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Analysis of Differences in Financial Management Across Enterprises: A Case Study of the Semiconductor Industry

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Abstract. This study aims to analyze financial and managerial analysis of two semiconductor companies, Advanced Micro Devices, Inc (AMD) and Nvidia Corporation (NVDA) to find out their differences and similarities, and implications for future development of the industry. The problem solved by this paper is how financial performance and management characteristics affect long-term competitiveness that is highly relevant to academic research on corporate finance and strategic management. This paper uses comparative financial analysis to analyze revenue growth, profitability, R&D spending, and market position of the two companies. The results show that despite adopting different strategies, NVDA has better financial performance than AMD with higher margins and higher market share in AI products. AMD is more flexible in adjusting its business, cost efficiency and competitive in CPU and GPU. Both the two companies attach importance to R&D investment. However, AMD focuses more on high performance computing while NVDA focuses more on AI acceleration. These two different market players adopt different strategies. These findings suggest that all the firms in the semiconductor industry should be flexible to adopt strategies based on financial stability and intelligence.

Keywords: Nvidia Corporation, Semiconduction industry, Financial management

1. Introduction

In recent years, the semiconductor industry has evolved as a key component of the global digital economy and artificial intelligence. Research in semiconductor material is an ever-evolving field where people are seeking new materials, enhancing the performance of current materials, and exploring their applications in devices and systems [1]. Advanced Micro Devices, Inc (AMD) and Nvidia Corporation (NVDA) are two of the representative enterprises in this industry. These two companies are not only competing in technology and product aspects but also exhibiting different styles in corporate performance and managerial behaviors. Hence, it is worthwhile to compare their financial performances and competitive strategies. The logic of several top companies' growth can be revealed and the semiconductor industry can also get some insights in company competition for future. Over the past three to five years, academic studies on semiconductor competition have mainly focused on technological innovation, market share evolution, and financial performance comparisons. For example, some research highlights NVDA's leadership in AI chips and high-performance computing NVDA has achieved differentiation beyond chips by continually leveraging

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the company's technology for innovation through the creation of a large community of AI programmers [2]; meanwhile, other studies point out AMD's rapid growth in CPU and GPU markets through flexible strategies and pricing advantages. NVDA dominates GPU use in deep learning, imaging, and safety-critical domains, while AMD lags due to limited embedded products and tool support. With ROCm, AMD offers an open stack that may boost flexibility, reproducibility, and serve as a viable alternative in real-time GPU research [3]. In addition, industry analysis reports widely suggest that differences in R&D investment, supply chain management, and financial resilience are key determinants of competitiveness [4]. Overall, existing research provides both theoretical and empirical foundations for this comparative study.

This paper intends to explore the similarities and differences between AMD and NVDA by comparing financial data, analyzing managerial strategies, and situating both companies within the broader industry context. Specifically, the analysis covers revenue and profitability comparisons, differences in R&D investment focus, contrasts in market strategy and product deployment, and the implications for the semiconductor industry's future. Through this research, the paper aims to address the central question of how semiconductor companies can achieve sustainable growth in the face of intense competition.

2. NVDA

2.1. Description of NVDA

NVDA was founded on April 5, 1993, by Jensen Huang, Chris Malachowsky, and Curtis Priem, with the vision of bringing 3D graphics to the gaming and multimedia markets. In 1999, it invented the graphics processing unit (GPU), laying the foundation for reshaping the computing industry. In 2006, it introduced the Compute Unified Device Architecture (CUDA®), providing GPU parallel computing capabilities for scientific research. In 2012, it kickstarted the modern AI era by driving the groundbreaking Alex Net neural network. In 2018, NVIDIA RTX™ is the first GPU to support real-time ray tracing, revolutionizing computer graphics technology. In 2022, with the NVIDIA Omniverse™ platform, it plays a fundamental role in building the metaverse, the next stage of the internet [5].

