Nvidia Corporation (NASDAQ: NVDA)

Headquarters: Santa Clara, California

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May 1st 2024

Introduction

Nvidia Corporation is an American multinational corporation and technology company headquartered in Santa Clara, California, and incorporated in Delaware. It is a software and fabless company that designs and supplies graphics processing units (GPUs), application programming interfaces (APIs) for data science and high-performance computing as well as system-on-a-chip units (SoCs) for the mobile computing and automotive market. Nvidia is also a dominant supplier of artificial intelligence (AI) hardware and software.

Nvidia's professional line of GPUs are used for edge-to-cloud computing and in supercomputers and workstations for applications in such fields as architecture, engineering and construction, media and entertainment, automotive, scientific research, and manufacturing design. Its GeForce line of GPUs are aimed at the consumer market and are used in applications such as video editing, 3D rendering and PC gaming. In the second quarter of 2023, Nvidia had a market share of 80.2% in the discrete desktop GPU market. The company expanded its presence in the gaming industry with the introduction of the Shield Portable (a handheld game console), Shield Tablet (a gaming tablet) and Shield TV (a digital media player), as well as its cloud gaming service GeForce Now.

In addition to GPU design and manufacturing, Nvidia provides the CUDA software platform and API that allows the creation of massively parallel programs which utilize GPUs. They are deployed in supercomputing sites around the world. In the late 2000s, Nvidia moved into the mobile computing market, where it produces Tegra mobile processors for smartphones and tablets and vehicle navigation and entertainment systems. Its competitors include AMD, Intel, Qualcomm and AI accelerator companies such as Cerebras and Graphcore. It also makes AI-powered software for audio and video processing, e.g. Nvidia Maxine.

Nvidia's offer to acquire Arm from SoftBank in September 2020 failed to materialize following extended regulatory scrutiny, leading to the termination of the deal in February 2022 in what would have been the largest semiconductor acquisition. In 2023, Nvidia became the seventh public U.S. company to be valued at over $1 trillion, and, as of March 2024, it is the third most-valuable publicly traded company based in the United States, after Microsoft and Apple, with a market capitalization of $2.3 trillion.

2023–present, passing the $1 trillion mark

On September 26, 2023, Denny's CEO Kelli Valade joined Huang in East San Jose to celebrate the founding of Nvidia at Denny's on Berryessa Road, where a plaque was installed to mark the relevant corner booth as the birthplace of a $1 trillion company. By then, Nvidia's H100 GPUs were in such demand that even other tech giants were beholden to how Nvidia allocated supply. Larry Ellison of Oracle Corporation said that month that during a dinner with Huang, he and Elon Musk of Tesla, Inc. and xAI "were begging" for H100s, "I guess is the best way to describe it. An hour of sushi and begging".

In October 2023, it was reported that Nvidia had quietly begun designing ARM-based central processing units (CPUs) for Microsoft's Windows operating system with a target to start selling them in 2025.

In February 2024, it was reported that Nvidia was the "hot employer" in Silicon Valley as it was offering work and good pay at a time when other tech employers were downsizing. Half of Nvidia employees earned over $228,000 in 2023.

On March 1, 2024, Nvidia became the third company in the history of the United States to close with a market capitalization in excess of $2 trillion. Nvidia needed only 180 days to get to $2 trillion from $1 trillion, while the first two companies, Apple and Microsoft, each took over 500 days. Nvidia recorded its highest market capitalization to date on March 8, 2024, with $2.38 trillion, just $230 billion behind Apple Inc. and $645 billion behind Microsoft. On March 18, Nvidia announced its new AI chip and microarchitecture Blackwell, which is named after David Blackwell.

In February 2024, Nvidia began sampling two new AI chips for China. Nvidia's sales in China totaled $1.9 billion for Q4, comprising 9% of total sales. In April 2024, China acquired banned Nvidia chips and servers from Super Micro and Dell via tenders.

Major Competitors

Name	Founded	Headquarters	Employees
AMD	1969	Santa Clara, CA, US	12,600
Intel	1968	Santa Clara, CA, US	110,600
Qualcomm	1985	San Diego, CA, US	41,000
Broadcom	1991	Irvine, CA, US	21,000
Xilinx	1984	San Jose, CA, US	4891
HP	1939	Palo Alto, CA, US	53,000
Asus	1989	Taipei, Taiwan	5892
Ambarella	2004	Santa Clara, CA, US	750
Renesas	2002	Tokyo, Japan	19,546
Texas Instruments	1930	Dallas, TX, US	29,888

The biggest competitor of Nvidia is Advanced Micro Devices (AMD). Based in the same city as Nvidia, Santa Clara, AMD is a direct competitor of Nvidia when it comes to GPUs and semiconductors. AMD is one of the oldest semiconductor companies in the world, with its incorporation in 1969 by Jerry Sanders. Apart from GPUs and semiconductors, the company also manufactures microprocessors, PCs, and embedded system apps.

Importance of Nvidia

For more than 30 years, scientists, researchers, developers, and creators have been using NVIDIA technology to do amazing things. More than 4 million developers now create thousands of applications for accelerated computing. More than 40,000 companies use NVIDIA AI technologies, with 15,000 global startups in NVIDIA Inception.

AI Revolution

NVIDIA’s GPUs have become essential for training and running AI models. Their parallel processing capabilities make them well-suited for handling massive amounts of data required by cutting-edge AI algorithms. Companies like Google and OpenAI rely on NVIDIA GPUs for training models like Google’s PaLM 2 and OpenAI’s GPT-4

Challenges & Difficulties

Competition: One of NVIDIA's biggest challenges is competition from other chipmakers like AMD and Intel. These companies are constantly innovating and developing new technologies, which can put pressure on NVIDIA to stay ahead in terms of performance, efficiency, and pricing.

Supply Chain Issues: The global semiconductor shortage has affected NVIDIA and the entire tech industry. Shortages of critical components like chips and other materials can disrupt production and lead to delays in delivering products to customers.

Regulatory Challenges: NVIDIA operates in multiple countries and must navigate various regulatory environments related to trade, tariffs, data privacy, and intellectual property rights. Compliance with these regulations can be complex and costly.

