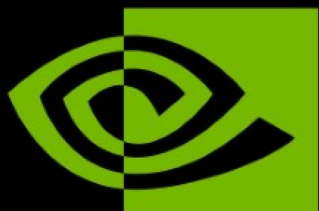


APRIL 2020

NVIDIA EQUITY REPORT

BY SANJAY GOSPODINOV COL'23



NVIDIA®

02**NVIDIA REVENUE STREAM**

NVidia Corp is a technology company based in Santa Clara, Ca with operations worldwide. It is primarily a graphics processing chip manufacturer that makes most of its revenue from the sales of graphics processing units (GPUs), which are used for gaming, professional visualization, and cryptocurrency mining. The Nvidia graphics card, Geforce, is a particularly popular gaming graphics card and as of right now, Nvidia controls 18% of the overall graphics card market and 73% of the discrete GPU market (where the GPU and CPU are separate). Nvidia also produces Quadro, a GPU aimed at professional graphics content designers. They additionally make Tesla (no relation to the car maker), which is a GPU accelerator that runs simulations, deep learning algorithms, and is primarily marketed towards AI data scientists and big data research. Lastly, this segment of NVidia also makes GRID, a product designed for cloud-based streaming. This reportable segment, which almost entirely sells GPUs, makes up 86.7% of Nvidia's revenue.

TEGRA SEGMENT AND OPPORTUNITY FOR GROWTH

The other reportable segment of Nvidia is Tegra, which combines a GPU and CPU onto one chip. This product is made to support online gaming, entertainment devices, drones, and self-driving cars. This segment of Nvidia's business is relatively new and only produced about 13% of the company's revenue in 2019. However, the opportunity for growth is tremendous here as, in early 2015, Nvidia partnered with Uber to expand in the self-driving car sector. They launched city trials in Pittsburg in 2016 and then in Phoenix in early 2017. In 2016, Nvidia also announced that the Tegra processor would be in all Tesla (yes, the car company this time) self-driving vehicles. So in addition to its profitable and growing core business, Nvidia has claimed a stake in the self-driving car sector and will benefit with its growth.

03**MARKET DRIVER I**

Seeing as 86.7% of Nvidia's revenues come from GPUs, the future of the GPU market is central to Nvidia's future earnings growth. The GPU market is experiencing increasing demand thanks to the need for processing units that can handle complex calculations related to 2D and 3D graphics. These are used in smartphones, tablets, consoles, and PCs, all of which are seeing rising adoption around the world. Essentially, as the need for graphics-based entertainment devices increases, the value of the GPU market rises. This is essentially the largest market factor and is a clear indicator of growth as smartphone penetration across the world is only projected to increase, as is the increased use of PCs and consoles. In fact, GPU sales are estimated to grow at an average of 31% until 2025.

MARKET DRIVER II

Another large factor fueling the current GPU market growth is the rising need for processors to support graphics tools and 3D content in a wide range of industries, such as the auto, manufacturing, real estate, and health industries. For example, to support manufacturing design applications in the automotive industry, CAD and simulation software use GPUs to make photorealistic images and video. These are industries that did not use to have a particular demand for GPUs, but in recent years tools like these have cropped up and have begun fueling a large demand for GPUs for a wide range of uses. For example, Nvidia projects that by 2022, 20% of its revenue will come from its automotive products, up from 6% now.

MARKET DRIVER III

Lastly, the cloud deployment segment in the GPU market is also projected to grow as customers (primarily businesses) turn to cloud-based solutions for the benefit of their scalability and flexibility. Huge cloud platform providers like Microsoft, Amazon Web Services, and IBM are partnering up with GPU makers to deliver on-demand GPU cloud computing. Cloud GPU services are essentially for machine learning and companies that use algorithms for example, benefit the most from these products.

WHAT DOES THIS MEAN FOR NVIDIA?

Current market trends favor future growth for Nvidia Corp. Nvidia controls 18% of the overall GPU market and as smart devices, PCs, and gaming consoles see increased penetration across all markets, Nvidia products will represent a significant portion of the GPUs that power the devices sold to these first-time buyers. It is important to note here the way the GPU market works. There are essentially two products, discrete GPUs and Integrated GPUs. Nvidia produces discrete GPUs (essentially, high graphical output GPUs) and is the market leader in that field (over 68% market share). It does not make integrated GPUs (low graphical output GPUs) which is why it makes up 18% of the overall GPU market. There are more low-end GPUs than high end.

And as these other industries turn to GPUs to power their new visual devices, Nvidia is taking a position as a main supplier as it already has a suite of products designed for various uses, like Quadro, Tesla, and the Tegra segment (discussed above)

As for cloud-computing, Nvidia is already a leader in the field as they have partnered with IBM to support their cloud GPU services with the Nvidia Tesla K80 cards.

