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Manufacturing and trade

From Just-in-time to Just-in-case?

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- The pandemic has helped to disrupt lean manufacturing processes…
- …leading some businesses to stockpile components and build inventories in order to mitigate future shocks
- This could help to support global trade flows but may also exacerbate shortages of critical goods in the near term

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From Just-in-time…

Just-in-time (JIT) manufacturing – where producers hold only the amount of parts they need – has transformed the operation of supply chains over the last 60 years, enabling businesses to minimise costs and improve efficiency. However, ongoing shipping disruption and strong demand for certain components, notably semiconductors, in the wake of the COVID-19 pandemic have significantly affected JIT supply chains, which rely on the seamless movement of inputs between suppliers and buyers around the world.

…to Just-in-case

As a result, some businesses are moving to hold even higher volumes of components than required under JIT manufacturing in order to mitigate future trade disruption. For example, Taiwan Semiconductor Manufacturing Company (TSMC) – the world's largest semiconductor manufacturer – expects its customers to gradually prepare higher levels of inventory through this year, while Toyota has been stockpiling key components for the past four months (TSMC, 15 April 2021 and Nikkei Asia, 2 June 2021).

Implications for trade

Although building safety stocks could help to support trade flows in the short run, there is a risk that over-ordering could exacerbate existing shortages of key components. However, we do not expect businesses to move to hold higher inventories permanently. Holding higher stocks can be costly and businesses risk having excess supply once demand eventually normalises.

Alternative risk mitigation tools

Longer term, businesses could take alternative measures to guard against future trade shocks, which may have competing effects on international trade. Measures to diversify markets could help to buoy international flows, while strategies to switch to nearby suppliers or to manufacture components in-house could lead to a reduction in some traded goods. Adopting digital technologies may also enable businesses to better manage inventories and identify potential supply chain disruptions going forward.

This is an abridged version of a report by the same title published on 21-Jun-21. Please contact your HSBC representative or email AskResearch@hsbc.com for more information.

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Stocking up

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Securing supply

Manufacturing has become increasingly lean over the past 60 years

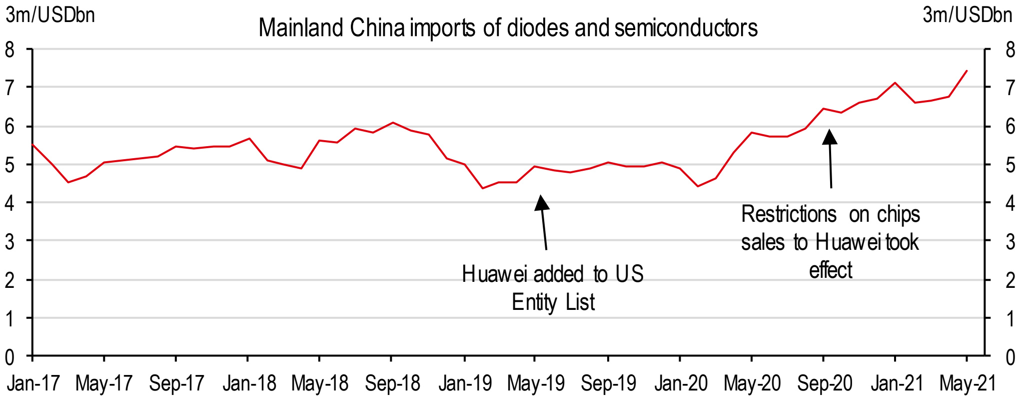
Just-in-time manufacturing and trade disruption

Manufacturing has become increasingly lean over the past 60 years or so thanks to the innovation of just-in-time (JIT) manufacturing. Pioneered by Toyota, JIT manufacturing aims to cut down on excess inventory and ultimately improve efficiency. Today, JIT production is used in a number of industries ranging from autos to electronics and fashion (Thomson Reuters, 3 July 2020).

However, JIT relies on the seamless movement of components and materials between suppliers and buyers around the world. Our global economists have written about how COVID-19 has highlighted just how fragile global supply chains are. Over the past year, shipping issues, lockdown restrictions, and strong demand for goods such as electronics, autos and construction materials, has significantly affected the ability of manufacturers to get their hands on critical inputs and led to delays in production.