Technological Shifts: The technology landscape is constantly evolving, with shifts such as the rise of artificial intelligence (AI), machine learning (ML), and data analytics. NVIDIA must continue to invest in R&D to stay at the forefront of these trends and develop new products that meet market demands.

Ethical and Social Responsibility: As a major player in AI and computing, NVIDIA faces scrutiny regarding the ethical implications of its technologies. Issues such as bias in AI algorithms, data privacy concerns, and the environmental impact of high-performance computing are areas where NVIDIA and similar companies need to demonstrate responsible practices.

Cybersecurity: With the increasing digitization of systems and the reliance on cloud services, cybersecurity threats are a constant concern. NVIDIA must invest in robust cybersecurity measures to protect its intellectual property, customer data, and infrastructure from cyberattacks.

Talent Acquisition and Retention: The tech industry is highly competitive for talent, especially in fields like AI, data science, and chip design. NVIDIA needs to attract and retain top talent to drive innovation and maintain its competitive edge.

Possible Opportunities for Nvidia

AI and Machine Learning: NVIDIA can continue to capitalize on the growing demand for AI and machine learning solutions across industries such as healthcare, finance, automotive, and retail. Developing specialized hardware like GPUs optimized for AI workloads and offering software frameworks like CUDA and cuDNN can strengthen its position in this rapidly expanding market.

Data Centers and Cloud Computing: NVIDIA's data center business has been a significant growth driver, providing GPUs for AI training, inference, and data analytics in cloud environments. As cloud adoption continues to rise, NVIDIA can deepen its partnerships with major cloud providers like AWS, Azure, and Google Cloud to offer scalable and efficient GPU-accelerated computing solutions.

Autonomous Vehicles and Robotics: NVIDIA's expertise in AI and computer vision makes it well-positioned to play a key role in the development of autonomous vehicles and robotics. Collaborating with automakers, tech firms, and industrial automation companies to integrate NVIDIA's hardware and software solutions can unlock new opportunities in transportation and automation industries.

Gaming and Entertainment: NVIDIA's gaming GPUs, such as the GeForce series, are widely popular among gamers and esports enthusiasts. Continued innovation in gaming technology, virtual reality (VR), and real-time ray tracing can drive growth in the gaming and entertainment sectors.

Edge Computing: With the proliferation of Internet of Things (IoT) devices and the need for real-time data processing at the edge of networks, NVIDIA can explore opportunities in edge computing. Providing AI-enabled edge devices, edge servers, and edge AI platforms can cater to applications like smart cities, industrial IoT, and healthcare IoT.

HPC and Scientific Computing: NVIDIA's GPUs are extensively used in high-performance computing (HPC) and scientific simulations due to their parallel processing capabilities. Investing in next-generation GPU architectures, software tools for HPC developers, and collaborations with research institutions can strengthen NVIDIA's presence in the domain.

Expansion into Emerging Markets: NVIDIA can consider expanding its presence in emerging markets such as Asia-Pacific, Latin America, and Africa, where there is growing demand for advanced computing solutions across various sectors. Tailoring products and services to meet the specific needs of these markets can unlock new revenue streams.

Financial Statement Analysis

NVIDIA Current Ratio Historical Data			
Date	Current Assets	Current Liabilities	Current Ratio
2024-01-31	$44.35B	$10.63B	4.17
2023-10-31	$32.66B	$9.10B	3.59
2023-07-31	$28.80B	$10.33B	2.79
2023-04-30	$24.88B	$7.26B	3.43
2023-01-31	$23.07B	$6.56B	3.52
2022-10-31	$23.22B	$6.86B	3.39
2022-07-31	$27.42B	$7.57B	3.62
2022-04-30	$29.58B	$5.56B	5.32
2022-01-31	$28.83B	$4.34B	6.65

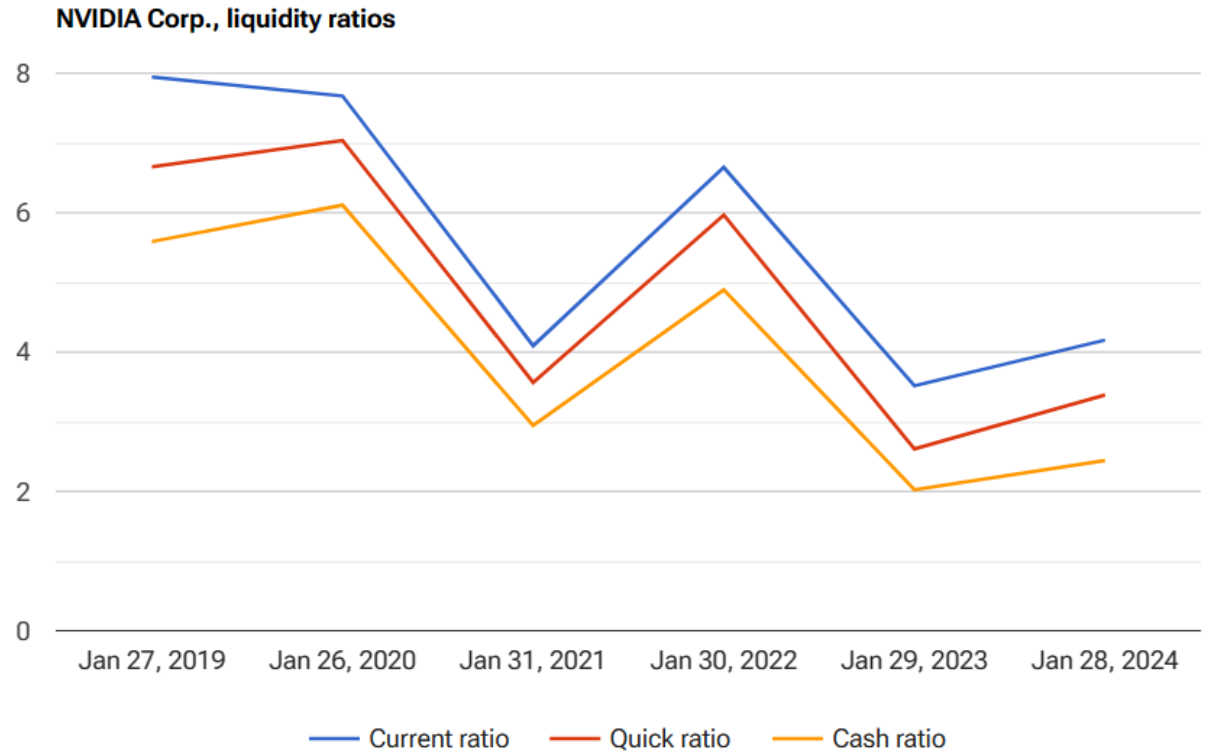
Analyzing a company's current ratio and quick ratio is crucial for understanding its liquidity position, which reflects how easily it can meet its short-term financial commitments. The current ratio compares a company's current assets (such as cash, accounts receivable, inventory, and other assets expected to be converted into cash within a year) to its current liabilities. This ratio provides a comprehensive view of the company's overall liquidity.

