Deloitte.

The Ripple Effect
How manufacturing and retail executives view the growing challenge of supply chain risk

Contents

Executive summary

Supply chains are becoming highly sophisticated and vital to the competitiveness of many companies. But their interlinked, global nature also makes them increasingly vulnerable to a range of risks.

A number of internal and external forces are converging to raise the risk ante for global supply chains. Some are macro trends such as globalization and global connectivity, which are making supply chains more complex and amplifying the impact of any problems that may arise. Others stem from the never-ending push to improve efficiency and reduce operating costs. Although trends such as lean manufacturing, just-in-time inventory, reduced product lifecycles, outsourcing, and supplier consolidation have yielded compelling business benefits, they have also introduced new kinds of supply chain risk and reduced the margin for error.

Because of the importance of supply chain management to companies' success, supply chain risk events are having a profound effect and becoming more costly.

In mid-2012, Deloitte Consulting LLP surveyed 600 executives at manufacturing and retail companies to understand their perceptions of the impacts and causes of these risks, the actions they are taking to address them, and the continuing challenges they face. Respondents represented large and small companies in a variety of industries, and from countries around the globe, with the majority located in North America, Europe and China.

The survey's key findings include:

Supply chain risk is a strategic issue. There are now more risks to the supply chain and risk events are becoming more costly. As a result, 71 percent of executives said that supply chain risk is important in strategic decision making at their companies.

Margin erosion and sudden demand changes cause the greatest impacts. The most common and the most costly outcomes of supply chain disruptions are erosion of margins and an inability to keep up with sudden changes in demand, which illustrates the extent to which the supply chain risk issue affects the "heart of the business."

Most concern about extended value chain. Executives surveyed are more concerned about risks to their extended value chain—outside suppliers, distributors, and customers—than about risks to company-owned operations and supporting functions.

Supply chain risk management is not always considered effective. Two thirds of companies have a supply chain risk management program in place, but only half the surveyed executives believed those programs are extremely or very effective.

Companies face a wide variety of challenges. Executives cited a wide variety of challenges including problems with collaboration, end-to-end visibility, and justifying investment in supply chain risk programs, among others. However, no single challenge stood out, indicating the need for broad approaches.

Many companies lack the latest tools. Current tools and limited adoption of advanced technologies are often constraining companies' ability to understand and mitigate today's evolving supply chain risks.

Many companies are working to address what is clearly a growing threat to their supply chains, but they do not always know how best to proceed. With the multifaceted nature of today's risks, piecemeal solutions and one-off initiatives are no longer sufficient. Instead, companies should aim to take a more holistic approach to managing supply chain risk and achieve greater visibility, flexibility, and control. In the long run, the key will be to build a "resilient" supply chain that not only seeks to reduce risks but also is prepared to quickly adjust and recover from any unanticipated supply chain disruptions that occur. Such supply chain resilience is quickly becoming a fundamental requirement. With today's complex, global supply chains, risk cannot be eliminated—and having the ability to quickly bounce back from problems and continue business operations as efficiently as possible will likely be integral to remaining competitive.

The growing problem of supply chain risk

Over the years, supply chain management has become a more sophisticated discipline. The fundamental vision has been to create an integrated approach to a company's end-to-end supply chain, from the furthest upstream suppliers to its end customers, with participants working in concert toward common goals. Through practices such as lean manufacturing, outsourcing, and supplier consolidation, companies have made tremendous progress in achieving that vision. For many companies—and their customers—these efforts have led to lower costs, higher quality, shorter time to market, and increased business agility.

As supply chains have become more interconnected and global, they have also become more vulnerable, with more potential points of failure and less margin of error for absorbing delays and disruptions. Supply chain risk exposure is increasing, and so too is the frequency of problems. A 2011 survey by the Business Continuity Institute found that 85 percent of companies with global supply chains had experienced at least one supply chain disruption in the previous 12 months.[1] The costs of such disruptions can be high, leading to fewer revenues, increased downtime, delays in delivery, lost customers, and even damaged reputations. One study found that companies have experienced 30% lower shareholder returns compared to their peers in the wake of a publicly-announced disruption.[2]

Categories of supply chain risk

Avoiding and reducing such disruptions is no small challenge. The risks to supply chains today are numerous and constantly evolving, and emanate both from within and outside of the company. Deloitte has identified and documented more than 200 significant sources of supply chain risk, which fall into the following four categories (Figure 1):

Macro-environment risks, which can have an impact on any portion of the supply chain, or across the entire supply chain. These include events such as downturns in the global economy, shortages of critical raw materials/resources, political instability, new regulatory requirements, and natural disasters such as hurricanes and tsunamis.

Extended value chain risks, stemming from problems with upstream or downstream supply chain partners, ranging from Tier One and secondary suppliers to outsourcers and even end customers.

Internal operational risks, which can occur anywhere along the chain from product development and manufacturing to distribution; increased efficiency has removed much of the "cushion" that traditionally helped companies absorb disruptions in these areas.

Functional support risks, in areas such as legal, finance, human resources and, especially, IT. Shortcomings in these functions can lead to anything from a lack of needed talent to regulatory compliance problems and interruptions to the vital flow of operational data.

