

# Nvidia's Long-Term Investing: A Value-Investing-Based Approach

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## Abstract

This paper empirically explores Nvidia's track record of long-term returns from a value-investing perspective. Using a quantitative analysis of Nvidia (NASDAQ: NVDA), we assess its growth trajectory, profitability, and risk-adjusted returns, focusing on trends over the past 20 years, ending in December 2024. Furthermore, we compare Nvidia's stock performance against the Magnificent Seven technology companies—Alphabet (NASDAQ: GOOG), Amazon (NASDAQ: AMZN), Apple (NASDAQ: APPL), Meta (NASDAQ: META), Microsoft (NASDAQ: MSFT), Netflix (NASDAQ: NFLX), and Tesla (NASDAQ: TSLA)—and measure their risk-adjusted returns. Additionally, we compare Nvidia's investment performance to major U.S. stock indices, including the Dow Jones, S&P 500, and NASDAQ, to evaluate its broader market position. We aim to identify key factors driving Nvidia's success, including an AI-driven market demand, capital expenditures, margin expansion, and strategic innovation. Our findings suggest that Nvidia's exceptional stock performance reinforces the long-term viability of investment in high-growth technology sectors.

## Keywords

Nvidia, Value Investing, Financial Statement Analysis, Fundamental Analysis, Gross Margin Analysis, Quantitative Finance, Return on Investment

## 1. Nvidia's Long-Term Investing Potential: A Value-Investing-Based Approach

The long-term return on investment (ROI) is a key consideration in investment decision-making, especially for high-growth technology stocks. Among these

players is Nvidia Corporation (NASDAQ: NVDA), a semiconductor company specializing in developing GPUs, AI services, and advanced computing hardware. Given its exponential growth in recent years, market observers have debated whether this American multinational company presents a good long-term investment under a value-investing framework. This study addresses the following research questions: Do Nvidia's financial trajectory and market positioning align with long-term value-investing principles, and how does its stock performance compare to that of its industry peers and major market indices? By applying quantitative financial analysis, we aim to compare Nvidia's profitability and growth trajectory with those of other high-growth firms and major stock indices.

## 2. Literature Review

### Evolution of Value Investing: Graham, Buffett, Lynch, and O'Neil

At its core, and for the typical investor, investing involves buying a stake in a company or business through purchasing shares of its stock. If the company is successful, one's ROI accumulates over time via the corresponding increase in stock value and the periodic dividends the company may pay. Formalized first by Benjamin Graham and David Dodd in 1934, the value-investing framework emphasizes investing in stocks that trade below their intrinsic value rather than focusing solely on the shorter-term price movements typical of speculative trading (Graham, 1949).

The core principles of value investing involve assessing a company based on various fundamental financial metrics, including revenue growth, earnings growth, and margin analysis. To minimize risk, value investing also aims to ensure that an investment is made at a price below the stock's actual worth, as determined by Benjamin Graham and Warren Buffett. It prioritizes businesses with sustainable competitive advantages over good short-term performance.

To draw an analogy, a value investor is to financial metrics as a physician is to a patient's vital signs. To assess a patient's health, a physician examines fundamental indicators such as heart rhythm, blood pressure, and cholesterol scores. Similarly, a value investor, as opposed to a short-term speculator, will look at long-term measures of intrinsic value to assess a company's economic well-being. Both physicians and value investors use these data to project future performance.

**Buffett's Expansion on Value Investing.** Warren Buffett, the legendary investor and iconic figure in the American investing community, took Graham's value-investing strategy and expanded on it. He emphasized qualitative factors alongside financial metrics. Buffett's approach involves investing in high-quality companies with substantial competitive advantages, often referred to as economic moats, rather than seeking stocks that are simply trading below their intrinsic value.

**Lynch's GARP.** Peter Lynch managed the Magellan Fund from 1977 to 1990 and further contributed to the evolution of value investing by introducing the concept of Growth at a Reasonable Price (GARP). Lynch stresses the importance of understanding business before investing, as outlined in *One Up On Wall Street*

(1989) and *Beating the Street* (Lynch & Rothchild, 1994). He urges investors to conduct extensive research on a company's fundamentals, such as its Balance Sheet and Profit & Loss Statement, and evaluate the financial soundness of the business. Lynch was the first finance master to devise a strategy for investing in "growth" companies. He categorized companies growing at 20% - 25% annually as "fast growers". He adopted the Price-to-Earnings-Growth (PEG) ratio to identify if a stock is reasonably priced given its growth potential. Lynch also advocates a buy-and-hold approach, recommending patience and a long-term investment trajectory of ten to twenty years. His philosophy suggests high-growth firms may be substantial long-term investments if their earnings growth aligns with reasonable valuations.

**O'Neil's CAN SLIM.** William J. O'Neil, in his book *How to Make Money in Stocks*, emphasizes the importance of a company's financial statements or fundamentals (O'Neil, 2009). The fundamentals include, but are not limited to, Current Quarterly Earnings (10Qs), significant earnings growth in the most recent reporting period, and consistent Annual Earnings (10K) Growth over the past several years. He also stresses to investors the importance of identifying companies with new products or services driven by innovation and market expansion, leadership with a great vision, and management with high productivity and operating efficiency. He advocates investing in leaders within their industries, not followers. O'Neil's approach favors strong growth, seeking stocks with high price appreciation. As is characteristic of value investing, he looks for companies delivering substantial revenue and earnings growth.

