Algorithmic Pricing and Consumer Sensitivity to Price Volatility

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Abstract

Algorithmic pricing can be broadly defined as a formula to set prices by a computer. It is typically associated with a lower cost of changing prices and a greater frequency of price changes. While commonly observed in ride-sharing, lodging, and airline tickets, there has been recent evidence of its implementation in pharmaceutical drugs, gasoline, and online retail. However, little is known about how consumers respond to encountering frequently changing prices for goods. Here we use detailed clickstream data from an online retailer that varied pricing methods to examine how exposure to the frequently-changing prices feature of algorithmic pricing affects purchase behavior. Aggregate analysis at the product-week level, before-and-after event studies around adoption time, and granular user-level models, all show a consistent pattern — exposure to price volatility increases price sensitivity. This is economically consequential because, even if implementing algorithmic pricing is profitable, it triggers unintended side effects that modify consumer behavior in ways that may undermine those gains. We complement these empirical findings with laboratory experiments and provide evidence for a key underlying mechanism—price salience.

Keywords— algorithmic pricing, price volatility, price sensitivity, salience, experiments

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