How Does Dynamic Pricing Affect Customer Behavior on Retailing Platforms? Evidence from a Large Randomized Experiment on Alibaba

by

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Date : 9 March 2018 (Friday)
Time : 11:00 am - 12:15 pm
Venue : Room 3001, LSK Business Building

Abstract: Dynamic pricing has been widely employed by online retailers. We study how a dynamic pricing policy-offering customers promotions for products in their shopping cart-affects customer behavior in the short and long term on a retailing platform. We conducted a randomized field experiment involving more than 100 million customers and 11,000 retailers with Alibaba Group, the world's largest retailing platform. We randomly assigned half of eligible customers to a treatment condition where they might receive promotions for products in their shopping cart; the other half of eligible customers did not receive coupons. In the short term, we find that our promotion program increased the likelihood of customers purchasing a product by 115% and increased sales of a product by 93% during the treatment period.

In the long term, we document unintended consequences of dynamic pricing during the month following our treatment period. On the positive side, our promotion program boosted customer engagement. We causally estimate that using our shopping-cart coupons in the treatment period subsequently increased the daily number of products customers viewed on the platform by 120% in the post-treatment period. On the negative side, we causally demonstrate that our promotion program intensified strategic customer behaviors in two ways. First, using coupons in the treatment period increased the proportion of products that customers added to the shopping cart upon viewing them by 65.43% in the post-treatment period, possibly due to customers' anticipation of promotions targeted at products in the cart. Second, and surprisingly, using coupons subsequently lowered the price customers paid for a product by 3.85% in the post-treatment period, suggesting that prior use of promotions trained customers to search for other promotion mechanisms. All long-term effects spilled over to sellers that did not previously offer promotions to customers. This research documents the causal effects of dynamic pricing on customer engagement and strategic behavior, which have important practical implications for platforms and retailers.

Bio: I am an assistant professor of Operations and Manufacturing Management at the Olin Business School. My research focuses on data-driven operations in digital marketplaces and the public sector. I implement field experiments and use other empirical methods with observational data to improve existing operations models and practices.