For semiconductors in particular, COVID-related bottlenecks have been exacerbated by other factors such as stockpiling by Chinese companies ahead of (pre-pandemic) US trade restrictions, severe weather in Texas, drought in Taiwan, and a fire in a chips plant in Japan (chart 1).

1. Mainland China has been stockpiling chips

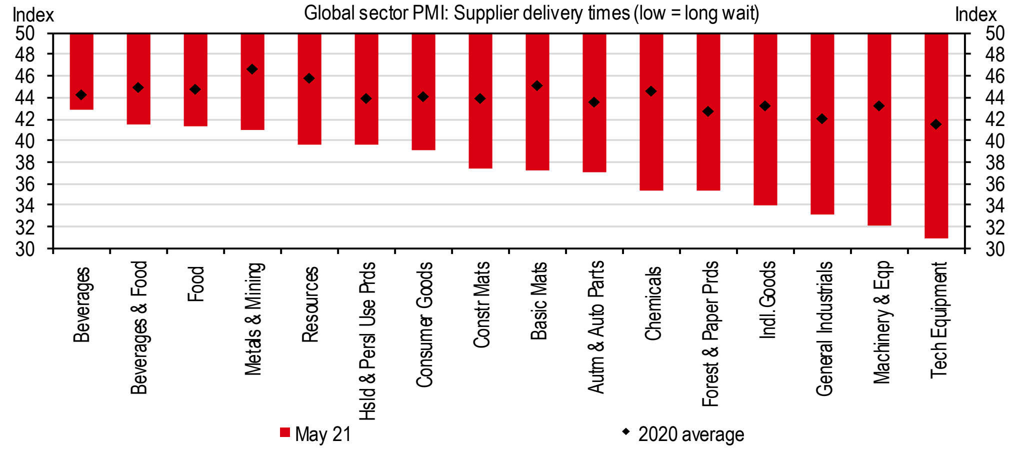


Source: Refinitiv Datastream

Ongoing delays have lengthened lead times for various components

As a result of ongoing delays and disruption, lead times for various components have lengthened and input prices continue to surge (Charts 2). For example, Nikkei analysis finds that it may now take up to 52 weeks for key electronics components such as microcontroller and power management chips to be delivered, compared to around 4 to 8 weeks pre-pandemic.

2. Delivery times across many sectors have extended



Source: IHS Markit. Note: This sub index is only available for some sectors.

Building resilient supply chains

Just-in-case manufacturing

Supply shortages and surging prices have raised questions about the effectiveness of JIT supply chains during times of disruption, and have prompted some businesses to look to hold higher stocks of components going forward, which could have implications for trade flows.

Toyota stockpiled key components to help mitigate trade disruption

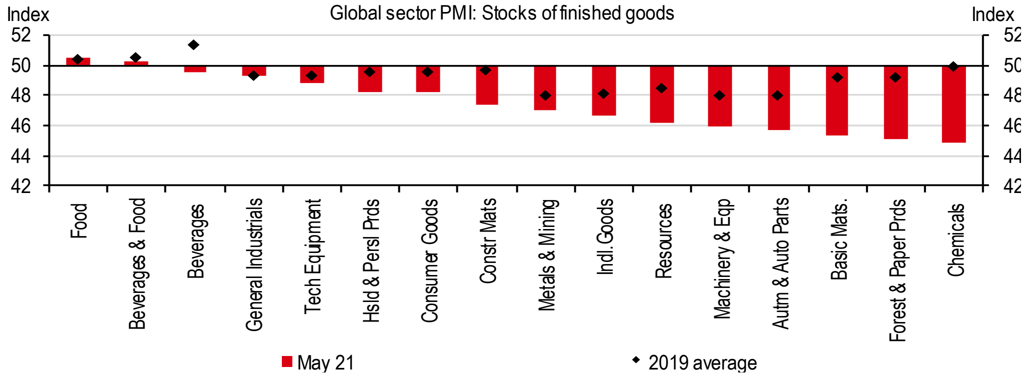
Take Toyota – for example – the pioneer of JIT supply chains. Toyota applied its experience of the 2011 earthquake and tsunami to the COVID-19 pandemic. Amid ongoing disruption, Toyota switched its JIT manufacturing model to a hybrid model in order to stockpile critical components such as semiconductors. As a result, it has managed to weather the chips shortage with minimal production disruption compared to its competitors. Other autos manufacturers are following Toyota's lead by looking at ways to secure their own supply chains.

