



THE FUTURE OF SUPPLY CHAIN

Busting the De-Chinafication myth and preparing for a digitised future.

Supply chains are changing, profoundly. Much of the cause and effect is in Asia.

- The Covid-19 pandemic has been massively disruptive to worldwide supply chains. But the assumptions on which our globalized network is based are under stress from other more structural drivers of change: as China moves up the value chain, emerging ASEAN markets are filling the gaps and experiencing economic and cultural demand shifts themselves.
- There are Western calls for de-Chinafication of global manufacture and distribution but this is very unlikely to become an economic reality, even as supply chains shorten and governments seek to on-shore key industries.
- Supply chain technologies are developing apace and digitisation is poised to add another facet of disruption to the sector as a whole.



INTRODUCTION

Supply Chain - which we define as the manufacture and distribution of goods - is fundamental to the world we live in. Globalisation itself has been substantially driven by the worldwide spread of supply chains, as companies - initially Western, but now Chinese, and Asian more broadly - set up factories and logistics networks in countries almost everywhere. The last few decades have seen a boom in this expansion, and in complexity too, leading to increased multinational and multi-corporation collaboration, higher quality products, and lower prices for consumers....

Then Covid happened.

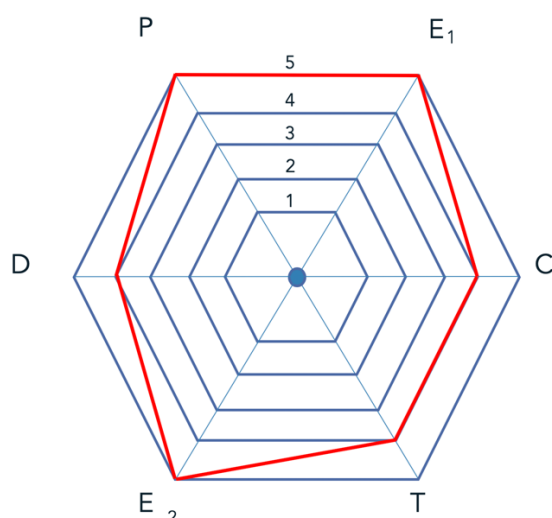
One of the first economic effects of the virus was the disruption of the global supply chain, as factories and networks across China and northern Asia shut down - either for lack of parts, or lack of labour. This shock came on the back of a testing few years of China and America waging a trade-war against each other, which had already started to unpick the certainties of the global supply chain.

Change is coming - in fact, it has started already. For context we include in this paper a PECTED™ summary and scorecard for the supply chain sector as a whole. Our analysis indicates strong broad-based momentum for structural change in supply chains, particularly due to political, economic and environmental and social factors.

In the discussion sections that follow we examine two of the most significant phenomena that supply chains face now. Western calls for China's role at the centre of the world's manufacture and distribution in the wake of Covid – **de-Chinafication** – need to be taken seriously, but how realistic are they? And what would such a move mean for the rest of Asia Pacific, ASEAN (the Association of Southeast Asian Nations) in particular?

Technology has always played a pivotal role in supply chain, and never more so than today. Which **supply chain technologies** are going to make the most impact moving forward, and how can investors benefit?

PECTED SUMMARY



PECTED KEY	
P	Politics
E1	Economics
C	Culture
T	Technology
E2	Environment, Social, Governance
D	Demographics

PECTED SCORES	
5	Strong tailwinds
4	Moderate tailwinds
3	Neutral: tailwinds balance headwinds
2	Moderate headwinds
1	Significant headwinds

PECTED SCORECARD: 27/30 - Indicating strong broad based momentum for fundamental structural change in supply chains