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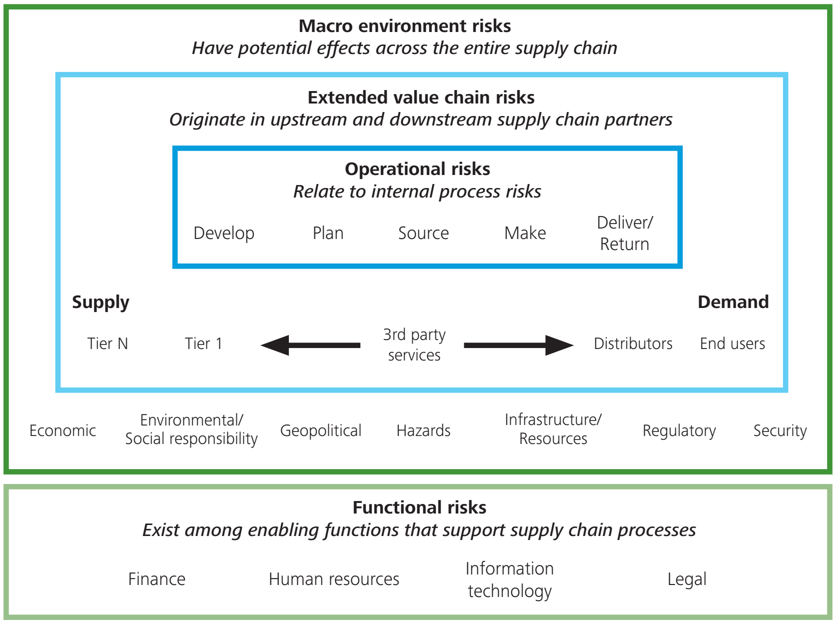
1 "Supply Chain Resilience 2011." Business Continuity Institute, November 2011

2 "An Empirical Analysis of the Effect of Supply Chain Disruptions on Long-Run Stock Price Performance and Equity Risk of the Firm," *Production and Operations Management Journal*, Spring 2005

Figure 1. Supply chain risks



Source: Deloitte Consulting LLP (2012), "Supply Chain Resilience: A Risk Intelligent approach to managing global supply chains", www.deloitte.com/us/supplychainresilience.

Understanding—and exploiting—risk

A resilient supply chain is one component of what Deloitte has defined as the Risk Intelligent Enterprise™—an enterprise that focuses not just on risk avoidance, but also on risk-taking as a means to value creation. In a risk intelligent organization:

- Leadership has a broad outlook on risk and integrates risk-aware thinking into strategic decision-making.
- The board executes fiduciary responsibilities and oversight to assess that appropriate risk management controls and procedures are in place.
- Processes, systems and trained people provide a common risk infrastructure that enables the company to act on risk intelligence in a timely and coordinated manner.
- A consistent risk process is used across the organization to manage all risk classes in an effective and efficient manner.

More frequent and costly risk events

The executives surveyed clearly recognize the reality of the growing scope of risk. In the survey, 48 percent of the executives said the frequency of risk events that had negative outcomes has increased over the last three years, while only 21 percent reported a decrease. (Figure 2) Executives from high-tech companies were most likely to report an increase, with roughly two thirds saying that was the case, followed by those from industrial products and diversified manufacturing companies, with just over half reporting an increase.

Such disruptions are not only more frequent, they are also having a larger impact. Fifty three percent of executives said that these events have become more costly over the last three years, including 13 percent who said they had become *much more* costly. (Figure 2) Studies have found that natural disasters are occurring more frequently, and the economic impact of each event is usually greater than before. For example, five of the 10 most expensive natural disasters have taken place just within the past four years.[3]

Executives from high tech, industrial products, and diversified manufacturing industries were most likely to report that supply chain risks had become more costly. Presumably, these industries are seeing greater impacts from supply chain issues because of the complex, interwoven, and time-sensitive nature of their supply chains, where a problem in one area can quickly have a ripple effect up and down the supply chain.

[3] "Counting the Cost of Calamities," *The Economist*, January 14, 2012 (www.economist.com/node/21542755)

48 percent of the executives said the frequency of risk events that had negative outcomes has increased over the last three years, while only 21 percent reported a decrease.

Sudden demand change and margin erosion have the greatest impacts

The survey also explored the types of negative outcomes that companies have experienced from supply chain risks. The outcomes experienced most often were *sudden demand change* (53 percent)—essentially, the inability to manage sharp increases or decreases—and *margin erosion* (42 percent), such as due to a cost increase, lost revenue, or unanticipated taxes/regulatory changes. Other types of events cited among the top two risks were *physical product flow disruption* (37 percent), *product quality failure* (28 percent), *regulatory non-compliance and/or worker-safety failure* (20 percent), and *social responsibility failure* (18 percent). Executives surveyed from larger companies were somewhat more likely to cite regulatory noncompliance/safety issues, while executives at smaller companies were more likely to say that they had been affected by product quality issues.

Executives had similar responses when it came to how costly each type of risk event was. Executives considered *margin erosion* to be more costly than other types of supply chain risk events, with 54 percent of respondents citing it as one of their top two issues. (Figure 3) This may be because margin erosion is a relatively high-profile, easy-to-measure problem, and executives are thus well aware of it. Executives at consumer-products, diversified-manufacturing, and energy companies were especially likely to report that *margin erosion* was one of their most costly supply chain risk issues.

