

AMD vs NVDA

Technology Investment Overview

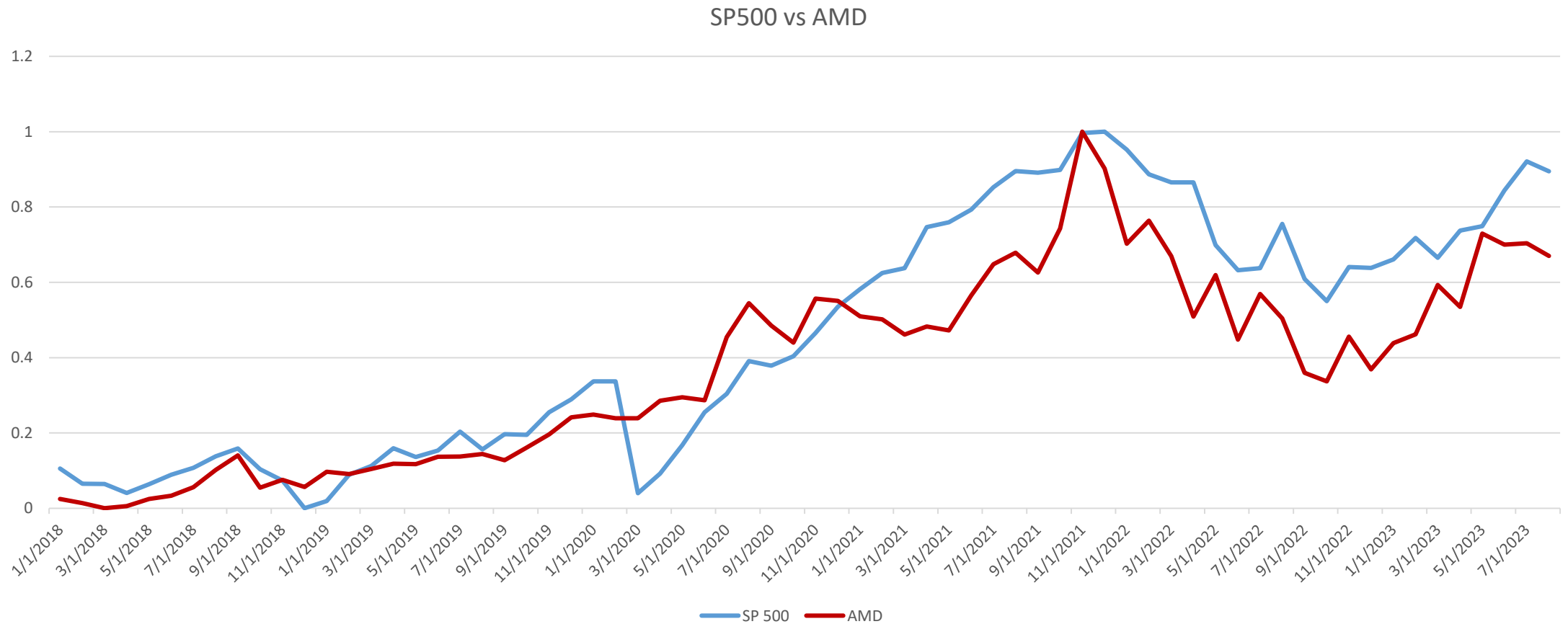
By Tin Hang

Introduction

Advanced Micro Devices (AMD) is a prominent American semiconductor company that has played a crucial role in the development of computing technologies. Founded in 1969, AMD has established itself as a key competitor in the semiconductor industry, particularly in the design and manufacturing of microprocessors and graphics processing units (GPUs). AMD operates as a semiconductor company worldwide. It operates through Data Center, Client, Gaming, and Embedded segments.