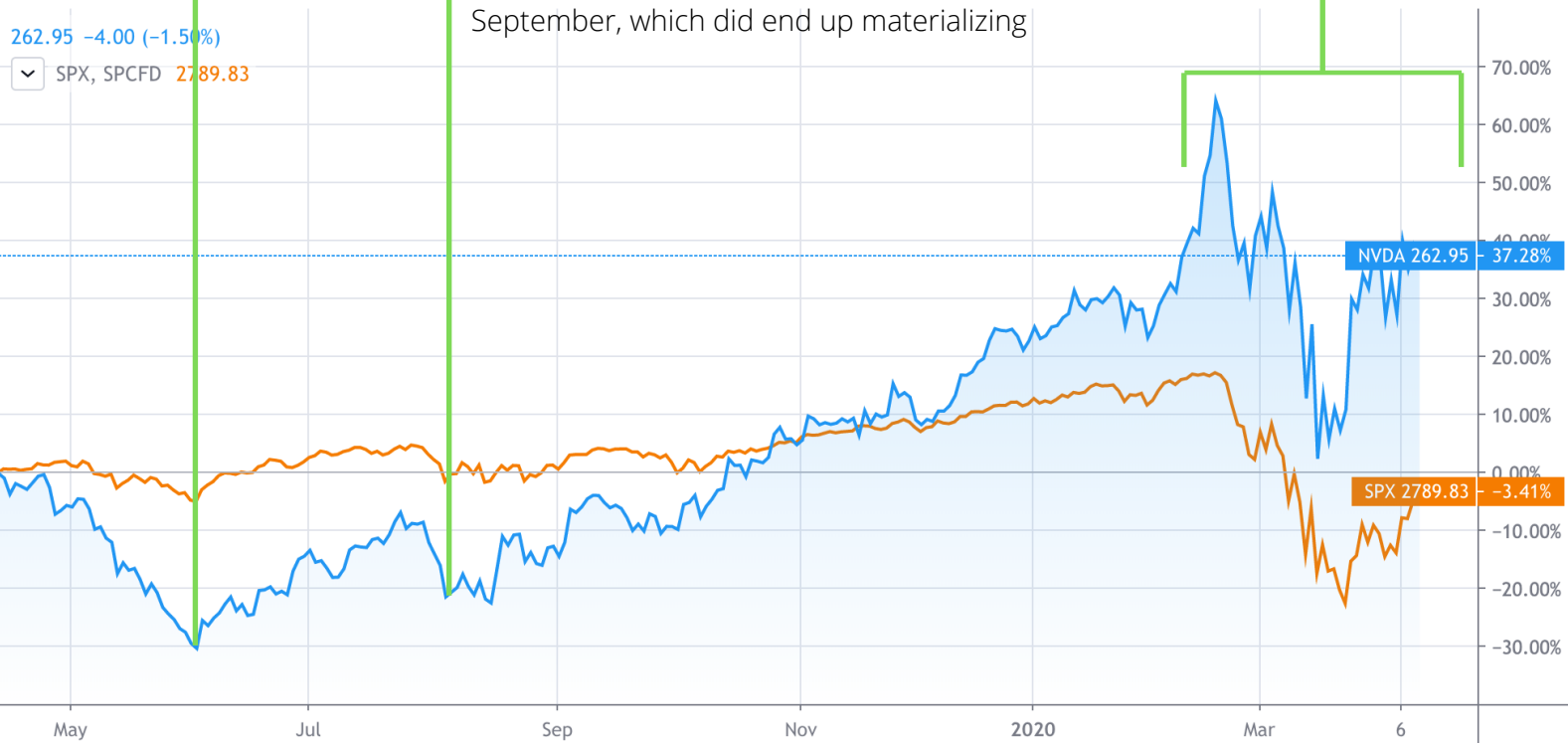
05

A LOOK AT NVIDIA'S STOCK OVER THE PAST YEAR

This dip in price seen from May to mid-April primarily reflects investors' concerns regarding the worsening trade tensions between China and the US.

Initially, Nvidia stock spiked nearly 20% after releasing very strong 4th quarter results on Feb 14, indicating that revenue had soared 41% year over year. This came in the middle of a huge market crash due to coronavirus so many investors jumped on the stock, driving its price even higher. Beginning in March, Nvidia stock began following the general trend of the market and crashed along with the S&P in early March before a very strong rally in late March on realization that Nvidia's business had not been impacted very much by the virus and has experienced a general trend upward since then.

Nvidia saw a decrease in stock price of around 14% in early August due to weak quarterly results of its main competitor, AMD, leading investors to expect the same of Nvidia, in addition to other worries regarding the trade war with China. However, it rallied quickly on expectation of strong quarterly results to be announced in September, which did end up materializing



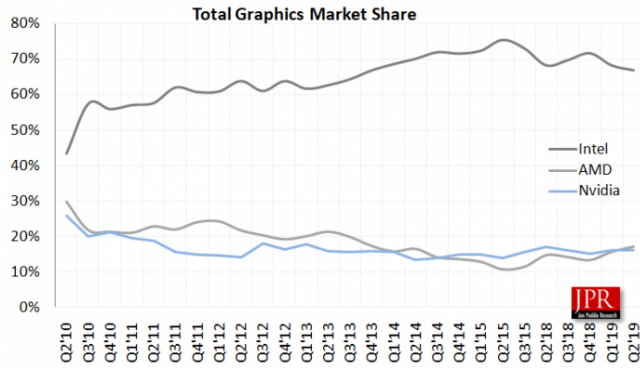
INVESTMENT THESIS

1. STRONG INDUSTRY GROWTH

Nvidia's future revenue growth rests largely on the fact that the GPU market is very strong and will continue to grow well into the future. The overall GPU market is projected to grow at an average of 31% until 2025 (study linked at the end) and due to Nvidia's market position, it is poised to at minimum grow its revenue with the market pace of 31%. This is, of course, based on the assumption that Nvidia will maintain its current market share, an assumption that will be fully-fleshed out on the next page. But, assuming market share stability, the company's revenue will likely grow at an average of 31% over the next few years. However, it will likely grow even more than that as there are reports that the real drivers of overall GPU market growth are going to be discrete GPUs (the kinds of high end GPUs used in gaming, etc.). This is excellent for Nvidia as this is their bread and butter, Nvidia as of Q4 2019 claims more than 68% of the discrete GPU market. So really, it is not simply that all GPUs are going to see increased shipments, but the kind of GPUs that Nvidia specifically produces will see increased shipments. Unfortunately those reports, like the one from Marketwatch linked at the end, do not have specific figures in their press release so I have purposely chosen not to include this potential upside in the revenue growth calculations. But, it should serve as a reminder that not only is Nvidia's standard revenue growth projection excellent, but their potential growth is even higher than is calculable. As to what is going on with all this discrete GPU growth, it comes as PC gaming, consoles, and other high graphical output devices become more prevalent and see increased penetration in developing markets. Additionally, as discussed before, new market segments are seeing a new demand for high-end GPUs, such as the automotive industry, and the demand for cloud GPU processing has increased. These are all fields in which Nvidia is poised to serve this new demand and in turn grow its revenue.

