

Katarzyna Bień-Barkowska

Modeling Financial Durations in the Dealing 3000 Spot Matching System

In this paper we discuss statistic properties of the inter-order durations, i.e. time spells between different types of orders submitted to the Dealing 3000 Spot Matching System, an automated brokerage system for interbank FX trading. We focus on the market microstructure of the EUR/PLN market.

Currency dealers who want to execute transaction can submit either a market (sell or buy) order which is immediately executed at the prevailing bid/ask quotes or can post a limit (sell or buy) order that waits for an execution at a more favorable price. The decision to post a limit order is always associated with a trade-off between the potential gain from obtaining a better price and the potential risk that the limit order may either never be executed or become mispriced when new information arrives. The process of order submissions in our modeling approach is reflected as an ordered point process. In the high-frequency finance literature, the irregular occurrence of different event types (orders, trades, price changes) in financial markets was often developed using the framework of dynamic intensity-based representations of point processes. However, in our analysis we rely on the duration-based representation of the order submission process. This alternative approach can be advocated for a very intuitive way of depicting irregularly spaced data in discrete time.

In our modeling setup we evidence the significant intraday seasonality (i.e. diurnality) pattern of different classes of inter-order durations, which we model with the nonparametric kernel regression or with the application of the Fast Fourier transform. We also evidence very strong autocorrelation and persistence of the duration processes, even after eliminating the seasonal effects. These dynamic properties of inter-order durations has been depicted with an application of the Autoregressive Conditional Duration models. Our empirical study provides new insights about trading rules and strategies of currency dealers.