Shipping giant Maersk is already witnessing the trend toward just-in-case (JIC) supply chains in its business. According to its CEO, there is evidence to suggest that customers are moving away from being dependent on single suppliers towards having multiple import sources to avoid being caught out by supply disruptions (FT, 29 March 2021).

Implications for trade

Building up safety stocks could help to support trade (and freight) flows going forward. However, ongoing shipping delays and strong demand for certain goods means that inventories remain low across various sectors (Chart 3). Looking ahead, the National Retail Federation (NRF) now expects US containerised imports to grow by 39% y-o-y in Q2 2021 and by 7.5% y-o-y in Q3 2021.

3. Inventories of finished goods remain low in key sectors



Source: IHS Markit. Note: This sub index is only available for some sectors.

Greater competition for inventory could exacerbate shortages in the near term

Therefore, as some businesses look to carry higher stocks – beyond typical levels of inventory – there is a risk that this could lead to further increases in competition for components and raw materials that are already in short supply. And with shipping disruption set to persist until at least the end of this year given ongoing port congestion and disruptions in Yantian, a port in Southern China, greater competition for inventory could prolong shortages of critical components in the near term.

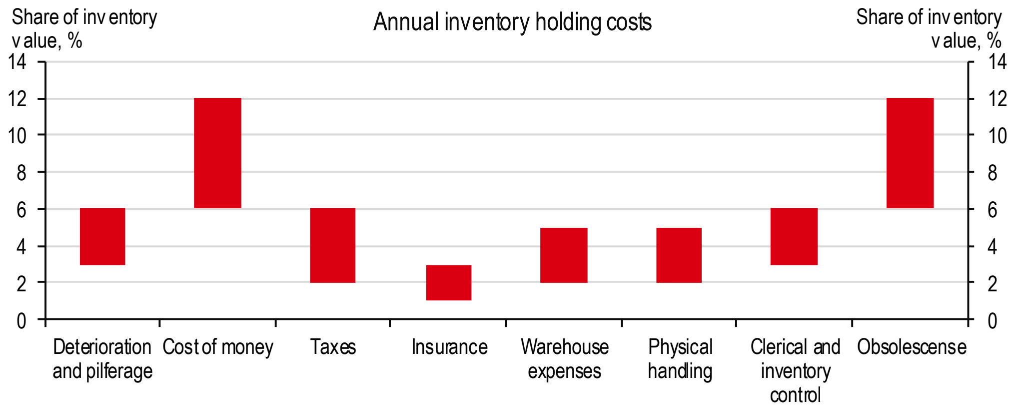
Against this backdrop, we might expect businesses to look to build up stocks of goods where production is concentrated in a small number of economies. Chart 9 shows high value exports (i.e. over USD50bn) for which the top five exporting economies account for over 60% of total global exports. According to this analysis, exports of soybeans, iron ore, coal, semiconductor machines and aircraft tend to be highly concentrated geographically. For semiconductors, the top five exporters (mainland China, Hong Kong, Malaysia, Japan and Singapore) accounted for two-thirds of total global exports pre-pandemic.

The new normal?