Forty percent of respondents cited *sudden demand change* as one of their two most costly problems—a reflection of the ongoing challenges involved with growing customer expectations, short product cycles, and emerging competitive challenges. Executives surveyed at retail and high-tech companies—which operate in a world where markets change especially rapidly—were most likely to identify demand change as being costly. Executives at smaller companies were more likely than those at large companies to report *product quality failure*, along with *sudden demand change*, as their most costly types of outcomes.

Altogether, surveyed executives' deep concerns about *margin erosion* and *sudden demand change* illustrate how supply chain risk is an issue that can have a significant impact on the heart of the business, and quickly affect revenues and customer relationships.

Figure 2. Negative outcomes of risk events compared to three years ago

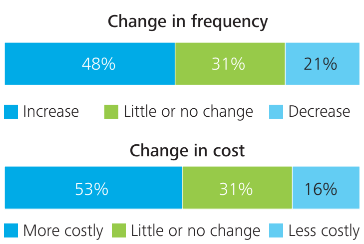
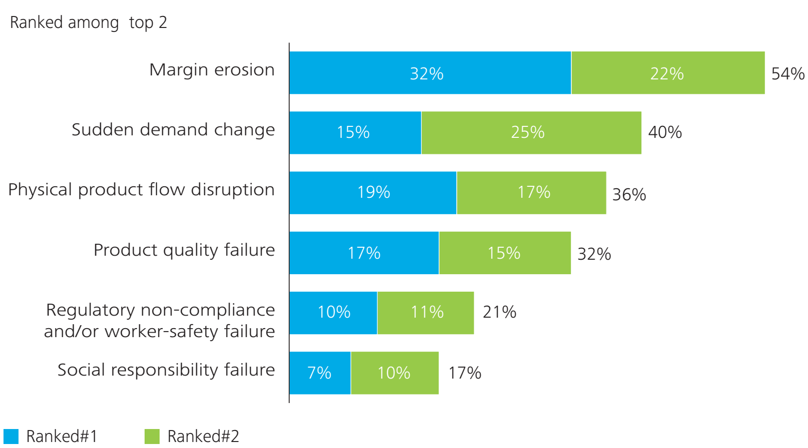


Figure 3. Most costly outcomes of risk events in the supply chain



Greatest concern about risks in the extended value chain

Executives surveyed are far more concerned about the extended value chain—where they have less control—than about risks to company-owned operations. Indeed, 63 percent of executives were highly concerned about risks within the extended value chain comprising vendors and customers, ranking it among their top two concerns. By comparison, 46 percent cited company-owned supply chain operations and 35 percent pointed to internal support functions as areas of high concern. (Figure 4)

Executives were divided on which events pose the greatest risk within the extended value chain, with four issues each ranked among the top two concerns: *changes in demand market structure, change in competitive dynamics or customer preferences, supplier execution failure or unavailability, and change in supply market structure.* (Figure 5) In looking at the extended value chain, executives appear to be most concerned about predictability and execution.

Key concerns about supply chain partners
Executives see a variety of risks in the extended supply chain, where their top concerns are:

Changes in demand market structure, such as the consolidation of customer companies or changes in the geographic span of the demand market.

Changes in competitive dynamics or customer preferences, such as the availability of new product/service substitutes, a reduction in switching costs, a change in channel usage, or a shift in brand preferences.

Supplier execution failure or unavailability, such as suppliers having financial issues, performance problems, or non-compliance events.

Changes in supply market structure, such as the consolidation of existing or potential suppliers or a reduction in supply capacity.

Figure 4. Categories of risk events most concerned about

Ranked among top 2

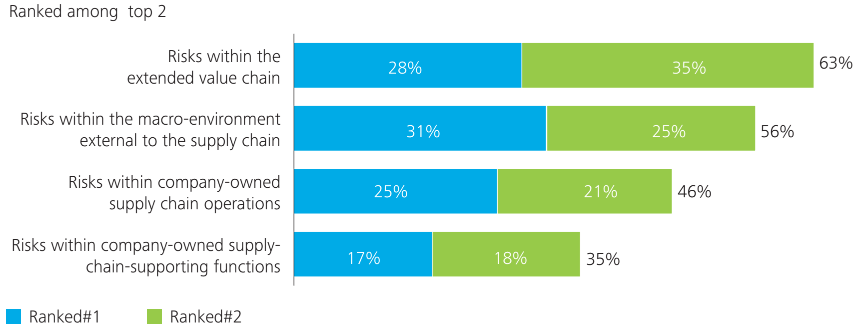
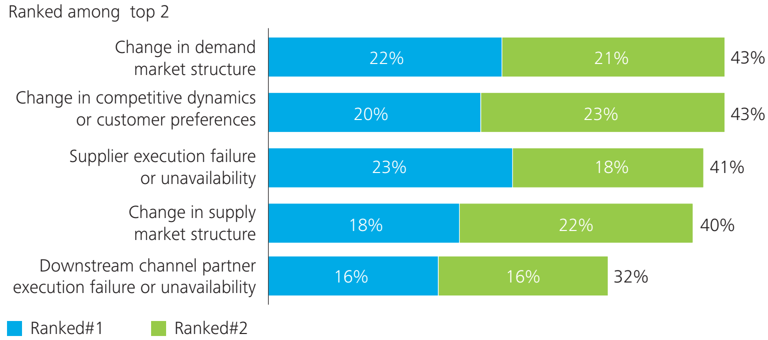


Figure 5. Types of risks most concerned about within extended value chain

Ranked among top 2



Meanwhile, 56 percent of executives surveyed cited macro-environmental risks as a concern. Here, by far the greatest concern was *economic shifts*, which 49 percent of executives cited among their top two concerns (Figure 6). The other types of macro-environmental risks—such as *adverse shift in availability of required resources, geopolitical or security related events, and failure of infrastructure*—were each cited by only about one-quarter of executives or fewer. The focus on economic upheaval is no doubt heightened by executives' experience of the last few years, as well as the fact that such economic shifts can have such a broad and difficult-to-manage impact across the supply chain.

