



Improving Economic Resilience Through Trade

— should we rely on our own supply?

2020



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Improving economic resilience through trade – should we rely on our own supply?

This report compares possible EU trade policy strategies for greater economic resilience. Are shorter supply chains and reshoring likely to improve resilience or is economic integration with the rest of the world a better answer? The objective is to contribute to the discussion about trade and resilience in the wake of the COVID-19 pandemic. We hope that the result will serve as fact-based input to the EU trade policy review.

We use two related concepts that together represent resilience in a broader ‘security of supply’ sense. *Resilience* focusses on the ability of firms to resume operations quickly after a disruption occurs, whereas *robustness* has to do with the ability to maintain operations during a crisis.

Resilience

Theoretical considerations and empirical evidence support the view that an integration approach to resilience is better than a reshoring approach. A trade policy that allows cost-effective sourcing from different parts of the world provides EU firms with greater flexibility during disruptions. When aggregated to the entire EU economy, firm-level flexibility with respect to sourcing thus supports the open strategic autonomy objective. By contrast, a reshoring approach provides fewer opportunities for firms to adjust. A reshoring approach would also reduce employment and increase poverty in developing countries, undermining sustainability development goals. It would also hurt EU efforts to reform the World Trade Organisation (WTO).

Robustness

Whether a reshoring or an integration approach is more robust depends on the geographic origin of the disruption. At the same time, the overall risk that supplies will be interrupted altogether is reduced under an integration approach, since it allows more diversified supply lines. For the COVID-19 pandemic, moreover, there is no evidence of correlation between the level of fragmentation of production in a sector - a traditional measure of value chain integration - and negative economic impacts in that sector. On balance therefore, an integration approach is preferable also from a robustness perspective.

Sectoral evidence

A spike in demand for medical supplies and personal protective equipment led to severe shortages during the initial phase of the COVID-19 crisis. During spring, however, global supply expanded quickly and by summer, initial shortages had been removed through the help of imports from countries that had already passed through the acute phase of the crisis. For pharmaceuticals and vaccines more than 80 percent of EU imports already originate in other European countries, making a reshoring strategy superfluous. In Europe, agricultural food chains have so far remained robust during the COVID-19 crisis.

Policy recommendations

The EU should avoid reintroducing barriers that were temporarily removed during the COVID-19 crisis.

Multilateral or plurilateral agreements improve supply-chain flexibility for EU firms. Multilateral solutions also mean that we don't put all our eggs in the same geographic basket. This, in turn, contributes to the open strategic autonomy objective. Consequently, multilateral or plurilateral solutions are our preferred policy option.

If multilateral or plurilateral efforts fail, one option is to liberalize imports of intermediate goods unilaterally. That would increase flexibility with respect to sourcing for EU firms. Canada has done this and studies have shown that import liberalisation of intermediate goods improves firm productivity. During a time when the US and China are reluctant to embrace open trade policies such an initiative would strengthen Europe's position as the hub of global trade.

Another option if multilateralism fails is to diversify our network of regional trade agreements (RTAs) and to make them more interregional. The long-term objective would be to multilateralize commitments in EU RTAs. The EU-MERCOSUR agreement, for instance, connects Europe with a region that is not part of the two other supply chain hubs - Asia-Pacific and North America. Efforts to link up the EU with the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP) could serve a similar strategic purpose. When the US, China and India all struggle to embrace multilateral liberalisation, an attractive option for the EU is to build multilateral building blocks from RTAs. Just like the GATT started out with just 23 countries, a multilateralism for the 21st century could be built 'inside out' from a solid base of like-minded countries. Because of its economic size and commitment to multilateralism, the EU has a particular responsibility to lead such a development.

For goods that EU member states cannot accept even a short interruption of supplies, the only way to guarantee full robustness is through stockpiling. Assuming a common understanding by member states, the EU could agree on a division of labour with respect to stockpiling of essential goods. Such an agreement would require EU legislation that restricts member states from confiscating essential goods during a crisis. It would also have to consider the individual needs of member states and national stockpile preparations during times of crises, conflict or war.