The shift towards holding more inventory is unlikely to be permanent

So is this likely to be the start of a permanent shift from just-in-time to just-in-case manufacturing? The short answer is probably not. Holding large inventories or maintaining spare production capacity can be costly. For example, the cost of holding inventory, which includes rent, utilities, warehousing and insurance, is typically around 25% to 55% of total inventory value according to inventory management company eTurns (Chart 4). And as noted by OECD economist Sébastien Miroudot these costs can often "outweigh the gains from mitigating risks, particularly in the case of low-probability events".[1]

4. Holding excess inventory can be costly



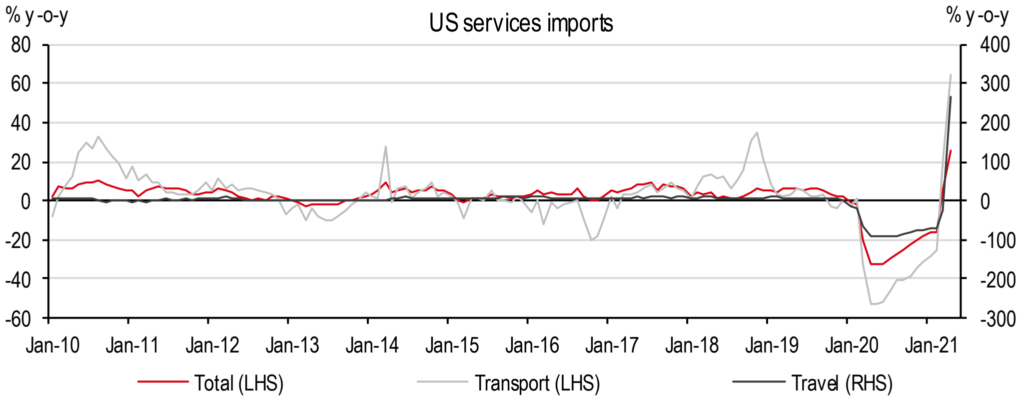
Source: eTurns

Moreover, building buffer stocks might seem sensible when demand is surging and supply chains are stretched, as is the case currently. However, holding higher inventories could lead to greater losses for companies in the event of a fall or correction in demand. Over-ordering and the associated ramping up of production also risks leading to a supply glut when demand eventually normalises.

It is also likely that supply pressures will start to ease somewhat later in the year as lockdown restrictions lift in Western economies and consumer spending rotates away from goods and into services. Already, there are some signs of this happening with travel services imports picking up in the US (Chart 5). And as our Asia economist Fred Neumann recently noted, retail restocking (excluding autos) is already underway in the US. Therefore, it is likely that the trend towards holding higher levels of inventory will be temporary and implemented by selected industries in which shortages are particularly acute, such as construction, electronics and autos.

[1] S. Miroudot, *Reshaping the policy debate on the implications of COVID-19 for global supply chains*, 12 October 2020.

5. US services trade is starting to recover as lockdown restrictions lifts



Source: BEA, HSBC

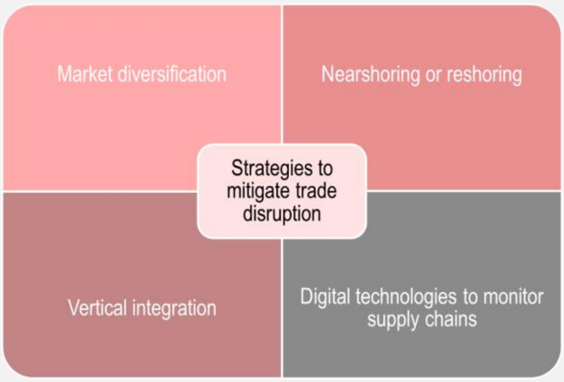
Conclusion

Looking ahead, supply and demand imbalances are likely to correct as lockdown restrictions lift but shortages of critical components could persist for some time and may be exacerbated by businesses building up buffer stocks in the near term. Although the pandemic has highlighted the fragility of lean manufacturing, this is not likely to be the end of just-in-time production.

As businesses look to build more resilient supply chains in the wake of the pandemic, the ability to flex supply chains in the event of an external or domestic disruption will be key – whether that be by diversifying trading partners, nearshoring or reshoring some production, or adopting digital technologies to better manage inventories. Although implementing these strategies can be costly, it is an investment that is likely to pay off over time and will ultimately ensure businesses are better positioned to navigate the next trade shock.

This is an abridged version of a report by the same title published on 21 June 2021.

The full note contains a more detailed look at implications of JIT and JIC as well as an in-depth look at alternative risk mitigation measures, including Market Diversification, near- or reshoring, vertical integration and digital (disruptive) technologies



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