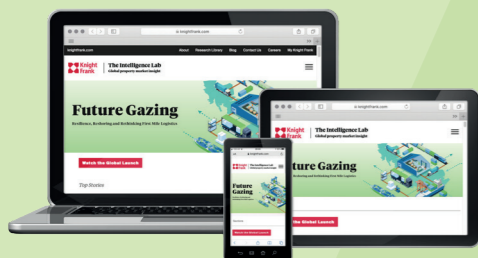


Future Gazing

Resilience, Reshoring and Rethinking First Mile Logistics



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Global economic growth is slowing, with heightened levels of uncertainty and rampant inflation is impacting household purchasing power.

FOREWORD



CHARLES BINKS
PARTNER, DEPARTMENT HEAD LOGISTICS & INDUSTRIAL

2021 saw massive disruption to global supply chains amid Covid lockdowns, labour and shipping container shortages and even a container ship stuck in the Suez canal.

Disruptions continued into 2022, with the war in Ukraine and geopolitical tensions with Russia, as well as ongoing Covid lockdowns in China and drought conditions impacting river freight in both Europe and China. Freight and logistics costs have been volatile as a result, with price spikes to all-time highs. These events have underlined the need for greater resilience in our supply chains.

Complex, transactional supply chains have evolved in a quest to improve cost efficiencies. Over the past forty years, supply chain models have grown longer and more complex on the back of falling shipping costs and declining tariffs and barriers to trade. These factors, amongst others, helped drive a wave of offshoring during the 1990's. The wage differential, between low-skilled labour in the UK and other developed countries, was a big draw for labour-intensive manufacturing firms to relocate labour-intensive manufacturing operations in Asia, and the containerisation of the freight industry made shipping more efficient and cost-effective.

Today, however, firms are seeing those cost advantages eroded. Economic growth in offshore production bases have led to rising costs, particularly due to wage growth. Manufacturing has also become

less reliant on low skilled labour. More capital-intensive production methods mean that labour is a smaller component of production costs. As businesses re-evaluate the 'full costs' of offshore production, including freight costs which have also risen (peaking five times higher than pre-pandemic levels), and take stock of the disruptive impacts recent shock events have had on their supply chains and order books, many are looking to shorten their supply chains, diversify their supplier base and are considering moving their production bases closer to home.

The notion of going back, to a more localised system of production and assembly, or reshoring has been framed as part of an anti-globalisation, or anti-trade movement. There is a need to explore the opportunities of reshoring away from the politicised narratives. Reshoring has been misconstrued as bringing low-skilled, low-paid industries and jobs back to the UK. But the growth of UK manufacturing doesn't mean reducing trade and the industries and jobs that left in the 1990's are not the same as those being created.

Rather than going backwards, new technologies, global markets and the vertical integration of supply chains may offer new ways for global firms to operate.

The growth of consumerism in Asia coupled with these supply chain risks, rising transportation costs and a growing awareness of the environmental impacts of these long supply chains are driving a uniting of consumption and production, of design and manufacturing.

A shifting of production bases has major consequences for supply chains, logistics and facilities. For the UK to grow its manufacturing base, it needs a strategy that encompasses logistics and infrastructure alongside investment, trade and education. The UK's manufacturing future looks very different from that of the past and so do its facility and location requirements. New manufacturing hubs will mean greater demand for industrial land and property for both production and logistics operations. It will mean changes in distribution networks, particularly for 'First Mile' logistics.

There are some big questions. Can the UK establish a competitive edge? Does the necessary infrastructure exist? Which sectors and locations offer opportunities? Could Freeports perhaps offer the right incentives and opportunities for growth? And what do shifting supply chains mean for the logistics sector?

INTRODUCTION

In this report we explore the sectors and locations which could benefit from reconfiguring supply chains.

Some locations will be better poised to take advantage of any reshoring of manufacturing operations. The locations to benefit are likely to be determined by existing trade links and industry, making use of existing infrastructure and skills. Growth sectors will be those where the UK has an advantage in terms of production and access to a sizable consumer market for the produce. A desire to make critical supply chains less reliant on international cooperation may also result in growth for critical sectors such as energy, food, defence or biomedical technologies.

The logistics sector has seen a boom over the past two years, with growth driven by discretionary consumer spending along

◆◆
Logistics investors and operators must look for opportunities and assets well-positioned to provide stability. Stability for their operations and for returns.
◆◆

with greater adoption of online shopping platforms. As we enter the next phase of the economic cycle and perhaps a new era, logistics investors and operators must look for opportunities and assets well-positioned to provide stability. Stability for their operations and for returns.

Through the past three years we have experienced a supply-side crisis. A global pandemic, along with economic and political turmoil, rapid inflation, rising energy scarcity and a need to transition to low-carbon energy have rocked global supply chains. Simply restoring the old order is unlikely to solve the crisis and provide much needed resilience amidst a shifting geopolitical landscape.

The current (or perhaps old) world order established a globally interconnected world, built on the back of factor-cost arbitrage and an opening up of global trade. However, geopolitical tensions and protectionist policies are on the rise, while cost differentials are dissipating, as more capital-intensive production and logistics operations offer promise of reduced risk, shorter lead times and lower operational costs.

Rather than turning back the clock on globalisation, reshoring or greater domestic sourcing strategies should be considered as part of a broader reorganising of global supply chains. It is not yet clear what this will mean for global supply chains, infrastructure and logistics. But as supply chains evolve and manufacturing hubs move, there will be new requirements for the logistics sector – in terms of locations and specifications. This will mean opportunities.



10 KEY POINTS

1

First Mile logistics assets are focused around key import and export locations including ports and airports, freight terminals as well as key road junctions. Demand for these assets and locations is determined by the volume of goods flowing through these nodes. Higher levels of production and trade, or an increased need to hold more stock, all drive up demand for these First Mile logistics assets. Investment in infrastructure and logistics may be necessary to increase the flow of goods through a specific node or port and this may offer opportunities for firms and operators to move, improve or change their supply chains.

2

Investors are becoming increasingly aware of the opportunities in the First Mile of the supply chain. First Mile markets allow distribution firms to build and maintain a secure and responsive supply chain for their end users. This demand will continue, with the potential to create attractive opportunities for investors looking to deploy capital into assets underpinned by strong structural tailwinds.

4

There are various ways that businesses and countries can look to protect their supply chain infrastructure, to lower the risk of shocks and improve resilience. Broadly speaking, these fall into three categories, they can improve existing supply chains, through investment in technology or infrastructure, they can move or diversify their production bases, or they can change their supply chain or distribution model, this may mean holding more stock or moving their distribution base.

Improvements may mean building in redundancies or holding more inventory. Trade tensions, labour shortages and COVID-related shutdowns and shipping disruptions have weakened the case for just-in-time strategies. Firms are increasingly adopting a 'just-in-case' approach. This could have a significant impact on storage space requirements, particularly for sectors with long, lean supply chains where lead times spiked dramatically over the past couple of years.

3

Numerous events have driven a breakdown of First Mile (and Middle Mile) logistics across the global supply chain in the past few years, and the impacts have been severe. Companies can now expect supply chain disruptions lasting a month or longer to occur every 3.7 years, and the most severe events can have a major financial impact (McKinsey Global Institute).

5

6

Additional warehousing costs, coupled with the costs and risks associated with ordering and holding more stock, may lead firms to consider moving or diversifying their supplier base in order to reduce lead times and limit uncertainties. As manufacturers move their facilities, or add additional production bases, they also have the option to upgrade their facilities, automate more of their production and operations and invest in smart and green technology. Firms looking to invest heavily in technology and automation will be less reliant on low-skilled, low-cost labour, thus eroding any cost advantage from locating offshore.

8

We have developed a scoring model to investigate which of the UK's ports offer the best potential. We have scored and ranked 41 ports across the UK, using weightings based on broad, generalised requirements. Despite only ranking top for one individual metric, Liverpool ranks top overall. It ranks highly in terms of capacity (4th) and in terms of expected exports growth (1st) and import growth (4th). It also scores well for the size of logistics market (4th) as well as availability of land (3rd), access to consumer markets (3rd) and skilled labour (3rd), and it benefits from Freeport status.

7

Port-centric supply chains can reduce the number of handling stages during storage and distribution and improve the environmental resilience of a supply chain. A port-centric model may incorporate storage, distribution as well as manufacturing and production facilities. Developing port-centric logistics depends upon several factors: The accessibility to major consumer markets, regional markets and infrastructure, the availability of land for logistics, the availability of labour and investment incentives.

9

Firms across a range of industries are talking about reshoring. Pharmaceuticals and healthcare related industries top the list but there are also automotive firms, including those focused on alternative fuel vehicles. There are also technology and biotech firms, as well as batteries and semiconductor firms.

10

The ability of the UK to capture the growth in global high tech industry and to attract manufacturing to (or back to) the UK will depend on various factors, including: labour costs, availability of skilled labour, infrastructure reliability and connectivity, investment incentives, corporate tax rates, political and economic stability, access to markets (trade agreements) as well as regulatory efficiencies, the rule of law and the level of state intervention in investment and financial processes.



FIRST MILE LOGISTICS

First Mile logistics is the transportation of goods across the first leg of the supply chain. That is, the movement of finished goods or products from a manufacturing hub to a warehouse or distribution centre.

The First Mile takes goods from where they are manufactured onward to the next destination, which may be a warehouse storage facility this may be prior to distribution to a fulfilment centre or it may be at a port, ready for the export market.

