

Operations Practice

Supply chain risk management is back

The world is getting riskier—and the most advanced supply-chain leaders are getting smarter about risk. Is your supply chain risk-ready?

by Knut Alicke and Anna Strigel



Today's complex and long supply chains are almost inevitably subject to disruption. But the stakes seem to have risen, whether due to intensifying trade disputes and political upheavals (of which Brexit is only one example), or to high-cost natural disasters plaguing more of the world.

As a result, we hear more global companies questioning how to assess and manage these risks and prepare their supply chains accordingly. Which precautionary measures make sense, and how much do they differ by industry? We conducted research by interviewing supply-chain managers across Europe to understand how they assess risks, what they do to prepare, and how they respond to disruptions.

Risks on the rise

Natural disasters are particularly dramatic illustrations of the difficulties facing supply-chain managers. Even in a comparatively benign year,

such as 2019, global losses due to earthquakes, floods, fires and the like reached \$150 billion. But dramatic spikes are happening more often, with nearly \$350 billion in losses recorded in 2017 (marked by Hurricanes Irma in the continental US and Maria in Puerto Rico) and in 2011 (Thai floods and the Fukushima earthquake-tsunami).

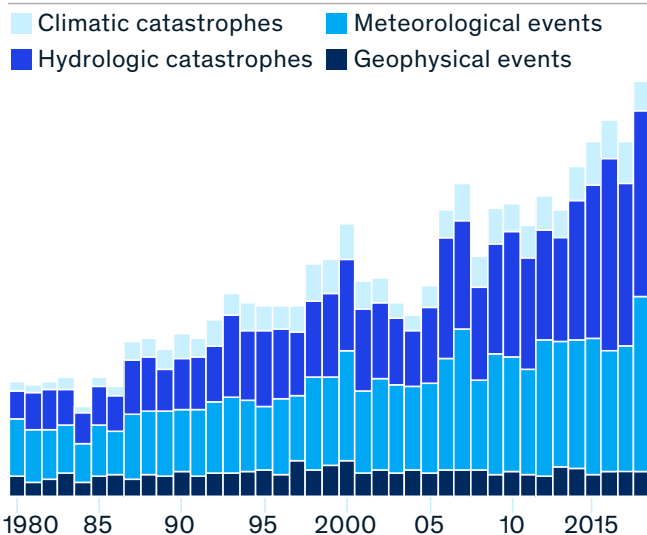
These high costs, in combination with long recovery times, have triggered many companies to reassess their supply-chain strategies and footprints to make them more resilient to any kind of disruption (Exhibit 1).

Geopolitical uncertainty has further accelerated the need for thoughtful, regular review of supply chains. Over the past two years, new tariffs have been imposed with scant notice, raising input costs by 15 percent or more almost overnight. Unsurprisingly, in the quarterly Economic Conditions Snapshot survey by McKinsey, "changes in trade policy" spent most of 2019 as

Exhibit 1

Noneconomic shocks are increasing in frequency and in impact on supply-chain cost and performance.

Number of disruptive events



Top 5 disruptions, 2017

	Estimated losses, USD billions	Average recovery time, weeks
Hurricane Irma, USA	61	33
Laredo border closing, USA & Mexico	n/a	24
Hurricane Maria, USA	69	23
Winter storms, USA	3	23
Hurricane Harvey, USA	95	17

Source: McKinsey Agile Operations

the single greatest threat respondents perceived to economic growth, both globally and for their home economy.

Accounting for 54 percent of imports and 49 percent of exports, the EU is the most important trade partner for the UK. Brexit discussions are especially relevant for companies with complex international trade flows. The impact of longer lead times due to border delays, additional administrative burdens, and inventory buildups may multiply, as the automotive example below shows (Exhibit 2). The end customer will not only have to pay for an increase in tariffs, but also for additional costs accumulated throughout the supply chain (such as for stock-holding costs).

