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World trade: despite a sudden interruption, global value chains still have a bright future

EXECUTIVE SUMMARY

In the midst of the COVID-19 pandemic, global trade has been dragged down by numerous factors: a global recession, skyrocketing uncertainty, restriction and rising cost of transport and localized protectionism targeting supply of food and critical medical wares. On the bright side, tight border controls have had a limited impact on trade and are being eased gradually in Europe, in order to revive the tourism industry and limit labour shortages in the agricultural sector. In the longer-term, multiple calls to relocate production domestically also constitute risks to the future of global trade. Nevertheless, shielding production from foreign supply shocks seems like an impossible quest: to imagine a full relocation of manufacturing processes at the domestic or regional level highlights issues of rising production costs and lack of domestic skills. Even if these two issues are addressed, this new local production process will still be dependent on raw material supply, which is highly location-dependent. Mitigating the exposure to one specific country by diversifying suppliers is also a tricky challenge. At first glance, finding alternatives to the top supplier country (i.e. China in most sectors) is possible. However, major input producers are also strongly connected to one another, which means that the exposure will not disappear even when input supply to other major hubs in the sector is diversified. Overall, the good news is that global value chains still have a bright future.

World trade in 2020: a sudden interruption

World trade has been dragged down by the global recession, skyrocketing uncertainty...

Global trade dynamics are linked to economic activity: if the GDP of two countries increases, the value of goods and services they trade with each other increases as well. However, this link changes over time. Dynamic world GDP growth between 2002 and 2008 went hand in hand with a strong growth of global trade, at around 6% per year. Both slowed down significantly during the following decade and the world trade growth to world

GDP growth ratio has remained at around 1 since 2011, i.e. twice as less than between 1990 and 2006. Nevertheless, during crisis periods, magnitudes differ: while global GDP growth declined by “only” 1.7% in 2009, the volume of good and services traded internationally plummeted by 12%. Therefore, the magnitude of the expected decline of global trade this year is hard to assess. According to our in-house model, which uses oil prices, business confidence in the US manufacturing sector, South Korean exports and the Baltic dry index of maritime transport as explanatory variables for global trade, the latter would decline by 7% in the third quarter of 2020 compared to the previous year and by 5% on average in 2020. However, as explained

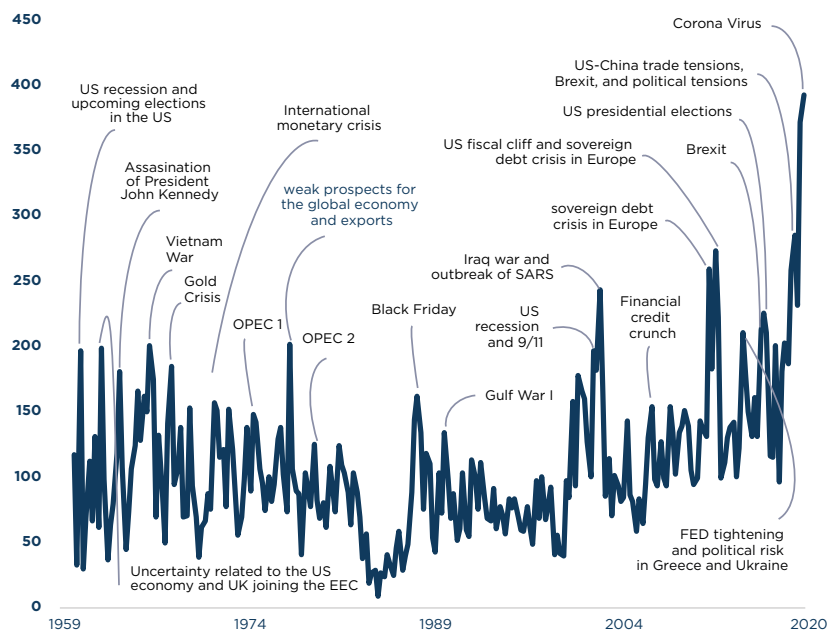
above, the usual correlation measured through linear models does not necessarily work when crises occur and the outcome could be significantly worse. According to the latest World Trade Organization (WTO) forecast, global trade could decline between 13 and 32% this year. Nearly all regions would suffer a double-digit decline in trade volumes.

