (in billions of USD)



Estimated Fair EV Range: \$70-75B

Average Fair EV: \$72.5B

Therefore, AMD's intrinsic value is lower than its market value of ~\$97B, signifying overvaluation.

Source: (Capital IQ, 2020)

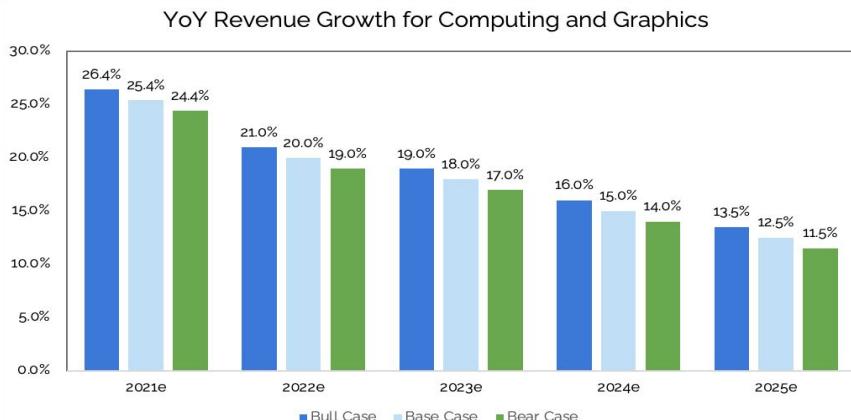
Scenario Analysis

Bear, Base, and Bull Revenue Growth Projections for AMD's Business Segments



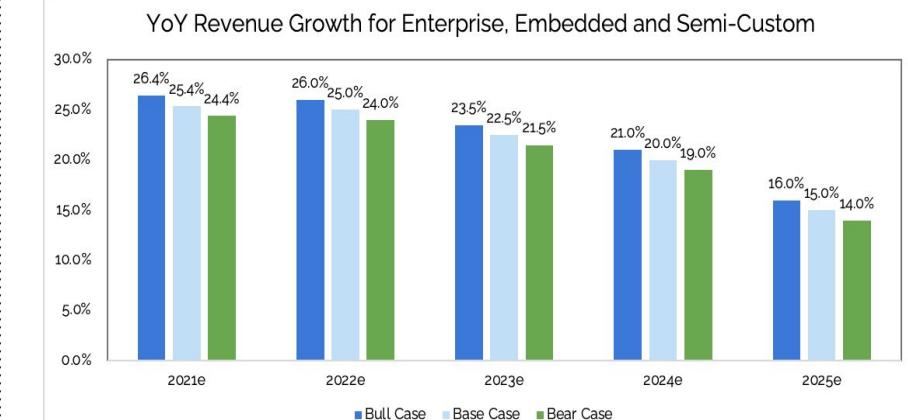
Computing and Graphics Segment

YoY Revenue Growth Projections (%)



Enterprise, Embedded, and Semi-Custom Segment

YoY Revenue Growth Projections (%)



BEAR CASE SCENARIO

- GLOBAL CHIP SUPPLY:**
the global chip shortage fails to subside and production falls
- PRODUCT PRICING:**
due to supply shortages, price per product skyrockets and decreases consumer demand
- COMPETITION IN THE MARKET:**
due to intense competition within semiconductors, AMD loses market share and faces further reductions in demand

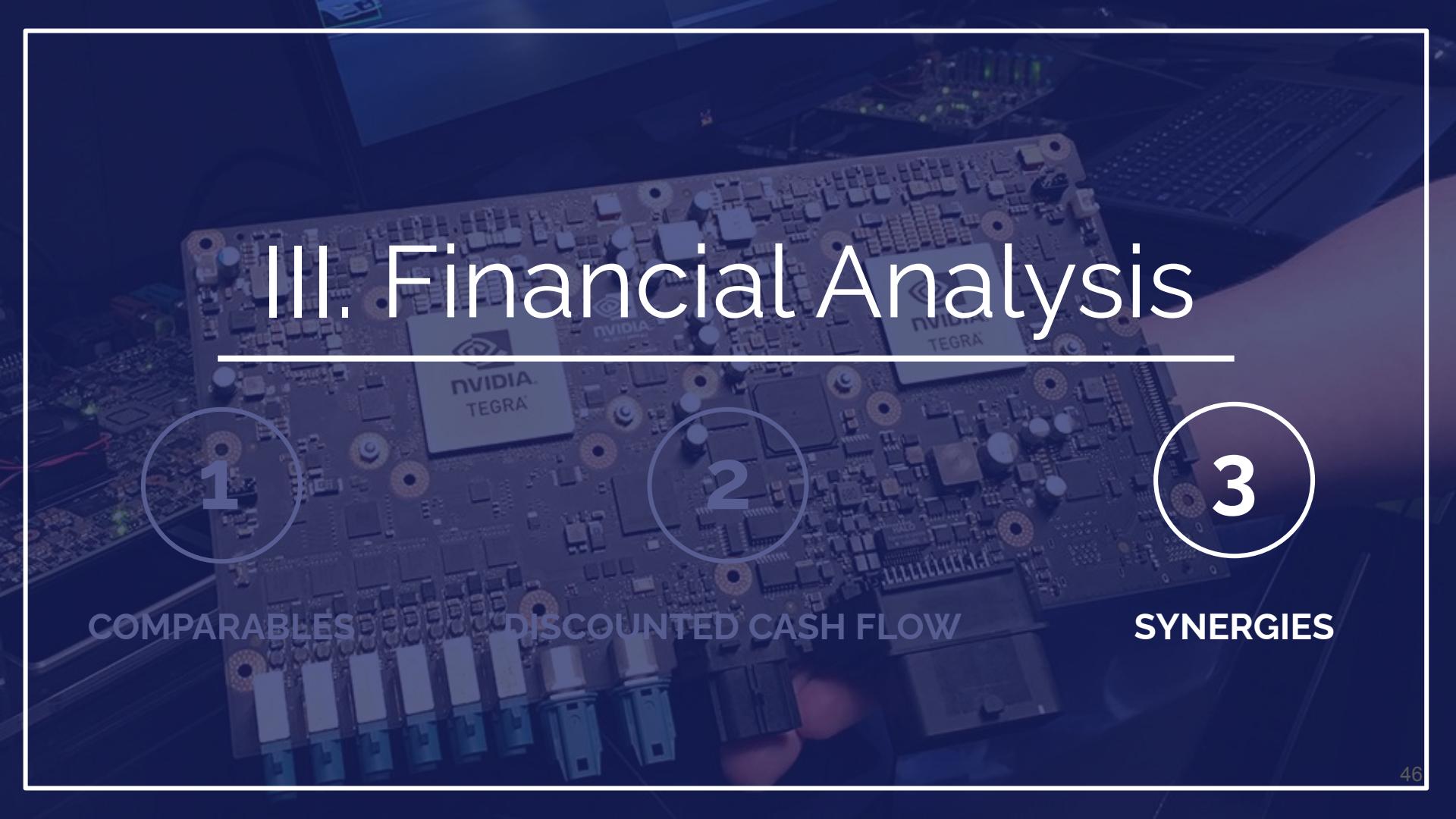
BASE CASE SCENARIO

- GLOBAL CHIP SUPPLY:**
the global chip shortage slowly subsides and supply continues to restore
- PRODUCT PRICING:**
price charged per product remains the same as supply grows
- COMPETITION IN THE MARKET:**
AMD maintains a fairly constant slice of the semiconductor market and continues to face similar competitive pressures

BULL CASE SCENARIO

- GLOBAL CHIP SUPPLY:**
the global chip shortage subsides faster than expected and supply skyrockets
- PRODUCT PRICING:**
due to large amounts of supply, lower prices are charged and consumer demand booms
- COMPETITION IN THE MARKET:**
AMD claims a larger market share and demand grows further

Source: (Advanced Micro Devices, 2020), (Capital IQ, 2020), (Trefis, 2021)



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Synergies Overview

Analysis of Potential Synergies for Nvidia and AMD



Nvidia and AMD Possible Synergies		Duration	Explanation
Corporate Functions	<ul style="list-style-type: none">Analyze crossfunctions within the organizations to eliminate overlap and unnecessary managementIdentify regional headquarters and offices for integration	1-3 yrs	<ul style="list-style-type: none">Analysis nextCost reduction, hard to calculate
Sales Network	<ul style="list-style-type: none">Profit divisions based on product to see overlap of design processSee combination of processing units to re-evaluate procurement initiatives	1-3 yrs	<ul style="list-style-type: none">Segmentation not visibleLong term
Research and Development	<ul style="list-style-type: none">Use of AMD licenses and patent to scale innovationReduce cost drivers of production and increase product portfolioIT Systems	5-7yrs	<ul style="list-style-type: none">Different product designAnalysis nextLong term
Distribution	<ul style="list-style-type: none">Utilize same suppliers and manufacturers to increase productionAMD products being distributed through Nvidia shipping/sales channels scaling	3-5yrs	<ul style="list-style-type: none">Logistics complicationsWider access to consumer markets
Post-Merger	<ul style="list-style-type: none">Employee relationship managementPartner recognition reevaluation and service terms	Lifelong	<ul style="list-style-type: none">Productivity measureSpecialized AMD partner programs difficult to integrate

Source: (Ashkenas, 2019)

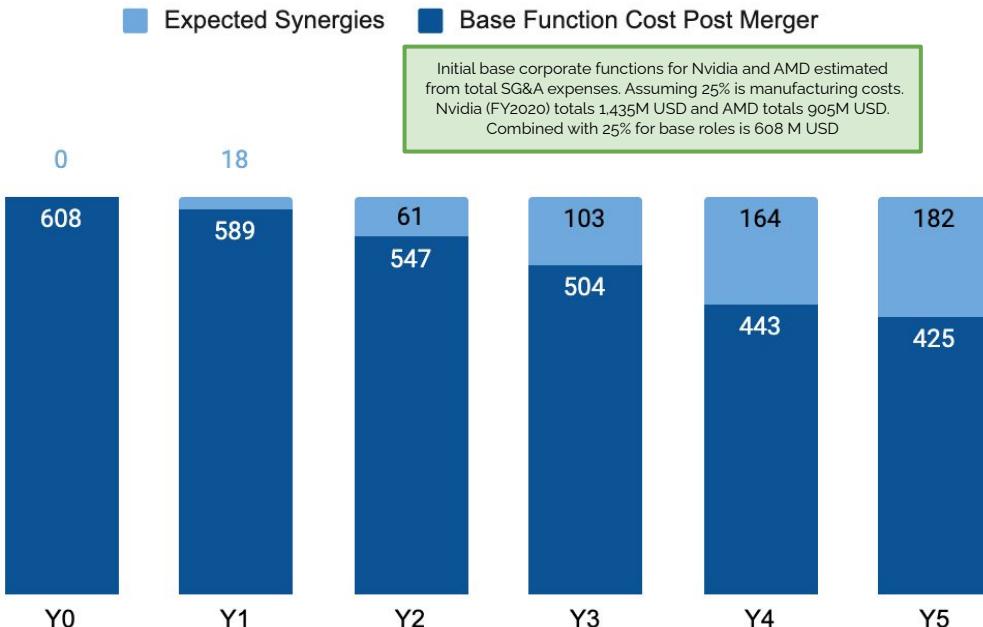
Removing Overlapping Corporate Functions

Restructuring Post-Merger Could Lead to a 20-30% Cut of Repetitive Roles within Two Years



A Merger could prove cost effective when combining similar jobs

Estimated Cost Savings Post Merger Yo-Y5, Millions USD



Eliminating Cross Functions

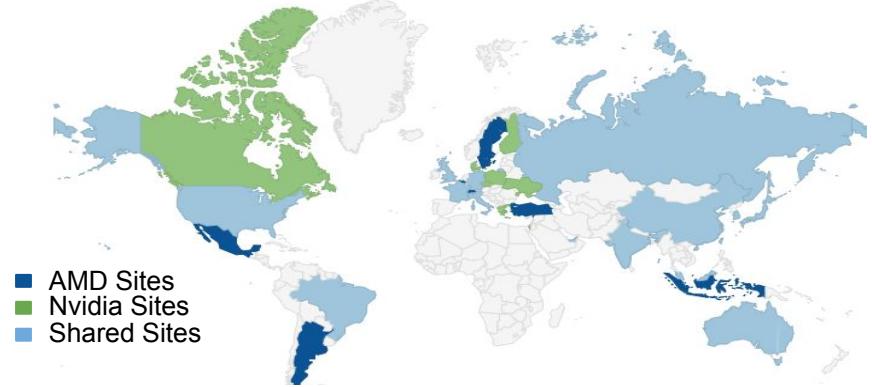
Potential Savings:

- Overlap of functions is 3% during merger initiation and 30% in Year 5 post merger integration
- In addition to people, automation and system combinations in cross functions are combined thus allowing for cheaper measures and higher visibility in teams
- People management is highlight and impact driver for revenue/employee synergies
- Reduction in executive compensation allocated but some positions cannot eliminate like CEO and other C-Suite

Source: (Advanced Micro Devices, 2021), (Harvard Business Review, 2016)

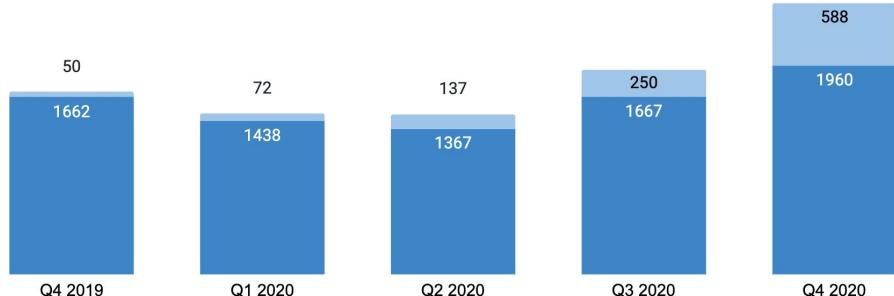
Increasing Production Capabilities and Locations

The current chip deficit is a global shortage heavily affecting GPU and AI industries. Combining operations allows for more Supply Chain capabilities and agility.



