LLOYD'S | wtw

From farm to fork:

Rethinking food and drink supply chains

Part 3: Insurance innovation opportunities

Lloyd's Futureset

Key:

- Client quotes
- Insurance case studies
- Acceleration opportunity with industry partners
- General sector insights

Introduction

Insurance innovation opportunities

The insurance industry has an extensive toolkit at its disposal to help organisations recover from a crisis and build resilience in their supply chains, whether removing risks from company balance sheets, providing advice on risk mitigation and management, or mobilising capital to help them recover quickly from a major disruption. With a legacy perception that supply chain insurance can be difficult to arrange and expensive to purchase, many in the food and drink industry are doubling down on their risk management to reduce their risks.

Helping the industry be brave: building resilience in the Winery Industry with the London Cargo Market

Over the last decade California's winery businesses have increasingly come to the London cargo market for insurance, particularly stock throughput policies. The proliferation of wineries (well over 800 in Napa and Sonoma today) combined with high values and the risk of wildfires and earthquakes have put mounting pressure on the US domestic insurance market. London's decades-long experience in stock throughput, covering the international supply chain for manufacturers, has expanded to include goods (stock) through various stages of production. The journey of a wine grape includes harvest, destemming, crushing, fermentation, aging, and bottling – and can take up to about 5 years[1].

Innovation in the insurance sector – powered by investment and collaboration – will be essential to meet the industry's needs, a point made clear by John Ludlow in a supply chain masterclass held by Lloyd's Futureset in March 2021:

> “Supply chain cover does exist today, but it can often be complex to underwrite and costly to buy. Additionally, these products will need significant development to support supply chain resilience against future systemic risks. Having affordable and accessible product and service solutions will be key to instilling confidence in businesses when facing the future. As an industry we need to develop a wider range of solutions that can fulfil this growing need, but to do this they will need the data to understand the complex supply chain networks that exist and the risks to which they are exposed. I see this as a great opportunity for our industry to work with all stakeholders, businesses, and governments around the world, to develop a greater level of certainty on supply chain resilience amid a world filled with challenges
>
> **John Ludlow, Former Airmic CEO[2]**

To support this, underwriters of all classes can learn from colleagues who focus on business interruption (BI), as well as from industry forums such as the London Business Interruption Association, whose 700 members have been focusing on these issues that can accelerate development. This will be essential to address the concerns and hesitancy that came up during our conversations with insurers, which has been driven by the complexity of historic losses.

There are three key areas where action could be focused to improve engagement with supply chain insurance in the food and drink industry and beyond:

01

Product innovation opportunities:

There are a number of products and solutions available across the market. However these are not often well understood by customers and on the insurer side, extensive conversations and data are often required for underwriters to understand the underlying risk. There is an opportunity to develop new end-to-end supply chain insurance solutions and new ways of sharing risk to help food and drink businesses feel more confident in navigating the uncertain landscape. There is deep expertise in the market that can be used to increase knowledge and support innovation, and attract interest from food and drink businesses in solutions that meet their needs. Current barriers that would likely need to be overcome include: aligning market and customer appetite; reducing the burden of information required from customers; and developing new products that can be accurately and sustainably priced at a point that is attractive to customers.

02

Enhancing supply chain data:

In order to develop both the existing and new product offerings there is a need to improve data. Clear guidance from insurers can highlight what data is needed and where the burden of information can be reduced. This is where partnerships with technology providers, responding to operational efficiencies and market tools and services such as risk management and supply chain diagnostics, can support translation and transmission.

03

Increasing communication to move the dial:

While the pandemic has already driven change, the food and drink industry has invested in new data sources and risk management practices in the face of ongoing global challenges, and there is interest in coming together to explore where action can take place. This is where Lloyd’s, through initiatives such as Futureset, the Lloyd’s Lab as well as the brokers who advise the industry as risk partners can convene stakeholders, support the development of clear guidelines, and challenge preconceptions.

Supply chain insurance overview

Current state of the market

There are several existing products in the market which afford some cover for supply chain risks. The most common of these are business interruption as a coverage within commercial property policies, with suppliers' extensions sometimes included by endorsement to provide contingent business interruption (CBI) cover. Other policies such as political violence, marine cargo, or product recall insurance can also be purchased to address specific supply chain risks, but there is very limited end-to-end, all-risks supply chain cover currently offered by the market.

This is largely due to the complexities associated with supply chain risks and the fact they are so wide ranging in terms of structure, process, and most importantly, aggregation. A company's supply chain starts with the raw materials it (or its own suppliers) orders, and ends at the point of delivery of its end products to customers. The range of risks faced along the entire chain is generally considered too wide to be covered under one policy currently.

Those same complexities make it difficult to identify, assess and quantify risks, hence (re)insurers tend to sub-limit coverage where it is given. Policies can include an unspecified Suppliers' Extension, but generally for a low limit of £1m or £2m, but this can be higher depending on the size of the insured and the premium they're paying for the policy. Specified suppliers in Tier 1 can be covered for higher limits, subject to the provision of Construction Occupancy Protection and Exposure (COPE) information. Coverage for certain perils can also be limited, particularly in specific geographies. Tier 2 suppliers and below are not generally included in the CBI cover, but can theoretically be added on a specified basis, subject to the same COPE information as is required for Tier 1. However as a result of the challenges in assessing the risks for Tier 2 suppliers and below, appetite across the market to offer this cover is generally restricted, both in terms of the limits and perils underwriters are prepared to cover.

COPE information is difficult for insureds to collect from suppliers, but if the cover available in return provided a clear resilience dividend to them, they could make the provision of this information part of the procurement onboarding and renewal process. It also provides food and drink businesses with useful information about the resilience of their suppliers, to support their supply chain risk management processes.

