Order flow and price formation: An empirical behavioral approach

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Data from electronic markets offer the ability to study the submission of trading orders and their effect on prices. Our approach begins with a zero-intelligence statistical model, and refines it with a more sophisticated behavioral model. We demonstrate the existence of several empirical regularities in order placement and cancellation, and show that these explain many of the statistical properties of price formation. The model correctly predicts the magnitude and functional form of the distribution of returns and the bid-ask spread. This yields equations of state for relating prices and order flows, and suggests that it is more useful to view a market as a nonlinear feedback process than as a passive information filter. The results also have applications for regulating volatility and spreads in markets.