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The impact of the global supply chain and raw material challenges on manufacturing production

Five steps to mitigate disruption to your production lines

A white paper



“Everywhere you look the global supply chain is a mess”

The Wall Street Journal - March 2021

The impact of the global supply chain and raw material challenges on manufacturing production and five steps manufacturers need to take now to prevent disruption to their production lines.

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Introduction

Whether during the height of the Covid-19 pandemic¹, or as a result of the Ever Given becoming wedged in the Suez Canal², the last 12 months has been marked by intense and rapid disruption of the global supply chain for a significant number of sectors.

As nations emerge from the Covid-19 crisis and, for developed economies - consumption accelerates, there are currently mounting shortages in vital raw materials, coupled with the inevitable increase in prices and increased costs in relation to transportation, that will all require a rapid response if impact on production is to be minimized.

This white paper sets out both the cause and effects of these supply chain issues and the steps involved in a speedy, carefully calibrated response that manufacturers can take now to protect themselves from the severest impacts in the coming months.

Factors influencing current shortages

While the world closes in on 2 billion Covid-19 vaccines administered globally³, the disruption caused both to humanity and global industry remains ever present. There are currently four key factors impacting the global supply of raw materials that are posing a significant threat to manufacturing.

1. Labour costs and shortages



Whether a result of lack of skilled candidates or hesitancy to return to the workplace, labour shortages are currently pervasive in key markets for manufacturing and production, such as China and the US, which is currently resulting in higher prices as well as lower supply of finished goods. This includes parts that go into those finished goods and those that keep the manufacturing line going.

2020 saw the highest increase in manufacturing labour costs for China in 5 years⁴ which represents a significant increase in costs for factories and plants that the manufacturers have been struggling to absorb as they have done in previous years.⁵ In some areas of industry, Chinese labour costs have increased by as much as half.

¹ Financial Times, 'COVID-19 Crisis Highlights Supply Chain Vulnerability'

² SupplyChainBrain, 'Will the Giant Containerships Cause More Supply Chain Disruptions?'

³ The New York Times, 'Tracking Coronavirus Vaccinations Around the World'

⁴ Statista, 'Manufacturing Labor Costs Per Hour for China, Vietnam, Mexico from 2016 to 2020'

⁵ Bloomberg, 'China's Supply Chain Frontliners Bear Brunt of Surging Costs'

Some companies are reassessing their Chinese footprint in the light of these economic predictions, proactively exploring other low-cost geographies in emerging trading networks. Rapid growth economies such as Bangladesh and Vietnam are catching up quickly, providing cheap alternative destinations. But that all takes time. In China's twelfth Five-Year-Plan, the leadership called for higher minimum wages, income tax reform, and increased welfare schemes - all of which are now feeding through to have an impact on costs and ability to produce.

Meanwhile in the United States, a survey conducted by the Institute for Supply Management (ISM) revealed that labour shortages have led to a decrease in the Production Index for the US market by 4%.⁶ This has already created an average lead time for production materials of 85 days, the highest on record for the US. At the same time, customer inventories currently are at an all-time low, but may remain there as ING Think (ING Bank's think tank made up of ING's global economists and strategists) anticipates that the current labour shortages within the US market will not lower significantly any earlier than September this year.⁷

2. Natural disasters

Along with the strong winds that turned the Ever Given into a \$10 billion blockage in the Suez Canal⁸, there have been a number of natural disasters within the last 12 months that continue to impact the supply of polymers, essential for industry and manufacturing (for example products like belts used in mechanical power transmission in finished products and on the production line).



Some may recall the impact of Hurricane Laura which swept through the petrochemical centre of the US, shutting down factories in Louisiana and Texas overnight which directly, as reported by Harvard Business Review, lead to the loss of 10-15% of US plastic and polymer production⁹. More recently, Texas was hit by a winter storm in February 2021 which knocked out its electrical grid, and once again froze production of plastics and polymers in the largest petrochemical complex in the world.¹⁰ Experts estimate that the disruption caused by winter storm Uri alone would continue to impact the plastics supply chain for at least 6 months. Harvard Business Review notes that:

“Only the companies that had developed solid monitoring and supplier mapping capabilities – down to the sub-tier site and part level – had a complete picture of how the evolving crisis would affect their supply chains”.