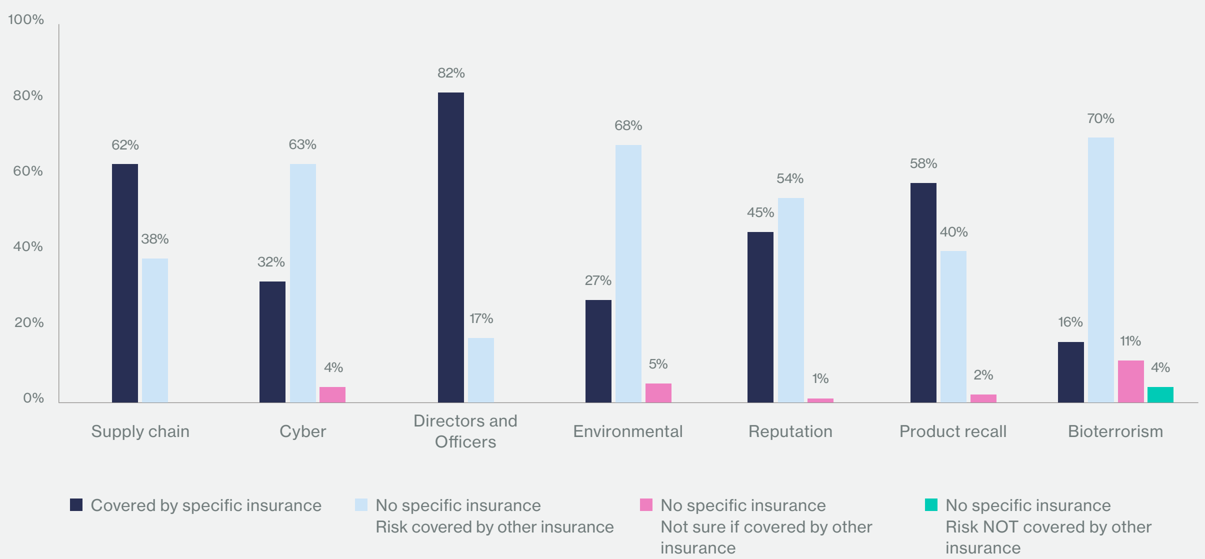
Insurers generally do not have detailed information about the supply chain risk management processes of their insureds. However, for well-managed risks these processes are extensive, and initiating conversations between underwriters and supply chain directors would be a valuable route to building insurer confidence.

Many businesses mitigate supply chain risk as far as reasonably practicable, but there will be elements of risk they can't totally control, e.g. will a supplier of a supplier suffer a property damage loss which takes them out of production for a period? Most businesses will do their best to reduce this Tier 2 and deeper risk as far as possible by identifying secondary suppliers and qualifying their risk management practices. Contingency measures could include actions such as placing suppliers on standby (either formally or by way of reciprocal agreement) or introducing additional buffer stocks.

Customer attitudes towards insurance

When asked about their approach to insurance, global food and drink businesses were found to have at least some insurance to cover their main risk areas. But there is a lack of alignment between the risk factors that respondents said were the greatest threats to business success and the level of cover they have. For example, environmental risks are a key driver of supply chain interruptions and came top of the list of external threats but almost three-quarters (68%) said they had no specific environmental insurance. These risks were believed to be covered by other policies. This figure was 63% for cyber risks, 54% for reputation and 40% for product recall, all of which rank highly as risk factors and can be drivers and consequences of supply chain incidents.

Figure 11: WTW Global Food and Beverage survey insurance approach



There is a clear need to be certain around where coverage exists across policies. As well as awareness of products, increasing digitisation by food and drink businesses and insurers could offer an innovation opportunity – for example, could a minimum set of questions be developed to give businesses clarity, as is the case with cyber, on what businesses need to evidence to meet minimum criteria?

> **“** Placing insurance and getting risks covered is a huge amount of work and time, e.g. just the amount of property and engineering surveys
>
> **Group Treasurer, food manufacturer**

Similarly, risks to brand and reputation were seen as the greatest internal risks to business success, yet 54% said they had no specific insurance for this – an area where Lloyd's underwriters have been driving innovative products. There was a similar disparity in product recall (40%), which also ranked highly as a risk factor.

More than a quarter of businesses (26%) said their insurance only includes physical damage to property in the event of extreme weather, with no cover for business interruption – a key factor in recovery and resilience. While 82% have at least some cover for extreme weather impact to the supply chain, less than a third (31%) are sure that this is sufficient cover. Interestingly, businesses in North America, which

have a high risk of extreme weather events, are among the least likely to have any cover (27%) or to have full cover. These gaps may be related to current market conditions, with pricing (30%) and available capacity (27%) named as the biggest challenges to buying property insurance.

Across our conversations, food and drink businesses tended to only have a high-level awareness of insurance covers available for supply chain risks, typically goods damaged in transit, marine insurance, political violence and supplier extensions (PDBI). Some had heard of trade disruption insurance (TDI) but were unclear as to conditions of cover. Interest in other areas of risk transfer included packaging insurance and new supplier integrity.

Most agreed that awareness is an issue that needs to be addressed in a more meaningful way. Interest in TDI was evident and respondents agreed that demand is likely to rise, if volatility continues to play a role in the world stage, for instance with heightened geopolitical tensions. Vulnerable areas discussed included grain shipments coming out of Ukraine, fertiliser from Russia, a volatile Middle East and the strategic importance of the Strait of Hormuz and Suez Canal, along with potential impacts of political challenges around some of the world's busiest shipping lanes, particularly in Asia Pacific and the South China Sea.

The awareness level is interesting and perhaps indicative of the need to strengthen communications between respective insurance and operational functions within organisations in order to ensure that operational leads such as supply chain managers have clear visibility over what covers are available, what cannot be covered, and potential alternative solutions.

Supply and demand barriers

There are a limited number of end-to-end supply chain products and solutions available across the market. However, there are also a number of key barriers that are preventing growth in this sector:

Supply barriers

- Insurers' appetite for end-to-end supply chain coverage varies, and many will tread cautiously by taking on relatively few customers when approached

- There is limited appetite for Tier 2 and beyond supplier coverage – an area of interest highlighted by food and drink companies. When asked if they would feel comfortable underwriting the risk if insurers received the same information as a mature Tier 1 client, the legacy of past complex supply chain losses continues to persist. This is where partnerships between insurers and insureds to increase understanding will be essential, and where insurers can tap into working forums within the food and drink industry

