

# **NVIDIA Comprehensive Analysis & Strategic Recommendations**

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## 1. Executive Summary

NVIDIA Corporation has undergone a significant transformation from a consumer-facing to an enterprise-facing organization, primarily driven by the explosive demand for its cutting-edge graphics processing units (GPUs) and artificial intelligence (AI) technologies. This strategic shift has enabled NVIDIA to capitalize on its technological superiority and aggressive pricing strategy, leading to substantial profit margins and a dominant position in the GPU market.

NVIDIA stands at a pivotal point where strategic decisions made today will determine its future trajectory. By adhering to these recommendations, NVIDIA can ensure sustained growth, maintain its market leadership, and respond proactively to the dynamic challenges of the tech industry.

### Key Strategic Insights:

- **Market Dominance:** NVIDIA has established itself as a leader in the GPU industry, benefiting from a "unicorn" market condition where its products are both highly innovative and profitable. The company's GPUs are essential for a variety of high-demand applications, including gaming, AI, healthcare, and autonomous vehicles.
- **Financial Performance:** NVIDIA's financial health is robust, characterized by strong revenue growth, high profit margins, and significant cash flow, which are well-documented in its latest financial reports and market analyses. This financial stability provides NVIDIA with the leverage to invest heavily in research and development, securing its market position against emerging competitors. (See Appendix 6.6)
- **Strategic Challenges and Opportunities:**
  - **Competitive Threats:** Other players in the tech industry, including AMD, Huawei, and Intel, are intensifying competition. NVIDIA's biggest customers – including Microsoft, Meta, Google, Amazon, Tesla, and others – are developing their own alternative AI hardware and building their own platforms to rent those out to startups, which will disrupt NVIDIA's market.
  - **Innovation and Expansion:** To mitigate these threats and sustain its market lead, NVIDIA is advised to expand and accelerate its innovation trajectory and explore strategic acquisition of a leading AI-as-a-service platform. This will not only enhance its product offerings but also expand its market reach and prevent new entrants from competing away NVIDIA's market share.

- **Strategic Recommendations:**

- **AI-as-a-Service Platform:** Acquire a leading AI-as-a-Service platform and transition from hardware sales to service subscriptions, leveraging NVIDIA's advanced GPU technology. This move is expected to open new revenue streams, reduce dependency on direct hardware sales, and offset future declines in demand for current products.
- **Price Adjustment Strategy:** Implement a strategic price increase for high-end GPUs to offset the investments in cloud infrastructure and create a financial barrier for competitors aiming to enter the platform business.
- **Renewed Focus on Innovation:** Intensify efforts in R&D to stay ahead of technological advancements and competitors. This is critical to maintaining NVIDIA's competitive advantage and addressing the evolving needs of the AI and gaming markets.

## 2. Company Primer

NVIDIA is a multinational firm that provides full-stack computing solutions comprised of hardware such as graphics processing units (GPUs) and systems on a chip (SoCs), and software like application programming interfaces (APIs). Through these technologies, their products enable accelerated computing for applications like gaming, artificial intelligence, digital twins, healthcare, robotics, and self-driving vehicles (*NVIDIA in Brief*, 2023). The firm operates in two segments, graphics and computing & networks (NVIDIA Corp., 2024).

NVIDIA developed its flagship product, the GPU, to solve advanced problems in computing that other technologies failed to address. Graphics-based computing is special because the chips use advanced mathematics to solve many problems at once. One critical aspect of NVIDIA's success is its position in the gaming market, in which NVIDIA enjoys "unicorn" market conditions in which its products are both highly profitable and at the forefront of innovation in the field. The revenues they made from gaming chips from the early 2000s to late 2010s bankrolled their extensive R&D efforts and further drove innovation (Nusca, 2021).

Their primary competitors in the GPU market are AMD, Huawei, and Intel. Their product is far superior to anything else on the market, boasting impressive specs that far outshine the nearest competitors (Ridley, 2023). For this reason, the company was well-positioned to supply the data centers that make AI possible. With the recent technological leaps in large language models, the need for advanced data centers skyrocketed, as did NVIDIA's revenues (Smith, 2024). See 6.7.1 Chart 1.

### **3. Corporate Performance**

#### **3.1 Current Financial Position**

Based on the numbers gathered, NVIDIA's current financial condition appears quite strong and their financial metrics paint a positive picture. The company is experiencing impressive revenue and net income growth, has healthy margins, and is generating a significant amount of cash flow. This type of financial performance positions NVIDIA well for continued growth in the future. However, this success shouldn't breed complacency. Constant innovation is key to staying ahead in the tech industry, and we encourage NVIDIA's leadership to strategize its next big move. (See last graph of Appendix 6.6)

NVIDIA's revenue has been on a steady upward trajectory, culminating in a phenomenal 63% year-over-year increase in Q4 2024. This isn't just a blip on the radar; it's a clear indicator of the surging demand for what NVIDIA offers. The company isn't just selling products – they're providing solutions that resonate with a growing market. Whether it's the power needed for cutting-edge artificial intelligence applications or the graphical muscle to drive the latest gaming experiences, NVIDIA seems to be hitting the right note. It's a positive sign for both NVIDIA and the industries they serve. (NVIDIA Corporation - Financial Reports)

NVIDIA's net income has mirrored their booming revenue, skyrocketing a remarkable 133% year-over-year in Q4 2024. This isn't just a case of a company "selling a lot of stuff;" it signifies that NVIDIA is operating efficiently and squeezing maximum profit out of each sale. This is all due to their strategic pricing, streamlined operations, and cost-effective manufacturing processes. The end result is a company that's not only growing its market share but also significantly boosting its bottom line. This financial strength allows them to reinvest in the business, develop new technologies, and weather any potential economic storms. A strong net income also positions them for continued growth. With more profit at their disposal, they can invest in research and development, expand into new markets, or even make strategic acquisitions. This virtuous cycle of increasing revenue is a key driver of long-term success in any industry. (NVIDIA Net Income 2010-2024)

Their profitability isn't just a result of booming sales; it's also driven by their impressive gross margins. Consistently hovering around 70% in recent quarters, this metric paints a clear picture: NVIDIA is adept at setting healthy pricing strategies. In simpler terms, they're able to charge a premium for their products while still generating significant customer interest. High gross margin is a double win. First, it signifies the value proposition NVIDIA offers. Their products are not only in high demand, but customers are willing to pay a premium for the performance, features, and reliability they deliver.

