Trading share competition between artificial stock markets with different tick sizes

Shota NAGUMO[*1], Takashi SHIMADA[1], Naoki YOSHIOKA[2], Nobuyasu ITO[1,2]

[1] Department of Applied Physics, Graduate School of Engineering, The University of Tokyo, 7-3-1 Hongo, Bunkyo-ku, Tokyo 113-8656 Japan
[2] RIKEN Advanced Institute for Computational Science, Minatojima Minamicho 7-1-26, Chuo-ku, Kobe, Hyogo 650-0047 Japan

E-mail: [*]shs-nag@serow.t.u-tokyo.ac.jp

The appearance of Proprietary Trading Systems, which are opened by online stock trading companies, has made the competition among stock markets for their trading volumes more active. Because such newer markets tend to have more attractive trading system such as shorter transaction time and smaller tick size (the unit of order price). For example, it is expected that smaller tick size allows the traders buy and sell at better price and hence leads to the increase in market share. In Japan, PTS actually became to have about 10% of share in total trading of Nikkei average adoption stocks by the end of 2013,. And then Tokyo Stock Exchange reduced its tick sizes of 100 stock brands in the first section in January and July, 2014. After this reduction of tick sizes, Tokyo Stock Exchange recovered its market share.

Such effect of tick size difference is studied by a simulation of two artificial markets[1]. In their simulation, it is found that a market with larger tick size is usually deprived of its initial major share by the competitive market. However, it is found in a certain range of tick size pairs that even a market with larger tick size can keep its major share.

To obtain a clear mathematical understanding of the mechanism of these results, we introduce a simpler model of two markets with non-strategic traders. In this model we can analytically calculate the steady states. It is shown that a market with larger tick size is generally deprived of its share by the competing market. However, if traders ' preference on the present market shares is strong enough, the market with larger tick size has a chance to keep major share in the steady state. These findings are consistent with the previous results obtained from a more complicated artificial market model, and also provide clear understanding of the basic mechanism of market competition[2].

References

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