The rise of uncertainty in bad economic times is one of the rationales behind the reduced trade-to-GDP growth ratio. Historically, high uncertainty coincides with periods of lower trade and GDP growth. S.Baker, N.Bloom, S.Davis and S.Terry identify 3 indicators (stock market volatility, newspaper-based economic uncertainty, subjective uncertainty in business expectation surveys) that provide real-time forward-looking uncertainty measures. All of these indicators reached all-time highs in March and April 2020 (see **Chart 1** on news-based economic uncertainty). According to the researchers, about half of the forecasted output contraction in the US in 2020 reflects a negative effect of COVID-19 induced uncertainty¹. S.Leduc and Z.Liu highlight that higher uncertainty is equivalent to an aggregate demand shock, which has a lasting impact on economic activity variables (like unemployment)². Thus, the recovery should be different from the V-shape first hypothesized and the consequences could be of longer-term.

...And localized protectionism targeting supply of food and critical medical wares

Trade protectionism is another aggravating factor. Similar to the 2009 crisis, trade policy is one of the tools policymakers use to try shelter their economies from turmoil. In this crisis, so far, trade policy has seemingly focused on ensuring supply of food and critical medical wares: as of 22 April, the Global Trade Alert recorded that 88 countries had undertaken 193 trade measures related to the abovementioned objective, out of 341 measures total in 2020. Therefore, "only" 148 concern the other sectors, compared to 422 globally in 2019. 83

CHART 1
World Uncertainty Index 1960 Q1 to 2020 Q1



Source: Coface, Ahir, H, N Bloom, and D Furceri (2018), "World Uncertainty Index", Stanford mimeo.

of the measures - mostly tariff reductions for imports of medical supplies - have been liberalizing, whereas the rest were predominately export bans on masks and other protective equipment, respirators and chemicals required in the production of various drugs. In other words, importers are facilitating the entry of these products, while exporters are making it harder to export them. Trade in medical goods used to fight COVID-19 is relatively concentrated: the top 10 exporters supply 72% of total exports. Germany, China and the USA represent 41% of exports and are also the biggest importers, with the USA accounting for a quarter of all purchases. For the time being, the supply chain has not witnessed major disruptions and prices have been affected moderately: according to the WHO, as of 27 March, export bans had led to a limited price increase of protective masks (around 20%).

That being said, some international announcements have also pushed towards opening: New Zealand and Singapore committed to maintain the flow of their supply chains and to lift restrictions on trade of essential goods and have been joined by Canada, Australia, Chile, Brunei, and Myanmar. The European Union (EU) rolled back its extra-union export restrictions (except for masks), after having successfully restored flows of protective equipment within the zone. The EU also removed intellectual property restrictions on protective equipment to accelerate the refitting of production chains and Germany lifted its ban on mask exports. The Chinese case is peculiar. Medical exports decreased by 15% in June 2019 and February 2020 - in the midst of a sanitary crisis in China. The restrictions imposed on masks, ventilators and thermometers have been lifted. China's return on global markets restrained the increase of mask prices. With a 55.3% share of global mask exports, China is the key player in this market and its cooperation has been essential to supply the rest of the world: production has jumped to 116 million masks per day, 12 times the amount it produced before the crisis.

This crisis has also led to a rise of protectionism in the agri-food sector. Historically, agricultural products have been at the forefront of protectionist measures, up until the 2009 crisis. The last ten years have been exceptional, as tariffs mostly targeted metal related products. However, the waves of panic buying triggered by lockdown prospects have not been limited to households and some vulnerable countries are looking to hoard grain to ensure continuity of national food supply. Under these combined influences, a resurgence of agri-food protectionism is being observed. Local overbuying concerns and increased external demand, coming mostly from Egypt and Turkey, led Russia, the n°1 wheat exporter (20.5% of world wheat exports in 2018), to a ban until the harvests of July. In Kazakhstan (10th exporter), a monthly quota of 200,000 tons of wheat was set for April, down from average sales of 350,000 tons in the current season. These quotas could be of regional significance and threaten the food security of central Asian neighbours. Romania (8th exporter) and Ukraine (7% of world sales) also restricted exports of wheat. Roughly a third of the market's wheat supply is under cautious restrictive measures. However, at this stage, export bans have mostly resulted in demand shifting to European countries (like France) rather than supply shortages.

Wheat is not the only targeted product. Vietnam, 3rd global exporter of rice, recently converted its export ban into an export quota. Cambodia, Myanmar and the Philippines - minor suppliers - have banned rice exports. The Eurasian Economic Union (except Kazakhstan) will also ban its rice exports. As for India, the world's main supplier, lockdown measures have disrupted domestic supply chains, reduced labour availability and made access to exporting ports difficult: deliveries can no longer be ensured and no new contracts are signed. Thailand, India's great competitor, has ample stocks of rice, but its exports are hampered by lockdown measures in Cambodia, depriving the sector of much-needed seasonal workers. Consequently, the price of rice reached a 7-year high at the end of March.

