Advanced Micro Devices

By
Henrry Reyes
Ashish Parmanand Pandey
Hritvik Patel
Tarun Deshmukh
Group-E

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AMD-Background

- AMD was found in 1969 by Jerry Sanders. AMD is widely recognized for its cutting-edge processors and graphics solutions. With a strong foothold in the technology sector, particularly in CPUs and GPUs, the company has solidified its position as a formidable competitor.As of April 1, 2024 AMD stock price is at $183.26 a share.

- Since 1989 the value of AMD had stayed under $15 a share. Until 2018 when the value of stock shot up. By 2020 the value of AMD was $155 dollar a share.

- AMD Market Cap is 296.30 Billion dollars

- We chose AMD primarily because we sought a company that demonstrates competitiveness within its industry rather than outright dominance. AMD gained prominence notably after emerging as the first company to provide a viable alternative product capable of challenging the market leaders, Intel and Nvidia. This shift marked a significant milestone in the industry, showcasing AMD's ability to compete effectively and offer compelling solutions within the CPU and GPU markets.

Market and Financial Performance

AMD's financial performance in recent years has showcased the company's strong growth and operational efficiency, particularly highlighted by its performance in 2023. Here's a summary of key financial metrics for AMD in 2023:

Revenue: AMD reported an income of $22.7 billion for 2023, indicating the company's ability to maintain a strong sales performance across its diverse product portfolio despite the competitive and challenging market environment.

Net Income: The net income for the year stood at $854 million.

Operating Income: AMD's reported operating income of $401 million in 2023 indicates the company's financial health and operational efficiency. Operating income is a company's profit from its core business operations, removing interest payments, taxes, and other non-operational financial activities.

Price History

Advanced Micro Devices Inc.
Nasdaq Global Select: AMD

Last 6 Month of AMD stock price.
Number of shares: 1,616,000,000

Competitors

Intel- "is a company that develops and manufactures microprocessors and other semiconductor components".-https://craft.co/amd/competitors
Stock Value- $44.56 Number of shares- 2,468,000,000

NVIDIA- "is a company that provides graphics processing units (GPUs) for the gaming and professional markets and system-on-a-chip units for the mobile computing and automotive sectors."-https://craft.co/amd/competitors
Stock Value- $915.35 Number of shares-4,222,000,000

https://www.intc.com/stock-info/historical-data

https://investor.nvidia.com/stock-info/stock-quote-and-chart/default.aspx

CAPITAL BUDGETING ANALYSIS

- Balance sheet
- Comparison of capital expenditure
- Analysis of capital budgeting with previous one and management analysis
- Comparison of Capital Structure of Analysis

Balance Sheet

Overview   Locations   **Financials**   Operating Metrics   Human Capital   Key People   Competitors   Supplier Risk

Financial Statements

Income Statement   Balance Sheet   Cash Flow   Annual   Quarterly

USD	FY, 2020	FY, 2021	FY, 2022	FY, 2023
Cash	1.6B	2.5B	4.8B	3.9B
Accounts Receivable	2.1B	2.7B	4.1B	5.4B
Prepaid Expenses	378.0M	312.0M	1.3B	1.3B
Inventories	1.4B	2.0B	3.8B	4.4B
Current Assets	6.1B	8.6B	15.0B	16.8B
PP&E	641.0M	702.0M	1.5B	1.6B
Goodwill	289.0M	289.0M	24.2B	
Total Assets	9.0B	12.4B	67.6B	67.9B
Accounts Payable	468.0M	1.3B	2.5B	2.1B
Current Liabilities	2.4B	4.2B	6.4B	6.7B