Second, a healthy gross margin translates directly to profitability. This proves NVIDIA's ability to not only develop cutting-edge technology but also to effectively bring it to market at a price point that captures significant value. (NVIDIA Corporation - Financial Reports)

Cash flow from NVIDIA's operations has been on a tear, skyrocketing from \$392 million to a whopping \$11.499 billion! This impressive surge is a clear sign that NVIDIA's core business is firing on all cylinders, generating significant cash flow and giving them a major advantage. They can reinvest in research and development to push the boundaries of technology, return profits to shareholders through dividends or stock buybacks, among other areas we will touch on in our strategy. Overall, it's a win-win for NVIDIA and a sign of strength in their core business. (NVIDIA Corporation - Financial Reports)

### **3.2 Positive & Negative Trends in the GPU Industry**

The GPU industry has experienced a perfect storm of positive trends that have propelled NVIDIA to its current financial heights. The resurgence of PC gaming has ignited demand for NVIDIA's high-performance graphics cards, solidifying their dominant market share with over 80% ownership since 2022. (Wilson, H. 2024) This dominance is further bolstered by the surging adoption of Artificial Intelligence (AI) across various sectors. While large companies lead the way, with over half of those exceeding 5,000 employees utilizing AI, sectors like manufacturing and healthcare are also experiencing significant growth. (MIT Sloan 2024) This widespread AI adoption creates a thriving market for NVIDIA's specialized computing hardware, perfectly suited for handling complex AI tasks. Looking towards the future, the potential of the Metaverse adds another layer of excitement. The Metaverse, with its reliance on powerful GPUs for rendering virtual environments, presents a promising avenue for continued growth for NVIDIA, as highlighted by recent Metaverse trend reports. (Sukhanova 2024) By capitalizing on these positive trends in gaming, AI, and the potential of the Metaverse, NVIDIA has secured a strong financial position and is poised for continued success.

Despite the positive trends propelling NVIDIA's success, there are also potential roadblocks to consider. The ongoing global chip shortage remains a significant challenge. (Run.AI) This shortage limits NVIDIA's ability to meet the high demand for their products, potentially hindering revenue growth. Additionally, competition in the chipmaking industry is heating up, with companies like AMD vying for market share. This could lead to price wars, squeezing NVIDIA's profit margins. (Wilson, H. 2024) Furthermore, the cryptocurrency market's volatility throws another curveball. As GPUs are used for mining cryptocurrency, fluctuations in the crypto market can directly impact

demand for NVIDIA's products. (Marketing Batman 2023) A sharp decline in cryptocurrency prices could lead to a sudden drop in GPU demand, impacting NVIDIA's sales. While NVIDIA is currently riding a wave of success, these negative trends highlight the dynamic nature of the tech industry and the need for constant adaptation to maintain their leading position.

## **4. Environmental Analysis Summary**

### **4.1. Market Landscape**

#### **4.1.1. Company Position:**

NVIDIA's market position is stellar. In the last year and a half, the stock price has risen 450% with a market cap of about \$2.2 trillion. Analysts expect this growth to continue because "NVIDIA controls more than 95% of the market for specialist AI chips" (The Economist Newspaper, 2024). NVIDIA's chips make up four-fifths of all gaming GPUs, but the NVIDIA chips are also used in self-driving cars, AI modeling, and more. This is due to the speed at which the chips can compute, and how many computations may occur simultaneously. Additionally, NVIDIA acquired Mellanox, a firm that makes network technology that optimizes NVIDIA's chips even further by increasing processing power, which gives them an advantage over the competition. Other companies have come out with chips that compete well with NVIDIA in terms of memory, but NVIDIA still carries a substantial competitive advantage with its CUDA software and networking kit. The three arenas NVIDIA has been successful in are the GPUs themselves, the networks to support them, and the CUDA software they have built to efficiently run them, which can be considered a resource bundle that other companies have not yet matched.

### **4.2. External Factors for Consideration**

#### **4.2.1. What are the most pressing observations that exist outside the company's control but are likely to present either threat(s) or opportunity(ies) to the business? (PESTEL)**

NVIDIA's future success is contingent on the continued rapid adoption of AI. Government and industry investment in data centers pose enormous opportunities for growth and NVIDIA is well-situated to position itself as a solution for a sustainable future due to the energy efficiency of GPU-accelerated computing. The firm is threatened by geopolitical conflicts in Israel, where it engages in engineering, sales support operations and manufacturing and Taiwan, where its manufacturing partner TSMC is based. See Appendix for a complete analysis of PESTEL threats and opportunities.

#### **4.2.2. Potential for Profitability (Porter's 5 Forces)**

NVIDIA operates in highly competitive, yet profitable markets due to the high barriers to entry and dependence of enterprises on the products they create. However, the firm faces bilateral threats from buyers looking to vertically integrate by creating their own GPUs and from Israeli and Taiwanese suppliers impacted by geopolitical conflict.



### 4.2.3. Market/Industry Landscape

Based on our research, NVIDIA holds a very strong market position relative to its competitors in the graphics processing unit (GPU) market. Here's a breakdown:

- **Dominant Market Share:** NVIDIA has maintained a market share of over 80% since 2022. This overwhelming dominance indicates a significant competitive advantage.
- **Brand Recognition:** Being a prominent brand in the GPU space translates to greater customer loyalty and brand recognition compared to competitors.
- **Innovation:** NVIDIA's focus on research and development suggests they're constantly innovating to stay ahead of the curve. This continuous improvement can make it difficult for competitors to catch up.
- **Emerging Competition:** The mention of AMD as a competitor suggests there are other players in the market, and competition might intensify in the future.

NVIDIA enjoys a very strong position in the GPU market. Their dominant market share, brand recognition, and focus on innovation give them a significant edge. However, it's important to acknowledge the presence of competitors like AMD and the potential for future challenges.

### 4.3. Corporate Resources and Capabilities (VRIO)

#### 4.3.1. Gaps in Resources and Capabilities

A potential constraint that NVIDIA could run into is manufacturing capacity as they continue to scale into other industries. Because they don't manufacture in-house, they could experience issues in their supply chain due to the massive demand for semiconductors and their GPUs.

AMD, a chip maker and NVIDIA's most threatening rival released a chip that has 2-2.4 times more memory than NVIDIA, but doesn't yet have a software platform as successful as NVIDIA or the network that NVIDIA has built up. However, they are fast approaching with more advanced processing and developing software in a way that makes switching costs low for customers. In order to mitigate this risk, NVIDIA may need to look for strategies that make buyer's power decrease and its competitive advantage increase.

#### 4.3.2. Particular Resource and Capability Strengths

As mentioned above, the strongest resource bundle that NVIDIA carries is their combination of the following three assets: patented and innovative GPU technology, successful software built specifically for that GPU technology, and the networking kit that increases the GPU power and speed.

#### 4.4. Core Competencies and Competitive Advantage (VRIO)

##### 4.4.1. Core Competencies

NVIDIA's core competencies are their GPU and AI chip innovation, their strategic partnerships, and their expertise in AI. As detailed in Appendix 6, NVIDIA gains its competitive advantage from the GPU and AI chip technology they have created and owns patents for. Their GPU processing has yet to be matched by any competitor. In addition, the strategic partnerships that NVIDIA holds provide a vast portfolio of uses for its innovative technology. With partnerships that span 13 industries, NVIDIA has created a wide variety of free and commercial uses for its GPU and AI chip technology.

##### 4.4.2. Competitive Advantage

NVIDIA certainly holds a competitive advantage in the GPU and AI market as detailed in Appendix item 6. NVIDIA's competitive advantage comes from its innovative technology, its strategic partnerships, the patents it owns on its technology, the NVIDIA brand, and its expertise in AI and advanced computing.