Foreword

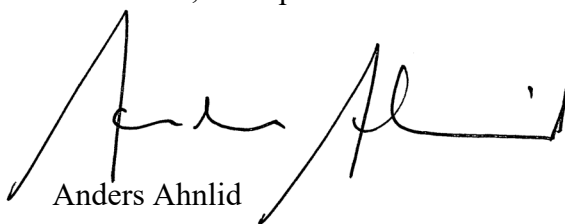
The COVID-19 pandemic has put enormous stress on the global trading system. According to the World Trade Organisation (WTO), world merchandise trade could fall in the range of 13-32 percent during 2020. During such a deep crisis it is natural to ask how we can build a more resilient world economy for the future? In times of crisis, it is also easy to react by pulling up the drawbridge and seeking refuge behind borders. Historically, we have witnessed such a development time and time again during crises. As our new report shows, however, resilience is better to build on a foundation of openness and international cooperation. While this may seem counterintuitive in the middle of a crisis, our report provides solid, fact-based evidence for global economic integration as the preferred EU strategy for greater resilience.

The issue of resilience is of course broader than the security of supply perspective that has been at the forefront during the COVID-19 pandemic. Sustainable development, the integrity of the multilateral trading system and the EU single market itself are other policy areas that require resilience in the broader sense. All of these areas are discussed in the report.

Finally, the report is intended to serve as a contribution to the review of EU trade policy that was announced by the European Commission in June 2020. From our perspective this review comes timely. World trade is currently hardly along a path of harmonious development and trade relations among major economies are strained. During such a time, it is important that we all reflect on how the EU can exercise leadership and build coalitions for open markets and a stable world trading system.

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1 Background and purpose

During the COVID-19 pandemic, some commentators have argued that countries should reduce their reliance on international supply chains in order to build a more resilient economy. For instance, the New York Times' economic correspondent, Niel Irving, claimed that "It's the End of the World Economy as We Know It", citing experts that argue that we need a "rethink of how much any country wants to be reliant on any other country" (16 April, 2020). Management professor Willi Shih also called the economic disruption caused by the pandemic "a wake-up call for managers...who need to understand their supply chain's strategic vulnerabilities" (Shih, 2020).

Others argue that global supply chains have functioned as an insurance policy, bolstering economic resilience during the pandemic. According to Baldwin and Evenett (2020), for instance, "a liberal world trading system gives health ministries, hospitals, and other medical service providers a wide range of suppliers to choose from. The fact that the COVID-19 pandemic hit different nations at different times implies that buyers can switch between suppliers and so reduce the risks of depending on any one of them. This facet of globalisation should be seen as a massive risk mitigation device."

At the political level, Peter Navarro, Director of Trade and Manufacturing Policy in the current US administration argued that "if we have learned anything from the coronavirus and swine flu H1N1 epidemic of 2009, it is that we cannot necessarily depend on other countries, even close allies, to supply us with needed items, from face masks to vaccines" (quoted in Financial Times, 12 February 2020).

In Europe, the European Commission has launched a model of "open strategic autonomy" in preparation for the EU's trade policy review and called for increased resilience with respect to global supply chains. Specifically, the Commission posed the following question in its consultation note of 16 June 2020: "how can trade policy help to improve the EU's resilience and build a model of open strategic autonomy?" (European Commission, 2020a).

Our report takes the Commission's call for improved resilience as a point of departure and asks what EU trade policy strategy is best suited to achieve that objective? Are shorter supply chains and a reshoring of production more likely to achieve improved EU resilience, or is further economic integration with the rest of the world a better answer? In the paper we refer to these two alternate strategies for greater resilience as *the reshoring approach* and *the integration approach*. Obviously, today's

EU economy is neither fully integrated with the rest of the world, nor completely self-reliant, so the two approaches should be seen as alternate strategies for the future *direction* of EU trade policy. It is also understood that the two alternate strategies are entirely policy-related. Firm-level decisions regarding resilience and risk management are not under scrutiny here. Policies to support reshoring could, for instance, include tariffs, local content requirements, subsidies and non-tariff measures that are discriminatory or more trade restrictive than necessary. Policies to support economic integration come in the form of negotiated or unilateral trade liberalization.

The objective of the analysis is to contribute to the discussion about trade and economic resilience in the wake of the COVID-19 pandemic. We hope that the result can serve as fact-based input during the current review of the EU's trade policy. While the main focus is on how different trade policy strategies might affect the resilience of the EU economy, we also discuss how alternate strategies might impact sustainable development goals and the WTO.

The empirical part of the analysis is based on a compilation of available evidence in the form of statistics, academic research, management literature, model simulations, analysis by international organisations and firm-level anecdotes. For the COVID-19 analysis, empirical evidence has of course been limited by the short time frame since the crisis erupted.

