Title:
Statistical analysis of bid-ask models for liquid markets

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Abstract:
The understanding of price formation is at the heart of many practical applications, such as optimal execution, HFT, monitoring of liquidity risk etc. The market micro-structure model presented in this poster was first proposed by Stoikov, Avellaneda and Reed (2010) and further extended by Cont and Larrard (2013). Its main assumption (single tick for bid-ask spread) is reasonable for liquid markets such as stocks from Dow Jones Index. One of the advantages of the model is it's mathematical tractability. In particular, the model gives a formula to predict price variance in terms of order book statistics. We describe a statistical test for the formula, and prove that for liquid stocks such as Citigroup the p-value of the statistic is 0.283 x 10^-3, a clear evidence that the model is correct. We plan to extend the test to illiquid assets, to understand if, by weakening the assumptions, the variance formula still holds.