Chip Shortage Demand Outstrips AMD Supply by 30 Percent

AMD Quarterly Revenue and Missed Earnings, 2019-2020, Millions USD



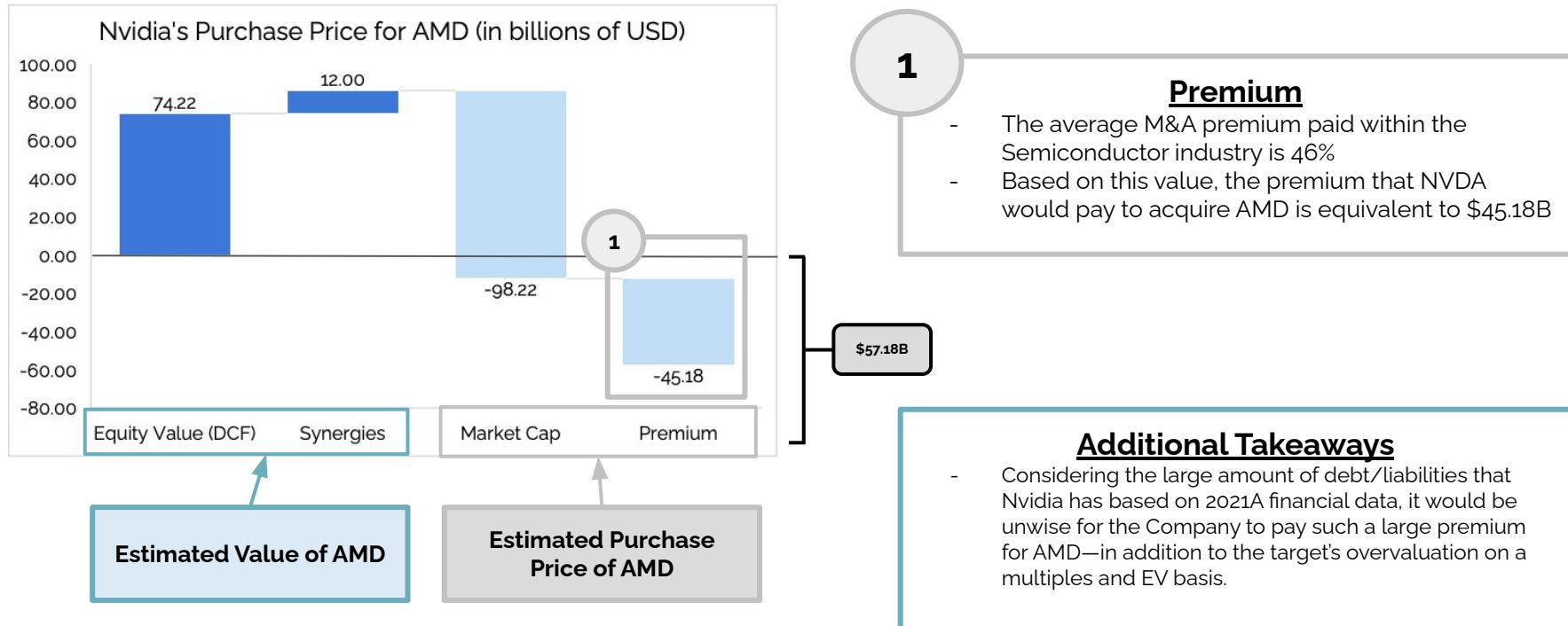
Source: (Craft Co., 2021), (Hruska, 2021), (Nvidia, 2021)

Combining Distribution Networks

- Most semiconductor companies use the same fabless process from the same manufacturer and sourcing basic circuit board components are homogenous
- TSCM supplies most of Nvidia's advanced components and AMD is transitioning more processes to TSCM
- Most Supply Chain expenditures for AMD and Nvidia come from distribution center divisions and the inability to fill a shipping pallet
- Combining operations may prove useful when meeting unexpected demand increases as seen in 2020

Purchase Price of AMD

If Nvidia were to Acquire AMD, the Company would Suffer a Financial Loss of \$57.18B



Source: (Capital IQ, 2020)

IV. Acquisition Feasibility

Functionality of
Company Integration

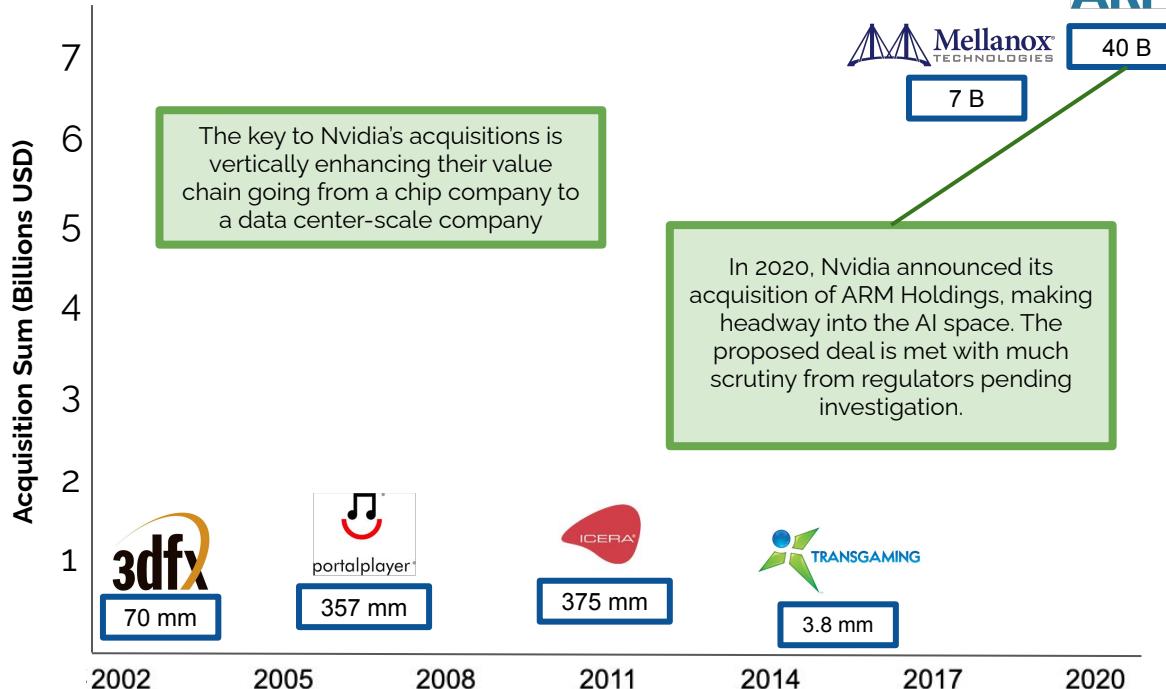
Nvidia's Past Acquisitions Forecast Future Mergers

Nvidia has gone through 17 total acquisitions. Most are financed in late stage.



Nvidia's Prime Acquisitions Lead to Control over the GPU Space

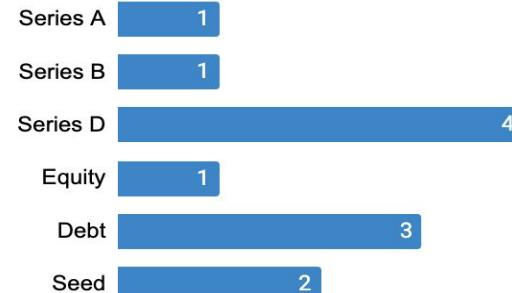
Nvidia's Major Acquisitions and Mergers 2002-2020



Source: (Crunchbase, 2021), (Reif, 2020)

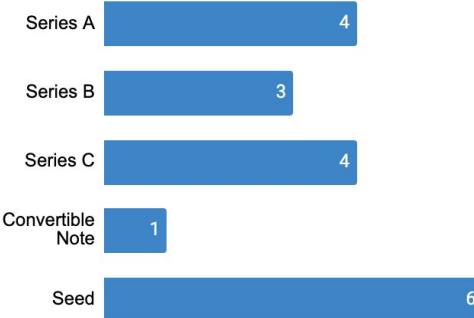
Nvidia Acquisitions by Stage Funding

Most Acquisitions occurred in Late Stage Funding



Nvidia Investing Stages

Most Investments Occurred in the Seed Stage



Company Ownership Structure

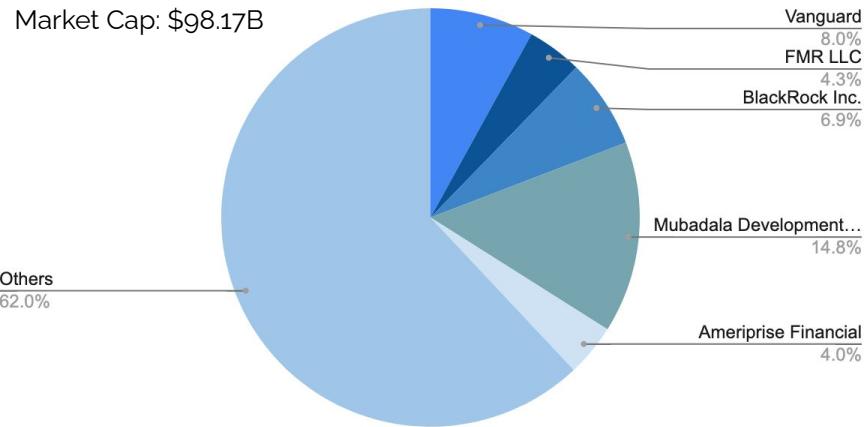
Crosses between AMD and Nvidia ownership may lead to easier merger



AMD Current Ownership Structure

Based off Percent of Market Capitalization, March 11,2021

Market Cap: \$98.17B



Assumptions

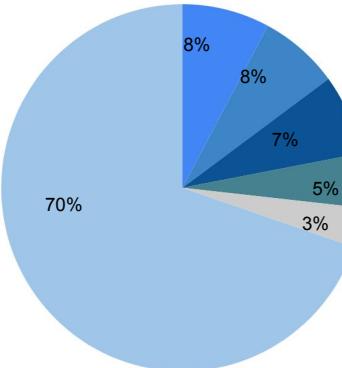
AMD market capitalization:	98.17B as of 3/11/21
Nvidia market capitalization:	318.83B as of 3/11/21
Acquisition premium:	46%

Source: (Advanced Micro Devices, 2021), (CNN, 2021), (Fintel, 2021), (Nvidia, 2021)

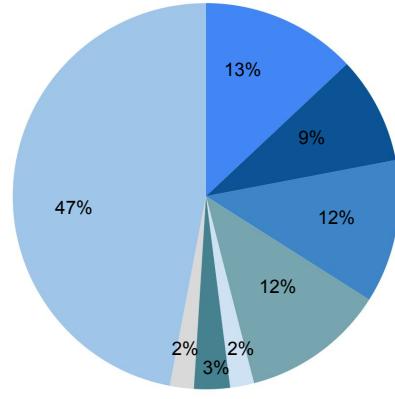
Change in Nvidia's Ownership Structure, Before and After

Based off Percent of Market Capitalization, March 11,2021

Before



After



Legend:

- Vanguard
- BlackRock Inc.
- FMR LLC
- Primecap
- CEO Jen-Hsun Huang
- Others
- Mubadala
- Ameriprise

