



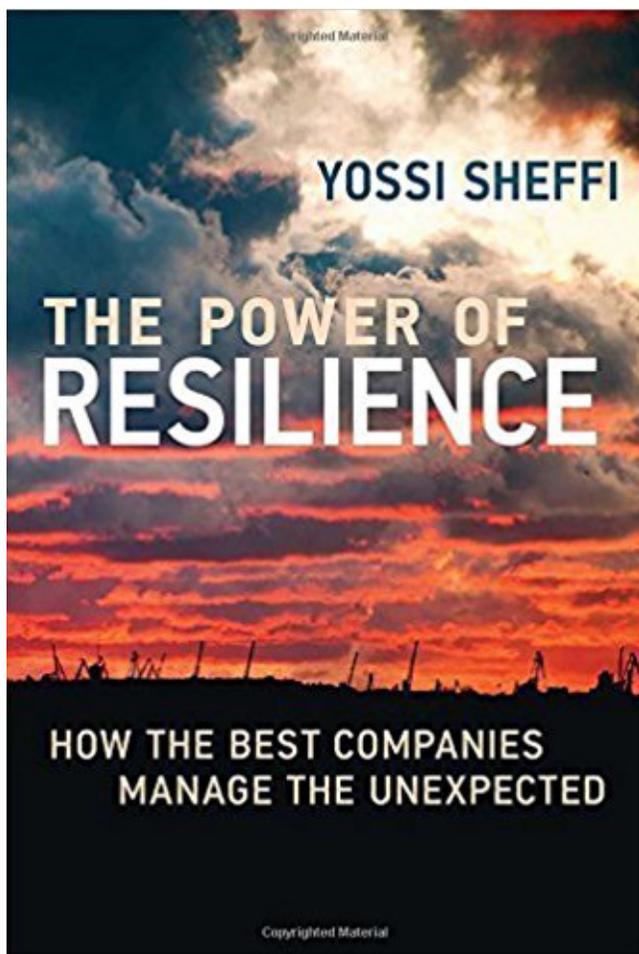
Lessons from a Crisis: Yossi Sheffi



Lessons from a Crisis: Building strength from supply chain interdependence

by Yossi Sheffi

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The approaching tenth anniversary of the 2008 Financial Crisis offers a chance to examine the revealed resilience and fragility of business and financial supply chains. On the resilience side: banks have recovered, unemployment is back down, and the stock market has rebounded. But on the fragility side, companies and their supply chains are inextricably linked, perhaps even more deeply than ever.

“The world is so connected that the feedback loops are more intense. Our supply chains are global. Our financial markets are global. So uncertainty in one part of the world infiltrates all parts of the world. These days, there are things that just come shooting across the bow ... at much greater frequency than we’ve ever seen,” said Ellen Kullman, CEO of DuPont.

While many risks remain, the good news is that the resilience tools and thinking forged during the crisis to protect against supplier bankruptcy can also be used to protect against other kinds of supplier disruptions. The upside of the financial crisis — as such — is a path to create a stronger and better financial supply chain.

How we learned: black swans, bullwhips, and dominoes

The Financial Crisis provided hard lessons in the effects of disruptions in the financial supply chain on the physical supply chain. Whereas flows in the physical supply chain move from raw material makers to parts makers to product makers to retailers to consumers, the flows in the financial supply chain move money in the opposite direction from consumers up the chain. Just as inventories of materials and products sit in different places in the

downstream flow of the physical supply chain, money sits in different places in the upstream flow of the financial supply chain. Banks play a huge role in financial supply chains — acting both as suppliers of money through loans and as the “long-haul truckers” and international ocean freighters of global money logistics.

Like electricity or running water, many people took flowing money for granted prior to 2008. The supreme confidence of government officials, investors, banks, and home buyers that housing prices could never go down laid the egg of one of the biggest black swans — high-impact, low-likelihood events — to appear in modern history.

From black swan to bullwhip: lean supply chain practices intensified the effect

The turmoil of the financial system in 2008 disrupted consumer spending, curtailed commercial credit, and sparked fears about the bank-to-bank web of trust that underpins international trade. The swift contraction in consumer demand following the Lehman bankruptcy sparked an amplified reaction in upstream supply chain activities that grew more and more extreme as the disruption in demand propagated up the chain of suppliers — a phenomenon known as “the bullwhip effect.” (See endnote).

During a financial crisis, cash-strapped companies often delay payments to suppliers and lengthen their payment terms. Meanwhile, suppliers try to accelerate payments they are owed. A spring 2009 survey found that 55% of companies had lengthened their payment terms with suppliers due to the crisis, and 25% had worked to accelerate customer payment terms as part of their efforts to reduce working capital and conserve cash.

