OUT OF THE UNKNOWN

Industry-leading supply chain risk management

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Agenda

- Supply chain risk in the real world
- Why is supply chain risk management so difficult?
- An example of an advanced approach to supply chain risk
- Practical steps to more effective supply chain risk management
- Discussion
Why is supply chain risk so high on the agenda?

- Research* has shown that the frequency of natural and man-made disasters has risen sharply in recent decades. The cost of these events has risen tenfold since the 1960s.
- Longer, more complex supply chains are more vulnerable.
- Smart phones, YouTube and other technologies can highlight risk events across the globe, rapidly and easily.

*Robust Strategies for Mitigating Supply Chain Disruption
– CS Tang, 2007
We have found that however firms try to transfer or avoid supply chain risk, much of it is retained and must be managed.

<table>
<thead>
<tr>
<th>Transfer risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tolerate</td>
</tr>
<tr>
<td>• All risk in this category retained, by definition</td>
</tr>
<tr>
<td>• May be difficult to assess exposure / value of the risk</td>
</tr>
<tr>
<td>• May be difficult to price risk into sales contracts</td>
</tr>
<tr>
<td>Pass to vendor</td>
</tr>
<tr>
<td>• Ts &amp; Cs are sometimes not clear (battle of forms) or recorded</td>
</tr>
<tr>
<td>• Vendor’s balance sheet / insurance scaled to their business, not yours</td>
</tr>
<tr>
<td>• May not be economic to transfer to supplier</td>
</tr>
<tr>
<td>• Liquidated damages must be quantifiable</td>
</tr>
<tr>
<td>• Reputational risk is not transferable</td>
</tr>
<tr>
<td>• Boundaries of responsibility may be disputed. May require legal action</td>
</tr>
<tr>
<td>Pass to customer</td>
</tr>
<tr>
<td>• Many risks cannot be passed forward</td>
</tr>
<tr>
<td>• Customer may be buying specifically to transfer risk to you</td>
</tr>
<tr>
<td>• Boundaries of responsibility may be disputed. May require legal action</td>
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</tbody>
</table>

| Insure - Contingent Business Interruption |
| • CBI triggered only by physical loss |
| • Restricted to named suppliers and FLEXA (at most) |
| • Low sub-limits – only increase sub-limits with a lot of data |
| • Tier 1 only |
| • Reputational risk is not insurable |

| Avoid |
| • Could require major change of strategy |
| • Potentially high opportunity cost or direct cost |
| • Likely to require a quantitative business case |
| • Not all avoidance strategies are effective (e.g., Weetabix) |

| Mitigate |
| • Potentially high opportunity cost or direct cost |
| • Likely to require a quantitative business case |
| • Not all mitigation strategies are effective (e.g., cigarette papers) |

Regardless of the risk strategies adopted, solid risk data and management are vital

- A high proportion of risk is always retained by your business
- Risk data is required to inform all risk treatment / transfer
- Risk treatment and transfer are costly, and should be optimised
- Risk information supports an agile response to risk events when they occur.
Research shows a gap between the SC risk capabilities that most companies have, and the capabilities they need

Our own discussions and survey (right) indicate that most businesses have immature approaches to SC Risk

- At best, most businesses monitor only financial risks, for their largest $n$ suppliers
- Risk information is stored in different systems, without a means of combining or interpreting it
- A traffic light (red / amber / green) system is used to score risks, with a default to “amber” in the absence of information

Meanwhile, the need to act is building

- **Allianz 2013 Risk Barometer** rated “Business Interruption, Supply Chain Risk” the top area of risk, above Natural Catastrophes, Intensified Competition, Qualify Deficiencies, and Eurozone Breakdown

- **Commercial Risk Europe Risk Survey** - 52% of respondents said they were “very concerned” about continuity of supply from direct suppliers, and 36% were “somewhat concerned”. 21% had experienced a material supply chain event in the past 2 years.