The contribution of our empirical study, which includes a three-dimensional analysis, is unique in the finance research literature. Our research demonstrated a comprehensive, cohesive, and timely approach. By tracing its historical development, this is the first time we have studied a tech giant, Nvidia. We examined its competitive advantages in comparison to its direct peers, Advanced Micro Devices and Intel, within the semiconductor sector. We then expanded our study of Nvidia to include its tech sister companies, the Magnificent Seven, which currently represent the most robust, fastest-growing, and influential technology players. Ultimately, we examined the broadest spectrum by comparing Nvidia against major stock Indices, such as the Dow Jones, S&P 500 companies, and QQQ. Another unique contribution of our research to the literature is that we focused on two key financial statement metrics strongly correlated with a stock's uptrend momentum. One key metric is revenue and earnings growth, which we believe is a positive indicator of a company's financial health and expansion. Nvidia's consistent and escalating growth shows that the potential for future earnings can be predicted by tracing the trend. The growth helps investors build confidence in the company. High revenue growth suggests a company has a strong competitive advantage through technical innovation, potent marketing, or effective execution. The second key financial statement metric we selected is the margin analysis—this profitability indicator is also strongly correlated with a company's stock mo-

mentum. A high profit margin indicates a company's success in operating efficiency, a wide economic moat, and a pricing strategy. It demonstrates that the company effectively manages its costs by offering a diverse range of products. It further attracts investors to invest in the company.

### **3. Materials and Methods**

This section proposes a method for determining Nvidia's success trajectory. We began by examining the evolution and trends of artificial intelligence from a microeconomic perspective. Then, we analyzed the AI spending levels of Microsoft, Meta, Google, and Amazon. We began to see that high levels of investment in AI development led to an increase in products offered by Nvidia, such as Blackwell and CUDA. The escalating demand for AI spending outlines a causal explanation for Nvidia's exponential growth.

#### **3.1. Investment Fundamentals and Wealth Accumulation Strategies**

We explored the fundamental principles of wealth accumulation through equity investments. Using compound interest and elementary mathematics, we sought to explain the concept of stock investment. We then conducted a literature review focusing on the investing strategies of Benjamin Graham, Warren Buffett, and William J. O'Neil. Graham is the basis for our analysis of value investing; broader qualitative assessments, such as leadership, are beyond the scope of this paper.

#### **3.2. Comparative Stock Performance Analysis**

We collected historical stock price data from 2004 to 2024 for Nvidia and The Magnificent Seven from Yahoo Finance. Within these twenty years, we analyzed the data in one-year, three-year, five-year, ten-year, and twenty-year intervals. Our empirical findings revealed that Nvidia towered above the Magnificent Seven Technology companies. Furthermore, we collected historical data on Nvidia's stock price and return information from Yahoo Finance. We benchmarked Nvidia's performance against the major U.S. stock indices: the Dow Jones Industrial Average, S&P 500, and NASDAQ. Again, Nvidia's stock performance far exceeded all three U.S. stock indices. Our approach revealed distinct performance patterns and growth acceleration phases, showing Nvidia's outperformance compared to its competitors.

#### **3.3. Financial Metrics and Profitability Analysis: Growth and Margin Analysis**

We collected data from Nvidia's annual reports over the past 10 years. We studied data from Nvidia's financial metrics, including key growth and margin analysis metrics. The company's revenue and net profit over the past decade have shown exponential growth, attributed to its advances in and continued dominance of the AI and data-center markets. This growth has accelerated rapidly in recent years,

with revenue increasing by 214% from fiscal year 2024 to 2025 and by 226% from fiscal year 2023 to 2024. Net profit rose 245% from fiscal year 2024-25 and 681% from fiscal year 2023-24. To evaluate Nvidia's profitability and operational efficiency, we also ran a margin analysis that covered gross margin, operating margin, and net margin over the past decade. Additionally, we examined the net-margin data on a TTM (Trailing Twelve Months, as of February 21, 2025) basis for leading companies across various sectors to contextualize Nvidia's unusual growth. Nvidia's net margin more than doubled that of the third-place winner, Merck & Co., Inc. (NYSE: MRK), with a 27% net margin.

### 3.4. Nvidia's Success Factor Identification

We dissected Nvidia's key success factors from readings and analyses of its history, the speeches of its founder, Jensen Huang, and sources such as its website and business analysts' reports. We summarize and present our findings later in this paper. In general, however, our research attributes its success to technological innovations and rapid adaptation to evolving market demands. The company initially focused on gaming but has recently transitioned to meeting the fierce demand for artificial intelligence infrastructure and data center solutions. This strategic transformation leveraged the surge in capital investments by tech giants in training large language models. By developing and launching dominating software and hardware solutions to leading tech companies and numerous enterprises, Nvidia has effectively provided infrastructure capable of addressing the high demand for AI computing power, creating a sustainable, win-win ecosystem for its customers while establishing strong, reliable relationships with its vendors.