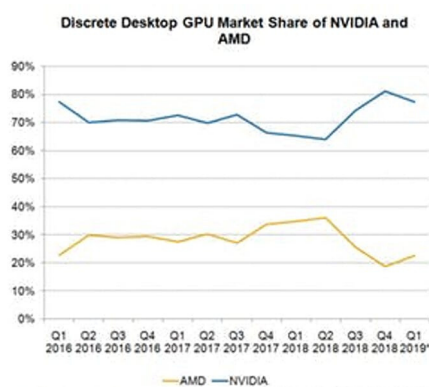


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2. STRONG MOAT

Nvidia's moat comes in the form of its very strong market position in discrete GPUs. Currently Nvidia has 68.92% of the discrete GPU market. The rest of the market share belongs to AMD and these two companies essentially make up the entire market. Overall, their market positions have been relatively stable for years, with around 2-10% of market share jumping from Nvidia to AMD and back every quarter. Nvidia's position in the overall GPU market, of which it claims 18%, is even more stable and has been at roughly 18% since 2011. The rest of that market is made of integrated GPUs, which are low-end cheap GPUs put in most office computers and produced mainly by Intel. Nvidia does not produce those and instead focuses on dominating the discrete market. Nvidia's stable market position is a result of the fact that it has established itself as the lead graphics card manufacturer for gaming and has built a rather public reputation for itself. People have been using their graphics cards for years and know their quality. It is important to note here that brand recognition is strong among discrete GPU manufacturers because the GPU is generally known to the consumer here. Most people who buy office computers do not care about the graphics card, which is why Intel has dominated that market by just producing the cheapest ones. In discrete GPUs (again, most often used in gaming), the consumer is very aware of the graphics card as it is a huge component of the graphical output of the PC and, since it is *discrete*, it can be removed from the PC and a new one put in. Often, people will keep the same PC but will shop directly for GPUs themselves and install the latest model into their PC. Consumers have been directly buying Nvidia graphics cards for years and Nvidia has thus generated a very good brand image. It would be very difficult for a new player to come into the discrete GPU market and take market share as not only has no other firm built up the technical expertise that producing these kinds of high-end graphics cards requires, not even considering the high R&D cost, but consumers would likely maintain their affinity for Nvidia cards as they have been the market leader for years. Additionally, it is very unlikely that AMD, for example, would come out with a better card, as Nvidia spends almost double what AMD does on R&D (2.8B vs 1.5B)



Note: this graph does, in fact, end at Q1 2019, however the point is to show the relative market share stability of discrete GPUs

3. UNDERVALUED SHARE PRICE

Lastly, Nvidia's share price actually does not take into account this future revenue growth. It could be correct if Nvidia were not to grow next year, but the company, along with the GPU market generally, are poised to ensure that does not happen. According to the discounted cash flow analysis I did, the share price should be \$452.46, which is a massive 72% upside from its current stock price of \$263. This is actually a conservative estimate for two reasons: I am not counting the potential of discrete GPUs to outpace the growth of the overall GPU market, which would even more significantly increase Nvidia's revenue and therefore share price. I also have a disagreement about the Gordon Growth Method, which I have left in the DCF at its original weight, but believe it unnecessarily lowers the share price due including its large amount of cash in the working capital calculation (explained more later).



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INVESTMENT RISKS

THE GPU INDUSTRY COULD TAKE A HIT:

Theoretically, the GPU market could end up displaying slower than expected growth, which would lower Nvidia revenue estimates. This would be the biggest problem for Nvidia as its business is very much at the whim of GPU demand. Of course, studies and projections show that this is not expected to happen but it is serious possibility and should be taken into account. It is also important to note here that even if the overall GPU market does not grow as much, this does not stop the discrete GPU market from performing well, which is all Nvidia needs to maintain revenue projections.

NVIDIA COULD LOSE MARKET SHARE:

Another grim situation for Nvidia would be for it to lose market share to a competitor. This would probably either be AMD or some new player in the discrete GPU market. This is a serious possibility as it is always possible for someone to come out with a better GPU. However, this is unlikely as its market position is very stable. Nvidia and AMD have basically maintained their market positions for years and no one has really ever been able to compete with them in the discrete for as long as the discrete GPU market has existed.

DISCRETE GPUS COULD SEE A DROP IN DEMAND

Lastly it could happen that the overall GPU industry continues growing healthily but discrete GPUs specifically see either slow growth or a drop in demand. This is really not a probable outcome as signs point to discrete GPUs being the drivers of overall GPU growth instead of integrated GPUs. This would basically mean that consumers would start choosing integrated GPUs over discrete, but so far there does not exist an integrated GPU that can match the technical output of a modern discrete GPU.



Game Ready and Studio Drivers

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COMPARABLE COMPANIES ANALYSIS

Nvidia (NVDA)

Comparable Companies Analysis

	Market Cap (\$B)	EV/Sales TTM	EV/EBITDA TTM	EV/EBIT TTM	EV/FCF TTM	P/B	P/E	D/E	Beta	Unlevered Beta
NVDA	\$ 160.93	13.76x	44.16x	49.76x	47.11x	12.99x	34.48x	0.22	1.47	1.26
AMD	\$ 56.65	8.16	75.84	117.98	152.10	19.70	41.67	0.26	2.39	1.99
TXN	\$ 100.55	6.94	14.38	16.94	23.90	11.14	20.45	0.69	1.13	0.73
INTC	\$ 244.59	3.69	7.52	10.83	20.80	3.22	12.09	0.38	0.83	0.64
AVGO	\$ 101.67	6.16	14.19	41.03	14.17	4.16	11.51	1.87	0.91	0.37
QCOM	\$ 81.82	3.58	8.86	10.81	18.77	18.42	17.21	3.53	1.40	0.37
Mean (weighted)	\$117.06	5.71x	24.16x	39.52x	45.95x	11.33x	20.59x	1.35x	1.33x	0.82x
Median (weighted)	\$100.55	6.16x	14.19x	16.94x	20.80x	11.14x	17.21x			
Assumed Low		3.69x	8.86x	10.83x	18.77x	4.16x	12.09x			
Assumed High		6.94x	14.38x	41.03x	23.90x	18.42x	20.45x			

Sources: SEC Filings, Bloomberg

	EV/Sales TTM	EV/EBITDA TTM	EV/EBIT TTM	EV/FCF TTM	P/B	P/E
Multiple	6.16x	14.19x	16.94x	20.80x	11.14x	17.21x
TTM Financial Metric	10.92	3.40	3.02	3.19	19.92	4.57
Enterprise Value	67.27	48.29	51.16	66.35	221.91	
Less: Total Debt	2.64	2.64	2.64	2.64	2.64	
Plus: Cash & Cash Equivalents	10.90	10.90	10.90	10.90	10.90	
Implied Equity Value	75.53	56.55	59.42	74.61	230.17	
Shares Outstanding	0.61	0.61	0.61	0.61	0.61	
Implied Share Price	\$123.41	\$92.40	\$97.09	\$121.92	\$376.09	\$78.63
25th Percentile	\$79.34	\$62.76	\$66.94	\$111.33	\$148.90	50.50
75th Percentile	\$137.33	\$93.46	\$215.97	\$138.07	\$613.05	93.43

Fill in the TTM financial metric in row 2 same with TTM debt and cash/cash equivalents below, same with shares outstanding