Thus, the financial crisis created a perfect storm with a decrease in new orders, a log-jam in cash flows, and a severe contraction in commercial credit by banks. Years of running lean supply chains and pushing down costs had reduced the physical and financial slack in many supply chains. That lack of slack was great during the good times, but the financial crisis showed that it could be fragile during the bad times. A 2009 Business Continuity Institute survey found that 28% of companies had suffered a disruption due to a financial failure of a supplier in the preceding year.

Dominoes: shared supply chains means shared risk and interdependence

Companies feared domino-effect collapses in the supply chains they shared with struggling competitors. The fear was so significant that companies even worked to save their competitors, such as when Ford CEO Alan Mulally spoke to the Senate banking committee on November 18, 2008.

He said:

“ If any one of the domestic [auto making] companies should fail, we believe there is a strong chance that the entire industry would face severe disruption. Ours is in some significant ways an industry that is uniquely interdependent — particularly with respect to our supply base, with more than 90 percent commonality among our suppliers. Should one of the other domestic companies declare bankruptcy, the effect on Ford’s production operations would be felt within days, if not hours. Suppliers could not get financing and would stop shipments to customers. Without parts for the just-in-time inventory system, Ford plants would not be able to produce vehicles. ”

The biggest lesson from the crisis was clear: even competitors are interdependent, linked by shared interest in supply chain health.

The rise of trade finance to protect supply chains

This interdependence and the fear of the domino effect pushed companies to think of their position in the financial supply chain and their own inventories of money.

In particular, many companies realized that their working capital and the working capital of their suppliers were linked. With banks restricting commercial lending, companies needed to think about how and when they paid their suppliers to ensure those suppliers remained viable.



Financial Relations with Customers

Companies also worked on the customer-side of the financial supply chain in ways to either reduce exposure to customer bankruptcies or to reduce the chance of such bankruptcies. A survey by World Trade magazine found that 43% of companies offered pricing concessions for early payments by customers in an effort to conserve working capital. A spring 2009 survey found that 7% of companies were providing financial assistance to customers.

Innovation and increase in trade finance options

Just as companies have developed careful strategies for deciding where to store physical goods and when to move those goods down the supply chain, they've developed strategies for deciding where to store money and when to move money up the supply chain by financing trade, making supplier investments as well as negotiating payment terms for accounts payable.

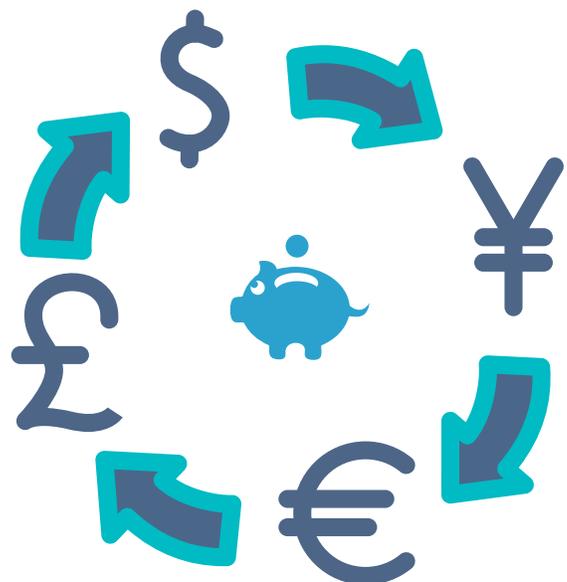
In many ways, the 2008 crisis catalyzed a diversity of trade finance options. The regulatory squeeze on banks created its own “bullwhip” effect of decreasing access to working capital deeper in the supply chain. As the examples above show, stronger companies became more responsible for helping their business partners manage working capital across the supply chain. As a result, supply chain finance shifted to a more direct relationship between companies and their supply chains — disintermediating banks that were no longer willing or able to provide credit. Companies use their excess cash on their balance sheets to fund affordable liquidity their suppliers need.

Direct Financial Support

The bankruptcy of auto parts maker Edscha in early 2009 shocked BMW, who needed the supplier's roof modules for its new Z4 convertible and other models. BMW said, “We had to help Edscha and try and stabilize it. We had no choice to go to another supplier, as that would have taken six months and we don't have that.” BMW was forced to offer direct financial support to its supplier. Surveys during the financial crisis found that between 9% and 12% of companies were providing financial assistance to suppliers. Some companies even took equity stakes in a few suppliers and, as it turned out, profited from such investments when the economy recovered.

