Discussion for News Trading and Speed

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Summary

- Benchmark model
  - Informed trader has more accurate information than the market maker
- Extension
  - Fast model: informed trader also trades on public information faster than other traders
- New Implications
  - Informed trading
    - Larger share of total trading volume
    - Order flow more volatile
    - Forecast short run price change
  - Market quality
    - Speed advantage lowers liquidity
    - Speed advantage does not change volatility and price discovery

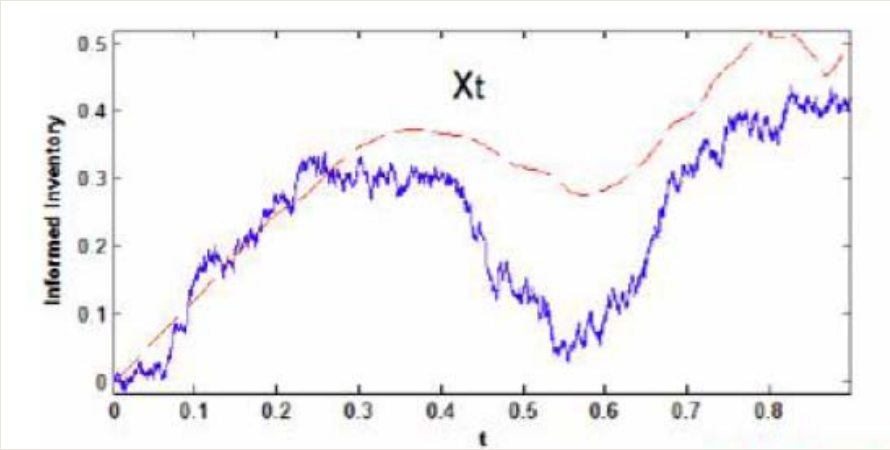
Interesting Trade-off in the Paper

- Price discovery is the same in the benchmark and the fast model
  - Speed advantage increases the correlation between price change and innovations in fundamental *Cov* (dp_t, dv_t)
  - Speed advantage decreases the correlation between price change and pricing error *Cov* $(dp_t, v_t - p_t)$
  - These two effects offset each other and information efficiency is unaffected
- Volatility is also same
  - Volatility due to trades increases
  - Volatility due to quotes decreases
  - They exactly offset each other
- Empirical evidence: Gai, Yao and Ye (2012) find that an increase in trading speed does not affect volatility and price discovery

Liquidity

- This paper: liquidity decreases when informed trader has speed advantage
- Assumption in the model: fast trader can only demand liquidity
- Result may be different if fast trader can also supply liquidity
  - Many high frequency traders are liquidity providers, and speed advantage enables them to quickly cancel orders

Limitation: Level of Inventory of the HFT



- Definition of HFT in Wikipedia
  - *Trading in and out of positions thousands of tens of thousands of times a day. At the end of a day of HFT there is no open position in the market.*
- Prediction of the Model
  - Inventory position does not change direction

Continuous Time v.s. Discrete Time Model?

