Stock Price Prediction

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Overview

The objective of this report is to analyze the stock performance of Mercedes-Benz Group AG (MBG.DE), compare it to its competitors in the industry, and forecast the closing stock price of the company on April 23, 2024. We will use machine learning in this report using an LSTM model, which is based on historical data as well as other factors such as the company's financial performance, market trends and developments.
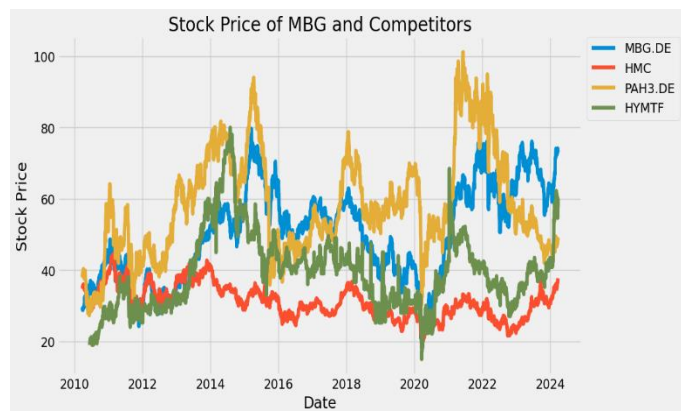
Methodology

The aim is to forecast the future stock price of MBG.DE using historical data and ML. The historical stock price data was collected from the yfinance library between March 24, 2010 and March 24, 2024 and compared to MBG.DE's competitors. Sharpe ratios (SRs), volatility (VATs), and annualized returns (ARs) were used to show the comparative data.

Utilizing past price data, an LSTM model was developed to forecast the closing price on April 23, 2024. To lessen overfitting, early halting was employed in conjunction with a 60/40 train-test split during the training process. Mean Absolute Error (MAE) and Root Mean Square Error (RMSE) were used to evaluate the model's performance. External elements were also considered, including market trends, industry news, financial performance in the recent past, and market threats.

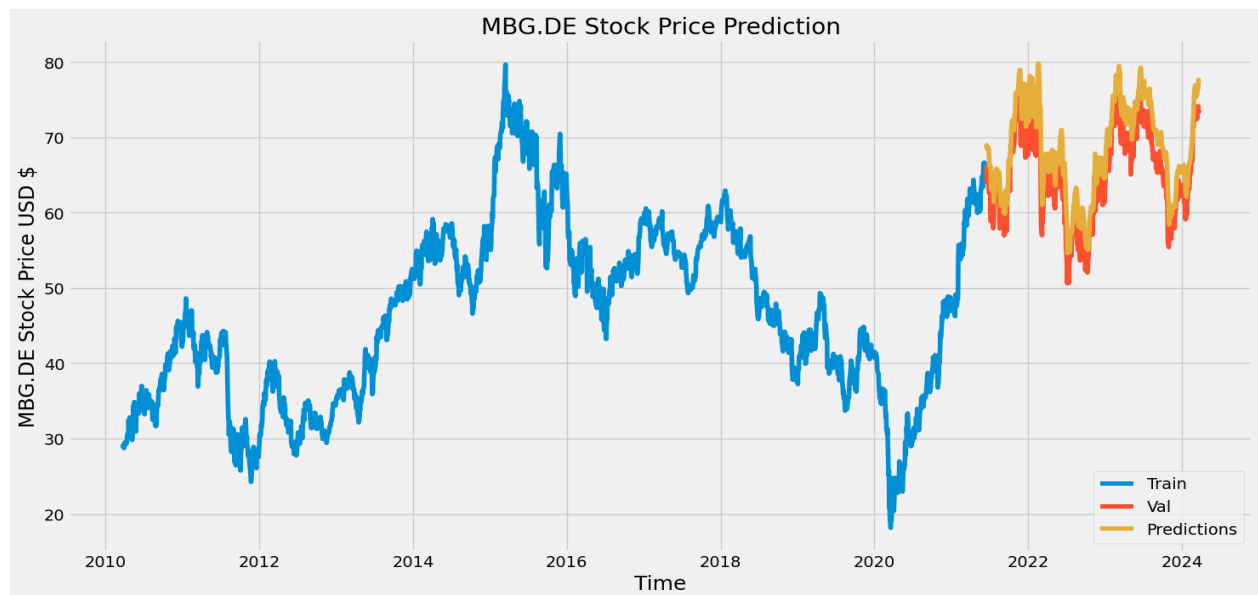## Stock Performance Analysis: MBG.DE and Its Competitors

This section examines the stock performance of Mercedes-Benz Group AG (MBG.DE) over an extended period, comparing it to counterparts in the automotive industry, namely Hyundai Motor Company (HYMTF), Honda Motor Co. (HMC), and Porsche Automobil Holding SE (PAH3.DE). Based on stock data going back to March 24, 2010, we offer a behavior analysis of the stock. The mean closing price of MBG.DE was $73.5, with a standard deviation of 0.93% and considerable variations. With an annualized return of 2.82% and a Sharpe ratio of 1.42, MBG's risk-adjusted returns were consistent. Conversely, Honda

Motor Co. (HMC) had the highest return, at 2.87%. In contrast, Porsche Automobil Holding SE (PAH3.DE)

and Hyundai Motor Company (HYMTF) displayed higher volatility and lesser profit returns, indicating the relative stability of MBG.DE's investments.

Predictive Stock Price for Mercedes Benz AG Group (MBG.DE)

The LSTM model predicted MBG.DE's stock price to be $74.45 on 04/23/2024, with an MAE of 3.10 and RMSE of 3.44, indicating reliable accuracy.

The projection was amended after accounting for beneficial aspects such as like strong financial performance, strategic acquisitions or partnerships, favorable industry trends, particularly from innovative products, positive news or events and overall economic conditions, the prediction was revised. With these considerations accounting for a **2%** possible price increase, the modified projection for **the closing price on 04/23/2023 is $75.94**.

References

https://finance.yahoo.com/quote/MBG.DE?.tsrc=fin-srch