

The Year of the Virus: Testing the Resilience of Global Supply Chains

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Manishimwe Claudine has never heard of Helsingborg, much less visited the town on Sweden's south coast. After all, it is almost 7,000 kilometres between her farm in Rwanda and the Zoégas coffee factory in Scandinavia.

But Swedish coffee drinkers can read all about 20-year-old Manishimwe's organic farming methods using Blockchain technology. On their packs of Limited Edition Summer 2020 Blend, Zoégas customers can scan a QR code to get information on where the coffee beans have been grown, when they were picked, when and where they were shipped, and finally when they were roasted and packed in Helsingborg.

The initiative between Nestlé, owner of the Zoégas brand, and the Rainforest Alliance, is one of the latest examples of growing digitization and transparency in global supply chains. As a result, the project is being monitored with interest by commodity traders around the world.

If supply-chain transparency is shown to influence purchasing decisions for coffee – the second most heavily traded commodity after oil – then producers of other high-consumption products could follow suit. “The benefits include the ability to share data among farmers to support decision-making, the ability to identify supply chain risks, and the potential to enhance the quality of certification audits,” says Marcus Schaefer of the Rainforest Alliance.

The digitization of supply chains has been accelerating since the beginning of the Millennium. From coffee to oil, and from car parts to aerospace, the first 20 years of the 21st century has seen supply chains transformed with data-collection and digital tracking being used to develop more sophisticated purchasing systems; to enhance just-in-time deliveries; to rebalance logistics and inventory management; and to provide greater visibility on sustainability and ethical sourcing.

But the prevailing orthodoxy of supply-chain management – to lower costs and improve margins – has this year been challenged by the global economic shock of the coronavirus pandemic.

“Not long ago, optimizing cost and time was the overarching objective in the design of

global manufacturing footprints, supply chains, and logistical support. Often, that meant concentrating production in high-volume factories in one or two low-cost nations. Inventory and excess capacity were equated with waste,” says François Candelon of Boston Consulting Group.

The Pandemic Effect

In a recent report on the supply-chain impacts of the pandemic, he added: “Recently, rising economic nationalism and trade barriers began forcing companies to rethink their supply chain strategies and rediscover the merits of redundancy. The COVID-19 crisis, which has disrupted global supply chains, has moved redundancy higher up on companies’ agendas as a means of reducing risk and weathering the next global shock.”

The pandemic has forced supply-chain managers and purchasing executives to rethink sourcing to minimize the threat of parts shortages. But this rethink is not virus induced. It was already underway before the full economic impact of the pandemic became clear.

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For more than a year, purchasing managers have been drawing up plans to revise sourcing and secure vital inventory to offset inter-related geo-political issues.

Growing tensions between the U.S. and China, with reciprocal trade sanctions imposed by Washington and Beijing, has forced a reassessment on sourcing.

“Companies have been diversifying supply chains away from China in recent years to limit tariff risk, and some are also working to reduce product manufacturing costs or passing along cost increases to customers to mitigate tariff expense,” according to Fitch, the credit ratings agency, which also told clients recently: “Risk is also somewhat mitigated by lower inventory requirements across many categories as retailers adjust to lower levels of demand in the near term.”

Similar reviews have been taking place in Europe, with the UK preparing to exit the EU single market and customs union. Likewise, companies in the U.S., Mexico, and Canada were already preparing for changing import-export regulations with the new U.S.MCA

system replacing the long-running NAFTA arrangements.

Alongside preparations for these changing trading relationships, some sectors went into the pandemic already adjusting inventories for slowing consumer demand. Other sectors have been changing their ordering patterns to meet new regulations, particularly with regard to environmental and sustainability legislation.

If companies were already digitizing supply chains ahead of the pandemic, and if multiple sectors were already preparing for disruption caused by trade sanctions and new tariff regimes, it raises the question about the state of readiness and levels of exposure in different industries for the scale of the shock caused by the prolonged lock-downs in many countries.

Clearly, the pandemic has hit supply chains in different countries and industries to varying degrees.

Lessons to be Learned

For companies looking for lessons to learn, and what to avoid, the best-case studies probably lie in bellwether industries that are, one way or another, leading indicators of wider economic activity.

Taking different ends of the consumer spectrum, it is instructive to look at the pandemic impact on supply chains in food production – arguably the fastest of all fast-moving consumer goods – and on car

production, with vehicles tending to be an intermittent, high-value purchase.

In both industries – one involving generally low-priced items; the other the most expensive item of expenditure after a person’s home – the respective supply chains are long, geographically dispersed, and ultimately dependent on crucial and sometimes scarce commodities.