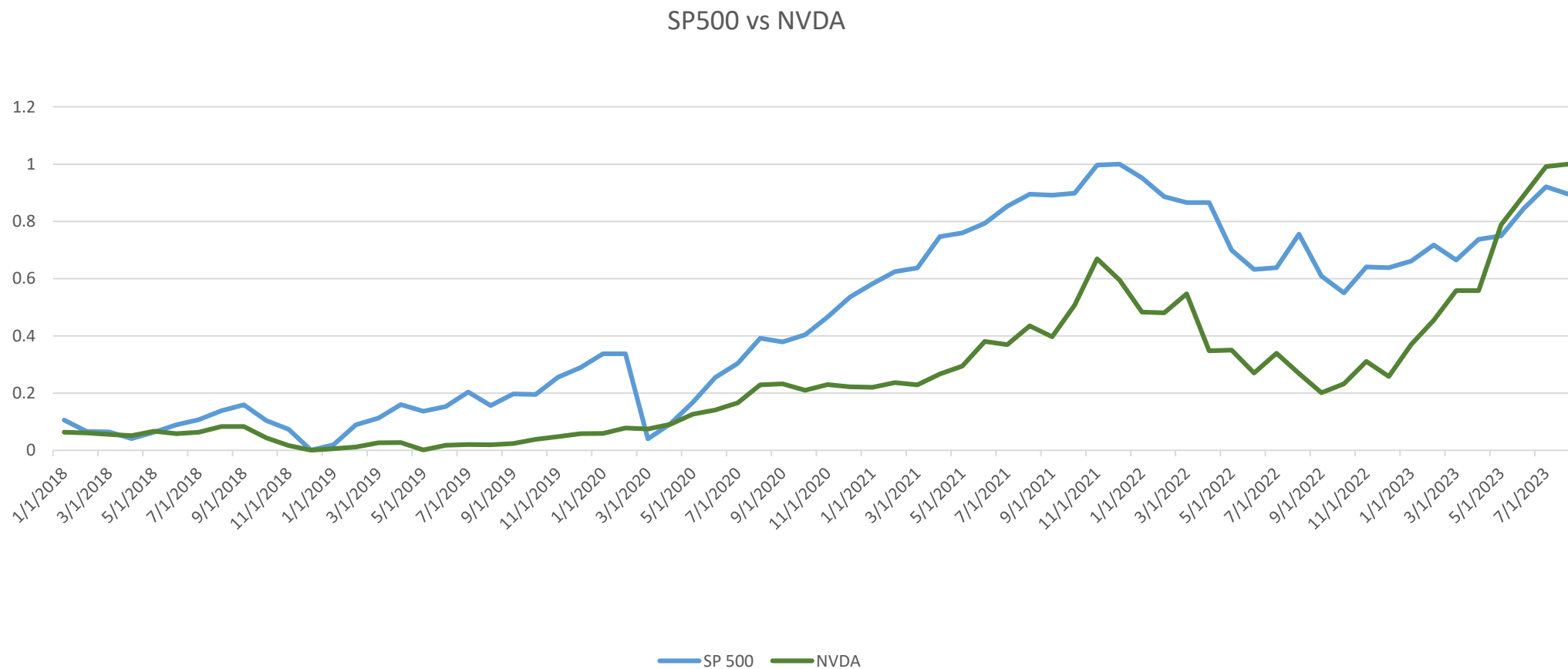
Nvidia (NVDA) Corporation, founded in 1993 by Jensen Huang, Chris Malachowsky, and Curtis Priem, is a leading American multinational technology company renowned for its graphics processing units (GPUs) and semiconductor innovations. Initially focusing on the gaming industry, Nvidia's GPUs have become synonymous with high-performance graphics and are integral components in gaming PCs, laptops, and gaming consoles.

S&P 500 vs AMD



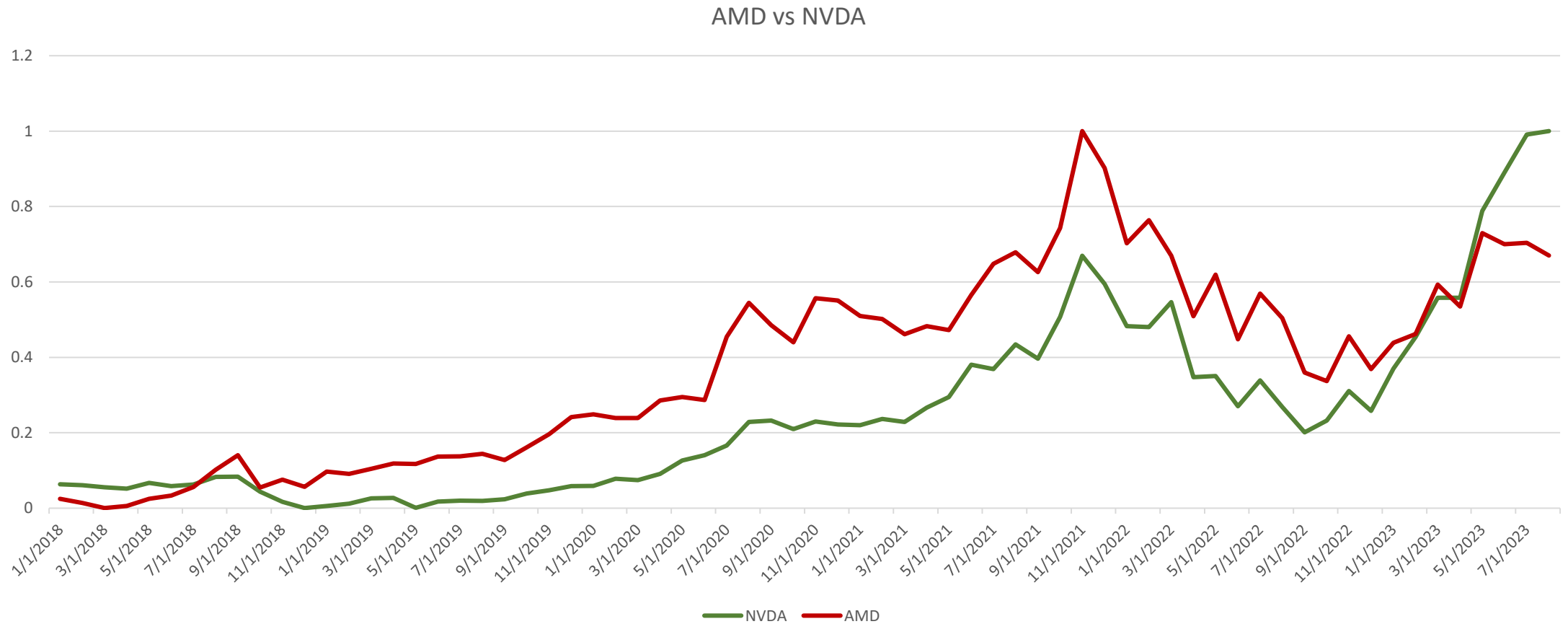
The correlation between the SP500 and AMD is 0.9315.