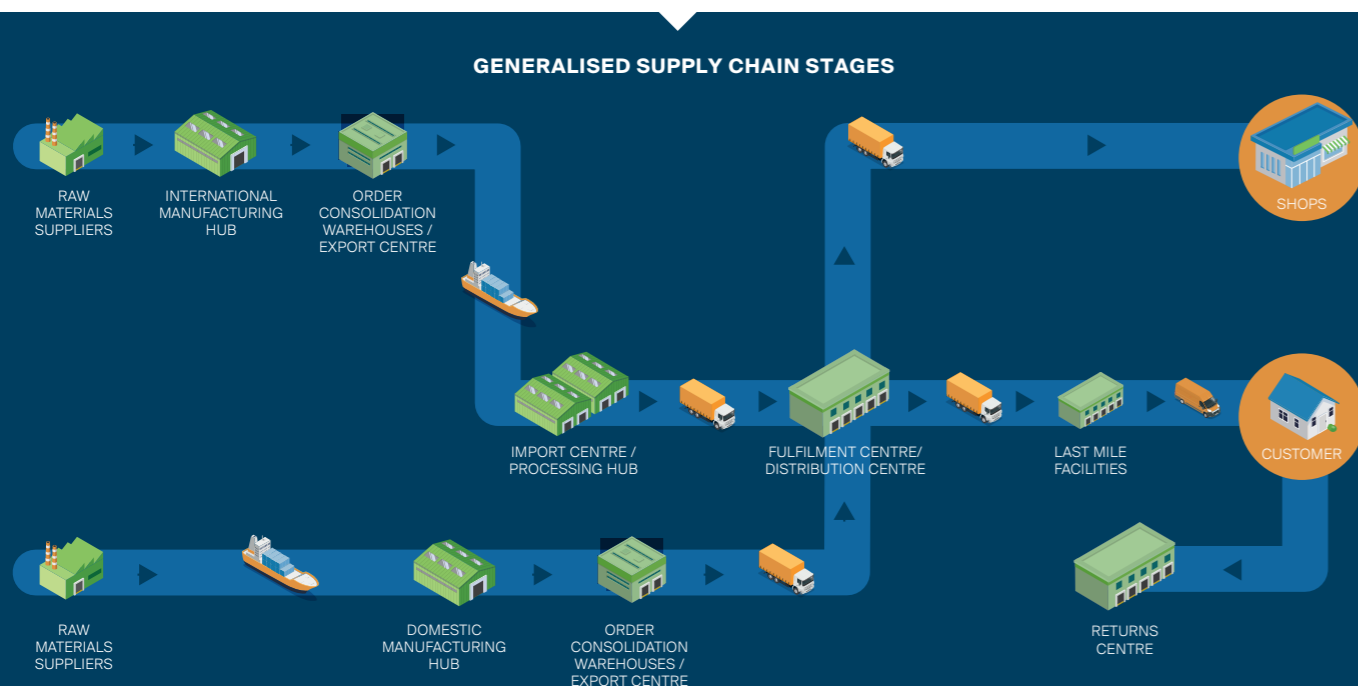
That said, supply chains and distribution models vary in length and complexity. The First Mile could mean different things for different supply chains, industries and businesses. However,

◆◆
First Mile logistics assets are focused around key import and export locations including ports and airports, freight terminals as well as key road junctions.
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in general terms they refer to business-to-business supply chain logistics that take place prior to the Last Mile, or up to and including the fulfilment / distribution centres.

First Mile assets

Logistics assets are typically found at nodes in the supply chain. While Last Mile assets are found on the final node of the supply chain, closest to the end consumer, First Mile logistics assets are focused around



Source: Knight Frank Research

◆◆
The move away from road freight will mean greater reliance on rail freight and the development of intermodal logistics networks could offer opportunities at ports and rail freight interchanges.
 ◆◆

key import and export locations including ports and airports, freight terminals as well as key road junctions. Demand for these assets and locations is determined by the volume of goods flowing through these nodes. Higher levels of production and trade, or an increased need to hold more stock, all drive up demand for these First Mile logistics assets.

Increasing the flow of goods through a specific node or port can be driven by increased manufacturing production and consumer demand for goods. However, even if demand rises, ports and intermodal freight interchanges with limited capacity will be unable to increase the flows of goods and capitalise on the opportunities. Investment in infrastructure and logistics may therefore be necessary to increase capacity.

First Mile logistics and infrastructure investment

Investment in roads or rail freight infrastructure can improve the flow of goods, reducing travel times, congestion, and stop-start traffic. An operator may be able to reach a greater catchment area within a specified drive time and this may enable them to consolidate more of their operations. Investment in infrastructure can also boost the profile of some, historically more secondary locations and can extend or expand prime location areas or corridors.

According to Preqin, the global infrastructure sector may see assets

under management (AUM) overtake that of real estate, reaching US\$1.87 trillion by 2026. It should be noted that there is significant crossover between logistics and infrastructure real assets and the growth of infrastructure-related investment offers clear opportunity for the logistics sector. Infrastructure investment may offer opportunities for firms and operators to move, improve or change their supply chains.

Strategic rail freight

The move away from road freight will mean greater reliance on rail freight and the development of intermodal logistics networks could offer opportunities at ports and rail freight interchanges.

The government has set a legally binding Fifth Carbon Budget which will see a 57% reduction in emissions by 2032, compared to 1990 levels, with a Net Zero Carbon target set for 2050. Shifting more freight from road to rail or water would help the UK meet future emissions targets. A tonne of freight transported by rail produces 76% fewer carbon emissions compared with road freight (Department for Transport, Rail Freight Strategy).

The government is committed to more rail freight and forecasts from MDS Transmodal on behalf of Network Rail in 2020, project demand for rail freight to double over the 15 years to 2033/34. However, ensuring the planning system is supportive of new inland rail freight terminals and that rail capacity is provided for freight coming from key ports and terminals will be key to driving the growth of rail freight.

Alongside ports, Strategic Rail Freight Interchanges (SRFIs) could offer opportunities for manufacturing growth and First Mile logistics as well as support the transition to a lower carbon economy. New rail connected inland terminals can help facilitate the movement of goods to and from ports and create new opportunities for the growth of logistics real estate at terminals or along rail corridors.

Energy infrastructure

Aside from transport infrastructure, power and energy infrastructure is also key for industrial and logistics occupiers. In West London, the electricity grid now faces severe constraints and developments could face long delays in securing a grid connection. Investment



in power infrastructure will be needed if these locations are to continue attracting industrial and logistics occupiers.

The need for power and labour has become of heightened importance for logistics operators. Some of the more established prime logistics locations in the Midlands, or the South East and London are tight on the supply of both. However, locations that used to be centres of heavy industry and manufacturing, often have large sites available, with latent power supply as well as availability of labour. These factors could help these locations rise in prominence as hubs for both production and First Mile logistics. Their ability to capitalise on the opportunity relies on them being able to attract companies and investors. Government can make use of policy instruments to encourage private sector investment into facilities and infrastructure in First Mile hubs, through initiatives such as Freeports. Infrastructure and the logistics sector can therefore play an important role in the government's levelling up agenda.

As firms look to improve their efficiencies and invest more in capital expenditure on the automation of their factory or warehouse, they are likely to amortise the cost over a longer period and remain in the property for longer. This means sticky tenants for landlords and improved prospects and long term gains for investors.

New and emerging technologies are giving rise to new types of infrastructure. They are also changing how industrial and logistics facilities are used and driving new sources of demand for industrial land as well as logistics operator requirements and preferences. Investments in electric-vehicle (EV) charging networks, battery storage, hydrogen distribution, rail technology, 5G telecom networks, and data centre capacity are all shifting logistics operations and the uses and preferences for industrial assets.

The green energy transition and the need for greater energy security have huge

Locations that used to be centres of heavy industry and manufacturing, often have large sites available, with latent power supply as well as the availability of labour. These factors could help these locations rise in prominence as hubs for both production and logistics.

implications for logistics, not just in terms of fleet vehicles, but as the locations of energy production shift, the supply chains and routes for distributing this energy change. The production of domestic green energy and the greening of fleet vehicles will require new infrastructure and industrial assets. BP has been active in investing in hydrogen distribution and electric vehicle charging, with £1 billion invested in EV charging infrastructure along with plans to build a blue hydrogen production facility in Teesside, which could produce 1GW of hydrogen and in July 2022, BP and BOC announced their joint venture in a hydrogen refuelling network for HGVs across the UK. This type of infrastructure means demand for industrial land for energy production and EV charging networks could influence fleet choices and route planning for distribution firms.

First Mile opportunities

Infrastructure nodes offer both potential points of weakness as well as opportunities for the strengthening or reconfiguration of supply chains and for investment and the growth of distribution as well as production industries. With infrastructure investment rising and warehouses forming an integral component of supply chain infrastructure and distribution models, there will be increasing opportunities for investment in

First Mile logistics. These opportunities may be particularly attractive to infrastructure investors.

Investors have gravitated to First Mile industrial markets for most of the latest cycle. Over the last decade, rapid growth in e-commerce and demand for home deliveries has driven competition amongst operators and strong returns for investors. However, investors are becoming increasingly aware of the opportunities in the First Mile of the supply chain. In March 2022, Cerberus Capital Management launched a joint venture with Almcors, focused on acquiring 'First Mile' assets that form a critical part of the logistics supply chain, to create a Pan-European €1.5bn portfolio of assets. This trend should continue to strengthen. Particularly as First Mile markets typically offer higher yields than assets in First Mile locations.

First Mile markets allow distribution firms to build and maintain a secure and responsive supply chain for their end users. This demand will continue, with the potential to create attractive opportunities for investors looking to deploy capital into assets underpinned by strong structural tailwinds.

New and emerging technologies are giving rise to new types of infrastructure. They are also changing how industrial and logistics facilities are used and driving new sources of demand for industrial land as well as logistics operator requirements and preferences.

SUPPLY CHAINS AND THE NEED FOR RESILIENCE

The length and complexity of supply chains has grown as companies expanded around the world in pursuit of margin improvements. But when shocks occur, such as natural disasters, these margins are eroded or even cancelled out.

Companies can now expect supply chain disruptions lasting a month or longer to occur every 3.7 years, and the most severe events can have a major financial impact (McKinsey Global Institute). Companies can expect to lose more than 40% of a year's profit every decade due to supply chain shocks (McKinsey Global Institute), though a single, extreme event could have a much greater impact. Industries where production is concentrated in just a few countries and which are heavily traded are most exposed.

Where critical supply chains are concerned, such as those for food or energy supply, or related to security or health, the impacts

can be even more detrimental than financial costs, with a risk to lives, the economy and national security.