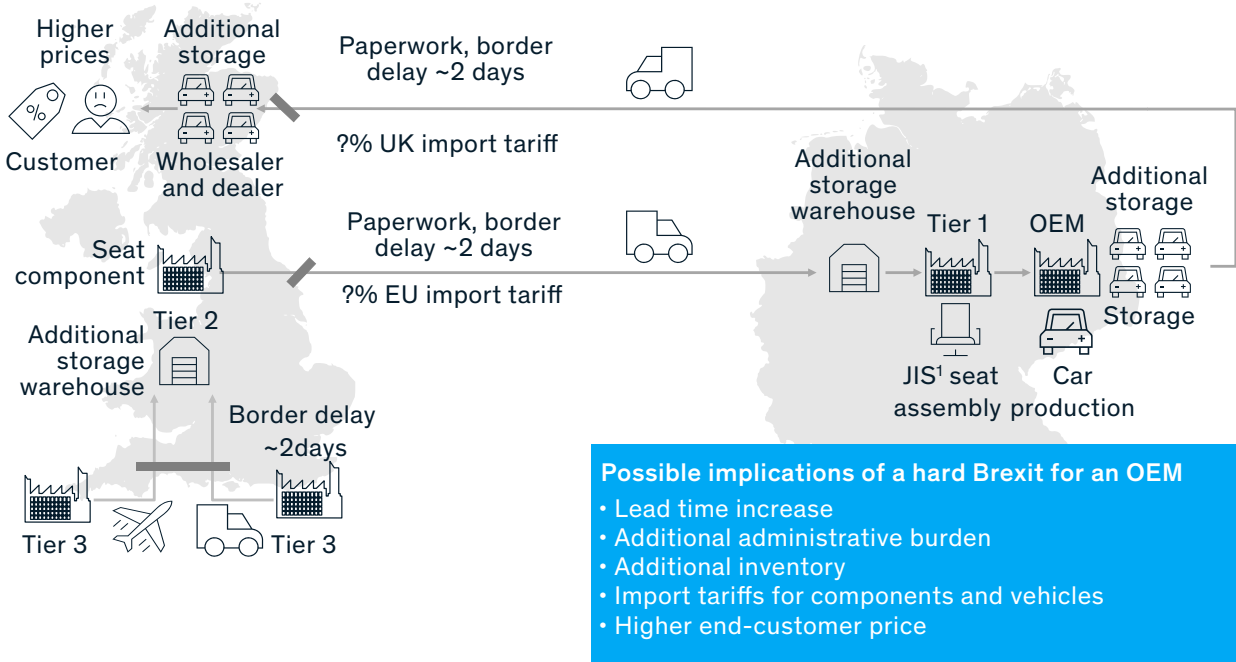
How companies are preparing for Brexit and trade disputes

We noticed a difference in the measures that companies are taking to prepare for the potential impact of Brexit in comparison to the evolving US–China trade negotiations. In short, Brexit is seen as a less-fundamental risk compared to proposed trade regulations. For many companies, the UK market is simply not large enough to dedicate significant resources to prepare for Brexit. They believe that the consequences of Brexit will be short-lived operational issues that will ease within a few weeks or months. These businesses are focusing on short-term measures such as setting up alternative transport routes and preparing for new customs requirements.

Exhibit 2

Brexit may cause major disruptions to trade flows between the UK and EU.

Example: Sale of a car produced in Germany to a UK customer



1 Just in sequence

Other companies are simply ready to accept the risk of longer lead times due to customs, stating that they “don’t care; customers will simply have to wait longer and pay a bit more; it affects the entire industry.” Companies with time-critical lead requirements (as with certain medical products) will try to limit the impact on final consumers by building up inventory and securing local supply. Most of them also report that they are launching cost-cutting projects to mitigate increases to end-customer prices.

We also hear that the long, unpredictable Brexit process has had one unexpected advantage: by now, everyone either is well-prepared or has consciously decided to take a wait-and-see approach.

We can see clear differences in the supply-chain impact of Brexit and other trade regulations by industry.

- **Pharma companies** operate in a highly regulated environment, so a hard Brexit—in which Britain and the EU do not secure a trade agreement—would cause major disruptions. They must secure multiple weeks’ supply for critical drugs and need to stock up accordingly. Many pharma companies have already transferred EU market authorizations, such as the retesting and accrediting of products, to EU entities, anticipating the post-Brexit risk.
- For the **fast-moving consumer goods** industry, border delays of several days could cause major damage, especially for fresh and perishable products. Almost 30 percent of food imported to the UK currently comes from the EU. A large consumer player has established customs-accredited warehouses to manage Brexit-lengthened lead times, while a retailer has opened new distribution centers in the EU and return centers in the UK to decrease duties on returned products. More generally, many consumer-goods companies feel the need to shorten their reaction times: “We need to become more agile to react faster.

Currently, our supply chain is a large tanker rather than a speedboat,” said one industry representative.

- Players in the **discrete manufacturing** industry—characterized by just-in-time production systems, such as in automotive—are reviewing various measures to minimize the potential impact of production delays. Many are assessing different transport routes and reviewing logistics contracts, or have decided to build up stock and extend warehouse capacity. Some automotive manufacturers are even considering changing their manufacturing setup, such as relocating production facilities from the UK to mainland Europe or establishing complete knock-down (CKD) plants in the UK to minimize possible tax burdens.

