No risky business

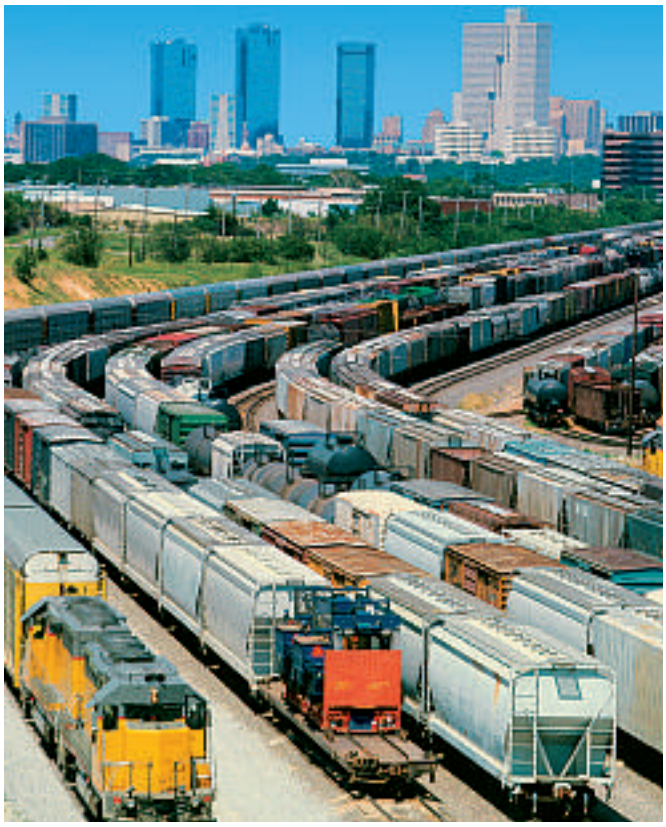
Risk management in global Supply Chains

Bill Vick

Pressure to supply the best possible product at the lowest possible cost has, over the last decades, pushed manufacturers to continually analyze, optimize and reinvent their Supply Chains. The transition to global sourcing and "just in time" logistics, while offering significant gains in terms of costs and agility, also exposes factories to additional risks. A disruption in a sub-supplier's manufacturing or shipping process often has significant and long term repercussions for a manufacturer.

To protect itself, a company must assess its Supply Chain for risks and must implement a strategy to handle these. Risk factors include supplier and customer problems, market and currency exchange-rate developments, quality shifts, internal disruptions and delays, accidents and catastrophes.

In the current and developing climate of global communications, major companies will compete on the basis of their entire value chains and not just on the basis of local operating units. Successful companies will be the leaders in terms of time to market and speed of response. Throughput times[1)] (TPT) and replenishment times will form a fundamental pillar of competitiveness. The globalization of Supply Chains, uncertainties of supply and demand as well as shorter product technology life cycles contribute to an increased exposure to risk in the Supply Chain. Disruptions to global product flow can be extremely costly, if not catastrophic to the survival and continued success of a business. Thus, the ability to identify disruptions, recover from them and redesign to prevent recurrence is critical to future business success. In the light of the ABB strategy of "Global Focused Feeder Factories", combined with the strategy of low cost country sourcing, the stability and security of Supply Chains must be a high priority business objective.



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Disruptions can come in many different forms with wide ranging impact to business. The trend towards lean/just-in-time (JIT) manufacturing, global sourcing and the increased need to be more responsive to customer demands has reduced the traditional buffers against Supply Chain disruptions. Cost savings and production efficiencies have exposed Supply Chains to significant commercial and financial risks.

Numerous researchers have explored Supply Chain disruptions and the results represent a wakeup call to the concept of risk management.

Michelman [1] found the following impact to companies experiencing disruption:

- Of businesses that have experience a prolonged disruption of 10 days or more, 73 percent close or suffer long-term impact.
- Forty three percent of businesses suffering a disaster never sufficiently recover to resume.
- Of those that do reopen, only 29 percent are still in operation 2 years later.