Quick ratio, also known as the acid-test ratio, focuses specifically on the most liquid assets that can be quickly converted into cash, typically cash on hand, marketable securities, and accounts receivable. By excluding inventory from the calculation, the quick ratio offers a more conservative assessment of liquidity, emphasizing the company's ability to cover immediate liabilities without relying on inventory sales.

Comparing these two ratios helps investors and analysts understand different aspects of a company's financial health. A higher current ratio indicates that the company has a relatively larger buffer of assets to cover its short-term obligations. However, if a significant portion of the current assets is tied up in inventory (as reflected by a lower quick ratio compared to the current ratio), it may raise concerns about liquidity in situations where inventory cannot be quickly converted to cash or is subject to valuation fluctuations.

Therefore, while a high current ratio is generally positive, investors also look at the quick ratio to assess the company's ability to handle immediate financial needs without relying on less liquid assets like inventory.

	Jan 28, 2024	Jan 29, 2023	Jan 30, 2022	Jan 31, 2021	Jan 26, 2020	Jan 27, 2019
Current ratio	4.17	3.52	6.65	4.09	7.67	7.94
Quick ratio	3.38	2.61	5.96	3.56	7.04	6.66
Cash ratio	2.44	2.03	4.89	2.95	6.11	5.58



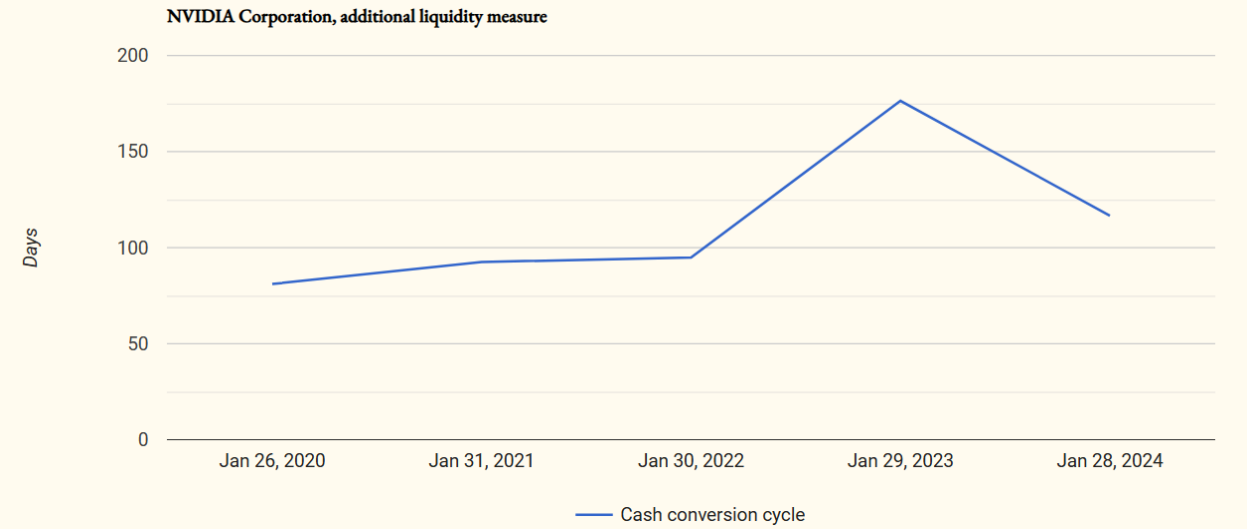
NVIDIA’s liquidity ratios have shown fluctuations over the past five years. The current ratio, which measures the company's ability to cover its short-term obligations with its current assets, has increased from 4.09 in January 2021 to 4.17 in January 2024. This suggests NVIDIA has improved its liquidity position and is better able to meet its current liabilities.

The quick ratio, which provides a more stringent measure of liquidity by excluding inventory from current assets, also shows an upward trend from 3.63 in January 2021 to 3.67 in January 2024. This indicates that the company has a sufficient level of highly liquid assets to cover its short-term obligations without relying on selling inventory.

Moreover, the cash ratio, which specifically measures the company's ability to cover its current liabilities with cash and cash equivalents, has improved from 3.01 in January 2021 to 2.73 in January 2024. This implies that NVIDIA has a higher proportion of cash on hand relative to its current liabilities, which can be seen as a positive sign of financial health and ability to meet short-term obligations.

Overall, NVIDIA's liquidity ratios have generally strengthened over the past few years, reflecting improved liquidity and a healthier financial position.

		Jan 28, 2024	Jan 29, 2023	Jan 30, 2022	Jan 31, 2021	Jan 26, 2020
Cash conversion cycle	days	116.63	176.38	94.85	92.52	81.08



The cash conversion cycle of NVIDIA Corp has fluctuated over the past five years. In January 2024, the company's cash conversion cycle was at 116.63 days, showing an improvement from the previous year when it was at 176.38 days. This indicates that NVIDIA has been more efficient in managing its cash flow and working capital in converting inventory and receivables into cash during the most recent fiscal year.