- Financial institutions like Vanguard, BlackRock Inc., and FMR had investments in both AMD and Nvidia
- Shareholder integration may prove to be easier since no one person/firm holds the majority

Other Considerations

Several other Hindrances Pose a Threat to Nvidia Post-Acquisition



Antitrust Regulation- Low threat

- This acquisition could increase Herfindahl-Hirschman Index to a dangerous concentration level if overall market is controlled
- Vertical acquisitions like Nvidia/AMD are usually under lower scrutiny from the Federal Trade Commission and the Department of Justice

Debt Accrual

- New debt financing for new merger or acquisition is needed because strictly cash is not feasible
- Nvidia has increased debt margins over the years with increases in 192% from FY 2020-FY 2021
- Debt financing can lead to decreased credit score for company if future loans need to be taken out

Retaining Company Culture

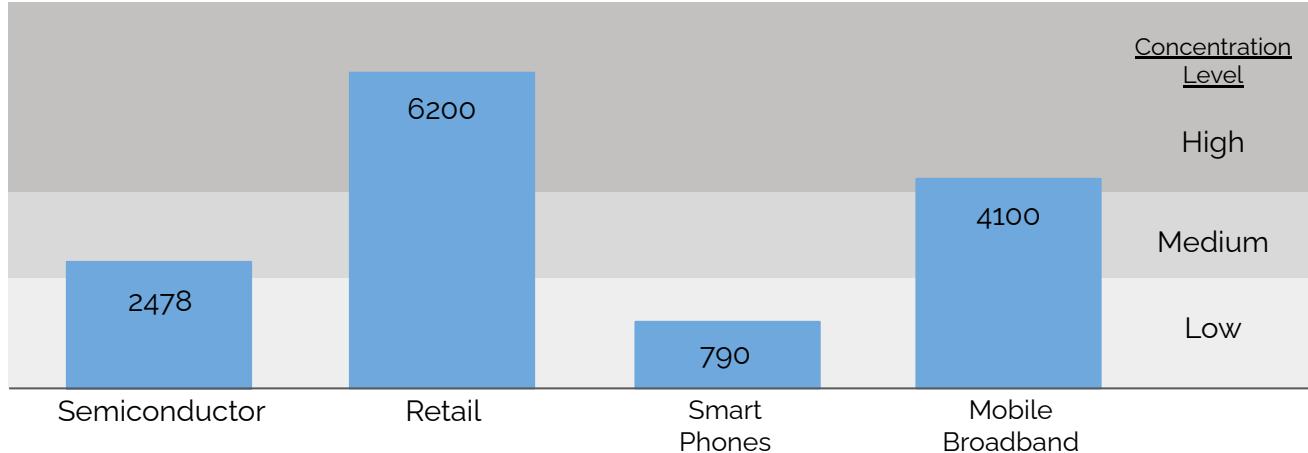
- Innovation and data-orientedness is the foundation of Nvidia
- Acquisition should reflect the pursuit of new R&D and the foundational value of advancement
- AMD's R&D is not as developed
- Shifts in structure may receive negative reception from AMD, with employee satisfaction at 84% according to a survey study conducted by Comparably
- Cultural alignment drives revenue, as morale directly increases productivity

Source: (Nvidia, 2019), (Nvidia, 2020), (Nvidia, 2021)



Analysis of concentration of various markets

Herfindahl-Hirschman index for selected US markets



Conclusion

- The semiconductor industry has a Herfindahl-Hirschman Index of 2,478 which is considered by antitrust regulations to be **moderately concentrated**
- A merger between Nvidia and AMD would increase the HHI Index to 2,486, meaning a merger between the two would be under **low scrutiny** by the FTC or DOJ

Trust Regulations

- **Sherman Antitrust Act**- prohibits companies from monopolizing and controlling overall market
- **Hart-Scott-Rodino Antitrust Improvements Act**- companies must go through FTC to gain approval for an M&A transaction to see if results would adversely impact US businesses in same segment
- **Clayton Act**- illegal for company to purchase stock of another post-acquisition, resulting in reduced industry competition

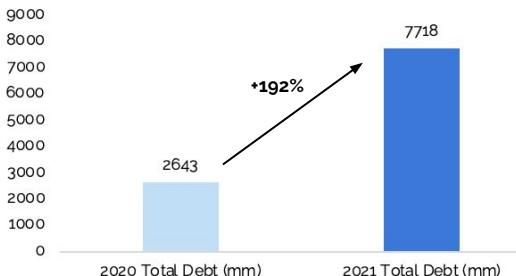
Source: (Britannica, 2021), (Statista, 2020)

Debt Financing Feasibility

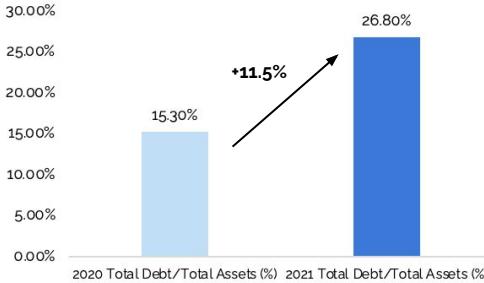
Given Nvidia's 2021 Total Debt and Liabilities, Debt-Financing is Unfeasible



NVDA's Total Debt (in millions of USD)

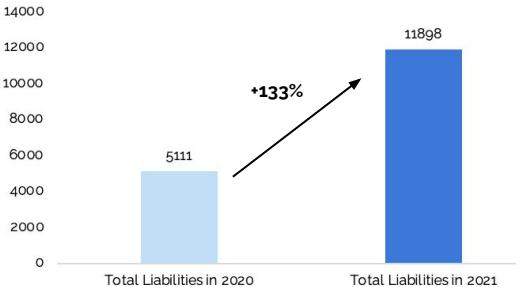


NVDA's Total Debt to Total Assets (%)

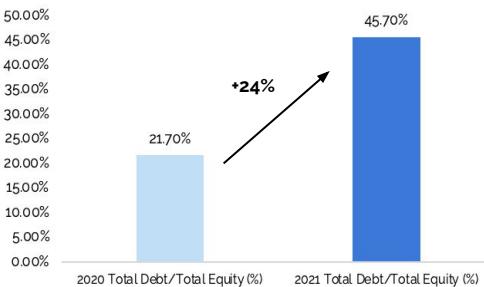


In 2021, Nvidia's total debt grew 192% from \$2643mm to \$7718mm. Consequently, total liabilities grew 133% from \$5111mm to \$11,898mm. Net debt grew 53.4% YoY.

NVDA's Total Liabilities (in millions of USD)



NVDA's Total Debt to Total Equity (%)



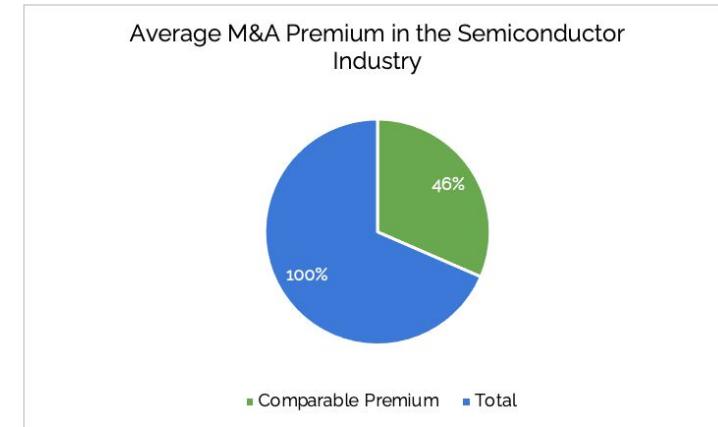
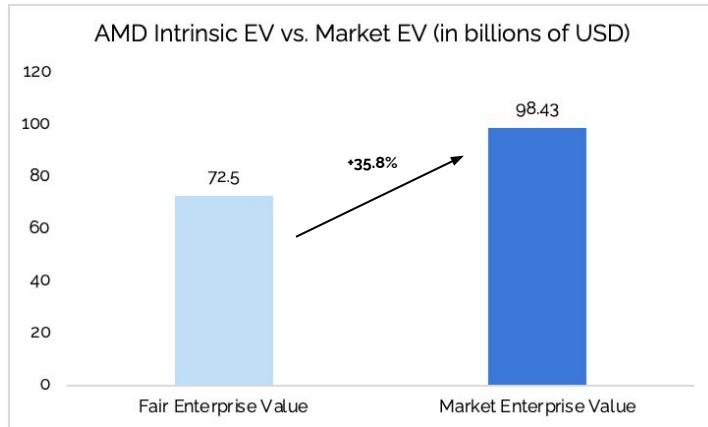
Due to Nvidia's recent spike in debt, acquiring AMD through debt financing would be unfeasible—causing an overload of debt (thus reducing FCF available for spending in other areas) and potentially harming the Company's current S&P credit rating of A-.

Source: (Nvidia, 2021)

AMD Overvaluation and Purchase Price



Based on Fair EV Calculations, NVDA Should Not Acquire AMD due to Overvaluation and High Premiums



AMD is Highly Overvalued

Based on Intrinsic vs. Market Value calculations, there is a 35.8% increase from Fair EV to Market EV. Therefore, Nvidia would be acquiring a Company that is currently trading at a \$25.9B premium to its intrinsic value.

High Premium to Pay for AMD

The average premium paid in M&A dealings within the industry and AMD not wanting to sell is 46%. Therefore, Nvidia would be paying a premium of \$45.18B for AMD—which would take a massive toll on financial flexibility, especially given its recent spike in debt obligations.

Source: (Capital IQ, 2020)



Conclusively...

Nvidia should NOT acquire Advanced Micro Devices.

Synergies do not justify the costs associated.

- Financial modeling and DCF show **Advanced Micro Devices is 33.4% overvalued**
- Synergies of **\$12B do not justify** expenses needed to complete overall transaction
- AMD's R&D is not highly developed, compromising Nvidia's 2021 company goals

Company loses fundamental innovation driver.

- Debt financing would have to be used to complete merger and Nvidia overall **debt is considerably high**
- AMD may **institute preventative measures** to protect current patents
- Nvidia lessens its ability to deliver quality products that innovate, along with integration of partnerships, thereby **losing brand value**

Source: (Advanced Micro Devices, 2021), (Nvidia, 2021)

V. Alternative Solution

Looking further

Evaluating Opportunities

Other Options Nvidia Could Pursue Instead of Another Acquisition



Industry Opportunity

Add to AI Product Portfolio

- AI market is the fastest growing in the semiconductor industry
- Acquisition will lead to new revenue segments and relevance in industry renewal

Current Efforts in AI

- Expanding data-centric vision as AI grows
- No announcement of a consumer-focused AI chip
- Opportunity to expand brand portfolio

Research and Development

Invest in AI Architecture

- AI powered solutions require big R&D budget expenditures
- Sector investment creates opportunity to develop new technologies

Existing Products and Features

- 2020 development of machine learning chip: "most powerful chip system"
- Architecture in place with no additional assistance needed

Supply Chain Visibility

Expand Operations

- 2020 semiconductor shortage demonstrated need for redefinition of operations
- Creates opportunity to partially own or develop a manufacturing foundry

Current Operations Strategy

- Dependence on partner foundries to keep up with chip demand
- However, met 2020 demand spikes with shortages
- Strong partnership with TSMC

Source: (Nvidia, 2021), Team Analysis

Evaluating Opportunities

Other Options Nvidia Could Pursue Instead of Another Acquisition



Acquisition

Buy an AI based company

- Acquire existing popular product lines and utilization of present AI developments
- May run into integration complications along with possible expenses to finance acquisition

Feasibility

- Nvidia's present trials with ARM Holdings show company is looking for investing opportunities
- Acquisition will prove beneficial in long-term strategy of growing AI investments

Partnership

Utilize partner program for venture

- Create partnership using established program
- However, integrating project may be time consuming and expensive considering long-term timeline

Feasibility

- Only allows for limited control of end product/service
- Partnership program mainly utilized for advisory and internal development, not new products

Development

Build AI chips

- Gives Nvidia full control of design process and full market of distribution
- However, very expensive to start from ground up and time consuming to give leeway to competition

Feasibility

- Good opportunity to independently own
- Time constraint for building consumer wide AI chips
- Increased investment in initial development of new technology

Source: (Team Analysis)



