

Contents

- Introduction
- The modern global supply chain
- Understanding and assessing supply-chain risk World trade flow
- Top-down risks

Political

Economic

Social

Technological

Environmental

Legal

Focus on solutions not causes

6 Bottom-up risk: Business impact analysis

Identify key suppliers by volume and profit

Focus on your customers

Consider high-impact vs high-likelihood events

What would be hardest to replace?

Next steps: linking supply chain risk to business continuity planning

10 Business Continuity Planning

The strategic crisis management plan

BCP for smaller companies

Resources for creating your own BCP

BCP for larger companies

Maintaining the plans

Insurance protection for your business

Property and business interruption insurance

Product liability

Case study: Food manufacturer

Contracts and the transfer of risk

Shipping and transport risk

- 18 Post event: what if the worst happens?
- 19 Conclusion
- 20 Credits
- 20 Further resources
- 20 Further reading

Introduction

QBE specialises in business insurance. We work closely with companies to protect their businesses and make their ambitions possible. Increasingly, we are helping customers to understand, manage and mitigate the risks in their supply chains.

Supply-chain management is inherently complex, especially in an age of Brexit uncertainties, increasing protectionism and global political upheaval. Supply-chain risk is hard to quantify. Within a company, one person alone rarely takes responsibility for it. The risk manager may be the owner of the business continuity plan, but the needs of the procurement, operations and distribution teams also have to be included. Finally, each business's leadership is likely to have strong views on costs and supply that affect how the chain is managed.

Companies struggle to pull these strands together. In this guide we offer a clear way to understand and manage the risks in your supply chain in a cost-effective and sustainable way. Good risk management requires strong leadership. If you lead a business that has yet to analyse the weaknesses in its supply chain, we hope this guide will show you how to protect your company, your customers and your future profitability.

Matthew Crane

Executive Director of Market Management **QBE** European Operations

Today it is supply chains rather than businesses that compete.

Professor Denis Kobzev.



The modern **global supply** chain

Understanding and assessing supply-chain risk

In the past 40 years, benign world trading conditions and technological revolution have caused a significant shift in global supply chains, with more operating across international markets. Not only do companies seek new customers farther afield, but increasingly they are also finding new sources of supply, leading to globalisation of supply chains as well as distribution. Almost all bluechip companies now have a global infrastructure and diversify their supply chains accordingly.

The main reason for this is cheaper manufacturing capacity, particularly in Asia but also in South America. This is supported by improved communications and transport links, which make it possible to find suppliers in many locations around the world. Meanwhile lowered trade barriers mean that goods can be moved more cheaply and easily. This has made supply chains more dynamic; it is easier for businesses to change suppliers if they can look around the world for an alternative.

While this dynamism is the reality for today's supplychain managers, it brings with it changes in the nature and level of risk

In the modern world supply chains dictate business costs. A recent report by management consultants McKinsev said: "A supply chain often defines the final costs to the consumer of a product, and affects how much money can be reinvested by a company to fund future product development." 1

So supply-chain failures can have serious consequences for a business, such as:

- Interrupted production due to shortage of raw materials
- Failure to meet contracts
- Production of low-quality, faulty or even dangerous goods.

These can result in:

- Product recall
- Damage to brand and reputation
- Financial failure.

These kinds of issues can, and regularly do, bring down successful enterprises, so you need to know what risks you might face and have a plan to handle them.

Initially, supply-chain risk should be examined in two ways. First assess **external risks**. How might the outside world unexpectedly affect your business? What are the external risks, such as political upheaval or environmental change? Alongside this you should undertake a bottom-up

analysis of your own business to identify individual or internal risks such as:

- What are your key raw materials
- Where are your potential manufacturing bottlenecks: if you can't ship products without packaging, for example, then packaging is a bottleneck
- Where your suppliers source their raw materials.

A supply chain often defines the final costs to the consumer of a product, and affects how much money can be reinvested by a company to fund future product development.

World trade flow

Supply chains are an essential part of international trade: the top export routes of seven major nations show where the money is flowing and how important each trading partner is to that country.