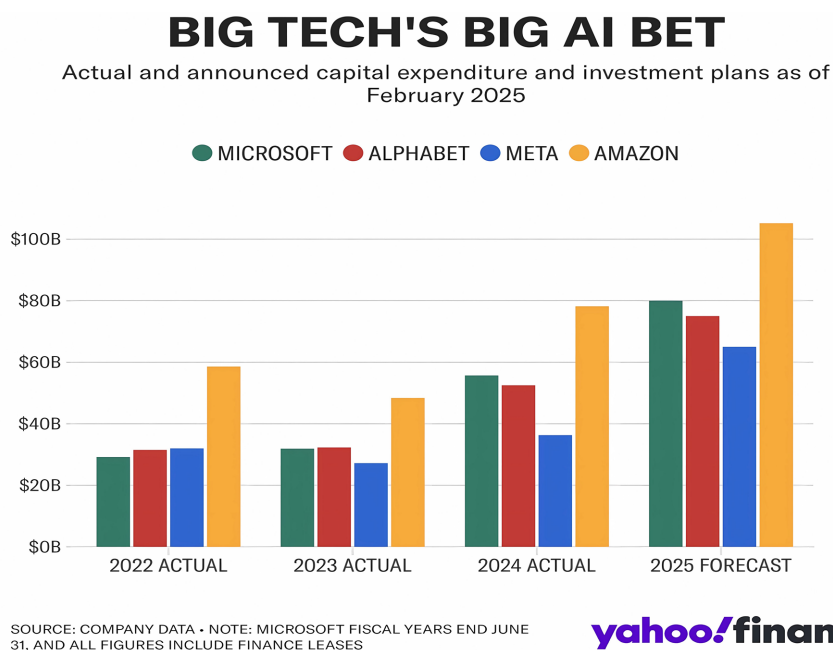
### 3.5. AI Trend Analysis: The Big Picture of High Demand for Nvidia

PwC (2023) recently predicted that AI could account for \$US15.7 trillion of the global economy by 2030. Of this, US\$6.6 trillion would arise from enhanced productivity, and US\$9.1 trillion from consumption. The potential economic boost will likely stem from improved productivity in the short term. This includes automating repetitive tasks and allowing workers to focus on higher-value activities. Capital-intensive industries, such as manufacturing and transportation, are expected to experience the most significant productivity gains as their operational processes become increasingly automated.

Over time, the economic impact of AI is likely to shift. GDP growth is driven by product innovation, and the resulting changes in consumer demand, behavior, and consumption patterns are projected to surpass the initial productivity gains. In 2030, these advancements could contribute over US\$9 trillion in additional global GDP. According to a Goldman Sachs report (2025), the economics team's baseline estimate was that widespread adoption of generative AI could boost U.S. labor productivity by 15% over 10 years, primarily by automating work tasks. That would add about US\$4.5 trillion to the annual U.S. GDP (in today's dollars). The economic benefits are expected to accrue to hardware and infrastructure provid-

ers in the early phases, then extend to platform and application developers in a later phase, and ultimately result in productivity and efficiency gains across the industry as a whole.

According to Yahoo! Finance (2025) data, major technology companies are planning unprecedented capital expenditures. Meta, Microsoft, Amazon, and Google are expected to spend approximately US\$325 billion on AI infrastructure development. The data in **Figure 1** indicates a 46% increase from the company's total 2024 spending of US\$223 billion, indicating the industry's aggressive push into artificial intelligence.



**Figure 1.** Big Tech's AI investment (2022-2024 Actual, 2025 Forecast). Data source: Yahoo! Finance. X-axis: Time (Years from 2000 to 2025). Y-axis: Big Tech's AI spending in USD.

Amazon leads the spending race with projected investments of around US\$105 billion for 2025, a significant increase from its US\$78 billion expenditure in 2024. CEO Andy Jassy emphasizes that most of this investment will be directed toward AI development for Amazon Web Services, viewing AI as the most significant technological advancement since the internet. Meta follows with planned investments of US\$60 - 65 billion, substantially higher than their initial guidance of US\$38 - 40 billion, while Google projects US\$75 billion in spending, exceeding Wall Street's expectations by 30%. Microsoft has already invested US\$42 billion of its planned US\$80 billion capital expenditure for 2025.

However, the U.S. stock market's response reflects growing investor concerns about returns on investment and the potential impact on other business sectors. Skepticism also exists regarding market dynamics, especially with the rise of competition from emerging players like DeepSeek. For example, shares of Nvidia dropped 16% on January 27, 2025, following its AI spending announcement.

### 3.6. Return on Stock Investment

To illustrate investment returns (Figure 2), consider Nvidia's stock performance in 2024, drawing on data from Yahoo! Finance (2023-2024)<sup>1</sup>. The stock closed at US\$134.29 on December 31, 2024, compared to an opening price of US\$48.15 on January 1. Nvidia also distributed dividends throughout the year: US\$0.004 per share in the first quarter and US\$0.01 per share in the remaining three quarters of 2024.

**Formula:**

$$\text{Return on Investment} = \frac{\text{Ending Balance} - \text{Initial Cost} + \text{Dividends}}{\text{Initial Cost}} \times 100\%$$

**Applying the Formula to Nvidia's 2024 Performance:**

- Ending Balance = \$134.29
- Initial Cost = \$48.15
- Dividends = \$0.004 + \$0.01 + \$0.01 + \$0.01 = \$0.034

Therefore:

$$\text{Return} = \frac{\$134.29 - \$48.15 + \$0.034}{\$48.15} \times 100\%$$

$$\text{Return} = \frac{\$86.174}{\$48.15} \times 100\%$$

$$\text{Return} \approx 1.7897 \times 100\%$$

$$\text{Return} \approx 178.97\%$$

**Figure 2.** ROI formula. Data source: Yahoo! Finance.

Figure 3, Yahoo! Finance (2023-2024), shows that Nvidia's (represented by the blue line) returns were approximately 171% from 2023 to 2024. During the same period, the market, represented by the S&P 500 (shown as the pink line), returned 23% to investors. We applied the same method to calculate and compare the five-year returns of Apple and Nvidia. Nvidia's return is estimated at 2192% (almost 22 times), while Apple's return is 252% (2.5 times) of the initial investment; the S&P 500 index fund investment has an 82% return. These calculations indicate that over these five years, Nvidia enjoyed an 8.7 times return compared to Apple and roughly a 26.7 times return compared to the S&P 500.

