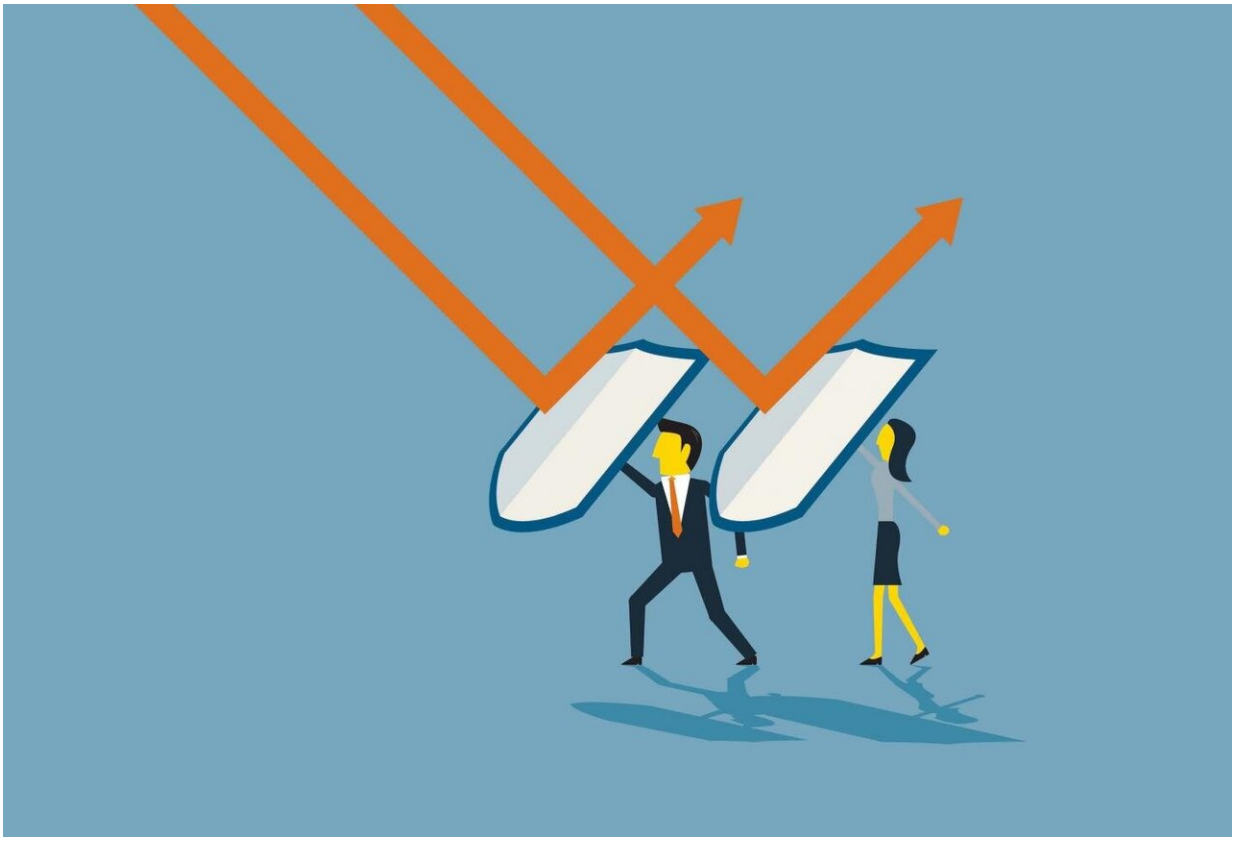
# Strategic redundancy can prevent collapse of supply chains during global crises

June 5 2020



Strategic redundancy can prevent the collapse of supply chains during global crises. Credit: University of Texas at Austin

When the novel coronavirus began spreading during the early months of 2020, it put kinks in multinational production chains—first in China and

then around the globe. But it didn't have to happen that way, according to Francisco Polidoro, associate management professor at the McCombs School of Business at The University of Texas at Austin.

In a forthcoming paper published online in advance by the *Academy of Management Review*, he suggests companies use redundancy as a way to fortify their operations against unforeseeable events such as pandemics.

It's a matter of preparing for the unexpected.

Unlike risk, which covers events that have happened before and could strike again, uncertain events lack any data points to inform decisions. Uncertainty refers to what you do not even know that you don't know.

Polidoro, with co-authors Curba Lampert of Florida International University in Miami and Minyoung Kim of the University of Kansas, introduces a strategy called branching. A company, say the researchers, can build multiple branches into its value chain, the string of steps that lead from research and development through manufacturing and sales. When a crisis strikes one branch, the overall chain can keep running.

"With branching, the idea is to have a kind of redundancy by design. It makes you more resilient. If you wait until your value chain is disrupted, it may be too late," Polidoro said. "You invest in flexibility before you need it."

Apple Inc., for example, which assembles iPhones in China, struggled with both manufacturing and distribution when the pandemic shuttered its factories. The pandemic created ripple effects that negatively affected the design of new products, as communication between design and manufacturing teams was also disrupted.

Other companies are suffering similar versions of Apple's woes. Many

pharmaceutical companies rely on China as the sole source of key ingredients for their drugs. Also, more than 60 medical manufactuers have facilities in China dedicated to essential medical devices. In fact, at least 200 of the Fortune Global 500 had a presence in Wuhan, China.

What appears to be sound strategy can risk a total collapse when uncertain events disrupt locations that companies heavily rely on to obtain efficiency gains. The current concerns with drug shortage risks due to the pandemic remind us that when uncertain events break down global supply chains, the entire economy can suffer.

The researchers said if branching had been put into practice, these companies would have facilities in other countries, thereby preventing financial losses. The researchers also said branching may reduce the value that companies get now, but it may sustain their value for a longer time. There's a trade-off between efficiency and flexibility. It's the difference between a somewhat higher cost for making a phone versus being able to make it at all.

"When you design your operations to optimize economies of scale, you've accounted for standard issues that could go wrong," Polidoro said. "Then a nonstandard event occurs that you have not accounted for, like a pandemic, a trade war or closing national borders. All of a sudden, the decisions that optimized your operations may lead to unprecedented disruptions."

**More information:** Curba Morris Lampert et al. Branching And Anchoring: Complementary Asset Configurations In Conditions Of Knightian Uncertainty, *Academy of Management Review* (2020). DOI: 10.5465/amr.2018.0238