S&P 500 vs NVDA



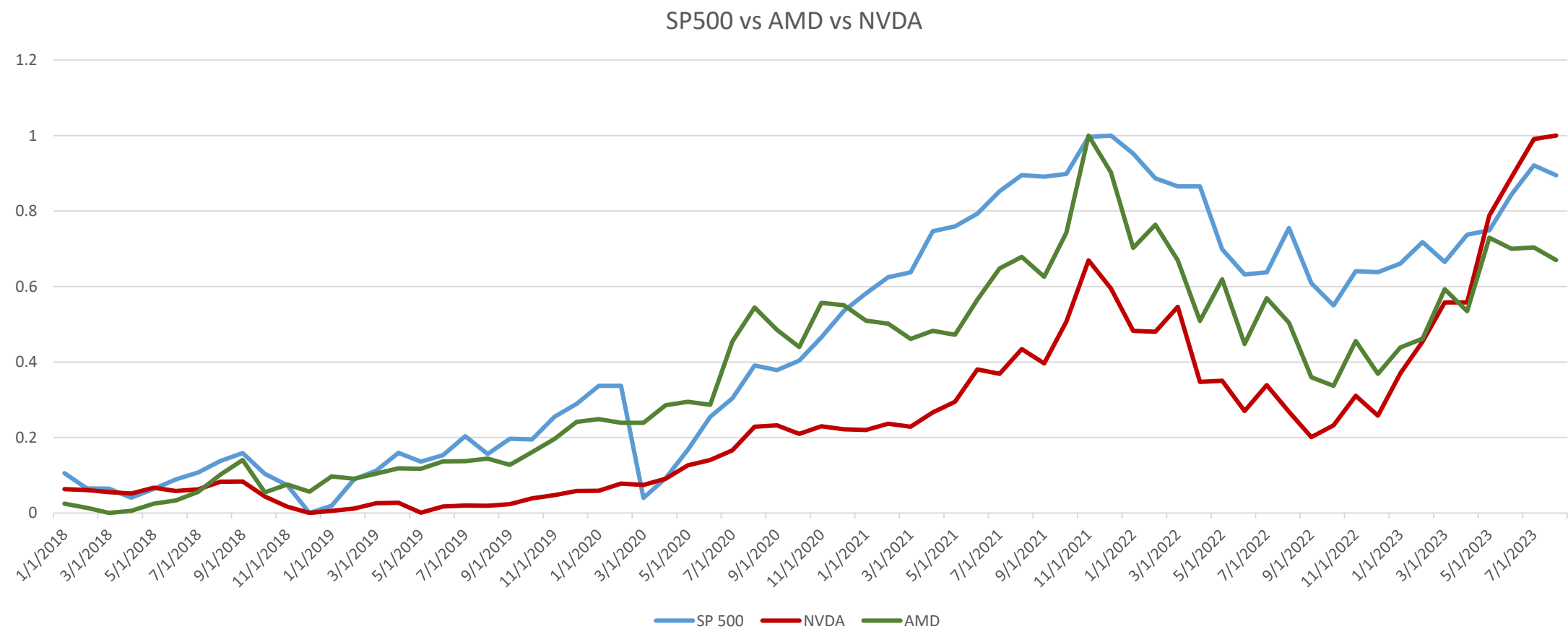
The correlation between the SP500 and NVDA is 0.8472.

AMD vs NVDA



The correlation between the SP500 and NVDA is 0.8470.