#### 4.5. Corporate Strengths & Weaknesses (SWOT)

##### Strengths

The main strength that NVIDIA has is its ***Technological Leadership***. NVIDIA is a leader in GPUs and AI accelerators, crucial for high-performance computing, gaming, and AI applications. This strength is crucial because it enables NVIDIA to dominate several fast-growing markets. The technological edge not only drives revenue growth through premium product offerings (e.g., the H100 GPU) but also enhances brand reputation.

Secondly, the ***Innovative Ecosystem*** the company created. NVIDIA created a robust development platform named CUDA (Compute Unified Device Architecture) that facilitates a broad array of applications, supporting a wide user community. It allows software developers and programmers to use a CUDA-enabled graphics processing unit (GPU) for general purpose processing – an approach known as GPGPU (General-Purpose computing on Graphics Processing Units). CUDA gives developers direct access to the virtual instruction set and memory of the graphics processing unit, enabling dramatic increases in computing performance by harnessing the power of the GPU.

This strength is crucial because it creates a high barrier to entry for competitors and increases customer stickiness. Developers, researchers, and companies deeply integrate these tools into their workflows, making switching costs high. This ecosystem supports a wide range of applications from scientific research to autonomous driving, further diversifying NVIDIA's revenue sources and embedding the company into multiple technology growth areas.

The third strength identified is NVIDIA's **Strong brand and Market presence**. The company is recognized as a top player in the graphics and AI fields with a solid reputation for quality and performance.

Lastly, its **High-Profit Margins**. Exceptional profitability, particularly on high-end products like the H100 GPU, reflecting strong demand and pricing power (1,000% margin).

## **Weaknesses**

NVIDIA's main weakness is its **Customer Concentration**. It has a high reliance on a few large customers (Meta, Microsoft, Amazon, Google, among others), who are increasingly developing their own in-house technologies, posing risks to NVIDIA's future demand stream.

This Weakness is key because if one or more of these customers decide to shift towards in-house solutions or choose a competitor's offerings, NVIDIA could face significant revenue and market share losses. This risk is accentuated in an environment where tech companies are increasingly looking to control their supply chains and reduce dependencies.

Secondly, NVIDIA's business model, like that of many high-tech companies, is **heavily reliant on complex global supply chains**, which are susceptible to a variety of risks, especially from geopolitical tensions. NVIDIA designs cutting-edge GPUs and AI accelerators but doesn't manufacture these chips itself. Instead, it depends on a global network of foundries (semiconductor fabrication plants), most of which are located in Asia, particularly in Taiwan and South Korea. TSMC, based in Taiwan, is one of the world's largest semiconductor manufacturers and a key partner for NVIDIA. The ongoing tensions between Taiwan and China pose a potential threat to NVIDIA's supply chain. Any escalation in conflict or imposition of trade restrictions could disrupt TSMC's operations, leading to severe supply constraints for NVIDIA.

Thirdly, **Product Durability**. NVIDIA has high-quality, durable products that reduce the frequency of repeat purchases, potentially leading to market saturation.

Lastly, **Market Dependence**. It has significant exposure to the AI and gaming sectors, making its financial performance sensitive to these markets.

## 4.6. Corporate Opportunities & Threats (SWOT)

### Opportunities

The first opportunity NVIDIA faces is **Market Expansion**, particularly into new and emerging markets that can significantly benefit from its advanced technology. The automotive sector, with its shift toward autonomous vehicles, offers a prime example of where NVIDIA's AI and machine learning technologies could play a crucial role. Additionally, the healthcare industry presents opportunities for NVIDIA's GPU-powered applications to transform imaging and diagnostic processes, thus opening new avenues for growth and innovation.

Another opportunity lies in the **Development of Complementary Software and Services** that can enhance the utility and stickiness of NVIDIA's hardware products. By expanding into AI platforms and cloud computing solutions, NVIDIA can not only diversify its revenue streams but also improve customer retention and satisfaction. This strategy will not only boost its competitive edge but also create a more integrated ecosystem for its users.

**Forming strategic partnerships outside of the traditional tech and consumer electronics sectors** represents a further opportunity for NVIDIA. By collaborating with industries like biotechnology, financial services, and entertainment, NVIDIA can explore new applications for its technology, from accelerating drug discovery to enhancing virtual reality experiences. Such partnerships could broaden NVIDIA's market reach and reinforce its position as a technology leader.

### Threats

On the threats side, one of the most significant is the trend of major customers like Google and Amazon developing their own **in-house AI solutions**. This movement towards self-reliance could diminish their need for NVIDIA's products, potentially leading to a substantial loss of revenue and a decrease in market share if other customers follow suit.

The **intensifying competition in the AI market** is another critical threat. As more companies, including major players like AMD and Intel, as well as various startups, enter this space, NVIDIA faces increased pressure to innovate and maintain its technological leadership. This competition could challenge NVIDIA's position and force continuous advancements in its offerings.

**Regulatory challenges** also pose a significant threat to NVIDIA, particularly due to its dominant market positions. Increased scrutiny from antitrust regulators could limit NVIDIA's operational freedom, result in significant fines, or compel changes in its business strategies, thereby affecting its overall market standing.

**Geopolitical risks** are a constant concern, especially given NVIDIA's reliance on a global supply chain with significant ties to Asia. Geopolitical tensions and trade disputes

could disrupt NVIDIA's operations or restrict access to key markets, particularly in regions like China, which are crucial for its supply chain and sales.

Lastly, **technological disruption** represents a perennial risk in the fast-evolving tech industry. New innovations could potentially render NVIDIA's current solutions obsolete, necessitating continual investment in research and development. Staying ahead of these technological shifts is crucial for NVIDIA to maintain its market leadership and continue to offer cutting-edge solutions.

## 5. Strategic Recommendations

**NVIDIA should strategically pivot towards acquiring a leading AI-as-a-Service platform, positioning itself as a dominant provider in the global AI services market.**

This initiative will leverage NVIDIA's superior GPU technology to transition from hardware sales to a service-oriented business model. By doing so, NVIDIA aims to retain major customers and preempt their efforts to develop in-house AI platforms and alternative hardware, which could otherwise erode NVIDIA's market share.

The rationale behind this recommendation is multifaceted. Firstly, there is a rising demand for AI services across various sectors including finance, healthcare, and automotive, indicating a substantial growth opportunity. NVIDIA's established technological lead in GPU manufacturing provides a unique competitive advantage. The company can utilize its own GPUs at cost, avoiding the typical 1000% markup faced by other companies purchasing NVIDIA's GPUs for similar AI platforms. This cost efficiency could allow NVIDIA to significantly undercut competitors on pricing, making its AI services more attractive and accessible while simultaneously protecting its margins.

The proposed implementation involves a substantial initial investment, primarily through the strategic acquisitions of established platforms like HuggingFace or Groq. These companies are already making significant strides in AI services and could provide NVIDIA with a rapid entry point into the market. Given NVIDIA's robust financial standing, with over \$25 billion in cash reserves, these acquisitions are not only feasible but also strategically sound. The urgency of this move is highlighted by the current market dynamics, where sales of NVIDIA's H100 cards are beginning to decelerate as the market saturation begins. Acquiring platforms that have already gained traction in the enterprise AI space would enable NVIDIA to immediately leverage existing customer bases and integrated services.