Top-down risks

The main external factors that could harm your supply chain can be grouped under the following political, economic, social, technological, environmental and legal (PESTEL) indicators:

Political

Political risk depends on the location, not only of your business, but of your suppliers and customers. A supplier based in a country with a history of regime change and political upheaval must be a severe risk. If you rely on raw materials available from only one or two sources worldwide, you need to understand clearly how long you can withstand a shortage or shutdown, and how you might mitigate this through inventory control, a purchasing programme or a product redesign.

British businesses currently face extreme political uncertainty as Brexit approaches. Combine this with increasing levels of protectionism, notably in the US, and political risk has changed enormously in iust two years.

Economic

Economic factors are the hardest to predict. An economic slowdown would affect most UK businesses. However, what about a major fluctuation in exchange rates or a change in export/import tariffs? How vulnerable are you to tax changes? More importantly, how vulnerable are your customers and suppliers to these factors? Identify the one or two most important economic factors that might affect your customers, your suppliers and yourselves, and mark them as red-flag items, for an immediate response.

Social

Social factors are most easily defined as changes in buyers' behaviour that could affect your supply chain. One example is the change in suppliers' behaviour in the 1990s, forced by consumer objections to child labour, low wages or dangerous working conditions. Your company's own conscience, and the ethical and environmental views of your customers can affect how you relate to suppliers. You will need to know their views and take action to avoid being caught up in these problems.

Technological

Technology drives almost everything we do these days, but specific supply-chain technology issues must be considered. Alongside the matter of how much you depend on a particular software, you need to ask serious questions about your suppliers' technological resilience and back-up plans. If your factory is run entirely by a robot pick-and-pack team, it will have to shut down during a power cut or if the system's computer crashes. How much resilience is built in?

What are the essentials to keep your operations running and customers supplied? Where are your servers backed up? What is your contingency plan if power, water, broadband, phones or lights fail?



Bottom-up risk: Business impact analysis

Responsibility for assessing risks in the supply chain sometimes falls between different groups. While companies may be acutely aware of supply-chain costs and are likely to watch these closely, they may not take a similar approach to risk. This can lead to a disconnection between the work of the risk manager and the operations or procurement team (which will focus primarily on cost control). Supply-chain risk can be managed properly only if the business and its risk managers are aligned. A healthy approach to supplychain risk also requires input from a senior figure in the husiness

It is estimated that 40% of British businesses do not have any information on who are the players in their supply chain beyond the first or second tiers. Professor Denis Kobzev, director of business education at Leeds Trinity University, says:

"The business may not realise how complex and extended its supply chain is."

They may also be put off by the complexity of compiling this information and stop at first-tier suppliers.

Identify key suppliers by volume and profit

"You actually get to understand your business better and you can help grow understanding by mapping the supply-chain process."

Julia Graham, Deputy CEO, AIRMIC

So where to start? First assemble a well-qualified team. with input from procurement, operations, finance and risk management, then work on your business impact analysis. It will need a customer-led approach:

- Identify the value of each of your business's activities by volume and profitability
- Assess the impact of an interruption to delivery of products or services
- Examine the impact this would have on you and your customers.

This should help you to understand how much you depend on suppliers for each activity.

Adrian Simmonds, a QBE senior risk manager, says:

You need to look at the risk level associated with each component or raw material that you need for your manufacturing and sales processes. Consider how many of your finished products each raw material affects."

For example, packaging and labels may seem minor, but most companies cannot ship products without them.

Once this study is complete, create a matrix of your critical raw materials and all your main products. That means the key ones - those that are single source, highly profit-driving or hard to replace. This will show how much each product is affected by each key raw material. This can then be repeated for profitability to let you understand how much profit is linked to each product and key component.

Now you can shorten the list and focus on mitigating key risks - perhaps only 10% of those identified.

Focus on your customers

A similar process could also be undertaken to understand and protect main sources of profit. By first identifying which customers deliver the most profit, a business can plot its supply chains from suppliers to final delivery. This will allow business managers to understand where the greatest risks lie to delivering on customer promises and to determine what is required to protect those key profit streams.