USD	FY, 2020	FY, 2021	FY, 2022	FY, 2023
Current Liabilities	2.4B	4.2B	6.4B	6.7B
Short-term Debt		312.0M		751.0M
Long-term Debt	531.0M	349.0M	2.9B	2.3B
Total Debt	531.0M	661.0M	2.9B	3.0B
Total Liabilities	3.1B	4.9B	12.8B	
Common Stock	12.0M	12.0M	16.0M	17.0M
Additional Paid-in Capital	10.5B	11.1B	58.0B	59.7B
Retained Earnings	(4.6B)	(1.5B)	(131.0M)	723.0M
Total Equity	5.8B	7.5B	54.8B	55.9B
Debt to Equity Ratio	0.1	0.1	0.1	0.1
Debt to Assets Ratio	0.1	0.1	0	0
Financial Leverage	1.5	1.7	1.2	1.2

All values are in Dollars USD

Comparison Between years 2020 to 2023

Comparison of Capital Expenditure of AMD

- capital expenditures = PP&E (current period) – PP&E (prior period) + depreciation (current period)

AMD

Overview Locations Financials Operating Metrics Human Capital Key People Competitors Supplier Risk

Income Statement   Balance Sheet   Cash Flow   Annual   Quarterly

USD	FY, 2020	FY, 2021	FY, 2022	FY, 2023
Net Income	2.5B	3.2B	1.3B	854.0M
Depreciation and Amortization	312.0M	407.0M	4.2B	3.5B
Accounts Receivable	(219.0M)	(640.0M)	(1.1B)	(1.2B)
Inventories	(417.0M)	(556.0M)	(1.4B)	(580.0M)
Accounts Payable	(513.0M)	801.0M	931.0M	(419.0M)
Cash From Operating Activities	1.1B	3.5B	3.6B	1.7B
Purchases of PP&E	(294.0M)	(301.0M)	(450.0M)	(546.0M)
Cash From Investing Activities	(952.0M)	(686.0M)	2.0B	(1.4B)
Long-term Borrowings	(200.0M)		(312.0M)	
Cash From Financing Activities	6.0M	(1.9B)	(3.3B)	(1.1B)
Net Change in Cash	125.0M	940.0M	2.3B	(902.0M)
Interest Paid	31.0M	25.0M	85.0M	84.0M
Income Taxes Paid	8.0M	35.0M	685.0M	523.0M

Analysis of capital budgeting with previous one & Management Analysis

- CapEx is reported under cash flow from investing activities as "Purchases of PP&E" (Property, Plant, and Equipment). Here are the values from the information provided:

  FY 2020: $294.0M

  FY 2021: $301.0M

  FY 2022: $450.0M

  FY 2023: $546.0M

- We can see that the Capital Expenditure is increasing from year to year which implies that the AMD Assests based are growing rapidly from year to year.

- There is a Revenue Increases.

Comparison of Capital Structure Analysis

- Debt-Equity ratio=Total Debt/Total equity

FY 2020:

Total Debt: $531.0 million

Total Equity: $5.98 billion

Debt to Equity Ratio: 0.089 (approximated)

FY 2021:

Total Debt: $651.0 million

Total Equity: $7.58 billion

Debt to Equity Ratio: 0.086 (approximated)

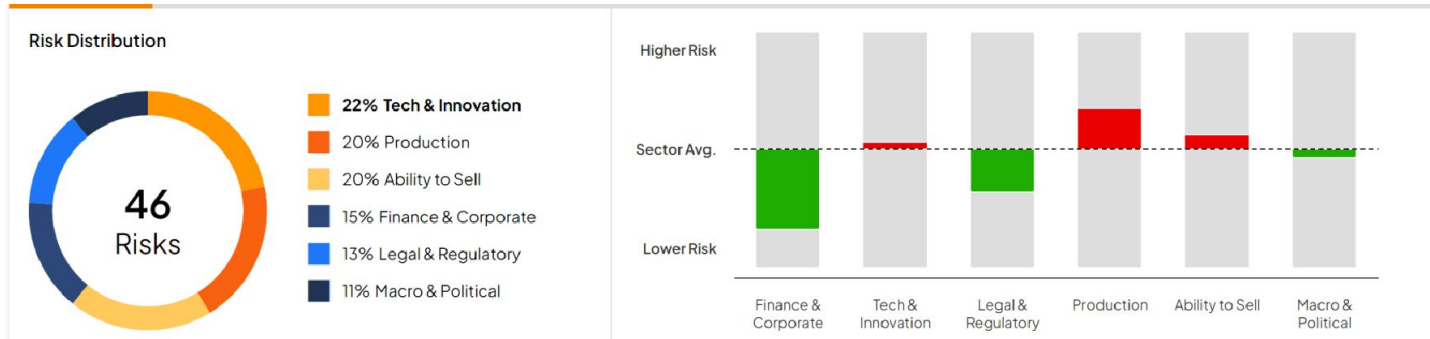**FY 2022**:

Total Debt: $2.98 billion

Total Equity: $12.88 billion

Debt to Equity Ratio: 0.231 (approximated)

- All figures are taken from balance sheet

- A higher debt to equity ratio can imply that a company is more aggressive in financing its growth with debt.

RISKS AND RETURN ANALYSIS

- PRODUCTION: AMD designs chips, but it doesn't manufacture them. For that, AMD relies on Taiwan Semiconductor. If a conflict were to disrupt the Taiwan fabrication plants, it would be devastating for AMD.
- INDUSTRY COMPETITION: When a company earns large profits on assets that wouldn't cost much to replace, it attracts competitors into the space. Recently, Amazon (NASDAQ:AMZN), Microsoft (NASDAQ:MSFT), and Apple (NASDAQ:AAPL) have been working on developing their own semiconductors, and they have a lot of capital to do it. Apple has hindered AMD's profitability in the PC market, and Amazon and Microsoft could hinder Data Center profitability in the years ahead. It's expected that competition will only worsen for companies like AMD, Intel (NASDAQ:INTC), and Nvidia (NASDAQ:NVDA).
- Unfavorable currency exchange rate fluctuations could adversely the stock prices
- LEGAL AND REGULATORY: If AMD cannot adequately protect the technology or other intellectual property in the United States and abroad, through patents, copyrights, trade secrets, trademarks and other measures, they may lose a competitive advantage and incur significant expenses.

Risk Distribution

46 Risks

- 22% Tech & Innovation
- 20% Production
- 20% Ability to Sell
- 15% Finance & Corporate
- 13% Legal & Regulatory
- 11% Macro & Political

Higher Risk

Sector Avg.

Lower Risk

| Finance & Corporate | Tech & Innovation | Legal & Regulatory | Production | Ability to Sell | Macro & Political |

- AMD's Data Center segment's revenue in the third quarter was flat year-over-year, coming in at $1.60 billion. Its Client segment revenue was higher by 42.2% year-over-year to come in at $1.45 billion, primarily driven by higher Ryzen mobile processor sales. However, its Gaming segment and Embedded segment revenues were down 7.7% and 4.6% year-over-year to $1.51 billion and $1.24 billion, respectively.
- AMD is expected to report a year-over-year improvement in revenue and earnings for the fourth quarter. Its Client and Data Center segments are expected to see double-digit year-over-year growth, driven by the recovering PC market and growing demand for AI-focused chips.

Financial Forecast

Annual Quarterly Export ⌄

Revenue This Year		Revenue Next Year		EPS This Year		EPS Next Year	
26.07B	↑ 14.95%	32.86B	↑ 26.05%	3.66	↑ 590.20%	5.52	↑ 51.02%
from 22.68B		from 26.07B		from 0.53		from 3.66	

Year		2019	2020	2021	2022	2023	2024	2025	2026	2027
Revenue		6.73B	9.76B	16.43B	23.60B	22.68B	26.07B	32.86B	39.95B	42.23B
Revenue Growth		3.95%	45.05%	68.33%	43.61%	-3.90%	14.95%	26.05%	21.56%	5.71%
EPS		0.30	2.06	2.57	0.84	0.53	3.66	5.52	7.26	8.50
EPS Growth		-6.25%	586.67%	24.76%	-67.32%	-36.90%	590.20%	51.02%	31.41%	17.14%

- However, its Gaming and Embedded segments are expected to continue witnessing a decline in revenues over the prior-year quarter as gaming chip demand remains weak. Also, softness in the embedded markets due to destocking will hurt Embedded segment revenues in the fourth quarter.
- Another critical factor driving AMD stock price is its commitment to product innovation and technological advancements. AMD has consistently pushed the boundaries of semiconductor technology, introducing cutting-edge processors and graphics solutions that have gained significant market traction. The company's ability to develop products that meet the evolving demands of consumers and businesses has resulted in increased adoption and market share.