THE UNFOLDING OF A SUPPLY CHAIN CRISIS

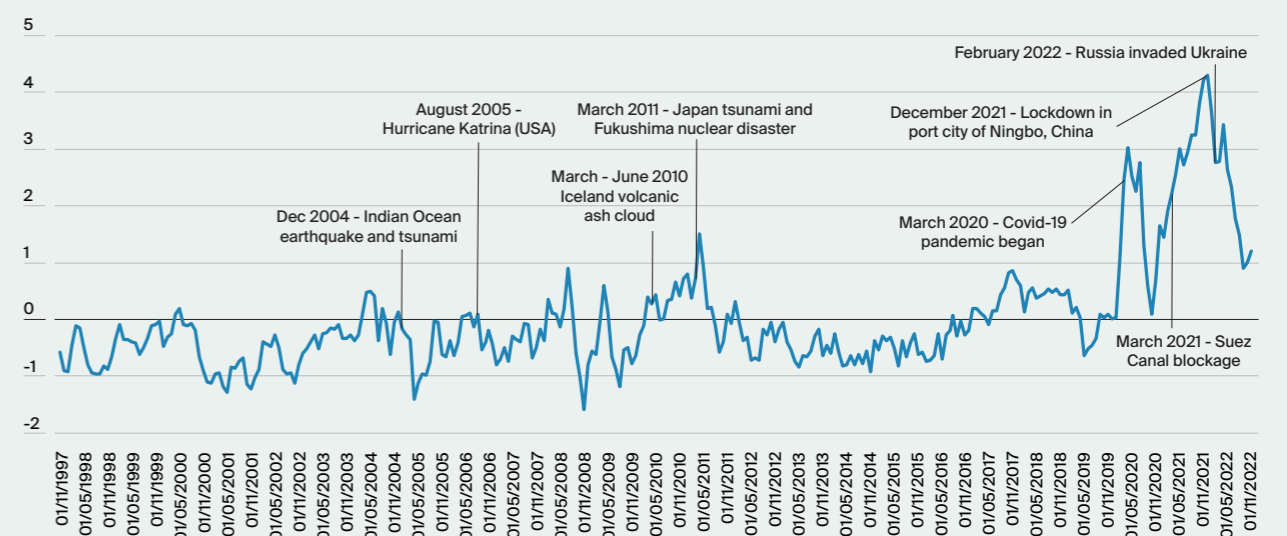
The Global Supply Chain Pressure Index (GSCPI), from Federal Reserve Bank of New York, which uses data from shipping, purchasing managers' index surveys and manufacturing to chart disruption across the globe, spiked to unprecedented levels in 2020 and again in 2021.

Covid-19 exposed the fragility of current global supply chains and highlighted vulnerabilities in supply chain linkages.

Companies can now expect supply chain disruptions lasting a month or longer to occur every 3.7 years, and the most severe events can have a major financial impact.

(MCKINSEY GLOBAL INSTITUTE)

Global Supply Chain Pressure Index (GSCPI)



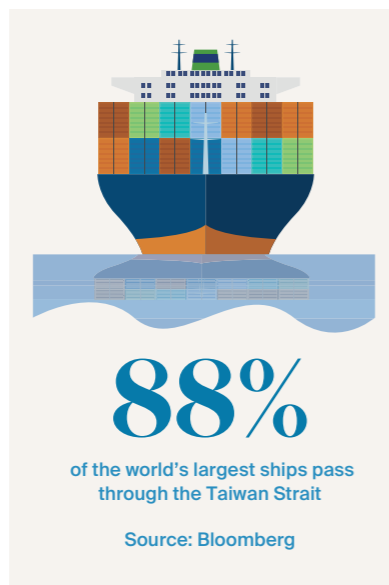
Source: Knight Frank Research, Federal Reserve Bank of New York

It has not been the only catalyst for supply chain issues recently, though its extremity, in both scale and length left few supply chains unscathed.

The onset of the Covid-19 pandemic led to both demand and supply-side shocks. Many factories halted production, due to raw materials shortages or a dramatic fall in orders, cargo ships reduced their journeys and import and export volumes were impacted. However, as lockdown restrictions eased, demand surged. With factories closed or running a limited operation, the supply-side was unable to react. Producers, particularly those with long and lean supply chains, faced lengthy delays in getting their operations functioning again. The disruption to production and trade flows meant the flow of shipping containers was disrupted leading to shortages and a spike in shipping costs. Ports become supply chain pinch points, and congestion and delays drove up lead times.

Once again, as the Suez Canal became blocked when the Ever Given ran aground in early 2021, one of the world's busiest maritime trade routes became paralysed. The Suez Canal is the fastest and most direct maritime trade link between Asia and Europe and approximately 30% of all global container traffic passes through it according to Egypt's Suez Canal Authority (SCA). At present, there are no suitable alternative routes.

The war in Ukraine has once again tested supply chains, demonstrating the impacts that geopolitics can have on our supply linkages. The war itself has impacted the production of Ukrainian exports while the conflict also impacted trade routes. The cooling relations with Russia has further impacted the supply and prices of food and energy imports from Russia, and both the EU and the UK have banned Russian ships from docking at ports.



◆◆ Covid-19 exposed the fragility of current global supply chains and highlighted vulnerabilities in supply chain linkages. ◆◆

Tensions over Taiwan have also escalated over the last 18 months, with some questioning whether these pose a risk to the Taiwan Strait; the primary route for ships taking goods from factories in East Asia to markets in the US and Europe. Almost half of the global container fleet and 88% of the world's largest ships by tonnage pass through this waterway, according to Bloomberg.

All of these events have exposed just how complicated, and in many cases fragile, contemporary supply chains are. Numerous events have driven a breakdown of First Mile, or business-to-business logistics across the global supply chain in the past few years, and the impacts have been severe. When one level in the supply chain experiences delays and problems, it impacts the

abilities of downstream members of the supply chain to serve their customers.

Upstream operations have been neglected, with operators focused on competing to perfect their Last Mile distribution. While delays and diversions in the Last Mile of the supply chain may result in delays in the magnitude of minutes or hours, delays and diversions in the First Mile can mean days, weeks or longer, and can result in spoiled produce. Driving efficiencies in the Last Mile is futile if goods are held up further up the supply chain.

The drive to shorten supply chains and improve their resilience will have a bigger impact on the first part of the distribution chain, with the Last Mile largely untouched by these shifts. To avoid single points of failure bringing a collapse of the supply chain, manufacturers and retailers are looking to diversify their supplier base, which is driving changes to the First Mile of distribution. First Mile logistics has tended to rely on long term contracts and fixed routes. However, the need for greater resilience means the First Mile landscape needs to become more dynamic, with greater investment, innovation and competition.

BUILDING RESILIENCE

Ways in which the supply chain issues can be strengthened and the potential for disruption reduced

There are various ways that businesses and countries can look to protect their supply chain infrastructure, to lower the risk of shocks and improve resilience. Broadly speaking, these fall into three categories, they can improve existing supply chains, through investment in technology or infrastructure, they can move or diversify their production bases, or they can change their supply chain or distribution model, this may mean holding more stock or moving their distribution base.

IMPROVING: INVESTING IN EFFICIENCIES, GROWING CAPACITY AND BUILDING IN REDUNDANCIES

Production bases, freight routes, ports and storage facilities all pose risks to the security of supply chains and investment in these can also boost capacity and resilience. Many logistics hubs, ports and airports have adapted to the strains placed on them and are now able to process cargo more efficiently, by better managing the capacity they have.

Infrastructure investment can improve capacity and investment in technologies; such as artificial intelligence (AI) and the

Internet of Things (IoT); is providing greater visibility and optimisation in the supply chain. Inventory management systems can help firms track lead times and make better decisions on stock levels. Research by supply chain platform Blue Yonder shows that 83% of organisations have increased investment into their supply chain recently to reduce disruption in the future, with one in 10 organisations investing more than US\$25 million.

While improving capacity or visibility can reduce the impact of choke points that exist, it cannot solve issues of fracturing or decoupling of supply chains. Supply

chains can be weaponised, particularly by countries that are prominent sourcing hubs. Geopolitical tensions pose a different type of risk that requires a different strategy.

Just-in-time vs Just-in-case

Improvements may also mean building in redundancies or holding more inventory. Long, lean, just-in-time supply chains have evolved to maximise cost efficiencies, taking advantage of locations with low labour costs through low shipping costs. But these supply chains have risks. The just-in-time paradigm, which relies upon predicting order requirements well in advance, has been weakened by trade tensions, labour shortages and Covid-related shutdowns and shipping disruptions. Spikes in demand or supply-side shocks can have a knock-on impact on outputs and order books.

There has been a shift, with firms adopting a 'just-in-case' approach. Despite additional storage costs, firms are looking to hold additional buffer stock, or safety inventory, enabling them ride out any blips in supply.

◆◆ Research by supply chain platform Blue Yonder shows that 83% of organisations have increased investment into their supply chain recently to reduce disruption in the future. ◆◆



◆◆
If we assume safety stock accounts for 20% of UK held inventory and firms need to increase this stock by 40% to account for longer lead times, it would mean firms need to raise their total inventory holdings by around 8%.
 ◆◆

Typical safety stock policies include holding safety stock equal to a fixed percentage of lead time usage (typically 50%) or a specific number of days' supply is maintained as safety stock (typically 7-14 days' worth of sales). There are various, more complex formulae but broadly speaking, the amount of safety stock a firm looks to hold is calculated based on average and maximum lead times, and maximum and average sales. Lead times can vary significantly across sectors and between suppliers, longer supply chains where more suppliers are involved, the longer the lead time is likely to be.

Where a lead time is 10 days and average sales are 20 units, a firm could cover its lead time by setting safety stock at 200 units. Using the 50% rule, it would mean setting safety stock at 100 units. However, if lead times rose to 14 days, this would raise the safety stock requirement to 140 units, a 40% increase in lead time and a 40% increase in safety stock.

As per the formula below, we can see that an increase in maximum lead times, generates a higher safety stock requirement. On the above calculation, a 30% increase in the maximum lead time (ceteris paribus), would mean a 40% increase in safety stock requirements. This could have a significant impact on storage space requirements, particularly for sectors with long, lean supply chains where lead times spiked dramatically over the past couple of years.

**Safety Stock Calculation:
Average - Maximum Formula**

$$\text{Safety Stock} = (\text{Max. Lead Time} \times \text{Max. Sales}) - (\text{Ave. Lead Time} \times \text{Average Sales})$$

NB: The above formula is reasonably simple method for calculating safety stock. However, there are variations. Where there is a high level of uncertainty/volatility, a standard deviation of the lead time distribution and/or demand/sales can be used.

Safety stock typically accounts for around 10-20% of a firm's total inventory, though it can account for 50%. If we assume safety stock accounts for 20% of UK-held inventory and firms need to increase this stock by 40% to account for longer lead times, it would mean firms need to raise their total inventory holdings by around 8%.