2.2. NVDA's financial statement analysis

Take a look at Table 1, over the past three years (2023-2025), NVDA has exhibited a notable and sustained upward trend in profitability, underscoring its robust financial health and effective strategic execution. As of January 26, 2025, the company reported revenue of $130,497 million, marking an extraordinary year-over-year increase of 114% compared to 2024. In the broader semiconductor industry, the average net profit margin, return on equity (ROE), and return on assets (ROA) are approximately 14.8%, 19.1%, and -2%, respectively. When measured against these industry averages, NVDA's superior performance metrics demonstrate its strong competitive positioning and operational excellence. This substantial outperformance reinforces NVDA's status as one of the most dominant and influential companies in the global semiconductor sector.

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Table 1. Profitability

	Jan 26, 2025	Jan 28, 2024	Jan 29, 2023
Gross profit margin	74.99%	72.72%	56.93%
Profit margin	55.85%	48.85%	16.19%
ROE	123.36%	103.08%	
ROA	87.69%	67.4%	

Take a look at Table 2, NVDA's liquidity position has also improved notably. The company's current ratio stands at 4.44:1, which significantly exceeds the widely accepted benchmark of 2.0 for strong liquidity, indicating a very healthy ability to meet short-term obligations without financial strain. Similarly, NVDA's quick ratio of 3.88:1 further confirms its robust liquidity, demonstrating that the company does not heavily depend on inventory liquidation to cover its immediate liabilities. Additionally, an inventory turnover ratio of 4.25 suggests that NVDA cycles through its inventory approximately 4.25 times annually, equating to nearly one full turnover every 86 days. While this turnover rate may not be exceptionally rapid, it is reasonable and consistent with the operational characteristics of a hardware-focused enterprise.

Table 2. Liquidity

	Jan 26, 2025	Jan 28, 2024
Current ratio	4.44:1	4.17:1
Quick ratio	3.88:1	3.67:1
Inventory turnover	4.25	

January 26, 2025, data from Table 3 of NVDA's cash flow statement show a net cash inflow from operating activities at $64,089 million, marking an increase of approximately 128%. An increase of 16% over the $28,090 million figure announced on January 28, 2024.The data mirrors NVDA's 2025 net income of $72.88 billion, a figure indicative of robust earnings quality and effective cash generation. Investing activities resulted in a net cash outflow of $20,421 million for the company, with the funds predominantly allocated to capital expenditures, research and development, and long-term investments. The investment pattern highlights NVDA's dedication to augmenting its prospective operational scale, especially in pivotal sectors like AI chips, data centers, and semiconductor fabrication plants. Financing activities resulted in a net cash outflow of $42,359 million, primarily attributed to extensive stock repurchases and dividend disbursements, reflecting an active approach to capital repatriation to investors. The cumulative cash flow dynamics exemplify NVDA's robust financial standing and prudent capital oversight. The cumulative cash flow dynamics exemplify NVDA's robust financial standing and prudent capital oversight.

Table 3. Cash flows

	Jan 26, 2025	Jan 28, 2024	Jan 29, 2023
Operating	$64,089m	$28,090m	$5,641m
Investing	($20,421m)	($10,566m)	$7,375m
Financing	($42,359m)	($13,633m)	($11,617m)

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NVDA's trailing P/E is around 55 times, and its expected forward P/E is around 35-36 times. Its P/E ratio multiple has an historical average of around 52 times, while the P/E multiple of the semiconductor industry is around 30-35 times. To the expected rate of 2024, NVDA FY24 target share price is US$171.62 and the expected total shareholders' return of -2.75% [6]. Therefore, with respect to its trailing P/E ratio multiple, NVDA's valuation is significantly higher than both its own historical average and the semiconductor industry's P/E multiple range. A high P/E ratio multiple indicates high market expectations of future growth, particularly due to the anticipated increase in demand for AI-related semiconductor products. However, this multiple also implies a risk premium. If NVDA's growth projections turn out to be incorrect, its stock price is likely to be pressured downwards. Some market participants have also flagged the risk of overpricing in the stock.