Most of this page will take care of itself once those are inputted and the multiple are inputted above

Watch for outliers, refer to the lecture notes

CRITICAL EXPLANATION:

With the Comparable Companies Analysis, the valuation is very tricky. As it stands, AMD, Texas Instruments, Intel, Broadcom, and Qualcomm are all some of the most comparable, if not the most comparable, companies to Nvidia. They are all global GPU manufacturers whose market caps range from 50-200 billion roughly. However, even though they are the most comparable in a relative sense, in an absolute sense the latter four of these firms are not actually very similar to Nvidia. Nvidia and AMD are really in a market of their own here which is why their EV to EBITDA ratios are much higher. While all these companies technically produce GPUs, Nvidia and AMD focus on making discrete GPUs, which are graphics cards that are separate from the PC's motherboard and are generally high-end, most often used in gaming computers, consoles, and other high graphical output devices. The rest of these firms, especially Intel, mainly produce integrated GPUs, low-end graphics cards that are cheap to make and are part of the PC's motherboard. These are essentially two very different markets. Nvidia and AMD basically maintain a duopoly of the discrete GPU market, with Nvidia at 68.92% and AMD at 31.08% as of Q4 2019. Additionally, Nvidia and AMD are much higher growth companies. Nvidia for example, has grown its revenue by 58% for the last four years and AMD has by 74%. Meanwhile Intel was at 21%, Texas Instruments at 7.6%, Qualcomm at 3%, and Broadcom at 71% (which may be striking but Broadcom is a very leveraged company, its debt-equity ratio is at 1.87 which drastically brings down its EV/EBITDA ratio). This also brings up the point that Nvidia and AMD have very little debt, their D/E ratios are both in the point twenties, meanwhile Intel's is at 0.38, TXN's is at 0.69, Broadcom is at 1.87, and Qualcomm is at 3.53. All this contributes to Nvidia and AMD having much higher EV/EBITDA ratios. So, when you apply the averaged EV/EBITDA ratios of these other companies, it lowers the price per share of Nvidia more than is realistically justified. This is why I make the recommendation that the Comparable Companies Analysis is not of great use here and have chosen for the DCF to apply the exit multiple of 50.5 rather than the average of the ratios of these firms. 50.5 is half of the distance between Nvidia's current ratio and the average of its current ratio and AMD's ratio. I did this to both ensure that the two most comparable companies and direct competitors, Nvidia and AMD, make up the ratio used but also to use a more conservative estimate in case AMD's ratio is higher than it should actually be.

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DISCOUNTED CASH FLOW ANALYSIS

Nvidia (NVDA)

Revenue Forecasting

	2016A	2017A	2018A	2019A	2020A	2021E	2022E	2023E
Net Revenue	\$5,010.0	\$6,910.0	\$9,714.0	\$11,716.0	\$10,918.0	\$13,852.1	\$17,695.9	\$22,731.2
%Δ	-	37.9%	40.6%	20.6%	(6.8%)	26.9%	27.7%	28.5%
GPU Revenue	4,187.0	5,822.0	8,137.0	10,175.0	9,465.0	12,399.1	16,242.9	21,278.2
% of Revenue	83.6%	84.3%	83.8%	86.8%	86.7%	89.5%	91.8%	93.6%
YoY Growth	-	39.0%	39.8%	25.0%	(7.0%)	31.0%	31.0%	31.0%
Tegra Processor Revenue	559.0	824.0	1,534.0	1,541.0	1,453.0	1,453.0	1,453.0	1,453.0
% of Revenue	11.2%	11.9%	15.8%	13.2%	13.3%	10.5%	8.2%	6.4%
YoY Growth	-	47.4%	86.2%	0.5%	(5.7%)	-	-	-
All Other Revenue	264.0	264.0	43.0	-	-	-	-	-
% of Revenue	5.3%	3.8%	0.4%	-	-	-	-	-
YoY Growth	-	-	(83.7%)	(100.0%)	#DIV/0!	-	-	-
Revenue Segment 4	-	-	-	-	-	-	-	-
% of Revenue	-	-	-	-	-	-	-	-
YoY Growth	-	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	-	-	-
Revenue Segment 5	-	-	-	-	-	-	-	-
% of Revenue	0.0%	0.0%	-	-	-	-	-	-
YoY Growth	-	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	-	-	-
Net Sales	\$5,010.00	\$6,910.00	\$9,714.00	\$11,716.00	\$10,918.00	\$13,852.14	\$17,695.88	\$22,731.16
% growth	-	37.9%	40.6%	20.6%	(6.8%)	26.87%	27.7%	28.5%

Sources:

SEC Filings (Forms 10-K, 10-Q, 8-K)

Company Guidance from Investor Presentations / Conference Calls

Credit Suisse Research Report (xxx/xx/xxxxx)

Guggenheim Partners Research Report (xxx/xx/xxxxx)

REVENUE GROWTH ASSUMPTIONS:

1. As covered in the investment thesis, revenue is projected to grow at an average of 31% until 2025 and Nvidia has a very strong market position that likely will not change.
2. With the Tegra segment, I am actually predicting roughly no growth year over year as its revenue has been flatlining for the past two years, largely because a huge factor in the segment's growth 4 years ago, its addition into the Nintendo Switch, has largely paid off. The nature of console sales is that sales generally do not grow year over year following the release of a console. Without a new huge contract for Tegra, its growth in the immediate future is uncertain, however it makes up such a small amount of Nvidia's total revenue that this largely does not matter. What is critical is Tesla's decision to use Tegra in its future self-driving cars. This cannot be projected here due to the fact that no one knows when self-driving cars will be fully released. But, it is a promise of a huge payoff later.