1 - <https://www.policyuncertainty.com/media/COVID-Induced%20Economic%20Uncertainty.pdf>

2 - <https://www.frbsf.org/economic-research/publications/economic-letter/2020/march/uncertainty-channel-of-coronavirus/>

TIGHTER BORDER CONTROLS HAVE HAD A LIMITED IMPACT ON TRADE AND ARE BEING EASED, IN ORDER TO REVIVE THE TOURISM INDUSTRY AND LIMIT LABOUR SHORTAGES IN THE AGRICULTURAL SECTOR

To limit the spread of the pandemic, a number of governments decided to tighten border controls in order to restrain the flow of travellers. Canada has implemented border restrictions with the U.S. The EU decided similar measures with non-EU countries. Some EU countries also tightened controls at borders with other EU members. On the one hand, government measures have had limited direct impacts on costs to trade, generally under the form of delays due to extra control procedures and prioritization of key supplies. On the other, the sharp decrease of passenger transit because of lockdowns and travel restrictions has had a notable effect on the cost of airfreight (sometimes multiplied by four) and on delays. Although 86% of cargo planes are still in service, compared to 26% of passenger planes, half of air-cargo tonnage is carried inside passenger airplanes. This cost effect is not to be neglected. In terms of tonnage, air transport represents 2.6% of European exports and 0.3% of imports, but it transported a total of EUR 999 bn worth of goods, around a quarter of the value of the EU's external trade, or half of the value transported by sea.

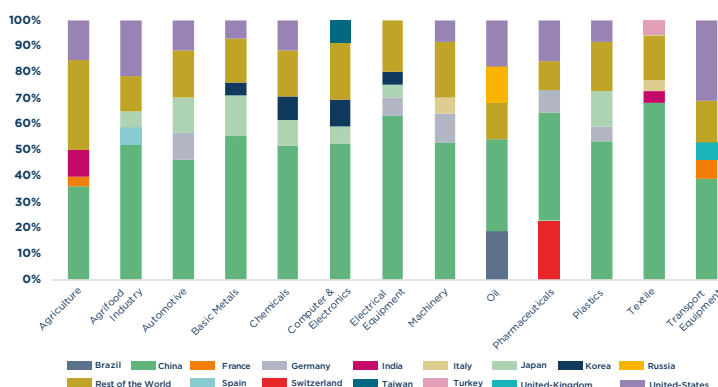
For road transport, re-entry rules and quarantine measures play a more important role in the EU, as many drivers fear a restriction when returning home. Externalities from other activities are also one of the drivers of costs. Transport costs have increased because of empty trips, longer hours worked and fixed cost redeployment. Regarding international border crossings, the multiple-hour long lines seen in the first days of border closures are no more. The EC's guidelines are followed and the objective of crossing borders by road in less than 15 minutes is overall attained: priority lanes for goods have been implemented and the reduction in private transit makes up for time lost elsewhere. There are exceptions around the borders of Balkan countries, Romania, Slovakia and Hungary, which imposed more stringent border controls and can have border-crossing times of 30 minutes or more. As for sea cargo, ports are operating at almost normal levels. The main victims of border closures are worker flows. The restrictions primarily affect the transport and agri-food sectors. In the EU, the latter is heavily dependent on foreign workforce. With a total of 837,000 extra-EU and 585,000 intra-EU workers, foreign workers represent about 5% of the workforce, up to 25% in countries such as Spain. In May, the measures could lead to a shortage of 85,000 workers for Germany and 200,000 for France. In Central Europe, construction, manufacturing and retail could be impacted more severely because of border closures with the Eastern neighbours, chiefly Ukraine. Germany already adjusted its policy, allowing 80,000 quasi-quarantined workers in for April and May, an initiative followed by Italy and the UK. The easing of border control policies also aim at accelerating the recovery of the tourism sector: on 13 May, the EU unveiled plans to resurrect the tourism industry by easing travel restrictions. Three days later, Italy announced that its citizens would be allowed to travel freely and national borders would be opened from 3 June onwards.

Shielding production from foreign supply shocks seems like an impossible quest

Beyond the short-term drags on global trade, the longer-term future will depend on the evolution of globalization. At the first stage of the crisis, when the pandemic was still an epidemic specific to China, global effects regarding trade had already materialized. Indeed, firms around the world realized how dependent they were on China in their supply chain. Some companies like Apple saw their production plans strongly delayed, as assembly plants in China were brought to a standstill by the COVID-19 outbreak and lockdown measures. Other firms, like Samsung, which had recently decided to move their factories out of China to countries with lower production costs such as India or Vietnam, also suffered a blow following the outbreak. As a matter of fact, even though their assembly lines were not located in China anymore, they still heavily relied on the country for intermediate inputs. Moreover, this situation did not only occur in the ICT sector, as illustrated by Hyundai's decision to halt car production in South Korea in February.

