Assignment 10 – Prediction Markets and Asset Markets

Overview (Weight: 7.5 %)

The goal of this assignment is to understand prediction markets, a relatively new development in financial markets, and their relationship with prices in the underlying asset markets. The assignment includes some descriptive statistics and visualizations of the markets that help understand the markets. You will also benchmark the performance of some predictive ML and DL models as before. The assignment is relatively short taking into account the short deadline.

Deadline: Wednesday, Nov 26

Deliverables

Your submission should include:

1. A **Jupyter notebook** (`.ipynb`) containing your code, clearly commented and organised.
2. An **HTML or PDF** output generated from the notebook showing the results.
3. A **five-page or less PDF** summarising your analyses and findings.

You **do not** need to submit the raw data files;

Data

There are two major prediction markets that are relevant for U.S. markets, even if U.S. investors may not be able invest in all these contracts.

Some sources for prediction markets are Kalshi and Polymarkets.

From either Kalshi or Polymarkets, pick some *markets* of interest related to finance. Don't pick politics, even though they may be related, or sports.

Analysis: Descriptive Statistics

1. Pick some markets from Kalshi
    - Crypto
    - Economics
    - Financials
    - Companies
    - see https://docs.kalshi.com/getting_started/quick_start_market_data
2. Pick some markets from Polymarkets
    - Crypto
    - Finance
    - Earnings
    - Economy
3. On each of the markets that you identify, pick some contracts based on data availability, maybe based on
    - volume
    - liquidity
    - volatility
4. For these contracts, plot the time-series of the prices for these contracts, and when available, the implied probabilities fro these

Analysis: Time-series and ML models (see previous assignments)

5. Analyze the (standard, not ML) time-series data for these contract prices? What components would you consider to understand these data?
6. Pick some ML and DL models from the previous assignments and analye the price and volume data
7. Corelate the prices with the volume. What are your observations?
8. Correlate the time-series of the prices (and volumes) of the contracts with the prices in the underlying markets. Do you see any lead-lag relationships between the prediction markets and underlying asset or finacial market prices?

9. Following on previous task, how about the relationship with event probabilities? For example, the probability of a FOMC decision in the next meeting. One example is contracts around the December FOMC decision. How does it correlate with the implied probabilities from other financial contracts?

    - https://kalshi.com/markets/kxfeddecision/fed-meeting/kxfeddecision-25dec
    - https://www.cmegroup.com/markets/interest-rates/cme-fedwatch-tool.html

Findings

10. Summarise your findings in a few bullet points. Address questions such as: Which contracts have the strongest relationship on underlying asset returns?