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OPERATING MODEL

Nvidia (NVDA)							
Operating Model (\$mm, fiscal year ending Jan. 26)							
Income Statement							
	2017A	2018A	2019A	2020A	2021E	2022E	2023E
Net Sales (\$mm)	6,910.0	9,714.0	11,716.0	10,918.0	13,872.1	17,695.9	22,731.2
Cost of Goods Sold	2,847.0	3,892.0	4,545.0	4,150.0	5,265.3	6,726.3	8,640.3
Gross Margin	4,063.0	5,822.0	7,171.0	6,768.0	8,586.9	10,969.6	14,090.9
SG&A	476.0	616.0	729.0	712.0	834.1	977.0	1,141.4
Other Operating Expenses	1,466.0	1,797.0	2,376.0	2,829.0	3,450.8	4,231.3	5,208.0
Operating Expenses	1,942.0	2,413.0	3,105.0	3,541.0	4,284.8	5,208.4	6,349.4
EBITDA	2,121.0	3,409.0	4,066.0	3,227.0	4,302.0	5,761.2	7,741.5
D&A	187.0	199.0	262.0	381.0	483.4	617.5	793.2
EBIT	1,934.0	3,210.0	3,804.0	2,846.0	3,818.6	5,143.7	6,948.2
Other expense (income)	(29.0)	(47.0)	(150.0)	(176.0)	(124.3)	(150.1)	(150.1)
Interest expense	38.0	61.0	58.0	52.0	53.8	53.8	53.8
EBT (Pre-Tax Income)	1,905.0	3,196.0	3,896.0	2,970.0	3,889.2	5,240.0	7,044.6
Tax Expense (Forecast future @ 21.0%)	239.0	149.0	(245.0)	174.0	816.7	1,100.4	1,479.4
Net Income	1,666.0	3,047.0	4,141.0	2,796.0	3,072.4	4,139.6	5,565.2
Income attributable to NCI							
Net Income attributable to CS	1,666.0	3,047.0	4,141.0	2,796.0	3,072.4	4,139.6	5,565.2
Shares Outstanding	385.0	606.0	606.0	612.0	612.0	612.0	612.0
Operating EPS	\$2.85	\$5.03	\$6.83	\$4.57	5.0	6.8	9.1
Dividends	261.0	341.0	371.0	390.0	428.6	577.4	776.3
Margin and Expense Analysis							
	Historical				Estimates		
	2017A	2018A	2019A	2020A	2021E	2022E	2023E
Gross Margin (% of Net Sales)	58.80%	59.93%	61.21%	61.99%	61.99%	61.99%	61.99%
SG&A (% of Net Sales)	6.89%	6.34%	6.22%	6.52%	6.02%	5.52%	5.02%
Other Operating Expenses (% of Net Sales)	21.22%	18.50%	20.28%	25.91%	24.91%	23.91%	22.91%
Operating Expenses (% of Net Sales)	28.10%	24.84%	26.50%	32.43%	30.93%	29.43%	27.93%
Dividends (% of Net Income)	15.67%	11.19%	8.96%	13.93%	13.93%	13.93%	13.93%
Days Sales Outstanding	43.63	47.53	44.36	55.40	55.40	55.40	55.40
Days Payable	127.18	106.72	106.73	156.91	156.91	156.91	156.91
D&A (% of Net Sales)	2.71%	2.05%	2.24%	3.49%	3.49%	3.49%	3.49%
CapEx (% of Net Sales)	2.53%	6.10%	5.12%	4.48%	3.98%	3.48%	2.98%
Balance Sheet							
	2017A	2018A	2019A	2020A	2021E	2022E	2023E
Cash and Equivalents	6,798.0	7,108.0	7,422.0	10,897.0	11,000.0	12,000.0	13,000.0
Accounts Receivable	826.0	1,265.0	1,424.0	1,657.0	2,102.3	2,685.7	3,449.9
Other Current Assets	912.0	882.0	1,711.0	1,156.0	1,441.3	1,841.2	2,365.1
Current Assets	8,536.0	9,255.0	10,557.0	13,690.0	14,543.6	16,526.9	18,815.0
Accounts Payables & Accruals	992.0	1,138.0	1,329.0	1,784.0	2,263.4	2,891.5	3,714.3
Unearned Revenue							
Current Portion of Debt	796.0	15.0					
Other Current Liabilities							
Current Liabilities	1,788.0	1,153.0	1,329.0	1,784.0	2,263.4	2,891.5	3,714.3
Long Term Debt	1,983.0	1,985.0	1,988.0	1,991.0	1,991.0	1,991.0	1,991.0
Other Liabilities	277.0	632.0	633.0	1,336.0	1,336.0	1,336.0	1,336.0
Noncurrent Liabilities	2,260.0	2,617.0	2,621.0	3,327.0	3,327.0	3,327.0	3,327.0
Total Liabilities	4,048.0	3,770.0	3,950.0	5,111.0	5,590.4	6,218.5	7,041.3
Total Equity	5,762.0	7,471.0	9,342.0	12,204.0	12,204.0	12,204.0	12,204.0
Net Working Capital	6,748.0	8,102.0	9,228.0	11,906.0	12,280.2	13,635.4	15,100.7
Change in Net Working Capital	N/A	1,354.0	1,126.0	2,678.0	374.2	1,355.2	1,465.3
Capital Expenditures	176.0	593.0	600.0	489.0	551.2	615.6	677.1

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Fill in historical cells that light blue - most of this w beyond that

Double check shares outs most recent 10K and 10Q changed in which case yo the new number into the

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Current portion of long t schedule in the 10K for

Long term debt you can I toward the industry aver suggested by a CapEx sc

Other Current Liabilities I hold constant if it's not w advisor or do some resea

SMALL NOTE:

The only note here that was not covered in the previous slide is the decision to hold long term debt steady, as well as other liabilities. Nvidia has a lot of cash, roughly 11B, and rather little debt so this area is not of particular concern. Also, I altered the growth of the SG&A expense and other operating expenses to be -0.5%, as staff, corporate HQ costs, etc. will not linearly follow revenue and will likely, even if they grow as a total, become a smaller percent of sales.

13

ASSUMPTIONS FOR FINAL DCF:

Nvidia (NVDA)								
Discounted Cash Flow Analysis								
	Historical			CAGR	Projected			CAGR
	2018	2019	2020	(2018-2020)	2021	2022	2023	(2021-2023)
Sales	9,714	11,716	10,918	6.02%	13,852	17,696	22,731	28.10%
% growth	-	20.6%	-6.8%		26.9%	27.7%	28.5%	
Cost of Goods Sold	3892	4541	4150		5265	6726	8640	
Gross Profit	5,822	7,171	6,768	7.82%	8,587	10,970	14,091	28.10%
% margin	60%	61%	62%		62%	62%	62%	
Operating Expenses	2,413	3,107	3,341		4,287	5,208	6,349	
EBITDA	3,409	4,066	3,227	-2.71%	4,302	5,761	7,741	34.13%
% margin	35%	35%	30%		31%	33%	34%	
Depreciation & Amortization	199	262	381		483	618	793	
EBIT	3,210	3,804	2,846	-5.84%	3,819	5,144	6,948	34.89%
% margin	33%	32%	26%		28%	29%	31%	
Tax Expense	149	(245)	174		817	1,100	1,479	
Net Operating Profit After Tax (NOPAT)	3,061	4,049	2,672	-6.57%	3,002	4,043	5,469	34.97%
Plus: Depreciation & Amortization	199	262	381		483	618	793	
Less: Capital Expenditures	193	600	489		351	616	677	
Less: Increase / Decrease in Net Working Capital	1154	1126	2678		374	1,315	1,465	
Unlevered Free Cash Flow	\$1,313	\$2,585	-\$114	#NUM!	\$2,560	\$2,690	\$4,120	0.268563393
WACC	7.11%				7.11%	7.11%	7.11%	
Discount Period					1.0	2.0	3.0	
Discount Factor					0.93	0.87	0.81	
Present Value of Free Cash Flow	\$1,313	\$2,585	-\$114		\$2,390.09	\$2,344.78	\$3,352.69	