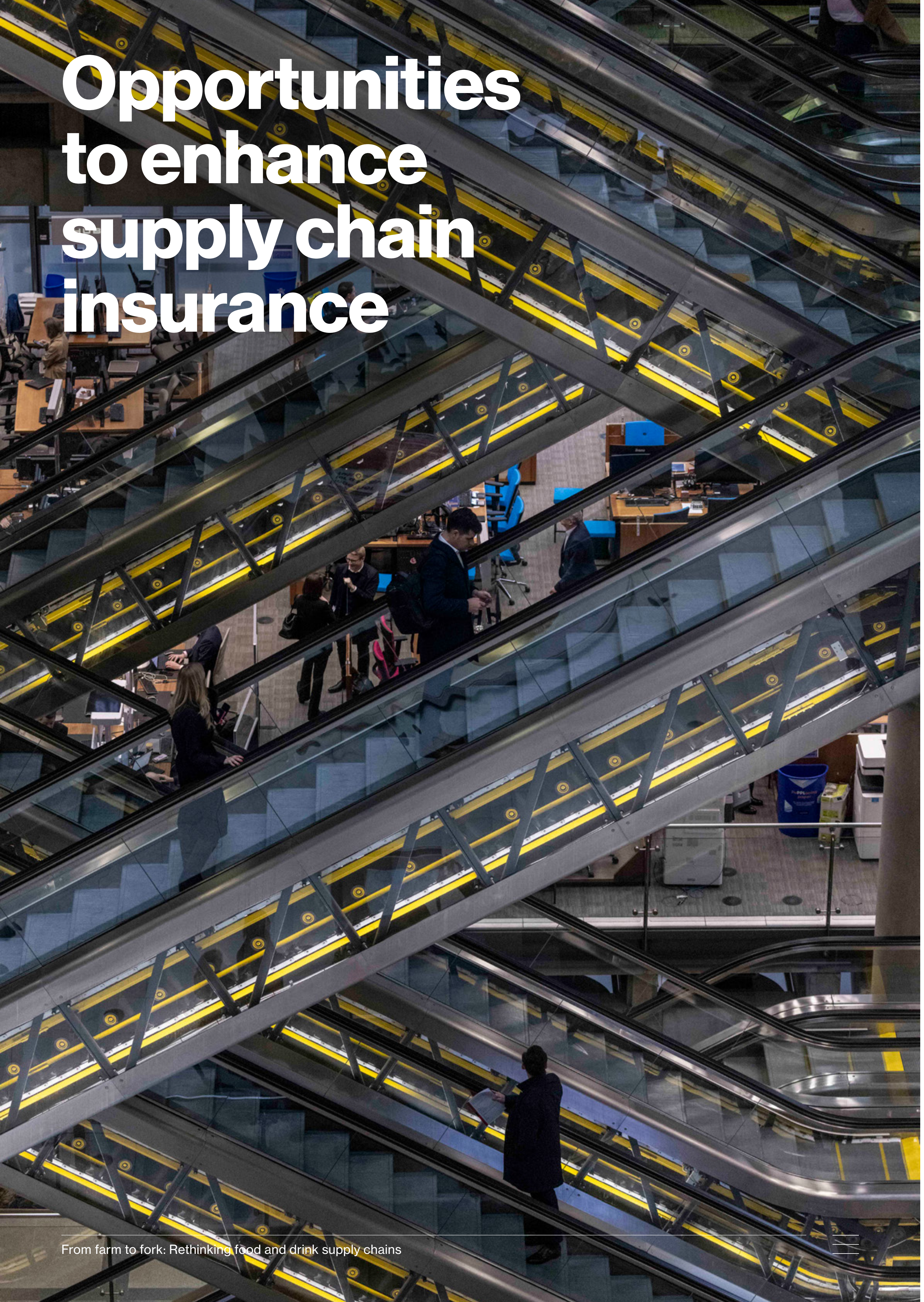
- There is a lack of understanding of the extensive supply chain risk management practices undertaken by businesses in the sector. These have increased in part due to the significantly increased uncertainties following the pandemic and in part to compensate for lack of transferable risk solutions

Demand barriers

- Specialist covers that are available are not widely understood or discussed by customers. There can be a reluctance within the broking community to promote products which in the end may prove difficult to place

- The level of information required to write a risk can be so extensive that the burden of this can discourage customers from pursuing the process

- Customers expect and perceive premiums to be prohibitively expensive, further compounding the issue of food and drink businesses managing their way out of supply chain problem. In the eyes of many, insurance coverage is seen as too difficult, expensive, and time consuming to procure



Opportunities to enhance supply chain insurance

Product innovation opportunities

Positive underwriting features

Our interviews have shown a growing maturity in managing risk and resilience across the food and drink industry. There is clear interest from businesses in the sector in risk transfer products that can meet the challenges that stretch beyond the capacity of their own risk management.

It is also worth noting that these businesses are unlikely to seek ground-up cover to deal with recurrent disruptions and are accustomed to high levels of self-insurance on policies such as property damage and BI. However, cover for major disruptions that cause serious financial loss are seen as valuable.

Opportunity to develop end-to-end solutions

There is an opportunity for the industry to develop new end-to-end supply chain insurance solutions and new ways of sharing risk to give food and drink businesses more confidence in navigating the uncertain landscape. There is deep expertise in the market that can be used to increase knowledge and support innovation, and there is clear interest from food and drink businesses in solutions that meet their needs.

Providing customers with clear guidelines - such as those produced for cyber insurance - on the types of information needed and the questions that need to be answered could help to accelerate the development of such solutions, by creating a clear industry standard set of criteria required by insurers, and giving businesses clarity on the types of information they need to share.

Case Study: How insurers are partnering with proactive businesses on their trade disruption risks: TMK Consequential Loss and Trade Disruption insurance

International trade is the lifeblood of the world economy and has grown exponentially in the past few decades with ever increasing pressure on supply chains to meet tight deadlines. The development of emerging markets means that this trajectory is likely to continue, with accelerated growth in the future.

Tokio Marine Kiln's Trade Disruption Insurance products (TDI) are designed to protect against the many obvious, and not so obvious, risks that international trade is exposed to throughout the supply chain, and are significant enablers for exports, imports and international projects. The cover can be targeted towards loss of profit, extra costs and expenses incurred in delays, and contractual penalties occurring on a pre-defined delivery route from the supplier's factory gate to point of delivery.

Key to the product – which is bespoke and covers a range of perils including political risk and emergency closure or blockage of waterways – is a mature understanding of supply chain risk mitigation and management, and the customer's ability to share that information with their underwriters. Being able to demonstrate how the business has plans for multi-sourcing of supplies, contingency plans to use alternative ports, and stockpiling of critical parts can allow the policy to be structured to respond at the point needed – catastrophic losses that go beyond the robust risk mitigation and company balance sheet – for future unforeseen events.