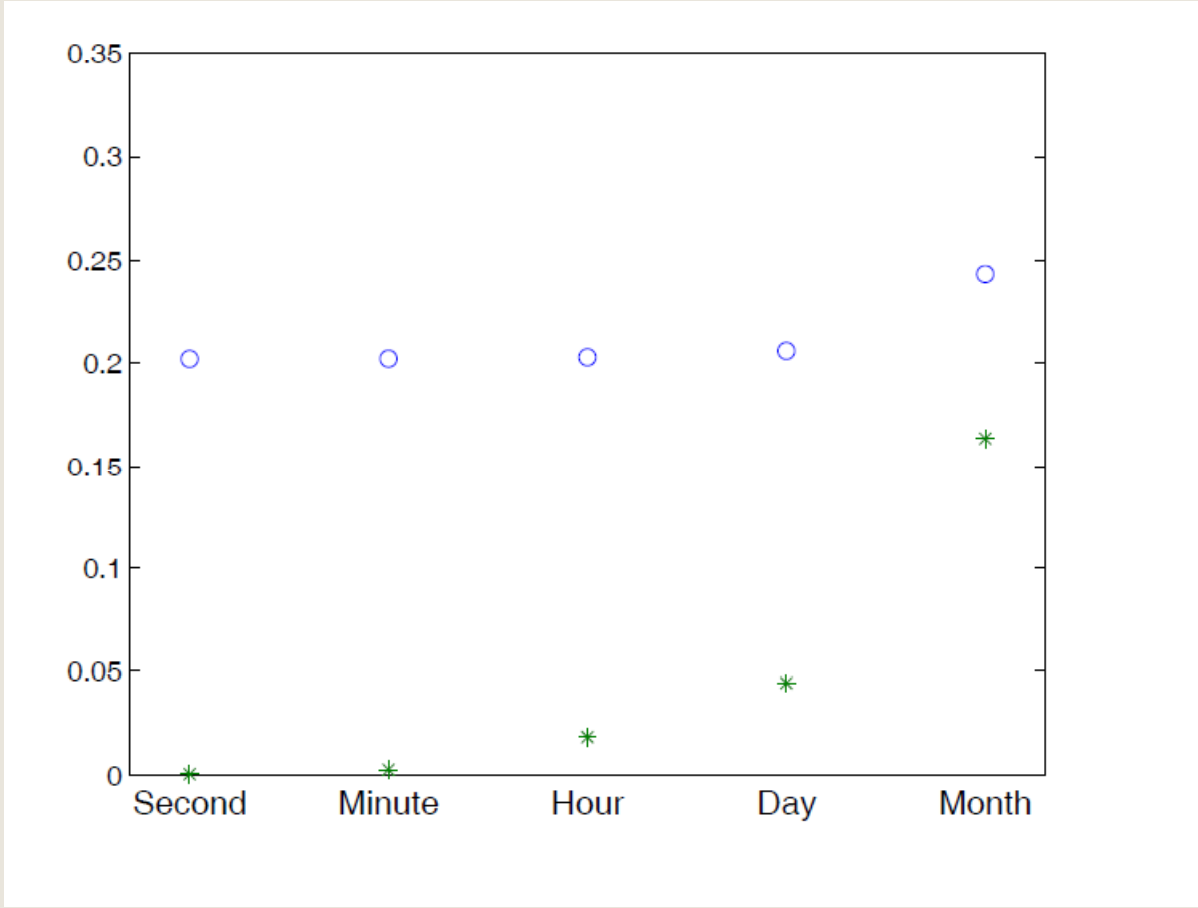
- Continuous time in the main text and discrete time in the appendix
- However, several major proofs and empirical implications in the main text are based on discrete time model
- Example 1: informed trader's strategy
  - $dx_t=\beta^k{}_t\,(v_t-q_t)dt+\gamma^k{}_t dv_t$
  - *"More generally, one may look for linear equilibria in which*

$$dx_t=\int_o^t \beta_j^k dv_j+\alpha_t$$

However, we show in In Appendix B that the optimal trading strategy for the informed investor in the discrete time version of our model is necessarily as in equation (10) when the market-maker's pricing rule is linear. It is therefore natural to restrict our attention to this type of strategy in the continuous time version of the model."

Example 2: Figure 3

Informed Participation Rate at Various Trading Frequencies



The Role of T in Discrete Time Model

- Divide time [0,1] into T intervals
- Comparative Statics with respect to T
  - Hold the level of variance and noise trading fixed
- One feature of high frequency trading captured by the literature
  - High frequency trader trades before other traders
- Another dimension of high frequency trading
  - Ability to trade more times in a fixed calendar time
  - Human may be able to trade once a second
  - High frequency traders can trade 1 million times a second and becomes faster and faster
  - An increase in T capture this feature
  - An increase in T means that high frequency traders becomes faster

Profit Difference between Benchmark and Fast Model

- Compare the differences in profit between the benchmark and fast model
- Measures the incentive to invest in speed
  - Informed trader will invest as long as the investment is smaller than the differences in profit between benchmark and fast model
- The profit difference also depends on number of periods T in discrete time model

Nice Paper!

- I encourage you to read it