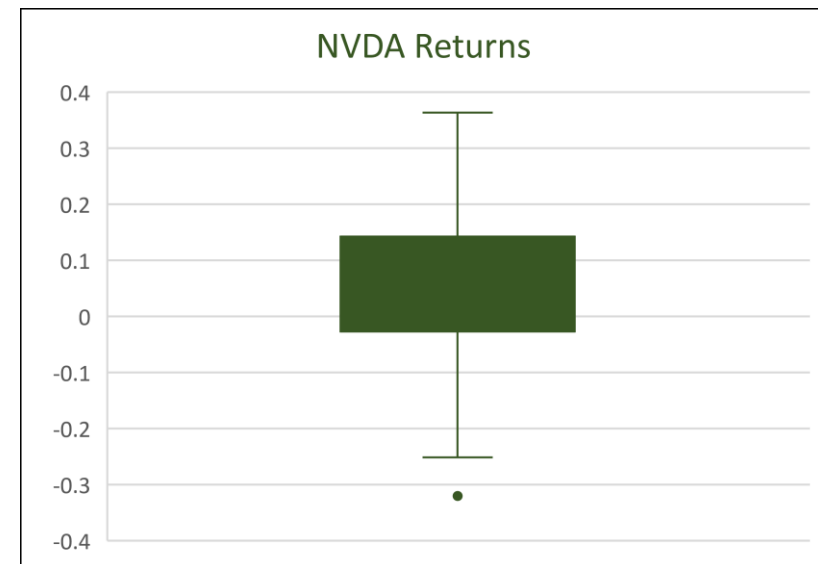
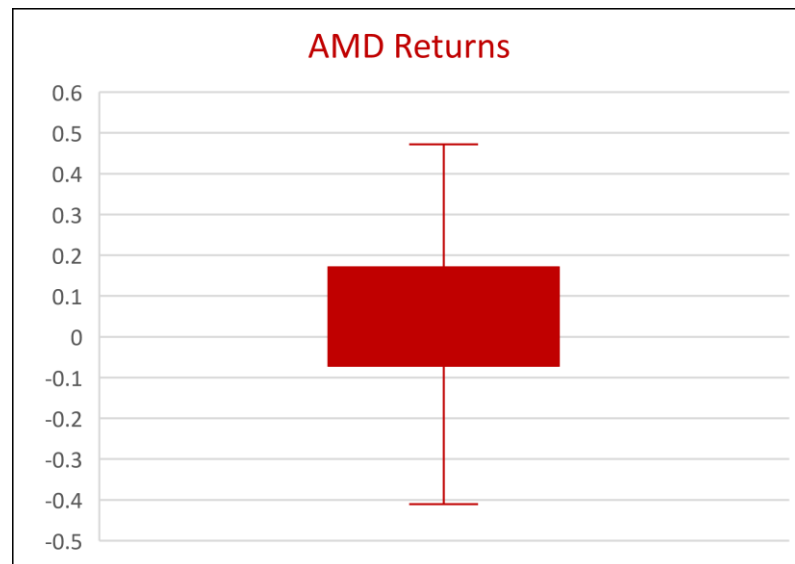
S&P 500 vs AMD & NVDA



Box & Whisker

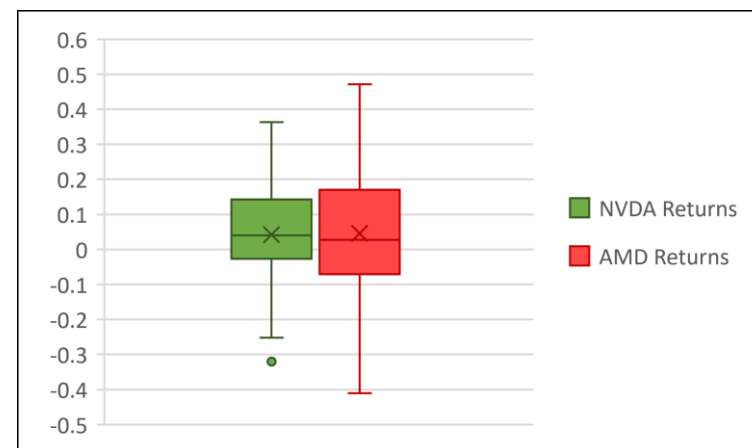
Box & Whisker Statistics

	NVDA Returns	AMD Returns
Min	-0.32016	-0.41049
Quartiles1	-0.02671	-0.07112
Median	0.04019	0.02691
Quartiles3	0.14228	0.17040
Max	0.36344	0.47177