Consider high-impact vs high-likelihood events

Mr Gregory further suggests looking at high-impact and high-likelihood events. High-impact events might include the complete loss of a manufacturing resource or a large batch of products. High-likelihood events may affect only one area of your business, or last for only a short time - a power cut, for example. They should be planned for carefully, so you do not lose a whole day's production.

Planning for high-impact events can be harder. Many companies get fixated on identifying every possible cause of a high-impact event. Sean Bell, practice leader for property risk solutions at QBE, says:

"You will do all you can to prevent or mitigate credible events in your business or location, such as fire, explosion or flood, but here we are talking about the 'what ifs'. Don't focus on the possible cause of the event, but its consequences. Make yourself as resilient as possible by planning your mitigation."

Whether losing three months' stock is down to piracy in the Gulf, a lorry fire or flooding in a warehouse, the question is the same:

"How can I replace the stock and retain my customers?"

This is where mitigation planning before the event has to be at its best



Next steps: linking supply chain risk to business continuity planning

At the end of the analysis, you will have assessed risk by volume, profit contribution, key customers and likelihood. You should be able to create a diagram like this:

Key risks - volume linked	Key risks - value linked	Key risks - major clients	High-likelihood risks	High-impact risks
ie critical to above 50% of product	ie critical to over 40% of profit	Dependencies for key clients, ie transport if delivery timings are critical, or sole user of a particular raw material	Eg loss of power, water, a known hard-to-source component, technology downtime	Loss of a production site or key manufacturing equipment
1.	1.	1.	1.	1.
2.	2.	2.	2.	2.
3.	3.	3.	3.	3.

This is where supply-chain planning can fail. Having assessed your supply chain and understood your biggest risks and weaknesses, you need to move this into two areas:

- 1. Operations
- 2. Business continuity planning

With the report in hand, the company should consider:

- How to fill the supply gaps identified as the biggest risks
- How to develop an effective early warning system that identifies when supply shortages could occur.

Typically, a combination of operations, procurement and risk-management teams can identify the risks, but it will usually require input from senior management to ensure the required changes happen. Operations will have to create an early warning system. Board approval may be needed to fill critical gaps in supply. These will be serious decisions, sometimes involving buying in bulk from competitors or, in extreme cases, even acquiring companies.

Meanwhile, some of the risks identified, including all the high-impact ones, have be put into a formal business continuity plan (BCP).



Business Continuity Planning

The strategic crisis management plan

With your supply-chain analysis in hand, the next step is a high-level, written strategic crisis management plan, designed to avert crisis. It is different to the main BCP because it defines strategy rather than the operational "how" and will guide the business on ways to manage extreme variations in supply and demand.

The strategic plan needs to be held at board level and gives high-level approval for tackling major issues. For example, if a supplier fails, it may let the management team release money to buy more expensive replacements for a short time. It may authorise them to switch suppliers, change a product's components or run down stocks below normal levels while they wait for supply to resume.

This type of plan may need creative thinking outside normal working methods. Can you temporarily team up with a competitor, or use the facilities of an allied business? Can you use downtime effectively by bringing forward annual site closures for cleaning and housekeeping? The plan should also contain clear markers for when to trigger extraordinary activity.

Once the board has set a supply-chain management strategy, extraordinary tactical and operational planning is held in the operational recovery/continuity plan usually known as the BCP. It will guide managers on how to act in a crisis. For example, it could say that "if the board chooses to purchase stock from competitors. we will need to..." The BCP is your "how-to" plan, so it needs to be tested and checked against how your business is really run.

Supply-chain failures come in two types. The first are sudden - fire, flood, power loss - and instantly stop supply. The second are more insidious, for example, a creeping shortage of critical parts caused by an unseen failure down the chain. To spot this you need to have advance measures in place.

QBE's Adrian Simmonds recommends that, as well as the BCP, your procurement team should have ways to spot if failures are starting.

"For example, if a supplier fails to deliver once, flag it. If they fail twice, that needs a red flag. If they fail to deliver three times, pick up the phone and investigate."

You don't need this level of checking for every raw material, but the key items in your supply-chain analysis do require this kind of scrutiny.

