7-1 Meeting Outline

June 30, 2019

1 Data Source

The data we used in this simulation is a time-series data of monthly retail sales from 01/01/1992 to 05/01/2016.

2 Bayesian Agent

Our data are divided into two parts. The first part is prior data, which are fed into agents to form their prior beliefs. The prior is formed by n and . n is the number of prior data fed into the agent. is the mean value of the prior data agent has. And once agent enters the market, he would update his signal based on both prior data and m data before he enters. The update rule is:

$$= \frac{n * + m * \hat{mu}}{n + m}$$

is the agent's private signal. When deciding the amount of shares he should sell or purchase, the agent would also take current price in to account. His belief is formed by

$$\frac{n + \hat{\mu}}{n + 1}$$

,where n is the number of trades posted by the market maker, is the current price, $\hat{\mu}$ is agent's private signal.

The agent can calculate δ based on the cost function and his belief by

$$\Delta C(\theta + \delta) = \frac{n + \hat{\mu}}{n + 1}$$