- One car manufacturer we are working with has had 12 supplier bankruptcies from January to May 2013
WHY IS SUPPLY CHAIN RISK MANAGEMENT SO DIFFICULT?
A robust process is not enough to drive effective supply chain risk management. There are formidable practical challenges to overcome at each step.

Conventional risk management typically follows three steps:

1. **Identify risks**
   - Identify the events which, if triggered, will cause problems.

2. **Assess and prioritise risks**
   - Assess the probability of occurrence and the severity of impact, and prioritise each risk.

3. **Manage risks**
   - Transfer, avoid, mitigate or accept risks, and monitor them.

When applied to the supply chain, each of these steps presents formidable challenges:

- Supply chains are often larger and more complex than they appear, making risk identification difficult.
- Given incomplete information, risk assessment using simple Red / Amber / Green scoring of risks creates a false sense of security.
- The lack of robust analysis makes it difficult to justify any risk management action which costs money.
Supply chains are often larger and more complex than they appear, making risk identification difficult

Recent history shows that supply chain risks often emerge from lower tiers of supply (that is, suppliers’ suppliers, or their suppliers)

The challenge for supply chain managers is that the number of firms involved in any given supply chain grows exponentially through the tiers of suppliers

Also, suppliers are often reluctant to share information about their own suppliers with the customer

It is not surprising that firms know little about their supply chains, or the associated risks, beyond Tier 1

**Merck’s Xirallic plant at Onahama, Japan** is a Tier 4 vendor for most car manufacturers, but when it was shut down by the tsunami in 2011, it disrupted global automotive assembly for 6 months.

When **Tesco** discovered horsemeat in some of its products, Tesco’s technical director said: “It was impossible to check the supplier in Poland as we didn’t know it existed.”

When **Findus** discovered horsemeat in its beef lasagne, it alleged that the horsemeat was entering the supply chain via a Tier 3 supplier in Romania, by way of Spanghero and Comigel.
Given incomplete information, risk assessment using simple red / amber / green scoring creates a false sense of security

- Supply chain risks are often scored using simple ‘traffic light’ or red / amber / green indicators

- In a multi-tier supply chain, information is often scarce. And this results in over-use of the ‘amber’ score

- Our experience is that over-use of ‘amber’ scores leads to systematic under-estimation of risks

- Vague interpretations of risk indicators also hamper risk assessment
  - For example, is it less risky if a company is family-owned or a PLC….?

### A classic “Traffic light” risk assessment

<table>
<thead>
<tr>
<th>Ref</th>
<th>Category</th>
<th>Risk</th>
<th>Potential impact</th>
<th>Completed/ Mitigation Action (on deck)</th>
<th>Impact</th>
<th>Action Plan</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Category 1</td>
<td>Risk 1</td>
<td>High</td>
<td>Implement new training programs</td>
<td>High</td>
<td>Implement new training programs</td>
<td>Notes</td>
</tr>
<tr>
<td>2</td>
<td>Category 2</td>
<td>Risk 2</td>
<td>Medium</td>
<td>Perform regular audits</td>
<td>Medium</td>
<td>Perform regular audits</td>
<td>Notes</td>
</tr>
<tr>
<td>3</td>
<td>Category 3</td>
<td>Risk 3</td>
<td>Low</td>
<td>Monitor supplier performance</td>
<td>Low</td>
<td>Monitor supplier performance</td>
<td>Notes</td>
</tr>
</tbody>
</table>

- Identify risks
- Assess and prioritise risks
- Manage risks
The lack of robust analysis makes it difficult to justify risk management steps which cost money or time, or limit options

• Many (although not all) of the steps recommended to manage supply chain risks cost money, or conflict with other aims of the business
• Without a robust risk evaluation in place, it is impossible to assign a value to the avoidance or mitigation of a risk
• Hence mitigations either can’t be justified, resulting in business inertia, or the wrong ones are chosen, leading to false reassurance
  • Should every food retailer own its own farms to provide total visibility of its supply chain?
  • Should manufacturers only source locally?