<sup>1</sup>We acknowledge that two data sources may yield slightly different stock-return estimates due to rounding and data-processing differences. To the best of our knowledge, the EOD Historical Data API is the primary source for stock-return estimates in Table 1, Table 2 and the accompanying narrative in Section 3.8 (A Marathon for Long-Run Investing), which covers NVIDIA, the "Magnificent Seven" high-tech companies, and the three major U.S. indices (S&P 500, Nasdaq Composite, and Dow Jones Industrial Average). A separate data source, NVIDIA's adjusted closing prices from Yahoo Finance, was used for the company's 2023-2024 return in Section 3.6 (Return on Stock Investment), with the last trading days of 2023 and 2024 as endpoints. Such discrepancies may arise from differences in how corporate actions are treated, whether prices are adjusted or unadjusted, dividends, rounding, and the exact period dates used. Full data and calculation details are provided in the Methods section.



**Figure 3.** Total stock return for Nvidia and Apple, Measured from 2023 to 2024. Data source: Yahoo! Finance. X-axis: Time (Years from 2023 to 2024). Y-axis: Investment Return in Percentage.

### 3.7. The Rule of 72

To explore these metrics further, we applied the Rule of 72, which demonstrates the power of compounding. This rule states that when the product of  $N$  (the number of investment periods) and  $I$  (the rate of return per period) equals 72 (%), the investment doubles in value.

This simple formula (**Figure 4**) (Investopedia, n.d.) provides a quick way to estimate the number of years required to double the invested money at a given annual rate of return. Based on the number of years necessary to double the investment, the Rule of 72 can also calculate the annual rate of compounded return on an investment.

$$N \times I = 72$$

$N$  = Number of Periods  
 $I$  = Interest Rate

**Figure 4.** The rule of 72 formula. Data Source: (Investopedia, n.d.).

### 3.8. A Marathon for Long-Run Investing

As shown in **Table 1**, the historical stock prices for the companies were retrieved from **EOD Historical Data (2025)**. Nvidia had a 171% gain over its initial investment, indicating a return of doubling that of Netflix and 2.6 times that of Tesla. Over three years, an investor's initial US\$10,000 investment in Nvidia would have grown to US\$45,700, compared to investing in Meta (US\$17,500) and Netflix

(US\$14,800). Extending the investment holding period to five years, an investor's US\$10,000 turns into US\$229,200 for Nvidia, US\$144,800 for Tesla, and US\$35,200 for Apple. In 10 years, the US\$10,000 initial investment in Nvidia grew to US\$2.8 million, US\$272,400 in Tesla, and US\$182,600 in Netflix. At this 10-year mark, Nvidia is predicted to return 6.4 times the combined returns of Tesla and Netflix. The longer an investor held the Nvidia position, the larger their gain. In 20 years, the US\$10,000 initial investment in Nvidia grew to US\$7.5 million, US\$5 million in Netflix, and US\$2.6 million in Apple. The longer an investor held the Nvidia position, the larger their gain.

**Table 1.** The value of Nvidia's Stock: Long-Term Investment Gains.

	One year	Three years	5 years	10 years	20 years
<b>Nvidia</b>	171%	357%	2192%	27,803%	74,494%
<b>Amazon</b>	44%	32%	137%	1314%	9807%
<b>Apple</b>	31%	43%	252%	919%	25,716%
<b>Meta</b>	66%	75%	186%	653%	N/A
<b>Netflix</b>	83%	48%	175%	1726%	50,503%
<b>Tesla</b>	63%	15%	1348%	2624%	N/A
<b>Google</b>	36%	31%	184%	616%	3838%
<b>Microsoft</b>	13%	29%	179%	958%	2175%

**Table 2** shows that investing in Nvidia has yielded significant gains for investors (EOD Historical Data, 2025). At a peak, Nvidia had an ROI of 171% over one year. The return trumps all significant indices, including the Dow Jones, S&P 500, and NASDAQ. It outpaced the NASDAQ (with a 29% return) almost 6 times over. Nvidia's 171% return was 7.3 times more than that of the market's S&P 500 (with a return of 23%). Nvidia's return was more than 13 times that of the Dow Jones (with a 13% return). Nvidia's three-year ROI of 357% outperformed major indices, such as the Dow Jones, S&P 500, and Nasdaq. This return dwarfed the returns of the NASDAQ (23%) by 15.3 times, the S&P 500 (23%) by about 15.3 times, and the Dow Jones (17%) by almost 21 times.