With firms potentially needing to increase their safety stock holdings in order to protect their order books, they may require additional warehouse space. Firms with long supply chains may

have the largest increase in safety stock requirements. However, the additional warehousing costs, coupled with the costs and risks associated with ordering and holding more stock, may lead them to consider moving or diversifying their supplier base in order to reduce lead times and limit uncertainties.

MOVING: PRODUCTION OR BROADENING SUPPLIER BASE

Developing alternative routes or suppliers may be a solution. Some companies caught out by Covid-19 related lockdowns and supply issues have sought to increase their supplier base or develop the ability to flex production across sites. Some firms are adopting a dual-sourcing strategy. This is also being termed a 'China-Plus-One', or a 'Plus One' strategy, whereby companies diversify their businesses to alternative destinations. Asian emerging economies like Vietnam, Indonesia and the Philippines are likely beneficiaries of firms diversifying their production from China.

A survey by Make UK found that 42% of British manufacturing firms had increased their domestic supplier base in the last 24 months (up to the date of the study in early 2022). A similar proportion also said they planned to make further moves in this direction before 2024.

There are alternative approaches or models for the relocation of supplier bases and they may be used along with a dual-sourcing strategy. There are nuances in the terminology but onshoring, reshoring,

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A survey by Make UK found that 42% of British manufacturing firms had increased their domestic supplier base in the last 24 months.
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CHANGING: CHANGING SUPPLY CHAINS AND DISTRIBUTION MODELS

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Firms looking to invest heavily in technology and automation will be less reliant on low-skilled, low-cost labour thus eroding any cost advantage from locating offshore. Protecting their intellectual property will also be important for firms investing in and developing technology, this may also factor into a relocation.
 ◆◆

There are a variety of different supply chain and distribution models that firms can adopt. The rise of e-commerce has led to considerable change at the consumption end of supply chains, with more costs and additional (Last Mile) facilities allocated to this part of the supply chain to raise service levels and reduce delivery times. However, rising costs and delays at the production end of the supply chain are driving a rethink on the locations of these facilities and the transport connections linking them to the rest of the supply chain.

The distribution of goods may shift, with networks perhaps rerouting or diversifying away from certain pinch points. Increasing road congestion, fluctuating fuel costs, HGV-driver shortages and environmental impacts of road freight make alternative transport modes such as rail or waterborne freight appealing. Changing transport modes may necessitate relocating distribution or fulfilment functions.

Co-location

A vertical integration supply chain strategy; whereby a firm looks to gain control over different elements of the supply chain, may incorporate some consolidation.

near-shoring, friend-shoring or ally-shoring are all different forms of relocation strategies, with firms choosing to partly or fully relocate business operations from previously offshored locations. Reshoring (also termed back-shoring) refers specifically to replacing previously offshored operations with domestic ones. Near-shoring, is the moving of operations closer to home, while friend-shoring or ally-shoring is the moving of operations for geopolitical reasons or a more favourable trading relationship.

As manufacturers move their facilities or add additional production bases, they also have the option to upgrade their facilities, automate more of their production and operations and invest in smart and green technology. Capital investment can help firms use space more efficiently and futureproof their business operations and supply chains. Firms looking to invest heavily in technology and automation will be less reliant on low-skilled, low-cost labour thus eroding any cost advantage from locating offshore. Protecting their intellectual property (IP) will also be important for firms investing in and developing technology, this may also factor into a relocation decision.

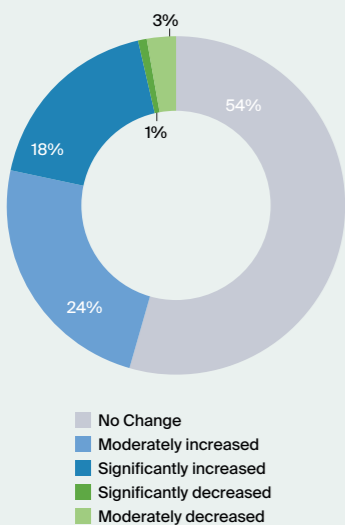
A relocating or diversifying of production bases will likely necessitate a change in the configuration of the supply chain.



This could involve co-location of manufacturing, assembly, distribution or fulfilment elements.

Industrial land and units are increasingly being used by firms for a diverse mix of business functions. While supply chain security and speed may be an important driver for co-locations, new technologies such as additive manufacturing are making it possible. The ability to 3D print prototypes can dramatically reduce the

UK Manufacturers' use of domestic suppliers in past two years



Source: Make UK Global Supply Chains Survey (2022)

time it takes a manufacturer to bring ideas to market and reduce transportation and storage costs, with the ability to send blueprints digitally instead of shipping goods. It can enable firms to unite the product development and manufacturing elements of production. With less reliance on low cost labour or large production spaces, the cost and time involved with shipping goods around the globe and holding large quantities of domestic stock may no longer stack up.

Bringing together research and development or engineering elements alongside distribution can mean a greater need for highly skilled labour and for high quality auxiliary office space along with a good amenity offering. As requirements for labour and facilities and amenities change, the ideal locations are also likely to shift. With proximity to skilled labour perhaps being more important relative to distribution-led factors.

Port-centric supply chains

Port-centric supply chains can reduce the number of handling stages during storage and distribution and improve the environmental resilience of a supply chain. Prior to the containerisation of freight and the development of intermodal logistics, logistics and distribution systems focused in and around the port areas. A port-centric model may incorporate storage, distribution as well as manufacturing and production facilities. It may focus on inbound or outbound logistics (imports or exports), or both.

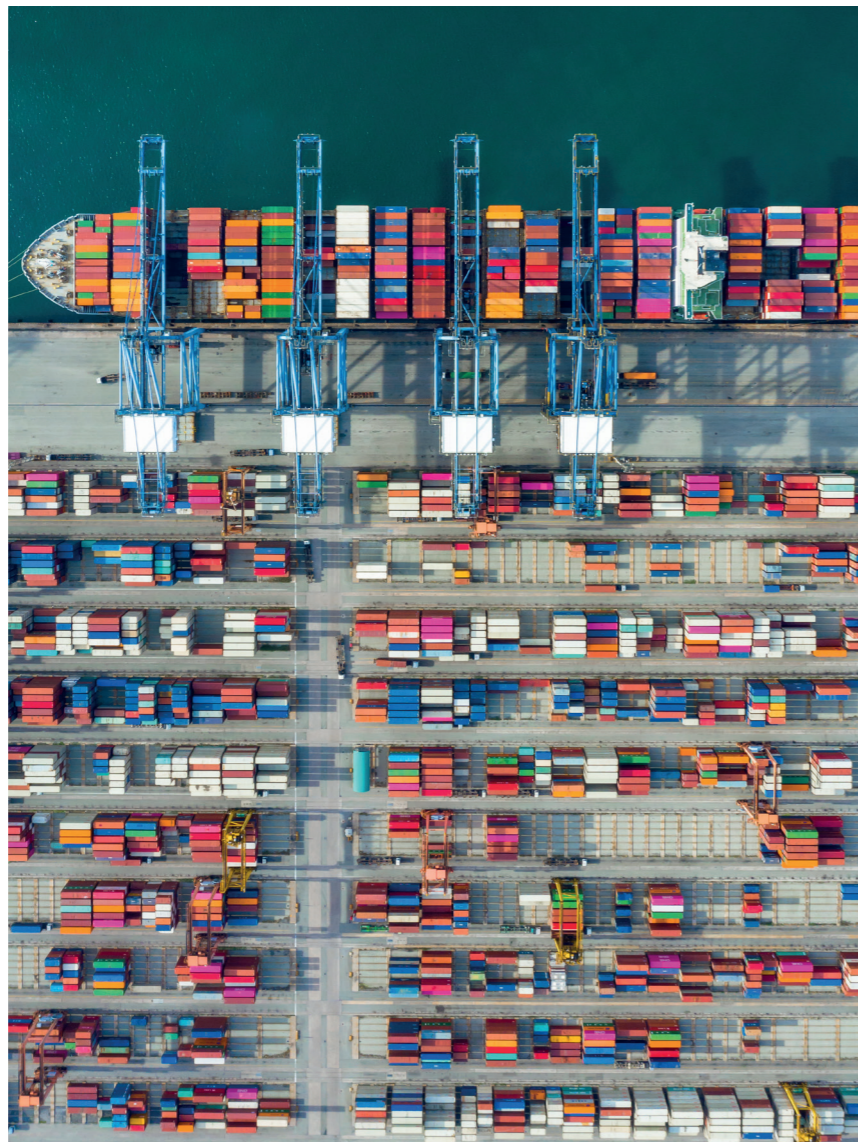
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Both Covid-19 and new post-Brexit trading regulations have led to congestion and delays at ports.
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Both Covid-19 and new post-Brexit trading regulations have led to congestion and delays at ports. Using ports, either close to the origin or destination of the cargo can reduce the number of legs in the journey and mean fewer road miles are consumed, thus removing carbon from the supply chain and reducing the risk of disruption caused by congestion.

Congestion and delays at ports can have extremely detrimental impacts on food supply chains. The agribulk industry often uses port-centric models. For example, there are three large grain processing facilities (including Europe's largest grain corn mill), which are fed by conveyor from Liverpool's grain terminal. Compagnie Fruitière, a supplier (and ripener) of

bananas to the UK market, leased a 69,718 sq ft ripening facility at London Gateway's Logistics Park (2020). The facility is adjacent to London Gateway's deep-sea container port, with an international rail terminal on site providing multi-modal integration. Highly connected, port-centric distribution enables food suppliers to maximise speed, efficiency and product shelf life.

It's not just food supply chains using effective port-centric warehouse operations. UK clothing company Barbour, based in South Shields, uses the coastal feeder container service from Felixstowe to South Shields. Each container shipped saves around 600 road miles per container, reducing CO2 emissions.



PORT OF APPEAL

Developing port-centric logistics depends upon several factors:

The capacity at the port, trade routes, accessibility to major consumer markets, regional markets and infrastructure, the availability of land for logistics, the availability of labour and investment incentives.

Understanding the potential for port-centric logistics requires an evaluation of a port against these criteria. To explore the potential for the establishment or expansion of port-centric logistics, we have developed a scoring model to investigate which of the UK's ports offer the best potential.