Risk management often involves trade-offs
In a recent report* Zurich, a leading supply chain risk insurer, proposed risk management actions including:
• Reducing global sourcing and outsourcing
• Adding multiple suppliers for a given item
• Adding inventory
• Adding redundancy
• Reducing reliance on just-in-time systems

AN EXAMPLE OF AN ADVANCED APPROACH TO SUPPLY CHAIN RISK
Working with an automotive client, we have developed an approach which overcomes challenges at each stage of the process.

**Identify risks**
- Visualise complex inter-dependencies
- Target key unknowns

**Assess and prioritise risks**
- Make sense of data, models and expertise
- Analyse probability and uncertainty
- Support informed stakeholder dialogue

**Manage risks**
- Demonstrate the business case
- Implement key actions
- Maximise stakeholder buy-in

**Benefits to the business**
- Avoid costs of risk
- Avoid reputational damage
- Reduce costs of risk mitigation

Avoid wasted research
Speed up the process and minimise errors
Deliver assured decisions
Enable agile response to future developments
We **identify risks** based on what the business knows – not what it thinks it knows

Often, supply chain risk assessments are vague about uncertainty, leading to under-estimation of risks
- Supply chain risks are often scored using 'traffic light' or red / amber / green indicators
- In a multi-tier supply chain, information is often scarce. And this results in over-use of the 'amber' score
- Our experience is that over-use of 'amber' scores leads to systematic under-estimation of risks
- Vague interpretations of risk indicators also hamper risk assessment

A classic “Traffic light” risk model

PA’s approach fully accounts for uncertainty, highlighting where it exposes the business to risk
- PA’s PerimetA toolkit uses Italian Flag graphics and state-of-the-art algorithms to analyse uncertainty as well as probability of performance
- The level of uncertainty, represented by white in the “Italian Flag”, can be used to prioritise research towards areas of risk with highest impact

PA’s “Italian Flag” graphic presents results in an engaging way
We bring rigour to the **assessment and prioritisation** of risk, through multiple tiers of the supply chain

PerimetA calculates how risk “propagates” between different elements of the supply chain

- Supply chain risk indicators can be tailored for your specific business, but may include variables such as location, financial status, and management behaviour. PerimetA rigorously calculates how each risk indicator will affect the supplier’s overall risk status, and also shows the extent of uncertainty
- PerimetA can also calculates the impact of risk and uncertainty at one tier of the supply chain on the tiers above. We can model these interactions for as many tiers as necessary

![PerimetA diagram](image-url)
Our approach creates actionable insights to help manage risk

Our risk model supports a risk management process which is both practical and effective:

- Bringing relevant information into one place
- Visualising key risks against business KPIs
- Enabling drill-down to root causes of risk issues
- Supporting collaborative solutions and negotiation with suppliers
- Quantifying the value of risk mitigation and the business case for better risk management
- Understanding the effects of mitigating actions, and how they interact with other variables
PRACTICAL STEPS TO MORE EFFECTIVE SUPPLY CHAIN RISK MANAGEMENT
Not all of you will need or want to bring in consultants… so what can you do?

- Consider all of the different dimensions of risk
- Consider the risk indicators you are monitoring. Is your interpretation robust?
- If information is incomplete, don’t assume the risks are “Amber” – are there any major knowledge gaps you can research and fill in?
- Avoid relying on spend as a proxy for the importance of a supplier to your business
- Consider risk through the supply chain – not just at Tier 1
- Don’t assume that you are alone – the largest firms and governments are frequently taken by surprise
- Empower staff to respond quickly …. The ability of the business to minimise the impact of risks after they have occurred is often important

Dimensions of supply chain risk

**Operational** – disruption to supply – e.g., natural disaster

**Strategic** - Lasting impact on overall business – e.g., theft of IPR

**Quality** - Affects production, product or service – e.g., contaminated materials

**Compliance** - Impact on reputation, ability to trade – e.g., dealing with businesses which are breaching sanctions

**Financial** - Impact on revenue, cash flow, profit – e.g., commodity price movements
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