Moreover, these platforms are experiencing exponential growth, with valuations that reflect their potential profitability even without the advantage of NVIDIA's cost structure. The strategic acquisition would thus not only secure NVIDIA's position but also potentially deliver significant returns as these platforms become increasingly central to business operations in the AI-driven economy. This bold move would ensure NVIDIA remains at the forefront of the AI technology landscape, driving both innovation and revenue growth in the emerging AI service market.

The valuation of these platforms suggests that investors are optimistic about their future profitability, which is underscored by their substantial growth rates and current market positions. NVIDIA's decision to acquire these platforms would not only capitalize on their existing growth trajectories but also enhance their profitability by leveraging NVIDIA's cost advantages in GPU manufacturing.

Given that these AI platforms are already experiencing annual growth rates exceeding 300%, NVIDIA's acquisition could lead to a rapid expansion in service offerings, potentially hastening the breakeven point. The reduction in capital expenditures, due to

NVIDIA's ability to deploy its own GPUs without the additional markup, will significantly lower operational costs and improve profit margins. This strategic move provides a clear path to rapid profitability.

### **Raise Sales Prices to Offset Cloud Platform Investments and Limit Competitor Growth**

NVIDIA should increase the sales prices of its high-end GPUs to offset the investments required for its expansion into AI-as-a-Service, and to make it harder for their current customers to carry out the stated goal of building competing AI-as-a-Service platforms and developing their own alternative hardware to compete with NVIDIA's GPUs.

The rationale behind this strategy is multi-faceted. Firstly, higher prices would help mitigate the infrastructure costs related to NVIDIA's proposed cloud platform, ensuring the company maintains profitability as it expands its service offerings. This approach leverages NVIDIA's existing market dominance and superior product performance, creating a financial barrier that could deter competitors from entering or expanding within the high-performance GPU market. It is harder for competitors to justify the high capital expenditure necessary to match NVIDIA's offerings when faced with higher market prices.

In terms of implementation, NVIDIA should introduce a graduated price increase across its most advanced GPU models. A comprehensive communication strategy should be developed to transparently convey the value proposition of these price increases to key stakeholders, including investors, customers, and partners. It will be crucial to regularly assess market responses to these adjustments to ensure that NVIDIA remains competitive.

One of the most important risk management aspects of this strategy is to try to drive demand away from purchasing GPUs and towards AI-as-a-Service through NVIDIA's newly acquired platform.

### **Renew Focus on Further Innovation in AI Hardware**

NVIDIA should intensify its research and development (R&D) efforts in GPU and AI technology to maintain market leadership and address the emerging competitive threats and technological advancements in the industry. This strategic shift towards heightened innovation is crucial not only for staying ahead of current market competitors, many of whom are developing their own in-house GPU solutions, but also to meet the evolving demands of the AI hardware market.

The drive for continual innovation stems from the high profit margins NVIDIA currently enjoys on its products, which may have slowed the pace of innovation in recent years. As the demand for more powerful and efficient AI hardware grows, NVIDIA faces the risk of competitors closing the technological gap. The H100 GPUs are a testament to NVIDIA's engineering prowess, but the market is rapidly advancing, necessitating a renewed focus on developing the next generation of GPUs and AI applications. This refocused effort on innovation will ensure that NVIDIA's products remain in high demand

across both existing and new customer segments, thereby securing its competitive edge.

To implement this strategy effectively, NVIDIA should allocate a significant portion of its budget towards R&D, specifically targeting the development of next-generation GPUs and the exploration of new AI applications. Collaborations with tech giants and startups should be enhanced, possibly incorporating cutting-edge technologies that are currently underrepresented in NVIDIA's portfolio, such as alternative quantization and homomorphism strategies. Additionally, a robust patent strategy is essential to protect these innovations and mitigate risks associated with intellectual property theft or imitation.

By doubling down on innovation, NVIDIA will not only reinforce its position as the industry leader in high-performance computing but also adapt to the shifting landscape where customers are increasingly looking to develop their own solutions. This proactive approach in R&D will enable NVIDIA to continue competing effectively on key metrics like teraflops per watt, which are critical for maintaining technological superiority in the AI and computing sectors.



6. Appendices

6.1. Company PESTEL

PESTEL Analysis

Component	A. Factor	B. Business Impact to Company
Political	<p>1. Trade policies and international relations affecting global operations.</p> <p>2. Government investments in AI and technology sectors, thus creating new opportunities.</p>	<p>1. The US government’s relationships with key nations may impact NVIDIA’s business in the form of additional labeling requirements. Further, some Israel and Taiwan-based operations have been compromised by geopolitical conflict (NVIDIA Corp., 2024).</p> <p>2. As the popularity of AI continues to rise and the impacts of the new tech are uncovered, government investment in sectors dependent on high-level computing will continue to drive demand for NVIDIA’s products.</p>
Economic	<p>1. Impact of broad economic performance on the cost of money.</p> <p>2. Currency fluctuations affecting international sales and supply chains.</p>	<p>1. The performance of the economy as a whole may impact NVIDIA’s ability to refinance the \$9.7 billion it owes lenders by 2060 (NVIDIA Corp., 2024).</p> <p>2. NVIDIA’s chip manufacturers are all located outside of the United States and non-domestic sales represented 56% of revenue in FY 2024 (NVIDIA Corp., 2024). Fluctuating exchange rates have the potential to help or harm NVIDIA’s income.</p>

Sociological	<p>1. Growing demand for AI capabilities across various sectors.</p> <p>2. Public concerns about AI ethics and job displacement impacting technology adoption.</p>	<p>1. As the technology is refined, the use of large language models to increase productivity is likely to become more widespread, driving GPU and data center demand.</p> <p>2. If social movements stall the widespread adoption of AI, thus lessening the need for NVIDIA's products in data centers, the company's meteoric growth will flatten out.</p>
Technological	<p>1. Rapid technological advancements necessitating continuous R&amp;D investment.</p> <p>2. Potential for breakthroughs in alternative technologies by competitors.</p>	<p>1. As computing needs become increasingly advanced, NVIDIA will need to invest in R&amp;D to maintain its market position and sustain a competitive advantage.</p> <p>2. NVIDIA is able to charge a premium for its products because they are significantly better than the competition's. If the other firms are able to develop more advanced chips, that would threaten NVIDIA's market position.</p>
Environmental	<p>1. Increased scrutiny on electronic waste and energy consumption of data centers.</p> <p>2. Opportunities to lead in green technology within AI and computing sectors.</p>	<p>1. NVIDIA will need to continue to innovate to reduce the energy requirements for its products to ensure a livable climate future.</p> <p>2. GPU-accelerated computers are less energy-intensive than traditional computers, so NVIDIA has the opportunity to position itself as a solution for green computing.</p>

Legal	<p>1. Intellectual property disputes and patent litigation risks.</p> <p>2. Compliance with global data protection regulations affecting operations.</p>	<p>1. NVIDIA's IP is the cornerstone of its profitability; legislation is critical to protecting IP. Loss of legal protections poses an enormous threat to NVIDIA's success.</p> <p>2. NVIDIA is subject to regulation regarding privacy, and changes to that policy could impact operations.</p>
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## **6.2. Required: Company Five Forces**

### **Porter's Five Forces**

#### Industry Rivalry:

- Intense competition from other chip manufacturers like TSMC, AMD, and Intel.
- All top customers developing in-house rival products with intent to compete.
- Pressure from tech giants developing their own hardware solutions.