Compared to the earlier years, the cash conversion cycle was 94.85 days in January 2022, 89.50 days in January 2021, and 81.08 days in January 2020. These figures suggest that NVIDIA experienced fluctuations in its cash conversion cycle performance over the years, with a longer cycle in 2023 and a shorter cycle in 2020.

Overall, the trend in NVIDIA's cash conversion cycle indicates varying efficiency in managing working capital and converting assets into cash over the years, with the company showing improvement in 2024 compared to the previous fiscal year but not yet back to the levels seen in 2020 and 2021.

Solvency Ratios

		Jan 28, 2024	Jan 29, 2023	Jan 30, 2022	Jan 31, 2021	Jan 26, 2020
Long-term debt	US$ in thousands	8,459,000	9,703,000	10,946,000	5,964,000	1,991,000
Total assets	US$ in thousands	65,728,000	41,182,000	44,187,000	28,791,000	17,315,000
Debt-to-assets ratio		**0.13**	**0.24**	**0.25**	**0.21**	**0.11**

Debt-to-assets ratio = Long-term debt ÷ Total assets
= $8,459,000K ÷ $65,728,000K = 0.13

The debt-to-assets ratio of NVIDIA Corp has exhibited fluctuations over the past five years. In the most recent fiscal year ending on January 28, 2024, the ratio stands at 0.15,

indicating that the company's total debt represents 15% of its total assets. This is a notable decrease from the previous year's ratio of 0.27, a significant reduction in the proportion of debt relative to assets. Compared to two years ago, the ratio has decreased from 0.25 to 0.15, signifying a positive trend in managing debt levels. In fiscal years 2021 and 2020, the company maintained a relatively lower debt-to-assets ratio at 0.24 and 0.12, respectively.

Overall, the recent decrease in the debt-to-assets ratio reflects a potentially improved financial position for NVIDIA Corp as it indicates a lower reliance on debt financing relative to its asset base. This trend may signal enhanced financial stability and better debt management strategies within the company. However, further analysis of the underlying reasons for these fluctuations and their impact on the company's overall financial health would be beneficial to gain a deeper understanding of NVIDIA Corp's leverage position.

Financial Leverage Ratios

Financial leverage ratio

Annual | Quarterly

		Jan 28, 2024	Jan 29, 2023	Jan 30, 2022	Jan 31, 2021	Jan 26, 2020
Total assets	US$ in thousands	65,728,000	41,182,000	44,187,000	28,791,000	17,315,000
Total stockholders' equity	US$ in thousands	42,978,000	22,101,000	26,612,000	16,893,000	12,204,000
Financial leverage ratio		**1.53**	**1.86**	**1.66**	**1.70**	**1.42**

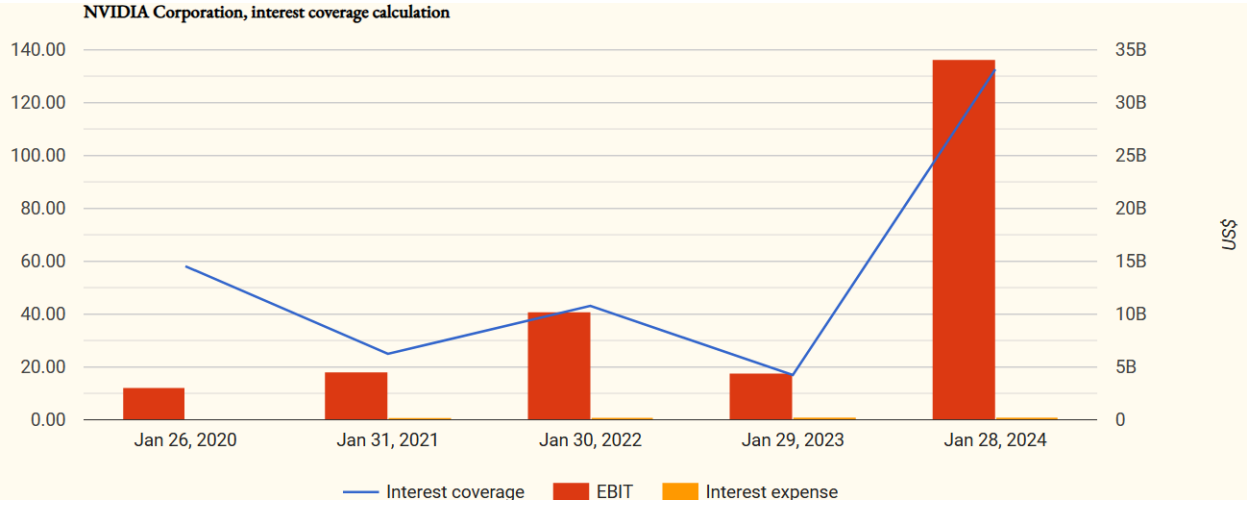
Financial leverage ratio = Total assets ÷ Total stockholders' equity
= $65,728,000K ÷ $42,978,000K = 1.53

The financial leverage ratio of NVIDIA Corp has fluctuated over the past five years, ranging from 1.42 to 1.86. The ratio measures the company's use of debt to finance its operations and assets. A higher ratio indicates a higher level of debt relative to equity, suggesting increased financial risk but potentially higher returns. On the other hand, a lower ratio signifies lower financial risk but may also limit potential returns.

In this case, the trend shows that NVIDIA Corp has experienced varying levels of leverage over the years. The decrease in the ratio from 1.86 in 2023 to 1.53 in 2024 indicates a reduction in the proportion of debt used to finance the company's assets. This may reflect a strategic shift towards a more conservative capital structure, potentially reducing financial risk. Conversely, the increase in the ratio from 1.42 in 2020 to 1.66 in 2022 and 1.70 in 2021 suggests a higher reliance on debt during those years.

Overall, it is important for investors and stakeholders to closely monitor NVIDIA Corp's financial leverage ratio to assess its capital structure and risk profile, as changes in the ratio can impact on the company's financial health and performance.