Indirect Financial Support

Most companies explicitly eschewed direct investment in suppliers due to risks and the companies' own needs to conserve capital. Instead, companies helped financially-struggling suppliers in a number of other ways. For example, BASF, HP, and others accelerated payments to suppliers or bought raw materials on their behalf. Other companies prepaid for tooling or other capital-intensive items if suppliers couldn't get their own credit. One large technology company assisted suppliers in creating financial plans and in finding other customers or investors as well as lending working capital to suppliers against future production. According to Dr. Hermann Krog, then Executive Director of Logistics at Audi, the car maker agreed to be the guarantor on some suppliers' bank loans.



Risk Management in the Financial Supply Chain

Although the financial crisis and the great recession may be over, many other global and local risks have risen to the fore. Brexit, North Korea, terrorism, populist animosity to global trade, cyber security, climate change, AI's effect on employment, etc. all sit on risk managers' long-range radar screens, sometimes approaching and sometimes receding.

Yet this list of risks and any other such list is probably wrong because black swans, by definition, are events thought to be impossible under prevailing wisdom until they happen. Who knows what additional black swan events are nesting in the marshy corners of the global economy?



What is known is that the world's physical and financial supply chains remain as interlinked as ever by continuing dependence on global natural resources, the use of far-flung suppliers, and the desire to sell into rising economies around the world. From a financial point of view, these global supply chains can be said to have a virtual balance sheet of assets and liabilities. And although business contracts may legally insulate a company from the liabilities of business partners, the potentially disruptive effects of those liabilities can certainly strike the company. As such, the global economy remains prone to bullwhips and "domino effect" disruptions affecting both financial and physical supply chains.

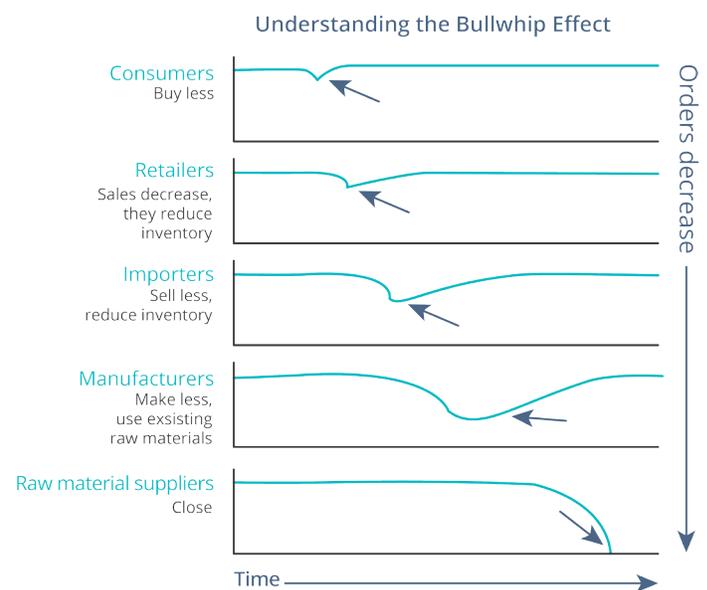
Such exposure to the risks of others remains as true today as it did in 2008, which makes management of working capital across the supply chain as important today as in 2008. Overall, the financial crisis did help the maturity of companies' supply chain

risk management including management of supplier financial risk and greater awareness of risks in the deeper levels of supply chains.

The shift is part of a more general trend toward managing the extended supply chain. As companies become more aware of all these interconnections, they may be able to detect and perhaps mitigate the deeper risks inherent in our global, connected economy. Thus, the interdependence at the heart of so many risks may also be the catalyst for change that benefits us all.

End note: understanding the bullwhip effect

In a hypothetical illustration of the bullwhip effect, if a retailer sees an X% drop in sales, it might reason that future sales will be low, too, because most forecasts are based on experience. In addition, the retailer might realize that its current inventories are too high if future sales continue to be low. Consequently, the retailer might cut orders to the wholesaler by, say, 2X% (reflecting both lower future sales and the desire to sell off the high current inventory). The wholesaler, seeing the 2X% drop in orders from the retailer, might prepare for future lower sales and too much inventory by cutting orders to the wholesaler by 4X%. At each echelon of the supply chain, the original decline in consumer demand sparks a bigger decline in orders from suppliers – each company reasoning that it needs to quickly cut production (to adjust to declining sales) and work off its bloated inventory. The exaggerated decline in orders can be especially damaging to upstream suppliers who have high fixed-costs tied to production assets or debts.



Dr. Yossi Sheffi

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Research and case studies for this article were sourced from Dr. Yossi Sheffi's book, *The Power of Resilience: How the Best Companies Manage the Unexpected* (MIT Press). The best-selling title uses cases studies and a narrative approach to present strategies for managing deep-tier risks, cybersecurity, long-term disruptions, business continuity planning, emergency operations centers, detection, systemic disruptions, and economic crisis. Sheffi's work builds a deep understanding of corporate resilience created through advanced risk management.

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