**Table 2.** Stock performance of Nvidia in comparison to major U.S. stock indices.

	One year	Three years	5 years	10 years	20 years
<b>Nvidia</b>	171%	357%	2192%	27,803%	74,494%
<b>S&amp;P</b>	23%	23%	82%	186%	385%
<b>Dow Jones</b>	13%	17%	49%	139%	295%
<b>NASDAQ Composite</b>	29%	23%	115%	308%	788%

Nvidia maintained its leadership position within the five-year investment period by delivering a 2192% return. Its closest competitor, the NASDAQ, managed

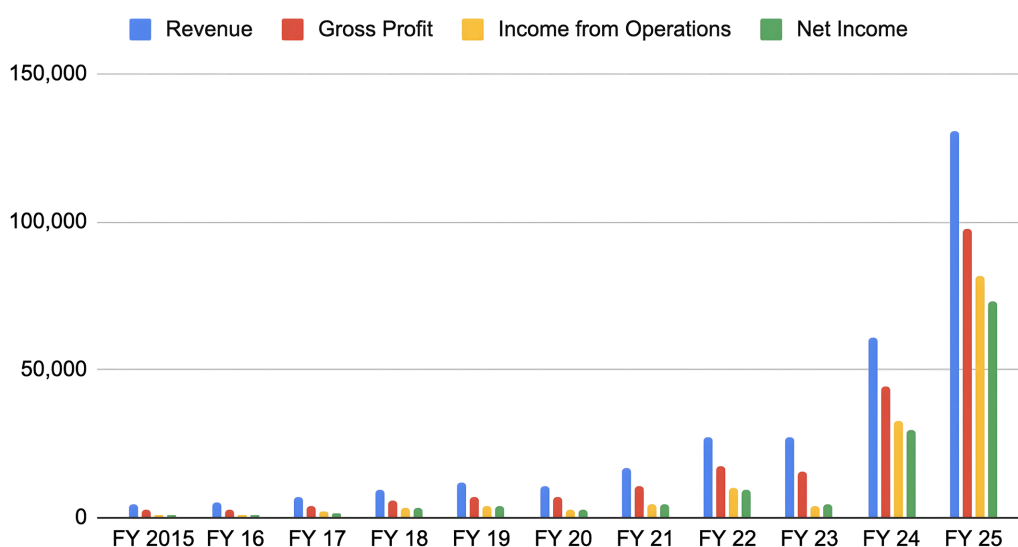
only a three-digit return of 115%. The remaining U.S. stock indices lagged even further behind, with the S&P 500 and Dow Jones generating returns of 82% and 49%, respectively.

Analysis of the last decade reveals Nvidia's extraordinary market dominance, with returns reaching 27,803%, translating to a US\$10,000 investment growing to nearly US\$2.8 million. This performance dramatically outperformed the tech-heavy NASDAQ's 308% return, while dwarfing those of the S&P 500 (186%) and the Dow Jones (139%). The prominence of NVIDIA's outperformance stresses its successful transformation from a gaming-chip manufacturer to an AI and computing powerhouse. The 20-year investment horizon showcases Nvidia's peerless market dominance, with a 74,494% return reshaping the boundaries of long-term investment potential. To put this performance in perspective, while US\$10,000 invested in the NASDAQ would have grown to US\$88,800 (788%) over this period, and the same amount in the S&P 500 or Dow Jones would have reached US\$48,500 (385%) or US\$39,500 (295%) respectively, an investor who bought US\$10,000 of Nvidia stock 20 years ago and held it would have seen their US\$10,000 multiply to an extraordinary US\$7.5 million. Nvidia's exceptional performance emphasizes its strategic transformation and technological capabilities, generating wealth on a scale that surpasses traditional market benchmarks.

### 3.9. Successful Key Financial Metrics—Growth and Margins

We adopted two key financial metrics—growth and margin analysis—to measure and highlight Nvidia's operating success over the past decade.

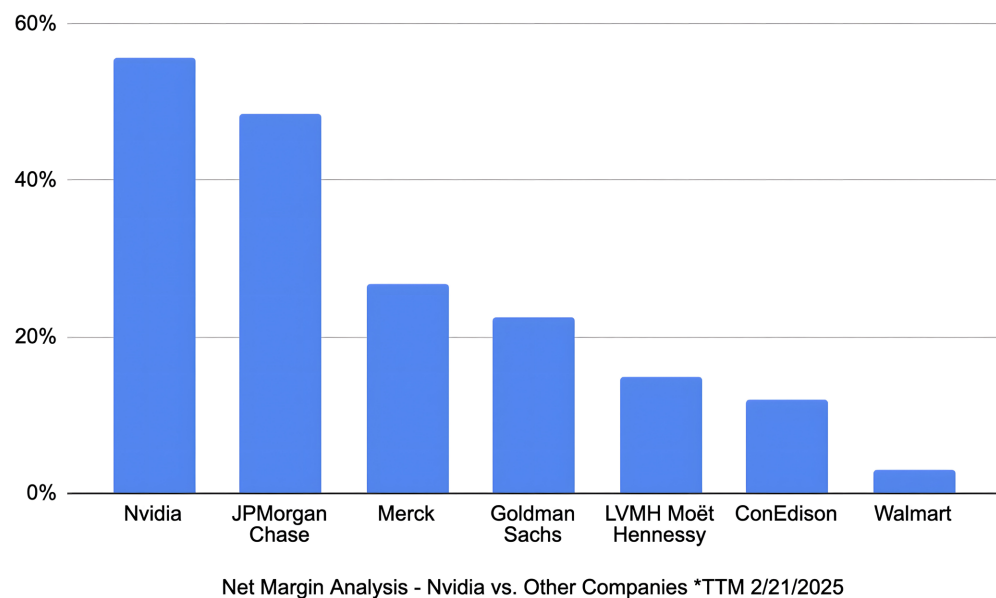
#### ***Nvidia Growth Analysis: Revenue, Gross Profit, Operating Income, and Net Profit Fiscal Years 2015-25***



**Figure 5.** Nvidia's growth analysis: fiscal years 2015-2025. Data source: [Nvidia Corporation \(2015-2025\)](#). X-axis: Time (Fiscal Years from 2015 to 2025). Y-axis: the Dollar Value.

