Fixing broken supply chains

Using circular economy strategies to build resilience

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As businesses start to reopen after months of nationwide lockdowns, they face potential shortages as well as an unprecedented economic meltdown. In the US, roughly one in four people who had jobs in February were unemployed by the end of April, and the European Union is expecting the deepest recession in its history. To rebuild the global economy, businesses are called upon to rethink models and operational processes. By implementing circular economy strategies, businesses could build more resilient supply chains, reduce materials costs and create new customer value propositions while reducing their environmental impacts. In just a few months, the Covid-19 pandemic has exposed the limits of our global supply chains. In February 2020, <u>Fiat Chrysler Automobiles</u> announced that it was temporarily halting production at a car factory in Serbia because it could not get parts from China. This was soon followed by a <u>report</u> that 94% of Fortune 1000 businesses were suffering supply chain disruptions. Even before the World Health Organization confirmed the Covid-19 outbreak to be a pandemic, <u>more than 12,000 facilities</u> <u>owned by these same businesses or their suppliers were in quarantined</u> areas of China, Italy, and South Korea. And by April, more than a million garment workers in Bangladesh had been sent home without pay or had lost their jobs after <u>clothing brands cancelled or suspended GBP 2.4</u> <u>billion of existing orders</u>.

In recent decades, sustained trade liberalisation, continued technological progress in transport and communication, and vertical industrial specialisation have focused on making global supply chains efficient. In some cases, efficiency building in supply chains has led to them becoming less flexible. Elsewhere, supply chains have sometimes been accused of not being efficient enough, of not having sufficiently leveraged digitisation to improve their visibility and monitoring, which makes them equally inflexible. Both lack of efficiency and utmost efficiency have been exposed by the Covid-19 pandemic as leading to fragility in supply chains. Resilience now needs to be built in.

Responses to the pandemic have demonstrated that alternative supply chain models that are more resilient can be created by leveraging circular economy.

Secure supplies

The shift of manufacturing from industrialised countries to emerging economies over the past few decades has created increasingly extended and dispersed supply chains. Today, consumption markets, especially in Europe and North America, are often very distant from production locations. Therefore, when a product reaches the end of its life, its components and materials are usually not sent back to where they were made to be reused or reconditioned. Most global supply chains use virgin raw materials and new components only.

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Yet, supply chains would be made more resilient and efficient if they were able to close the materials and components loop. More resilient because they would secure their supply. More efficient because they would save money. According to the European Commission, <u>circular economy could</u> <u>save EUR 600 billion for EU businesses</u>, equivalent to 8% of their annual turnover. Since <u>manufacturing firms in the EU spend</u>, <u>on average</u>, <u>about</u> <u>40% of their revenue on materials</u>, circular economy models could increase profitability, while providing shelter from resource price fluctuations.

Unfortunately, only a few of these models exist today. One industry-wide example is the global secondary fibre stream for paper and cardboard production. This fibre stream is used in Asia to make packaging materials for export products as <u>it is less expensive to use recovered fibres than</u>

virgin fibres.

During the Covid-19 pandemic, there has been a critical gap between how many ventilators are needed and how many are available. Ventilators deliver air to patients' lungs and help prevent respiratory failure, a common cause of death among patients with Covid-19. Unfortunately, just at the time when they were most needed, the global supply chains that could deliver all those parts and products at high velocity were being dismantled. To face the ventilator shortage in the US, the State of California asked <u>Bloom Energy, a fuel cell company, to locally refurbish</u> <u>hundreds of ventilators sitting idle in a state warehouse</u>. But this kind of reuse has not been possible in all regions.

Shorten flows

Today, most global companies have based their supply chain designs on the assumption that materials flow freely globally, enabling them to source, produce, and distribute products in the lowest-cost locations around the world. This means that materials, components and products are travelling all over the world, often vast distances.

For example, <u>cod caught off the Norwegian coast to be sold in France</u> <u>travels around 15,000 kilometres just to be turned into filets and injected</u> <u>with chemicals in China</u>. Similarly, a <u>Zara shirt dress</u> is sent from Europe, where its lyocell fibres are made, to Egypt, where they are spun into yarn, then to China, where the yarn is woven into fabric, to Spain, where fabric is dyed, and then to Morocco, where the fabric is cut into the various parts of the dress and sewn together. Finally, the dress is sent back to Spain, where it is packaged.

Due to global trade imbalances, twice as many containers of goods are transported from Asia to the United States than the other way around. As a result, it is not uncommon to see <u>whole containerships being chartered</u> <u>solely to transport empty containers</u>. Global transportation costs may be minimal from an economic perspective, but they have a significant environmental impact. <u>Trade-related freight transport currently accounts</u> for around 7% of global CO2 emissions. As refineries have become more sophisticated, producing higher quality petrol for cars, for example, the worst bits of the barrel have ended up in the engines of ships. Low quality fuel used by ships contains sulphur concentrations more than 3,500 times greater than in the diesel used in cars.

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By shortening supply chains, businesses would not only reduce the environmental impact from transport but would be able to create circular systems that provide access to materials and components. In the Netherlands, during the pandemic, hospitals have used CT scanners that allow doctors to quickly take pictures of a patient's lungs to help determine whether or not they have Covid-19. A few years ago, health technology business Philips established a healthcare imaging systems refurbishment facility in Best, Netherlands. The facility has taken back old CT scanners that hospitals have been using for many years, updated their hardware and software so the scanners work like new, and then sent them back to the hospital. Leveraging a short supply chain, <u>Philips has been</u> <u>able to refurbish customer scanners in only two weeks</u>.

Redesign products

Products are often designed based on the assumption that they will be made at the lowest cost possible, provided they meet the needs of the customer. Durability of a product is often made a lower priority.

For example, <u>China produces about half the world's sanitary face masks</u>, <u>around 20 million a day, or more than seven billion a year</u>. With such volume, Chinese manufacturers have been able to offer masks at very competitive prices while meeting international standards. Prior to the Covid-19 pandemic, it was not considered a priority to design these masks for more than one use or to be functional for more than a few hours. However, during the pandemic, as <u>many countries have faced</u> protective equipment shortages, scientists, physicians, and manufacturers have come together to design <u>reusable protective face</u> masks. In only a few weeks, they experimented with several methods to decontaminate used masks, finally <u>designing a mask that can be used a</u> <u>hundred times</u>. The mask will have a consumer price of EUR 28 and will be delivered with 5 washable filters, which will allow for 100 uses — a cost of 28 cents per use compared to a single-use FFP2 ventilation mask which costs EUR 3.

Resilience over efficiency

While global supply chains work to keep product costs low, their impact on the environment and human health incurs subsequent costs. Shipping pollution causes about <u>14 million cases of childhood asthma as well as</u> <u>400,000 premature deaths a year from lung cancer and cardiovascular</u> <u>disease</u>. That is more than 1,000 deaths a day. Meanwhile, though manufacturing of textiles in China is often cheaper than in Turkey or Europe, it produces <u>40% more carbon emissions because China depends</u> <u>on coal-based energy</u>.

The Covid-19 pandemic's disruption of our global supply chains offers the opportunity to build them in better ways. The European Commission

President Ursula von der Leyen told EU lawmakers in Brussels that a "circular economy will make us less dependent and boost our resilience. [...] This is not only good for our environment, but it reduces dependency by shortening and diversifying supply chains."

We need to turn the economic recovery from Covid-19 into a real opportunity to create supply chains that are resilient. This reconstruction will certainly be more challenging for some sectors, such as automotive or aerospace, than some others, such as food, and may incur short term costs. But the crisis we are experiencing may be enough to make the benefits clear.