Categories of risk

There are several different risk models defined in literature. These vary from the fairly simple models proposed by Deloach [2] and Juttner [3], where risks are categorized as internal, external and process; to the more complex model defined by Chopra and Sodhi [4], where risks are divided into nine different categories, as shown in Textbox 1.

Regardless of the model used, there are several key questions that need to be answered when developing a risk profile. These are as follows:

- What risks are important to the company and how can they be identified?
- What is the potential likelihood of these risks and their expected impact?

Risk mapping and actions

Supply Chain risk management is not the sole responsibility of Supply Management. It is important to establish a multi-disciplinary team comprised of experts in the fields related to the nature of the risks identified. In most large organizations, the portfolio of products and risks is such that it is necessary to focus risk management efforts around the narrow group of risks that offer the highest potential impact on the business. The nature of the risk and the assessment of its probability of occurrence will determine the type of resources needed on a risk management team. The categorization of risks is one of the first tasks of a newly established risk management team. Having identified the risks in the Supply Chain, they should now be plotted on a 2-dimensional matrix map of probability 1, as shown below and the focus of effort should be those risks that are located in the top right hand quadrant.

Textbox 1 Categories of risk

Categories of risk – Automotive Model

- Financial
- Strategic
- Hazard
- Operational

Categories of risk – Chopra & Sodhi

- Disruptions
- Delays
- Systems
- Forecast
- Intellectual Property
- Procurement
- Receivables
- Inventory
- Capacity

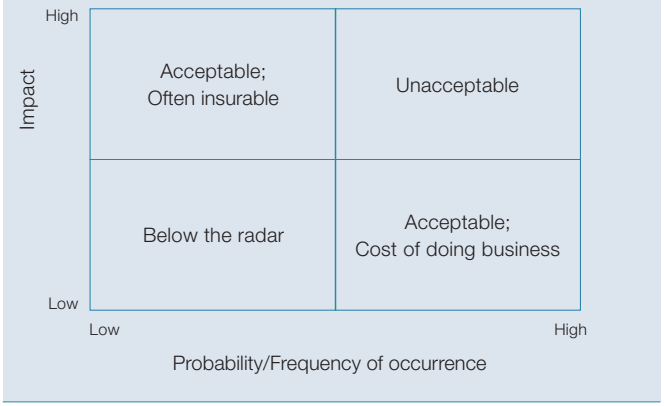
Footnote

1) see glossary on page 74.

The process of addressing the high probability/impact risks involves three stages:

1. Disruption discovery
To reduce or eliminate the negative impact from a Supply Chain disruption, there needs to be an effective means of detection in place. Early recognition of disruptions is vital to risk mitigation. The appropriate systems need to be established to provide consistent and regular updates of key metrics.

1 Supply Chain risk map



2. Disruption recovery
Once the disruption is discovered, an effective means of recovery needs to be established. This can involve proactive options such as buffers, predictive analysis or preplanned scenarios with a variety of options. Another approach is to adopt a more reactive mode, with options such as overtime, premium freight and expediting.

3. Supply Chain redesign
The nature of the disruption and the means of recovery will provide insight into how the Supply Chain could be redesigned in order to make the system more resilient and less susceptible to the risks. This can involve characteristics such as flexibility, strategically placed excess capacity and visibility. In every case, a full understanding of the total Supply Chain costs and tradeoffs is necessary in order to be able to make objective decisions.

Drivers of risk

Every Supply Chain can be defined by a number of key characteristics that drive the risks associated with the chain. These drivers can be described as follows:

■ Supply Chain design characteristics
The design of the Supply Chain will impact the level of risk in the chain. Factors include clustering of suppliers, transportation modes used and numbers of tiers in the Supply Chain.

■ Product characteristics
The product itself can be a risk driver. Factors include complexity of the part, packaging requirements, value of the product, uniqueness of the part and storage requirements.

■ Market characteristics
Market factors can increase levels of risk in the Supply Chain. Factors include: product demand, seasonality issues and competitors.