We have scored and ranked 41 ports across the UK, using weightings based on broad, generalised requirements. However, the importance of different factors will vary by industries, sectors and the functionality of required facilities. For example, an export-orientated manufacturer is likely to place greater importance on investment incentives, or Freeport status. For a retail distribution firm focused on the domestic

market, access to consumer markets will be more important, while labour-intensive sectors or functions will place greater importance on the cost and availability of labour.

Despite only ranking top for one individual metric, Liverpool ranks top overall. It ranks highly in terms of capacity (4th) and in terms of expected exports growth (1st) and import growth (4th). It also scores well for the size of logistics market (4th) as well as availability of land (3rd), access to consumer markets (3rd) and skilled labour (3rd), and it benefits from Freeport status.

Whether a port scores well for forecast imports or export growth will depend

on the trading partner countries and the expectations for UK trade with those countries. These scores are also influenced by trade volumes, or port capacity. Ireland is the main trading partner (in terms of tonnage) for the port of Liverpool. While Tees and Hartlepool ranks 8th in terms of capacity and 7th in terms of import growth prospects, it ranks third for export growth potential. Some of the top trading partners with Tees and Hartlepool are Netherlands, Poland, Belgium and Lithuania. China is the main trading partner for Felixstowe and for Southampton, and while both of these ports rank highly for imports growth, their export growth potential is weaker.

Port logistics scoring model - Top 15 results

| PORT | PORT CAPACITY | IMPORT GROWTH FORECAST | EXPORT GROWTH FORECAST | SIZE LOGISTICS MARKET | LOGISTICS DEVELOPMENT | LOGISTICS RENTS | AVAILABILITY OF LAND | ACCESS TO CONSUMER MARKETS | AVAILABILITY OF LABOUR | SKILLED LABOUR | COST OF LABOUR | CONNECTIVITY | INVESTMENT INCENTIVES | OVERALL RANK |
|---------------------|---------------|------------------------|------------------------|-----------------------|-----------------------|-----------------|----------------------|----------------------------|------------------------|----------------|----------------|--------------|-----------------------|--------------|
| | Low-High | Low-High | Low-High | Low-High | Low-High | Low-High | High-Low | Low-High | Low-High | Low-High | High-Low | Low-High | Freeport Status | |
| Liverpool | 4 | 4 | 1 | 4 | 14 | 23 | 3 | 3 | 13 | 3 | 21 | 5 | Y | 1 |
| Grimsby & Immingham | 3 | 5 | 2 | 12 | 13 | 6 | 14 | 20 | 24 | 26 | 10 | 5 | Y | 2 |
| London | 1 | 2 | 4 | 5 | 3 | 41 | 6 | 1 | 31 | 4 | 34 | 2 | Y | 3 |
| Tees & Hartlepool | 8 | 7 | 3 | 9 | 1 | 16 | 10 | 14 | 36 | 14 | 25 | 5 | Y | 4 |
| Hull | 7 | 6 | 12 | 8 | 11 | 9 | 11 | 25 | 5 | 28 | 19 | 16 | Y | 5 |
| Bristol | 12 | 9 | 14 | 2 | 2 | 32 | 8 | 4 | 2 | 2 | 38 | 8 | | 6 |
| Southampton | 5 | 3 | 7 | 9 | 12 | 38 | 17 | 9 | 14 | 8 | 40 | 1 | Y | 7 |
| Felixstowe | 2 | 1 | 6 | 27 | 5 | 31 | 25 | 27 | 17 | 24 | 11 | 8 | Y | 8 |
| Tyne | 16 | 14 | 20 | 1 | 9 | 19 | 6 | 11 | 27 | 13 | 1 | 2 | | 9 |
| Newport | 15 | 17 | 16 | 7 | 21 | 19 | 9 | 7 | 21 | 6 | 8 | 8 | | 10 |
| Medway | 10 | 11 | 18 | 18 | 18 | 36 | 13 | 6 | 33 | 11 | 4 | 8 | | 11 |
| Sunderland | 25 | 21 | 29 | 3 | 10 | 17 | 5 | 13 | 4 | 16 | 3 | 16 | | 12 |
| Portsmouth | 13 | 12 | 19 | 13 | 15 | 37 | 16 | 8 | 16 | 7 | 37 | 8 | Y | 13 |
| Forth | 10 | 10 | 5 | 23 | 28 | 11 | 28 | 33 | 19 | 29 | 35 | 16 | | 14 |
| Harwich | 9 | 13 | 15 | 23 | 5 | 30 | 23 | 28 | 18 | 27 | 22 | 20 | Y | 15 |

Source: Knight Frank Research

◆◆
Tees and Hartlepool ranks third for export growth potential. Some of the top trading partners are Netherlands, Poland, Belgium and Lithuania.
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If production bases move, away from Asia, with more goods coming from domestic or European countries, this would mean a change to the flow of goods coming into and out of UK ports. Short sea shipping, transshipment and domestic waterborne freight are likely to increase, with increased flow of goods domestically as well as to and from Europe. There may be a diversification in import locations, with a shift in the flow of goods, with less of a focus on deep sea ports such as Felixstowe.

The largest logistics market (in terms of existing stock) is Tyne, followed by Bristol and Sunderland. These markets all have a strong trading and manufacturing history with large swathes of industrial land located close to ports and this has allowed logistics stock to build up in these locations. Felixstowe, despite ranking second for port capacity, ranks just 27th for size of logistics market. As a supply constrained market, rents here are relatively high, ranking 31st. Felixstowe has the 10th highest rents of the markets considered. Tees and Hartlepool, followed by Bristol and London rank highest for logistics development. Most of the top port logistics markets rank poorly for logistics rents, though Grimsby & Immingham (which ranks second overall) is relatively affordable, ranking 6th for rents.

Industrial development land, either within the port boundary or in close proximity, could be used to develop manufacturing and logistics operations that would be able to take advantage of the facilities and services that ports offer. The availability of land metric assesses the availability of sites of various sizes located around the port. The highest ranking of the top 15 ports

is Liverpool, in third for availability of industrial development land. Sunderland ranks 5th while Tyne and London rank joint 6th.

Unsurprisingly, London ranks top for access to consumer markets. Liverpool and Bristol also rank highly for access to consumer markets. This will make these locations more desirable for retail or distribution firms.

The availability and cost of labour will be highly important for firms with labour-intensive operations. For logistics operators with highly automated facilities or manufacturing or engineering firms, the availability of skilled labour will be crucial (either highly educated or skilled trades people). Bristol scores highly for availability of labour and availability of skilled labour, while Tyne and Sunderland score well for labour costs.

Port connectivity scores are based on both physical and digital infrastructure, including the proximity of motorways and A-roads, the availability, proximity and gauge of rail freight and whether the port has a private 5G network. Southampton, with a W12 gauge rail freight connection, motorway access within close proximity and a private 5G network ranks top, London and Tyne tie for second place, London benefits from excellent road and rail links while Tyne has a private 5G network.

Seamless multi-modal or intermodal logistics can remove the need for expensive drayage and thus rail freight connections can be of great benefit to some operators and a key strategy for reducing delays at ports. Rail freight is poised to play a much bigger and more prominent role in the movement of goods in the UK. The use of rail freight is steadily increasing in the UK, with a total volume of rail freight moved rising by 3% year on year. Network Rail has forecast that rail freight could grow by around 30% by 2035 if sufficient capacity were made available.

The eight Freeports announced in 2021 are East Midlands Airport, Felixstowe & Harwich, Humber, Liverpool City Region, Plymouth & South Devon, Solent, Thames and Teesside. Nine of the top 15 ports fall within the announced Freeport designations. Discussions for establishing equivalents in Wales, Scotland and Northern Ireland are ongoing. The locations all offer a wide package of tax reliefs, simplified customs procedures, streamlined planning processes to boost redevelopment and these will appeal to a range of occupiers.

While Liverpool ranks top overall according to our generalised rankings, the weightings could be adjusted to account for more specific requirements and priorities, which may produce a different ranking.



SHIFTING PRODUCTION BASES

Exploring the growth potential for manufacturing in the UK

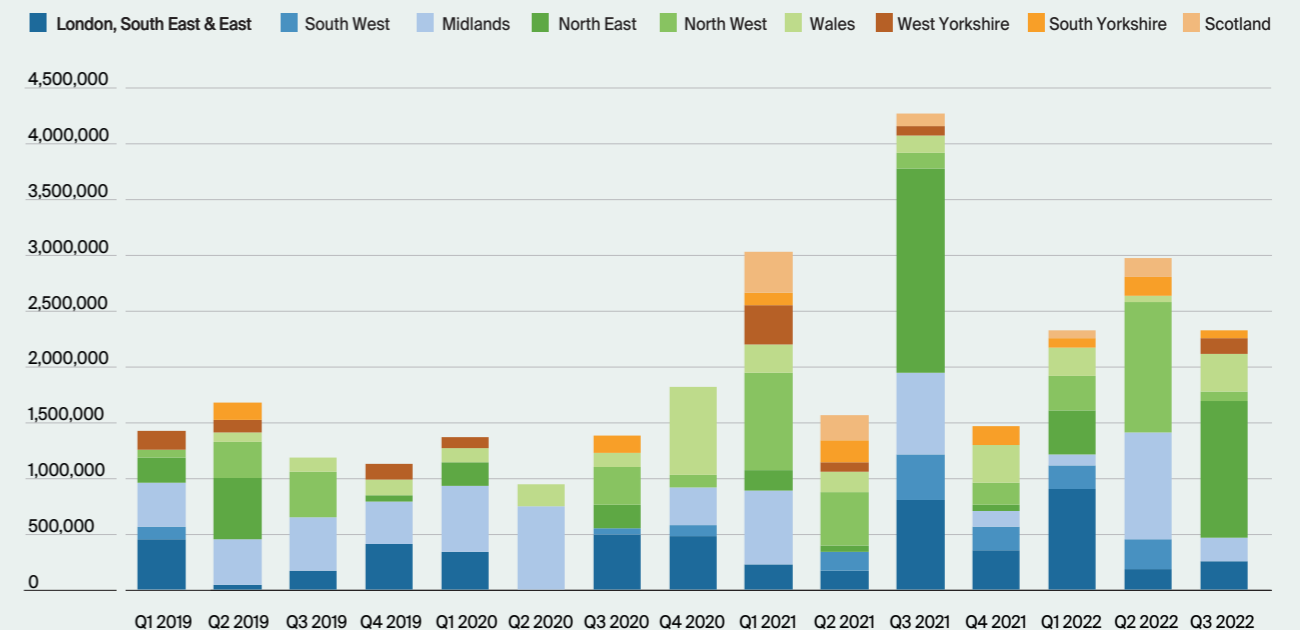
According to the McKinsey Global Institute, 15-25% of global exports could potentially shift to different countries over the next 3-5 years. With global trade worth US\$28.5 trillion in 2021 (UNCTAD Global Trade Update), there is huge opportunity. The 'reshoring' opportunity for the UK lies in high value parts of the supply chain and in manufacturing processes undergoing significant automation.