Opportunities to develop new coverage in specific areas

Examples of specific product innovations are shown below:

Case Study: Exploring innovation opportunities in marine transit disruptions: OTT Risk

Parametric solutions, subject to credible, authoritative and reliable index references, may be well positioned to address supply chain concerns. Traffic data - be it marine, aviation, rail or road - can be used to structure solutions to cover disruptions at key bottlenecks. Where these disruptions can be tied to industry activity indices, or economic indices, insurers like **OTT Risk** are innovating to fill a gap for risks that were previously uninsured[3].

OTT Risk's parametric non-damage business interruption (NDBI) insurance for supply chains helps risk and logistics professionals better manage their exposures through modelling the interwoven risks inherent in supply chains and covering business against large-scale disruption. Coverage focuses on marine-transit disruptions that delay shipments or policies that incorporate the cost of transit - in some cases, combining the two.

Transit Delay Insurance: A baseline transit time is set for a specific route (or regional group) from departure port to arrival port. Insurance pays when companies experience a material and precipitous increase in this transit time. This cover is particularly suited to companies with a reliance on imports, and those moving seasonal or perishable goods, where a delayed arrival can mean a lost sale, not simply a delayed one.

Transit Cost Insurance: OTT Risk tracks the market price for transit across trucking, air cargo, and container ships. When companies must buy at a spot price that is materially above baseline expectations, insurance payments can offset the cost.

Case Study: How insurers are building resilience in cold storage transportation with Parsyl

Food losses in the postharvest supply chain amount to a great loss of investments in the packaging, transportation, and storage operations. About 25–30% of global food produced is lost between on-farm food production and its storage at a retail facility, largely as a result of poor chain management and spoilage[4].

To support perishable food risks, **Parsyl** uses an integrated supply chain monitoring and insurance solution that uses granular data to help customers manage, mitigate, and insure complex supply chain risks. Parsyl collects supply chain data from its sensing devices and other sources and transforms that data into actionable insights and deep analytics that power tailored underwriting. Cargo claims can be paid in as little as two days using data from Parsyl's sensors without requiring a loss survey. Parsyl's data, insights and insurance help clients reduce waste, avoid losses and generate insurance savings.

Parsyl's combined IoT and software solution helps customers understand, mitigate and insure risks to goods as they move through the supply chain, both in transit and storage. Customers have the option of using Parsyl's proprietary sensing devices or can integrate their own devices or data feeds with the Parsyl platform to support coverage.

Case Study: How insurers are helping farmers build resilience to market volatility: Stable

Market volatility is a major risk for all producers and buyers of agricultural products. Prices can fluctuate by as much as 20% or 30% a year, making it difficult for farmers to manage their businesses and plan their finances, and for commodities investors to gauge investment decisions. Larger farms mitigate this risk using several strategies, including trading options and futures, but these products are often out of reach for smaller farms. Current estimates put the number of farms worldwide at around 570 million. 72% of farms are smaller than one hectare in size, and 16% of farms - those larger than 2 hectares - account for 88% of the world's farmland[5].

Stable has been meeting this gap in the agri-food sector, helping businesses manage commodity price risk by offering targeted, index-based, price insurance policies that cover products that cannot be hedged on traditional commodity futures markets. Stable's policies can be linked to over 3,000 indices, such as fresh fruit and vegetables, juice, dairy, meat, nuts, and packaging, so a policy can cover a client's exact commodity exposures in terms of quality, location and currency.

Once a robust, third party index that represents the client's underlying physical exposure is agreed with the customer, Stable structures price protection insurance at various levels, based on the current index price. For example, for UK dairy farmers DEFRA's All Milk Farmgate Index is a government index that represents the average price paid by dairies for all milk purchased in the month. Stable typically offers insurance against a 5%, 10%, or 15% price rise in the underlying index, with the maximum payout limited beyond a 50% price rise from the current index price[6]. On the expiration of the insurance contract, the index price is compared to the start and stop prices and the potential settlement amount is automatically calculated and paid to the client.

Case Study: Protecting intangible assets: Reputation risk insurance with Beazley

At a time of unprecedented social, political, economic and environmental change, corporate risks have become unpredictable and are increasing exponentially. Reputation is one of the hardest areas of corporate risk to manage and is an asset that is high on the minds of food and drink companies.

Beazley is supporting businesses with these challenges through a reputational risk solution that addresses the entire life cycle of a crisis: initial crisis management expertise upon notification, BI triggered by a drop in revenue if the event deepens, and a final stage if the BI is triggered of a $1m sublimit for advice on reputation remediation. The policy provides cover for 'all-risks' reputational damage, with exclusions for cyber, fraud/intentional criminal acts, willfully harmful/controversial corporate strategic decisions, systemic and macroeconomic declines.

There is also increasing interest in parametric models, which offer the opportunity to design bespoke solutions for businesses' supply chain risks, subject to a relevant, reliable and impartial index. Information and data requirements are extensive and this, coupled with pricing levels means, that there are relatively few covers written for businesses in the sector.

Case Study: How insurers are innovating with IoT sensors for hail risks with Hailios

Vines in Bordeaux, industrial hemp in Colorado, tulips in the Netherlands, and Australian mangoes all have one thing in common: they're highly valuable, yet highly vulnerable to hail. Hail storms can pop up unexpectedly, cause damage, and then melt before proof can be recorded. This has made studying, measuring, and assessing risk for hail very difficult.

Hailos meets this gap through IoT sensors that collect granular, hyper-local, ground-truth data in real-time[7]. The sensors acts as a third-party data provider for parametric coverage. For example, Hailios placed sensors around a hemp farm in Australia to gather local risk data, which were augmented with radar analysis. Descartes Underwriting used the data to build a parametric policy tailored to the farm[8].

Case Study: How insurers are building resilience to adverse weather with Meteo Protect

In 2017, farmers and producers across Europe experienced unexpected and severe weather conditions, with below average rainfall and abnormally high and low temperatures that ruined many harvests. Spring frost affected almost every vineyard in France, with only two-thirds of Burgundy's usual crop being picked as a result.

Meteoprotect meet this gap through parametric insurance policies that insure policyholders for the seasonal short-term impacts of extreme weather events using independent data from third-party indices and metrics that measure objective parameters such as excessively high temperatures or commodity prices falling below a predetermined value. This coverage allows farmers to be compensated in the case of losses in revenues due to climate volatility, to implement adaptive measures to climate change (such as modifying sowing and harvesting times, crop types, and labour management practices) and to invest in new agro-technologies (e.g. installing post-harvest storage facilities for a warmer climate).