BCP for smaller companies

Business continuity planning needs to grow with your business. This is true not just of the scale of planning, but of how the plan adapts to a changing business. If you grow rapidly you will regularly need to add new customers, manufacturing sites and products into the plan.

However, you can start small. If you are a small-to medium-sized business with turnover under £50 million you can begin the process yourself, in-house. Take small steps - don't try to eat the elephant all at once. Break the work down into chunks and consider who has time - and most importantly the skills - to work on it.

Once you know the size of the task and the resources you have to undertake it, you can decide what to do yourself, where you might need external support and what budget you will need.

Most of our experts agree on one piece of advice for a small company thinking about continuity planning: "Don't put it off. Start today."

Resources for creating your own BCP

There are several helpful resources to get you started in resilience planning.

RISCAuthority is an annually-funded research scheme that uses some of its resources to produce best practice advice for insurers and their customers. Its website features free business continuity templates, as well as ROBUST, its free-to-use business continuity and incident-management planning software. There is also a library of risk reports, with guidance on the most common insurance claims in particular industries and how to avoid them. You can use these to identify and quantify your own risks.

If you want something more informal, RISCAuthority also has interactive PDF templates, which can be used to create a BCP report.

These can all be found at www.riscauthority.co.uk

For a more detailed overview, the Business Continuity Institute (BCI) publishes Good Practice Guidelines, the most widely-known independent body of knowledge for good business continuity practice worldwide. It includes terminology from ISO 22301:2012, the International Standard for business continuity management systems. The guidelines can be purchased and downloaded at www.thebci.org

The BCI's Online Incident Simulation Game, BC24 is another useful tool. With data from 4,000 teams, it takes only 10-15 minutes to play and allows informal benchmarking. The game gives understanding of the likely questions to arise during a crisis and the decisions needed. It also highlights the impact of decisions made in one part of an organisation on other areas and the need to make decisions quickly.

BCP for larger companies

Larger businesses, with turnover above £50 million and more complex organisation and production, may need external expertise. Many companies of this size will already have a basic plan, which contains contact details for key staff members, but may lack the business impact analysis, which links through to supply-chain risks.

Without an external consultant, a company may not understand its own critical recovery points. A consultant will take a systematic approach, helping you to build up a full business continuity plan and create a list of critical recovery points for high-impact events before they occur.

The **Business Continuity Institute** website has a list of qualified consultants and is a good place to begin to find one of the many companies and freelancers who can help to develop your BCP.

Insurers are becoming more focused on resilience planning, offering extra support for large companies. In-house risk managers work with customers to check and improve their business continuity plans, and can advise on how they have been developed and what benchmarks were used. If you work with your insurers, they will want to know how your plan is maintained and how key risks are managed. Evidence of good resilience planning can make policy renewal simpler, smoother and more cost-effective. Major insurance brokers are also an excellent source of support and will generally have consultancy teams with in-depth BCP and training expertise. They will understand corporate strategy, enterprise risk management and strategies for resilience planning, key customers and understanding the supply chain in detail.

Maintaining the plans

Once your planning is complete and your early warning system in place, it must be kept up to date. Dominic Louks, of RISCAuthority, advises integrating the supplychain risk assessment with other risk-management activities. Because of the changing nature of supply-chain risks, he says, organisations need to:

- Establish a repeatable process for analysing and monitoring the supply chain
- Keep the analysis up to date and identify opportunities for continuous improvement
- Identify individuals responsible for the review and build it into the management process
- Build supply-chain continuity management into procurement.

Within a BCP that assesses the supply chain, you need a way to update details of key contacts and suppliers. This should be done every six months. Every time you adjust your sites, supply chains or products, parts of your BCP will have to be updated. The plan should also be tested in an exercise at least once a year. Depending on the type of business, this can be done by means of a desktop exercise, or something more elaborate, such as a live scenario. Testing the plans is an opportunity to identify the strengths of your response and areas for improvement. For larger businesses, it is recommended that the plan be tested with the support of a third party for example your insurer.