None of this is to say that many executives are not aware of the risks to be found in the internal operations that are under their control. As mentioned above, nearly half cited internal operations and about one-third cited functions that support supply chain functions as areas of concern. In company-owned supply chain operations, executives surveyed gave similar ratings across different types of risks, with roughly 40 percent each citing several issues as concerns, especially failure to execute sourcing processes. (Figure 7) When it came to internal supply chain support functions, the greatest concern was IT infrastructure failure (50 percent). This is not surprising, given the integral role that IT plays in enabling coordination and collaboration among supply chain processes, internally and across company boundaries. The next greatest concern was *finance process execution failure* (47 percent), which can create significant compliance and investor-related issues. (Figure 8) on page 10.

Figure 6. Types of risks most concerned about within macro environment (External to the supply chain)

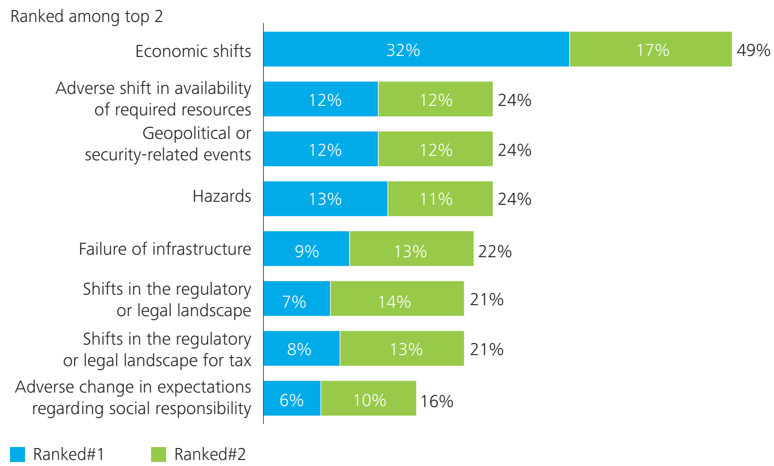
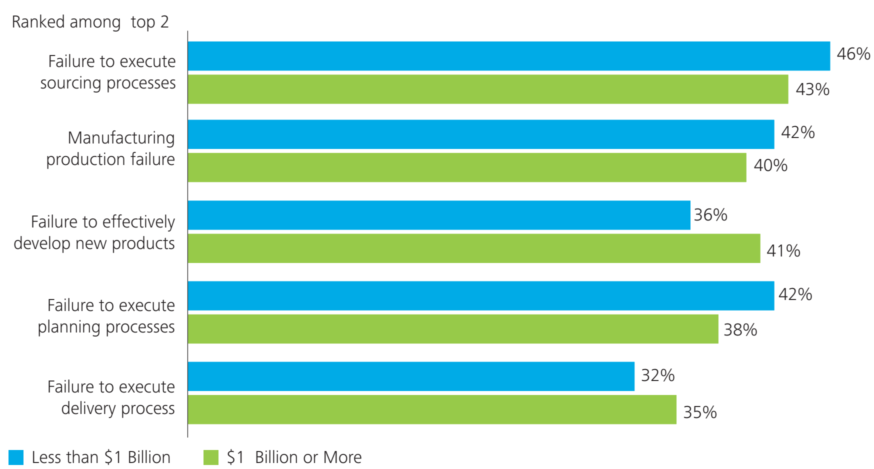


Figure 7. Categories of risk events most concerned about within company-owned supply chain operations



In short, respondents have significant concerns about a number of supply chain risks in both internal and external operations. There is no clear consensus about the greatest sources of risks, indicating that executives recognize that risk emanates from multiple sources and it is virtually impossible to predict and prepare for every type of risk. In that environment, companies should work proactively to identify and address specific vulnerabilities in the supply chain that expose them to risks—and at the same time, develop the resilience to be able to recover from the risk events that are anticipated to occur.

Risks in company-owned operations can generate costly outcomes

Although they said they were less concerned about risks to internal operations, 38 percent of executives reported that company-owned operations are among the top two sources of costly outcomes in their supply chains, the same percentage as for Tier 1 suppliers. (Figure 9) The lack of direct control may explain why executives are more concerned about risks from their extended value chain, such as Tier 1 and Tier 2 suppliers and customers. However, risks to company-owned operations can be equally costly. Indeed, with the interdependencies that exist between supply chain partners, problems in either internal or external operations can easily spill across the entire supply chain.