The UK manufacturing landscape

Manufacturing retains a strong role in the UK's export economy. Although the sector only contributes 10% of GDP, it comprises 44% of exports. The UK's manufacturing industry has been strengthened recently by the drop in the value of the British pound against the US dollar and the euro, thereby facilitating an increased demand overseas for UK goods.

The UK's manufacturing sector expanded in 2021, with product sales of £401 billion, up 9.4% year-on-year. However, sales remained lower than in 2019, when £402 billion was recorded (ONS). Manufacturers' take up of industrial and logistics space has increased in 2021 and 2022, pointing to a continued expansion and enquiries remain robust as we go into 2023. In 2021, manufacturers took a total of 10.3

Take up by manufacturing firms (units over 50,000 sq ft)
sq ft



Source: Knight Frank Research

million sq ft (in units over 50,000 sq ft), compared with 5.5 million sq ft in 2020 and 5.4 million sq ft in 2019. In the first three quarters of 2022, a total of 7.6 million sq ft of manufacturer take up was recorded.

Despite an uptick in the take up of space in recent years, employment in manufacturing has been in decline over the past forty years. In 1980, the UK had more than 6.3 million employed in manufacturing, accounting for 23% of the workforce. By 2021, this had fallen to a low of just 2.5 million, 7% of the workforce. It is forecast to shrink further and account for less than 6% of the workforce in ten years' time (Oxford Economics).

While the numbers of workers employed in the sector are falling, the amount of space needed appears to be rising, as too does investment into manufacturing. Investment in real terms has increased 51% over the past ten years (ONS) and is forecast to rise a further 17% over the next ten years (Oxford Economics). This may be due in part to reshoring, as well as a need to improve efficiencies and the growth of high value manufacturing within the UK.

Over 70% of all UK manufacturers believe that conditions are right for improving export growth and 76% of manufacturers in the UK have a strategy they believe will help their business grow overseas (Source: Brookings Institute). However, the UK's trade deficit for goods has continued to grow over the past 20 years. If the UK is to reduce this deficit, it will need to become more competitive and this will mean selecting industries and sectors where the UK can excel, specialising in high value-added upstream segment of the chips supply chain, while simpler manufacturing processes will continue to be offshored (typically to Asia).

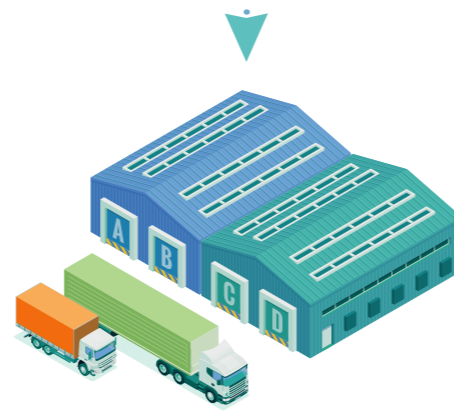
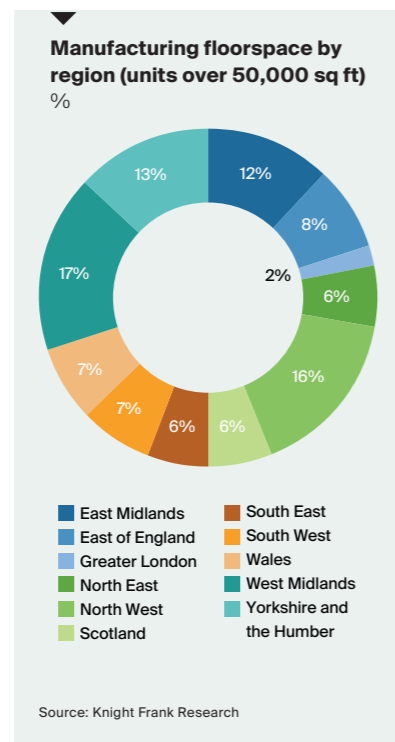
Whatever the scale of opportunity that reshoring presents, what is clear is that the functions and jobs that were lost to offshoring, will not be the same as those created by these new opportunities.

Manufacturers are estimated to occupy around 392 million sq ft of industrial floorspace across the UK (in units over

50,000 sq ft). The largest concentrations are in the West Midlands and the North West, followed by Yorkshire and the Humber and the East Midlands.

With manufacturing investment expected to rise 17% over the next ten years, the sector is likely to place further demands on industrial land and floorspace, as well as continued investment into facilities. This change in the occupier base is likely to mean longer leases (compared with retailers or distribution firms) and different preferences in terms of fit-out and location. As supply chains and production bases shift, the requirements for First Mile logistics and infrastructure may also evolve, creating opportunity.

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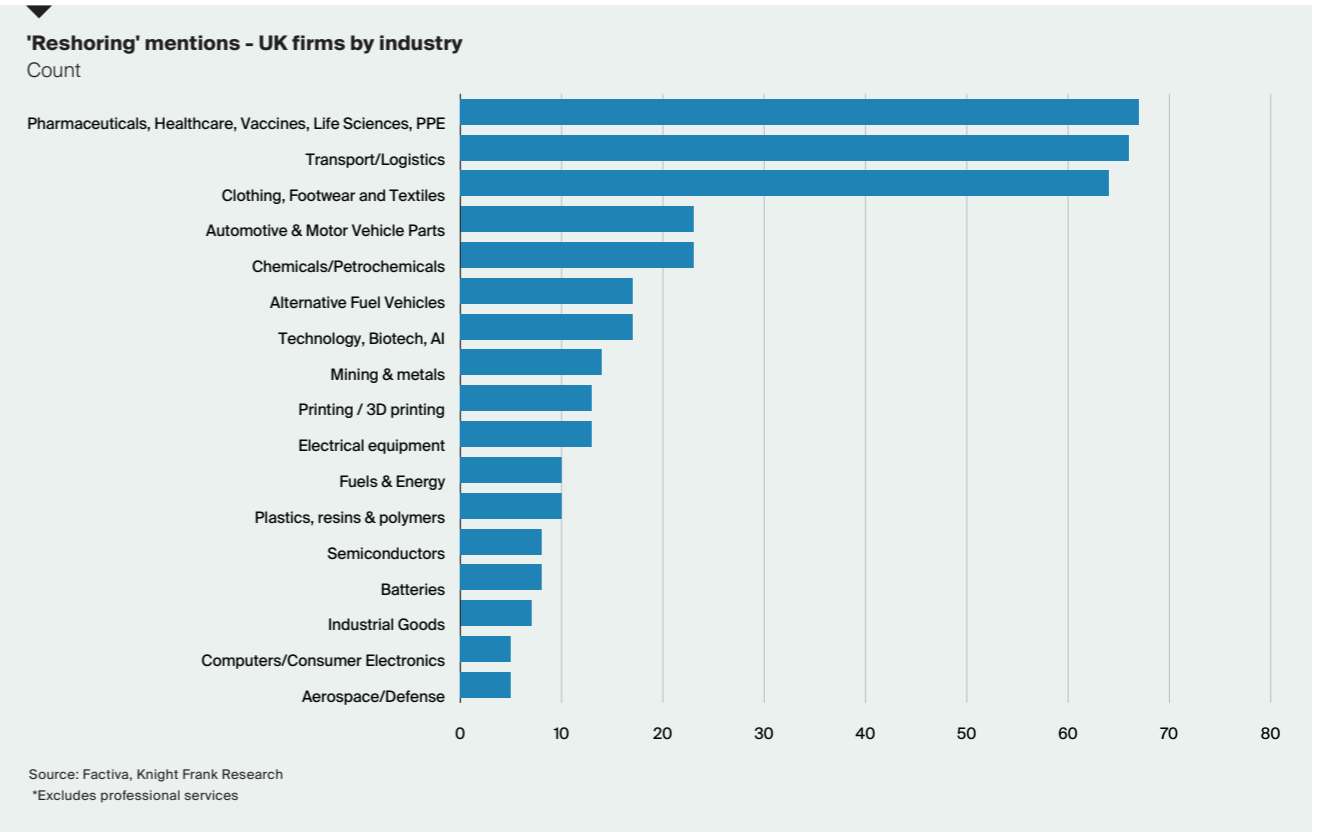


RESHORING - KEY SECTORS

In the US, recent research by Barclays showed that firms were expected to have moved the equivalent of 350,000 jobs back to the US, primarily from Asia in 2022. This compares to 260,000 in 2021 and just 6,000 back in 2010. A recent UK report by logistics platform ShipBob, indicated that two in five small businesses were considering a switch to UK manufacturers.

Reshoring is definitely being talked about. Mentions in company documents have been increasing since Q1 2020, when the Covid-19 pandemic took hold. Countries were competing for ventilators and supplies of PPE, while production hubs imposed export restrictions. This highlighted the perils of critical supply chains being reliant on a single, or small number of overseas production bases, as well as being dependent on international trade and cooperation for these critical supplies. Mentions of 'reshoring' peaked in Q2 2022, perhaps as a result of the war in Ukraine and escalating tensions between the US and China over Taiwan, with heightened concerns over a shift in the geopolitical landscape and faltering international cooperation.

There is a clear benefit for countries and firms to bring critical supply chains and infrastructure requirements, such as energy and the manufacturing of medical supplies, pharmaceuticals and defence technology and equipment onshore. However, firms across a range of industries are talking about reshoring. Pharmaceuticals and healthcare-related industries top the



list but there are also automotive firms, including those focused on alternative fuel vehicles, there are technology and biotech firms as well as batteries and semiconductor firms.

