

Press release

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New research from ESMT Berlin shows why startups may be learning the wrong lessons from customers

Startups and companies launching new products often believe they can quickly “learn from the market” by adjusting prices, advertising, and inventory as customer data comes in. But a new ESMT Berlin study shows that many firms learn the wrong lessons because they fail to coordinate these decisions properly.

The study was co-authored by [Huseyin Gurkan](#) (ESMT), [N. Bora Keskin](#) (Duke University), and [Rodney P. Parker](#) (Indiana University). The paper, “[Dynamic Learning for Joint Pricing, Advertising, and Inventory Management](#),” has been accepted for publication in the peer-reviewed journal *Manufacturing & Service Operations Management*. The researchers developed a dynamic model that simulates how firms make repeated pricing, advertising, and inventory decisions while gradually learning about customer demand over time.

Launching a new product often means making critical business decisions with very limited customer insight. Companies must simultaneously decide how much to charge, how much to spend on advertising, and how much inventory to stock while still learning how customers respond to the product.

The researchers show that these decisions are far more interconnected than many companies assume. Advertising, for example, not only influences short-term sales but also shapes long-term customer awareness. Yet companies cannot directly observe how aware customers are of a product. Instead, they only see partial signals, such as whether customers arrive or make purchases. This creates a major learning dilemma. If firms advertise too little, too few customers engage with the product for companies to learn meaningfully about demand. But if firms advertise too aggressively, customer awareness becomes so widespread that it becomes difficult to measure whether advertising itself is still driving demand.

“Many companies assume they can simply observe customer behavior over time and gradually improve their decisions,” says Huseyin Gurkan, associate professor of management science at ESMT. “In reality, passive learning often leads firms in the wrong direction. To learn efficiently, companies need deliberate experimentation across pricing and advertising decisions. Well-designed experimentation reduces long-term losses and helps firms make substantially better decisions as they grow.”

“Inventory is often treated as a purely operational decision, separate from marketing,” adds Rodney P. Parker, professor of operations and decision technologies at Indiana University’s Kelley School of Business. “But when a customer wants to buy, and there is no stock available, that sale is lost and so is the learning opportunity. Our model shows that getting inventory right during the experimentation phase is just as important as choosing the right price or advertising level. Firms that neglect this coordination consistently underperform, even when their marketing decisions are otherwise sound.”

The study finds that structured experimentation, such as testing different price points or varying advertising spending over time, is not merely a marketing tactic but an essential part of learning about customers effectively. Crucially, these experiments must be coordinated because pricing and advertising decisions influence what firms are able to learn from one another. But companies do not need to experiment indefinitely to improve decision-making. A relatively short but carefully designed testing phase can help firms learn about customer behavior much faster and significantly improve long-term performance. Over time, the disadvantages of operating with limited customer information become substantially smaller.

The findings are particularly relevant for startups, e-commerce firms, and companies operating in uncertain or fast-changing markets, where customer behavior is difficult to predict, and historical data is limited.

About ESMT Berlin

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