Figure 8. Categories of risk events most concerned about within company-owned supply chain supporting functions

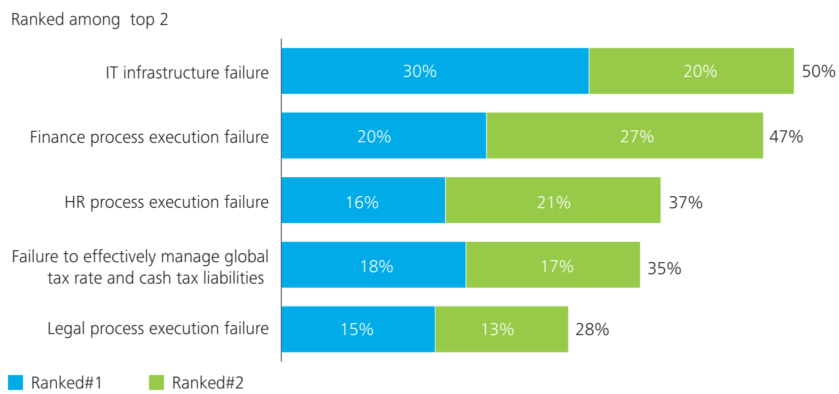
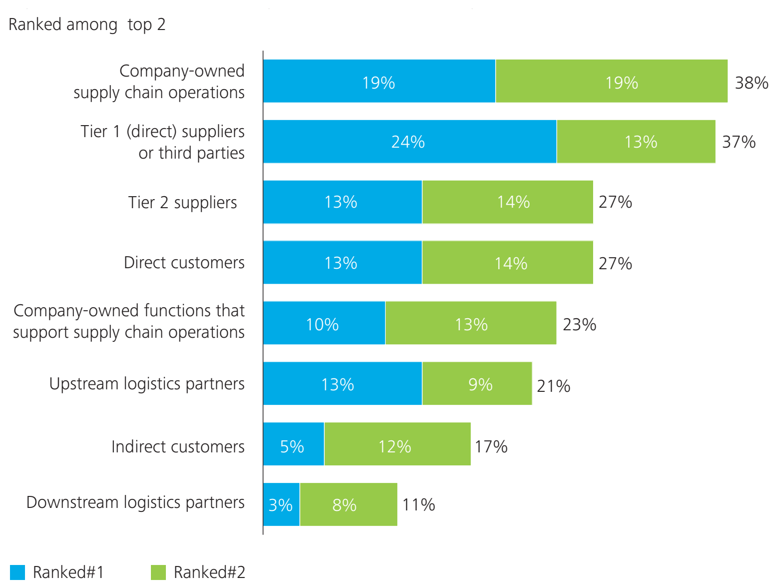


Figure 9. Locations in the supply chain of the most costly outcomes of risk events over last three years

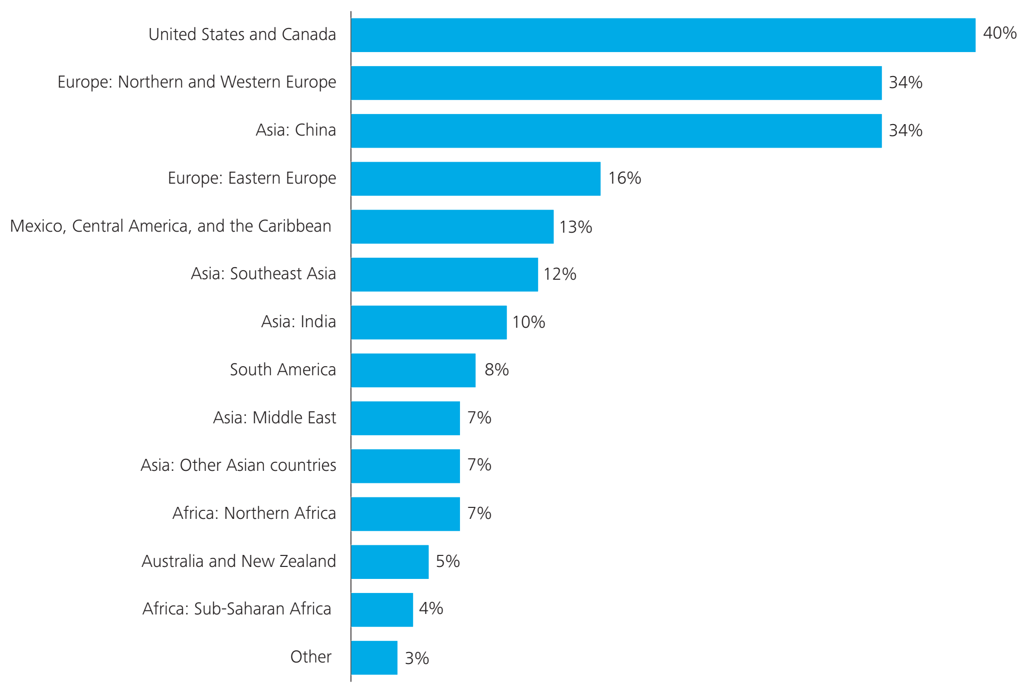


Supply chain risk a concern both in developed and emerging markets

Finally, the survey also looked at which geographic areas are anticipated to be the greatest sources of supply chain risk. There has been a great deal of attention paid to supply chain issues that have arisen in emerging markets in recent years. However, executives most often said the United States/Canada was the most costly source of negative outcomes (40 percent saying it was among the top two locations), followed closely by Northern and Western Europe (34 percent) and China (34 percent). (Figure 10)

Even in an increasingly global business environment, executives see supply chain operations in North America and Europe as key to their success—and therefore, as areas where supply chain events carry the greatest risk of having a major impact. The fact that China ranked alongside Europe as an area where risks are a top source of costly supply chain outcomes is a clear indication of China's growing role as a critical link in global supply chains—a role that is only likely to continue to grow.