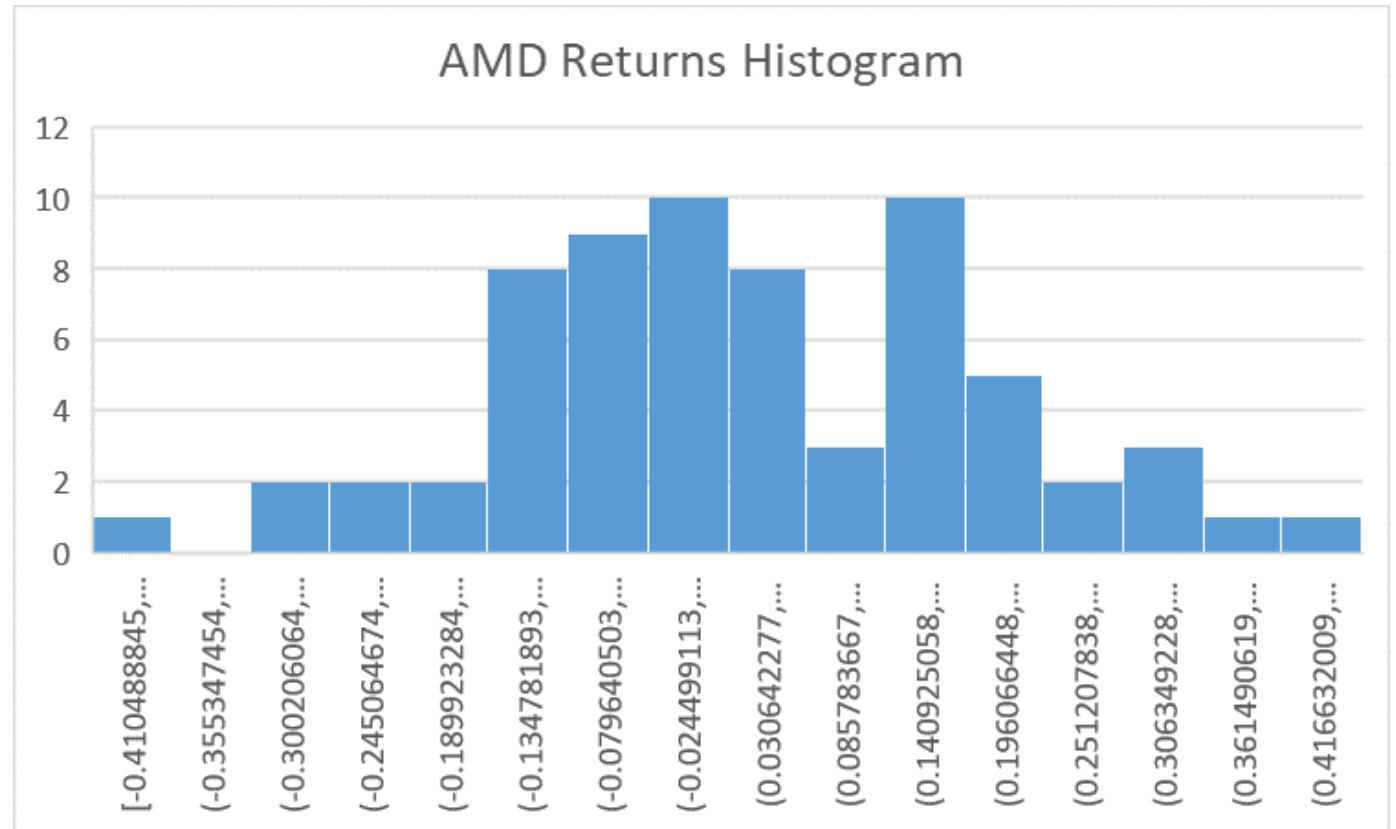
In this case, AMD has a higher maximum return of 47.18% compared to NVDA's 36.34%. This suggests that, historically, AMD has shown the potential for higher gains during certain periods.

However, it's equally important to consider the minimum returns. AMD has a minimum return of -41.05%, while NVDA has a minimum return of -32.02%. A lower minimum return indicates a potentially smaller downside risk.



