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## Modeling and forecasting of the Dow Jones Industrial Average using the Box-Jenkins methodology and GARCH models

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### **Abstract**

The Dow Jones Industrial Average is one of the most important indicators that are relied upon in the study of the stock market, and the Dow Jones index is the oldest index that was used in the stock market, as it began to be used in February 1885, and it currently includes the thirty largest American industrial companies from the New York Stock Exchange and the Nasdaq Stock Exchange, as a company Boeing, which specializes in the aircraft industry, and Microsoft, which specializes in information technology, and the Walt Disney Company, which specializes in media and entertainment, and several other industrial fields. The research aims to achieve an ideal model for forecasting the Dow Jones Industrial Index using econometric methods and models. Modeling and forecasting, in order to help investors, portfolio managers and those interested in the stock markets, to make sound investment decisions. To achieve this model, a sample of 949 views was used from January 1, 2019 to October 6, 2022, taking into account the stock market holidays and after analyzing the time series, studying its stability and experimenting with many models, we concluded that the optimal model for prediction is ARIMA (2,1,2) - GARCH (1,1), and it was Verify that the model matches all required conditions before making a prediction.

**Keywords:** ARIMA - Stock Market - Econometrics - Time Series - EViews