Effects of the COVID-19 pandemic on stock price

- **Intro**
  - Backgound:
    - The COVID-19 pandemic is an extreme event that has brought uncertainty to the financial markets, led to a sudden fall in stock prices, and has given rise to financial volatility (Mahata et al., Citation2021).
  - Why
    - Economic impact: The stock market is an important indicator of economic health, and the impact of COVID-19 on the stock market reflects the economic impact of the pandemic. Understanding the impact of COVID-19 on the stock market can help us better understand the overall economic impact of the pandemic.
    - Investment decisions: The stock market is an important investment channel for many individuals and institutions. Analyzing the impact of COVID-19 on the stock market can help investors make more informed investment decisions in response to the pandemic.
    - Public policy: Governments and policymakers may use data on the impact of COVID-19 on the stock market to inform their public policy decisions. For example, they may use this data to determine how much economic stimulus is needed to offset the negative impact of the pandemic on the stock market.
    - In summary, analyzing the impact of COVID-19 on the stock market is important for understanding the economic impact of the pandemic, making informed investment decisions, and informing public policy.
  - How
    - We use the Markowitz efficient frontier theory to construct an optimal investment portfolio by selecting stocks from different industries with high investment value. Using March 11, 2020 as a dividing point, we use the h-test to determine if there is a difference in the return and volatility of the investment portfolio before and after the outbreak of the COVID-19 pandemic. Based on the research results, we explore whether the COVID-19 pandemic has a significant impact on the stock market and provide a reasonable
      - March 11, 2020 by the World Health Organization (WHO) regarding the outbreak of the coronavirus (COVID-19) as a global pandemic
- **Data Description**
  - Data recourse: yahoo finance, Rules:
    - (1) Listed for over 2 years with no significant asset restructuring events in recent times;
    - (2) Total continuous suspension time within 500 trading days does not exceed 5 days;
    - (3) Sound financial condition with no significant risk warnings.
  - Selection and Introduction of Individual Stocks
    - The reason why we want to construct a portfolio rather than use market portfolio:
      - Different research purposes: (we choose our own built portfolio rather than market portfolio)
      - 1. If the purpose is to understand the overall performance of the stock market, market indices may be a better choice because they represent the performance of the entire market. However, if the purpose is to understand the impact of different factors such as industries, market capitalization, regions, and risk characteristics, then self-constructed stock portfolios may be more suitable because different stock portfolios can be flexibly selected for comparison.
      - 2. Consider more factors: Market indices usually only consider factors such as stock market capitalization and industry classification, while self-constructed stock portfolios can consider different characteristics of different companies more carefully, such as geographical location, business model, and profit status, which may also have some impact on studying the impact of the epidemic on the stock market.
      - 3. Personalization: Self-constructed stock portfolios can be selected according to personal investment preferences, while market indices cannot meet personalized needs.
      - In summary, choosing to study the impact of the epidemic on the stock market using self-constructed stock portfolios may be more suitable for research purposes that need to consider more factors and have personalized needs.
    - Why we choose these stock and how does our portfolio both represent the market and have personalized factor
      - Key Point:
        - 1. Company has high market value
          - represent market
        - 2. High Volume
          - no liquidity risk
          - Ensuring that stock prices can promptly reflect changes in market conditions
        - 3. Diversivied
          - less risk and same as 1.
      - Other Point
        - 1. High Return
        - 2. Stable
        - 3. Love It

Visualize: price plot, volume plot

- **Methodology**
  - Detailed explanation of the model and econometric method
    - hypothesis
      - H0: mean equal
      - H0: var equal
    - Data processing
      - Download earliest stock return
      - OLS 4-Factors Model
      - Markowitz Efficient Frontier get weights and Sharpe-Ratio
      - download 2017-3-11__2023-3-11 data , seperated in 2 parts
      - run regression and see whether mean and var equal

Visualize: Efficient Frontier

- **Results and Discussion**
  - Descriptive statistical analysis
    - Compare the summary mean and std give preliminary conclusion
  - Regression analysis (α=5%)
    - mean is equal
    - var is not equal

Visualize: Portfolio Price

- **Conclusion**
  - Main conclusion
    - the return are same, but var is highly different after the pandemic.
    - still expect to earn a similar level of return on their investments but need to tolerate the increased level of risk.
  - Limatations
    - we only figured out that covid-19 do have affected stock market, but we still dont know how
    - other Contributing Factors
      - changes in interest rates,
      - global economic trends
      - political events
      - corporate earnings and performance,
      - investor sentiment and speculation.
  - Further Research
    - how investor sentiment and behavior were affected by the pandemic and how these changes led to increased volatility
    - different sectors and industries
    - how government policies may have influenced stock returns and volatility.

Disclaimer: Study design Yiming Zhang

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