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Supply Chain Management

Inflating Orders Can Worsen Supply Chain Uncertainty

How firms can fight the temptation. **by Tarikere T. Niranjan, Shobhit Mathur, Narendra Kumar Ghosalya, and Nagesh Gavirneni**

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Global supply chains are facing unprecedented inventory shortages due to massive disruptions caused by the Covid-19 pandemic, geopolitical conflicts, trade wars, and extreme weather events. Procurement managers, worried that they may not receive the materials they need, order higher quantities than what their manufacturing or service operations actually need.

But, as our research — consisting of two case studies and a set of controlled laboratory experiments using eye-tracking technology — shows, inflating orders in this manner and the mistrust that it generates only increase systemic inefficiencies in the supply chain.

The possible remedies: Firms can communicate demand forecasts that include the uncertainties. The parties can engage intermediaries such as an industry trade association to help them negotiate contractual terms that will reduce uncertainties and build trust. And managers can utilize neuropsychology tools, now commercially available, to gain deeper understanding of their own subconscious behaviors that adversely influence their decisions.

Understandable Behavior

The practice of inflating orders in volatile or uncertain times is understandable. Firms must decide what level of inventories to maintain even when demand and supply are not known with complete certainty. Purchasing managers are often worried about not having enough inventory, resulting in production stoppages, customer attrition, business loss, and the associated lost profits and market share loss. So, they order more units than what their company's demand forecast warrants in the hope that enough of the orders will be delivered to avert these problems. They also hope that the larger orders will make suppliers treat them as a higher priority.

Although buyers may realize some immediate benefits from inflating orders, it will be short-lived. Large suppliers, in particular, (such as manufacturers of semiconductors and automobile parts or systems) are often well-established, have a wide customer base, are technologically superior, and are more knowledgeable about markets than many buyers. They quickly discern that a customer is inflating its orders and write off a commensurate fraction of customer orders.

The Evidence

We documented these reactions in our case studies of two Indian manufacturers.

One concerned a manufacturer of automotive steering systems that routinely inflated its orders to a particular supplier by 10% to 15%. In response, its supplier, which also caters to lucrative overseas customers, filled only about 90% of the orders. The other case was a metal forging company that operated in a much more stable demand market but still inflated its orders by nearly 5% to garner the attention of its suppliers, which were powerful. Its suppliers shrewdly filled only about 95% of the orders, on average.

We also conducted controlled experiments to reproduce and evaluate the behaviors we discovered in our case studies. In our experiments, human participants made decisions on the quantities of items to purchase. We programmed an automated supplier to execute the manipulation checks, such as fulfilling all of the demand or undersupplying the buyer for exaggerating orders. Using eye-tracking technology, we tracked the gazes of participants, under three different experimental conditions, to observe how they viewed and considered past unfilled orders as buyers. We found that human participants placed exaggerated orders even after the supplier ceased to undersupply them in order to penalize them.

Ideally, both the buyer and supplier should notice and respond to changes in the behavior of the other party. However, humans tend to neglect emerging information. This tendency creates a cycle of mistrust in information exchange between the parties, resulting in a deadlock that undermines supply chain efficiency.

Here are ways that supply chain managers can address the systemic inefficiencies due to inflated ordering and discounting behaviors.

Share Contextual Forecasts

Buyers and suppliers routinely share demand forecasts but usually as single points (i.e., a quantitative number). But sharing such numerical forecasts does not adequately capture the inherent uncertainties.

Instead, both parties should also qualify their forecasts (optimistic, pessimistic, most likely values, scenarios, economic trends, etc.). The supplier can then better rationalize the order quantities when they are significantly larger than the point forecasts. Procter & Gamble and Walmart are well-versed with this practice and have demonstrated the effectiveness of contextual forecast sharing.

Engage an Intermediary

The manufacturer of automotive steering systems recognized the cycle of mistrust in its supply chain and engaged an industry body, the Confederation of Indian Industry, to break it. The confederation formed a consulting team to mediate between the manufacturer and its suppliers.

The consulting team redesigned the incentive system so the manufacturer paid suppliers not solely for quantities delivered but also for timeliness and completeness of deliveries. The manufacturer also rewarded suppliers that excelled on all three performance dimensions and gave it high visibility so other suppliers would notice it and become motivated to improve delivery performance.

These steps broke the information gridlock between the parties, increased trust between the manufacturer and its suppliers, and resulted in a near-perfect flow of order information. Other firms

can similarly engage intermediaries such as trade associations and consulting firms to perform this kind of a role.

Utilize Eye-Tracking Technology

So far, the eye-tracking technology has been used by both academicians and industry professionals in fields such as neuromarketing. We are among the first to use it to investigate supply-chain-management problems albeit in an academic environment.

However, such neuropsychological tools have advanced to the point that they can and should be used by the industry in training and for supply chain performance improvements. Through eye-tracking, purchasing firms can analyze individual purchasers' interactions with supply-chain-management software to identify any cognitive patterns that impair decision-making in procurement processes.

For instance, firms can use eye-tracking to detect and alert purchasing agents to the fact that they are overlooking information such as previous orders that are in transit previous or are putting too much emphasis on inconsequential details such as outdated demand information from the past.

Order inflation has long been a major problem plaguing supply chains. By reducing its severity, the approaches that we have recommended could benefit both purchasers and suppliers.

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