**Figure 5** shows that Nvidia Corporation has demonstrated a consistent upward

trend in all three growth metrics—revenue, gross profit, operating income, and net profit—over the past ten years, with particularly significant jumps in the most recent fiscal years of 2024 and 2025 (Nvidia Corporation, 2015-2025). The dip in 2023 was likely caused by the cryptocurrency crash that year. However, Nvidia was able to bounce back and leverage the AI boom to achieve rapid growth acceleration. Nvidia used software like CUDA and TensorRT to lock the nascent AI industry into using its hardware, including both gaming GPUs and purpose-designed processors like the H100. These efforts paid off. In FY2025, its annual sales surpassed US\$130 billion, and its gross profit reached over US\$97.9 million. Operating income is around US\$81.5 million, and net income is about US\$70.9 million. With a current market cap of over US\$2.7 trillion, Nvidia has grown from a moderately sized gaming-focused tech company into the third most valuable company in the world in under a decade.

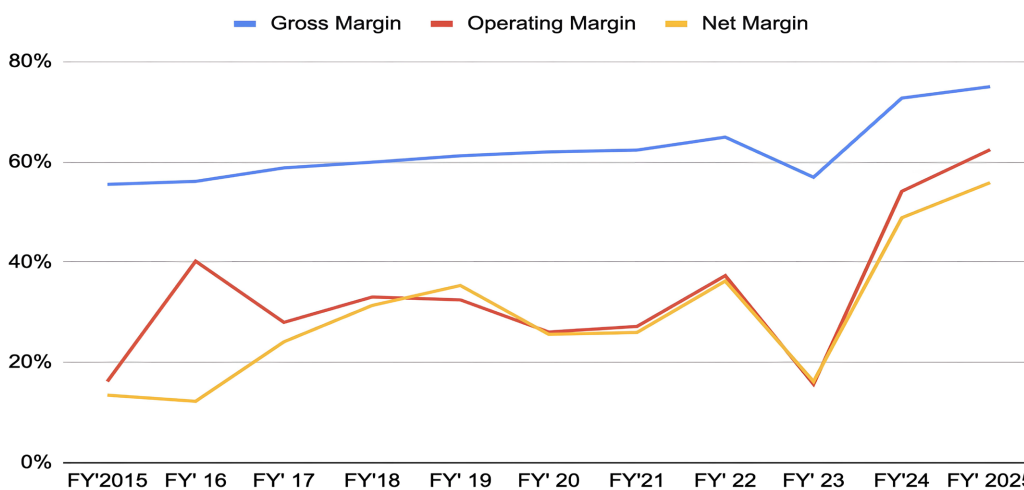


**Figure 6.** Margin analysis: Nvidia vs. leading companies across different sectors on a trailing twelve months (TTM) basis as of February 21, 2025. Data Sources: Yahoo! Finance. X-axis: the Companies. Y-axis: the Net Margin in Percentage.

We can examine Nvidia's net margin compared to industry leaders across various sectors for the trailing 12-month period ending February 21, 2025 (Yahoo Finance, 2024a, 2024b, 2024c, 2024d, 2024e, 2024f, 2024g, 2024h, 2024i, 2024j; Yahoo Finance, n.d.a, n.d.b, n.d.c, n.d.d, n.d.e, n.d.f). Net margin—the net profit (in % form) generated from every dollar of revenue—often makes visualizing insights into a business's profitability or success more evident. Figure 6 shows that Walmart (NYSE: WMT) had a modest net margin of 3%. This was the lowest net margin in the retail sector. Walmart succeeds through a large volume of revenue and razor-sharp operating efficiency. Moving up, utility company Consolidated Edison, Inc. (NYSE: ED), is positioned as a regional player that benefits from a local monopoly. LVMH Moët Hennessy (PARIS: MC.PA), the French luxury

goods company that sells women's handbags and fashion items such as scarves, jewelry, and gifts, has a high net margin of 15% due to its positioning, branding, and sophisticated, premium pricing strategies. Leading investment bank The Goldman Sachs Group, Inc. (NYSE: GS) has sustained a high margin of 23% among its various investing verticals. Merck, a pharmaceutical leader that provides medicines to humans and animals, has a high net margin of 23% due to patent protection and a high barrier to entry. JPMorgan Chase & Co. (NYSE: JPM) is the second-highest in net margin, with a net margin of 48%. Lastly, Nvidia has a net margin of 56%, combining advantages in pricing, barriers to entry, operating efficiency, and intellectual property protection.

#### **Nvidia's Gross Margin, Operating Margin and Net Margin**



**Figure 7.** Nvidia margin analysis (Fiscal Years 2015-2025). Data source: [Nvidia Corporation \(2015-2025\)](#). X-axis: Time (Fiscal Years from 2015 to 2025). Y-axis: the Margins in Percentage.

