Department of Management and Information Sciences	Key words	Economic Statistics, Financial Econometrics, Market Microstructure

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Main research themes and their characteristics

## 「An Innovative Evaluation Method for Price Discovery Functions of Stock Markets」

In the stock market, informed traders can profit by trading based on the new information and the stock price approaches its efficient price. This function is called the price discovery function of the market. Needless to say, the stock market contributes greatly to economic development when new information is correctly incorporated into stock prices and the market has high liquidity. Recently, system updates have made orders extremely fast, and the orders generated by active price discovery provide extremely rich information. Among these order information, price series data are important and closely related to the price adjustment process. By applying the data to an econometric model called a 'partial adjustment model', we can measure the speed of price adjustment within the model. In this topic, we apply Bayesian statistical methods to the model and make the adjustment coefficients time-varying so that the adjustment speed can be expressed flexibly. Future work includes an empirical analysis using this method.
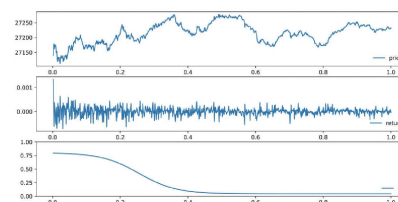
Price series (top), return series (middle), and adjustment coefficients (bottom) of the Nikkei Stock Average in morning session on January 5, 2021. All are in 10-second time series.

「Empirical analysis of the microstructure of the stock market」

Since stock price fluctuations and the price discovery function of the market are strongly influenced by the market microstructure, it is very important to quantitatively evaluate the effects of these factors. In particular, the Japanese stock market is a attractive subject for analysis due to the concentration of orders on the Tokyo Stock Exchange (TSE) with the pure limit order market and the lunch break, all of which are interesting from an international academic perspective. The optimal strategy for market participants is known to be affected by various factors such as a tick size and the performance of the trading system, which also affects the price discovery function of the market. Among these issues, the impact of index futures markets on the cash market is one of the most important topics. Index futures are settled at the opening price of the underlying asset on the settlement day (also called expiration day), so there is a rush of orders around the opening period (they are intended to close the underlying arbitrage position). Previous studies have pointed out the influence of the futures market on the cash market, and have confirmed an increase in trading volume and price volatility. In this topic, we apply the price series around the clearing futures to our method and propose a new approach to evaluate the impact of the expiration effect.
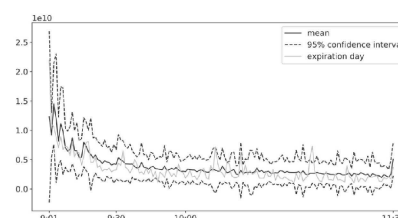
Comparison of trading volume of the Nikkei Stock Average components between expiration days and regular days (minute-by-minute)

Major academic publications

K. Hatakenaka (2019), "The relationship between tick size reduction and price discovery in the limit order market", Contemporary Finance, Vol. 41, pp. 57--69. (in Japanese)

K. Hatakenaka (2021), "Price adjustment speed around opening period", Working Paper Series J, No. J-2, Institute of Economics and Management, Shiga University, March 2021. (in Japanese)

K. Hatakenaka and K. Oya(2021) "Bayesian inference for time varying partial adjustment model with application to intraday price discovery", Discussion Papers In Economics And Business, No. 21–19.