#### Threat of New Entrants:

- High barriers to entry due to the complexity and cost of GPU technology development.
- Potential for startups to innovate in niche areas using new technologies.

#### Threat of Substitutes:

- Increasing capabilities of alternative AI processing technologies.
- In-house development of processing units by major technology companies.

#### Bargaining Power of Buyers:

- High concentration of major buyers who are investing in their own solutions.
- Buyers' increasing negotiation power due to alternative options.

#### Bargaining Power of Suppliers:

- Dependency on specialized semiconductor manufacturing processes.
- Limited number of suppliers like TSMC affecting pricing and availability.

### 6.3. Required: Company “Market Position” Assessment

#### Strategy Diamond

##### Arenas:

- Current: AI accelerators, gaming GPUs, professional visualization, and automotive.
- Potential Shifts: Increased focus on markets less likely to develop in-house solutions, such as smaller tech firms, startups, or specific sectors like healthcare and robotics.

##### Vehicles:

- Internal Development: Continued innovation in next-generation GPUs and AI technologies.
- Partnerships and Mergers: Strategic alliances or acquisitions to enter new markets or enhance technological capabilities.
- Licensing: Potentially licensing proprietary technologies to other firms, including those developing in-house solutions.

##### Differentiators:

- Product Superiority: Maintaining leadership through superior performance and features not easily replicated by competitors or in-house solutions.
- Brand Reputation: Leveraging NVIDIA's brand as synonymous with high-quality and reliable GPU technology.
- Ecosystem Integration: Enhancing compatibility and integration with a broad range of software and hardware ecosystems to increase the cost of switching away from NVIDIA.

##### Staging & Pacing:

- Immediate Focus: Address potential revenue dips from major clients by diversifying the customer base and investing in emerging tech sectors.
- Long-term Strategy: Develop new technologies that set industry standards, ensuring long-term relevance and demand.

### Economic Logic:

- Revenue Streams: Transitioning from one-time hardware sales to recurring revenue through services, software, and cloud-based offerings.
- Cost Management: Optimize production and R&D expenditures to sustain profitability even if market conditions force a reduction in hardware pricing.
- Value Creation: Focus on creating value through technological advancements that justify premium pricing and maintain high profit margins.

## 6.4. Company VRIO assessment and assessment of current state of competitive advantage

### NVIDIA VRIO ANALYSIS

#### Resources

1. Innovative & Proprietary Technology
2. Strategic Partnerships
3. Intellectual Property & Patents
4. Supply Chain and Manufacturing
5. Brand Equity
6. Expertise in AI

Innovative & Proprietary Technology: NVIDIA has become the giant in GPU technology and AI chips. These products are the core of their business and have yet to be matched by any other tech company in terms of quality, speed, and innovation of the products and their networks. NVIDIA has also created software ecosystems and other architectures to maximize the usefulness of their products.

#### - Is this resource valuable?

- Yes, NVIDIA's technological innovation is the bread and butter of the business and the reason for their growing success in their industry. The GPU and AI technology are driving their strong financial success in the market.

#### - Is this resource rare?

- Yes, NVIDIA's tech is rare for several reasons. First, the intellectual property and patents they have secured have secured their first-mover advantage in the industry. Second, the technological innovation is paired with processing architectures and software networks to support their innovation and maintain its superiority.

#### - Is this resource inimitable?

- Yes, for now. So far, no other competitor has created products that truly rival the GPU processing power that NVIDIA has created in tandem with sufficient networks or software to power them. They have a head start in the market, but if they do not continue to innovate, they could lose this competitive advantage to large software incumbents like Tesla, Google, Apple, etc.

#### - Is this resource organized to capture value?

- Yes, NVIDIA's supporting software, processing architectures, patents, and engineering top talent have allowed this resource to capture value in the market.

- **Does this resource give NVIDIA a competitive advantage?**
  - **Yes!**

Strategic Partnerships: NVIDIA has created a network of partners across 13 categories based on their investments in accelerated computing. Through these networks, NVIDIA has created quite a thorough list of peripheral software and hardware to deliver on customer's demands for advanced computing. These partnerships are in the following categories: data providers, distributors of NVIDIA products, cloud services, third-party platforms, education services, government, healthcare, professional services, integration partners, consulting, systems integrations, storage partners, and independent software vendors.

- **Is this resource valuable?**
  - Yes, NVIDIA's partnerships allow for widespread use of NVIDIA and provide solutions to customers in numerous industries. The network of partners allows for "a growing portfolio of free and commercial software for accelerated computing" (Martin, 2023).
- **Is this resource rare?**
  - Yes, these partnerships facilitate the integration of NVIDIA's technology into a wide array of industries, allowing for NVIDIA to be the most prominent GPU and AI chip company. This strategy is not commonly held by competitors.
- **Is this resource inimitable?**
  - Yes, the resource is incredibly difficult to build up as a competitor of NVIDIA, especially with the brand equity that NVIDIA has established for itself. Coupled with the innovative technology that NVIDIA has created, the vast network of partners has given the firm a strong position in the market.
- **Is this resource organized to capture value?**
  - Yes, the size and scope of the network of partnerships has continuously built financial success for NVIDIA. The firm is continuously looking to build up more partnerships to expand its portfolio of unique software solutions.
- **Does this resource give NVIDIA a competitive advantage?**
  - **Yes!**

Intellectual Property & Patents: NVIDIA owns several patents in several different technologies relating to advanced computing, graphic processing, and computer architecture. This creates large barriers to entry for competitors, and protects NVIDIA's market position and innovation.

- **Is this resource valuable?**



- Yes, having patents on the technology it has introduced to the market has prolonged its first-mover advantage.
- **Is this resource rare?**
  - Yes, the patents themselves are by definition rare. This means that competitors have very high barriers to copying the technology that NVIDIA owns.
- **Is this resource inimitable?**
  - Yes, the patents for the specific technology are inimitable. The technology itself can be developed in different ways that do not break patent rights, but the patent creates barriers to entry for new and existing competitors.
- **Is this resource organized to capture value?**
  - Yes, the barrier to entry that the patents cause allow for great financial success for NVIDIA.
- **Does this resource give NVIDIA a competitive advantage?**
  - **Yes!**

Supply Chain and Manufacturing: NVIDIA has a cost-effective supply chain and has great relationships with manufacturers and suppliers. Instead of in-house manufacturing or in-house distribution, NVIDIA has partnered with large manufacturing facilities that are in regions with skilled labor and infrastructure. Additionally, through the creation of their strategic partnership networks, the GPU and AI chip reach the end consumer through that network of partners.

- **Is this resource valuable?**
  - Yes, having a cost efficient and reliable supply chain is incredibly valuable. NVIDIA's supply chain efficiency is a large part of their financial success in the market.
- **Is this resource rare?**
  - Not necessarily. Efficiency in supply chain is challenging to accomplish, but many competitors are well-equipped to capture value through their already existing supply chain.
- **This resource provides competitive parity.**

Brand Equity: NVIDIA's brand is correlative to high-performing and powerful GPUs and other innovative technologies across many categories but especially in gaming and artificial intelligence. The brand reputation is in great standing even after competition has increased due to consistent product quality and industry recognition.

