Linear Regression, Loss Functions, and Futures Hedging

Finance 5330: Project 1

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Introduciton

This exercise calls for the preparation of a case study of a hedging problem. The various parts of the exercise below will ask you to pose a simple, perhaps imaginary, hedging scenario, to collect appropriate data, to analyze the data statistically, and to recommend a hedge.

- **(a)** *Description of Scenario:* In 100 words or less, describe the scenario: "Who is hedging how much of what at what data, and why?" Suggest the futures contract or contracts that you will consider, and why. Your analysis should cover a hedge for a specific time period (like over the next 30 days) as well as a stack-and-roll scenario (like rebalancing the hedge monthly for the next 5 years).
- **(b)** *Data Collection:* Collect your data for the hedging problem. Supply, with your assignment, at least 26 observations on each of the prices or other quantities of interest. Attached, are some example data for heating oil spot and futures obtained from the US Energy Information Administration (EIA). See here: https://www.eia.gov/petroleum/data.php#prices. You may use Bloomberg or any other source of data. (If you are having trouble with this, plese contact me and I will assist you.)
- **(c)** *Data Analysis:* Using statistical methods, analyze the data for a reasonable estimate of the risk-minimizing futures position(s). You may wish to analyze both price increments and log-price increments, suggesting which one of these approaches may lead to a better hedging estimate (if either), and why you think so.
- **(d)** *Hedge Recommendation:* Based on your analysis, and on any other reasoning that you may wish to supply, recommend a hedge. State precisely the timing and quantities involved in your hedging strategy, as though they are instructions to the broker.

The deliverable for your project is either a GitHub repository or a zip file containing the various resources for your project (data files, code files, Jupyter notebooks, narratives, etc).