Nvidia Corporation's margin analyses ([Figure 7](#)) from fiscal years 2015 to 2025 indicate a clear pattern in its operational success across three key financial metrics: gross margin (blue line), operating margin (red line), and net margin (orange line). These metrics show significant variations over the past decade ([Nvidia Corporation, 2015-2025](#)). From 2015 to 2025, the gross margin remained stable, ranging from 57% to 73%. Operating and net margins also gradually improved, reaching peaks of approximately 36% and 37%, respectively, in 2023. The same year saw a noticeable decline, with all margins experiencing a significant dip. Gross margins dropped to approximately 57%, and operating and net margins fell to their lowest points, around 15% - 16%. This decline can be attributed to increased infrastructure investments and rising GPU prices, which were caused by the cryptocurrency crash. The year 2024 was a period of recovery, marked by significant improvements across all key metrics. Gross margin reached its highest level at approximately 73%, operating margin recovered to about 54%, and net margin improved to about 49%. This recovery suggests that Nvidia continued improving operational efficiency. Overall, the parallel movement of operating and net mar-

gins throughout the period indicates consistent, successful financial management. The 2023 dip and the 2024 recovery suggest navigating a significant investment phase with deft skill.

Additionally, the expanding margins in 2024-25 reflect Nvidia's strong pricing power, as demand far outpaced supply during the AI boom, and the company's success in achieving economies of scale. This margin analysis demonstrates Nvidia's ability to maintain and improve profitability while scaling operations, particularly in the strong recovery and expansion of margins in 2024-25. The pattern suggests effective cost management and strong market positioning, especially in the high-demand AI sector.

## **4. Challenges and Concerns**

Among its challenges and concerns, Nvidia faces competition from direct industry rivals, the emergence of DeepSeek, and questions surrounding its valuation. We will address these issues as follows:

### **4.1. Nvidia's Competitive Advantages over Direct Competitors**

Intel dominated the chip market for a significant period, particularly from the 1990s through the early 2010s. Intel grabbed nearly 80% of the CPU market, and AMD gained almost 20% of the CPU market by catering to small and medium-sized businesses. Nvidia avoided competing with Intel and AMD in the CPU market, where they were well-established, and instead focused on GPUs (graphical processing units). In the GPU market, Nvidia has primarily competed with AMD over the last decade. In 2010, Nvidia held a market share of around 60%, while AMD held a market share of around 40%. The competition dynamics, however, have completely shifted in recent years, stemming from the origin of innovative creation, market penetration, and vast adoption of Nvidia's GPUs. Nvidia positioned itself as a first mover in graphics design by providing graphics cards to its gaming users early. Since 2020, it has innovated high-performance computing and GPUs (with their parallel processing architecture) to meet the unprecedented and escalating demand for artificial intelligence, which requires data centers for LLM (Large Language Model) training and interface, especially when deep learning is involved. Estimates suggest that the combined AI-related capital expenditures of Amazon, Google, Meta, and Microsoft could exceed \$320 billion in 2025. NVIDIA developed CUDA (Compute Unified Device Architecture), a parallel computing platform and programming model that allows developers to use Nvidia GPUs for general-purpose processing. This powerful and easy-to-use ecosystem has become the standard for AI and HPC development. Nvidia's CUDA platform and extensive software ecosystem are deeply ingrained in the AI development community. This provides a significant advantage that is difficult for newcomers to overcome quickly. AMD and Intel have been lagging in developing powerful GPUs and establishing the industry standard in the new AI era. Nvidia has consistently released new GPU architectures designed and optimized for AI workloads, main-

taining its high performance and absolute competitiveness.

In the new AI age, Nvidia has held a 90% share of the discrete GPU market from late 2024 to early 2025. In contrast, AMD's market share has dropped to around 10% while Intel's continues to hover in the sub-1% range. It also has a 98% market share in the data center GPU business.

Nvidia's data center revenue soared to \$115.2 billion in fiscal year 2025. The revenue increase represents a 142% increase year-over-year. For comparison, in the past year, Nvidia had \$130.5 billion in revenue and \$72.9 billion in net income. During the same period, Intel's revenue was \$53.1 billion (about 40% of that of Nvidia's), and AMD's was close to \$25.8 billion (less than 20% of Nvidia's). Their net income figures for that year were \$1.6 billion for Intel and a net loss of \$18.8 billion for AMD. While AMD is making strides in both CPUs and GPUs, and Intel is re-entering the discrete GPU market with renewed vigor, NVIDIA currently holds a strong leadership position, particularly in the high-performance and AI segments. In conclusion, NVIDIA's early and strategic focus on the potential of GPUs for parallel processing, the development of the powerful CUDA ecosystem, and timely hardware innovations tailored for AI have all contributed to NVIDIA's significant market share gains in recent years.

#### 4.2. DeepSeek Concern

In January 2025, the emergence of DeepSeek caused Nvidia to lose 17% of its stock value in a single day, resulting in a total loss of US\$590 billion. The Chinese company DeepSeek offers an open-source AI model that will cost only \$6 million, rather than billions of dollars, to train its large language model. In contrast to previous models, DeepSeek requires significantly lower computational resources and costs. DeepSeek raised immediate concerns about whether the demand for Nvidia's expensive chips will still be high. However, Nvidia's CEO, Dr. Jensen Huang, soon responded, "The incidence of DeepSeek will trigger more demand for Nvidia's products." NVIDIA is a crucial technology partner for DeepSeek. NVIDIA's hardware and software play a pivotal role in developing and deploying DeepSeek's advanced AI models. So, Nvidia and DeepSeek will be more of collaborators than competitors. Including DeepSeek-R1 on Nvidia's ecosystem further confirms this collaboration, making DeepSeek's capabilities readily accessible to developers.