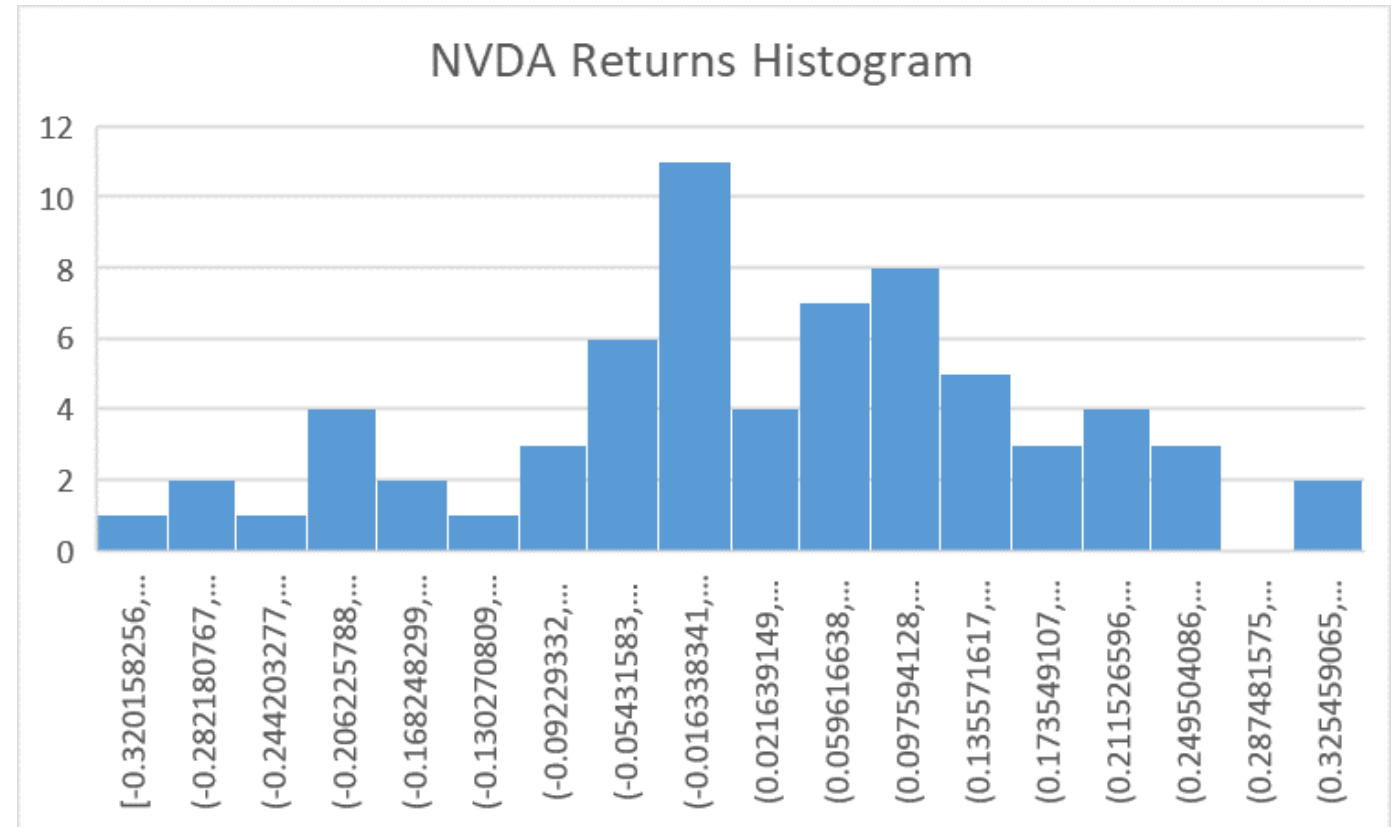
AMD Returns Histogram

The AMD Returns Histogram exhibits a bimodal distribution, characterized by "two modes." This term is commonly employed to depict distributions of values featuring two central tendencies.