3. AMD

3.1. Description of AMD

AMD is a global leader in high-performance and adaptive computing, dedicated to delivering top-tier products and services that help customers tackle their most critical challenges [7]. Founded in Silicon Valley in 1969 with just a few dozen employees, AMD has been on a continuous path of innovation, striving to stay at the forefront of the semiconductor industry. It once near bankruptcy, revived under Dr. Lisa Su through bold strategic shifts. Refocusing on high-performance computing, AMD challenged Intel and NVDA, regaining industry leadership [8]. Today, AMD has evolved into a modern, worldwide enterprise, setting new standards in computing through cutting-edge technology and groundbreaking industry achievements [9].

3.2. AMD's financial statement analysis

Take a look at Table 4, overall, AMD's profitability still exhibits considerable room for improvement. While its gross profit margin has experienced moderate growth, the company's net profit margin remains slightly below the semiconductor industry average of 14.8%. According to its income statement, AMD allocated $1,728 million to research and development (R&D) as of March 29, 2025, reflecting a substantial commitment to innovation and long-term competitiveness. Nevertheless, its ROE and ROA are relatively low. An ROE of 6.4% suggests that shareholders are receiving modest returns relative to their invested equity, while an ROA of 5.17% indicates suboptimal efficiency in utilizing assets to generate earnings.

Table 4. Profitability

	Mar 29, 2025	Dec 28, 2024	Mar 30, 2024
Gross profit margin	50%	51%	47%
Profit margin	9.53%	6.29%	2.25%
ROE	6.4%	6.74%	
ROA	5.17%	5.61%	

Take a look at Table 5, as of March 29, 2025, AMD's current ratio stands at 2.8:1, reflecting a slight increase compared to December 28, 2024. This level indicates a safe liquidity position, suggesting the company faces no immediate short-term solvency risks. Its quick ratio of 1.97:1 further demonstrates that AMD maintains a strong base of liquid assets capable of covering current liabilities without reliance on inventory sales. Overall, the company's short-term financial health

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appears solid. However, its inventory turnover ratio is notably low at 0.57, indicating that inventory is cycled less than once per year. This sluggish turnover may be attributable to slow sales, inventory accumulation, inefficiencies in the supply chain, or a mismatch between production and demand. In comparison, NVIDIA's inventory turnover of 4.25 reflects a significantly faster rate of product movement.

Table 5. Liquidity

	Mar 29, 2025	Dec 28, 2024
Current ratio	2.8:1	2.62:1
Quick ratio	1.97:1	1.82:1
Inventory turnover	0.57	

Take a look at Table 6, for the three months ended March 29, 2025, AMD reported net cash inflows from operating activities of $939 million, indicating positive operational cash generation, which is both favorable and consistent with normal business operations. Net cash used in investing activities amounted to $357 million, representing a moderate investment level that suggests the company is allocating resources towards growth, though not at an aggressive pace. Notably, net cash provided by financing activities reached $1,666 million, an unusually high figure that implies AMD obtained substantial capital from external sources. This inflow could indicate preparations for significant strategic initiatives or, alternatively, an effort to strengthen overall liquidity.

Table 6. Cash flows

	Mar 29, 2025	Mar 30, 2024
Operating	$939m	$521m
Investing	($357m)	($135m)
Financing	$1,666m	($129m)

AMD's trailing P/E ratio currently stands at approximately 119 times, significantly exceeding the semiconductor industry median of 35–36 times. This elevated multiple reflects strong market confidence in the company's growth prospects, particularly in AI and data center segments. Its forward P/E ratio, estimated at 40–42 times, presents a comparatively more reasonable valuation. Nevertheless, should AMD's growth momentum weaken or its AI-related traction fall short of expectations, the elevated trailing P/E could expose the stock to a sharp downward re-rating [10].