P (Politics)	The US China Trade War is heightening geo-political tensions that are driving supply chains to change and reorganise, superficially at least, away from China. Governments in Asia ex-China are watching developments closely, being keen not to alienate themselves from either the US or China as key relationships. Almost all governments are seeking to onshore or protect access to essential national industries and supplies. China's internal ambitions to move up the global goods value chain is driving lower value, labour intensive sectors to emerging ASEAN markets, particularly Vietnam, Cambodia, Laos and Indonesia.	5
E1 (Economics)	Regardless of politics, the economic reality is that China is the world's most complex industrial system and integral to global supply chains. It is the leading trade partner with many countries around the world and will continue to dominate in many sectors. Large multinational corporates have no alternatives that can match China's scale and price, nor can they ignore that China is home to a billion potential customers. Infrastructure that is required to develop supply chains outside of China's border is often integrated with China's Belt & Road Initiative. Economic development throughout Asia means labour arbitrage is on the wane and intra-regional trade is an increasingly important factor in Asian supply chain re-organisation that is likely to benefit ASEAN markets the most.	5
C (Culture)	The Covid-19 outbreak has pushed more consumers online and increased awareness of product provenance - exacerbating pre-existing trends towards home delivery and requiring products with transparent ESG credentials. Pressure will continue for supply chains to shorten and digitise accordingly.	4
T (Technology)	Digitisation is a trend intensified by the Covid-19 pandemic but also a long term driver of fundamental change in global supply chain. Blockchain has many potential applications: increasing transparency, reducing finance costs and facilitating ESG authentication at source. Robots and automation increase supply chain resilience and cushion against rising labour costs. Many aspects of Artificial Intelligence can enhance supply chain efficiency: improving inventory management and reducing the need for human intervention with automation, machine learning and natural language processing.	4
E2 (Environmental, Social, Governance)	The Covid-19 pandemic and various ensuing lockdown measures have been massively disruptive for global supply chains. After the initial freeze, supply chains are re-organising as different countries control and emerge from the pandemic at different rates. But mostly the pandemic has served to accelerate existing trends of shortening supply chains, on-shoring and digitisation. Asia on the whole is recovering ahead of the rest of the world.	5
D (Demographics)	APAC is the workshop of the world and home to the most consumers. These facts are cornerstones for future supply chain organisation, reflecting increasing labour supply capabilities throughout the region and growing Asian middle class consumer demand.	4

DE-CHINAFICATION AND ASEAN

On Thursday 18th June President Trump reiterated to the world his Administration's view that the total decoupling of the US and China, including the cutting of all economic ties, remained a viable option.

In one sense this was nothing new. A winding down of ties has already begun thanks to the trade-war between Washington and Beijing that had dominated relations between the two giants since 2018. The pandemic has simply served to worsen relations.

Throughout the trade-war Trump has been applying political pressure on American companies to bring manufacturing back home, especially from China, a trend that has only increased in the last few months. Japan, for its own geopolitical and economic reasons, has followed suit, and made \$2.2 billion available to help its manufacturers shift production out of China.

Many in Europe have adopted a similar strategy. As well as Project Defend in the UK, designed to make the country less reliant on China for critical supplies, the French Finance Minister announced in March this year that his country was thinking the same way. "We have to decrease our dependence on a couple of large powers, in particular China, for the supply of certain products".

There is, however, a big difference between reducing dependence and cutting off all ties; the latter, says US Trade Representative Robert Lighthizer, is now impossible. In a statement before a US House of Representatives committee the day before President Trump's June 18th pronouncement, Mr Lighthizer said of full de-Chinification, "That was a policy option years ago, but I don't think it's a policy or reasonable policy option at this point."

The stats support this view. China is a dominant or leading trade partner with a slew of countries. In 2019 the country accounted for 38% of Australia's exports, 19% of Japan's, and 7% of Germany's. In the developing world China is the leading partner of countries across Asia and Africa, and indeed in the first part of 2020, ASEAN replaced the EU as China's largest trading partner.

Yet where the real difficulty lies for politicians, like Trump, who want to reign back on economic ties, is the West's reliance on the Chinese supply chain.



These supply chains to which China is integral have been established over many decades now. They work well, in terms of being both cost-effective and of high quality. In addition, many of the raw materials used in manufacture elsewhere initially come from China.

According to the Asian Financial Cooperation Association, a Chinese government-backed institution, the country is not only the world's biggest exporter of manufactured goods but is also the largest exporter of intermediates used by factories around the globe, accounting for 32% of the overall total.

China is a dominant or major supplier of materials and components from cars to computers to garments, for example supplying 45% of the world's textile materials. It also produces massive amounts of a long list of unexpected items, such as 25% of the world's tomatoes, mainly from the troubled province of Xinjiang. It is the planet's most complex industrial system, and no other country can compete in its depth and breadth; America and Europe long ago ceded their lead.

But China's manufacturing and distribution footprint is changing, and indeed it is – to the satisfaction of some in the West – losing some of its capabilities here. However, it is China which is doing this to itself.

As the country's labour costs have increased and its innovation has improved, Beijing has sought to move into higher-value activities, and with some success. Its leading companies now produce some of the world's most sophisticated technology, as the continued argument around Huawei's involvement in Western 5G networks has shown. China's share of global exports has declined in recent years as a result.

This has created opportunities for other Asian countries. Over the last decade nations like Vietnam, Malaysia, Thailand, and India have all grown their exports of labour-intensive manufactured goods. This has resulted in new manufacturing hotspots, like the cities of Hai Phong (Vietnam) and Bekasi (Indonesia), which are now known for their electronics.