In food production, immediacy is the key. Supply chains are determined by speed of low-value products from farm to shelf, which carries its own range of data and logistics issues.

In car-making, by comparison, the supply-chain process is driven much more by reliability of long-term supply of high-value components, involving huge interdependency of so-called tier-one to tier-three suppliers.

The supply chain between farmers and food stores has long been an exercise in precise time management, with large-scale distributors acting as intermediaries between producers and sellers to ensure that supply meets demand.

As McKinsey noted in a recent paper on food industry reactions to the pandemic, “The

distributors run an optimized and stable supply chain, with upstream orders coming in that anticipate downstream orders going out.”

In this sector, the consultants rightly concluded that margins depend on there being a steady flow in both directions and having only a subset of products in inventory awaiting orders. But this routine has been thrown into disarray by consumer behaviours during the coronavirus shutdowns. With fewer customers visiting supermarkets, and with demand spikes for certain products such as toilet roll upending all previous modelling, it has become much harder to manage stocks and adjust supplies of perishable foodstuffs.

In farming, at the top of the food supply-chain, changing consumer spending habits could force landowners to change what they produce. “The dilemma farmers face is whether they should change crops; plough ahead with planned crops, hoping for a return to normal; or exit production entirely,” says McKinsey. “For many value chains, crops can be returned once rotations are complete. For value chains in areas such as dairy, it can take years to recover production after farmers decide to reduce herds.”

In some countries, farmers are reportedly taking extreme measures to deal with excess product that they can't sell: breaking eggs, spilling milk and ploughing under crops. Analysts warn that if farmers go a step further

to reduce capacity, such as eliminating hens or culling herds, this could impact overall supply-availability, with a knock-on impact on prices when consumer demand returns.

Scarcity of Migrant Labor

All of the aforementioned challenges have been compounded by the pandemic coinciding with new immigration policies in some industrialized countries, which is both reducing and disincentivizing migrant labor.

Ahead of Brexit, farmers in the UK have warned of a reduction in low-wage crop-pickers from eastern Europe as Britain prepares to introduce a new points-based system for foreign workers.

In the U.S., large parts of the farming industry and food-processing sectors are dependent on migrant workers. With borders locked down and visa programs becoming more restricted, industry experts predict it will be challenging to find workers, even at a premium, as people avoid close-quarters activities and limit their own exposure risk. Since worker wages are already a significant cost factor for farms,

the pandemic may further strain farm economics if they have to replace low-wage migrant labor with higher-cost domestic workers.

At the other end of the industrial spectrum, large industrial manufacturers are also re-examining their supply-chain systems. In multiple production sectors, companies are checking that supply chains can adjust for the unexpected way that the pandemic has reduced component availability and restricted cross-border trade.

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Even before the virus hit, leading automotive manufacturers have spent years trying to cut costs by removing complexity and by seeking to automate component purchasing as much as possible. That process is logical in times of reliable and competitive parts availability. But when any one part of the interconnected supply chain ceases to function, the whole system can grind to a halt.

“Supply-chain disruptions can cause a cascade of downstream process delays and bottlenecks due to lean inventories,” according to credit-rating analysts at Fitch. It warned recently that manufacturers such as Ford and GM could be forced to extend production shutdowns because of their dependence on component suppliers in Mexico, where the government this summer limited employee attendance to 50%.

Auto Sales Resumption

Ironically, the imposition of the shutdowns may not prove to be the biggest threat to the automotive industry. Instead it has enabled purchasing managers to revisit the efficiency with which supply chains are managed. With no cars being sold from dealer forecourts, with assembly lines halted and with sharply reduced inbound component-deliveries, purchasing managers could use the breathing space to consider what may be a potentially bigger challenge: how to restart production and resume sales.

Fortunately for carmakers, the resumption of production has so far been gradual with only selected plants returning to work. This meant that suppliers could adjust components

specifically for the models that dealers were calling for. “The priority is to make sure that we can build the cars that are being called for by our sales channel,” says the head of purchasing at one leading automaker. “We first must determine which models can get sold and then ensure we can resume sourcing of all the necessary parts. There’s no point in producing a car that’s got a bit missing – it just needs one part missing and the car’s no good to anybody.”

Automakers are, therefore, taking additional steps to reduce supply chain complexity and to reconsider the range of options that they offer to customers. Jaguar Land Rover, for example, found that customers in Brazil

typically only ever ordered vehicles in six different colors although it offered them more than 50 shades of paint.

