

## Tariffs

# Use AI to Stress Test Your Supply Chain

by Robert Handfield and Walt DeGrange

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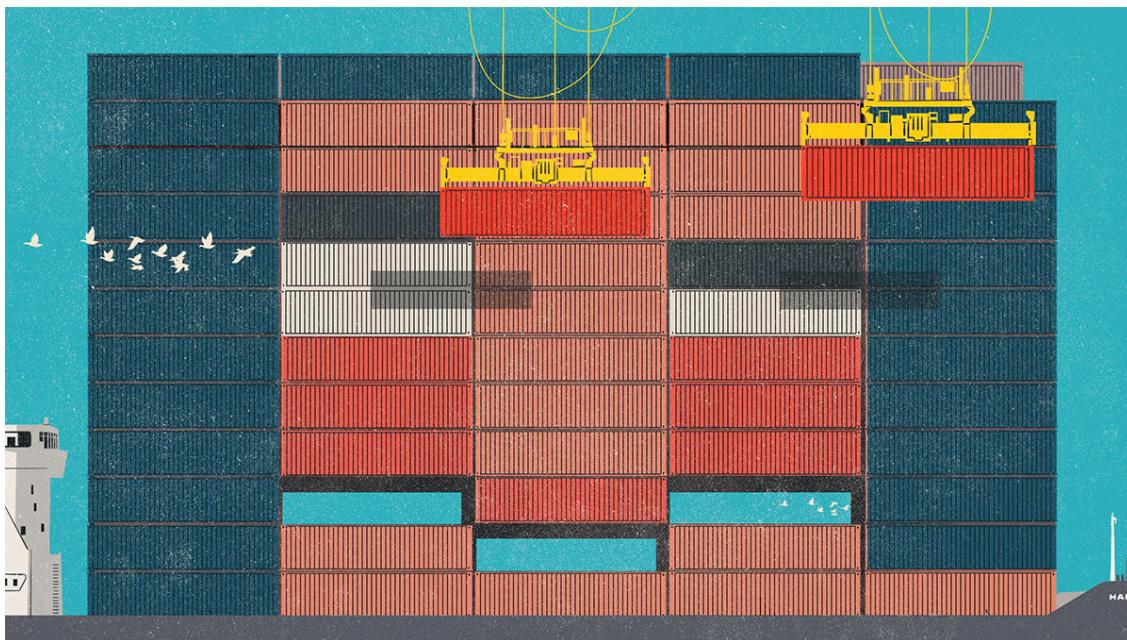


Illustration by Jason Schneider

**Summary.** Firms around the world are struggling to adjust their supply chains and operations to the chaotic trade war unleashed by the Trump administration. Some firms have developed a *dynamic stress-testing system* to assist them. It uses a combination of AI and human experts to spot vulnerabilities in the supply chain, create possible scenarios, and find potential remedies. This approach involves four steps: mapping the supply chain, collecting intelligence, developing scenarios, and creating a mitigation plan. [close](#)

In the current environment of shifting tariff rates and ongoing trade deal negotiations between the United States and other countries, businesses continue to struggle to figure out how to preserve their profit margins in the near term and how to create budget and sourcing plans for next year and beyond. Over the last

six months, we have worked with a number of firms that have developed a planning approach that can help deal with this massive uncertainty. It entails *dynamic stress testing*.

Stress testing a supply chain is important for identifying supply chain vulnerabilities so actions to mitigate them can be taken. However, a static stress test run annually or biannually is insufficient to prepare for the kind of daily volatility that the current trade war has produced in supply chains. There is a remedy: By combining emerging AI technologies with expert-based market intelligence, organizations can develop a capability—dynamic stress testing—that can help companies cope with the rapidly changing environment.

Below, we describe the steps in developing such a system. It is based on our interviews at two U.S.-based companies that have created them: a large manufacturer of automation and aerospace systems, (AAS) and a major exporter of liquified natural gas (LNG). Both requested that their names not be used.

### **Step 1: Map the value chain.**

To begin, identify the parts and materials from your suppliers across tier 1 (direct), 2 (suppliers to tier 1), and 3 (suppliers to tier 2) that go into your products and where their factories, warehouses, and distribution facilities are located. Create a database that links the supplier-provided parts to the bill of materials and revenues associated with those products. This will enable a company to quickly assess how disruptions at any major suppliers' operations will affect revenues. Following the disruptions stemming from the Covid-19 pandemic, both AAS and LNG had invested in mapping their supply chains as part of an

effort to make them more resilient and link them to their general ledger's revenue streams.

In 2018, the first Trump administration announced its tariffs on imports from China. This prompted AAS to move much of its tier 1 supply base to Mexico. As its managers continued to extend the mapping to tier 2 suppliers, though, it became apparent that many of the components from tier 1 suppliers were imported from tier 2 suppliers in China. The supply chain resilience team is currently exploring new sources that will enable it to reduce its exposure to tariffs on goods and materials from tier 2 suppliers in Asia.

LNG identified a tier 1 supplier and its supplier's supplier (tier 2) that were producing in China critical machined parts for major capital investment projects. Further analysis led its managers to understand that many other tier 1 suppliers had tier 2 parts coming from Asian suppliers that were subject to the new tariffs. Further discussions with suppliers in the first two tiers helped to identify sister companies and divisions in non-Asian countries, which led to the next set of capital project investments being sourced in those locations.