Evaluating Possible Acquisitions

Infeasible

Relevance and Rationale	Product Alignment	Strategic Feasibility	Financial Feasibility	Decision
 <ul style="list-style-type: none"> Apple is a huge investor in the AI chip market especially in mobile chip and SoC innovation Dominante the mobile consumer market and consumer electronics 				<ul style="list-style-type: none"> Current tensions with Apple switching to AMD products Apple not looking to sale and cost too high
 <ul style="list-style-type: none"> Direct competitor with AMD and Nvidia in AI and GPU segments Many patents and licenses, giving sole ownership of some AI innovation/technologies 				<ul style="list-style-type: none"> Sheer size of Intel makes merger unfeasible Currently holds GPU market share over Nvidia
 <ul style="list-style-type: none"> Graphcore develops accelerators in AI and machine learning Forecasted disruptor in AI chip market, already competing even as a startup 				<ul style="list-style-type: none"> Held at a 2.77B valuation within 4 years of operation High valuation along with unwillingness to sell
 <ul style="list-style-type: none"> Internet related services companies headquartered in Beijing, China One of the largest AI developers and holds partnerships with American conglomerates like Snap Inc. 				<ul style="list-style-type: none"> Currently serving antitrust lawsuits for past deals Chinese company so US merger is risky

Source: (Apple, 2021), (Crunchbase, 2021), (Graphcore, 2021), (Intel, 2021), (Investopedia, 2021)



Evaluating Possible Acquisitions

Infeasible

Relevance and Rationale	Product Alignment	Strategic Feasibility	Financial Feasibility	Decision			
 <ul style="list-style-type: none"> Fabless semiconductor software company specializing in AI data processing and visualization Collaborations in Autonomous vehicles and data center solutions 				<ul style="list-style-type: none"> Viable acquisition However, doesn't align with Nvidia's end goal of AI chip development in consumer gaming 			
 <ul style="list-style-type: none"> VC-backed company with unique data flow architecture and AI combination Acquires MIPS processors for SoC for mobile, home, and IoT devices 				<ul style="list-style-type: none"> Filed for Chapter 11 Protection in 2020 which shows volatility May be too much restructuring and integration for Nvidia 			
 <ul style="list-style-type: none"> Develops accelerators that have fastest response and maximum performance without offset of either Newest technology of TSP with ASIC implementation giving more computing power 				<ul style="list-style-type: none"> New startup with patents in AI hardware that may disrupt current industry Not looking to sell 			
 <ul style="list-style-type: none"> Media chip specialization in telecommunications field AI chip developer in consumer multimedia products and attractive "NeuroPilot" technology 				<ul style="list-style-type: none"> Product alignment with Nvidia's media sector expansion Acquiring an international company may see challenges 			
<p>Source: (Groq, 2021), (Kalray, 2021), (MediaTek, 2021), (Wave Technologies, 2021)</p>							
Executive Summary	Industry Overview	Company Overview	Financial Analysis	Acquisition Feasibility	Alternative Solution	Conclusion	63

Seeing MediaTek as a Target and Defining What an Acquisition Means for Nvidia

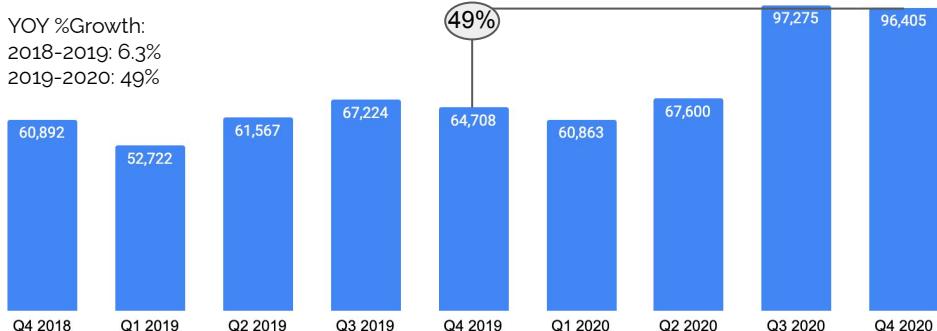
Company Overview



Between 2019-Q4 2020, MediaTek's revenue climbed 49%

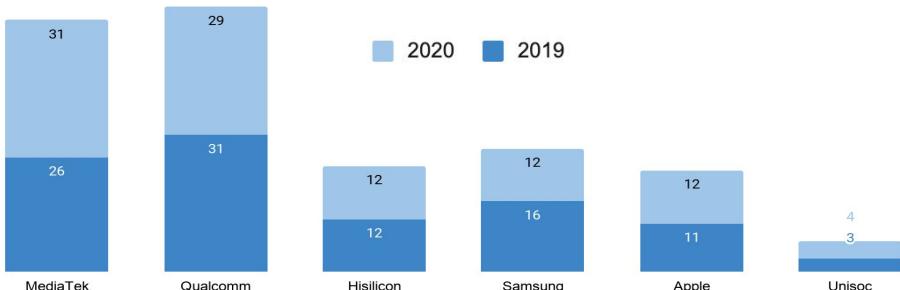
Based off Percent of Market Capitalization, March 11,2021

YOY %Growth:
2018-2019: 6.3%
2019-2020: 49%



In 2020, MediaTek overtook Qualcomm in Smartphone Chipset Market Share

Global Smartphone Chipset Market Share%, 2019-2020



Source: (MediaTek, 2019), (MediaTek, 2020), (Singh, 2020)

Five units comprise the technology development sector

Mediatek: Technology Corporate Functions

- 1 **SoC System Architecture**
Construct and plan technology-leading chips in a single capacity chip minimizing external hardware
- 2 **Central Design**
Implement technologies into chips, including wireless communication, and artificial intelligence
- 3 **Wireless Technology**
Develop and design wireless communication core technologies, system, software, and wireless comms
- 4 **Computing and AI**
Research and develop high-efficiency computing platforms and artificial intelligence technologies
- 5 **Multimedia**
Research and develop video and image multimedia technologies

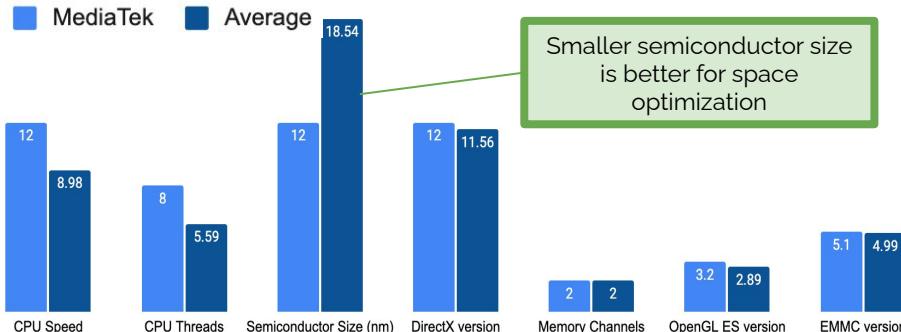
MediaTek AI Expansion

Plans to Introduce AI Chips for Gaming Smartphones and More



MediaTek's Helio G95 is newest chip for 4G gaming smartphones

Mediatek Helio G95 Review: MediaTek outperforms chip averages



MediaTek's company partnerships enhance company growth

Based off Percent of Market Capitalization, March 11,2021

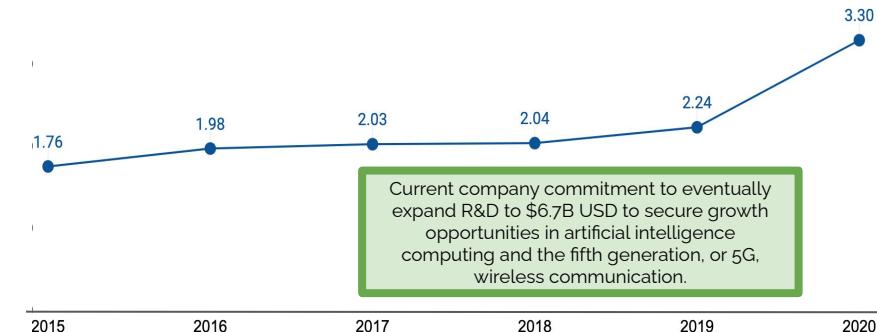
Recent partnerships have seen the acceleration of AI. MediaTek's close client relations prove useful when scaling R&D and product testing.

Gaming:
Consumer Tech:
Smart Phones:
Artificial Intelligence:

Source: (MediaTek,2019), (MediaTek, 2021), (Ting-Fang, 2018), (Versus, 2021)

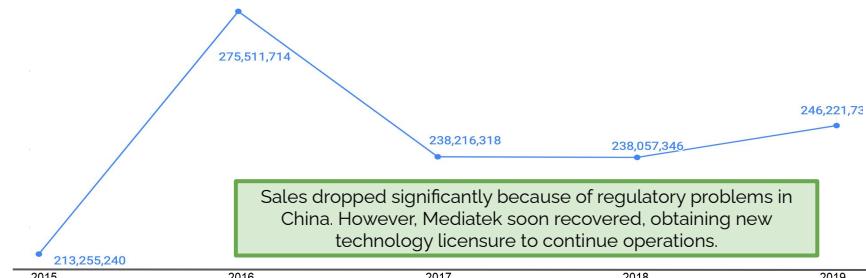
The race to scale to 5G increases R&D expenditures YoY

MediaTek R&D Spending, 2015-2020, USD Billions



YoY Sales Growth

Based off Percent of Market Capitalization, March 11,2021



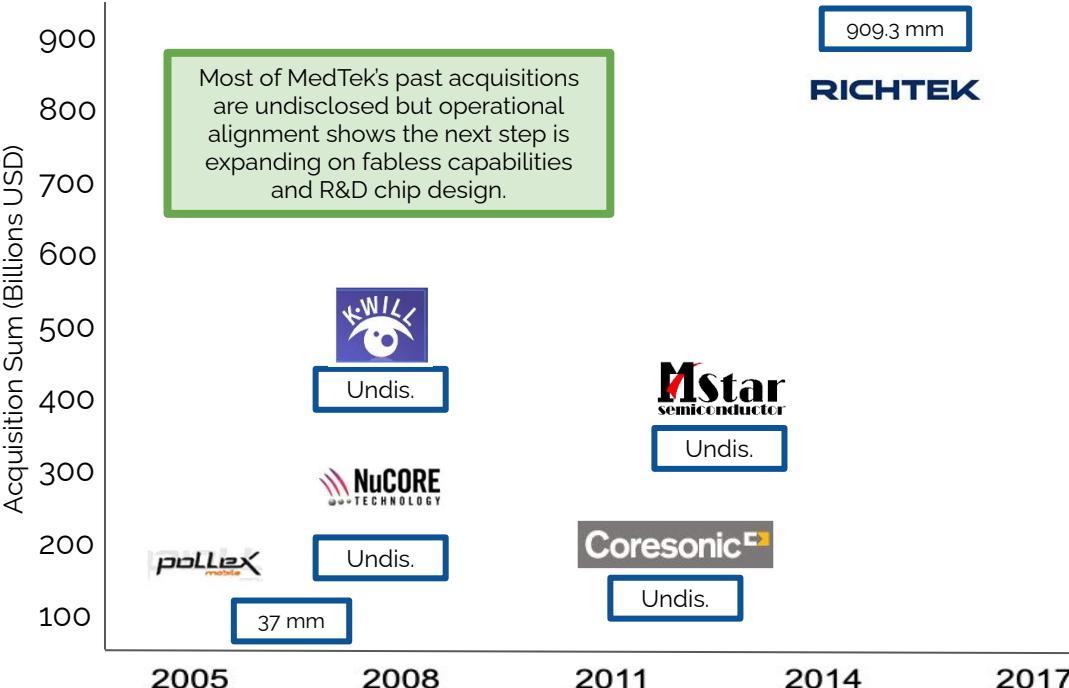
Past Deals and Benefit of Acquiring MediaTek

MediaTek's Technology is Well-Regarded and Can be Implemented into NVDA's Products



MediaTek's past acquisitions lead to increased market share

Mediatek's Major Acquisitions and Mergers 2006-2016



Source: (Crunchbase, 2021), (MediaTek, 2021), (Nvidia, 2021)

How MediaTek plays into Nvidia's Picture

Evaluating Integration Strategy and the Target

Expanding into the Communications Market

- Nvidia aims to bring 5G gaming to consumers in gaming libraries but needs access to a larger telecommunications company to integrate technology
- MediaTek has a 8.4% 5G chip manufacturing market share in China, making it one of the largest producers in the world
- Integration between both companies' products will correlate with the race towards broader 5G connectivity in the AI marketplace

Utilizing Shared Partnerships and AI R&D

- MediaTek's NeuroPilot AI ecosystem enhances "Edge AI" which is gaining traction, especially in the GPU industry
- Integration with Nvidia's current chips will allow for more flexibility along with innovative improvements like Cloud connectivity, decreased run time, and increased computing power
- MediaTek also improves Nvidia's Tegra processors, which account for almost a quarter of revenue, but MediaTek's processors are more favored
- Scalability of production and manufacturing integration also account for a decrease in COGS post merger