Predicting Stock Prices with LSTM

1.Leveraging LSTM Networks for Stock Price Prediction:

- LSTM networks are adept at capturing long-term dependencies in sequential data, making them ideal for predicting stock prices.
- Incorporating memory cells and gating mechanisms, LSTM networks excel at learning complex patterns and trends in stock prices over time.

2.Importance of Accurate Stock Price Predictions:

- Accurate predictions are crucial for investors, traders, and financial institutions, facilitating informed investment decisions.
- Reliable forecasts optimize portfolio management strategies, minimize risks, and capitalize on profitable opportunities within financial markets.

3.Utilizing LSTM Networks in Financial Markets:

- LSTM networks provide valuable insights into potential price movements in volatile financial markets, aiding effective trading decisions.
- These networks excel at capturing complex temporal dependencies in stock price data, enabling identification of patterns and trends.

Data Processing

Import necessary libraries:

- Import essential libraries such as PyTorch, NumPy, Matplotlib, and Yahoo Finance.

Set random seeds for reproducibility:

- Initialize random seeds to ensure reproducibility of results across different runs.

Define the ticker symbol and fetch historical stock price data:

- Specify the ticker symbol of the stock (e.g., "AMD").

Utilize the Yahoo Finance API to retrieve historical stock price data.

- Set the start and end dates for data retrieval.

Normalize the data using Min-Max scaling:

- Apply Min-Max scaling to normalize the stock price data.Ensure that the data is within a predefined range (typically [0, 1]).

Define the LSTM model architecture and training parameters:

- Define the architecture of the LSTM model, including the number of hidden layers, neurons, and other hyperparameters.