4. Comparison analysis

Based on the earlier financial and strategic analysis of AMD and NVDA, these two companies share the same direction in high-performance and adaptive computing, yet differ significantly in business structure, profitability models, and strategic positioning. In terms of financial performance, NVDA's data center revenue accounts for the largest share, with its gross margin consistently above 70%, far exceeding AMD's 50–55%. This advantage is largely driven by the CUDA ecosystem, AI accelerator cards, and near-monopolistic software lock-in. AMD's gross margin has been steadily improving in recent years, particularly boosted by the MI-series GPUs and EPYC server CPUs, though it remains in a catch-up phase. In cash flow, NVDA operates as a "cash machine," generating abundant operating cash flow and making substantial, fast-paced capital expenditures. AMD has also shown significant cash flow improvement, but remains more cautious, with tighter control over

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capex. AMD's inventory turnover ratio stands at 0.57, indicating a relatively longer inventory cycle, requiring precise product launch timing and channel management, while NVIDIA faces relatively lower inventory pressure due to strong demand. In terms of liquidity, AMD's current ratio is 2.8:1 and quick ratio is 1.97:1, showing a healthy liquidity position, though with room for improved capital utilization. In 2021, the revenue of AMD was similar to NVDA, and it may have ability to beyond NVDA [11].

From a management perspective, NVDA adopts a full-stack, platform-oriented approach, leveraging CUDA, developer tools, and a deep partner ecosystem to lock in both developers and enterprise clients, creating strong customer stickiness and pricing power. AMD, in contrast, pursues an open standards strategy, emphasizing high performance-to-cost ratios and compatibility with industry norms, which makes it more appealing to markets seeking alternative solutions. Both companies are expanding AI-related product lines and prioritizing energy efficiency, total cost of ownership (TCO), and software compatibility. However, their customer bases differ: NVDA's is heavily concentrated in large cloud service providers and internet giants, while AMD's is more diversified across OEMs, enterprise clients, and embedded markets, reducing the risk of over-reliance on a few major customers.

Despite their differences, both share common trends: heavy investment in data center and AI computing as core growth engines, a focus on energy efficiency and TCO, and the development of end-to-end solutions for both training and inference workloads. However, they also face similar risks, including capacity constraints in advanced packaging, cyclical fluctuations in AI infrastructure investment, geopolitical and export control uncertainties, and potential ecosystem disruption from emerging operators or frameworks.

5. Suggestions

Looking ahead to 2026 and 2027, AMD should seize the "replacement window" by strengthening joint optimization solutions with cloud providers and large AI model developers, delivering integrated hardware-software packages, and highlighting cost-effectiveness through TCO calculation tools. In embedded and edge AI markets, AMD can leverage its adaptive chip advantages in low power consumption and long lifecycle to penetrate industrial and automotive sectors. Additionally, AMD must enhance its software stack and developer tools to lower migration barriers, evolving from "can run" to "easy to run and well optimized." NVDA, meanwhile, should continue advancing its platformization strategy, packaging hardware, software, and services into standardized, ready-to-deploy clusters, while improving power efficiency and thermal solutions to reduce deployment complexity. Expanding inference-side solutions can help capture more lifecycle value, and proactive compliance planning, including segmented product lines, can mitigate export control risks. It is shown that there is a strong positive correlation between NVDA and its competitors [12].

At the industry level, accelerating supply chain diversification—especially in advanced packaging—will help reduce "chokepoint" risks. Promoting open-source compilers and standardized middleware can lower ecosystem switching costs, while competition will increasingly shift from pure performance metrics to dual optimization in "performance per watt" and "performance per dollar." Cooling and power delivery innovations should be integrated into green financing and ESG frameworks. For investors, attention should be paid to the structural shift of AI demand from training to inference, the adoption rate of "hardware + software + services" bundles, energy efficiency leadership, delivery lead times, and developer migration costs. Overall, NVDA operates as a platform player holding strong ecosystem control, while AMD offers a unique competitive

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position through openness and cost efficiency. In the next phase of the AI compute race, efficiency, ecosystem strength, and delivery capability will be the deciding factors for industry leadership.