⁶ Institute For Supply Management, 'Report On Business Roundup: May Manufacturing PMI'

⁷ ING Think, 'US Supply Constraints Hold Back the Recovery'

⁸ Bloomberg, 'How a Desert Wind Blew \$10 Billion of Global Trade Off Course'

⁹ Harvard Business Review, 'The Latest Supply Chain Disruption: Plastics'

¹⁰ Click2Houston, 'Power Struggle: The Texas Energy Crisis'

This allowed those companies to take action before the disruption hit. Some were able to avert any negative impact from the shortages thanks to the systems developed during the pandemic. Many others just had to suffer the full force of the impact.

3. Post-pandemic demand surge



Current shortages for commodities and raw materials are being exacerbated by a widening gulf between supply and demand. Demand generated by the accumulation of consumer savings globally¹¹ and recovering industries scrambling to meet it, has caused a surge in calls on raw materials and goods¹² leading to disruption for construction and manufacturing as they both struggle to obtain the steel, timber, plastic, and metals they rely on.

To put this into further perspective, from a global negative base caused by the pandemic, US Gross Domestic Product (GDP) grew at a huge 6.4% in the first quarter of 2021 and is forecast to rise to a whopping 9% percent (annualized rate) in Q2 2021. It will average out at 6.6% for 2021 as a whole. Looking further ahead, the US is forecast to see economic growth of 3.8% in 2022 and 2.5% in 2023. All of this as the combined impact of a mass vaccination rollout and federal stimulus checks triggered a surge in consumer spending.¹³

The forecast for growth in continental Europe is a little more muted but the UK is slated to most closely mirror the unusually high levels of demand and related expansion of GDP in the US. From a global point of view growth is projected at 6% in 2021 as a whole, moderating to 4.4% in 2022.¹⁴

According to Reuters interview with Jim Baird, the Chief Investment Officer at Plante Moran Financial Advisors in Michigan, the pressure that the sudden boom is placing on the supply chain is significant. Baird stated that:

*“Strong demand is a good problem to have, but that demand is increasingly straining manufacturers’ ability to keep pace”.*¹⁵

Manufacturers will be unable to cash in on this once in a lifetime demand boom without adequate supply of raw materials, while the demand itself is increasing the severity of the shortages.



¹¹ S&P Global Market Intelligence, ‘Consumers to Unleash Trillions of Dollars in Excess Savings when Pandemic Ends’

¹² The Wall Street Journal, ‘The Economic Recovery is Here. It’s Unlike Anything you’ve Seen.’

¹³ The Conference Board, ‘The Conference Board Economic Forecast for the US Economy’

¹⁴ International Monetary Fund, ‘IMF Global Economic Outlook April 2021’

¹⁵ Reuters, ‘U.S. Manufacturing Gains Steam; Raw Material, Labor Shortages Mounting’

4. The impact on transportation and logistics



To add to all of this, there are the challenges involved in moving raw materials and products around the world. The global supply chains are highly dispersed in the 21st century. This is good for prices, costs and production when everything is moving smoothly but is very disruptive when there are challenges and problems. One local challenge can have a global impact. Currently the sector faces multiple challenges.

HDI Global noted that:

“The worldwide production shutdowns in the first quarter of 2020 resulted in an overall reduction in active transport capacities; but in the second and third quarters, East Asian states bounced back from the pandemic’s first wave more quickly and were able to ramp up their economies once again, resulting in growing imbalances in the worldwide flow of goods.”

They went on to state that this meant:

*“Empty containers have piled up in European and American terminals, while Asian exporters have not had sufficient empty containers available for their shipments.”*¹⁶

As manufacturers began to replenish stocks this has resulted in further imbalances in transportation supply and demand. This results in transport costs for container shipments increasing, delays to deliveries and, in some cases, cancellations. HDI notes that:

*“Surcharges as high as 5,000 USD per container are being levied in some markets”.*¹⁷

In another report¹⁸ nearly half of US and European business leaders (45%) note that they have felt the impact, stating that Covid-19 “significantly” disrupted their supply chain.

In addition to sea freight - air freight is seeing unprecedented demand with global cargo volumes reaching the highest level in the history of IATA’s records in March 2021.¹⁹ Industry-wide cargo tonne-kilometres (CTKs) rose by 4.4% vs. the pre-crisis levels and by 0.4% month-on-month.

In 2021, CTKs are estimated to rise by 13.1% vs. 2020. However, global available cargo tonne-kilometres (ACTKs) are still ~12% below the pre-crisis level. All of which results in demand outstripping supply by some considerable way and related rising costs for manufacturers.



¹⁶ HDI Global, ‘Container and Shipping Shortages: Pandemic Effects in Global Logistics’

¹⁷ Ibid.

