

# Information Flow Between Spot and Futures Market - The Role of Algorithmic Traders

Manish K. Singh

Assistant Professor  
Department of Management Studies (Economics)  
Indian Insititute of Technology Delhi

February 8, 2020

# Summary

- To establish the direction of information flow between future and spot market:
  - single stocks (160), intra-day data (1 min and 5 min interval), order imbalance instead of prices
- Key findings:
  - temporal relationship between single stock future and spot market (futures market lead by a minute);
  - information flow is primarily established through non-algorithmic traders;
  - high-frequency algorithmic traders are not informed;

# Suggestion: Methodology

Basic idea: To establish lead-lag relationship

- 1 Why order imbalances instead of returns? Some argument/theoretical underpinning will be nice.
  - I would suggest that if you have the data, do the analysis using returns and robustness checks using order imbalance.
  - If you still decide to use the proxy variable, then a subsection must be added to justify/establish its relevance.
- 2 Deviation from time-series analysis must be discussed in greater detail;
- 3 *"In an ideal frictionless environment, price movements across markets should be contemporaneously correlated and not cross-correlated. A situation where one market assimilates information faster compared to the other gives rise to a lead-lag relationship between price movements."*
  - Cross-correlation is the first step for establishing lead-lag relationship;
  - I would suggest the author to explain/justify the use of panel data techniques used in the analysis.

# My concerns: Methodology

Basic idea: To establish lead-lag relationship

- ① Current specification:  $R_{it} - R_{mt} = a + \sum_{k=0}^5 b_k CM\_OIB_{i,t-k} + \delta_i + e_{it}$

$$R_{it} - R_{mt} = a + \sum_{k=0}^5 b_k CM\_OIB_{i,t-k} + \sum_{k=0}^5 c_k FUT\_OIB_{i,t-k} + \delta_i + e_{it}$$

- ② My suggestion will be:  $R_{it} = a + \sum_{k=0}^n b_k CM\_OIB_{i,t-k} + \delta_i + e_{it}$

$$R_{it} = a + \sum_{k=0}^n c_k FUT\_OIB_{i,t-k} + \delta_i + e_{it}$$

- ③ For intra-day returns (1 min, 5 min), my guess is that  $R_{mt}$  will not matter.
- ④ Autocorrelation and multicollinearity is a serious concern here. Why not consider OIB in difference?
- ⑤ Why only 5 lags are considered? Lags can be estimated endogenously.
- ⑥ The 1 min and 5 min interval are all exogenous. Can this be estimated endogenously? Can we find a time-varying estimate for this lead-lag relationship?

# Suggestions

## Why futures lead the cash market?

- 1 Market restrictions: Short-sale constraints in the cash market
  - Futures prices are symmetric in reflecting private good news and bad news.
  - The lead-lag relation would not be the same under bearish and bullish markets, and futures prices should lead the cash index to a greater degree under bad news
  - My suggestion: This must be tested.
- 2 Transaction cost perspective: Futures market is less costly for traders to utilize than the cash market;
  - So when it becomes more/less costly for traders to exploit the information in the cash market, the lead-lag relation must change;
  - If the time period of study contains any such action, incorporating that will add value to the paper.

# Algo vs non-algo: Information content or transmission lag

- Econometric specification:

$$CM\_OIB_{it} = r_{ft} + \sum_{k=1}^n CM\_OIB_{i,t-k} + \delta_i + \epsilon_{it}$$

$$\Delta CM\_OIB_{it} = r_{ft} + \delta_i + \epsilon_{it}$$

## Some additional remarks

- Liquidity concerns: High non-trading probability is of concern. Some statistics on this must be reported;
- Since it takes some time to start trading, may be some robustness checks while excluding first 30 minutes will give more authenticity to your results.

# Questions!

**Contact us:** [mks@iitd.ac.in](mailto:mks@iitd.ac.in)/+91-8657437993