China may currently produce 80% of the world's toys, but many manufacturers there are now heading abroad to find cheaper labour and to avoid US trade-war tariffs on China. Land prices in parts of Vietnam surged 20% in just a few months last year as toy makers sought locations for new factories.

Although ASEAN countries often have labour-cost and tariff advantages over the Middle Kingdom, their workforces are small in comparison. The only country with a comparably sized

workforce, India, has not yet developed the manufacturing or supply chain infrastructure it needs to properly take on Beijing – although it is trying.

Then there is the question of infrastructure. Countries wanting to boost their manufacturing and distribution need stable electricity supplies, high quality roads and ports, machine tools and warehousing - and the capital to pay for it. And it is Chinese companies that, at least in Asia and Africa, are currently winning many, if not most, of these projects.

It seems that no matter what the West does, or desires, China's economic expansion is unstoppable for now. President Trump and other Western leaders may not like it, but their companies and consumers alike are enmeshed in the Chinese supply chain at a fundamental level. In the UK for example, high street stalwarts Asda, IKEA, and Marks and Spencer are just three of the major retailers who have exposure, as do industrial champions like Rolls Royce, JCB and Unipart. Standard Chartered and HSBC not only rely on Hong Kong for much of their profits (54% in HSBC's case), but bank a large chunk of the international trade emanating from China's manufacturing too.

Western companies will put up a strong fight against abandoning the Chinese supply chain. Not only is it hard to find alternatives that match the country's scale and price, but it is also home to over a billion potential consumers.

Apple is a case in point. Although it panders to President Trump in aspiring to onshore back to America, and has recently announced a shift of a fifth of its global production to India, the Californian firm has made it clear that it cannot move all production away from China for some time to come - and nor does it want to.

Its recent dealings with Luxshare-ICT, the fast-growing Chinese manufacturer and rival to longstanding Apple partner Foxconn, show that the company is doubling down on its presence there. As China contributes around 15% of Apple's revenue, this is no surprise: the company knows that its market access depends on a continued manufacturing presence. With Chinese "Wolf Warrior" diplomacy in the ascendancy, where punitive actions are taken against anyone deemed to have slighted Beijing, businesses abandoning Chinese factories are likely to be barred from selling there.

This does not mean that it is not possible for other countries to increase their share of the global supply chain. Far from it, and ASEAN – thanks mainly to its cost advantages and proximity to China - is possibly the region that can be the biggest winner.



SUPPLY CHAIN TECHNOLOGY

The pandemic is not only going to reframe the macros of supply chain. The use and nature of supply chain technology is going to substantially change over the coming period as a result of the pressures generated in recent years

Promised as the saviour of everything from advertising to global trade, but for so long defined by underachievement, enterprise blockchain for supply chain is finally here. Between 2018-20, Singapore start-up #dltledgers executed over US\$3bn in blockchain trades. This includes shipments of wheat from North America to Indonesia where all six trade participants transacted digitally on blockchain – a world first.

Now that the tech works the time could be right to see an explosion in blockchain's use, given its potential in some of the key trends that are emerging post-Covid.

Many companies were blindsided by disruptions to the supply chain when the virus first hit, and that lack of control and understanding is something that managers will want to urgently correct. Blockchain, thanks to its inbuilt transparency, will help to achieve this, for example by better tracking inventory along the supply chain to keep production going.

Blockchain should have a significant financial impact too. By using the technology, say #dltledgers, traders can reduce processing times by 90% and reduce finance costs by 20%.

Even before Covid there was pressure on global supply chains from an Environmental, Social, and Governance (ESG) point of view, as consumers and pressure groups in the West demanded more evidence of responsible production and sustainability. This driver has been strengthened in recent months given the upwelling of concerns over health and political reliability. Indeed, provenance and authentication will only improve as blockchain becomes more mainstream.

However, it is not all good news when it comes to the rise of blockchain in global trade, at least from a Western government point of view. Beijing is heavily investing in leading the world in this new technology.

In April this year China launched a major new initiative called the Blockchain-based Services Network (BSN). Domestically "the BSN will be the backbone infrastructure technology for



massive interconnectivity throughout the mainland,” from government to company to individual, [says](#) Professor Michael Sung from the Fintech Research Centre at the Fanhai International School of Finance at Fudan University.

Internationally, the network will form the backbone of connectivity to the Digital Silk Road – part of the Belt and Road Initiative. To put this development into context, in the same time that #dltledgers, a true success story in Western terms, has done \$3 billion in trades, China Construction Bank has executed \$50 billion of blockchain transactions.