We begin the analysis by establishing definitions and discussing theoretical perspectives. How can we think about economic resilience? How are core concepts, such as “resilience” and “robustness”, defined? The next section examines empirical evidence of different responses during historical cases of supply chain disruption, including during the current pandemic. The final section evaluates alternative strategies for increased resilience and draws conclusions.

2 Definitions and theoretical considerations

2.1 Resilience and robustness

In the risk management literature a distinction is made between two related concepts, *resilience* and *robustness*. Here we borrow the definitions from Brandon-Jones et al. (2014):

- **Resilience** is “the ability to return to normal operations over an acceptable period of time, after being disturbed”.
- **Robustness** is “the ability of the supply chain to maintain its function despite internal or external disruptions” (Brandon-Jones et al. 2014).

Resilience thus focusses on the ability to resume operations quickly after a disruption, whereas robustness has to do with the ability to continue operations during a crisis. As we understand it, the Commission's intention is to stimulate a discussion about both these two aspects in the context of the EU trade policy review. Consequently, we see improvement in both dimensions – the ability to resume operations quickly *and* the ability to maintain operations during a crisis – as the relevant policy objective under scrutiny.¹ Together, the two concepts represent overall *security of supply* from the perspective of a firm or an economy.

2.2 Introducing trade

The general benefits of international trade to producers, consumers and society at large need not be discussed in depth here. Among other things, trade improves global resource allocation, allows greater specialization, leverages economies of scale, reduces global poverty, reduces prices and increases consumer choice, improves productivity and stimulates competition. The reader should keep in mind that these benefits, as well as potential drawbacks associated with trade and economic integration, are largely left outside this analysis.

It is clear, however, that one aspect of international trade is particularly relevant for the purpose of this study: when an economy goes from autarky to trade with the rest of the world, the number of potential suppliers expands - typically a lot. The effect in this regard that comes from opening up to trade is of course larger for a small economy than for an economy that already has a large domestic market.

When we relate this aspect of international trade to our key concepts, it appears that, from a firm *resilience* perspective, it is always better to have access to more rather than fewer suppliers, be they domestic or foreign. All else equal, therefore, the possibility for a given domestic firm to shift to alternate suppliers is greater when it has access to world markets than under autarky. Note that this conclusion doesn't change with the geographic origin of the disruption. Whether it's domestic, foreign or global in nature, it's still better to have access to more rather than fewer potential suppliers from a resilience perspective.

From a *robustness perspective*, on the other hand, the optimal choice of trade policy depends on the nature and geographic origin of the disruption. If the disruption is domestic in origin, the ability to maintain

¹ The McKinsey Global Institute collapses the two terms into one. According to their definition, resilience represents “the ability to resist, withstand and recover from shocks” (McKinsey Global Institute, 2020: p. 1)

operations uninterrupted will be difficult under autarky, whereas the opposite is true if the disruption is entirely foreign. If the disruption is global (i.e. both domestic and foreign, as in the case of the COVID-19 pandemic), the ability to maintain operations uninterrupted will depend on the specific supply structure of the firm. Before the geographic origin of the disruption is known, however, an integration approach still reduces the *risk* from a robustness perspective. The reason is that countries are more likely to have a diversified supply structure with an integration approach, thus reducing the risk that there will be an interruption of supplies altogether.

Finally, from a macroeconomic perspective, it is important to keep in mind that any economic disruption that affects large parts of an economy, requires considerable micro level adaptation. To take the economy from an initial equilibrium to another that has adapted to the constraints created by the disruption, requires flexibility and room to manoeuvre for millions of firms and individuals. For the purpose of our analysis it is therefore also important to determine if more or less economic integration with other countries creates the best conditions for this adaptation to occur.

2.3 Firm- vs. government decision-making during a crisis

Before discussing empirical experiences, it's also important to make a distinction between firm decisions regarding their operation during a crisis, and government decisions regarding the resilience/robustness of the economy as a whole.

For business managers, decisions will be of a hands-on nature, whereas decisions faced by governments (at least regarding trade) will mostly have more to do with keeping options open for firms. This is in line with the observation in the previous section that any major economic disruption requires governments to allow for and support the adaptation path to a new macroeconomic equilibrium. In trade policy terms, this means keeping as many different ways of serving operational needs as possible open, be it through trade in goods, trade in services, movement of people or through digital means. Similarly, governments need to keep the financial arteries of domestic and international trade open, a task that became particularly challenging during the 2008-09 global financial crisis.

