

Price formation and its dynamics in online auctions

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This research uses functional data modeling to study the price formation process in online auctions. It conceptualizes the price *evolution* and its first and second derivatives (velocity and acceleration respectively) as the primary objects of interest. Together these three functional objects permit us to talk about the *dynamics* of an auction, and how the influences of different factors vary throughout the auction. For instance, we find that the incremental impact of an additional bidder's arrival on the rate of price increase is smaller towards the end of the auction. Our analysis suggests that "stakes" do matter and that the rate of price increase is faster for more expensive items, especially at the start and the end of an auction. We observe that higher seller ratings (which correlate with experience) positively influence the price dynamics, but the effect is weaker in auctions with longer durations. Interestingly, we find that the price level is negatively related to auction duration when the seller has low rating whereas in auctions with high-rated sellers longer auctions achieve higher price levels throughout the auction, and especially at the start and end. Our methodological contributions include the introduction of functional data analysis as a useful toolkit for exploring the structural characteristics of electronic markets.

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