SOE 5: Financial Markets and Risk Management II

Time: Monday 15:00–16:00 Location: H17

SOE 5.1 Mon 15:00 H17

How spread changes affect the order book: Comparing the price responses of order deletions and placements to trades — •Stephan Grimm and Thomas Guhr — Faculty of Physics, University of Duisburg-Essen, Lotharstr. 1, 47048 Duisburg, Germany

We observe the effects of the three different events that cause spread changes in the order book, namely trades, deletions and placement of limit orders. By looking at the frequencies of the relative amounts of price changing events, we discover that deletions of orders open the bid-ask spread of a stock more often than trades do. We see that once the amount of spread changes due to deletions exceeds the amount of the ones due to trades, other observables in the order book change as well. We then look at how these spread changing events affect the prices of stocks, by means of the price response. We not only see that the self-response of stocks is positive for both spread changing trades and deletions and negative for order placements, but also cross-response to other stocks and therefore the market as a whole. This leads to the conclusion that spread changing deletions and order placements have a similar effect on the order book and stock prices over time as trades.

SOE 5.2 Mon 15:30 H17

Order book model with herd behavior and long-range memory — •Aleksejus Kononovicius and Julius Ruseckas — Institute of Theoretical Physics and Astronomy, Vilnius University, Lithuania

Earlier we have proposed a financial ABM, which is capable of reproducing the stylized facts of absolute return [1] as well as the exact PDF and PSD of absolute return [2]. Price in our approach, similarly to other contemporary approaches, was included indirectly by using Walrasian scenario. Yet we can introduce the price directly by considering how the same agents would behave in an order book scenario. To introduce order book dynamics into our model we have took heavy inspiration from an empirically motivated order book model proposed by Kanazawa et al. [3]. The description of the full model is available on arXiv [4].

[1] A. Kononovicius, V. Gontis, Physica A 391: 1309-1314 (2012). doi: 10.1016/j.physa.2011.08.061. arXiv: 1106.2685 [q-fin.ST].

[2] V. Gontis, A. Kononovicius, PLoS ONE 9 (7): e102201 (2014). doi: 10.1371/journal.pone.0102201. arXiv: 1403.1574 [q-fin.ST].

[3] K. Kanazawa et al., PRL 120: 138301 (2018). doi: 10.1103/PhysRevLett.120.138301. arXiv:1703.06739 [q-fin.TR].

[4] A. Kononovicius, J. Ruseckas, under review. arXiv: 1809.02772 [q-fin.ST].