Enterprise Value - Terminal Multiple Method		Calculation of Implied Share Price	
Cumulative Present Value of FCF	\$8,087.55	Enterprise Value	\$326,249.83
Terminal Value		Less: Total Debt	2.64
Terminal Year EBITDA (Financial Metric)	7,741.48	Less: Preferred Securities	-
Exit Multiple	30.30x	Less: Noncontrolling Interest	-
Terminal Value	390,944.72	Plus: Cash & Cash Equivalents	10.90
Discount Factor	0.81	Implied Equity Value	\$326,258.09
PV of Terminal Value	318,162.27	Shares Outstanding	612.00
% of Enterprise Value	97.52%	Implied Share Price	\$533.10
Enterprise Value	\$326,249.83		

Enterprise Value - Gordon Growth Method		Calculation of Implied Share Price	
Cumulative Present Value of FCF	\$8,087.55	Enterprise Value	\$92,148.08
Terminal Value		Less: Total Debt	2.64
Terminal Year FCF	\$4,119.65	Less: Preferred Securities	-
Terminal Growth	3.00%	Less: Noncontrolling Interest	-
Terminal Value	103,290.11	Plus: Cash & Cash Equivalents	10.90
Discount Factor	0.81	Implied Equity Value	\$92,156.34
PV of Terminal Value	84,060.52	Shares Outstanding	612.00
% of Enterprise Value	91.22%	Implied Share Price	\$150.58
Enterprise Value	\$92,148.08		

Current Share Price	\$ 263.00
Terminal Multiple Method Weight	60%
Gordon Growth Method Weight	40%
Implied Share Price	\$380.09
Upside / Downside	44.5%

Most of the value is in the preferred shares

The key assumptions made in final DCF are:

1. As discussed before, using a 50.5 EV/EBITDA ratio as the exit multiple
2. A 3% terminal growth.
3. No preferred securities as none have been issued.

Note: I have slightly altered the weight of the models because I think the Gordon Growth Method is not as useful because it counts cash in net working capital, which I think is a mistake. Nvidia has a lot of cash and cash equivalents on hand and the model essentially counts that against it. This cash if it is invested in treasuries, for example, earns a fair interest and should be excluded from working capital calculations.

Conclusion: the resulting implied share price from the dcf is \$380.9, which is a huge 44.5% upside.

FINAL NOTES:

CAPITAL STRUCTURE:

Nvidia has a great debt-equity ratio of 21.66, the lowest of any of its peers. It also has a lot of cash on hand. Its current ratio is 7.67, which is extremely good and means the firm has a tremendous amount of liquidity. Nvidia could cover all of their operating expenses for 3 years with just their cash. This will help it make investments now to boost growth later and also weather any unforeseen economic issues, a luxury many companies wish they had in the midst of this crisis.

PROFIT MARGIN:

Lastly, it should be noted how great Nvidia's profit margin is. It has a gross margin of 62% and an operating margin of roughly 30%, both giving the firm ample room to take any unforeseen hits.

CORONAVIRUS :

Lastly, it should be noted that Nvidia's business is not only going to be relatively unaffected by coronavirus, but it will likely see gains as more people stay home and take up gaming. Additionally, Nvidia is comparatively a very safe stock to buy right now for this reason and the reason that this is not a company that will experience volatility, rely on the government to bail it out, or pin its business hopes on the unsure condition of when people will leave their homes.



nVIDIA®

STUDY LINKS:

GPU overall growth:

<https://www.mordorintelligence.com/industry-reports/graphics-processing-unit-market>

Discrete GPU advantage

<https://www.marketwatch.com/press-release/global-graphics-processing-unit-gpu-market-2019-supply-consumption-cost-and-profit-analysis-and-forecast-to-2025-2019-10-30>

EXCEL SCREENSHOTS:

STOCK NAME (NVDA)							
Operating Model (Bnm, fiscal year ending Jan. 26)							
Income Statement							
	2017A	2018A	2019A	2020A	2021E	2022E	2023E
Net Sales (\$mm)	6,910.0	9,714.0	11,716.0	10,918.0	13,852.1	17,695.9	22,731.2
Cost of Goods Sold	2,847.0	3,892.0	4,545.0	4,130.0	5,265.3	6,726.3	8,640.3
Gross Margin	4,063.0	5,822.0	7,171.0	6,788.0	8,586.9	10,969.6	14,090.9
SG&A	476.0	616.0	729.0	712.0	764.8	800.1	800.4
Other Operating Expenses	1,466.0	1,797.0	2,376.0	2,829.0	3,450.8	4,231.3	5,208.0
Operating Expenses	1,942.0	2,413.0	3,105.0	3,541.0	4,215.6	5,031.4	6,008.5
EBITDA	2,121.0	3,409.0	4,066.0	3,227.0	4,371.3	5,938.1	8,082.4
D&A	187.0	199.0	262.0	381.0	483.4	617.5	793.2
EBIT	1,934.0	3,210.0	3,804.0	2,846.0	3,887.9	5,320.6	7,289.2
Other expense (income)	(29.0)	(47.0)	(50.0)	(76.0)	(124.3)	(150.1)	(150.1)
Interest expense	(58.0)	(61.0)	(58.0)	(52.0)	(33.8)	(33.8)	(33.8)
EBT (Pre-Tax Income)	1,905.0	3,196.0	3,896.0	2,970.0	3,958.4	5,416.9	7,385.6
Tax Expense (Forecast future @ 21.0%)	239.0	149.0	(243.0)	174.0	831.3	1,137.6	1,551.0
Net Income	1,666.0	3,047.0	4,141.0	2,796.0	3,127.1	4,279.4	5,834.6
Income attributable to NCI	-	-	-	-	-	-	-
Net Income attributable to CS	1,666.0	3,047.0	4,141.0	2,796.0	3,127.1	4,279.4	5,834.6
Shares Outstanding	885.0	606.0	606.0	612.0	612.0	612.0	612.0
Operating EPS	\$2.85	\$5.03	\$6.83	\$4.57	\$5.1	\$7.0	\$9.5
Dividends	261.0	341.0	371.0	390.0	436.2	596.9	813.8
Margin and Expense Analysis							
	2017A	2018A	2019A	2020A	2021E	2022E	2023E
Gross Margin (% of Net Sales)	58.80%	59.93%	61.21%	61.99%	61.99%	61.99%	61.99%
SG&A (% of Net Sales)	6.89%	6.34%	6.22%	6.52%	5.52%	4.52%	3.52%
Other Operating Expenses (% of Net Sales)	21.22%	18.50%	20.28%	25.91%	24.91%	23.91%	22.91%
Operating Expenses (% of Net Sales)	28.10%	24.84%	26.50%	32.43%	30.43%	28.43%	26.43%
Dividends (% of Net Income)	15.47%	11.19%	8.96%	13.95%	13.95%	13.95%	13.95%
Days Sales Outstanding	43.63	47.53	44.36	55.40	55.40	55.40	55.40
Days Payable	127.18	106.72	106.73	156.91	156.91	156.91	156.91
D&A (% of Net Sales)	2.71%	2.05%	2.24%	3.49%	3.49%	3.49%	3.49%
CapEx (% of Net Sales)	2.35%	6.10%	5.12%	4.48%	4.48%	4.48%	4.48%
Balance Sheet							
	2017A	2018A	2019A	2020A	2021E	2022E	2023E
Cash and Equivalents	6,798.0	7,108.0	7,422.0	10,897.0	8,775.2	11,210.2	14,400.0
Accounts Receivable	826.0	1,265.0	1,424.0	1,657.0	2,102.3	2,685.7	3,449.9
Other Current Assets	912.0	882.0	1,711.0	1,136.0	1,441.3	1,841.2	2,365.1
Current Assets	8,536.0	9,255.0	10,557.0	13,690.0	12,318.8	15,737.1	20,215.0
Accounts Payables & Accruals	992.0	1,138.0	1,329.0	1,784.0	2,263.4	2,891.5	3,714.3
Unearned Revenue	-	-	-	-	-	-	-
Current Portion of Debt	796.0	15.0	-	-	-	-	-
Other Current Liabilities	-	-	-	-	-	-	-
Current Liabilities	1,788.0	1,153.0	1,329.0	1,784.0	2,263.4	2,891.5	3,714.3
Long Term Debt	1,983.0	1,985.0	1,988.0	1,991.0	1,991.0	1,991.0	1,991.0
Other Liabilities	277.0	632.0	633.0	1,336.0	1,336.0	1,336.0	1,336.0
Noncurrent Liabilities	2,260.0	2,617.0	2,621.0	3,327.0	3,327.0	3,327.0	3,327.0
Total Liabilities	4,048.0	3,770.0	3,950.0	5,111.0	5,590.4	6,218.5	7,041.3
Total Equity	5,762.0	7,471.0	9,342.0	12,284.0	-	-	-
Net Working Capital	6,748.0	8,102.0	9,228.0	11,906.0	10,055.4	12,845.6	16,500.8
Change in Net Working Capital	N/A	1,354.0	1,126.0	2,678.0	(1,850.6)	2,790.2	3,655.2

-- You might need to

Fill in historical cells that light blue - most of this w beyond that

Double check shares out most recent 10K and 10Q changed in which case yo the new number into the

Step

I'm sure this looks gross l historical balance sheet h lump them into Other Cu Liabilities

Based on historical most revenue basis - this isn't things so if you're confid CapEx, D&A etc.

Current portion of long t schedule in the 10K for

Long term debt you can't toward the industry aver suggested by a CapEx sch

Other Current Liabilities l hold constant if it's not w advisor or do some resa

Nvidia (NVDA)

Revenue Forecasting

	2016A	2017A	2018A	2019A	2020A	2021E	2022E	2023E
Net Revenue	\$5,010.0	\$6,910.0	\$9,714.0	\$11,716.0	\$10,918.0	\$13,852.1	\$17,695.9	\$22,731.2
%Δ	-	37.9%	40.6%	20.6%	(6.8%)	26.9%	27.7%	28.3%
GPU Revenue	4,187.0	5,822.0	8,137.0	10,177.0	9,465.0	12,399.1	16,242.9	21,278.2
% of Revenue	83.6%	84.3%	83.8%	86.8%	86.7%	89.3%	91.8%	93.6%
YoY Growth	-	39.0%	39.8%	25.0%	(7.0%)	31.0%	31.0%	31.0%
Tegra Processor Revenue	539.0	824.0	1,534.0	1,543.0	1,433.0	1,433.0	1,433.0	1,433.0
% of Revenue	11.2%	11.9%	15.8%	13.2%	13.3%	10.3%	8.2%	6.4%
YoY Growth	-	47.4%	86.2%	0.3%	(7.7%)	-	-	-
All Other Revenue	264.0	264.0	43.0	-	-	-	-	-
% of Revenue	5.3%	3.8%	0.4%	-	-	-	-	-
YoY Growth	-	-	(83.7%)	(100.0%)	#DIV/0!	-	-	-
Revenue Segment 4	-	-	-	-	-	-	-	-
% of Revenue	-	-	-	-	-	-	-	-
YoY Growth	-	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Revenue Segment 5	-	-	-	-	-	-	-	-
% of Revenue	0.0%	0.0%	-	-	-	-	-	-
YoY Growth	-	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Net Sales	\$5,010.00	\$6,910.00	\$9,714.00	\$11,716.00	\$10,918.00	\$13,852.14	\$17,695.88	\$22,731.16
% growth	-	37.9%	40.6%	20.6%	(6.8%)	26.87%	27.7%	28.5%

Sources:

SEC Filings (Forms 10-K, 10-Q, 8-K)
Company Guidance from Investor Presentations / Conference Calls
Credit Suisse Research Report (csx/cs/xxxxx)
Guggenheim Partners Research Report (csx/cs/xxxxx)

Nvidia (NVDA)