The following risks faced by businesses across food and drink supply chains are currently not fully addressed by the insurance industry, and could represent a development opportunity:

Risk	Loss of Tier 2 supplier	Shortfall in yield or quality	Notifiable pests and diseases	Transit delays	Price volatility	Reputation damage
Examples of sources of supply chain disruption						
Agricultural production	Cloud service provider or seed coating chemical supplier	Poor crop yield due to specified weather conditions, drought or excessive rain.		Crops delayed in transit from other countries e.g. wheat, fruit or vegetables	Revenue shortfall from reduced agricultural production	Rising ESG interest increasing reputation risks e.g. abuse of employees, including poor working conditions (Modern Slavery).
Livestock, dairy, meat and fish processing	Supplier of raw material (Tier 2) to animal feed supplier (Tier 1)	Low temperatures impacting milk yields	Climate risks and increase in land use required to support future food needs. Prolonged wetter seasons increasing disease risks. Contingent cover available for specified livestock disease. Provides compensation for impact to financial results, as opposed to traditional cover for value of lost animals	Input delayed in transit from overseas e.g. fertiliser	Rising cost of grain, fuel and other costs associated with growing livestock will be passed down the chain. Highly specialist and limited coverage for parametric price volatility insurance, such as Lloyd's coverholder Stable	Rising ESG interest increasing reputation risks e.g. abuse of animals, including poor transportation conditions
Processing and manufacturing	Supplier of eggs (Tier 2) to liquid egg supplier (Tier 1), or cyber-attack on third party logistics provider e.g. "dark warehouse"	Weather contingent production risk leading to shortfall in yield or quality	Contingent cover available for specified livestock disease. Provides compensation for impact to financial results, as opposed to traditional cover for value of lost animals e.g. pork (African swine fever) and poultry (avian influenza) manufacturers	Raw materials delayed in transit from overseas supplier e.g. melons from South America or seafood from Asia	Weather contingent production risk leading to price volatility	Supply of products causing injury such as food fraud scandal or contamination
Food service, wholesale and distribution	Packaging supplier (Tier 2) to product supplier (Tier 1)	Weather contingent production risk leading to shortfall in yield or quality	Contingent cover available for specified livestock disease. Provides compensation for impact to financial results, as opposed to traditional cover for value of lost animals e.g. pork (African swine fever) and poultry (avian influenza) manufacturers	Product delayed in transit from overseas supplier	Weather contingent production risk leading to price volatility	Supply of products causing injury
Non-standard, or not widely available, covers could represent a development opportunity for the insurance industry						
Potential protection gaps	Loss of profit cover in respect of Tier 2 supplier or deeper are typically available under TDI products, however availability is currently limited Access to data and independent assurance around risk management practices through the supply chain could assist new product innovation	Parametric solutions - for example weather, yield or quality - are currently available, at relatively small scale. Lloyd's Lab alumnus Hailios offers a parametric crop hail damage product There is an increasing sophistication of data sets available satellite data and IoT sensors Government support for crop insurance is available in some markets	Cover is currently limited in the market	Limited existing cover is available for transit delays or port closures and trade disruption insurance For businesses which invest in digitisation and their own supply chain awareness, there is the potential to explore coverage on named routes. This is the approach that Lloyd's Lab participant OTT Risk is exploring Innovation in the market includes Parsyl which offers parametric container-based coverage underpinned by their risk management systems	Highly specialist and limited coverage available for parametric price volatility insurance, such as Lloyd's coverholder Stable New covers and wider adoption could be enabled though interrogation of new industry data sources	Increasing interest in ESG labour relations and environmental impairment resulting in reputation risk insurance and risk management

Enhancing supply chain data

In order to develop new products and offer additional capacity to existing solutions, there is a need for greater data sharing, and this is where clear guidance from insurers can highlight what is needed from customers and where the burden of information can be reduced.

Establishing new partnerships with technology providers responding to operational efficiencies and market tools and services such as risk management and supply chain diagnostic tools could help to improve data translation and transmission.

Access to data on supply chains has been a barrier for both clients and insurers. But that is changing, and the most recent BCI Supply Chain Resilience survey found that more organisations than ever are now using technology to assist with supply chain management and mapping. Organisations are increasingly sensitive to the need to strengthen resilience and risk management within their operations and examples of best practice have been quoted in our report.

More than half (55.6%) of organisations who responded to the BCI survey are now using technology to help analyse and report on supply chain disruptions, with the number using technology to help with supply chain mapping almost doubling from 22.6% in 2019 to 40.5% in 2022.

As digitisation advances, businesses have responded to supply chain events by investing in efforts such as resource planning software, business continuity planning (BCP), deeper conversations with their own suppliers, and accompanying data that insurers can use to consider product innovation – whether that's designing new products or tailoring existing offerings. Opportunities to further accelerate this include:

01

Establishing unique supplier identifiers for every company to generate a granular view of networks, supplier tiers, routings etc. Progress in this area is already underway with some technology companies offering dedicated data-processing platforms

02

The pandemic accelerated the use of remote working not only in office environments but also in the property loss control sector through the use of remote surveys, increased drone utilisation, remote image transfer etc. Further development of this could lead to the ability to create a view of physical hazard from just geocodes, extending property loss control services to Tier 2 suppliers and beyond

03

Food system data collation has been mentioned above, but this could be enhanced through the creation of industry supply chain risk standards - for example, in conjunction with organisations like ISO or the Food and Drink Federation, and subsequent data sharing with insurers

As a result of investments by food and drink businesses there are clearer questions and accompanying data that insurers can use to consider product innovation – whether that's designing new products, or expanding capacity in the market by moving into new offerings.

For example, PD/BI policies are subject to loss limits and are scheduled across a large number of insurers, who generally work to a reasonably common set of data inputs. This raises the interesting idea of adopting a similar approach to supply chain risk – i.e. collaboration between brokers and insurers across the industry to prepare a Supply Chain Risk Management checklist, per type of cover required, which could be provided by the insured as a pre-requisite to the conversation about cover availability and cost, and which would demonstrate whether they are a sufficiently well-managed risk for insurers to want to engage with. In time, these developments could feed into 'digital twins', mapping out supply chains to provide a greater view of risk and enable more sophisticated modelling.