Lookback : 10

```
y_pred_best = best_model
Test loss :  tensor(0.0006
[176.63452] [180.49000549]
[177.58107] [183.33999634]
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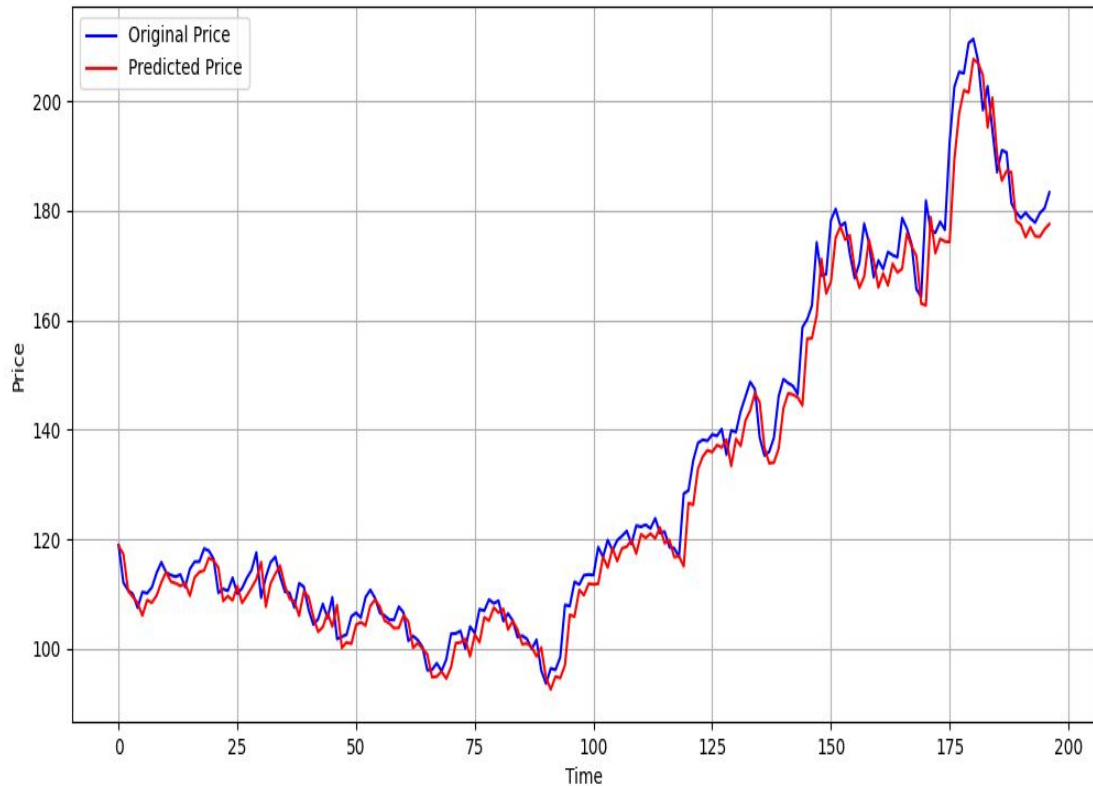
Lookback : 20

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182.18190038802328 178.699996