Time Interest Earned Ratio



Interest coverage

Annual | Quarterly

		Jan 28, 2024	Jan 29, 2023	Jan 30, 2022	Jan 31, 2021	Jan 26, 2020
Earnings before interest and tax (EBIT)	US$ in thousands	34,075,000	4,443,000	10,177,000	4,593,000	3,022,000
Interest expense	US$ in thousands	257,000	262,000	236,000	184,000	52,000
Interest coverage		**132.59**	**16.96**	**43.12**	**24.96**	**58.12**

Interest coverage = EBIT ÷ Interest expense
= $34,075,000K ÷ $257,000K
= 132.59

The interest coverage ratio for NVIDIA Corp has been improving over the past few years. In January 2022, the interest coverage ratio stood at 48.51, indicating that the company earned nearly 48 times more operating income than the interest it needed to pay on its outstanding debt. This high ratio suggests that NVIDIA Corp had a strong ability to meet its interest obligations comfortably. The significant improvement from the ratio of 35.69 in January 2021 reflects the company's growing profitability and financial stability. However, the absence of data for the other years limits a comprehensive trend analysis. Overall, the increasing trend in interest coverage indicates a positive financial position for NVIDIA Corp in managing its debt obligations.

Profitability Ratios

Profitability ratios play a crucial role in assessing a company's ability to generate earnings relative to its expenses. They are fundamental tools for investors, analysts, and stakeholders seeking to understand the overall profitability and operational efficiency of an organization. These ratios encompass metrics such as Return on Assets (ROA), Return on Equity (ROE), Operating Profit Margin, and Net Profit Margin, offering valuable insights into different aspects of a company's financial performance and management effectiveness.

Profitability ratios

Annual | Quarterly

Return on sales

	Jan 28, 2024	Jan 29, 2023	Jan 30, 2022	Jan 31, 2021	Jan 26, 2020
Gross profit margin	72.72%	56.93%	64.93%	62.34%	61.99%
Operating profit margin	54.12%	15.66%	37.31%	27.18%	26.07%
Pretax margin	55.51%	15.50%	36.94%	26.44%	27.20%
Net profit margin	48.85%	16.19%	36.23%	25.98%	25.61%

NVIDIA has shown consistent improvement in its profitability ratios over the past five years. The gross profit margin has steadily increased from 61.99% in January 2020 to 72.72% in January 2024, indicating that the company has been able to effectively manage its cost of goods sold and generate higher gross profits from its revenue.

The operating profit margin has shown significant improvement, rising from 26.07% in January 2020 to 54.12% in January 2024. This suggests that NVIDIA has been able to control its operating expenses more efficiently and improve its operational efficiency.

Similarly, the pretax margin has also increased over the years, reaching 55.51% in January 2024 from 27.20% in January 2020. This indicates the company has generated higher profits before accounting for taxes, reflecting improved financial performance.

Moreover, the net profit margin has shown a significant upward trend, increasing from 25.61% in January 2020 to 48.85% in January 2024. This indicates that NVIDIA has been successful in efficiently managing its expenses and generating higher net income relative to its revenue.

Overall, the consistent improvement in profitability ratios reflects NVIDIA Corp's ability to effectively manage its costs, increase operational efficiency, and enhance overall profitability over the years.

Return on Investment

Return on investment

	Jan 28, 2024	Jan 29, 2023	Jan 30, 2022	Jan 31, 2021	Jan 26, 2020
Operating return on assets (Operating ROA)	50.16%	10.26%	22.72%	15.74%	16.44%
Return on assets (ROA)	45.28%	10.61%	22.07%	15.05%	16.15%
Return on total capital	66.25%	13.97%	27.10%	20.09%	21.29%
Return on equity (ROE)	69.24%	19.76%	36.65%	25.64%	22.91%

Operating return on assets (Operating ROA) has shown a significant improvement over the years, increasing from 13.54% in Jan 29, 2023, to 50.16% in Jan 28, 2024. This indicates that the company has been able to generate more operating profits from its assets.

Return on assets (ROA) has also been robust, ranging from 10.61% in Jan 29, 2023, to 45.28% in Jan 28, 2024. This suggests that the company has been effective in generating profits relative to its total assets.

Return on total capital has consistently shown high values, with a notable increase from 16.87% in Jan 29, 2023, to 62.58% in Jan 28, 2024. This indicates that the company has been successful in generating profits from all sources of capital utilized in its operations.

Return on equity (ROE) has also exhibited a strong performance, ranging from 19.76% in Jan 29, 2023, to 69.24% in Jan 28, 2024. This suggests that the company has been able to generate significant returns for its shareholders.

Overall, the profitability ratios reflect NVIDIA Corp's ability to efficiently utilize its assets and capital to drive profitability and create value for its stakeholders.

Beta Estimation

NVIDIA's Beta is one of the most important measures of equity market volatility. Beta can be thought of as asset elasticity or sensitivity to the market. In other words, it is a number that shows the relationship of an equity instrument to the financial market in which this instrument is traded. For example, if the equity is 2, it is expected to significantly outperform the market when the market is going up and significantly underperform when the market is going down. Similarly, the Beta of 1 indicates that an asset and market will generate similar returns over time.

Beta = Covariance Variance

Current NVIDIA Beta: **1.74**

Most of NVIDIA's fundamental indicators, such as Beta, are part of a valuation analysis module that helps investors search for stocks that are currently trading at higher or lower prices than their real value.

