

1. Problem: What is the exact business problem? What is the use scenario? What precisely is the data mining problem? Is it supervised or unsupervised?

The Secured Overnight Financing Rate (SOFR) was first released in 2018 by BNY, NY and aims to globally replace the use of IBORs in the financial industry. It is a broad measure of the cost of borrowing cash overnight collateralized by the U.S. Treasury securities in the repurchase agreement (repo) market. This rate is robust, is not at risk of cessation (ending), and it meets international standards. By using this data, we reflect more on how the financial institutions can fund themselves, and can measure the spike, and help the institutions to take precautionary measures by predicting the SOFR values. This will help firms to consider the properties of the SOFR rate into pricing or simulating the path of the products referencing SOFR rate, especially in the transition since the term-structure is not yet available and the jumps in the overnight structure might have significant implications on the price.

2. Solution: what is the solution proposed? (high level description), which forecasting algorithms do you think are appropriate for this problem domain and why?

To forecast the values of SOFR for the coming 6 months, we plan to build a time series model by comparing general GARCH processes according to a poisson distribution with student/skewed student t-distributed innovations. Due to extremely high volatility in the current market and the expected jumps, using the concept of SOFR better predicts the movement of the market than the usual LIBOR.

3. Programming language.

Python

4. Performance evaluation: How would one test the performance of the algorithm to be used?

To test the performance of the model, we plan to use the following Information criterion:

- a. AIC
- b. BIC
- c. Adjusted R Square.

**5. Data: What is the data to be used? What might be the target variable?
What features would be useful?**

The SOFR data is retrieved from the Federal Bank of New York. Federal Bank publishes SOFR rate every morning 8 AM (est) based on transactions of yesterday with the volume and transaction in USD. Our target variable is SOFR rate and feature is the volume of transactions in USD.

6. Impact: How exactly would it add business value?

There are many financial products which are dependent on SOFR rate. This time series analysis of SOFR rate will help to determine the prime interest rate and understand the behaviour of market's yesterday specially its volatility compared to LIBOR. The main effect of SOFR rate is Banks in the United States also have a history of offering loans based on the Prime Rate, which is essentially an overnight rate, and there have been floating rate notes issued based on the fed funds rate or, more recently, SOFR.

7. Names of all team members on the proposal

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