

The unintended consequences of tinkering with online prices

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Credit: Olin Business School

When your online retail platform clears billions of transactions a year, what's the harm in testing different prices for the same products on a relative handful of your customers? You might find a way to maximize

revenue by increasing sales volume on your lower-priced products, right? Or, you might lock down sales on a product that your consumers were on the fence about.

That's the theory behind "dynamic pricing," a practice in vogue among online retailers as they attempt to better manage revenue and take advantage of massive amounts of data they're collecting about their customers.

But a new paper by a team of researchers—including two faculty from Olin Business School at Washington University in St. Louis—shows the practice of dynamic pricing can generate [unintended consequences](#) by changing the behavior of customers.

"Retailers didn't realize that offering different [prices](#) to different customers may backfire in the long run," said Dennis Zhang, assistant professor of operations and manufacturing management and one of the paper's authors.

In the paper titled "How Do Price Promotions Affect Customer Behavior on Retailing Platforms? Evidence from a Large Randomized Experiment on Alibaba," accepted for publication forthcoming in *Management Science*, the researchers focused on a promotional tool Chinese [online retailer](#) Alibaba Group uses to target customers who leave products to languish in their shopping carts.

Between March 12 and April 11, 2016, Alibaba conducted an experiment on more than 100 million Alibaba customers who shopped at 11,000 retailers. They targeted a random set of customers who had products untouched in their shopping carts for more than 24 hours with special price promotions. Other customers who met the same criteria received no special price promotions. The researchers collaborated with Alibaba to analyze this experiment.

In the short term, the dynamic pricing program worked like gangbusters. Products flew out of the Alibaba shopping carts as sales doubled on the promoted products. But it didn't take long for customers to get wise to what was happening.

"You're training the customers to be more strategic and, in this paper, we're showing the unintended consequences of dynamic pricing," Zhang said. "People are not just keeping stuff longer in the shopping cart, but they're becoming bargain hunters. They're spending more time looking for deals, even before they put something in their shopping cart."

In fact, the longer-term results of [dynamic pricing](#) and special shopping cart promotions showed three unintended consequences that were a mix of good and bad news for retailers.

- First, and on the upside, retailers started to see more website views for their products and a higher likelihood of driving a purchase during the month.
- Second, customers were indeed becoming more strategic about their [shopping](#). They were adding more products to their carts and hoping for a price [promotion](#), or they were being more choosy about what they bought, with the effect that even the sale of products without promotions were rising after the experiment period.
- And third, the effects of these promotions spill over to a large set of sellers who never offered price promotions in the first place. They find that their customers start acting more strategically, too. In other words, once you've become more strategic, you're not only more strategic with the promotion sellers, you're also more strategic with the no-promotion sellers.

"If I learned that customers are looking for deals, I would probably be motivated to give those kind of deals to attract customers to increase

sales," said Olin's Lingxiu Dong, professor of operations and manufacturing management and co-author of the paper. The online platform, however, would worry that the practice could lead to a downward spiral as retailers undercut themselves to move products, but revenues continue to fall as customers keep bargain hunting.

"We also need to be creative about having customers' time more engaged with the platform," she said. Selling more brand awareness advertisements to capitalize on the bargain hunting web traffic might be an option, for example.

More information: Dennis Zhang et al. How Does Dynamic Pricing Affect Customer Behavior on Retailing Platforms? Evidence from a Large Randomized Experiment on Alibaba, *SSRN Electronic Journal* (2018). [DOI: 10.2139/ssrn.3029707](https://doi.org/10.2139/ssrn.3029707)

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