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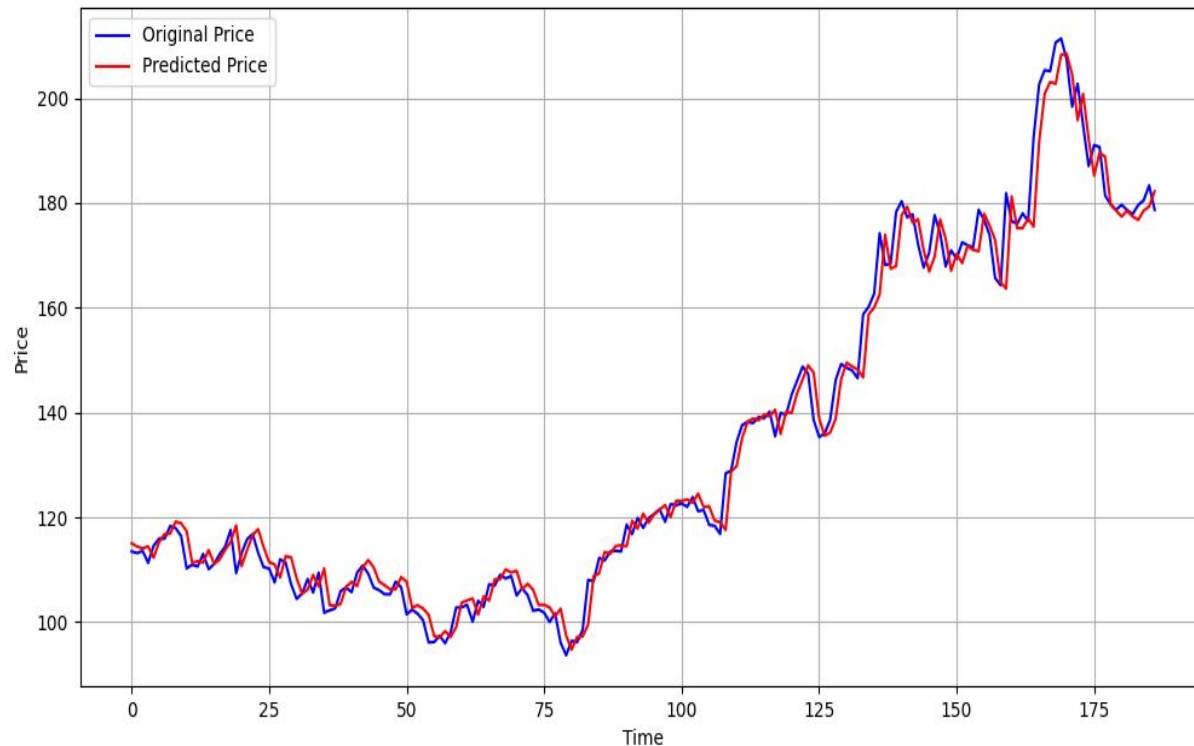
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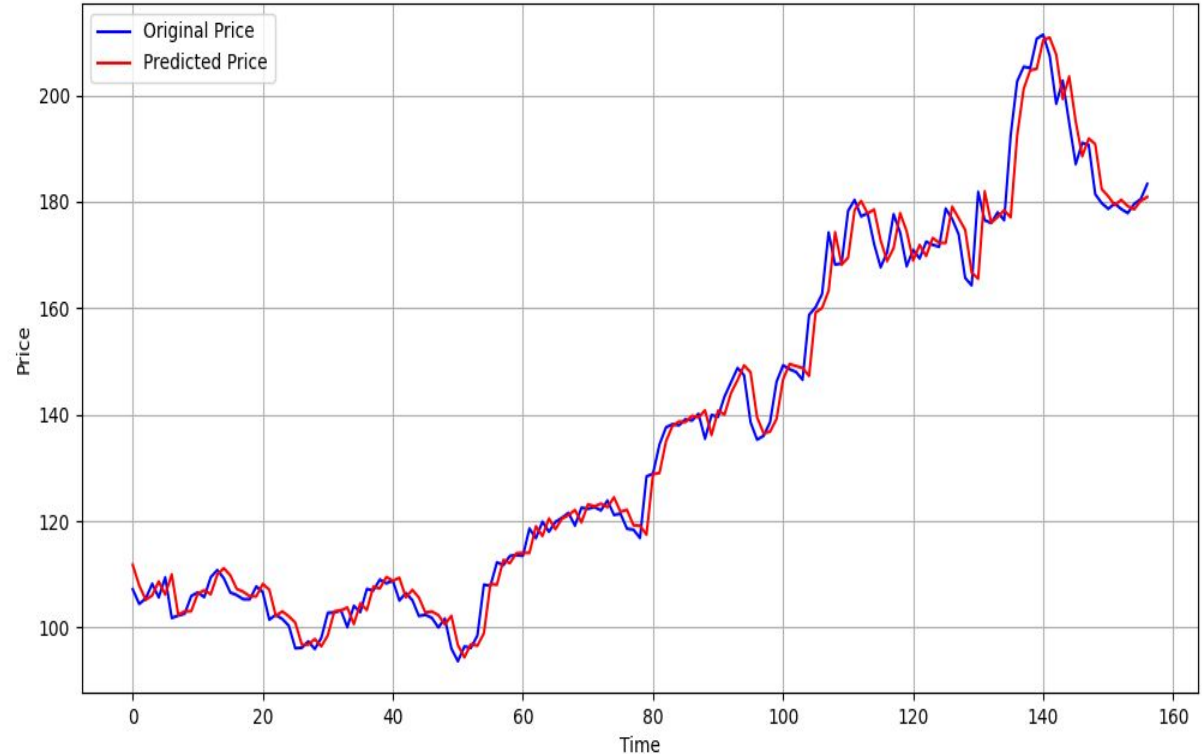
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17 -> 164.1648406982422
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Lookback : 100