- **Is this resource valuable?**
  - Yes, NVIDIA's brand equity has contributed to their financial success and market domination. Having a strong brand reputation has provided

opportunities for the brand to distribute their product in various forms across many different industries.

- **Is this resource rare?**

- In the GPU industry, strong brand equity is rare especially among the gaming community. Additionally, no other companies are creating GPU and AI chips with the same power, speed, or quality which makes the brand equity NVIDIA has built even more rare.

- **Is this resource inimitable?**

- This resource is *currently* inimitable in the market. As competitors rush to gain market share through creating their own version of NVIDIA's GPU and AI chips, it will take a long time to garner the same reputation that NVIDIA has built. Although, it is not inimitable in the long-term scope of the market. As other companies successfully create products that truly rival NVIDIA's, perceptions about NVIDIA could change.

- **Is this resource organized to capture value?**

- Yes, NVIDIA's brand equity is organized in a way that captures value, and they are actively working to maintain that brand equity through partnership networks and continued innovation.

- **Does this resource give NVIDIA a competitive advantage?**

- **Yes!**

Expertise in AI: NVIDIA's expertise in AI stems from their expertise in advanced GPU technology, and their dedication to R&D in this field. Not only has NVIDIA created powerful GPUs that enable advanced processing needed for AI, but they have also created AI ecosystems including software developers and startups that encourage the use of AI technology. Additionally, NVIDIA has created hardware solutions for AI and AI computing platforms.

- **Is this resource valuable?**

- Yes, NVIDIA's expertise in AI is valuable and has established them as a pioneer in this field. Their AI technology has had a big part in moving the AI industry forward from their R&D, tech innovation, to GPU and software platforms that support AI.

- **Is this resource rare?**

- Yes, there are few companies with the scale of AI expertise as NVIDIA. This positions them as the experts in this emerging industry.

- **Is this resource inimitable?**

- Yes, NVIDIA's expertise in AI is currently inimitable due to their leadership position in the market, their superior GPU and AI chips, and their talented

team of engineers. These factors give NVIDIA a significant advantage over other companies attempting to enter the AI industry.

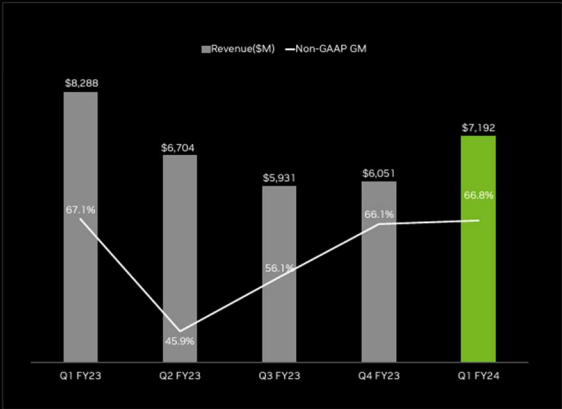
- **Is this resource organized to capture value?**
  - Yes, NVIDIA's expertise in AI software and hardware allows it to produce GPUs and other AI solutions that outpace competition.
- **Does this resource give NVIDIA a competitive advantage?**
  - **Yes!**

## 6.5. Company SWOT Analysis.

	<b>Opportunities</b> <ol style="list-style-type: none"><li>1. Expansion into new markets like automotive and healthcare.</li><li>2. Development of service and software solutions to enhance hardware utility.</li></ol>	<b>Threats</b> <ol style="list-style-type: none"><li>1. Customers developing in-house solutions reducing reliance on NVIDIA</li><li>2. Potential regulatory challenges due to dominant market positions.</li><li>3. Geopolitical risks impacting supply chain or market access.</li></ol>
<b>Strengths</b> <ol style="list-style-type: none"><li>1. Technological leadership in GPUs and AI accelerators.</li><li>2. Strong brand reputation and market presence.</li><li>3. High profit margins on products like the H100.</li></ol>	<b>Strategic Alternatives</b> <ol style="list-style-type: none"><li>1. Acquire AI-as-a-Service Platform: Position as a dominant AI services provider to capitalize on global market opportunities and enhance technological leverage (S1, O1).</li><li>2. Increase Pricing Strategy: Adjust prices to offset cloud investments and restrict competitor growth, utilizing strong brand leverage (S2, T1).</li><li>3. Enhance AI Hardware Innovation: Focus on advancing AI hardware innovation to maintain leadership and address market saturation risks (S1, W2, T4).</li><li>4. Leverage technological leadership to retain and attract customers, enhancing barriers against in-house solutions by customers (S1, S3, T1).</li><li>5. Diversify into automotive and healthcare markets to reduce dependency on current large customers and gaming markets (S1, W1, W3, O1).</li><li>6. Develop robust supply chain strategies, including alternative suppliers and manufacturing regions (S3, W4, T4).</li></ol>	
<b>Weaknesses</b> <ol style="list-style-type: none"><li>1. Heavy reliance on a few large customers</li><li>2. Market saturation potential due to the durable nature of products</li><li>3. High dependency on the AI and gaming markets.</li></ol>		

6.6. Required: Financial Data.

Q1 FY24 Financial Summary

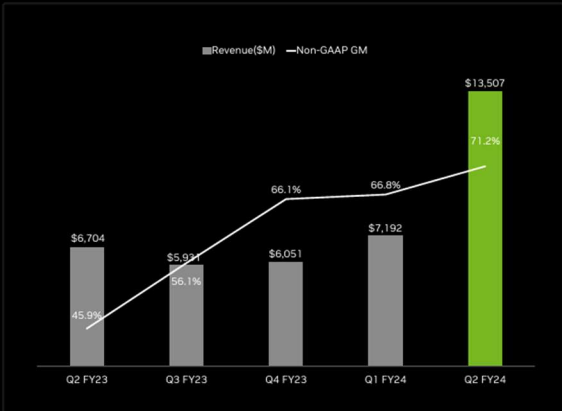


	GAAP			Non-GAAP		
	Q1 FY24	Y/Y	Q/Q	Q1 FY24	Y/Y	Q/Q
Revenue	\$7,192	-13%	+19%	\$7,192	-13%	+19%
Gross Margin	64.6%	-0.9 pts	+1.3 pts	66.8%	-0.3 pts	+0.7 pts
Operating Income	\$2,140	+15%	+70%	\$3,052	-23%	+37%
Net Income	\$2,043	+26%	+44%	\$2,713	-21%	+25%
Diluted EPS	\$0.82	+28%	+44%	\$1.09	-20%	+24%
Cash Flow from Ops	\$2,911	+68%	+29%	\$2,911	+68%	+29%

All dollar figures are in millions other than EPS. Refer to Appendix for reconciliation of Non-GAAP measures.