For most of our respondents, the supply-chain impact of the US–China trade disputes—and the related introduction of new tariffs—is seen as a more profound and systematic threat than Brexit. In reassessing their supply-chain structures, some companies have decided to localize their footprints or even to relocate their production facilities. Others are moving parts of their manufacturing capacity from China to Southeast Asian countries to limit tariff exposure.

Some of the effects could turn out to be positive, at least in the longer run. A supply-chain manager told us that the tariffs are perceived as a “chance [...] to shake up [the] supply chain and increase agility.” As in their response to Brexit, automotive companies are evaluating CKD plants to overcome the risk of high import tariffs. But the majority of companies are still in the analysis phase, waiting for more clarity before making any major investment decisions (Exhibit 3).

How advanced companies manage supply-chain risk

The degree of professionalization of supply-chain risk management varies widely. Many companies still follow a more-reactive approach in responding

Exhibit 3

Companies with high exposure focus on short-term measures to prepare for Brexit, while US-China tariffs are causing a fundamental review of supply-chain footprints.

	 Brexit	 US/China trade tariffs
Predictability and impact of risk 	<ul style="list-style-type: none"> • Brexit scenario still open, impact is not clear • Uncertain, long decision-making process • Even with a no-deal Brexit, a new normal will settle in after a few chaotic months, with slightly longer lead times 	<ul style="list-style-type: none"> • Systematic approach to revitalize the US supply chain • Long-term moves with high impact • Stringent implementation plan in place
High exposure to risk 	<ul style="list-style-type: none"> • No-deal “hard” Brexit is the planning focus • Emphasis on short-term measures <ul style="list-style-type: none"> – Build up inventory – Reconfigure transport, phase out UK as POE1 – Build distribution or return centers – Prepare for customs/admin requirements – Postpone long-term investment decisions 	<ul style="list-style-type: none"> • The majority of companies are still in wait-and-see mode • Systematically review supply-chain setup • Localize supplier footprint • Relocate production facilities
Low exposure to risk 	<ul style="list-style-type: none"> • Accept risks and shift consequences to supplier side <ul style="list-style-type: none"> – Incorporate conditional clauses into contracts to secure supply prices – Continually call for tender to get competitive pricing offers • Accept risks and shift consequences to end-customer side <ul style="list-style-type: none"> – Increase product prices – Increase lead times – Accept risk of supply shortage 	

1 Port of Entry

to supply-chain disruptions. That said, almost all of the companies that we surveyed diversify their operations and implement multi-sourcing strategies wherever feasible and economically justifiable. Working closely together with their suppliers and performing regular supplier audits is part of their general business practice. On an ongoing basis, they monitor the most relevant risks—such as regulatory changes or changing customer demand.

But relatively few invest much time and money in automating any of these activities. When hit by sudden supply-chain disruptions, they build temporary task forces to manage the issue on an ad hoc basis. In some cases, precious time is lost due to insufficient preparedness.

More advanced companies have permanent supply-chain risk-management teams and processes in place. The leading automotive OEMs,

chemicals, and electronics companies with very complex global supply chains generally belong to this group. The information cascade between the supply-chain risk-management team and other functions such as marketing, IT, and legal is well-established, with clearly defined interfaces. In the case of disruptions, these teams exchange information on the fly and react quickly.

Furthermore, these companies continuously monitor trends and events that might cause disruptions in the global supply chain. They work to increase transparency throughout even multitier supply chains, with leaders in supply-chain risk management setting up databases of suppliers across tiers, including each supplier's location, performance, and audit results. And they use external software and data sources to receive push notifications about the latest incidents, together with the possible implications on their supply footprints.

By developing and assessing scenarios with different probabilities for pre-identified risks, the most advanced organizations can make high-level impact calculations that enable better prioritization. Accordingly, prioritization is based not only on financial factors, but also on business-specific factors such as regulatory and strategic considerations and the company's specific risk appetite. Supply-chain risk leaders develop a set of reactive and proactive response strategies, and foster general risk awareness among their employees, by creating an openness to address potential shortages and failures.