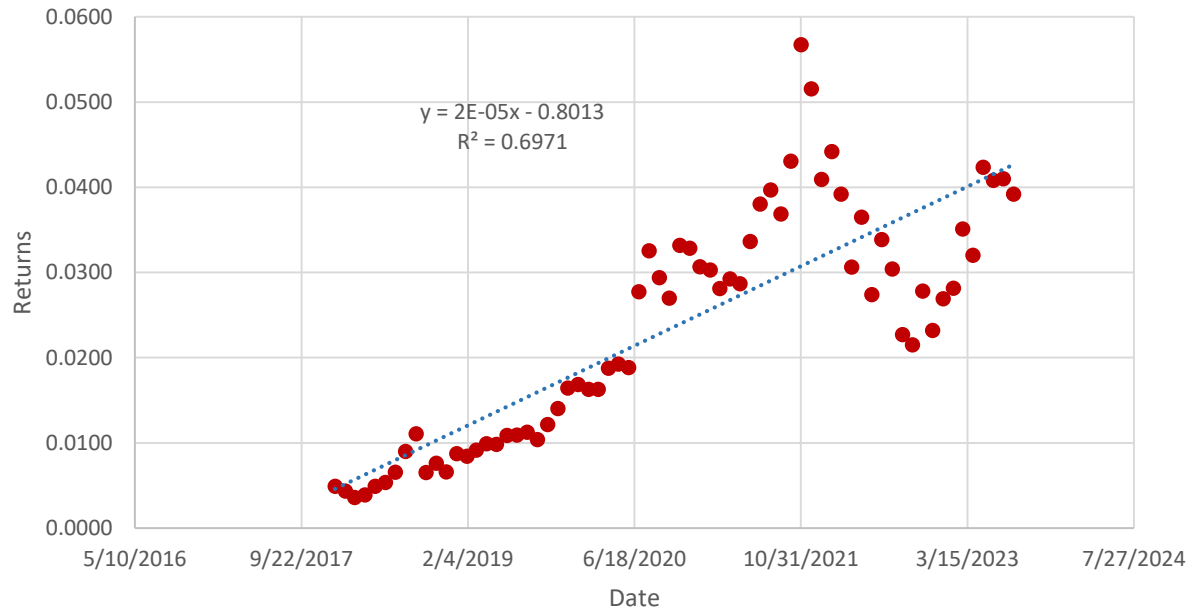
NVDA Returns Histogram

The NVDA Returns Histogram displays a bell curve distribution, characterized by a graph depicting the normal distribution. This curve exhibits a shape reminiscent of a bell.

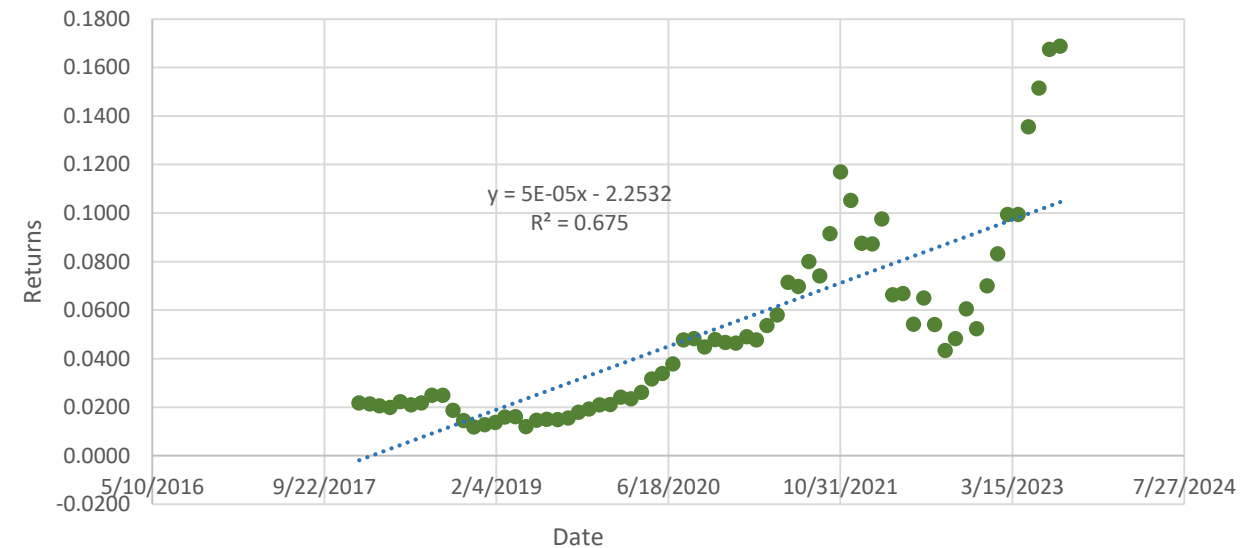


Linear Regression

AMD Linear Regression



NVDA Linear Regression



The R-squared value for AMD is 0.6971, whereas for NVDA, it is 0.675. A higher R-squared value for AMD indicates a more reliable beta figure. Consequently, with AMD's R-squared value approaching 100% while maintaining a beta below 1, it is highly likely to offer better risk-adjusted returns.

Summary Statistics Returns

AMD Returns	
Mean	0.04522393
Standard Error	0.020584524
Median	0.026913534
Mode	#N/A
Standard Deviation	0.168491589
Sample Variance	0.028389415
Kurtosis	0.017581889
Skewness	0.052371441
Range	0.882262244
Minimum	-0.410488845
Maximum	0.471773399
Sum	3.030003314
Count	67
Confidence Level(95.0%)	0.041098328

NVDA Returns	
Mean	0.041641972
Standard Error	0.017881616
Median	0.040190705
Mode	#N/A
Standard Deviation	0.146367339
Sample Variance	0.021423398
Kurtosis	-0.10293625
Skewness	-0.246394581
Range	0.683594811
Minimum	-0.320158256
Maximum	0.363436554
Sum	2.790012133
Count	67
Confidence Level(95.0%)	0.035701799