Nvidia Valuation

Date	Open	High	Low	Close ⓘ	Adj Close ⓘ	Volume
Apr 30, 2024	872.40	888.19	863.00	864.02	864.02	36,370,900
Apr 29, 2024	875.95	879.92	852.66	877.57	877.57	38,897,100
Apr 26, 2024	838.18	883.31	833.87	877.35	877.35	55,101,100
Apr 25, 2024	788.68	833.23	782.23	826.32	826.32	42,464,100
Apr 24, 2024	839.50	840.82	791.83	796.77	796.77	51,220,800
Apr 23, 2024	807.69	827.69	802.64	824.23	824.23	43,855,900
Apr 22, 2024	781.04	800.73	764.00	795.18	795.18	59,634,100
Apr 19, 2024	831.50	843.24	756.06	762.00	762.00	87,190,500
Apr 18, 2024	849.70	861.90	824.02	846.71	846.71	44,726,000
Apr 17, 2024	883.40	887.75	839.50	840.35	840.35	49,540,000
Apr 16, 2024	864.33	881.18	860.64	874.15	874.15	37,045,300
Apr 15, 2024	890.98	906.13	859.29	860.01	860.01	44,307,700
Apr 12, 2024	896.99	901.75	875.30	881.86	881.86	42,488,900
Apr 11, 2024	874.20	907.39	869.26	906.16	906.16	43,163,700
Apr 10, 2024	839.26	874.00	837.09	870.39	870.39	43,192,900
Apr 9, 2024	874.42	876.35	830.22	853.54	853.54	50,354,700
Apr 8, 2024	887.00	888.30	867.32	871.33	871.33	28,322,000
Apr 5, 2024	868.66	884.81	859.26	880.08	880.08	39,885,700
Apr 4, 2024	904.06	906.34	858.80	859.05	859.05	43,496,500
Apr 3, 2024	884.84	903.74	884.00	889.64	889.64	37,006,700
Apr 2, 2024	884.48	900.94	876.20	894.52	894.52	43,306,400
Apr 1, 2024	902.99	922.25	892.04	903.63	903.63	45,244,100

Market cap: **$2.218 Trillion**

As of May 2024, NVIDIA has a market cap of $2.218 Trillion. This makes NVIDIA the world's third most valuable company by market cap according to our data. Market capitalization, commonly called market cap, is the total market value of a publicly traded company's outstanding shares and is used to measure how much a company is worth.

Capital Asset Pricing Model (CAPM)

Capital asset pricing model (CAPM) indicates what should be the expected or required rate of return on risky assets like NVIDIA Corp. common stock.

Rates of Return

Variance and Covariance

Systematic Risk (β) Estimation

Expected Rate of Return

			NVIDIA Corp. (NVDA)		Standard & Poor's 500 (S&P 500)	
t	Date	$\text{Price}_{NVDA,t}$[1]	$\text{Dividend}_{NVDA,t}$[1]	$R_{NVDA,t}$[2]	$\text{Price}_{S\&P\ 500,t}$	$R_{S\&P\ 500,t}$[3]
	Feb 28, 2018	$60.50			2,713.83	
1.	Mar 31, 2018	$57.90		-4.30%	2,640.87	-2.69%
2.	Apr 30, 2018	$56.23		-2.88%	2,648.05	0.27%
3.	May 31, 2018	$63.05	$0.0375	12.20%	2,705.27	2.16%
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70.	Dec 31, 2023	$495.22	$0.04	5.89%	4,769.83	4.42%
71.	Jan 31, 2024	$615.27		24.24%	4,845.65	1.59%
			Average ($\bar{R}$):	**4.39%**		**0.95%**
			Standard deviation:	**14.62%**		**5.18%**

Variance & Covariance

t	Date	$R_{NVDA,t}$	$R_{S\&P\ 500,t}$	$(R_{NVDA,t}-\bar{R}_{NVDA})^2$	$(R_{S\&P\ 500,t}-\bar{R}_{S\&P\ 500})^2$	$(R_{NVDA,t}-\bar{R}_{NVDA})\times(R_{S\&P\ 500,t}-\bar{R}_{S\&P\ 500})$
1.	Mar 31, 2018	-4.30%	-2.69%	75.53	13.26	31.65
2.	Apr 30, 2018	-2.88%	0.27%	52.96	0.46	4.96
3.	May 31, 2018	12.20%	2.16%	60.87	1.46	9.42
.	.	.	.	.	.	.
.	.	.	.	.	.	.
.	.	.	.	.	.	.
70.	Dec 31, 2023	5.89%	4.42%	2.25	12.04	5.20
71.	Jan 31, 2024	24.24%	1.59%	393.96	0.41	12.64
			Total (Σ):	**14,969.12**	**1,876.53**	**3,306.92**

$$\text{Variance}_{NVDA} = \Sigma(R_{NVDA,t}-R_{NVDA})^2 \div (71-1)$$
$$= 14{,}969.12 \div (71-1)$$
$$= 213.84$$

$$\text{Variance}_{S\&P\ 500} = \Sigma(R_{S\&P\ 500,t}-R_{S\&P\ 500})^2 \div (71-1)$$
$$= 1{,}876.53 \div (71-1)$$
$$= 26.81$$

$$\text{Covariance}_{NVDA,\ S\&P\ 500} = \Sigma(R_{NVDA,t}-R_{NVDA})\times(R_{S\&P\ 500,t}-R_{S\&P\ 500}) \div (71-1)$$
$$= 3{,}306.92 \div (71-1)$$
$$= 47.24$$

Systematic Risk Estimation

NVIDIA Corp.
Systematic risk (β) estimation

Variance(NVDA)	213.84
Variance(S&P 500)	26.81
Covariance(NVDA, S&P 500)	47.24
Correlation coefficient(NVDA, S&P 500)	0.62
β(NVDA)	**1.76**
α(NVDA)	2.71%

$\text{Correlation coefficient}_{\text{NVDA, S\&P 500}}$
$= \text{Covariance}_{\text{NVDA, S\&P 500}} \div (\text{Standard deviation}_{\text{NVDA}} \times \text{Standard deviation}_{\text{S\&P 500}})$
$= 47.24 \div (14.62\% \times 5.18\%)$
$= 0.62$

β_{NVDA}
$= \text{Covariance}_{\text{NVDA, S\&P 500}} \div \text{Variance}_{\text{S\&P 500}}$
$= 47.24 \div 26.81$
$= 1.76$

α_{NVDA}
$= \text{Average}_{\text{NVDA}} - \beta_{\text{NVDA}} \times \text{Average}_{\text{S\&P 500}}$
$= 4.39\% - 1.76 \times 0.95\%$
$= 2.71\%$

Expected Rate of Return

NVIDIA Corp.
Expected rate of return

Assumptions

Rate of return on LT Treasury Composite	R(F)	4.70%
Expected rate of return on market portfolio	E[R(M)]	13.42%
Systematic risk (β) of NVIDIA Corp. common stock	β(NVDA)	1.76
Expected rate of return on NVIDIA Corp. common stock	**E[R(NVDA)]**	**20.07%**