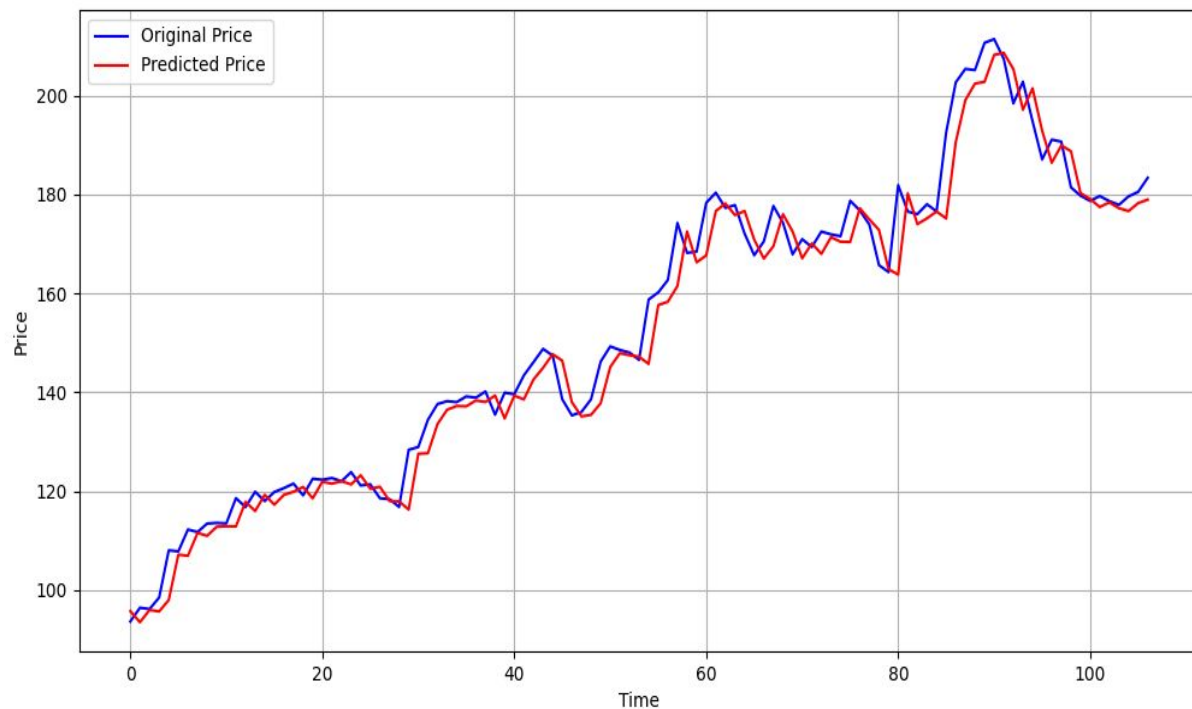
Conclusion

As a group we all agree that investing in AMD would not be profitable and we expect that by April 23 the stock value will be at $173.96 a decrease of 3%. Based on current events and passed history.
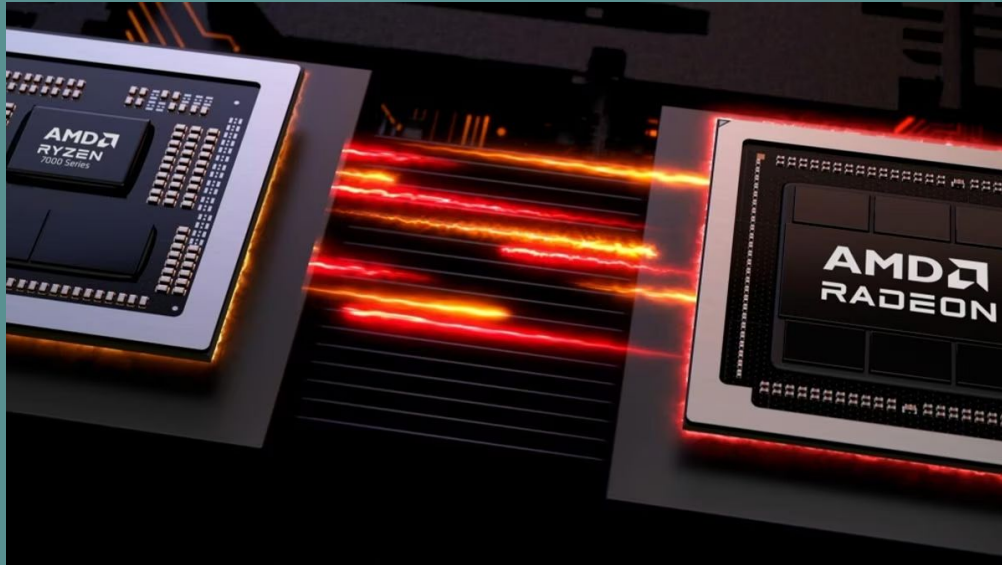
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