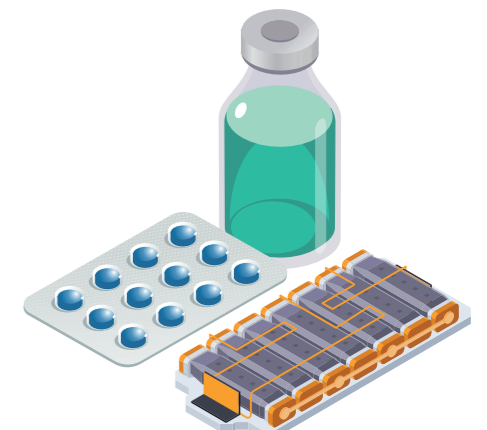
Protecting IP will be particularly important for high tech manufacturing firms, engineering firms as well as biotech, pharmaceuticals and life sciences manufacturers who all invest heavily in research and development.

WHO IS ACTUALLY DOING IT? ...AND WHY?

In January 2021, British bus maker Alexander Dennis (ADL) announced it will manufacture the chassis for both its single- and double-deck electric buses in the UK. Previously, the chassis were made in parent company BYD's factories in Hungary and China and shipped to the UK for assembly. The change will mean the complete vehicles will be made in Britain, despite both Hungary and China having lower production costs than the UK.

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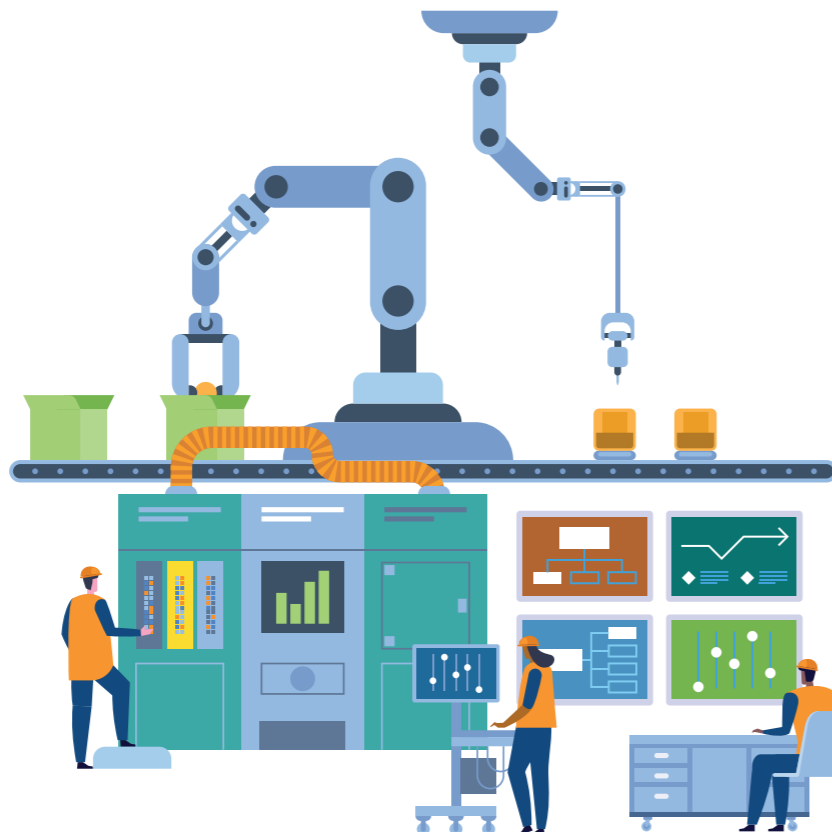
In 2020, Walsall-based automotive parts manufacturer Albert Jagger reshored production of almost a quarter of a million fastening components from China as it was no longer cheaper to source from China. After finalising the reshoring process, they secured multiple contracts, allowing them to expand their



Electric bike manufacturer Volt reshored production from Poland to Milton Keynes due to uncertainties around tariffs post-Brexit. Volt initially set up production in China but moved to Poland in 2017 as the EU mooted the possibility of anti-dumping duties on e-bike imports from China. When the UK triggered Article 50 and began the process of exiting the EU, uncertainties around duties returned and the decision was made to move production to the UK, close to their key consumer market of London. Volt opened a new purpose-built 20,000 sq ft production facility in Milton Keynes, a city that is establishing itself as an innovation and tech hub, with a growing cluster of tech manufacturing firms including component part manufacturers. However, Volt continue to rely on component parts manufactured abroad.

There are examples but reshoring has yet to become widespread. Of course, not everything will come back to the UK but where manufacturers are considering dual-sourcing strategies, the UK can be an appealing option and not just for UK firms.

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AREAS OF OPPORTUNITY

Identifying the key sectors can help us identify the locations of opportunity, with manufacturers in the same industries tending to cluster in hubs or corridors. Certain sectors will choose to locate in areas where experienced labour is present, or component manufacturers may choose to locate close to assembly and later stages of production. However, reshoring across broad industries is typically not possible, or desirable given cost implications and inefficiencies involved in bringing back home some part of supply chains. That said, there could be opportunity to bring back high value component part manufacturing across a range of industries.

Automation and digitisation

The ability to automate or digitise production makes an industry more likely to reshore operations. Automated procedures can reduce the reliance on human labour, the cost of which is often a key factor determining production

locations. Advanced production methods, automation technologies and robotics are having a huge impact on the types of labour needed for manufacturing. A need for large numbers of unskilled labour is being replaced by demand for specialist skilled labour. While unskilled labour is relatively abundant globally, these specialist skills are scarce.

Increased automation and high tech manufacturing necessitates higher levels of investment. As capital expenditure increases, property protection rights as well as tax and investment incentives, the stability of the economy and the political system will all become increasingly important for firms making location choices for their manufacturing bases. With increased technology and digitisation comes greater reliance on power and digital infrastructure. The cost, reliability and environmental impacts of both physical and digital infrastructure could motivate firms to relocate their manufacturing bases.

ADDITIVE MANUFACTURING

While not all parts can be manufactured in this way, additive manufacturing (3D printing) can remove or reduce the need for physical inventory, thus reducing shipping and storage costs. If parts can be scanned to create a digital version and stored in the cloud, then a digital scan set to a 3D printer to manufacture locally, there is no longer a need for lengthy supply chains and large stock holdings. Though this may reduce the need for warehousing space in the traditional manufacturing centres, this need is replaced by a need for high tech manufacturing space in or close to consumer markets.

DB Schenker has launched a new on-demand production service using additive manufacturing. Its new virtual warehouse can provide spare parts for its customers from the mechanical engineering, automotive, and rail transport markets with parts produced locally on demand, via a 3D printer.

Automation and reshoring are bringing opportunities for manufacturing firms and investors and will have significant implications for location choices and real estate requirements. With firms investing more in automation and the fit out of their facilities, they will want to remain in those facilities for longer and are likely to amortise their capital expenditure over their lease period. Meaning long-term stable income for investors.

The ability of the UK to capture the growth in global high tech industry and to attract manufacturing to (or back to) the UK will depend on various factors, including: labour costs, availability of skilled labour, infrastructure reliability and connectivity, investment incentives, corporate tax rates, political and economic stability, access to markets (trade agreements) as well as regulatory efficiencies, the rule of law and the level of state intervention in investment and financial processes.

High value manufacturing

Due to the post Brexit rules of origin and the strengths of the UK market, which include highly skilled labour and robust intellectual property rights, the opportunity for manufacturing growth and reshoring lies in advanced, high value manufacturing.

The High Value Manufacturing Catapult, which supports the growth and success of high value manufacturing in the UK, launched in 2011. Today there are 25 sites around the UK. Opportunities for the growth of high value manufacturing could be found in locations close to these centres, due to their fostering of links between industry and academia, through investment, knowledge sharing and collaboration.

Critical infrastructure

Rising geopolitical tensions and the Covid-19 pandemic have brought into focus the need to strengthen *critical* supply chains. In early 2020, many countries

started halting exports of critical medical supplies in order to keep supplies at home, leaving import dependent countries unable to secure supplies. The war in Ukraine has further highlighted the vulnerability of some of our vital supply chains, including energy and food.

The UK has 13 defined Critical National Infrastructure Sectors: Chemicals, Civil Nuclear, Communications, Defence, Emergency Services, Energy, Finance, Food, Government, Health, Space, Transport and Water. While most of these are already located here in the UK, pharmaceuticals, medical equipment, defence equipment, food and energy may be sourced offshore. The need for security around these critical supply chains should drive an increase in domestic production in these sectors or industries. It is perhaps not surprising that pharmaceuticals, healthcare, vaccines, life sciences and PPE firms topped the list for mentions of 'reshoring'. Fuels and energy firms and aerospace and defence firms are also talking about reshoring.



Medicinal and pharmaceutical products are in the top 3 goods exported from the UK, with the UK a net exporter of medicinal and pharmaceutical products (worth £20.3 billion in 2021). Pharmaceutical and life science companies are focused geographically around the Oxford – Cambridge Arc, though there are also clusters growing in other UK cities. Indeed, 50% of jobs in the sector are located outside of London and the South East (Bioscience and health technology statistics 2020). Links with leading academic institutes are key to driving location choices for these firms. However, production may not take place alongside the research and development of products and many SMEs in the sector have no manufacturing capabilities and will outsource production.

