PROJECT OVERVIEW

Introduction
The explosion of algorithmic trading has been one of the most prominent recent trends in the financial industry. Actually, trading volume estimation is necessary for high-frequency and algorithmic trading strategies. This is a research-oriented project dedicated to the study of the trading volume for intraday financial markets. We are going to explore the optimal models for estimating the trading volume and predict future trading volume. Furthermore, we would like to compare the recently developed strategies. Additionally, we will use trading volume data from online trading platforms such as the Volume Weighted Average Price (VWAP) will be investigated. Especially focus on the distribution of volume during the trading hours, volume per trade, and time intervals between every trade. Volume traded in stocks in the S&P 500 index will be targeted.

Aims and Objectives
The aims of the project are:
1) Technical report of the model chosen.
2) Simulation report with numerical evaluation of the methods.
3) Proposal for improvement or construct software applying tree-estimation model if they have well performance.

The objectives of the project are:
1) Compare and ranking the current methods.
2) Evaluate and compare the improve methods with VWAP or any widely extended strategies.

METHODOLOGY

Knowledge Needed to Execute the Project
1. Capital Asset Pricing Model (CAPM)
2. Autoregressive Moving Average Model (ARMA)
3. Seasonal Autoregressive Forecasting Model (SARMA)
4. Component Multiplication Error Model (CMEM)
5. Seasonal Autoregressive Multiplication Error Model (SARMEM)
6. Different Autoregressive Conditional Heteroskedasticity (ARCH)
7. Generalized ARCH (GARCH)
8. Periodicity (GARCH)
9. Volume Weighted Average Price (VWAP)

1. Research Phase
- Grasp the current literature and learn the fundamental knowledge of the trading volume estimation model.
- Analyze and research various studies and compare with the proposed model.
- Identify potential improvements and create a validation dataset.

2. Implementation Phase
- Implement the algorithm into analysis tools.
- Test and validate the model.

3. Evaluation Phase
- Evaluate the performance of the selected methods.
- Compare with the existing methods.

4. Development Phase
- Develop the model for real-world applications.

5. Evaluation and Finalization Phase
- Summarize the overall result of the selected methods and proposed improvement.

RESULTS

- Bloomberg
- Reuters
- MATLAB
- Matlab

- [Graphs and charts showing trading volume analysis]