¹⁸ Reuters Events, ‘Supply Chain Disruptions may have Caused up to \$4 trillion in Lost Revenues’

¹⁹ International Air Transport Association, ‘Air Cargo Market Analysis March 2021’

The impact of shortages for UK manufacturing



The resulting global shortages from these drivers, and particularly in raw materials, notably plastics and polymers, rubber, cold-rolled, pressed, pipe and sheet steel, aluminium, copper, nickel and zinc, is already being felt by many industries including construction,²⁰ automotive,²¹ and manufacturing.

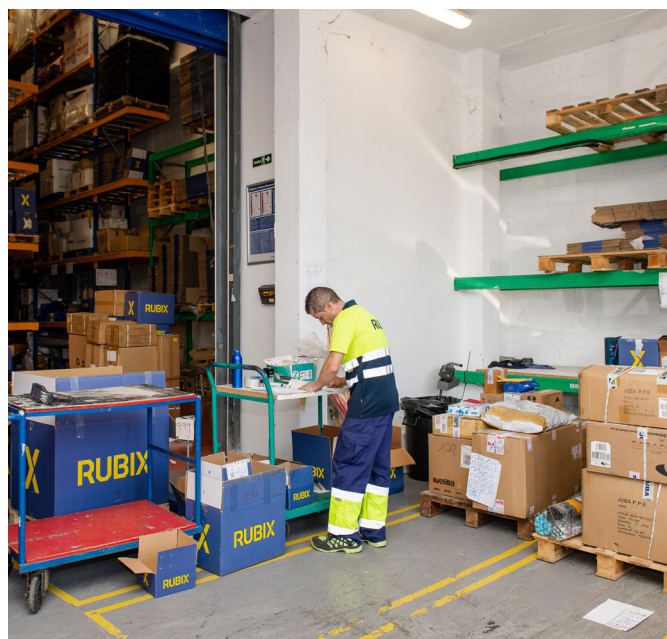
These shortages affect production, and by extension the supply, of everything from semi-conductors to semi-gloss paint both due to their direct use in the manufacturing of those products, and through being used to make the parts necessary to keep those plants running.

One of the impacts the UK market is already facing is the rising cost pressure brought on by the increase in costs of raw materials. Although UK manufacturing growth is currently enjoying a 30-year high,²² there are growing cost pressures that are no longer feasible for factories to absorb by sacrificing their profit margins.

These will increasingly have to be passed on to customers down the chain. This could lead to a surge in inflation and is thought to be a possible cause of a new commodities ‘super-cycle’, with sustained high prices for raw materials lasting potentially decades.²³

But if not decades, then months of price pressures are already hard-wired into markets. As Roland Busch, CEO of Europe’s largest industrial manufacturer - Siemens - noted:

“At least for the next two quarters, we will see this [price] pressure,” noting that **“the markets are so volatile”**²⁴ that the manufacturing giant’s suppliers are struggling to meet demand.



Factory shutdowns over increases in raw materials costs and shrinking profits could soon become a reality in the UK as it already is in China, where small and medium sized factories are finding it difficult to stay afloat amid the current surge in costs.²⁵

German automotive manufacturing giant, Audi, has recently had to idle 10,000 staff after shortages in semi-conductors meant they could no longer continue production,²⁶ a decision that many factories in the UK might soon be faced with if they are unprepared for the incoming shortages.

²⁰ BBC News, ‘Travis Perkins warns of Price Rises Amid Shortage of Raw Materials’

²¹ MetalMiner, ‘Supply Chain Shortages: Could One Industry’s Challenge be Another’s Solution?’

²² BusinessMatters Magazine, ‘UK Manufacturing Growth at 30-year High’

²³ Financial Times, ‘Markets Weigh Prospect of New Commodities Supercycle’

²⁴ Financial Times, ‘Siemens Jolted by Global Supply Chain ‘Rollercoaster’

²⁵ China Macro Economy, ‘China’s Factories Decry Surge in Raw Material Prices as they Cut Production and Say 2021 may be Worse than 2020’

²⁶ CITY A.M., ‘Audi to Idle 10,000 Workers as Chip Shortage Continues - Report’

Hindsight is 2020, foresight is 2021



Supply chain disruption may have been centre stage during the last year, but it isn't the first stress test that supply chains have faced in the modern age, neither was the previous learning moment experienced during the 2011 earthquake in Fukushima, Japan.²⁷ Unfortunately, there is no vaccine for supply chain weaknesses and force majeure, but a lot of thought will be given to how to manage threats and deal with disruption going forward.

Whilst key in relation to managing the raw materials challenges and supply chain disruptions to meet demand for the manufacturing of the end products, too little focus is given to the dealing with the impact that raw material supply disruption will have on the parts that make the products.