If restrictions on one or several of these channels are in place *when the crisis begins*, governments will have to kick-start crisis management by relaxing some of the restrictions. During the COVID-19 pandemic, we

witnessed a range of such liberalizing measures by governments that cut import duties, facilitated customs-clearance, and streamlined approval requirements for medical supplies (IMF and WTO, 2020).² Having initial restrictions in place can therefore be a problem from a resilience/robustness perspective since they cause an unnecessary delay in the ability of firms to adjust during a crisis.

2.4 Strategic sectors and essential goods/services

A final important general consideration has to do with whether resilience is more important for some goods, services and sectors and, in that case, if the strategy should be different for them?

Essential goods and services

It is often suggested that improved resilience is particularly important for *essential* goods and services. In early August 2020, for instance, US President Trump signed an executive order requiring the federal government to buy essential medicines from US manufacturers. According to the Financial Times the motivation was to “reduce reliance on foreign supply chains”.³ Another example is the EU’s Cybersecurity directive that requires member states to identify “operators of essential services”.⁴ The EU also maintains a list of critical raw materials, which was recently updated.⁵

While the definition and scope of goods and services regarded as essential (or non-essential) differ between countries, medical supplies, pharmaceuticals, agricultural products and food stuffs have regularly been listed in such categories during the COVID-19 crisis.⁶ Consequently, we will look at these categories of goods more closely.

² See for instance European Commission Decisions 2020/491 (3 April 2020) on relief from import duties and VAT exemption on importation granted for goods needed to combat the effects of the COVID-19 outbreak during 2020 or the European Commission Notice 2020/C 96 I/01 (24 March 2020) on the implementation of the Green Lanes under the Guidelines for border management measures to protect health and ensure the availability of goods and essential services.

³ <https://www.ft.com/content/14b71ce4-0f57-4e9f-a2a6-5380229cf8c5>

⁴ Directive (EU) 2016/1148 of the European Parliament and of the Council of 6 July 2016 concerning measures for a high common level of security of network and information systems across the Union

⁵ See Annex 1 of the Commission’s Communication on Critical Raw Materials Resilience: Charting a Path towards greater Security and Sustainability: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52020DC0474>

⁶ For medicines, the World Health Organization maintains a list of essential medicines: <https://www.who.int/medicines/publications/essentialmedicines/en/>

Strategic sectors

The perception of which economic sectors are regarded as *strategic* have changed a lot over time. The EU itself was created on the notion that coal and steel were of strategic importance from a security perspective. For the EU's founders, the resounding answer to how supply chains should be organised in Europe in order to improve security was *increased* economic integration. In recent years, digital tech has become a sector that is regarded as strategic, particularly by the US. As a result, that sector has become the epicentre of geopolitical tensions between the US and China. In this case, however, the strategy applied by the US is the opposite from that enshrined in the EU's coal and steel community. The current keyword to describe trade relations between the US and China is decoupling – in other words economic disintegration in at least the digital tech sector.

In the past few years, sectors other than health and digital tech have also been identified as strategic. In 2018, The Strategic Forum on Important Projects of Common European Interest (IPCEI) established by the European Commission, identified the following six “key strategic value chains” for “Europe’s industrial competitiveness, climate ambitions, strategic autonomy and security”:

- Connected, clean and autonomous vehicles
- Hydrogen technologies and systems,
- Smart health
- Industrial Internet of Things,
- Low-CO2 emission industry,
- Cybersecurity

While these are not economic sectors in the traditional sense, the example illustrates that the European perception of strategic interests is broader than the health and digital tech sectors. The example also tells us that strategic *objectives* can range from industrial competitiveness to environmental concerns, political strategic autonomy and national security.

In this context, we want to caution against a phenomenon that international relations scholars refer to as “securitization” (Buzan, Wæver and De Wilde, 1998). During such a process, more and more societal challenges are framed as a security threat in order to pave the way for extraordinary political action. Similarly, it's important to avoid a situation in the EU where we give a wide range of economic sectors special treatment because they are all regarded as strategic. Such a trend would run the risk of introducing policy measures that create economic

distortions and reduce productivity even in the sectors that we want to support. In particular, the National Board of Trade cautions against mixing security policy with objectives that relate to trade and investment in civilian goods and services.

3 Empirical evidence

We have now introduced the definition of economic resilience/robustness, i.e. security of supply, and discussed some theoretical aspects related to our analysis. In the following, we examine the empirical evidence of different responses during historical cases of supply chains disruptions, including during the COVID-19 pandemic.