Quality control and intellectual property rights could be reasons for firms to choose to manufacture within the UK. The desire to control domestic supply of these products and create high value job growth within the UK are key reasons for the government to incentivise UK production. The government has various funds that support life sciences

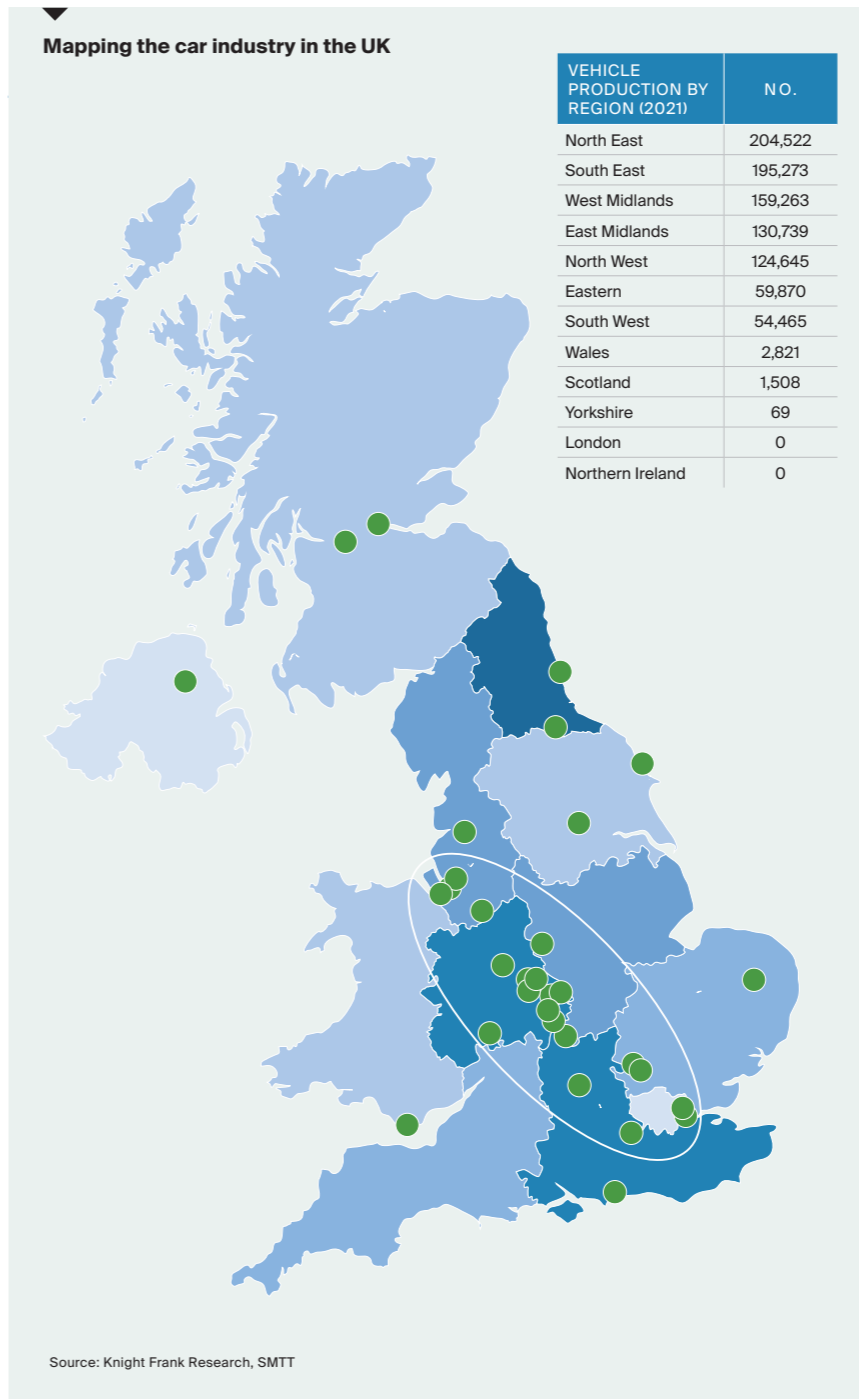
investments including the £60 million Life Sciences Innovative Manufacturing Fund (LSIMF).

Spread across the UK, the High Potential Opportunity (HPO) scheme, run by the Department for International Trade (DIT), works with local partners and identifies opportunities to attract international investment into emerging, fast-growing sectors, regions and clusters. These include; chemicals in the Humber, biomanufacturing in Tees Valley, Medtech health in Wales and vaccine development and manufacture in Liverpool City Region.

Fujifilm Diosynth Biotechnologies (Japan) recently committed £400 million to create the largest multi-modal biopharmaceutical manufacturing site in the UK, creating up to 350 highly skilled jobs on Teesside. PCI Pharma (US) is expanding their manufacturing facility in Tredegar, Wales. The expansion will help the company keep pace with global demand for the production of cancer therapies, and will add about 200 jobs once the facility is at full capacity.



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Automotive

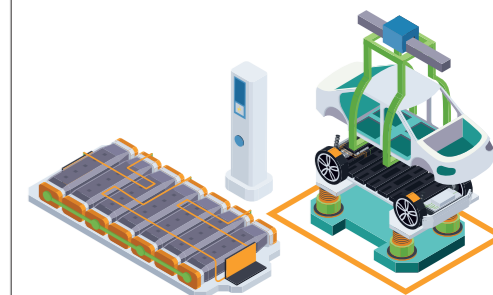
As part of the zero-tariff free trade agreement agreed between the UK and EU, rules of origin (ROO) were introduced, these criteria must be met in order to access tariff-free treatment for goods exports and imports to or from the EU. In effect, the ROO limit the proportion of imports from outside the UK/EU that can be used to create a product that qualifies for zero-tariff trade.

The UK-EU Trade and Cooperation Agreement (TCA) temporarily exempted electric vehicles (EVs) from the ROO because such a large proportion of the car's value (c.30-45%) comes from the batteries, which are imported from Asia. Until 2024, at least 40% of the content of EVs and 30% of batteries must originate in the UK or EU. From 2024 (until 2027) this will increase to 45% of EVs and 50% batteries. If you combine the ban on petrol and diesel by

2030 and the tightening tariff rules by 2027, there may be an acceleration of change in the automotive production supply chain. This will necessitate increased battery and EV production in the UK and EU and reduced sourcing from Asia.

The UK has a total of 32 automotive assembly and production plants (SMTT). While the North East region is the largest vehicle producer, the West Midlands is home to the largest number of plants, there is a notable cluster of plants along the M6 and M40/M1 between London, Birmingham and Liverpool. The need for increased EV and battery production could be expected to benefit these same areas, due to the clustering effect along with existing labour skills and facilities.

Port locations could also be an important draw, the ports of Grimsby & Immingham, Bristol, Tyne, London and Medway are key hubs for the import and export of motor vehicles (Department for Transport, Port Freight Statistics).



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Freeports

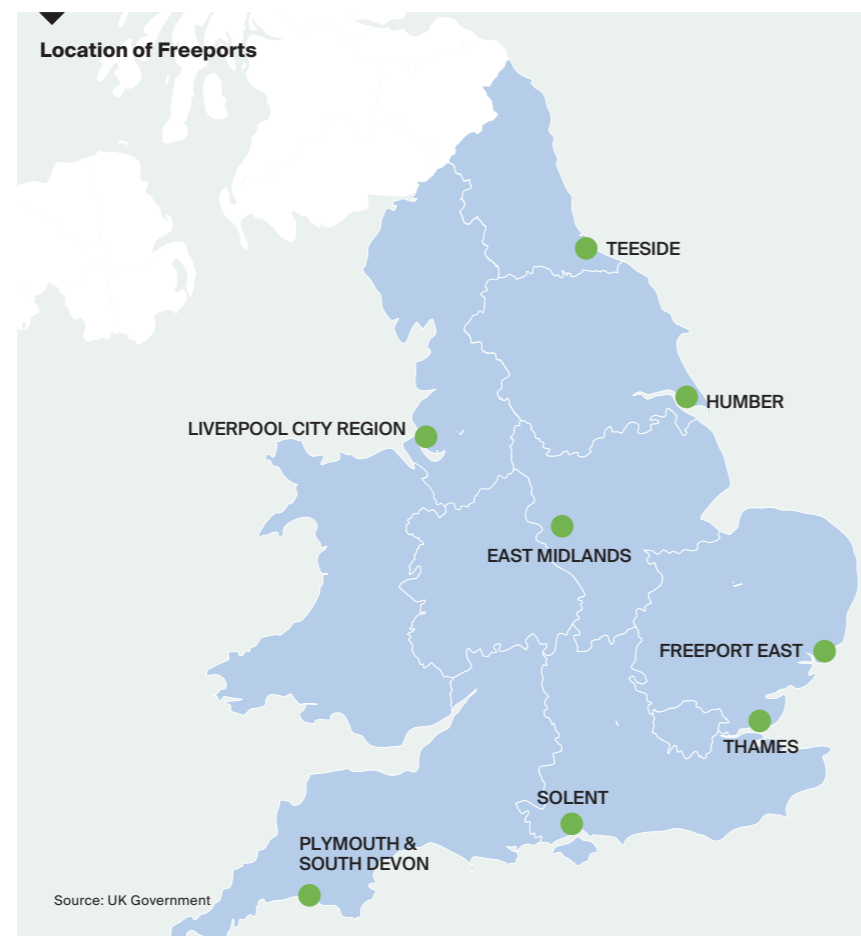
The benefits of Freeports are relevant to all businesses, not just those focused on import/export operations. They could also present an appealing location for firms seeking to reshore manufacturing operations due to the range of tax incentives and reliefs.

The potential for tax savings is significant. The NIC relief could be particularly appealing to manufacturing firms establishing new facilities with more labour-intensive operations. Capital allowances could incentivise firms committing to large capital expenditure on plant and machinery. Business rates

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relief (at 100% for five years) could be particularly valuable, particularly given the ratings revaluations in April 2023. Industrial and logistics occupiers are likely to face large increases due to sector's strong rental growth over the ratings revaluation period (Q1 2017 to Q1 2021).

Our port-centric logistics scoring model could be adapted to take account of the specific requirements of manufacturers. Though many of the factors driving location decisions will be the same, the weightings given to the factors may differ and there will be variations across different manufacturing sectors.



CONCLUSIONS

Global economic growth is slowing, with heightened levels of uncertainty and rampant inflation is impacting household purchasing power. These factors are likely to weigh on the UK economy and the industrial and logistics sector. However, while cyclical factors may dampen prospects for the short term, the secular rise in the need for resilience does pose some longer term opportunities, along with challenges for the sector.

The reconfiguration of supply chains, the need for some firms to hold additional stock and the reshoring and the broader growth potential for UK manufacturing will necessitate a dynamic and evolving

industrial and logistics sector and this means opportunities, for investors and for logistics operators.

A need to improve the resilience of domestic infrastructure, supply chains and logistics will mean a need for increased investment in ports and in rail freight. New terminals, or locations undergoing upgrades and particularly new multi-modal hubs are likely to appeal to logistics operators as they look to improve efficiencies. The need to hold additional safety stock may simply mean they look for more efficient ways to hold stock within their existing facilities but some firms close to capacity may need to bring forward expansion plans.

Shifting global supply chains and changing global production bases will also have implications for the UK, both as an opportunity to grow its manufacturing and logistics base and changing trading relationships will mean shifts in terms of location preferences. The reshoring of production could lead to an increasingly diverse occupier base, with demand coming from high value, advanced manufacturing firms and others who will have different requirements in terms of facilities, locations and labour etc. These producers will also have distribution requirements, further impacting demand.



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