As well as insurance industry acceleration opportunities, there are technology companies innovating with the sector in business resilience and operational initiatives that could serve as partnership opportunities to fill data gaps:

Azure FarmBeats

FarmBeats is a business-to-business offering that enables aggregation of agriculture datasets across providers and generation of actionable insights by building artificial intelligence (AI) or machine learning (ML) models by fusing the datasets. This enables agricultural businesses to add their different historical and real-time agricultural datasets into a single platform. Examples includes sensors, drones, and weather stations. In one test case for a farm in the US, the end-to-end IoT platform allowed for precision agriculture, monitoring temperature and humidity in food storage, and monitoring animal shelters[10]. Microsoft is also developing a supply chain track-and-trace architecture in Azure that would allow IoT-enabled monitoring of an asset, as it moves along a multi-party supply chain.

IBM Food Trust

IBM Food Trust connects farmers, processors, distributors, and retailers in order to share data such as availability, food item location, certifications, safety tests and temperature exposure. It uses a permissioned, shared record of food system data. Retailers or food manufacturers process this data and make it available to supply partners according to pre-agreed permissions. Data usage is exercised in line with the Food Trust's governance agreement set out by an advisory council. A series of customisable modules allows targeting of key supply chain issues. For example, the Trace module enables end-to-end supply chain visibility, upstream or downstream – allowing for querying of provenance of commodities, their status or location at any point in the supply chain, and verification of supplier information. The world's largest food manufacturer, Nestlé, and US retailer Walmart have been early adopters of IBM Food Trust, with further users including vegetable wholesalers, coffee growers, and members of the seafood sector[11].

> In 2018, a multistate outbreak of E. coli-related illnesses linked to romaine lettuce started making headlines. Walmart had recently completed a food traceability pilot on the IBM Food Trust platform in which it reduced the time required to trace a box of mangoes back to farm from 7 days to 2.2 seconds. As a result of the successful pilot, the company sent a letter to all its leafy green suppliers asking them to join the IBM Food Trust-enabled Walmart Food Traceability Initiative. The goal was to have leafy green suppliers be able to instantaneously trace every product back to its farm, by production lot, within a year.
>
> To help suppliers get started, Walmart worked with IBM Food Trust to provide education and onboarding support. Today, the majority of the retailer's leafy green suppliers are using blockchain technology.
>
> **IBM Food Trust use case[12]**

FourKites

FourKites is focusing on connecting global end-to-end supply chains and provides predictive estimated times of arrival based on the company's over 1.3 trillion LTL (Less Than Truckload) transit patterns; its patented Smart Forecast Arrival platform uses over 1 billion tracked miles and artificial intelligence neural networks to forecast speed and routing patterns to estimate shipment arrival times. FourKites' Sustainability Dashboard also contains temperature tracking and security as well as allowing users to identify the highest sources of freight-related emissions in the supply chain. It serves seven industries, including food and drink, and has several companies such as Tyson Foods, Mondelēz, and Coke Consolidated - the latter of which has reduced excess inventory and cost per case delivered, while improving in-stock position to over 99%.

Farmerline

Farmerline an operation launched in 2013 and serving over 800 famers in Ghana, has sought to bridge the gap between suppliers and commodity brokers by linking the multiple agents of the supply chain with one another. Combining inputs, commodities, intelligence, and equitable access to credit has created a formula that has resulted in Mergdata, the company's platform that has helped over 130 corporate and development partners across 33 countries to reach over one million farmers.

iProcure

iProcure is connecting major agricultural input suppliers directly to local agro-dealers via its proprietary distribution technology system, connecting agricultural supply chains in East Africa. The agtech is designed to address the challenge of stock-outs and sub-standard supplies, bringing about new efficiencies that aim to lower and stabilise product prices. Currently reaching 1 million Kenyan farmers, Series B funding in August 2022 is supporting iProcure's expansion into Uganda and Tanzania, as well as the launch of a credit offering for agro-retailers to purchase supplies on credit.

Building confidence with a transparent supply chain picture

It is clear that access to reliable, quality data underpins underwriters' ability to quote for a risk. It is also accepted that for the calculation of business interruption exposures, there is a well-defined process and approach to calculating losses which the industry is comfortable with. Based on this, the question could be asked as to whether it would be possible to develop a parallel Supplier Interruption Exposure. Another potential acceleration opportunity is the use of analytical tools to surface more information between insurers and food and drink companies.

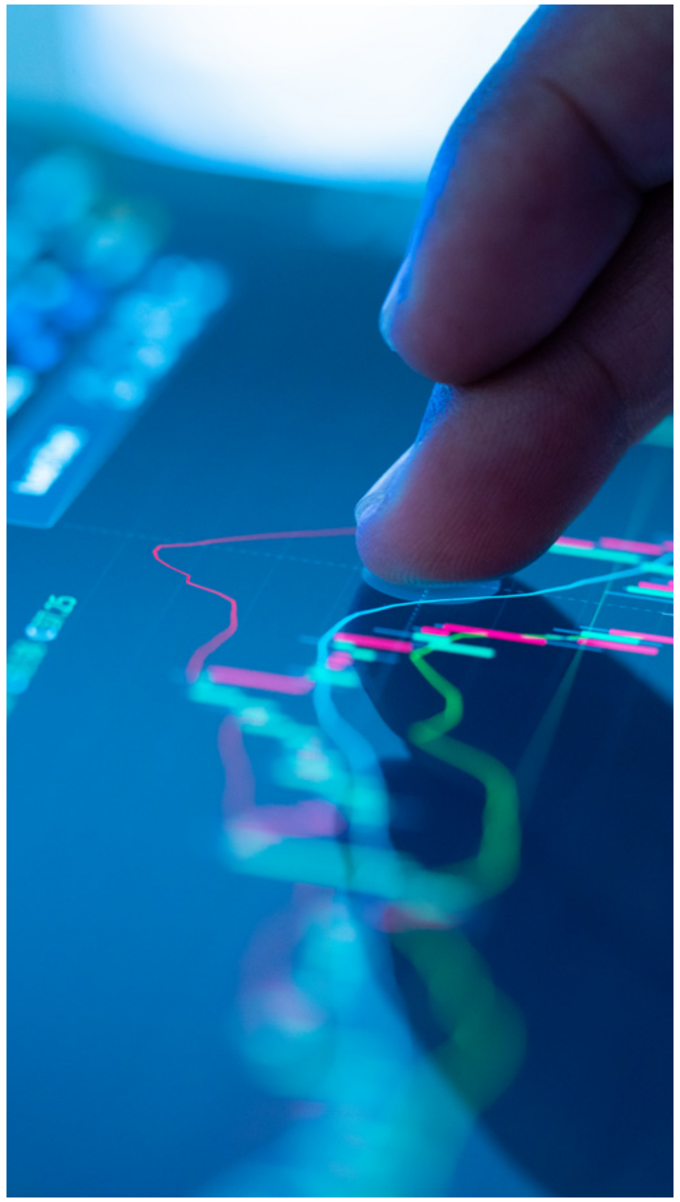
From an insurer perspective, being able to support or incentivise organisations to take such actions will ultimately result in greater mitigation of risk and exposure. WTW and Zurich are two examples where insurers and brokers are using technology, risk engineering expertise and insurance to help clients identify, assess, mitigate, and transfer supply chain risks:

Helping businesses understand their supply chain risks with Zurich's Risk Management Services

Access to data on supply chains has been a barrier for clients and insurers, something Zurich meets head on by helping business to understand their risks and surface the data needed to support risk conversations. Supply Chain Risk Management Services combines technology, risk engineering expertise and insurance to help businesses identify, assess, mitigate, and transfer supply chain risks.

Through a partnership with riskmethods, a supply chain risk management solution, the service is underpinned by an artificial intelligence tool that combs through millions of data sources to identify supply chain risks. The process aims to support clients with improving their risk profile and surface information that can be used to support business interruption and contingent business interruption coverages.

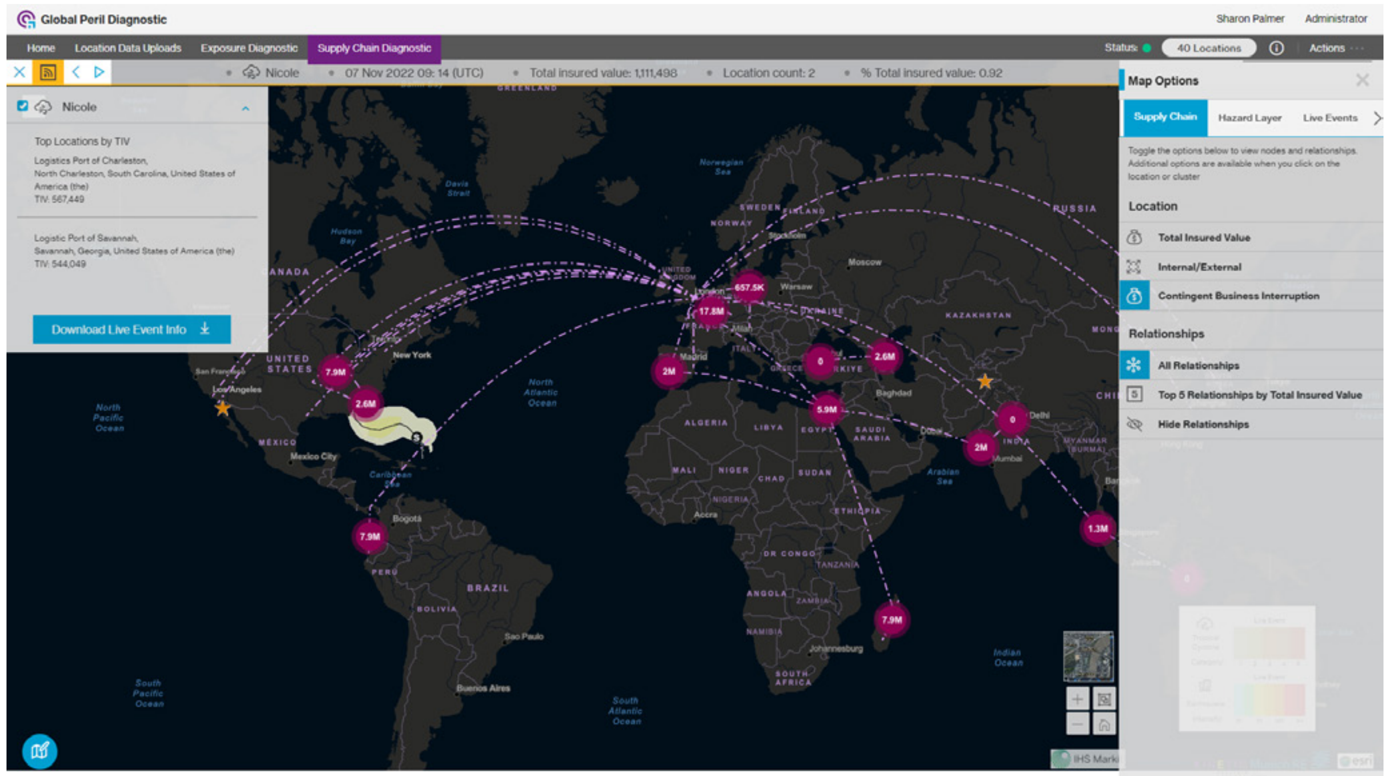
Source: Zurich



Visualising supply chains with WTW's Supply Chain Risk Diagnostic

WTW has developed a real-time risk and analytics model – Supply Chain Risk Diagnostic – that provides a framework to digitally enable supply chain portfolio components, allowing clients to measure, monitor and visualise each of these elements. The tool allows users to assess supply chain continuity options while also informing any third-party business interruption coverage they may be considering. In this way, risk and analytics models can support risk professionals in advocating for the cover they believe necessary to protect the business.

WTW's framework translates supply chain information into an interactive map and scorecard of risk using real-time intelligence to look at current risk assessments and linkages between supply chain components. This tool enables organisations to view their supply chain exposures in different ways, for example, as an aggregate of total insured value, including both the clients' own and third-party risk, or as exposures through a contingent business interruption prism.



Increasing communication to move the dial

The food and drink industry has been deepening its data sources and risk management practices in response to the disruption it has faced in recent years. The businesses operating in the sector that we have spoken to have signalled that they are interested in working with the insurance industry to leverage these improvements, to explore where action can take place. Lloyd's will continue to bring together customers, brokers and underwriters to support innovation around the customer protection gaps raised in this report, and brokers who advise the industry as risk partners can help to convene stakeholders and support the development of clear guidelines.