Valuation and Cost/Profit of Acquiring MediaTek (Part 1)

Discounted Cash Flow Analysis



MediaTek's Discounted Cash Flow through 2025

Discounted Cash Flow (\$ in Millions Except Per Share Data)	2018	2019	2020	2021e	2022e	2023e	2024e	2025e
Revenue	\$7,895.0	\$7,965.0	\$10,941.0	\$13,129.2	\$15,098.6	\$17,212.4	\$19,363.9	\$21,300.3
EBITDA	787.7	1,001.3	1,804.1	3,221.0	3,479.7	3,858.9	4,188.1	4,513.4
EBIT	537.3	730.8	1,467.8	2,853.4	3,056.9	3,377.0	3,645.9	3,917.0
Income Tax Benefit (Expense)	(85.2)	(131.6)	(226.4)	(599.6)	(642.3)	(709.5)	(766.0)	(823.0)
Net Operating Profit After Tax (NOPAT/EBIAT)	452.1	599.2	1,241.4	2,253.8	2,414.6	2,667.5	2,879.9	3,094.1
YoY % Growth	32.5%	107.2%		81.6%	7.1%	10.5%	8.0%	7.4%
(+) Depreciation	512.0	612.0	0.0	236.3	271.8	309.8	348.6	383.4
(+) Amortization	(261.6)	(341.5)	0.0	131.3	151.0	172.1	193.6	213.0
(+) Stock-Based Compensation	176.0	175.0	153.0	164.1	188.7	215.2	242.0	266.3
(-) Capital Expenditures	(1,736.0)	(2,006.0)	0.0	(2,625.8)	(2,642.3)	(2,667.9)	(2,711.0)	(2,769.0)
(Increase)/Decrease in Net Working Capital	173.7	587.0	(44.0)	112.9	343.0	204.5	102.7	133.4
Unlevered Free Cash Flow	(683.8)	(374.3)	1,350.4	272.6	726.9	901.2	1,055.9	1,321.1
YoY % Growth	(45.3%)	(460.8%)		(79.8%)	166.6%	24.0%	17.2%	25.1%
Full-Year Discount				1.76	2.76	3.76	4.76	5.76
Mid-Year Discount				0.88	2.26	3.26	4.26	5.26
Discount Factor				0.96	0.89	0.85	0.81	0.77
Present Value of Future Free Cash Flow				261.0	650.0	767.0	855.3	1,018.5
YoY % Growth				149.1%	18.0%	11.5%	19.1%	

Source: (Capital IQ, 2021)



Valuation and Cost/Profit of Acquiring MediaTek (Part 2)

WACC Calculation and Capitalization

MediaTek: WACC Calculation

WACC Assumptions	
Beta	0.76
Risk-Free Rate	1.55%
Equity Risk Premium (ERP)	4.63%
Pre-Tax Cost of Debt	1.23%
Effective Tax Rate	21.00%
Cost of Preferred Stock	0.00%
Cost of Debt	
Pre-Tax Cost of Debt	1.23%
Tax Rate	21.00%
After-Tax Cost of Debt	0.97%
Cost of Equity	
Risk-Free Rate	1.55%
Equity Risk Premium (ERP)	4.63%
Beta	0.76
Cost of Equity	5.07%

Source: (Capital IQ, 2021)

Capitalization		\$ Amount	% Weight	Cost%
Market Value of Debt		\$0	0.0%	0.97%
Market Value of Equity		\$50,520	100.0%	5.07%
Market Value of Preferred		\$0	0.0%	0.00%
Total Capitalization		\$50,520		5.07%
WACC Sensitivity		Pre-Tax Cost of Debt		
Debt To Total Capital	1.13%	1.18%	1.23%	1.28%
	(10.0%)	5.49%	5.48%	5.47%
	(5.0%)	5.70%	5.69%	5.68%
	0.0%	5.70%	5.69%	5.68%
	5.0%	5.49%	5.48%	5.47%
	10.0%	5.07%	5.07%	5.07%

WACC = 5.07%

- The Weighted Average Cost of Capital (WACC) represents return to lenders and shareholders.
- MediaTek's WACC of 5.07% represents the required rate of return (discount rate) necessary for DCF analysis.
- Furthermore, it indicates that the Company must pay investors an average of \$0.0507 for every \$1 received in funding.

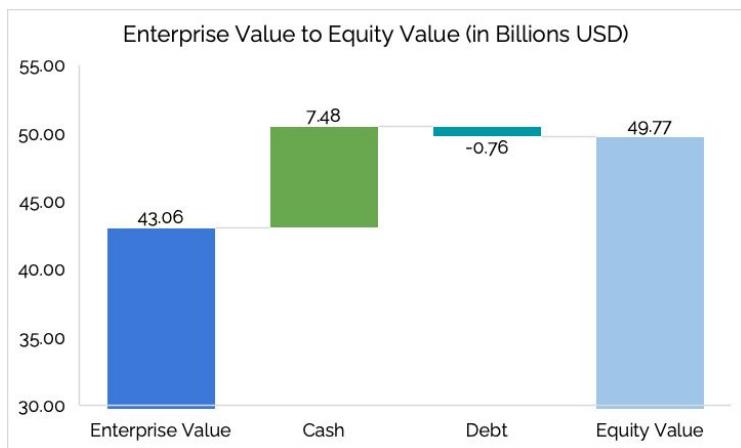
Valuation and Cost/Profit of Acquiring MediaTek (Part 3)

Fair Enterprise Value and Football Field



Enterprise to Equity Value Bridge

Waterfall Chart (in billions of USD)



Enterprise Value (2020A): \$43.06B
+ Cash and ST Investments: \$7.48B
- Total Debt: \$0.76B

Equity Value: \$49.77B

Source: (Capital IQ, 2021)

Executive Summary

Industry Overview

Company Overview

Financial Analysis

Acquisition Feasibility

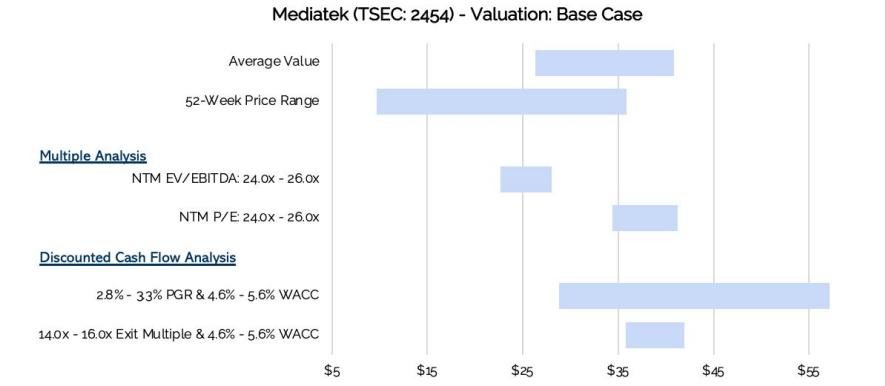
Alternative Solution

Conclusion

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Football Field

Fair Enterprise Value (in billions of USD)



Estimated Fair EV Range: \$40-46B

Average Fair EV: \$43B

Compared to MediaTek's Market EV of \$43.06B, the Company's Fair EV of equal amount indicates fair valuation.



Rebranding Nvidia's current GPU lineup with AI Integration...



- Integrate MediaTek NeuroPilot technology into chip
- Nvidia's current design allows for flexibility of new innovation additions, especially programmable integration
- Utilize combined partner TSMC manufacturing to increase production process and meet unexpected demands heightened by the semiconductor shortage
- Post launch: expansion into the telecommunications industry after trial sales rounds to assess consumer reactions to acquisition

Source: (Nvidia, 2021), (MediaTek, 2021)

The Road to Mass Consumer 5G Connectivity...

5G Gaming

Expand Nvidia's product portfolio in Mobile APU gaming segments. Integration of MediaTek's SDK allows developers to 'write once, apply everywhere' for existing and future devices. Methodology can integrate with Nvidia's applications.

Multimedia Partnerships

Capitalize on shared partnerships between companies and existing SDKs like Google TensorFlow, Caffe, Amazon MXNet, Sony NNabla and more. At the OS level, MediaTek offers support for Android and Linux.

Streaming VR and AR

NVIDIA CloudXR™ SDK enables the streaming of OpenVR applications to 5G-connected Android and Windows devices. Enable Edge streaming with MediaTek's NeuroPilot platform.

VI. Conclusion

Final Decisions



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Therefore...

Nvidia Should Not Acquire Advanced Micro Devices and Should Instead Opt for a More Synergistic and Cost-Effective Approach: Acquiring MediaTek



Should Nvidia acquire Advanced Micro Devices (AMD)?

Synergies

AMD's lack of R&D alignment with prospective new innovation in AI, along with potential complications that come with organizational restructuring, make an acquisition unviable.

Valuation and Cost

Although there is an estimated synergies amount of \$12B, the potential benefits would be severely outweighed by the financial losses incurred due to AMD's overvaluation.

Alternative

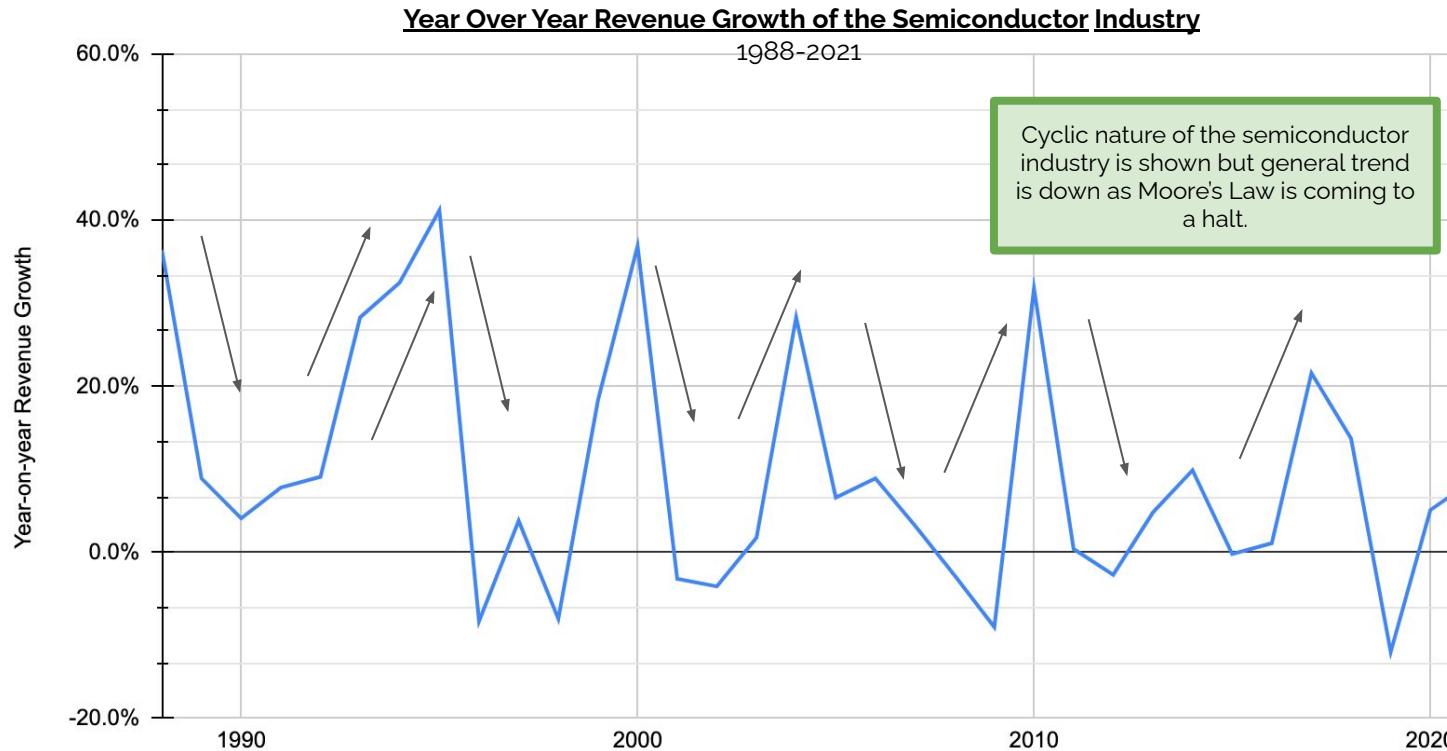
Nvidia should acquire MediaTek due to the new target's fair valuation, combined with product alignment and on-trend AI technology.