Q2 FY24 Financial Summary

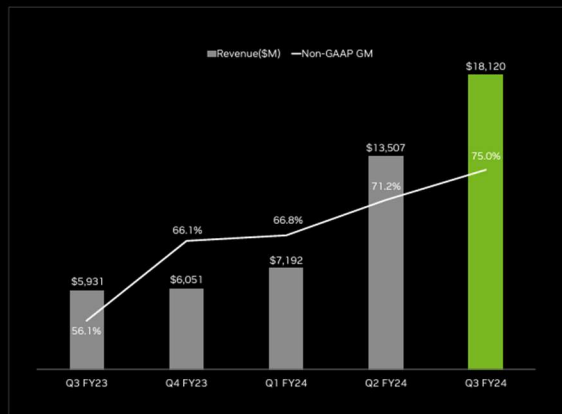


	GAAP			Non-GAAP		
	Q2 FY24	Y/Y	Q/Q	Q2 FY24	Y/Y	Q/Q
Revenue	\$13,507	+101%	+88%	\$13,507	+101%	+88%
Gross Margin	70.1%	+26.6 pts	+5.5 pts	71.2%	+25.3 pts	+4.4 pts
Operating Income	\$6,800	+1,263%	+218%	\$7,776	+487%	+155%
Net Income	\$6,188	+843%	+203%	\$6,740	+422%	+148%
Diluted EPS	\$2.48	+854%	+202%	\$2.70	+429%	+148%
Cash Flow from Ops	\$6,348	+400%	+118%	\$6,348	+400%	+118%

All dollar figures are in millions other than EPS. Refer to Appendix for reconciliation of Non-GAAP measures.



## Q3 FY24 Financial Summary

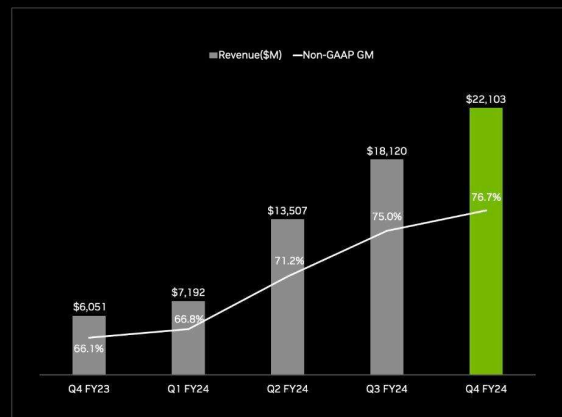


	GAAP			Non-GAAP		
	Q3 FY24	Y/Y	Q/Q	Q3 FY24	Y/Y	Q/Q
Revenue	\$18,120	+206%	+34%	\$18,120	+206%	+34%
Gross Margin	74.0%	+20.4 pts	+3.9 pts	75.0%	+18.9 pts	+3.8 pts
Operating Income	\$10,417	+1,633%	+53%	\$11,557	+652%	+49%
Net Income	\$9,243	+1,259%	+49%	\$10,020	+588%	+49%
Diluted EPS	\$3.71	+1,274%	+50%	\$4.02	+593%	+49%
Cash Flow from Ops	\$7,333	+1,771%	+16%	\$7,333	+1,771%	+16%

All dollar figures are in millions other than EPS. Refer to Appendix for reconciliation of Non-GAAP measures.



## Q4 FY24 Financial Summary



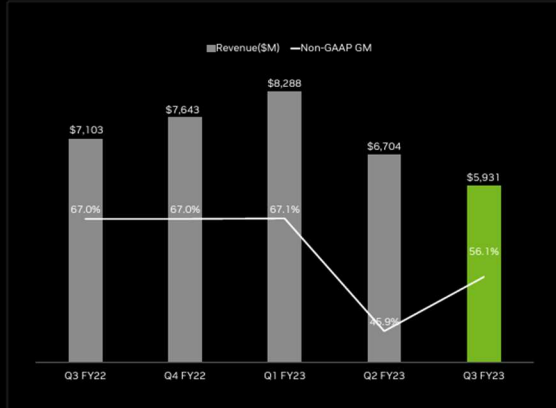
	GAAP			Non-GAAP		
	Q4 FY24	Y/Y	Q/Q	Q4 FY24	Y/Y	Q/Q
Revenue	\$22,103	+265%	+22%	\$22,103	+265%	+22%
Gross Margin	76.0%	+12.7 pts	+2.0 pts	76.7%	+10.6 pts	+1.7 pts
Operating Income	\$13,615	+983%	+31%	\$14,749	+563%	+28%
Net Income	\$12,285	+769%	+33%	\$12,839	+491%	+28%
Diluted EPS	\$4.93	+765%	+33%	\$5.16	+486%	+28%
Cash Flow from Ops	\$11,499	+411%	+57%	\$11,499	+411%	+57%

All dollar figures are in millions other than EPS. Refer to Appendix for reconciliation of Non-GAAP measures.



## Financial Data (Cont)

### Q3 FY23 Financial Summary

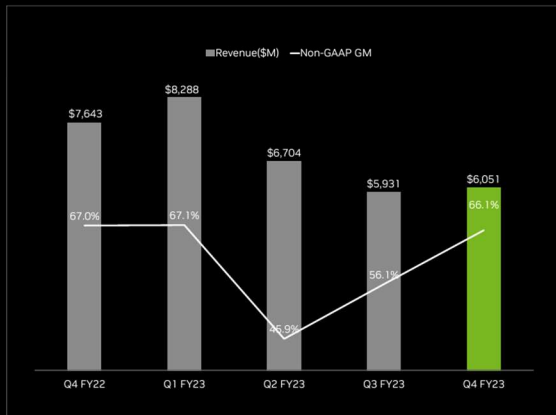


	GAAP			Non-GAAP		
	Q3 FY23	Y/Y	Q/Q	Q3 FY23	Y/Y	Q/Q
Revenue	\$5,931	-17%	-12%	\$5,931	-17%	-12%
Gross Margin	53.6%	-11.6 pts	+10.1 pts	56.1%	-10.9 pts	+10.2 pts
Operating Income	\$601	-77%	+20%	\$1,536	-55%	+16%
Net Income	\$680	-72%	+4%	\$1,456	-51%	+13%
Diluted EPS	\$0.27	-72%	+4%	\$0.58	-50%	+14%
Cash Flow from Ops	\$392	-74%	-69%	\$392	-74%	-69%

All dollar figures are in millions other than EPS.