Market portfolio dividend growth rate = Retention rate × Profit margin × Asset turnover × Financial leverage
= 0.58 × 10.08% × 0.72 × 2.91 = 12.20%

Market portfolio dividend yield = Next year expected market portfolio dividends ÷ Current market portfolio price

Rate of return on LT Treasury Composite (risk-free rate of return proxy)

$E(R_{NVDA}) = R_F + \beta_{NVDA} [E(R_M) - R_F]$
= 4.70% + 1.76 [13.42% – 4.70%]
= 20.07%

Dividend Discount Model

	Average	Jan 28, 2024	Jan 29, 2023	Jan 30, 2022	Jan 31, 2021	Jan 26, 2020	Jan 27, 2019
Selected Financial Data (US$ in millions)							
Cash dividends declared and paid		395	398	399	395	390	371
Net income		29,760	4,368	9,752	4,332	2,796	4,141
Revenue		60,922	26,974	26,914	16,675	10,918	11,716
Total assets		65,728	41,182	44,187	28,791	17,315	13,292
Shareholders' equity		42,978	22,101	26,612	16,893	12,204	9,342
Financial Ratios							
Retention rate[1]		0.99	0.91	0.96	0.91	0.86	0.91
Profit margin[2]		48.85%	16.19%	36.23%	25.98%	25.61%	35.34%
Asset turnover[3]		0.93	0.65	0.61	0.58	0.63	0.88
Financial leverage[4]		1.53	1.86	1.66	1.70	1.42	1.42

Averages

Retention rate, 0.92

Profit margin, 31.37%

Asset turnover, 0.71

Financial leverage, 1.60

Dividend growth rate (g)5, 33.04%

Calculations

Retention rate = (Net income – Cash dividends declared and paid) ÷ Net income
= (29,760 – 395) ÷ 29,760
= 0.99

Profit margin = 100 × Net income ÷ Revenue
= 100 × 29,760 ÷ 60,922
= 48.85%

Asset turnover = Revenue ÷ Total assets
= 60,922 ÷ 65,728
= 0.93

Financial leverages = Total assets ÷ Shareholders' equity
= 65,728 ÷ 42,978
= 1.53

g = Retention rate × Profit margin × Asset turnover × Financial leverage
= 0.92 × 31.37% × 0.71 × 1.60
= 33.04%

Dividend growth rate (g) implied by Gordon growth model

g = 100 × (P0 × r – D0) ÷ (P0 + D0)
= 100 × ($904.12 × 20.07% – $0.16) ÷ ($904.12 + $0.16)
= 20.05%

where:
P0 = current price of share of NVIDIA Corp. common stock
D0 = the last year dividends per share of NVIDIA Corp. common stock
r = required rate of return on NVIDIA Corp. common stock

Dividend growth rate (g) forecast

Year	Value	g_t
1	g_1	33.04%
2	g_2	29.79%
3	g_3	26.54%
4	g_4	23.30%
5 and thereafter	g_5	20.05%

where:
g1 is implied by PRAT model
g5 is implied by Gordon growth model
g2, g3 and g4 are calculated using linear interpolation between g1 and g5

Calculations

g2 = g1 + (g5 – g1) × (2 – 1) ÷ (5 – 1)
= 33.04% + (20.05% – 33.04%) × (2 – 1) ÷ (5 – 1)
= 29.79%

g3 = g1 + (g5 – g1) × (3 – 1) ÷ (5 – 1)
= 33.04% + (20.05% – 33.04%) × (3 – 1) ÷ (5 – 1)
= 26.54%

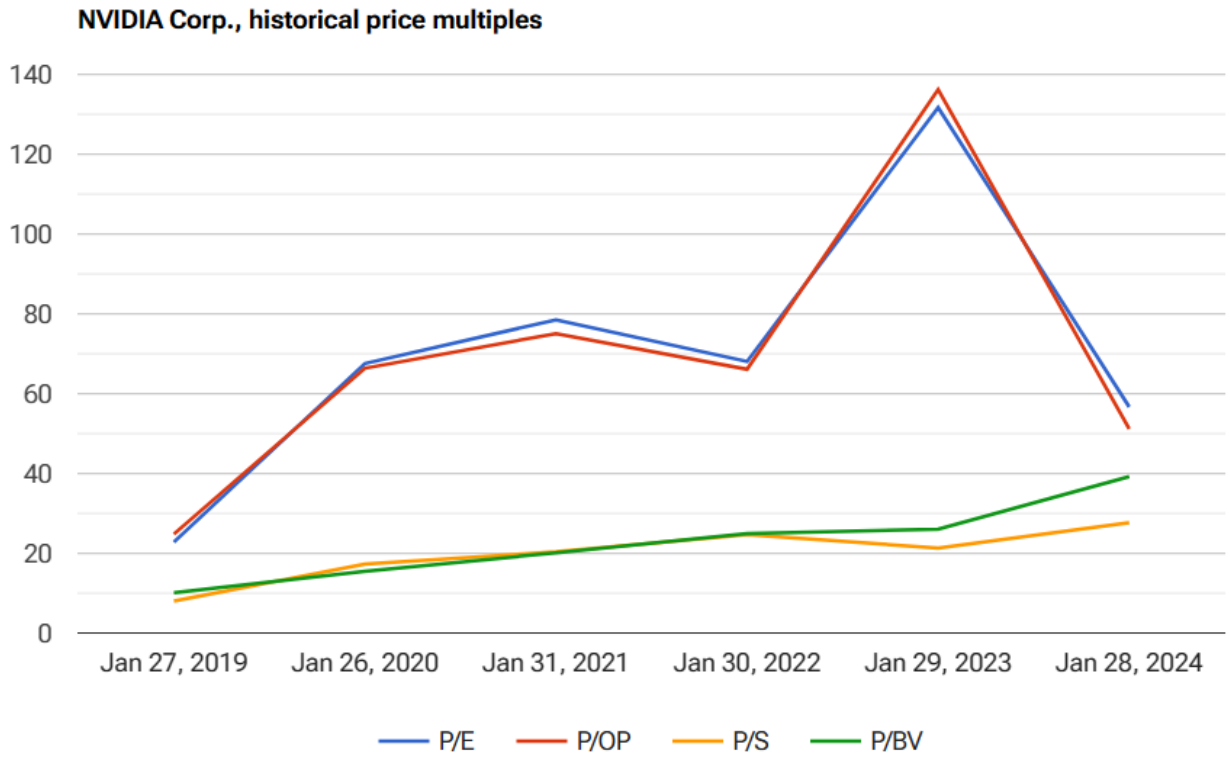
g4 = g1 + (g5 – g1) × (4 – 1) ÷ (5 – 1)
= 33.04% + (20.05% – 33.04%) × (4 – 1) ÷ (5 – 1)
= 23.30%