Figure 10. Geographic regions that caused the most costly outcomes from risk events in the supply chain



These percentages total to more than 100 since executives were allowed to select more than one country in each region.

Achieving a holistic view of supply chain risk

Executives are keenly aware of the growing risks associated with global supply chains—and the potential impact on their companies. Seventy-one percent of executives surveyed said that supply chain risk is an important factor in their companies' strategic decision making, including 20 percent who viewed it as *extremely* important. (Figure 11)

At many companies, this awareness has translated into action aimed at mitigating supply chain risk. Sixty-three percent of surveyed executives reported that their companies have a risk management program focused specifically on the supply chain. Another one-quarter said their companies are working to develop one.

These programs employ a variety of strategies designed to prevent or recover from risk events. The most common strategies are *developing business continuity and risk contingency plans* (45 percent), followed closely by *building stronger extended value chain relationships* (41 percent) and *building the ability to rapidly adapt the production or distribution network* (41 percent). When asked which strategies have been most effective, executives most often cited those same three approaches. (Figure 12) Yet, none of the strategies listed were ranked highly by more than roughly one-quarter of executives, suggesting that no single strategy is the key, but instead that multiple strategies are needed.

Despite these efforts, companies are not always seeing the results they want from the supply chain risk-management programs. Only about half of the executives surveyed believed their companies are extremely or very effective at managing supply chain risk, including just 13 percent who considered their companies to be extremely effective. Executives from larger companies are somewhat more likely to see their efforts as effective—but even among this group, 42 percent say their programs are only somewhat or not effective. Overall, these findings suggest that not only are companies having difficulty managing supply chain risk, they are also struggling to assess and measure the effectiveness of their efforts.

Executives surveyed see a number of obstacles that make it difficult to manage risk effectively. When asked about the greatest challenges, they cited a variety of areas. *Lack of acceptable cross-functional collaboration*

Figure 11. Importance of supply chain risk in strategic decision-making

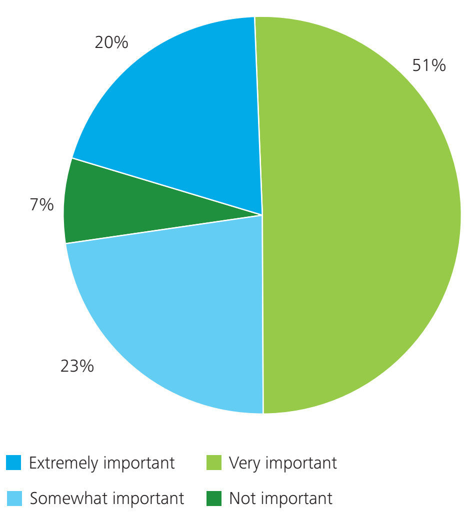
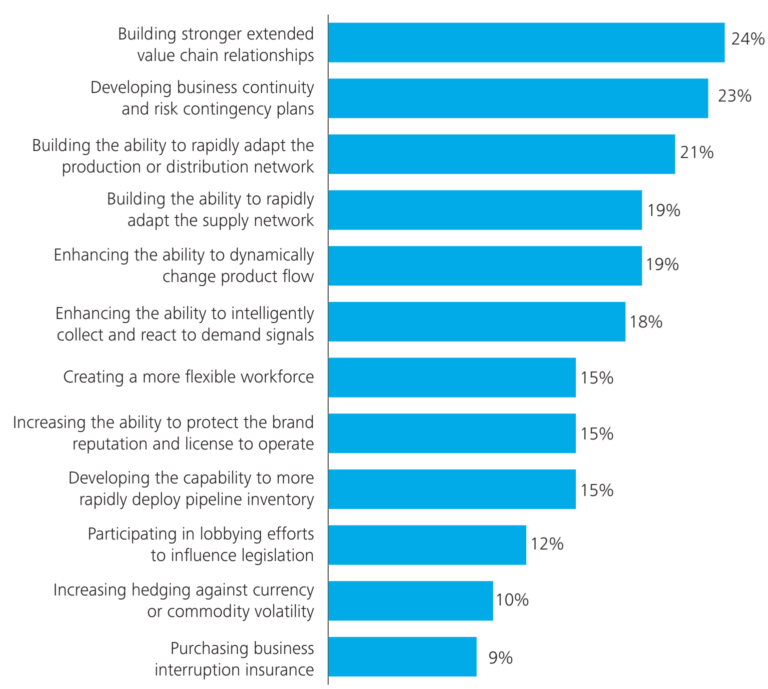


Figure 12. Most effective strategies for preventing or recovering from negative outcomes of supply chain risk events



was named slightly more often as among the top two challenges (32 percent), followed by *implementing risk management strategies* (26 percent). But a number of other challenges—such as *lacking required data on risk events, lack of end-to-end supply chain visibility, and inability to measure benefits of risk-managements*—were each cited by more than 20 percent of executives. In short, executives perceive a wide range of challenges—indicating that a multidimensional, holistic approach is required to manage supply chain risks (Figure 13).