Creating supply-chain resilience

In light of increasing business complexity and growing overall uncertainty, establishing a systematic supply-chain risk-management approach becomes more and more relevant. Many companies relying mostly on reactive measures today want to improve their supply-chain risk management capabilities—and say they are willing to invest more time and resources to do so. Multiweek supply-chain disruptions causing significant financial burden have triggered

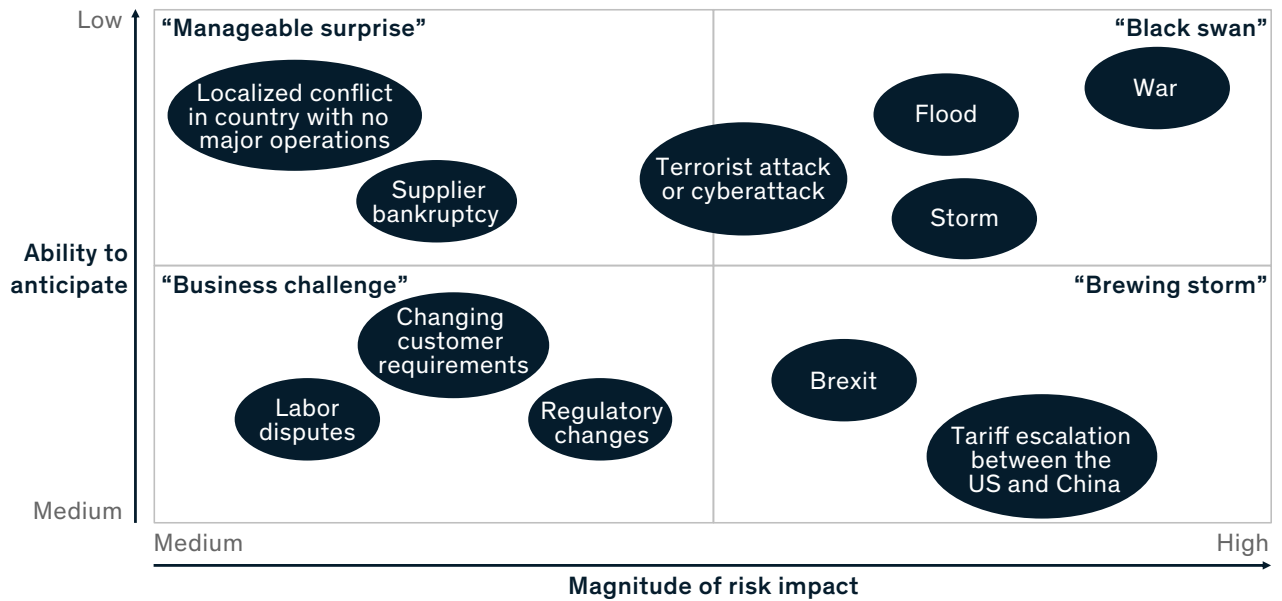
a revival of risk management in operations. Advanced companies aim to prepare for new risks, including cyberattacks, or environmental challenges, such as decarbonization of the overall production footprint.

Increasing supply-chain resilience is a leading theme for many globally operating companies with complex operations. Based on our experience, we suggest a four-step process that can be tailored to a company's needs based on its individual starting position. Less-advanced companies will typically start by concentrating on establishing an end-to-end process first; their more-advanced counterparts may instead focus more attention on advancing steps 3 and 4.

1. Identify the most relevant events and risks threatening to disrupt the company's supply-chain operations.
2. Define possible outcome scenarios and assess their high-level impact. Depending on the level of exposure and magnitude of the impact, the company prioritizes risks for targeted attention.
3. Develop response strategies for prioritized risks. It is essential to create an unbiased process to decide where to invest and how to prepare. A systematic calculation of business cases is the foundation for these investment decisions. The trade-off between investing in prevention versus taking the risk of being hit when unprepared—resulting in severe disruptions and losses—needs to be quantified. Different dimensions important to the company need to be incorporated to create a meaningful business case, otherwise it is difficult to get the required funding for risk management.
4. Finally, supply-chain risk management needs to be incorporated into regular decision-making and planning processes. Embedding risk-management capabilities as a regular ingredient of business decisions in operations is the first step towards creating a true risk culture and a resilient company.

Exhibit 4

A simple classification of supply-chain risks helps in defining response strategies.



A systematic classification of risks, and development of a related response strategy, is essential to improve supply-chain resilience strategically—while keeping required investment to a minimum. A simple framework can help by classifying risks on two axes: the vertical estimates to what extent a risk can be anticipated, while the horizontal quantifies the risk’s expected impact (Exhibit 4).

- **"Manageable surprises"** are difficult to anticipate but manageable in terms of impact.
- **"Black swans"** are hard to anticipate and severe in terms of impact.
- **"Brewing storms"** can be anticipated and will have a high impact once they materialize.
- **"Business challenges"** are typically low-impact risks that can be both anticipated and managed quite easily.