Insurance protection for your business

Once you understand what creates risk in your supply chain, you can implement risk management strategies (dual source, emergency supply contracts) to reduce some exposures to a level you are comfortable with. However, where you feel the risk is too large to keep on your balance sheet you need to look at risk transfer options starting with insurance. The cover to protect you and your supply risk comes in several types, shown below.

A key protection is your property insurance policy, which may include business interruption cover. This can protect against catastrophic interruptions of supply caused by a range of perils, such as fire, explosion and, where cover extends, broader all risks events including windstorm, flood and earthquake. You can also insure against product liability issues and shipping and transport risks with liability and marine policies respectively.

The sections below look at some areas of cover. The final section, on protection, looks at how to use contracts to eliminate some supply-chain risks completely.

Property and business interruption insurance

Every business should have a good property insurance policy that includes business interruption cover. A key consideration is how long you are covered after an interruption, reflected in the maximum indemnity period you choose. Is there enough time - in the worst case - to source critical machinery, to rebuild from scratch on your current site or to relocate and start operations elsewhere? Are you covered for interruptions caused by failure of your own suppliers? Cover is generally available for direct supplier risk; for major exposures it is imperative you seek protection on a named supplier basis where the risk can be underwritten and agreed limits negotiated accordingly. You can also secure some cover for unnamed suppliers generally for a modest limit and with cover restricted to FLEXA perils (fire, lightning, explosion/ and aircraft damage) only outside of the UK.

Ensuring that you get your property insurance right is a collaborative effort. You should seek advice from your broker and discuss cover with your insurer. If your business is particularly at risk, it may be worth asking the view of a loss adjuster who has experienced many business property insurance claims and can advise on risks you may not have thought about.

Product liability

Businesses often think that business continuity is all about property insurance, but this is only part of the story. In fact, more business interruption claims are made on product liability policies than on property policies.

Product liability insurance is usually provided along with employer's liability and/or public liability. Product liability insurance covers against third-party injury or damage as a result of a faulty product. In essence, it protects against most quality issues that can be caused by supply-chain risk, apart from damage originating in your own manufacturing process.

Product liability insurance also provides protection in the event of upstream supply-chain failure. If you are the producer, wholesaler or retailer of a faulty product, that claim is covered by this policy.

When buying product liability insurance, it is important to tell your broker and insurer about your supplier risks. If your supply chain depends on new and developing economies, it can create a greater insurance risk. You must ensure that your product is fit for purpose and safe to use. You must either ensure that your supplier has quality assurance procedures or test the product yourself to see that it complies with local safety standards.

You will need to know the product safety standards within your sector. These vary from industry to industry. Keep up to date with legislation affecting your business and pass this information to your suppliers. Work with them to meet the standards you need, rather than trusting them to know what is required, especially if they are abroad. The Health and Safety Executive and industry organisations will help. Use their knowledge and read their publications.

Jim Sherwood, a partner in law firm BLM, says:

"The complexity of the safety regime and testing environment should go hand in hand with the risk profile of the product. For anything with an inherent risk, the law has a risk-based approach."

He suggests asking yourself:

"Do you have a risk-based approach to the products you are dealing with?"

If not, should you?

Under the Consumer Protection Act, 1987, if you supply a consumer with something imported from outside the EU, you are deemed to be the producer. Equally, any product imported from outside the EU may come from a legal regime where you may find it hard to gain redress or compensation.

Case study: Food manufacturer

A protected supply chain

In 2005, a British food manufacturer had to recall more than 350 types of foods, ranging from pizza to pot noodles, after a banned ingredient was found in a batch of chilli powder.

Sudan 1, a red dye used to colour solvents, oils and waxes and linked to increased rates of cancer, is banned in foodstuffs in the UK and the FU.

The company was the victim of "food fraud", and did not know its products contained Sudan 1. As a result, it escaped censure by the Food Standards Agency and won praise for its innovative response to the incident, which included a major independent review of the circumstances of the supply of the illegal product.

The brand survived the incident, despite the £100 million cost of the recall, because it neutralised the risk to its reputation and avoided any financial risk, via well-planned contractual and insurance provisions.