Ratio Analysis

	NVDA	AMD
Average Returns	0.0416	0.0452
Standard Deviation	0.1464	0.1685
Risk Free	0.0001	0.0001
Annual Trading	15.8745	15.8745
Beta	1.3483	1.1198
Alpha	0.0338	0.0374
R-Squared	0.1382	0.0720
Count Number of Decrease	21	4
Count Number of Increase	46	63
Total Rows	68	68
Sharpe Ratio	0.2838	0.2678
Sharpe Ratio Trading	4.5055	4.2514
Return on Investment (ROI)	674.76%	696.43%
Compound Annual Growth Rate (CAGR)	178.35%	182.21%
Loss Rate	30.88%	5.88%
Win Rate	67.65%	92.65%

Risk Analysis

	NVDA	AMD
Alpha α	0.05	0.05
Investment Amount	\$5,000	\$5,000
Average Drawdown	-3.3377	2.6002
Min Drawdown	-0.1109	-0.6196
Max Drawdown	-380.9185	-50.5539
Standard Error	6.0577	3.0539
Standard Deviation	0.1464	0.1685
VaR	-0.2161	-0.2143
Conditional Value at Risk (CVaR)	-0.2616	-0.2828
VaR Amount	(\$1,080.55)	(\$1,071.55)

Three reasons why invest in AMD

1. Return on investment:

According to monthly data of Yahoo Finance Historical, the return on investment (ROI) calculation for AMD it shows 696.43%, while NVDA shows 674.76%. Comparing to NVDA, AMD has provided higher returns with a better choice for investors seeking stable long-term growth. Despite NVDA shows a historically favorable Sharpe ratio, which measures the risk-adjusted return of an investment, NVDA has a higher Sharpe ratio of 0.2838, whereas AMD's Sharpe ratio is 0.2678. However, for stable long-term growth, AMD remains the preferable choice.

2. Reduced risk profile:

Analyzing the risk factors associated with both companies, AMD tends to have a reduced risk profile compared to NVDA. Based on Yahoo Financial monthly data for AMD, the value-at-risk (VaR) is -0.2143, which is statistical measures of riskiness and the loss amount of money in specific time frame. If you were to invest \$5,000 in AMD in beginning of January 2018, the loss would amount to -\$1,071.55. On the other hand, if you invest in NVDA presents a VaR is -0.2161, resulting in a loss of -\$1,080.55. AMD is a safer bet for long-term for investors. AMD has a reduced risk profile compared to NVDA due to its diversified product portfolio, broader market exposure, and wider customer base. Unlike NVDA, which specializes solely in graphics processing units (GPUs) and related technologies, AMD benefits from its involvement in various areas. Additionally, AMD faces less competition in certain areas, contributing to its stability and attractiveness for investment in its business outlook.

3. Higher share volume:

AMD offers the advantage of a lower stock price compared to NVDA, potentially allowing investors to acquire a greater number of shares for the same investment amount. According to Yahoo Finance data, on January 2018, AMD price was \$13.74 and NVDA price was \$60.81. If you have \$5,000, you can purchase 364 shares of AMD. However, with the same amount, you would only be able to acquire 82 shares of NVDA. Additionally, the closing price for AMD in August 2023 is \$109.43, with a corresponding ending amount of \$39,832.52. As for NVDA, the closing price stands at \$471.16, resulting in a total ending amount of \$38,635.12. This increases the potential for higher returns as the company continues to grow and prosper over the long term.

Conclusion

- In conclusion, the analysis of key financial metrics and risk factors between AMD and NVDA provides valuable insights for potential investors. The return on investment (ROI) figures clearly indicate that AMD has outperformed NVDA, offering a substantial 696.43% compared to NVDA's 674.76%. Despite NVDA displaying a higher Sharpe ratio, reflecting a historically favorable risk-adjusted return, AMD remains the preferable choice for investors seeking stable long-term growth.
- Furthermore, the examination of risk profiles reveals that AMD maintains a reduced risk profile compared to NVDA. The value-at-risk (VaR) analysis illustrates that if one were to invest \$5,000 in January 2018, the potential loss with AMD would be -\$1,071.55, while NVDA would result in a larger loss of -\$1,080.55. This reduced risk can be attributed to AMD's diversified product portfolio, broader market exposure, and a wider customer base, providing a safer bet for long-term investors.
- Additionally, the advantage of a lower stock price for AMD allows investors to acquire a greater number of shares for the same investment amount compared to NVDA. This is evident in the comparison of share volume, where \$5,000 invested in AMD in January 2018 could purchase 364 shares, whereas the same amount would only buy 82 shares of NVDA. The subsequent growth in stock prices further solidifies the potential for higher returns with AMD over the long term.
- In summary, based on the evaluated factors, AMD emerges as a more attractive investment option, offering higher returns, a reduced risk profile, and the potential for greater share volume, making it a compelling choice for investors seeking stability and growth in the long run.

Thank you for your time.