Reading the list of raw material shortages, it does not take much imagination to think of what impact this will have on the bearings, belts, chains tools and the many other key parts and items that manufacturers need to keep their plant running. Brammer Buck & Hickman - the UK's leading supplier of industrial supplies and services to industry and a Rubix Company (Europe's number one multi-specialist supplier of industrial products and services) have done the analysis on the specifics. Their category team experts, working with their logistics and supply managers and the parts providers themselves (the key brands such as SKF, NSK, Schaeffler, Gates, Opti, Renold - in total 24 of them) have identified the following major categories and products that will see the severest impact in relation to shortages and increased prices:

Category	Sub category
Rolling and plain bearings	<ul style="list-style-type: none">• Radial Ball Bearings• Radial Roller Bearings• Housed Bearings
MPT	<ul style="list-style-type: none">• Belts• Chain• Ironware
Gearboxes & Motors	<ul style="list-style-type: none">• Motors
Tools & Maintenance	<ul style="list-style-type: none">• Lifting & Handling Equipment• Hand Tools• Power Tools• Storage Equipment
DIN Parts	<ul style="list-style-type: none">• DIN Parts

The issue for those manufacturers who are able to secure sufficient supply of raw materials to produce finished products is that their lines may not be able to keep abreast of the demand simply due to a shortage of maintenance spares they need on hand to keep those lines running. Resulting 'stock outs' up the chain are likely to result in prolonged shutdowns with significant impacts.

Brammer Buck & Hickman has already taken action to help preserve availability and protect customers in these categories - taking delivery of more than £1m of extra stock in the month of June. Proactive measures throughout the manufacturing and supply chain are required, and there are five key actions that all parties should be considering.

²⁷ The New York Times, 'Stress Test for the Global Supply Chain'

What to do now - the five step guide

Brammer Buck & Hickman note a series of recommendations to ensure that UK manufacturing can insulate itself as much as possible against these impacts:

- 1** First, if you have not already done this, as soon as possible calculate the normal min / max stock levels you need in your store to meet normal demand from the maintenance team. This will need to be driven by your data and analysis before setting min / max algorithms. If you do not have access to the data or are unfamiliar with what algorithms to use - or you are unsure where to start - find a good distributor or supplier like Brammer Buck & Hickman to help and support you. The chances are they will have other customers and a wealth of data of their own that will provide a good analogous starting point for your initial min / max base line levels.
- 2** Next, you need to flex the data to take account of the specific impact of the forecast shortages in each category. This requires benchmarking, knowledge of part supplier challenges and stock levels and a predictive algorithm as well as trading and stock control data to provide further comparisons.
- 3** Set the levels to max and stock to that level. Even if you do not follow points 1 and 2 and have no min / max calculation stock up now.
- 4** In stocking now, select your supplier based on their expertise and buying power in each of these categories; their stock-holding capacity; and their deeper reserve inventory supplies that they may have around their business in both the UK and in Europe.
- 5** Ensure also that your supplier has a close relationship and considerable buying power with the parts manufacturers themselves. This should give them - and therefore you as their customer - more access to limited supplies, the ability to hold prices lower than others in the market and an enhanced ability to forecast in advance of further supply constraints.

Finally - act now. In fact, that is the simplest message of all. Do NOT delay. If you do you will first see prices rise to an unprecedented level and then you will find your suppliers imposing quotas as they, in turn, experience quotas from their parts suppliers and finally - you will find neither you, nor they, have the stock needed to keep your lines working.

Act now



Time is rapidly running out for companies who wish to protect themselves during the mounting shortages and price increases.

The least severe outcome will be enjoyed by those that take a structured approach, choosing to identify and reduce the impact of incoming crises using careful monitoring and data-driven optimisation rather than having to learn from costly first-hand experience. But any company can simply increase their

stock holding in preparation and anticipation, even if they do not employ the best data driven optimisation techniques.

This product supply shortage is entirely foreseeable, as is the unprecedented increase in consumer demand. Missing out on that demand is preventable provided the manufacturers have taken the trouble to ensure that they have sufficient supply of the products they need to keep their plant running. To do that they must act now.

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Brammer Buck & Hickman are offering their decades of experience, and expertise to help identify areas where customers are likely to be affected by shortages in part supplies and can support them in both preventing them experiencing that shortage and optimising their inventory for the future during the continuing crises and when the situation returns to something like normal.

➤ For more information on how you can tap into this expertise, provided entirely free of charge to customers, call your local branch or contact them [here](#).



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