The real reason why stores ran out of toilet paper

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It's easy to blame panic-buying for the empty grocery store shelves shoppers have encountered during the COVID-19 pandemic.

But the real reason for shortages of many products may have more to do with a shift in how people consume those products, and also how they're made and sourced, explains Robert Swinney, an associate professor in operations management at Duke University's Fuqua School of Business.

Toilet paper shortages were perhaps the most widely discussed example in 2020.

"In the wake of stay-at-home orders, there was a shift in consumption from a mixture of at-work and at-home consumption of things like toilet paper, to nearly 100 percent at-home," Swinney said in a live discussion on Fuqua's LinkedIn page (see video).

Because the paper products we use at work and home differ, and because people suddenly began working at home en masse, retail stocks of toilet paper for at-home use quickly vanished, he said.

Efficient vs. responsive supply chains

Companies couldn't quickly flood stores with more toilet paper because their processes were never designed to respond surges in demand, he said. Rather, they were designed to be steady, cheap and efficient to make the most of a product with a low profit margin, he said.

Often, efficient supply chains are slow, Swinney said: "They have long lead times because speed is sacrificed for operating at a low cost and high efficiency."

Efficient supply chains work best when demand is predictable and the industry has low prices or low margins, Swinney said. He contrasted them with responsive supply chains, which are more flexible, but more costly.

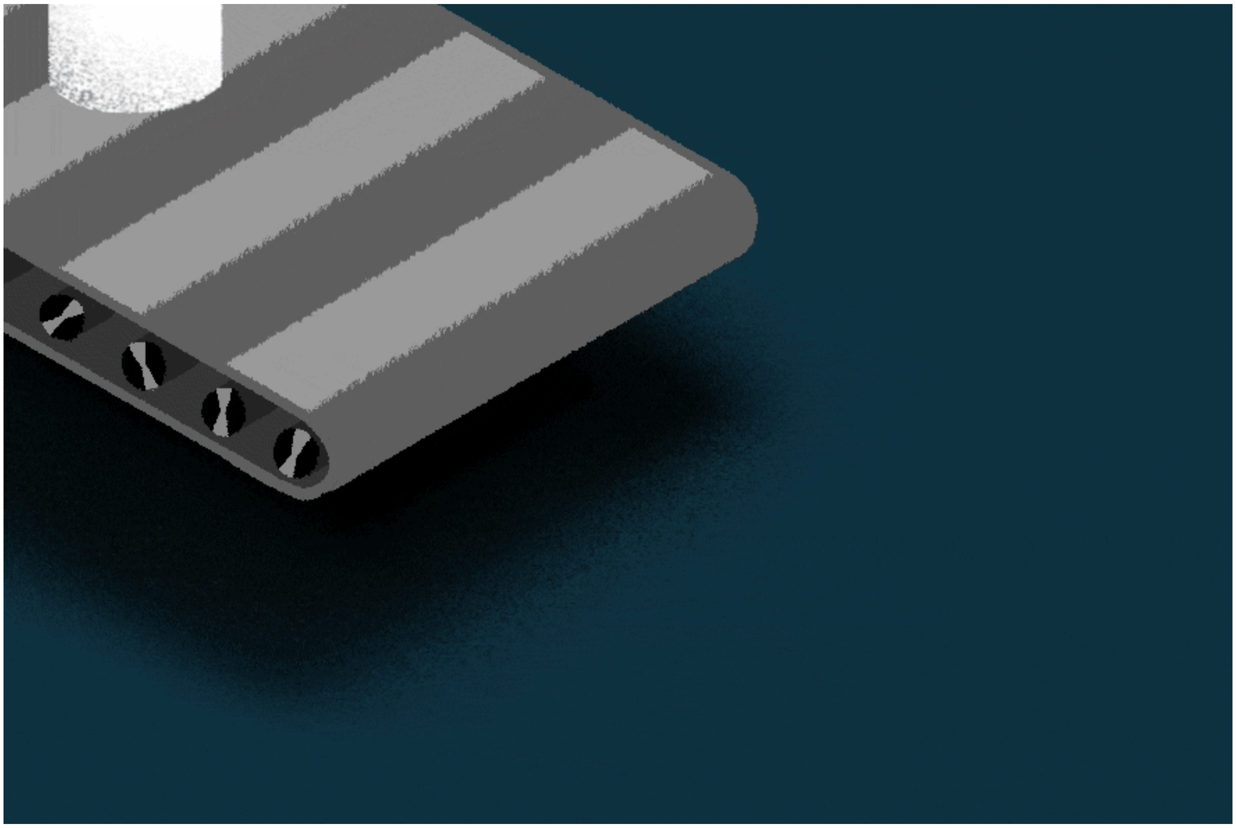
"Responsive supply chains are optimized to handle highly variable or unpredictable demand patterns. So these kinds of supply chains are often fast and are built to handle surges in demand, but the speed comes at a cost," he said.

Responsive supply chains are profitable only when margins are very high, Swinney said, pointing to fast-fashion apparel firm Zara, which has been the subject of some of his research.

The future is likely (still) lean

Some experts would argue the pandemic exposed a major vulnerability in lean production, but that's unlikely to stop companies from using lean practices, Swinney suggested.

"Lean production is often demonized in the wake of disruptive events, but it saves an enormous amount of money by not having unproductive inventory sitting around," and thus has offered significant benefits in manufacturing efficiency in the past 50 years, he said.



Credit: Duke University's Fuqua School of Business

Firms will likely continue to follow lean principles and rely on global supply chains, Swinney said, but will diversify their suppliers to minimize risk or establish back-up resources in the event of a crisis.

During and after a crisis, many firms tend to focus on building and holding extra inventory, which is costly and especially expensive if disruptions are rare, he said.

"If a disruption like a pandemic happens once in 100 years, then 99 percent of the time you're holding this inventory, you're not going to use it. It's just going to be a wasted resource," he said.

Solutions in design, tech

The pandemic may also prompt companies to consider other strategies to protect against disruption, such as redesigning products to use more common components or more easily accessible parts that don't rely on one specific channel or supplier, Swinney said.

"We've already seen this—going back to the very first example of toilet paper—where we're using less of variety of different materials in different products that are being sold in the market, and more common components," he said.

Firms may also expand their investments in artificial intelligence and remote work technologies so their processes rely less on workers having to be physically present to keep production processes running smoothly, he said.

Provided by Duke University's Fuqua School of Business

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