Appendix

A Deeper Dive

Industry Analysis

Illustrating the Nature of the Semiconductor Industry



Source: (Statista, 2020)

Appendix

Industry Overview

Industry Analysis

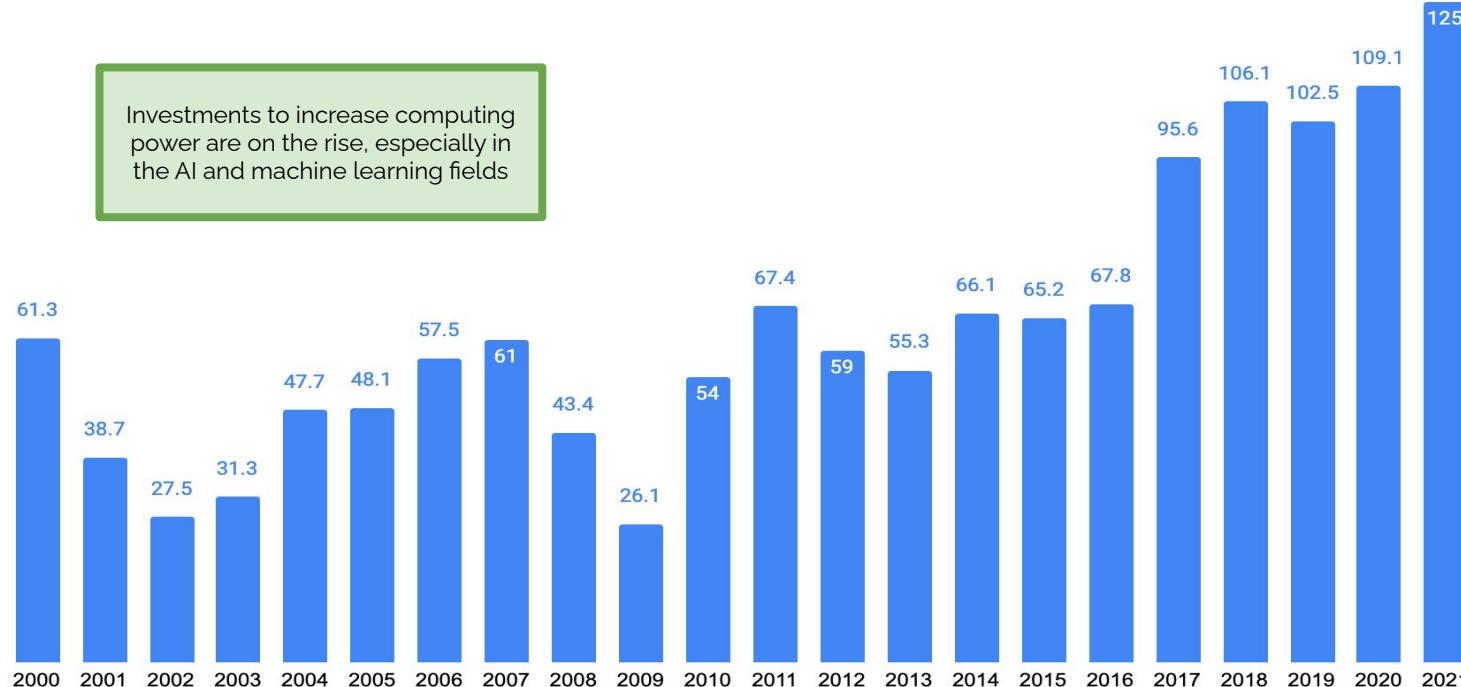
Semiconductor Capital Expenditure



Capital expenditure in the global semiconductor industry

2000-2021

Investments to increase computing power are on the rise, especially in the AI and machine learning fields



Source: (Statista, 2021)

Appendix

Industry Overview

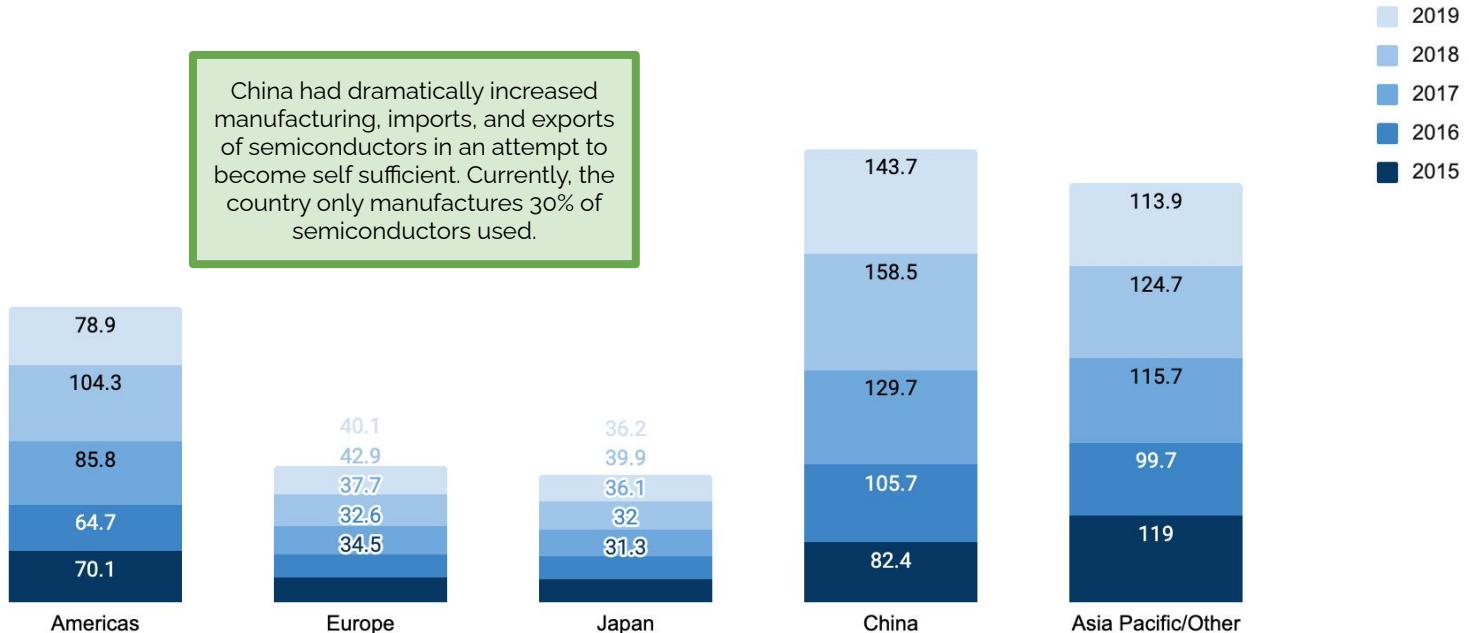
Industry Analysis

Global Key Players and Charting China's Growth



Semiconductor sales by region, USD Billions

2015-2019



Source: (Nvidia, 2021), (MediaTek, 2021)

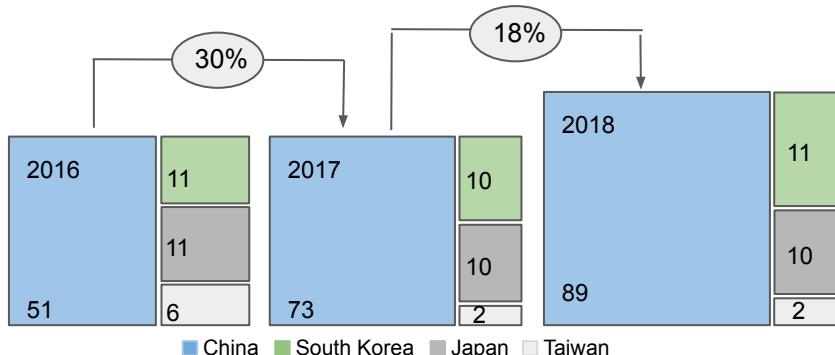
Appendix

Industry Overview



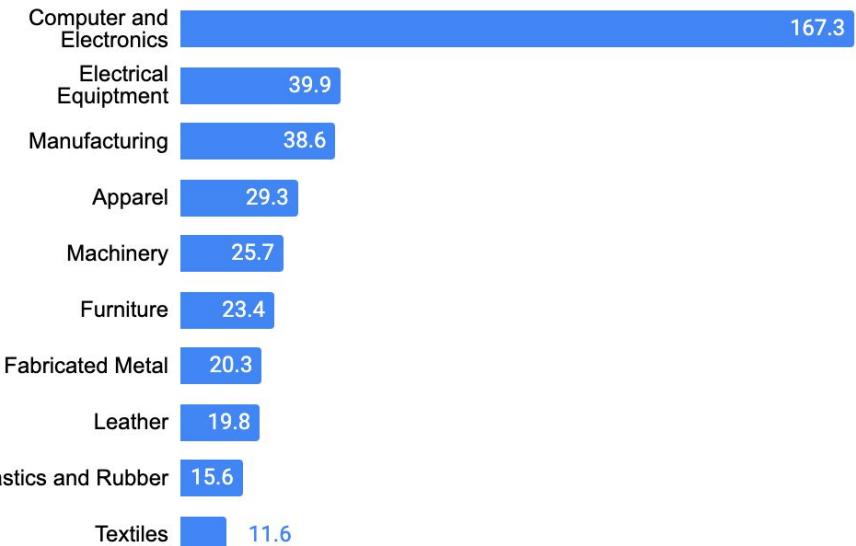
Domestic M&A Volume Growth- East Asia

2014-2018



US deficits with China, USD Billions

As of 2018



Source: (Deloitte, 2020)

Appendix

Industry Overview

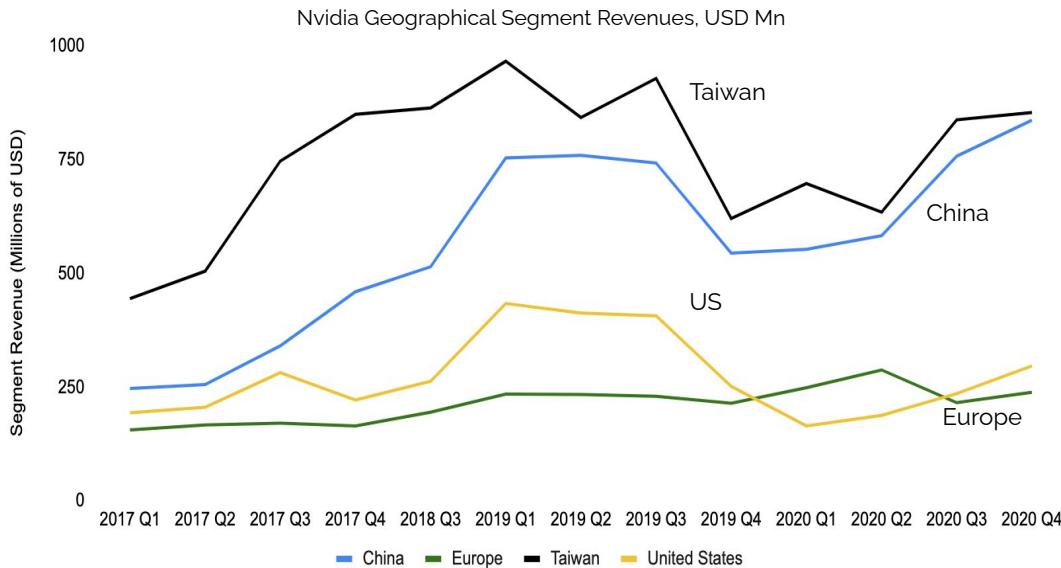
Industry Analysis

Nvidia's Dependence on Chinese Markets



Nvidia Semiconductor Revenue by Region

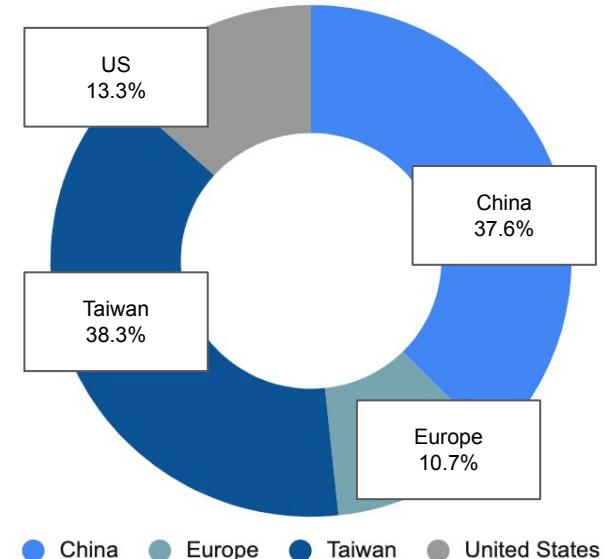
2017-2020



Source: (Nvidia, 2021)