For each of the quadrants, a specific set of response strategies can be developed. A reactive risk-management approach should be taken for risks that are difficult to predict, and a more proactive approach for those with higher predictability (Exhibit 5).

- **Low-impact risks** that are **hard to anticipate**, such as the bankruptcy of an individual supplier or a localized conflict in a country without major operations, can be accepted or avoided to a certain extent by diversifying operations. Systematically implementing a dual-sourcing strategy, through nominating new suppliers or negotiating a second source of supply from the same supplier, help mitigate this risk category
- **High-impact risks** that are **hard to anticipate**, including natural disasters, terrorist attacks, or cyberattacks, can

Exhibit 5

Each category of risk implies multiple responses.

Ability to anticipate	Low	<p>“Manageable surprise” Accept or avoid to the extent possible</p> <ul style="list-style-type: none"> • Diversify operations <ul style="list-style-type: none"> – Move out of high-risk areas – Have a dual-sourcing strategy in place 	<p>“Black swan” Have strong crisis management in place and build in resilience</p> <ul style="list-style-type: none"> • Build in agility and flexibility <ul style="list-style-type: none"> – Maintain healthy reserves for parts with long recovery times – Consider scenario planning – Use risk-transfer methods, eg insurance, contract language 	<p>Apply reactive mitigation strategies</p>
	Medium	<p>“Business challenge” Manage risk within the framework of other key management decisions</p> <ul style="list-style-type: none"> • Build up robustness <ul style="list-style-type: none"> – Train workforce to handle everyday risks – Have information systems and tools in place – Create a risk-awareness culture 	<p>“Brewing storm” Improve mitigation maturity and proactively reduce risk exposure</p> <ul style="list-style-type: none"> • Rethink supply-chain strategy <ul style="list-style-type: none"> – Redefine sourcing strategy – Revisit footprint – Review inventory build-up strategy – Prepare for changes in demand 	
		Medium	High	
Magnitude of risk impact				

be managed by building strong crisis-management capabilities and resilience throughout the system. A supply-chain risk-management team can introduce a systemic risk-monitoring process which can be enhanced by regular scenario-planning exercises. Through keeping healthy reserves for parts with long recovery times, companies can prevent some supply-chain disruptions. Another way to mitigate risks which are difficult to anticipate is transferring risk to other parties: taking out insurance and introducing risk-related contract language are possible answers.

- **Low-impact risks** that are relatively **easy to anticipate**, such as labor disputes, regulatory changes, or changes in customer preferences (for minimal plastic usage or increased product

sustainability, for example) can be managed proactively by increasing the robustness of the supply-chain system. The most important single measure, though, is solid training of the workforce to handle everyday risks. Encouraging employees to voice concerns about possible defects and disruptions helps create a general risk awareness as a first step to managing disruptions. IT systems and tools can then help to continuously monitor disruptive trends and events.

- **High-impact risks** that are relatively **easy to anticipate**, including Brexit, US–China trade regulations, or decarbonization targets, need the most attention. A systematic review of the supply-chain setup may be advisable. Possible response strategies include redefining the sourcing strategy by, say, raising the share of

About our research

During the fourth quarter of 2019, we conducted deep structured interviews with 25 European supply-chain executives from a representative set of leading companies in the fast-moving consumer goods, retail, chemicals, pharma, and discrete-manufacturing industries. The questions focused on the respondents' general supply-chain risk-management practices and specific response strategies to geopolitical risks such as Brexit and the US-China trade dispute.

local suppliers, or revisiting the manufacturing footprint by moving some manufacturing operations out of certain areas. Establishing CKD operations in countries with high import taxes on finished products can be another option. The review of the inventory build-up strategy helps optimize service levels by increasing safety-stock levels for critical components which cannot be sourced from alternative locations. In some cases, preparing for changes in demand can be an appropriate answer.

In an increasingly volatile world, companies are putting supply-chain risk management back on the agenda. They are not only confronted by

permanently changing customer requirements and increasing geopolitical risk, but also risks related to the environmental concerns such as decarbonization, decreasing plastic usage, and overall product sustainability—all of which increase stress on existing supply chains. Ignoring these shifts could result in severe penalties, whether enforced by government or the market. Cybersecurity risks are gaining ever-more-disruptive potential. Incidents are occurring more and more often, with attacks against businesses almost doubling in five years, raising the total impact of these kinds of risks. A proactive approach, combined with a vibrant risk-management culture, will be a game changer for companies, helping them avoid and manage future disruptions in their supply chains.

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