Therefore, a new mantra has started to propagate around supply chain management teams around the globe: increase supply chain resilience to foreign supply shocks. This could be done through two methods: either a full relocation of production on the domestic market or a strong global strategy of supplier diversification. One of Apple's manufacturing partners, Pegatron, announced its choice to follow the first option by abandoning its plants in mainland China while increasing domestic capacity in Taiwan. Differently, another partner of Apple, Wistron Corp, announced that they were aiming at a 50% relocation of production outside China within a year, targeting already existing plants in India, Vietnam and Mexico. When it comes to the full relocation of production processes in home countries, from the production material to the final good, several reasons allow us to doubt the feasibility of such movements at a very large scale. First comes the question of production costs. Reducing production costs was the main driver of the past offshoring of production, in order to propose lower prices to consumers. A relocation of production processes into more developed markets would necessarily mean an increase in prices, which would be shared at least partially by consumers. Production cost gaps remain significant between countries, even though they have somewhat decreased in the last

CHART 2
Distribution of Intra-Sector Intermediate-Good Flows
Among Top-5 Global Providers For Each Sector



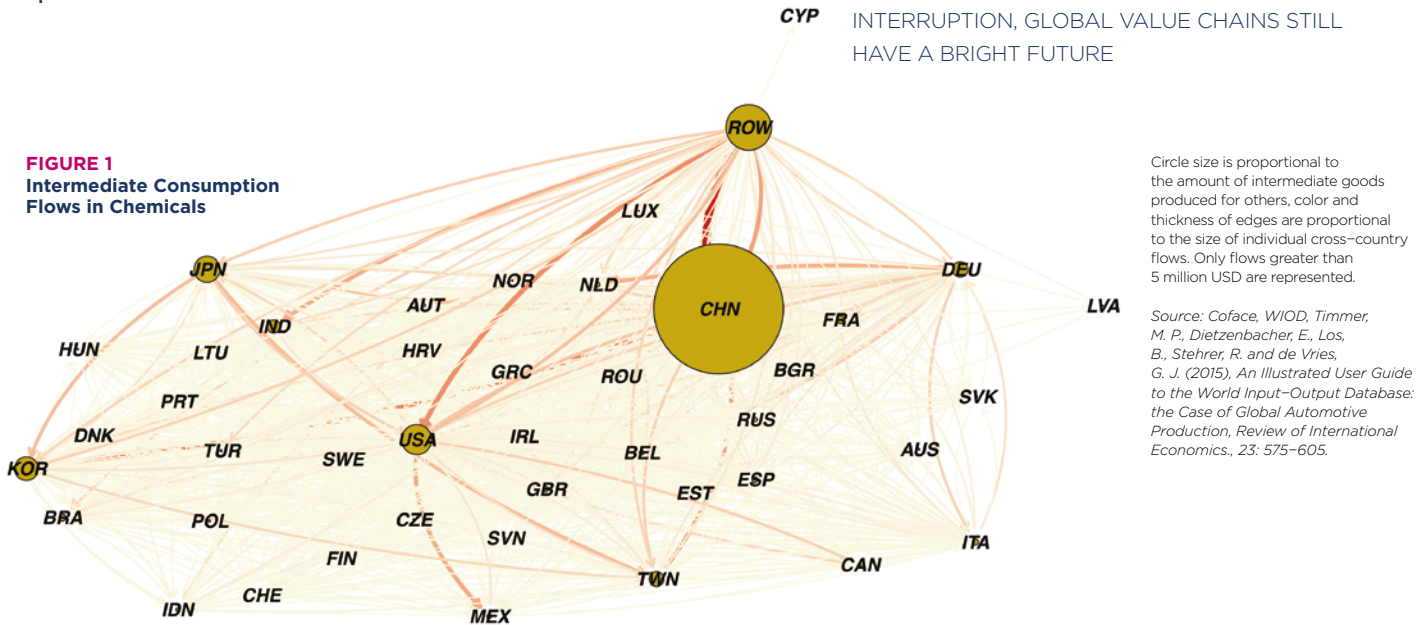
Source: Coface, WIOD, Timmer, M. P., Dietzenbacher, E., Los, B., Stehrer, R. and de Vries, G. J. (2015), *An Illustrated User Guide to the World Input-Output Database: the Case of Global Automotive Production*, *Review of International Economics*, 23: 575-605.

