First interim report
Beyond the clouds

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Topic and motivation

Our research topic is "Exploring Factors Affecting Boeing's Share Prices."

We chose this research area because of the significant role that the aerospace industry, particularly Boeing, plays in the global economy. Our motivation comes from the curiosity about how external economic and geopolitical events influence major corporations.

We will explore the relationship between economic factors — specifically, fluctuations in oil prices and various economic indicators (global GDP growth rates, unemployment rates, inflation rates) — and the performance of Boeing's share prices. Additionally, the effects of geopolitical events, like the increase in flights in neighboring countries following the onset of the war in Ukraine, on air travel and, by extension, on Boeing's market performance will be considered in the research.

Our findings could guide investment strategies and business planning, by providing valuable information for investors, analysts, and companies that are working in this industry.

The aim and the tasks

The primary aim of this research is to understand and quantify the relationship between Boeing's share prices and external economic factors, including oil prices, global economic indicators, and the impact of significant geopolitical events.

Our tasks in this research are the following:
1. Identifying how fluctuations in oil prices correlate with changes in Boeing's stock prices, considering the aviation industry's heavy reliance on fuel and how fuel cost variations can significantly impact stock shares.

2. Determining the influence of global economic indicators on Boeing′s share price movements. Here we intend to check the sensitivity of Boeing′s share prices to the global economic environment.

3. Predicting the influence of the economic indicators on Boeing′s future stock price movements through regression analysis and other statistical methods.

4. Assessing the impact of geopolitical events, specifically the increase in flights in countries that Ukraine borders after the beginning of the war in Ukraine, to understand the broader implications of such events on Boeing′s market shares.

Main hypotheses that we want to test:

Hypothesis 1: There exists a negative correlation between oil prices and Boeing′s stock prices, with higher oil prices leading to lower stock prices due to increased operational costs for airlines, reducing demand for new aircraft.

Hypothesis 2: There is a significant correlation between global economic health indicators (such as unemployment rates) and Boeing′s financial performance, with poor global economic health negatively impacting Boeing′s stock prices.

Hypothesis 3: Global GDP growth rates have a positive effect on Boeing′s financial performance and stock prices, as economic expansion drives demand for air travel and aircraft.

Hypothesis 4: Inflation rates have a measurable impact on Boeing′s stock prices, with higher I nflation potentially reducing airline profitability and demand for new aircraft.

Literature review

For our research on the impact of oil prices and economic indicators on Boeing′s share prices we are considering the following literature:

- "Oil Price Volatility and Its Impact on Economic Activity, Oil Consumption, and Energy Stocks". This paper explores the broader economic effects of oil price fluctuations.
- "Macroeconomic Variables and Stock Market Returns: Full Information Maximum Likelihood Estimation". It discusses how various economic indicators influence stock returns.
- Official Boeing's website. We will find here the necessary information that is related to Boeing's company.

We will also refer to the book "A guide to modern econometrics" to get the necessary theoretical information.

Data description.

In our project, we will use a variety of datasets to explore the factors influencing Boeing′s share prices. First of all, we have historical data on the share prices of Boeing. It includes information such as the date, opening price, closing price, high, low, and volume of shares traded. This data will be central to our analysis as we seek to understand how various factors have influenced

Boeing's stock performance over time. We also have information about [historical oil price data](#), [global GDP growth rates](#), [historical inflation rate](#) data and [unemployment rate](#) data. For our study we will use only world indicators, so all our data sets are time series.

Methods

Methods to be used in the research:

1. Descriptive Statistics and Visualization: statistical techniques to summarize the data and visual tools to illustrate trends, patterns, and outliers in Boeing's share prices, oil prices, and economic indicators over time. <u>Possible methods:</u> measures of central tendency, measures of spread, histograms, box plot, scatter plot.

2. Correlation and Causation Analysis: statistical tests to identify the strength and direction of relationships between Boeing's share prices and the selected external economic factors. <u>Possible methods:</u> Pearson correlation coefficient and probably some other methods that we are going to learn later on the course for identifying correlation in time series data.

3. Regression Analysis: regression techniques to model the relationship between Boeing's stock prices and independent variables like oil prices and economic indicators, potentially identifying predictive models. <u>Possible methods:</u> Multiple Linear Regression.

4. Time Series Analysis: examine the data across time to identify trends, patterns, and the impact of specific events on Boeing's share prices. <u>Possible methods:</u> ARIMA.

Schedule

1. Literature Review and Data Collection
- Due date: 10.03.2024
- Tasks:

  1. Gather historical data on Boeing's share prices, oil prices, and key economic indicators.

  2. Organize and clean the data to prepare for analysis.

2. Descriptive Data Analysis
- Due date: 21.03.2024
- Tasks:

  1. Perform descriptive statistical analysis to understand the basic features of the data.

  2. Identify trends, patterns, and outliers in Boeing's share prices, oil prices, and economic indicators.

3. Model Building
- Due date: 28.03.2024
- Tasks:

      1. Conduct correlation analysis, regression analysis, and time series forecasting.

      2. Apply statistical tests to investigate the relationships and impacts of oil prices and economic indicators on Boeing's share prices.

4. Analysis of Flight Activity in countries that Ukraine borders with
- Due date: 02.04.2024
- Tasks:

      1. Collect and analyze data on flight activities in countries that Ukraine borders with.

      2. Assess the impact of geopolitical events on air travel and Boeing's market performance.

5. Writing the second interim report
- Due date: 05.04.2024
- Tasks:

      1. Gather insights from the basic and deeper analysis.

      2. Write a report that includes a summary of previous studies, methods we used and the results.

6. Final Analysis
- Due date: 13.04.2024
- Tasks:

      1. Review and revise the report based on feedback.

7. Writing the final research report
- Due date: 18.04.2024
- Tasks:

      1. Finalize the research findings and conclusions.

      2. Write the final report, including all results of our analysis.