■ Supplier characteristics
The characteristics of the supply base can also have a significant impact on Supply Chain risk. Factors include supplier location, supplier relation-

ships, capabilities, flexibility and the use of proprietary technology.

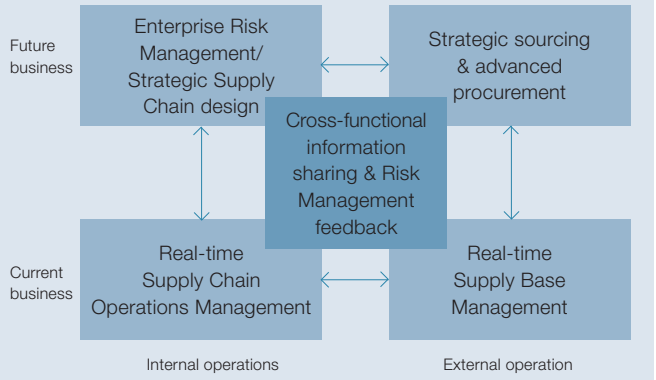
The way that these characteristics drive risk needs to be fully understood in order to design and manage a risk-resilient Supply Chain.

Risk management frameworks

What can managers do to prepare for Supply Chain risks and disruptions?

The approach is a delicate balancing act between inventory, capacity and other mitigation strategies in an environment where Supply Chains are dynamic and fast-changing. The management of risks is a complex process. Individual risks are often interconnected and the actions taken to mitigate one risk could negatively impact another. The challenge to managers is to intelligently position and size Supply Chain reserves without decreasing profitability.

2 Organizational functions with Supply Chain risk management responsibilities



Recent research carried out by the Supply Chain Resource Consortium [5] identified four risk management functions 2 and 18 best practices Textbox 2 that companies can explore to enhance Supply Chain operational resilience and risk management.

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None of the companies surveyed had implemented all 18 of the best practices, nor is it suggested that all 18 are necessary in order to develop an effective risk management program. A few well placed best practices can significantly improve the awareness, resilience and disruption management capability of an organization. Doing something is always better than doing nothing, and a cost/benefit/impact analysis should always dictate the actions and their relative priorities.

Textbox 2 18 best practices for risk management in global Supply Chains

Strategic sourcing and advanced procurement

1. Screen and regularly monitor current and potential suppliers for potential Supply Chain risks.
2. Require critical suppliers to produce a detailed disruption-awareness plan.
3. Include the expected costs of disruption and operational problem resolution in the sourcing total-cost equation.
4. Require suppliers to be prepared to provide timely information and visibility of material flows that can be electronically shared with your enterprise.

Supply base management

5. Conduct frequent teleconferences with critical suppliers to identify issues that may disrupt daily operations and tactics to reduce them.
6. Seek security enhancements that comply with the Customs-Trade Partnership Against Terrorism (C-TPAT), Container Security Initiative, and other initiatives.
7. Test and implement technologies to track containers to enhance global inventory visibility.
8. Conduct a detailed incident report and analysis following a major disruption.
9. Create “exception” detection/early warning systems to discover critical logistics events that exceed normal planning parameters.
10. Gather Supply Chain intelligence and monitor critical supply base locations.

Real-time operations management

11. Improve visibility of inventory buffers in domestic distribution channels at a part level.
12. Classify buffered material by its level of criticality.
13. Train key employees and groups to improve real-time decision-making capabilities.
14. Develop decision-support tools that enable the company to reconfigure the supply chain in real time.

Enterprise risk management/strategic Supply Chain design

15. Develop predictive analysis systems that incorporate intelligent search agents and dynamic risk indexes.
16. Construct damage-control plans for likely disruption scenarios.
17. Understand the cost trade-offs for different risk mitigation strategies.
18. Enhance system-wide visibility and Supply Chain intelligence by using improved near-real-time databases.

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[3] Juttner, U et al. Supply Chain Risk Management. International Journal of Logistics, 2003
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