

Microstructure and execution strategies in the global FX market

Anatoly B. Schmidt

Business Development & Research, ICAP Electronic Broking

Parsippany NJ USA

Alec.Schmidt@us.icap.com

EBS (which is an ICAP company) is the leading inter-bank spot electronic FX brokerage with the average daily volume exceeding 200bn USD in 2008. In the introduction, we describe the specifics of the EBS market that are important for simulation and back-testing of trading strategies. In particular, EBS is a pure limit-order market with credit filtering. It has a distributed architecture with interconnected matching order processes in London, New York, and Tokyo. In a limit-order market, execution strategies may differ from that of in a market that permits market orders. In short, a trader assuming a long position can submit a *maker order* at a price equal to (or lower than) the current best bid. Another option is to submit a *taker order* at a price equal to (or higher than) the current best offer price. In order to illustrate possible implications, we discuss two problems.

First, we describe our simulations of maker loss in the EBS market. We assume that if price moves in the adverse direction before the maker order is executed, the order is canceled and resubmitted at a new best price. Our goal is to check if such a strategy may lead to a loss exceeding the taker loss (i.e. the bid/offer spread). We describe three simulation models that differ in the level of explicit usage of the EBS market data. In the first model, price dynamics are simulated with a random trinomial tree function while the initial order book size and its depletion rate are simulated using probability distributions drawn from the EBS market data. In the second model, real EUR/USD rates rather than simulated prices are used. In the third model, both prices and initial order book size are taken from the EBS market data records; only the order book depletion rate (which is not an observable variable) is simulated. All three models yield similar values of the expected maker loss well below one pip. This result points at an advantage of the maker trading strategy over the taker one.

Second, we discuss the problem of optimal slicing of large orders for minimizing execution costs. We start with analysis of the expected execution times for the EUR/USD orders in the EBS spot market. We provide estimates of the execution time for different order sizes and for varying distances between the order price and the market best price. We then introduce a loss function that comprises of two terms. The first one is the market volatility term similar to the one used in a value-at-risk based risk theory. The second term is the order's P/L in respect to the maker order price. This loss function can be optimized for given risk aversion.. Finally, we expand this approach to a strategy in which a large order is sliced into small pieces and every new piece is submitted after the former one is executed.

Keywords

Foreign exchange, market microstructure, execution strategies, simulation