3.1 Historical cases of disruption and recent trends

Major disruptions in the global economy are not a new phenomenon. In the modern age, world wars, geopolitical tension, political revolutions, the global depression of the 1930s, the oil crisis of the 1970s, natural disasters, the global financial crisis of 2008-09, and pandemics such as the Spanish flu, all led to the reorganisation of international supply networks.

According to the McKinsey Global Institute (MGI) severe economic disruptions have become more frequent in recent years (MGI, 2020). They list the 2011 earthquake and Tsunami in Japan, the 2011 Thailand floods and the 2017 Hurricane Harvey as recent examples of events that disrupted key supply chains in globalised industries. During the same time, trade disputes, tariffs and trade policy uncertainty has generally been on the rise, while digitalisation trends augment cybersecurity threats.

MGI doesn't provide statistical evidence for the assertion that global shocks have become more frequent, but climate research suggests that global warming causes more extreme weather events (IPCC, 2014; US National Climate Assessment, 2018). Continued digitalisation and the roll-out of 5G networks undoubtedly also contribute to vulnerabilities that firms must cope with now and in the future. The argument that economic disruptions caused by pandemics will become more frequent in the future is more disputed, however,⁷ and interstate military conflicts are still at low levels compared to the 20th century. Yet, as the COVID-19

⁷ While globalisation makes viruses travel faster, travel simultaneously helps people grow resistant to various diseases that circle the globe since current virus strains are typically weaker mutations of earlier versions of the same virus. Thompson et al. (2019) argue that this factor explains why pandemics were in fact relatively rare during the past century.

pandemic teaches us, it is always wise to prepare for unexpected economic disruptions, both at the firm- and at the societal level.

During the past 30 years, there has also been an evolution in the range and complexity of international supply networks. After the global financial crisis in 2008-09, global value chains recovered quickly but since 2011 the expansion has stopped and has even gone into reverse (OECD, 2020a). In recent years, global value chains have become shorter and more regionalized (Miroudot and Nordström, 2019).

3.2 Types of impact from economic disruptions

The OECD (2020a) divides the impact of the COVID-19 pandemic into four different channels. In our view, they can be generalized to most, if not all types of large-scale economic disruptions.

1. The *direct supply-side impact* when firms stop producing due to a disruption
2. The *indirect supply-side impact* when production stops because a firm doesn't receive intermediate goods or services from downstream suppliers that are impacted directly. This channel includes disruptions of transport networks
3. The *demand impact* when production can continue but consumers stop consuming the product offered by firms
4. *Increased uncertainty* with respect to trade and investment policy.

The OECD (2020a) furthermore argues that the economic disruptions caused by the COVID-19 pandemic have more in common with natural disasters that hit Japan and Thailand in 2011 than with the 2008-2009 global financial crisis. Whereas the global financial crisis affected supply chains indirectly through the contraction in global financial markets and aggregate demand (channel 3), the primary economic disruption during the COVID-19 crisis were lockdown measures that directly affected domestic firms (channel 1). And when domestic production came to a halt - first in China and then in other countries – this domestic lockdown effect also rippled through international supply chains (channel 2).

While channel 1 and 2 factors probably explain the lion's share of the COVID-19 related drop in trade, this conclusion requires some qualification. The reason is that there were also demand-side effects, particularly in sectors which have received a lot of attention during the pandemic – pharmaceuticals and medical supplies. In this case, however, the disruption was due to a sharp *increase* in demand. The reason why there were acute shortages of some medical supplies during the early phase of the crisis was not that supply chains stopped working. In fact, as

we shall see, both production and supply chains for medical goods have worked remarkably well during the crisis. Instead, shortages emerged because of a sudden spike in demand that could not be met on short notice through existing production levels and available stocks. It was this demand shock that prompted governments to implement export restrictions on a range of goods, measures that were widely criticised for their ineffectiveness in removing shortages.⁸

There is also a time dimension to this. The Swedish truck manufacturer Scania explains that they can even put a date on when the channel 2 effect kicked in for them. On 16 March 2020 when President Macron announced far reaching lockdown measures in France, Scania had to stop production at their plant in Södertälje, Sweden. Before 16 March, Scania was able to accommodate supply chain challenges despite problems in China and Italy. They could for example change to alternate suppliers. When France entered lockdown, however, it was no longer possible to maintain production. On 1 June, Scania successfully started up production again with functioning supply chains. But by that time, demand for their products had dropped.⁹ Judging from this anecdotal example from the automotive industry, trade was primarily affected through channels 1 and 2 until late spring. After that, many firms had already adapted to the new supply side conditions. From then on, the demand channel (3) instead explains the main share of the drop in trade.