Its contracts specified that some costs of the recall must be borne by suppliers. The company also had product liability insurance which covered costs that could not be recovered in this way.

The company continues to trade a decade after the scandal and remains a major food supplier in the UK.



Post event: what if the worst happens?

"The best reaction to a loss is where all parties, management, broker, insurer and loss adjuster genuinely work as a team on behalf of that business."

Steven Nock, CILA council representative business interruption special interest group and head of CFAS, Crawford and Company UK Ltd

The final part of this report considers how you should act if the worst happens. Even if you have a full BCP in place and follow it closely, there are ways to improve things for yourself and your customers after an incident.

First, prepare to work closely and in partnership with your insurer. They are most likely to appoint a thirdparty loss adjuster, and between them will probably have a good deal of useful experience about how to minimise business interruption. Use their skills and advice, and work together to find ways to get stock to your customers. Take your ideas to them and listen to them. Involve your broker, too.

Steven Nock says damage-based business interruption insurance normally includes provision to protect the business and avoid loss of gross profit. In some cases, the insurer might support the buying of materials from a competitor to supply to your customers, even at a short-term loss. He says:

"In almost every case a B2B business will see retaining customers as one of their biggest concerns, and we would work to support them in doing that."

Mr Nock has even seen a case where an insured company bought a rival business, with their insurer's support, to provide manufacturing capacity. He says businesses must consider moving into alternative sites, renting a site or outsourcing to keep production going, and that this is within the scope of most business interruption policies.

If you come up with your own plan without working closely with your insurer, they may not buy into your ideas. This can lead to an unhelpful "them and us" approach. If the insurer and adjuster agree your recovery plan in advance, the team is all in it together. If the worst happens, work with your insurer to make the best of the situation. Use their experience and remember they are on your side.

Conclusion

You and your business depend on suppliers. In turn, your customers depend on you. Managing a business well means delivering on time and on budget. But managing a supply chain is not just about cost. It is also about resilience, dodging avoidable bumps in the road and having a plan ready to mitigate unforeseen disasters.

While supply-chain risk can be extensive, it can be controlled by:

- Taking time to understand your own risks
- Protecting yourself contractually
- Investing in a proper business resilience planning exercise to make sure you have a current risk assessment, a strategic crisis plan and a fit-for-purpose continuity plan
- Being properly insured.

If you follow the steps outlined in the report, your supply-chain risks will be - as far as humanly possible documented, visible and protected.

In a world of global supply, those who plan properly are the ones who succeed.

Credits

Thanks to the following experts who gave their time and shared their expertise on supply-chain risk management with the authors of this report.

Jim Sherwood, Partner and Head of Product Liability and Recall. BLM

Denis Kobzev, Professor and Director of Business Education, Leeds Trinity University

Deborah Ritchie, Editor, CIR Magazine

Steven Nock, CILA Council Representative, Business Interruption Special Interest Group and Head of CFAS, Crawford and Company UK Ltd

Sean Bell, Practice Leader for Property Risk Solutions, QBE European Operations

Adrian Simmonds, Senior Risk Manager, Risk Solutions, QBE European Operations

Julia Graham, Deputy CEO, AIRMIC

Jeff Carr, Director of Client Services, QBE European Operations

Dominic Louks, Manager, RISCAuthority

Further resources

RISCAuthority

www.riscauthority.co.uk.

The Business Continuity Institute www.thebci.org

AIRMIC

airmic.com

AIRMIC has a library of technical publications around risk management, several of which relate to supply-chain risk. All publications are available to download from the Technical Library pages on its website.

Further reading

DHL Business Brief

The three stages of supply chain segmentation

UPS Logistics

Supply Chain Mapping

McKinsey & Company

Expect the unexpected: reduce corporate exposure and create value through supply-chain risk management by Katy George, Venu Nagali and Louise Rassey, 2015

Raconteur Publishing

Raconteur's special report published in The Times on the 'Future of Construction'. You can find the full report here: https://www.raconteur.net/supply-chain-2017

CIR Magazine

www.cirmagazine.com/cir/Supply-chain-disruption-costs-businesses-1m-a-year.php



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