Comparable Companies Analysis

	Market Cap (\$B)	EV/Sales TTM	EV/EBITDA TTM	EV/EBIT TTM	EV/FCF TTM	P/B	P/E
NVDA	\$ 160.93	13.76x	44.16x	49.76x	47.11x	12.99x	34.48x
AMD	\$ 56.67	8.16	73.84	117.98	152.10	19.70	41.67
TXN	\$ 100.57	6.94	14.38	16.94	23.90	11.14	20.43
INTC	\$ 244.59	3.69	7.52	10.83	20.80	3.22	12.09
AVGO	\$ 101.67	6.16	14.19	41.03	14.17	4.16	11.51
QCOM	\$ 81.82	3.78	8.86	10.81	18.77	18.42	17.21
Mean (weighted)	\$117.06	5.71x	24.16x	39.52x	45.95x	11.33x	20.59x
Median (weighted)	\$100.57	6.16x	14.19x	16.94x	20.80x	11.14x	17.21x
Assumed Low	3.69x	8.86x	10.83x	18.77x	4.16x	4.16x	12.09x
Assumed High	6.94x	14.38x	41.03x	23.90x	18.42x	18.42x	20.45x

Sources: SEC Filings, Bloomberg

	D/E	Beta	Unlevered Beta
NVDA	0.22	1.47	1.26
AMD	0.26	2.39	1.99
TXN	0.69	1.13	0.73
INTC	0.38	0.83	0.64
AVGO	1.87	0.91	0.37
QCOM	3.73	1.40	0.37
Mean (weighted)	1.35x	1.33x	0.82x

	EV/Sales TTM	EV/EBITDA TTM	EV/EBIT TTM	EV/FCF TTM	P/B	P/E
Multiple	6.16x	14.19x	16.94x	20.80x	11.14x	17.21x
TTM Financial Metric	10.92	3.40	3.02	3.19	19.92	4.57
Enterprise Value	67.27	48.29	51.16	66.35	221.91	-
Less: Total Debt	2.64	2.64	2.64	2.64	2.64	-
Plus: Cash & Cash Equivalents	10.90	10.90	10.90	10.90	10.90	-
Implied Equity Value	75.53	56.55	59.42	74.61	230.17	-
Shares Outstanding	0.61	0.61	0.61	0.61	0.61	-

Implied Share Price	\$123.41	\$92.40	\$97.09	\$121.92	\$376.09	\$78.63
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	25th Percentile	75th Percentile
EV/Sales TTM	\$79.34	\$62.76
EV/EBITDA TTM	\$66.94	\$111.33
EV/EBIT TTM	\$148.90	\$138.07
EV/FCF TTM	\$50.50	\$613.05
P/B	\$148.90	\$613.05
P/E	\$50.50	\$93.43

Fill in the TTM financial metric in row 2 same with TTM debt and cash/cash equivalents below, same with shares outstanding

Most of this page will take care of itself once those are inputted and the multip are inputted above

Watch for outliers, refer to the lecture notes

Nvidia (NVDA)

Discounted Cash Flow Analysis

	Historical			CAGR	Projected			CAGR
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% margin	60%	61%	62%		62%	62%	62%	
Operating Expenses	2,413	3,103	3,341		4,281	5,208	6,349	
EBITDA	3,409	4,066	3,227	-2.71%	4,302	5,761	7,741	34.15%
% margin	35%	35%	30%		31%	33%	34%	
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Most of it in the pre Preferred them

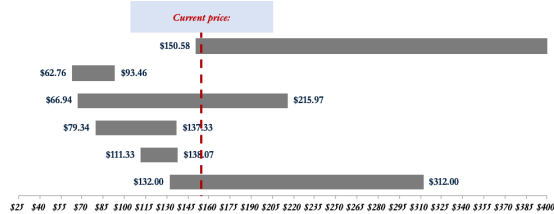
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Terminal Multiple Method Weight	60%
Gordon Growth Method Weight	40%
Implied Share Price	\$380.09
Upside / Downside	44.5%

Nvidia (NVDA)

Football Field

	Low	Range	High	Implied	Weight
Discounted Cash Flow	\$170.78	\$382.32	\$733.10	\$380.09	0.3
Comps EV/EBITDA	\$62.76	30.69	\$93.46	\$92.40	0.123
Comps EV/EBIT	\$66.94	149.03	\$211.97	\$97.09	0.123
Comps EV/Sales	\$79.34	37.99	\$137.33	\$123.41	0.123
Comps EV/FCF	\$111.33	\$26.74	\$138.07	\$121.92	0.123
12-week Range	\$132.00	180.00	\$312.00		
Current Price	263.00			Combined Target Price	\$244.46



Nvidia (NVDA)

Weighted Average Cost of Capital

Capital Structure	
Total Capital	14,193
Debt/Equity	0.22
Cost of Debt	
Cost-of-Debt (1)	2.70%
Tax Rate	21.00%
After-tax Cost of Debt	2.13%
Cost of Equity	
Risk Free Rate (2)	0.73%
Market Risk Premium (3)	7.30%
Relevered Beta	0.939
CAPM	7.92%
WACC	0.071081

Beta Calculation - Average Comps			
Average	D/E	Marginal	Relevered
Unlevered Beta	Tax Rate		Beta
0.819	0.22	21%	0.96

Current Capital Structure	
D/E	0.16
D/TC	0.14
E/TC	0.86

(1) Based on weighted average yield to maturity
 (2) Interpolated yield on 10-year U.S. Treasury, sourced from Bloomberg, or Google it
 (3) S&P500 average return minus T. Bill average return (1928 - 2018)

Debt Profile

Long Term Debt	Outstanding	Coupon Rate
Senior Note Due 2021	1,000.00	3.20%
Senior Note Due 2026	991.00	2.20%
Senior Note Due 2023		
Senior Note Due 2028		
Credit Agreement		
Advances under Revolving Credit Facility		
Term Loan Facilities		
Other Notes Payable		
Capital Lease Obligations		
Less: Current Liabilities		
Total Long Term Debt (Sum)	1,991.00	
Total Long Term Debt (Balance Sheet)	1,991.00	
Check		

fill out 26-28 with long term notes and coup rates - use most recent 10K so it matches with the check on the bottom. If you need to insert rows, add the row below row 26 each time to keep it in the formula.

To be more accurate you can use the info from a 10Q, but you'd have to hardcode TTM long term debt and current portion of long term debt (cell E34)

Cost of Debt 0.0270