Taking the opportunity created by the pandemic, Jaguar Land Rover is looking to reduce complexity on future models. Ian Harnett, global head of purchasing at the British carmaker, says: “The real time you save the money is on the new models. Once you’ve actually introduced a color and a template and an option, you’ve spent all the money on making the tools, doing the development, doing the tests, the validation work and you’ve got the parts. But the real saving is by not doing it in the first place. So, this is where we’ve got to really take learning on what customers really want and embed that into the new models. If we do that, it saves on engineering time and effort, saves on supplier time and effort.”

Harnett argues that major crises often prompt such re-assessments and rethinking of product complexity, and whether certain supplies are really necessary.

He cites the 2011 Japanese tsunami and earthquake, which flooded the only plant in the world producing specialist metallic paint-

pigments. Jaguar Land Rover reacted by introducing new chemical processes to reduce their dependence on the Merck-operated paint factory, which was offline for months due to its proximity to the explosion of the nearby Fukushima nuclear reactor.

“We got our chemists to thin out the amount of pigment that went into the paint, so we had enough to get through without halting production,” recalls Harnett. “And with less pigment we were able to claim the cost savings. We got cheaper paint, so a good thing came out of something bad.”

Other manufacturing companies are now examining whether there are lessons to be learned from what many are calling the “messy rebalancing” of global supply chains.

It seems clear that the economic shock of 2020 will accelerate several major trends that were already well underway before the pandemic, and this will continue as companies shift their focus to recovery. As a result, management consultants are predicting that some manufacturing industries will shift from heavily concentrating sourcing and production in a few low-cost locations to build more redundancy into their value chains.

But that spells a problem for most purchasing managers, who equate redundancy with waste, especially if it involves holding excess inventory or dual tooling. In order to minimize such costs, companies in different sectors are now accelerating their use of artificial intelligence and machine-learning to manage supplier arrangements.

One leading automaker is applying algorithms and AI to streamline purchasing decisions, enabling its specialist managers to focus on securing higher-value materials. Others are building resilience into manufacturing operations and supply chains, while at the same time minimizing cost and seeking to protect margins.

The Promise of AI

Analysts say that smarter application of AI will enable manufacturers to optimize cost in each factory through predictive maintenance and better planning. It could also allow them to operate a larger number of small, efficient facilities nearer to customers, rather than a few massive factories in low-wage nations. These smaller facilities are likely to involve greater deployment of advanced manufacturing technologies such as 3-D printing and autonomous robots that require fewer workers. New data systems are also being introduced to ensure supply-chain resilience in ways that protect business continuity, technical capabilities, data security, and inventory practices.

Among such systems, Bureau Veritas, the European provider of testing, inspection, and certification services, recently launched what it

calls its “Supply-R” solution to help companies ensure supplier network reliability. It says that the data tool will provide a customized risk assessment of supply chains. The system is based on field data collected from independent on-site verification of critical suppliers, which will provide visibility to support business decisions and minimize the risk of shortages.

In a similar step, C.H. Robinson, the U.S. logistics group that has almost \$20 billion in freight under management, and which makes 18 million shipments annually, has recently teamed up with Microsoft to deploy its Azure software to measure factors such as temperature, shock, tilt, humidity, light, and pressure in shipments to give customers intelligence about goods as they move through the supply chain. Minnesota-based C.H. Robinson predicts that the supply chain of the

future will be smarter, less volatile, and can be navigated with a new level of visibility, which it claims will offer its logistics customers a greater competitive edge.

Taking these innovations together, the first half of 2020 may be remembered as a period of acceleration and deepening of supply-chain digitization. Of course, no company is celebrating the great pandemic of 2020 as a golden business opportunity. The crisis has, first and foremost, been a healthcare and human disaster.

Notwithstanding the terrible loss of life, and the ensuing economic disruption, businesses are now looking beyond the virus to consider how best to manage their supply chains of the future. This means refocusing technology from simply being a cost-reduction tool to being a platform for a more fundamental reorganization in the way supply chains are operated.

Technologies such as Blockchain will be used increasingly to improve verification and responsible sourcing of products, whether it is cobalt for future electric vehicles or for the Rwandan coffee beans that ultimately end up in the Zoégas coffee factory in southern Sweden.

Having piloted such supply-chain digitization with coffee, Nestlé is now applying Blockchain tracking in supply chains for commodities from palm-oil to baby-formula milk. “This open blockchain technology will allow anyone, anywhere in the world to assess our responsible sourcing facts and figures,” says Benjamin Ware, Global Head of Responsible Sourcing at Nestlé. “We believe it is another important step towards the full disclosure of our supply chains, raising the bar for transparency and responsible production globally.”