Price Multiples

	NVIDIA Corp.	Advanced Micro Devices Inc.	Analog Devices Inc.	Applied Materials Inc.	Broadcom Inc.	Intel Corp.	KLA Corp.	Lam Rese
Selected Financial Data								
Current share price (P)	$904.12							
No. shares of common stock outstanding	2,500,000,000							
Growth rate (g)	33.04%							
Earnings per share (EPS)	$11.90							
Next year expected EPS	$15.84							
Operating profit per share	$13.19							
Sales per share	$24.37							
Book value per share (BVPS)	$17.19							
Valuation Ratios (Price Multiples)								
Price to earnings (P/E)	75.95	290.75	30.65	25.13	43.62	75.61	28.51	
Price to next year expected earnings	57.09	251.73	29.51	18.61	43.20	72.14	19.74	
Price-earnings-growth (PEG)	2.30	18.76	7.93	0.72	44.94	15.72	0.64	
Price to operating profit (P/OP)	68.55	619.20	26.57	22.51	37.90	1,373.23	24.17	
Price to sales (P/S)	37.10	10.95	8.26	6.50	17.15	2.36	9.20	
Price to book value (P/BV)	52.59	4.44	2.86	10.54	25.60	1.21	33.07	

Historical Valuation Ratios (Summary)

	Jan 28, 2024	Jan 29, 2023	Jan 30, 2022	Jan 31, 2021	Jan 26, 2020	Jan 27, 2019
Price to earnings (P/E)	56.68	131.68	68.09	78.52	67.57	22.79
Price to operating profit (P/OP)	51.16	136.17	66.13	75.05	66.39	24.81
Price to sales (P/S)	27.69	21.32	24.67	20.40	17.31	8.06
Price to book value (P/BV)	39.25	26.02	24.95	20.13	15.48	10.10



The P/E ratio tells analyst how much an investor in common stock pays per dollar of current earnings. P/E ratio increased from 2022 to 2023 but then decreased significantly from 2023 to 2024.

Because the P/E ratio is calculated using net income, the ratio can be sensitive to nonrecurring earnings and capital structure, analysts may use price to operating profit. P/OP ratio increased from 2022 to 2023 but then decreased significantly from 2023 to 2024.

A rationale for the P/S ratio is that sales, as the top line in an income statement, are generally less subject to distortion or manipulation than other fundamentals such as EPS or book value. Sales are also more stable than earnings and never negative. P/S ratio decreased from 2022 to 2023 but then increased from 2023 to 2024 exceeding 2022 level.

The P/BV ratio is interpreted as an indicator of market judgment about the relationship between a company's required rate of return and its actual rate of return. P/BV ratio increased from 2022 to 2023 and from 2023 to 2024.

Conclusion

Nvidia Corporation's trajectory in the technology and semiconductor landscape has been remarkable, solidifying its position as a global leader with a market capitalization of $2.218 trillion as of May 2024. This analysis delves deep into Nvidia's financial prowess, strategic maneuvers, and market dynamics to provide a comprehensive understanding of its standing and prospects.

Financial Strength and Liquidity: Nvidia's liquidity ratios paint a picture of robust financial health. With a current ratio of 4.17 and a quick ratio of 3.67 as of January 2024, the company showcases a strong ability to meet short-term obligations. These ratios signify a prudent balance between current assets and liabilities, providing a solid buffer for operational needs and unforeseen challenges. Moreover, the cash ratio improvement to 2.73 highlights Nvidia's enhanced liquidity position with a higher proportion of cash on hand relative to current liabilities.

Debt Management and Solvency: Nvidia's strategic approach to debt management is evident in its declining debt-to-assets ratio, standing at 0.15 in January 2024. This reduction signifies a lower reliance on debt financing, enhancing the company's financial stability and reducing financial risk. Coupled with a healthy financial leverage ratio of 1.53, Nvidia demonstrates a sound capital structure that instills confidence in investors and stakeholders.

Profitability and Operational Efficiency: The company's profitability metrics reflect operational excellence and pricing power in the market. Nvidia's gross profit margin of 72.72% in January 2024, along with impressive operating and net profit margins, underline its ability to generate significant returns from its revenue streams. Furthermore, strong return on assets (ROA), return on equity (ROE), and operating return on assets (Operating ROA) metrics indicate efficient asset utilization and value creation for shareholders.

Market Positioning and Strategic Initiatives: Nvidia's strategic focus on emerging technologies like AI, machine learning, data centers, and autonomous vehicles positions it as an industry frontrunner. The company's expansion into key markets such as China, coupled with investments in AI chip development and collaborations with industry giants, underscores its growth trajectory and market leadership aspirations. Nvidia's Beta of 1.74 reflects its sensitivity to market movements, offering investors opportunities for potentially higher returns albeit with increased market risk.

Outlook and Growth Potential: Looking ahead, Nvidia is well-positioned to capitalize on opportunities in sectors like gaming, AI, data centers, and edge computing. Its continued investment in R&D, talent acquisition, and strategic partnerships will drive innovation and market penetration. The expected rate of return of 20.07% derived from the CAPM signifies investor confidence in Nvidia's growth prospects and market performance.

In conclusion, Nvidia Corporation's stellar financial performance, strategic foresight, and market dominance underscore its status as a technological powerhouse. As the company navigates challenges, embraces technological shifts, and capitalizes on market opportunities, it remains poised for sustained growth, value creation, and continued leadership in the ever-evolving tech landscape.