Additionally, Nvidia's recent expansion into the international market has significantly enhanced and solidified its global leadership in AI. The Gulf states are substantially investing in artificial intelligence to diversify their economies. During President Donald Trump's recent Middle East trips, Nvidia has secured deals to supply 18,000 Blackwell (advanced version) AI chips to Humain, a Saudi-backed AI startup. The collaboration plans for several hundred thousand Nvidia AI chips over the next five years demonstrate a significant demand for Nvidia's high-performance GPUs to build AI data centers and infrastructure within Saudi Arabia. There are ongoing negotiations regarding the sale of over a million Nvidia

AI chips to the United Arab Emirates (UAE).

### 4.3. Is Nvidia's Stock Price Overvalued?

Given its years of high growth and superior returns to investors, one might question whether Nvidia's stock is overvalued. To assess this, we will use two key metrics: the Price-to-Earnings (P/E) Ratio and the Price/Earnings to Growth (PEG) Ratio.

The P/E ratio represents the amount investors are willing to pay for each dollar of a company's earnings. Its formula is a company's Share Price divided by its Earnings Per Share (EPS). To determine if a stock is overvalued based on its P/E ratio, it is typically compared against three benchmarks:

- 1) The company's historical average P/E.
- 2) The average P/E of its industry competitors.
- 3) The P/E of the overall market (e.g., the S&P 500 average, which commonly ranges from 15 - 25 but can fluctuate).

Nvidia's recent P/E ratio of 45 is significantly higher than the S&P 500 average of 28, as of the most recent data. Its direct competitors include AMD and Intel. However, this higher P/E can be justified by its superior revenue and earnings growth, as well as its exceptional margins. When compared to its historical performance, Nvidia's current P/E ratio of 48 for fiscal year 2025 appears very reasonable. In contrast, its mean P/E ratio over the last 5 years has been 68, with a median of 55. Over the past 10 years, the mean P/E ratio was 49, and the median was 48. We believe that the P/E ratio observed over the past five years more accurately reflects Nvidia's evolving business model and strong competitive advantage.

The PEG Ratio factors in expected earnings growth, complementing the P/E ratio by showing how much an investor is paying for each unit of growth. The formula for the PEG ratio is P/E Ratio/Earnings Growth Rate (where the growth rate is expressed as a whole number percentage, e.g., 50 for 50% growth). This ratio is particularly pertinent for growth stocks, as it justifies a high P/E. A PEG ratio greater than 1.0 is generally considered an indicator of overvaluation.

A review of Nvidia's PEG ratio over the past 10 years reveals that it only exceeded 1 in 2021, reaching 1.32. The second-highest applicable PEG was 0.54 in 2019. There were three years when Nvidia's PEG was not appropriate due to negative EPS growth (2023 and 2020) or flat EPS growth (2017). All other applicable PEG values were well below 0.5, ranging from 0.08 to 0.47. Nvidia's most recent PEG ratios are 0.33 for fiscal year 2025 and 0.08 for fiscal year 2024.

Therefore, Nvidia's stock is not over-valued. Instead, it's well under-valued for its investors.

## 5. Conclusion

Our study illuminates crucial observations of Nvidia as an unprecedented technological behemoth. Our research findings traced its eccentric, ever-changing

technological novelty and its light-speed adaptation to evolving market demands. The company initially focused on gaming in its early years, but has recently transitioned to meeting the growing demand for artificial intelligence infrastructure and data center solutions. This strategic transformation originated from ballooning capital spending on gigantic technology companies investing in training large language models with machine learning and deep learning. By developing and launching innovative software and hardware solutions for leading tech companies, Nvidia has effectively provided the infrastructure to meet the high demand for AI computing power, creating a sustainable, win-win ecosystem for its customers while establishing strong, reliable relationships with its vendors.

This paper discussed wealth accumulation through long-term investment in accomplished companies. Investors can build wealth by participating in a company's operations and receiving dividends. Nvidia has established itself as a phenomenal example of a company that provides its investors with exceptional returns, particularly over the multi-year equity holding strategy. The stock's performance is especially compelling compared to its technology peers, the "Magnificent Seven". Our comprehensive benchmarking analysis against major U.S. indices further illustrates Nvidia's exceptional outperformance over the past 20 years.

We highlighted Nvidia's financial success using two key metrics that reveal its operational excellence:

1) Over the past decade, growth analysis has examined revenue, gross margin, income from operations, and net profit, demonstrating exceptional expansion, particularly in recent years.

2) Margin analysis comparing Nvidia's net margin over the past five years with those of major companies across various sectors, highlighting Nvidia's industry-leading profitability.

As the seller of tools used in the modern AI gold rush, Nvidia has carved out an effective market niche: it has become a leader in AI technology through its forefront hardware and software infrastructure. The company has created a wide moat by consistently developing cutting-edge AI infrastructure focused on GPUs, data center solutions, and strategic market positioning. Nvidia has secured phenomenal financial returns for its stockholders to date, particularly in the eight quarters of 2023 and 2024, setting a benchmark for success in the technology sector.

Nvidia has been confronting consistent challenges from domestic competitors such as AMD and Intel, as well as global rivals like Huawei in China. Will it face a decrease in customer demand or a drop in its gross margins? How will it cope with geopolitical risks related to trade conflicts and restrictions on AI product sales? The emergence of DeepSeek may trigger a decline in demand for Nvidia's expensive, high-end chips. We have yet to witness Nvidia's continued technological innovation and its ability to sustain its competitive and strategic edge.

## Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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