A number of those challenges have their roots in approaches to both supply chain management and risk management that are commonly used by companies. For example, although many executives report using a wide range of tools to manage risk, no more than about one-third are using *predictive modeling* (36 percent), (Figure 14) *risk sensing data, worst-case scenario modeling, or business simulation* (29 percent)—tools that could help drive more proactive management of supply chain risk. The limited use of such tools may contribute to challenges associated with implementing risk management strategies, measuring program benefits, establishing effective performance metrics, and supply chain risk governance.

More broadly, supply chains have become more complex, especially those in industries such as consumer products, energy, and high tech that typically handle large volumes on a global scale. This complexity requires greater sophistication in terms of identifying and addressing risk. These findings suggest, however, many companies have not kept pace with the evolving capabilities and tools needed to manage risk in today's supply chains.

Figure 13. Greatest challenges to effectively managing supply chain risk

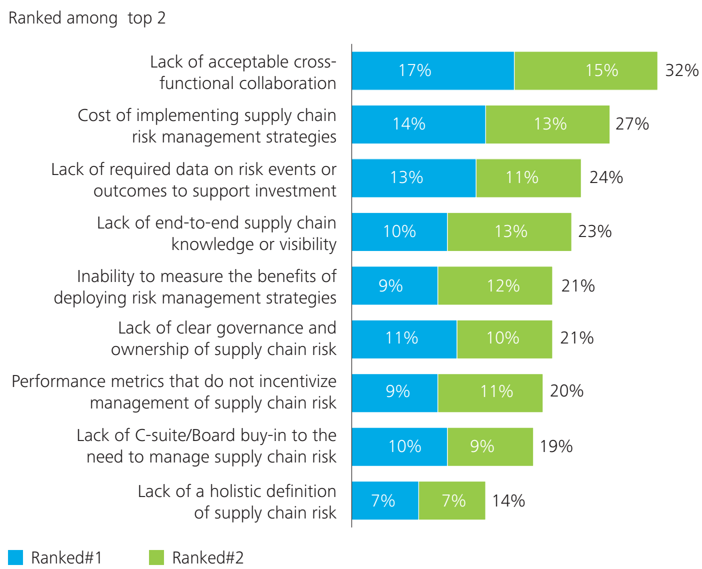
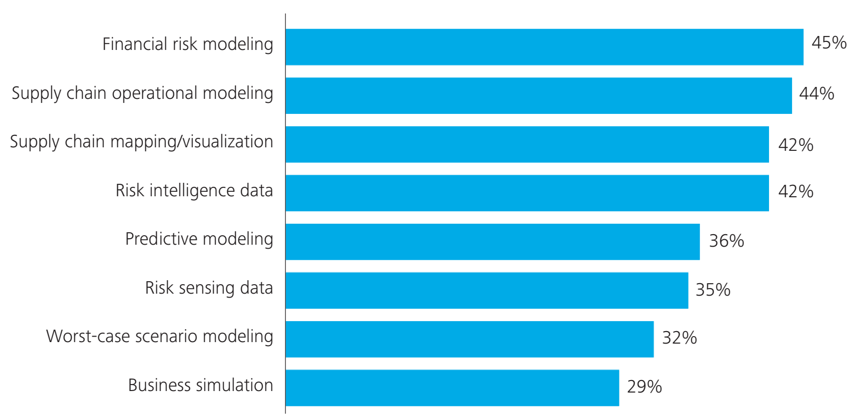


Figure 14. Types of Data/Visualization/Analytical Tools used to manage risk in the supply chain



There are also organizational factors that make effective supply chain risk management more difficult. Only about one-quarter of executives surveyed said their companies use an integrated supply chain operating model. The other three-quarters said their model is organized around silos, with roughly equal percentages having completely siloed functions, a mix of silos and consolidated functions, or a matrixed structure with independent functions operating under central coordination (e.g., a center of excellence). Such siloed approaches can lead to a lack of supply chain visibility and collaboration, and make it difficult to assess and manage risk on a holistic basis.

The nature of these supply chain organizational models is reflected in the way many companies are overseeing supply chain risk management efforts. Although 58 percent of the companies represented in the survey have one executive who is accountable for managing supply chain risk, there is a significant variation in the executive role that is accountable. Twenty five percent rely on the chief supply chain officer, 25 percent on the chief risk officer, 17 percent on the chief operating officer, and 16 percent on the chief executive officer. This reliance on relatively high-level roles is in keeping with executives' views on the strategic importance of managing supply chain risk. But the variety of roles cited suggests that companies have not identified a clear leading practice approach to assigning oversight responsibilities.

Having a single executive responsible was more common at the large companies surveyed, where 62 percent take this approach. But even among large enterprises, more than one-third do not. As with any process, not having a single point of accountability can lead to fragmented decision-making and a tendency to optimize risk at the local or functional level, rather than for the overall supply chain.

Conclusion: Achieving supply chain resilience

Executives have significant concerns about supply chain risk, and many are not satisfied with their companies' efforts to understand and manage that risk. Deloitte has found that organizations are often unsure where to focus their risk-management efforts, and when they do take action, they often under-invest in dealing with risk.

To be effective, companies should take a holistic, integrated approach to managing supply chain risk. That means establishing clear cross-functional ownership and governance over supply change risk, and investing in organizational and risk management enablers, including the appropriate tools and processes for understanding, tracking, and predicting risk.