20 years: while China's GDP per capita accounted for 6% of the US' in 2000, it now stands at around 30%. Then the country's specialisation has to be factored in.

Chart 2 identifies key intermediate good producers for intra-sector flows using latest available data, from year 2014. The chart shows the distribution of intra-sector intermediate flows among the top five producers for each sector, excluding smaller suppliers. For instance, the Chinese automotive sector is the prime input supplier for the automotive sector globally, when considering inputs streaming from the automotive sector itself. It supplies more than 50% of inputs supplied by the top five producers. The chart highlights that most specialized producers differ significantly across sectors, except for China, which means that most countries do not have this multi-sectoral specialisation in production. Thus, a full relocation of production over a wide variety of sectors will create significant constraints on capacities and skills. Lastly, even with a full relocation of manufacturing processes at the domestic or regional level (within the EU for instance), the issue of supply chain resilience to external disruptions would still not be fully addressed. Indeed, this new local production process would still be dependent on raw material supply, which is highly location-dependent. Thus, if goods components are not changed based on materials available domestically,



FIGURE 1
Intermediate Consumption
Flows in Chemicals



which will be limited to certain types of goods, then the relocation of production at home will only postpone the supply chain resilience issue without fully solving it.

There is also the alternative of supplier diversification. This means a reduction in dependency to a single supplier, whether local or foreign, in order to multiply supply channels. With the pandemic, the issue was first unfolded around the dependency to Chinese suppliers, as demonstrated by the Japanese plan of 23.5 billion yen to support Japanese companies to move production out of China. However, the same question on diversification needs to be addressed for other suppliers, in countries under lockdown, where production was also halted.

Chart 2 highlights Chinese dominance on intermediate flows in nearly all manufacturing sectors. Given that we are considering intermediate and not final good flows, it means that in some cases, Chinese companies are key intermediate suppliers internationally, which is the case for the textile and the electrical equipment sectors. In some other cases, Chinese companies mostly supply other Chinese companies in the same sector, of which the demand is particularly important for the production of final goods, for either export or the domestic market. The latter channel can explain China's dominance in the computer and electronics sector, but also in the coke and refined petroleum products one.

Moving beyond Chinese predominance in sectoral intermediate flows, if such diversification were to happen, comes the issue of identifying alternatives. In **Chart 2**, potential substitutes appear. Indeed, it will be cheaper for companies to set up new plants in countries that already have an organized industry in their sector. Therefore, it is not surprising to find other major production hubs at the global level. However, each country's comparative

advantages are particularly salient here. Asian ICT hubs (Japan, South Korea & Taiwan) prevail for computer & electronics, while the US, Japan and Germany take the lead for the automotive sector, Switzerland for pharmaceuticals, France, the UK and the US for transport equipment.

However, when trying to mitigate the exposure to one specific country, it is not enough to focus only on direct exposure to this country's intermediate goods, i.e. the share of inputs from this country used to produce total output. Indeed, as we can see in **Figure 1** for the chemicals sector, major input producers are also strongly connected to one another. As described by the most coloured edges, all the potential alternative locations are strongly connected to China and highly linked to one another. This means that when diversifying input supply to other major hubs in the sector, the exposure to China will not completely disappear, as long as some inputs are sourced in China. This indirect exposure will certainly be lower than a direct exposure to Chinese suppliers, but it will also be much less tractable. Moreover, the disruption capacity of China, or any other country that could end up dominating certain sectors' supply chain, will highly depend on the structure of this supply chain. Indeed, as previously detailed in one of our studies³, a snake-type organisation of the supply chain, as opposed to a spider type, will allow for much less risk mitigation. Snake-type supply chains organize all production steps in high dependence to one another, each part of the process using outputs produced at the prior step as inputs, which means low input substitutability. Conversely, spider-type chains have independent intermediate steps and one central final step for which inputs substitutability is greater. Thus, all sectors involved into snake-type supply chains will be highly exposed to supply shocks affecting upstream sectors, i.e. sectors involved in the first steps of the process, such as basic metals, chemicals or plastics. Supply shocks to those sectors have the potential to slow - if not fully stop - the whole production process.

An efficient decrease in any sector's exposure to China or to any other key supplier will only come at the cost of a full supply chain reorganization, which would take into account these indirect effects and allow for an easy reallocation of supply channels when needed. However, shielding production completely from external supply shocks seems like an impossible quest.

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3 - "US Trade Protectionism: what are the knock-on effects on global value chains?", Coface Panorama, October 2018