6. Conclusion

This study compared AMD and NVDA in terms of financial performance, management strategies, and industry positioning. The results show NVDA enjoys clear advantages in gross margin, cash flow, and ecosystem lock-in, while AMD leverages openness, cost-efficiency, and customer diversification. Both companies invest heavily in AI and data centers, yet pursue different paths: NVIDIA focuses on platformization and software integration, whereas AMD emphasizes performance-per-dollar and adaptive solutions. Financially, AMD should optimize inventory turnover, improve capital efficiency, and focus on high-margin products, while NVIDIA should maintain capex discipline, diversify its customer base, and strengthen risk controls. At the industry level, competition is shifting from pure performance to efficiency, ecosystem strength, and delivery capability. Overall, NVIDIA currently dominates, but AMD's differentiated approach provides long-term opportunities for growth.

This study faces limitations. The analysis relies on recent financial data and public disclosures, which may not fully reflect fast-changing markets or internal management choices. External factors such as macroeconomic uncertainty, supply chain risks, and regulations were not deeply quantified, yet they can strongly influence outcomes. Future research could expand scope by applying scenario forecasting, comparing more players beyond AMD and NVDIA, and examining software ecosystems as a financial driver. Incorporating primary data—such as expert interviews or user adoption surveys—would provide richer, more dynamic insights. Addressing these areas would strengthen future understanding of the competitive landscape in high-performance computing and AI.

References

[1] Sujit Mukherjee, Debmalya Pal, Arunava Bhattacharyya, Subhasis Roy. (2024). Future of semiconductor industry. Handbook of Semiconductors, 359-374.
[2] Don Clark. (2023). How Nvidia Built a Competitive Moat Around AI Chips. International New York Times, NA-NA.
[3] Nathan Otterness, J Anderson. (2022). AMD GPUs as an alternative to NVIDIA for supporting real-time workloads. Proceedings of the 23nd Euromicro Conference on Real-Time Systems.
[4] Varadarajan, R., Koch-Weser, I., Richard, C., Fitzgerald, J., Singh, J., Thornton, M., & Casanova, R. (2024). Emerging Resilience in the Semiconductor Supply Chain. Boston Consulting Group & Semiconductor Industry Association, 11.
[5] NVIDIA Corporation. (2025). Retrieved from https: //www.nvidia.cn/about-nvidia/corporate-timeline/
[6] João Pedro dos Reis Godinho. (2022). Nvidia Corporation (NVDA) Nvidia: Reshaping the Foundations of Tomorrow. PQDT-Global.
[7] NVIDIA CORPORATION. (2025). ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934 For the fiscal year ended January 26, 2025, Retrieved from https: //s201.q4cdn.com/141608511/files/doc_financials/2025/q4/177440d5-3b32-4185-8cc8-95500a9dc783.pdf.
[8] Bernardo Sousa, Cláudia Alves, Marta Mendes, Manuel Au-Yong-Oliveira, (2021). Competing with Intel and Nvidia: The Revival of Advanced Micro Devices (AMD). 2021 16th Iberian Conference on Information Systems and Technologies (CISTI), 1-7.
[9] Haber, C. (1998). AMD's last chance. Electronic News.
[10] ADVANCED MICRO DEVICES, INC. (2025). CONDENSED CONSOLIDATED STATEMENTS OF OPERATIONS. Retrieved from https: //d1io3yog0oux5.cloudfront.net/_e6d2954671111d7f15d49cdaedef84dd/amd/db/841/9160/financial_tables_pdf/Q1+2025+Gaap+and+Non-gaap+Earnings+Tables.pdf

DOI: 10.54254/2754-1169/2025.GL27380

[11] Tseng, F. C. (2008). The future of semiconductor industry — A foundry's perspective. Asia & South Pacific Design Automation Conference. IEEE Computer Society Press.
[12] Wang Y. C. (2025). NVIDIA’s Comprehensive Market Analysis: Technologies and Competitors. Finance & Economics, 1 (3).