Nvidia Regional Revenue Breakdown

2020

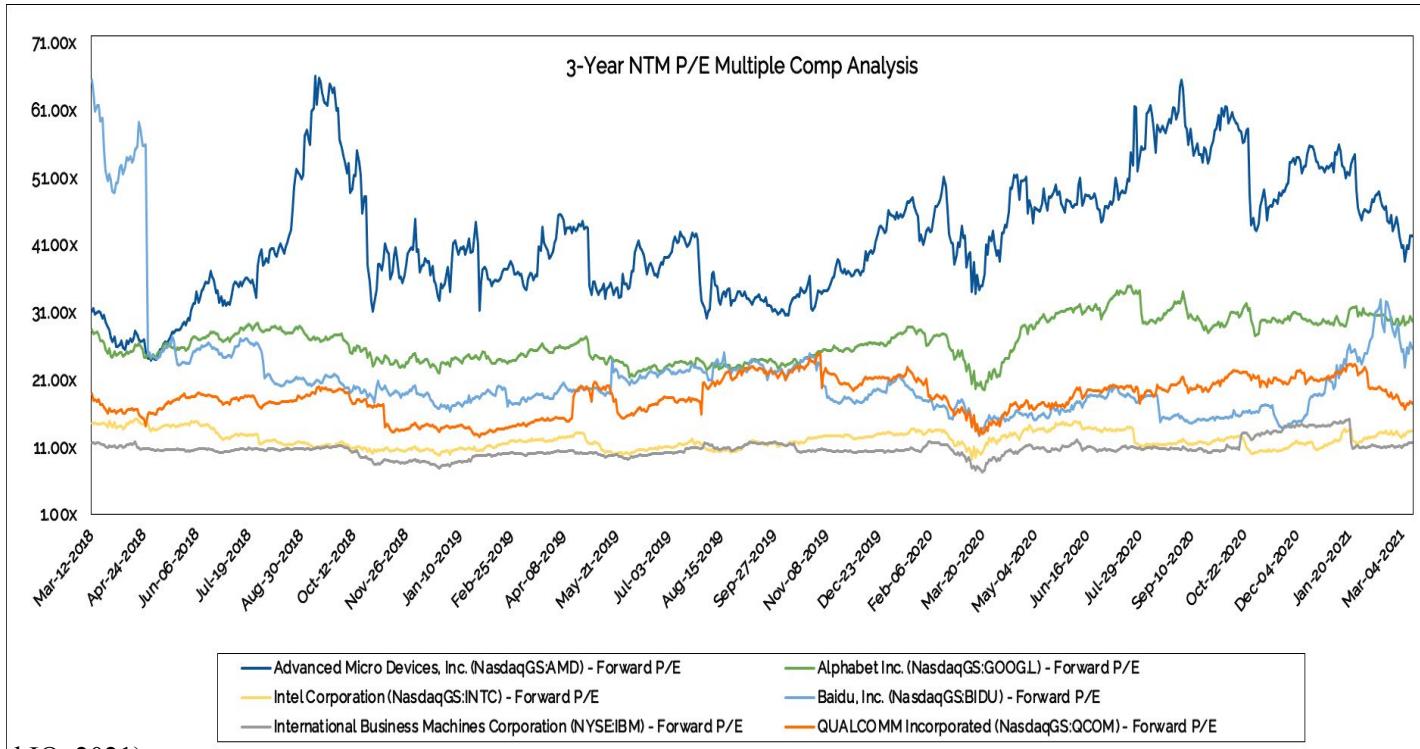


Appendix

Industry Overview

Financial Analysis: Comparables- Supplemental AMD Peer Group Information

3-Year NTM P/E Multiple Valuation Graphs for Comparable Companies



Source: (Capital IQ, 2021)



Financial Analysis



Financial Analysis: Comparables- Precedent Transaction Analysis



Comparing Company Financials

Evaluating a Transaction

Company Name	Market Data			Financial Data 2020A			Valuation			
	Price	Market Cap	TEV	Sales	EBITDA	EBIT	EV/Sales	EV/EBITDA	P/E (LTM)	P/E (NTM)
	\$/Share	\$B	\$B	\$M	\$M	\$M	X	X	X	X
NVIDIA	514.24	318.8	321.9	10918	3272	2891	19.3	56.3	74.5	38.1
AMD	81.05	98.2	98.2	9763	1723	1369	10.1	57	39.3	39.3
Infor										
Broadcom	451.17	184.2	236.5	23888	11262	4357	9.6	19.5	52.4	16.4
Xilinx	125.45	30.8	30.5	3163	978	820	10	32.2	50	37.9
Intel	62.9	255.5	271.9	77867	35910	22232	3.5	7.6	12.7	13.2
Qualcomm	129.98	147.7	155.3	23531	7620	6227	5.8	17	22.2	17

Source: (Capital IQ, 2021)

Appendix

Financial Analysis

Financial Analysis: Supplemental AMD Financial Data

Multiples Sensitivity Analysis



NTM P/E Multiple Calculation

Implied Share Price and Implied Return Sensitivity

Price / Earnings	
Period 1 EPS	\$0.44
Period 2 EPS	\$0.46
Period 3 EPS	\$0.52
Period 4 EPS	\$0.53
NTM Earnings Per Share	\$1.95
Target NTM Multiple	37.0x
Implied Share Price	\$72.15
% Return	(8.1%)

Earnings Per Share	Price / Earnings Implied Share Price				
	35.0x	36.0x	37.0x	38.0x	39.0x
\$1.76	\$61.60	\$63.36	\$65.12	\$66.88	\$68.64
\$1.85	\$64.84	\$66.69	\$68.54	\$70.40	\$72.25
\$1.95	\$68.25	\$70.20	\$72.15	\$74.10	\$76.05
\$2.05	\$71.66	\$73.71	\$75.76	\$77.81	\$79.85
\$2.15	\$75.25	\$77.40	\$79.55	\$81.70	\$83.85

Earnings Per Share	Price / Earnings Implied Return				
	35.0x	36.0x	37.0x	38.0x	39.0x
\$1.76	(21.6%)	(19.3%)	(17.1%)	(14.8%)	(12.6%)
\$1.85	(17.4%)	(15.1%)	(12.7%)	(10.4%)	(8.0%)
\$1.95	(13.1%)	(10.6%)	(8.1%)	(5.6%)	(3.2%)
\$2.05	(8.7%)	(6.1%)	(3.5%)	(0.9%)	1.7%
\$2.15	(4.2%)	(1.4%)	1.3%	4.0%	6.8%

Source: (Capital IQ, 2021)

Appendix

Financial Analysis: Supplemental AMD Financial Data

Multiples Sensitivity Analysis



NTM EV/EBITDA Multiple Calculation

Implied Share Price and Implied Return Sensitivity

Enterprise Value / EBITDA	
Period 1 EBITDA	\$702.0
Period 2 EBITDA	722.0
Period 3 EBITDA	802.0
Period 4 EBITDA	821.0
NTM EBITDA	\$3,047.0
Target NTM Multiple	27.0x
Enterprise Value	\$82,269.0
(-) Net Debt	(2,126.0)
(-) Preferred Stock	0.0
(-) Non-Controlling Interests	0.0
Equity Value	\$80,143.0
Shares Outstanding	1,207.0
Implied Share Price	\$66.40
% Return	(15.4%)

EBITDA	Enterprise Value / EBITDA Implied Share Price				
	25.0x	26.0x	27.0x	28.0x	29.0x
\$2,750	\$55.20	\$57.47	\$59.75	\$62.03	\$64.31
\$2,895	\$58.19	\$60.59	\$62.99	\$65.39	\$67.79
\$3,047	\$61.35	\$63.87	\$66.40	\$68.92	\$71.45
\$3,199	\$64.51	\$67.16	\$69.81	\$72.46	\$75.11
\$3,359	\$67.82	\$70.60	\$73.38	\$76.17	\$78.95

EBITDA	Enterprise Value / EBITDA Implied Return				
	25.0x	26.0x	27.0x	28.0x	29.0x
\$2,750	(29.7%)	(26.8%)	(23.9%)	(21.0%)	(18.1%)
\$2,895	(25.9%)	(22.8%)	(19.8%)	(16.7%)	(13.7%)
\$3,047	(21.9%)	(18.7%)	(15.4%)	(12.2%)	(9.0%)
\$3,199	(17.9%)	(14.5%)	(11.1%)	(7.7%)	(4.4%)
\$3,359	(13.6%)	(10.1%)	(6.6%)	(3.0%)	0.5%

Appendix

Acquisition Feasibility- Evaluating Possible Acquisitions- A Deeper Analysis

Infeasible Acquisitions



Relevance and Rationale



- Fabless semiconductor software company specializing in AI data processing and visualization
- Collaborations in Autonomous vehicles and data center solutions although main market in consumer electronics. Several collaborations and investment expenditures in the AI industry, specifically mobile.
- Large Deep Learning, Reinforcement Learning, and Research funds aimed at unsupervised learning
- Developing/expanding on natural language processing and speech technologies with *Siri* platform



- One of the biggest semiconductor companies in the world centered on AI innovation
- Currently the sole proprietor of over 90,000 patents and expanding especially in AI Edge integration
- Global partner ecosystem encourages company innovation and allowance of new architecture development to build new products and form new partnerships
- Flexibility of chip is especially attractive with multi-purposeness, cloud connectivity, and customization. Expanding all services on SoCs are becoming more of a revenue driver as AI increases



- Owned by serial chip entrepreneurs who sold last company Icera to Nvidia for \$435 million in 2011
- Starting to become a huge threat to major industry players with SoC designs and new IPU systems
- Forecasted to be transformative across all industries and had received \$222M USD in Serial E funding
- Current valuation holds at \$2.77B USD and has many strategic backers like Microsoft, BMW, and Dell
- One of the major threats to Nvidia as customers flock to the innovation and start-up culture



- Chinese multinational technology company specializing in Internet-related services and products and artificial intelligence.
- Second largest search engine in the world, occupying 76.5% of China's search engine market share
- Entered the GBU market as a major player with partnership with Snap Inc as company's official ad reseller

Source: (Apple, 2021), (Crunchbase, 2021), (Graphcore, 2021), (Intel, 2021), (Investopedia, 2021)

Decision

- Sheer size of Apple shows the company is not willing to sell and company would overtake Nvidia
- From a value perspective, Apple does not have a big share in gaming markets and therefore cannot match Nvidia's main goal of integrating AI in gaming GPUs

- Intel's dominant market share indicates they would not be willing to sell even one of their business segments. Currently hold leading GPU market share.
- AI segments are not as largely focused on gaming as Nvidia so business priorities regarding R&D misaligned

- High valuation along with unwillingness to sell makes acquisition unfeasible
- Graphcore mainly operates in home, automobile, and mobile services, not gaming which is Nvidia's main operational focus.

- Currently serving antitrust lawsuits for past mergers and acquisitions deals
- Risk analysis proves more harm than good when partnering with Baidu even though AI tradeoff is beneficial

Appendix

Acquisition Feasibility- Evaluating Possible Acquisitions- A Deeper Analysis

Feasible and Target Acquisitions



Relevance and Rationale

- Fabless semiconductor software company specializing in AI data processing and visualization
- Collaborations in Autonomous vehicles and data center solutions
- Kalray's acquisition of MPAA (Massively Parallel Processor Array) is patented and serves as a unique positioning platform for the companies differentiating in data center innovation and machine learning
- Offers programmable and flexible NVMe-oF Smart Storage Adaptor along with SDK environments



- VC-backed company with unique data flow architecture and AI combination
- Acquired MIPS processors for SoC for mobile, home., and IoT devices and integrates for professional partnerships with companies like Microsoft, Dell, Cisco, Maraki, and Barracuda
- Developing AI native dataflow technology which is a dataflow application that demands a dataflow processor, eliminating host and co-processor in the calculations of a neural network



- Develops accelerators that have fastest response and maximum performance without offset
- Newest technology of TSP with ASIC implementation giving more computing power
- Development of AI integration with robotics for example pipe bots which keep sewer pipes clean
- Hardware capable of performing over 400,000 multiplications before one byte is retrieved from memory on a GPU. GPU integration with Nvidia may open up new projects and markets to explore



- Media chip specialization in telecommunications field
- AI chip developer in consumer multimedia products and attractive "NeuroPilot" technology
- Helps achieve Nvidia's like mindedness of a "data centric" and "data driven" organization by implementing AI architecture in product spheres and increase 5G networks globally
- Also has a gaming sector and chip deficits have presented with GPU shortages aka Nvidia's speciality

Decision

- Viable acquisition, however, doesn't align with Nvidia's end goal of AI chip development in consumer gaming
- Kalray mainly focuses on machine learning in data centers which Nvidia already has stakes in including a well developed partner program.