### Q4 FY23 Financial Summary

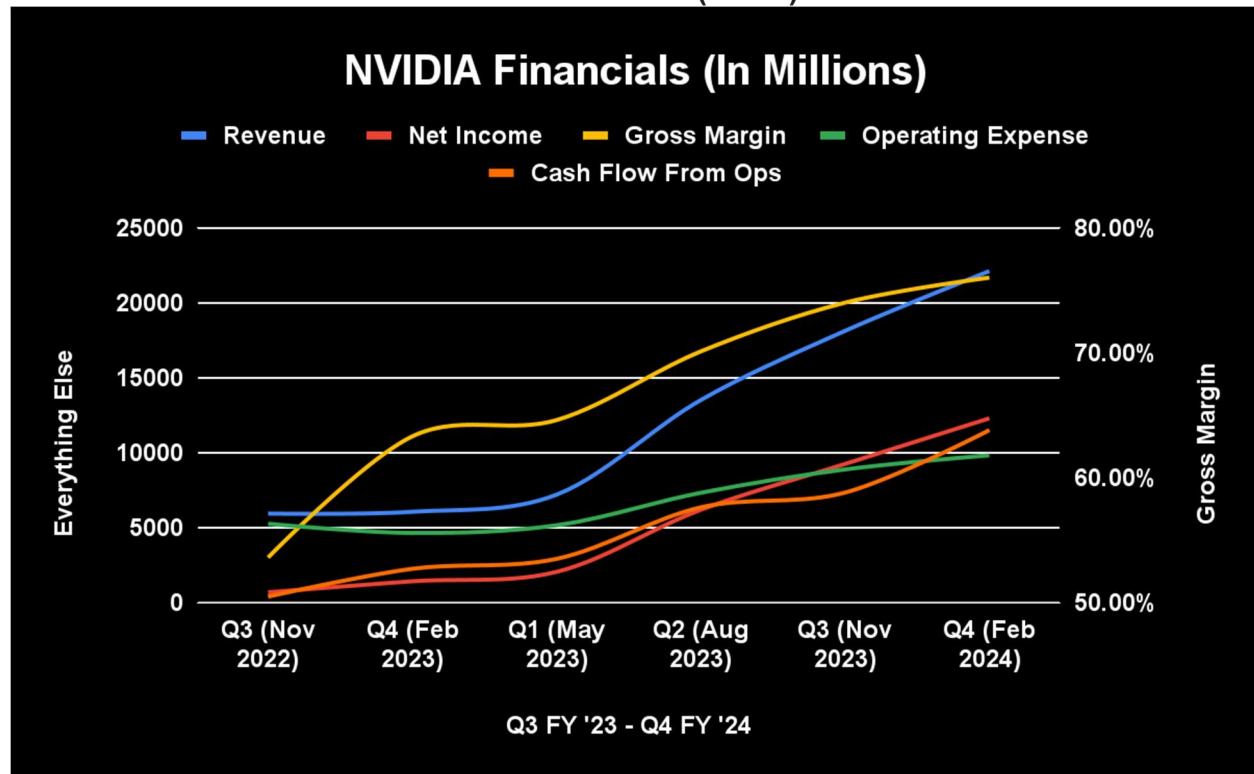


	GAAP			Non-GAAP		
	Q4 FY23	Y/Y	Q/Q	Q4 FY23	Y/Y	Q/Q
Revenue	\$6,051	-21%	+2%	\$6,051	-21%	+2%
Gross Margin	63.3%	-2.1 pts	+9.7 pts	66.1%	-0.9 pts	+10.0 pts
Operating Income	\$1,257	-58%	+109%	\$2,224	-40%	+45%
Net Income	\$1,414	-53%	+108%	\$2,174	-35%	+49%
Diluted EPS	\$0.57	-52%	+111%	\$0.88	-33%	+52%
Cash Flow from Ops	\$2,249	-26%	+474%	\$2,249	-26%	+474%

All dollar figures are in millions other than EPS. Refer to Appendix for reconciliation of Non-GAAP measures.



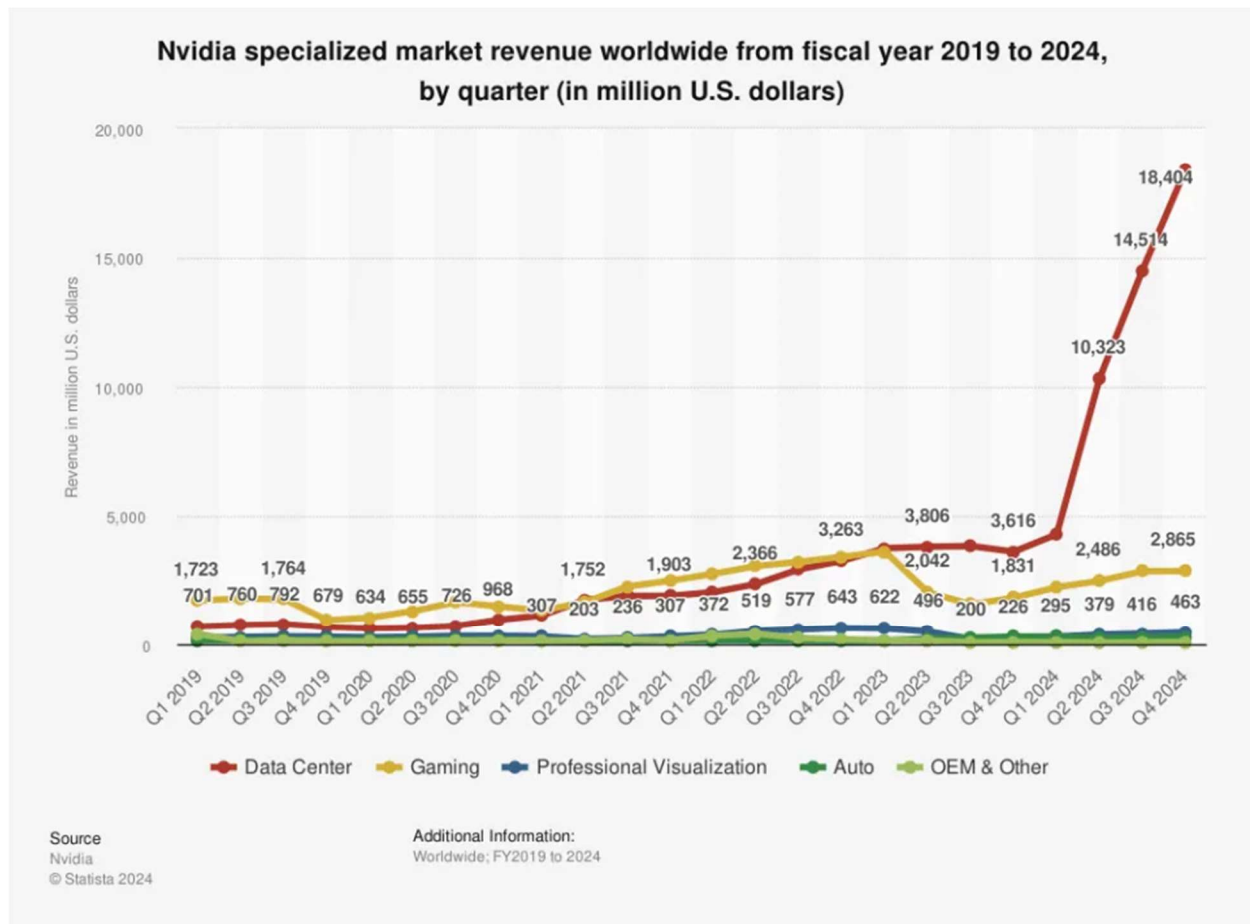
## Financial Data (Cont.)





## 6.7. Anything else:

### 6.7.1 Chart 1: NVIDIA specialized market revenue worldwide from fiscal year 2019 to 2024, by quarter (in million U.S. dollars)



This chart shows the sudden change in NVIDIA's revenue streams as AI computing took off in the early 2020's (Smith, 2024).

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## Quarterly Financial Data Links

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[Q4 FY '23](#)

[Q1 FY '24](#)

[Q2 FY '24](#)

[Q3 FY '24](#)

[Q4 FY '24](#)