## **Step 2: Collect Intelligence.**

Prior to President Trump's announcement of his tariffs plan on April 2, few business leaders understood that would include double- and triple-digit tariffs on dozens of different countries let alone the raft of tariff exceptions and exclusions that have followed. Both companies we talked to believed that tariffs would be coming, but were unsure of their magnitude. The supplier mapping work had already helped identify vulnerabilities, but no specific planning was conducted before April 2.

Once the U.S. government's direction became known, AAS and LNG acted quickly to assess the potential outcomes. They assembled a set of internal and external experts to collect and

summarize intelligence on how the Trump administration's trade negotiations might unfold across different timelines, geographies, industries, and market channels.

### **Step 3. Develop scenarios.**

Both companies conducted brainstorming sessions with separate teams of experts, including legal, purchasing, operations, sales, government policy experts, and trade negotiators on site in Washington. These teams developed several potential scenarios that might evolve over time and assessed the likelihood of them unfolding. Examples included: *What if the UK is exempted from all tariffs? What if tariffs on China double to 200%? What if the USMCA negotiation in 2026 does not pass?*

Next, teams ran the human-generated scenarios through AI impact engines, which generate the projected outcomes for their supply chains and showed how they would affect their product costs. The benefit of AI is that it can rapidly generate potential outcomes once the supply chain map and the codes for products and the revenues associated with those products are fed into it, identify vulnerabilities that are likely to occur, and prioritize which vulnerabilities are most likely to occur and will have the biggest impact on revenue. In some cases, AI engines might also suggest actions to address the most serious of the vulnerabilities identified.

### **Step 4. Create a mitigation plan.**

Following the AI-generated scenario outcome results, teams worked on mitigating the vulnerabilities identified by the potential outcomes generated by the AI systems. Examples of mitigation plans developed by AAS and LNG in the last few weeks include the following:

Given the exposure to China, AAS began exploring other sites in Vietnam, Cambodia, Thailand, and India, where tariffs may be considerably lower. A supplier in India was identified, and a site

engineer was sent to the site to assess facility suitability, logistics infrastructure, and required skills available in the community. (This preceded President Trump's announcement on Aug. 4 that he would "substantially" increase the 25% tariffs on India because it still buys and resells oil from Russia.)

LNG revamped its supply chain so it included foreign trade zones (FTZs), designated areas within the United States where imported and domestic goods are considered outside of U.S. Customs' jurisdiction. Components built overseas can be brought into these zones, substantially altered, and then declared as domestic content. Such activities must also adapt to new 40% tariffs on *transshipments*: shipments into the United States of goods made in China through other countries.

AAS similarly embraced FTZs as a channel to minimize tariff exposure. It prioritized commodities that were exempt from the United States-Mexico-Canada Agreement (USMCA). The sourcing team also explored development of suppliers in regions where transformation of the product occurs, which then makes that country an "originating location."

Given how rapidly the tariff environment is changing, both companies are holding planning discussions almost daily with their legal, marketing, logistics, and planning teams to address immediate developments. But both are also developing longer-term strategies, with the assumption that increased global trade barriers are inevitable for the foreseeable future.

For instance, LNG is using scenarios to understand the impacts of potential developments on the first three tiers of suppliers and how it would affect the company. The team is beginning to map out the possible long-term effects of tariffs on the supply chain, identifying where investments in developing domestic sources of supplies need to begin today. This approach is helping LNG not only manage how to mitigate the impact of the current set of

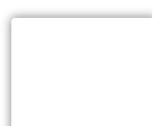
tariffs on capital projects in its 2026 plans but is also aiding it in identifying where certain goods will need to originate from for projects in 2027 and 2028.

Similarly, AAS has begun applying stress-testing scenario planning to understand how it could be affected if suppliers that are now its sole source for particular items are hit by especially high tariffs. This analysis has caused AAS to explore alternate suppliers or hold discussions with the existing suppliers to develop another factory location. Executives are also using stress testing to explore scenarios related to how the Trump administration's domestic immigration and deportation policies could affect the workforces of its suppliers.

Given the shifting global trade environment in 2025, companies can't possibly know what is going to happen day to day. However, dynamic stress testing can enable them to make the best of a chaotic world.

#### More Resources

- [6 Short-Term Strategies for Doing Business in a Trade War](#)
- [The Tariff Wars Just Upended Your Supply Chain. Here's How to Adapt.](#)
- [What the Last Trump Tariffs Did, According to Researchers](#)
- [Research: Why Some Companies Weather Trade Wars Better Than Others](#)
- [Will Tariffs Drive Domestic Innovation?](#)



**Robert Handfield** is the Bank of America Distinguished Professor of Operations and Supply Chain Management at North Carolina State University's Poole College of Management in Raleigh, North Carolina. He is a member of the Center for Advanced Purchasing's executive advisory board.



**Walt DeGrange** is an MBA executive advisor to North Carolina State University's Poole College of Management. He is also the senior director of analytics at CANA Advisors and a faculty member of the operations management graduate program at the University of Arkansas.



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