- Filed for Chapter 11 Protection (bankruptcy) in 2020 which shows volatility
- May be too much restructuring and integration for Nvidia especially financing a company in debt
- SoC technology attractive but doesn't outweigh negatives

- New startup with patents in AI hardware that may disrupt current industry
- Not looking to sell but Tensor processors and Tegra units align with half of Nvidia's business segments

- Product expansion with Nvidia's media sector and 5G gaming connectivity with gaming processors
- Acquiring an international company may see challenges but business strategy and segments can easily align and integrate with one another.

Source: (Groq, 2021), (Kalray, 2021), (MediaTek, 2021), (Wave Technologies, 2021)

Appendix

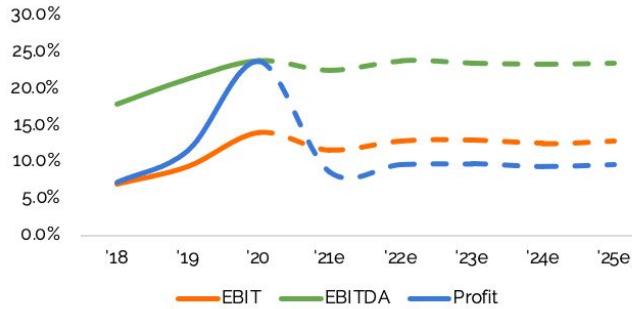
Alternative Solution- Company Targets: Comparing Margin Projections

Profit, EBIT, and EBITDA Margins for AMD and MediaTek



AMD

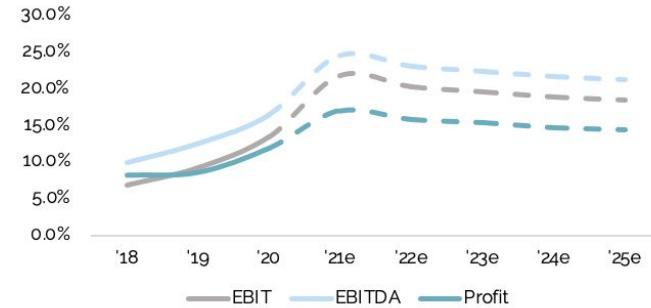
AMD Margins Analysis



While EBITDA and EBIT Margin growth is relatively flat through the projection period, Profit Margins see a spike from 2019A-2020A, and return to normal levels through 2025.

MEDIATEK

MediaTek Margins Analysis



EBIT, EBITDA, and Profit Margins see slight growth from 2020A-2021E, and a fairly flat growth in margins for the remaining years through 2025.

Source: (Advanced Micro Devices, 2021), (Capital IQ, 2021)

Appendix

Feasibility

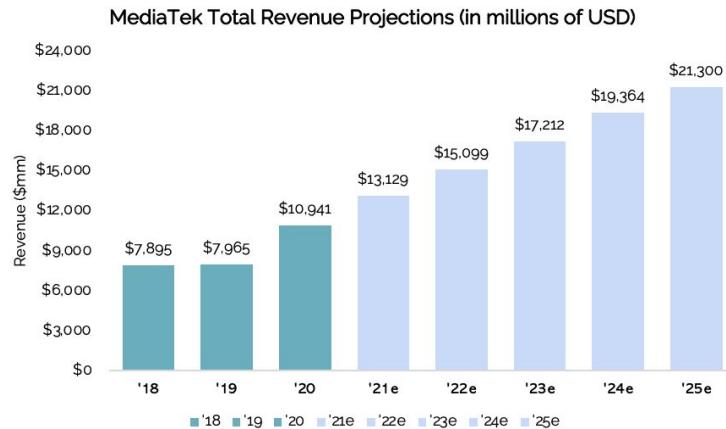
Alternative Solution- Supplemental MediaTek Financial Data



Revenue Projections for Sole Business Segment

MEDIATEK

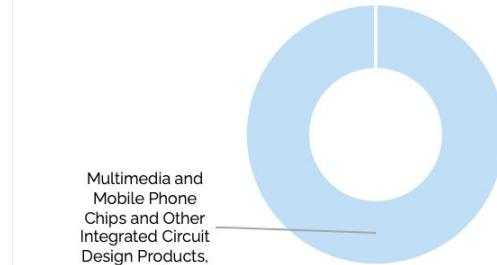
Total Revenue Projections through 2025



MediaTek Segment Breakdown

The Company has one reportable business segment

MediaTek Business Segment Breakdown



Source: (MediaTek, 2021)

Appendix

Alternative Solution

Alternative Solution- Supplemental MediaTek Financial Data

Multiples Sensitivity Analysis



NTM P/E Multiple Calculation

Implied Share Price and Implied Return Sensitivity

Price / Earnings	
Period 1 EPS	\$0.40
Period 2 EPS	\$0.36
Period 3 EPS	\$0.39
Period 4 EPS	\$0.36
NTM Earnings Per Share	\$1.51
Target NTM Multiple	25.0x
Implied Share Price	\$37.75
% Return	18.3%

	Price / Earnings Implied Share Price					
	23.0x	24.0x	25.0x	26.0x	27.0x	
Earnings Per Share	\$1.36	\$31.34	\$32.71	\$34.07	\$35.43	\$36.79
	\$1.43	\$32.99	\$34.43	\$35.86	\$37.30	\$38.73
	\$1.51	\$34.73	\$36.24	\$37.75	\$39.26	\$40.77
	\$1.59	\$36.47	\$38.05	\$39.64	\$41.22	\$42.81
	\$1.66	\$38.29	\$39.95	\$41.62	\$43.28	\$44.95

	Price / Earnings Implied Return					
	23.0x	24.0x	25.0x	26.0x	27.0x	
Earnings Per Share	\$1.36	(1.8%)	2.5%	6.7%	11.0%	15.3%
	\$1.43	3.4%	7.9%	12.4%	16.8%	21.3%
	\$1.51	8.8%	13.5%	18.3%	23.0%	27.7%
	\$1.59	14.2%	19.2%	24.2%	29.1%	34.1%
	\$1.66	20.0%	25.2%	30.4%	35.6%	40.8%

Source: (Capital IQ, 2021)

Appendix

Alternative Solution- Supplemental MediaTek Financial Data

Multiples Sensitivity Analysis



NTM EV/EBITDA Multiple Calculation

Implied Share Price and Implied Return Sensitivity

Enterprise Value / EBITDA	
Period 1 EBITDA	\$281.0
Period 2 EBITDA	352.0
Period 3 EBITDA	616.0
Period 4 EBITDA	637.0
NTM EBITDA	\$1,886.0
Target NTM Multiple	25.0x
Enterprise Value	\$47,150.0
(-) Net Debt	(6,996.0)
(-) Preferred Stock	0.0
(-) Non-Controlling Interests	(116.3)
Equity Value	\$40,037.7
Shares Outstanding	1,582.7
Implied Share Price	\$25.30
% Return	(20.7%)

EBITDA	Enterprise Value / EBITDA Implied Share Price				
	23.0x	24.0x	25.0x	26.0x	27.0x
\$1,702	\$20.24	\$21.32	\$22.39	\$23.47	\$24.54
\$1,792	\$21.54	\$22.68	\$23.81	\$24.94	\$26.07
\$1,886	\$22.91	\$24.11	\$25.30	\$26.49	\$27.68
\$1,980	\$24.28	\$25.54	\$26.79	\$28.04	\$29.29
\$2,079	\$25.72	\$27.04	\$28.35	\$29.66	\$30.98

EBITDA	Enterprise Value / EBITDA Implied Return				
	23.0x	24.0x	25.0x	26.0x	27.0x
\$1,702	(36.6%)	(33.2%)	(29.8%)	(26.5%)	(23.1%)
\$1,792	(32.5%)	(29.0%)	(25.4%)	(21.9%)	(18.3%)
\$1,886	(28.2%)	(24.5%)	(20.7%)	(17.0%)	(13.3%)
\$1,980	(23.9%)	(20.0%)	(16.1%)	(12.2%)	(8.2%)
\$2,079	(19.4%)	(15.3%)	(11.2%)	(7.1%)	(3.0%)

Source: (Capital IQ, 2021)

Appendix

Alternative Solution- Supplemental MediaTek Financial Data

DCF Sensitivity Analysis- Exit Multiple Method



Exit Multiple Method	
Terminal Year EBITDA	\$4,513.4
Exit Multiple	15.0 x
Terminal Value	\$67,701.6
PV of Terminal Value	50,919.7
PV of Stage 1 Cash Flows	3,551.7
Implied Enterprise Value:	54,471.4
(+) Cash & Equivalents	6,996.0
(-) Preferred Stock	0.0
(-) Total Debt	0.0
(-) Non-Controlling Interests	(116.3)
Implied Equity Value:	61,351.1
Diluted Shares Outstanding	1,582.7
Implied Share Price:	\$38.76
% Return:	21.4%

Implied EBITDA Multiple

14.6 x

Exit Multiple Method

Calculation of Implied EBITDA Multiple

Weighted Average Cost of Capital	Exit Multiple Implied Share Price				
	13.0x	14.0x	15.0x	16.0x	17.0x
4.07%	\$36.13	\$38.40	\$40.67	\$42.93	\$45.20
4.57%	\$35.29	\$37.50	\$39.70	\$41.90	\$44.11
5.07%	\$34.47	\$36.62	\$38.76	\$40.91	\$43.05
5.57%	\$33.68	\$35.77	\$37.86	\$39.94	\$42.03
6.07%	\$32.92	\$34.95	\$36.98	\$39.01	\$41.04

Weighted Average Cost of Capital	Exit Multiple Implied Return				
	13.0x	14.0x	15.0x	16.0x	17.0x
4.07%	13.2%	20.3%	27.4%	34.5%	41.6%
4.57%	10.6%	17.5%	24.4%	31.3%	38.2%
5.07%	8.0%	14.7%	21.4%	28.2%	34.9%
5.57%	5.5%	12.1%	18.6%	25.1%	31.7%
6.07%	3.1%	9.5%	15.8%	22.2%	28.6%

Source: (Capital IQ, 2021)

Appendix

Alternative Solution

Exit Multiple Method is used to calculate the terminal value of the Company's FCFs, under the assumption that business value will be determined at the end of the projection period.

Alternative Solution- Supplemental MediaTek Financial Data

DCF Sensitivity Analysis- Perpetual Growth Rate



Perpetuity Growth (PGR) Method	
Terminal Year FCF	\$1,321.1
PGR	3.00%
Terminal Value	\$65,773.1
PV of Terminal Value	49,469.3
PV of Stage 1 Cash Flows	3,551.7
Implied Enterprise Value	\$53,021
(+) Cash & Equivalents	6,996.0
(-) Preferred Stock	0.0
(-) Total Debt	0.0
(-) Non-Controlling Interests	(116.3)
Implied Equity Value	\$59,900.7
Diluted Shares Outstanding	1,582.7
Implied Share Price	\$37.85
% Return	18.6%

Implied Terminal Growth Rate

3.1%

Perpetual Growth Rate (PGR) Method Calculation of Implied Terminal Growth Rate

Weighted Average Cost of Capital	Perpetual Growth Rate Implied Share Price				
	2.50%	2.75%	3.00%	3.25%	3.50%
4.07%	\$50.01	\$58.36	\$70.60	\$90.32	\$127.38
4.57%	\$38.60	\$43.09	\$49.00	\$57.15	\$69.12
5.07%	\$31.64	\$34.41	\$37.85	\$42.23	\$48.01
5.57%	\$26.95	\$28.82	\$31.04	\$33.75	\$37.11
6.07%	\$23.59	\$24.92	\$26.47	\$28.29	\$30.46

Weighted Average Cost of Capital	Perpetual Growth Rate Implied Return				
	2.50%	2.75%	3.00%	3.25%	3.50%
4.07%	56.7%	82.8%	121.2%	183.0%	299.1%
4.57%	20.9%	35.0%	53.5%	79.0%	116.5%
5.07%	(0.9%)	7.8%	18.6%	32.3%	50.4%
5.57%	(15.6%)	(9.7%)	(2.7%)	5.7%	16.3%
6.07%	(26.1%)	(21.9%)	(17.1%)	(11.4%)	(4.6%)

Source: (Capital IQ, 2021)

Appendix

Alternative Solution

Perpetual Growth Rate Method assumes a constant rate of cash flow generation into perpetuity.

The background image shows a wide-angle aerial view of a modern stadium or arena during dusk or dawn. The stadium's most prominent feature is its large, illuminated, blue-tinted roof, which has a complex, faceted, diamond-like pattern. The building itself is mostly dark, with some lights visible inside. In front of the stadium is a multi-lane highway with several cars. To the left, there's a green park area with a small building. The sky is a deep blue, suggesting it's either night or the sun is just rising. In the far distance, more city buildings and hills are visible.

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