Earlier in this report, we stated that 'we will never be able to eliminate risk completely'; but with risk comes opportunity, and there are spaces in the food and drink industry where insurers and the financial services ecosystem can support businesses more effectively in their response to the interconnected world we live in. A key opportunity here is raising greater awareness of the coverage available and facilitating deeper conversations between insurers and food and drink companies.

Risks to brand and reputation, for example, were seen as the greatest internal risks to business success, yet more than half of the surveyed food and drink companies said they had no specific insurance for this, despite the presence of innovative products in this area. The position was similar for product recall (40%), which also ranked highly as a risk factor - suggesting that presentation, dissemination and promotion of such products needs to be reviewed to make them more accessible and better understood. As an industry, sharing more examples of where risks match solutions and the role of risk transfer in supporting resilience can help ensure all stakeholders are aware of the possibilities.

On the insurer side, there was a perception that underwriters were unable to talk with supply chain risk directors and managers in order to gain greater understanding that could enable additional capacity or the development of new solutions. Food and drink businesses also shared a desire for a deeper relationship with their insurers outside of the renewal process, for example through being able to share their risk registers in 'Chatham House' knowledge exchange sessions to identify and secure new/better insurance solutions.

This is where brokers and risk advisory companies providing risk management services have an essential role to play in connecting these stakeholders together and providing clarity around the questions that really need answers. As previously highlighted, with respect to the extensive information required by COPE forms, the development of a core set of criteria by insurers and brokers that can be shared with food and drink companies, along with the benefits of collecting and sharing that information, will be essential. This information can be added to recommendations to food and drink businesses to ensure they are optimising the total cost of risk and insurance purchases at a time of increasing inflation and financial concerns.

There is also the potential to establish partnerships with companies working in the food and drink industry – some of which have been highlighted throughout this report – to explore how to fill data gaps and connect actions that are building organisational resilience to risk transfer solutions.

Conclusions

The role for the global insurance industry

The supply chain disruption experienced during the COVID-19 pandemic, and more recently following the outbreak of conflict in Ukraine, has highlighted both the importance of the food and drink industry and the fragility of global food security and supply chains.

Insurers have a unique opportunity to develop the coverage they provide to food and drink businesses – and create new end-to-end supply chain solutions – to meet demands for additional insurance capacity and fill product gaps. All of this is being driven by an increasing movement towards operational efficiency and investment in supply chain management resilience.

Entering into dialogue with businesses operating across the food and drink industry value chain can help both insurers and customers better understand the challenges around obtaining specialist insurance cover, and whether cover could be restructured, segmented or consolidated to make it more effective and sustainable.

Brokers and risk management service providers have a unique opportunity to support conversations between insurers and insureds. For an industry built on the principle of bringing teams together to discuss and share risk, the dialogue on supply chain needs to be reopened and new partnerships need to be formed to allow it to respond to a fast-moving landscape. Food and drink companies are acting now, and brave and agile insurers can harness this opportunity.

Actions that Lloyd's will take

Lloyd's will continue to support innovation around food and drink supply chain protection gaps through Lloyd's Futureset, the Lloyd's Lab and our leadership of the Sustainable Markets Initiative (SMI) Insurance Taskforce.

- Through this research, we hope to help businesses and private investors understand how specific risks across food and drink supply chains can be managed, where existing support from the insurance industry is currently available, and where new specialist coverage could be introduced. We will continue to work closely with underwriters across the Lloyd's market, including members of Lloyd's Product Launchpad, to help them understand where protection gaps may lie and to explore potential innovation opportunities
- In our recent publication Ukraine: A conflict that changed the world – the (re)insurance industry response, Lloyd's announced the establishment of an Innovation Forum that will support the commercialisation of new solutions to address customer needs emerging from the conflict in Ukraine, including the disruption to food and drink supply chains
- Members of the SMI Insurance Taskforce, convened by Lloyd's, are exploring the adaptability of current crop insurance models to emerging countries, including preparing a proposal for potential public and private partnerships

The food and drink industry is not the only sector to have experienced significant supply chain challenges in recent times. Our supply chain research series will continue into 2023 and explore other industries that have been severely impacted by recent events, including the semiconductor industry and transportation and logistics:

Semiconductor industry

Semiconductors are the foundation of the advanced technologies that we increasingly rely on. On top of a shortage of key raw materials such as neon and palladium driven by the conflict in Ukraine, and longstanding pandemic-related supply disruptions, geopolitical tensions and trade disputes are also impacting semiconductor supply chains.

Transportation and logistics

A supply chain is only as strong as its weakest link, and transportation and logistics are already experiencing massive global dislocations. The result has created shortages of key manufacturing components, order backlogs, delivery delays and a spike in transportation costs and consumer prices, highlighting the potential for disruptions to cascade through global systems.

References

1 https://www.lloyds.com/resources-and-services/lloyds-agency/agency-news/california-wild-fires-the-winery-industry-and-the-london-cargo-market

2 https://www.airmic.com/news/guest-stories/airmic-ceo-speaks-systemic-risks-global-supply-chains

3 https://www.wtwco.com/en-US/Insights/2022/02/leveraging-alternative-risk-transfer-art-to-ride-out-the-insurance-market-storm

4 Coulomb, D. Refrigeration and cold chain serving the global food industry and creating a better future: Two key IIR challenges for improved health and environment. Trends Food Sci. Technol. 2008, 19, 413–417 and Shafiee-Jood, M.; Cai, X. Reducing Food Loss and Waste to Enhance Food Security and Environmental Sustainability. Environ. Sci. Technol. 2016, 50, 8432–8443.

5 https://www.sciencedirect.com/science/article/pii/S0305750X15002703

6 https://www.agri-tech-e.co.uk/wp-content/uploads/2017/03/Product-description.pdf

7 https://hailios.com/hailios-expands-to-australia-protecting-high-value-agriculture/

8 https://www.cisl.cam.ac.uk/files/climatewise_climate_product_innovation.pdf

9 https://www.thebci.org/static/e02a3e5f-82e5-4ff1-b8bc61de9657e9c8/BCI-0007h-Supply-Chain-Resilience-ReportLow-Singles.pdf

11 https://www.ledgerinsights.com/sustainable-shrimp-partnership-blockchain-traceability-ibm-food-trust/

12 https://www.ibm.com/blockchain/resources/food-trust/fresh-produce/

Twitter @LloydsofLondon
LinkedIn lloyds.com/linkedin
Facebook lloyds.com/facebook

Lloyd's Futureset