Companies should work to go beyond traditional risk management approaches and build resilience into the supply chain. That means doing more than simply striving to head off and avoid negative events. Companies should recognize that because of the complex nature of today's supply chains and the wide range of risks they face, negative supply chain events will likely occur, often from causes that were not anticipated. Resilience means building in the ability to recover quickly and reduce the impact of those events—a capability that could be the difference between winning and losing in today's competitive industries.

There are four key attributes, or pillars, that are critical to supply chain resilience:

Visibility: The ability to monitor supply chain events and patterns as they happen, which lets companies proactively—and even preemptively—address problems. Critical enablers include people capabilities and analytics capabilities.

Flexibility: Being able to adapt to problems quickly, without significantly increasing operational costs, and make rapid adjustments that limit the impact of disruptions. Critical enablers include people capabilities and governance processes.

Collaboration: Having trust-based relationships that allow companies to work closely with supply chain partners to identify risk and avoid disruptions. Critical enablers include people capabilities and analytics capabilities.

Control: Having policies, monitoring capabilities, and control mechanisms that help ensure that procedures and processes are actually followed. Critical enablers include governance processes and analytics capabilities.

To build resilience, companies can follow a continuous process that begins with assessing the current state of supply chain resilience and pinpointing critical vulnerabilities, and then defines a business case for improvements/mediation and creates a prioritized roadmap for improvement. Working from that foundation, companies can then implement improvements and establish processes for monitoring and managing risk over the long run.

Building a resilient supply chain will require investment, effort, and cooperation with supply chain partners. But supply chain risks are growing more common and costly, and there is a clear need for new, more comprehensive approaches to managing that risk. Indeed, supply chain resilience is fast becoming a necessity, rather than an option. By adopting those resilient approaches, companies can position themselves for fewer disruptions, recover more quickly from problems that do occur, and leverage their supply chains for increased efficiency, agility, and competitiveness.

About the survey

Deloitte conducted a survey of 600 executives from manufacturing and retail companies with a minimum of $100 million in annual revenues to assess their attitudes and challenges in managing supply chain risk. The survey was conducted via both telephone and online interviews from July to October 2012.

Regarding company size, 29 percent of the companies had sales of less than $1 billion, 30 percent had sales of $1 billion to $5 billion, 16 percent of $5 billion to $10 billion, 25 percent of $20 billion or more.

The companies represented a variety of industries with the largest representation in consumer products (18 percent), retail (14 percent), industrial products (11 percent), diversified manufacturing (11 percent), high tech (10 percent), and energy & resources (7 percent) (Figure 15).

The respondent companies also came from all major economic regions. Thirty-six percent of the companies are headquartered in North America, 28 percent in Europe, 11 percent in China, 11 percent in Japan, and 7 percent in Brazil (Figure 16).

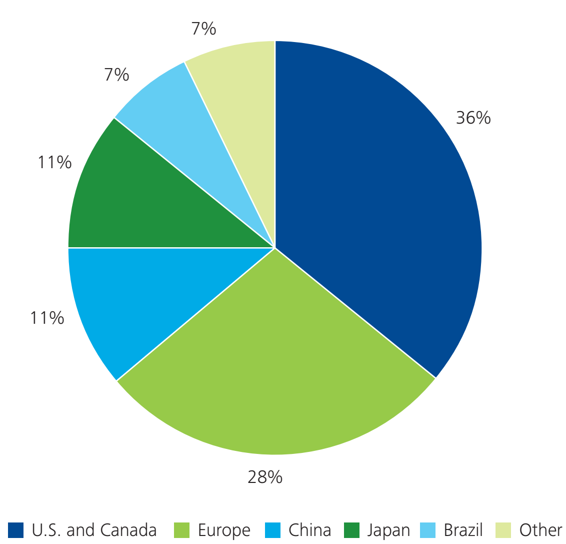
Regarding the titles of respondents, 38 percent held C-suite titles (such as chief executive officer, chief financial officer, chief operating officer or chief information officer), 23 percent were executive vice president, senior vice president or vice president, 12 percent were directors, and 27 percent had other titles.

For more information, visit www.deloitte.com/us/supplychainrisksurvey.

Figure 15. Industry

Consumer Products	18%
Retail	14%
Industrial Products	11%
Diversified Manufacturing	11%
High Tech	10%
Other manufacturing industry or cross-industry	9%
Energy & Resources	7%
Automotive & Commercial Vehicles	4%
Telecommunications	4%
Pharmaceuticals & Biotechnology	4%
Medical Devices	3%
Process & Chemicals	3%
Aerospace & Defense	2%

Figure 16. Location of parent company global headquarters



Authors and contributors

Authors

Kelly Marchese
Principal
Deloitte Consulting LLP
+1 404 631 2240
kmarchese@deloitte.com

Siva Paramasivam
Senior Manager
Deloitte Consulting LLP
+1 404 631 2242
sparamasivam@deloitte.com

Contacts

Scott Sopher
Principal
Deloitte Consulting LLP
+1 404 631 2600
ssopher@deloitte.com

Jerry O'Dwyer
Principal
Deloitte Consulting LLP
+1 216 830 6657
jodwyer@deloitte.com

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Andrea Hartman
United States
Deloitte Consulting LLP

Erik Kiewiet de Jonge
United States
Deloitte Consulting LLP

Jessica Heine
United States
Deloitte Services LP

Shanelle Little
United States
Deloitte Services LP

Lisa Rivel
United States
Deloitte Services LP

Mahendar Korada
Deloitte Support Services
India Private Limited