China is also a world leader in other technologies that will revolutionise supply chain, such as robots and automation. The country now has one of the leading robotics industries in the world and accounted for 35% of total robot sales in 2017 – a percentage that could possibly increase in the coming years as the government puts even more emphasis on automation.

This has been spurred in part by the pattern of disruption during the Covid outbreak. Factories and distribution networks with less reliance on humans fared better: robots don’t get sick or require operation-limiting social distancing. They also provide a cushion against rising labour costs, something that has been a feature of the Chinese economy for some time as the workforce reaches its maximum size.

JD.com, the Chinese e-commerce giant, is one of the companies leading the way in automation. It has already developed a fully autonomous warehouse that can fulfil 200,000 packages a day, but this is likely to be just a fraction of what is to come.

The pandemic has woken up the rest of the world realise to the benefits of automation. In the last few months logistics giant Deutsche Post DHL has announced investment in 1,000 new robots to replace manual labour throughout the supply chain. This is likely to be just a taste of what is to come. Western companies will announce far more ambitious projects as they see not only what can be achieved with automation, but also what their Chinese competitors are doing.

Artificial Intelligence is a crucial component of the new generation of robots, but it will have great importance in supply chain more generally.

In this regard AI can be split into two categories. First is automation. This is AI that works autonomously without the need for human intervention, for example robots performing key process steps in a warehouse.

Second is augmentation. This is where AI assists humans with their day-to-day tasks, and will be useful not only for grappling with hefty challenges (like product shipment predictions) but also removing many of the tedious, time-consuming activities like paper-based processes and checks. Other applications for augmentation AI could be:

- **Machine Learning (ML) and Natural Language Processing (NLP) for supply chain planning.** This has come to the fore since the start of the year because the complexities of global supply chains have made it hard, if not impossible, for many managers to keep tabs on potential and actual blockages – and what to do if the worst comes to the worst. ML and NLP will be used to sort through and digitise the huge datasets across the supply chain and simplify the strategic and operational pictures, thus handing more control to managers.
- In the same way, AI will be used for **supplier relationship management** (for example, chatbots for rapid low-level communication).
- **Warehouse management.** AI is expected to radically enhance this vital element of the supply chain, particularly in conjunction with the roll out of IoT applications like RTLS (real time location system) which make it easier, cheaper, and faster to identify the location of assets not only in a warehouse, but across the supply chain.
- **Autonomous vehicles for delivery.** The “last mile challenge” has loomed large in the minds of planners throughout the pandemic as drivers have been stymied by illness and emergency regulation. Automating this part of the supply chain is expected to be a heavy focus for AI programmers over the coming years.

For all the investment expected in supply chain technology, it is not going to be a fully smooth ride. For years digitisation has been blocked by bad actors, who know it is easier to make (fraudulent) money with a paper-based system.

Another key obstacle will simply be the time taken to overcome inertia within such a massive part of the economy. Factories and distribution networks all need to be changed, but it will not be as quick as many people hope. Partly this will be down to regulation: although change is in the air thanks to Covid, once the disease properly starts to wane vested interests in the status quo will make their voices heard once more.

But in the end technology will win the day. As will the investors that accurately read not only the way the tide is flowing, but its speed too.



THE FUTURE IS ASEAN

The global supply chain is changing. It always was, and always is; but this time – thanks to the US-China tradewar, the Covid-19 pandemic, and the overall political, economic, and cultural shift the world is seeing - change is happening faster than at any time before.

Asia Pacific will benefit from this. Already it is the workshop of the world and home to the most consumers – and it is hard to see how anyone, including the US, can succeed in changing this in any meaningful way.

Looking at ASEAN specifically, the region is likely to benefit from both of the topics discussed in this paper. As China progresses it is shedding some of its manufacturing to South East Asia. And as these countries seek to move up the value chain, following in Beijing's footsteps, they will most likely use Chinese companies to help them do so. De-Chinafication is not only not going to happen, but because Chinese firms are exporting more and more each year, we are likely to see a deepening of the Middle Kingdom's economic relationship with South East Asia.

ASEAN, especially Singapore, has a strong record in supply chain technology. Many more opportunities – from blockchain to AI to robots – will emerge as the industry digitises and automates. Integration with China's Digital Silk Road may speed this up, although countries will be wary about seeing their native technologies subsumed by better technologies coming down from the north.

Change in the supply chain is coming. As one of the panellists on our recent webinar on the topic pointed out, we have two choices for the resultant fallout of this change: we can adapt and be like birds, or adopt a more dinosaurial, and ultimately doom-laden approach.



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