3.3 The 2008-2009 Global Financial Crisis

After the 2008-2009 global financial crisis, some argued that the global fragmentation of production that had preceded the crisis exacerbated the 2008-2009 fall in global demand (Tanaka, 2009; Milberg and Winkler, 2010). The reason, it was argued, was that integration into global supply chains allowed for a greater transmission of the initial credit crunch disruption. Others (O'Rourke 2009, Fontagné and Gaulier et al 2009) questioned this thesis and pointed to other factors that could explain the excessive contraction of trade compared to GDP. Altomonte and Ottaviano (2009) argue that “international networks of production may also display some degree of 'resilience' to adverse shocks like the current [global financial] crisis: supply-chain-related trade flows may react later (rather than sooner) to an adverse shock. Their fall may be smaller and,

⁸ Export restrictions (1) limit the global supply of scarce products, (2) prevent an optimal global allocation of a given level of available supply, (3) remove incentives for increased production or new manufacturers, and (4) increase the price of affected goods as a consequence of 1-3.

⁹ Åsa Pettersson, public affairs officer at Scania during a conversation at SNS Centre for Business and Policy Studies on 8 June 2020:
<https://www.youtube.com/watch?v=utcMrDXCcG4>

eventually, their recovery may happen faster relative to overall trade flows.”

Irrespective of this debate, it is clear that the underlying cause of the 2008-09 global financial crisis was a financial collapse that was transmitted to the ‘real’ economy. Unlike the 2011 natural disasters in Japan and Thailand (reviewed below), the global financial crisis was a demand shock that affected most countries simultaneously. Production at the firm level was therefore halted or slowed down for demand-related reasons during the global financial crisis. The economic disruption was transmitted through channel 3 in our stylised classification above.

3.4 The 2011 earthquake in Japan

The earthquake in eastern Japan 2011 was one of the most powerful earthquakes of the past century. Studies have found that Japanese firms were generally relatively resilient in the wake of the earthquake. Inoue and Todo (2017) report that plants that were directly hit by the earthquake restarted operations within three months. According to Todo et al. (2015), furthermore, firms with a wider supply network were initially struck harder but showed stronger resilience by recovering more quickly. They conclude that the “results suggest that the positive effects of supply chains typically exceed the negative effects”

Other analyses examine how firms changed their supply strategies after the earthquake. The general impression that we get from research and news reports is that firms in the auto sector stuck to a just-in-time model of production after the earthquake but with some tweaks. A Reuters article reports that Renesas Electronics, a manufacturer of microcontrollers for cars whose plant was devastated in 2011, didn’t increase its inventories in response to the 2011 disaster, but standardized parts across vehicle models to improve efficiency and to enable alternative production sites during disruptions. Since the earthquake, both Toyota and Nissan have also developed greater transparency in their supply chains by creating advanced supply chain databases. And Nissan now requires suppliers to include alternative sourcing plans for parts for new models.¹⁰ Research largely confirm this picture. According to Zhu et al. (2016), Japanese firms reacted to the disruption by moving operations abroad to a greater extent. Matous and Todo (2017) found that firms diversified suppliers after the earthquake, deviating from a model of single and long-term suppliers.

¹⁰ “Five years after Japan quake, rewiring of auto supply chain hits limits”, Reuters article, 30 March 2016. Available at <https://www.reuters.com/article/us-japan-quake-supplychain-idUSKCN0WW09N>

3.5 The 2011 floods in Thailand

The following section draws heavily on Haraguchi and Lall (2015). In 2011 severe floods occurred in the Chao Phraya river basin north of Bangkok, Thailand. The floods were caused by a combination of a “La Niña” event and vulnerabilities specific for the region. Altogether, the floods affected seven industrial parks with around 800 firms, a majority of which were Japanese multinational enterprises. The two sectors that were hit the hardest were the automotive sector and the hard disk drive industry.

The automotive sector

In the automotive sector, 10 out of 11 factories resumed operations within 18 to 42 days, while it took almost six months (174 days) for one plant to resume production. Of the three Japanese automotive firms that had operations in the affected region, Nissan recovered its operations more quickly than Honda and Toyota. According to Haraguchi and Lall (2015) the reason was that Nissan:

- was less impacted by the floods
- “had diversified sources of supply, and globalized the procurement system”
- had higher inventories when the floods hit

Ultimately, the 2011 production in Thailand’s automotive sector was 20 percent below expected production at the beginning of the year (and 11 percent below production in 2010).

The hard disk drive sector

The hard disk drive sector generally recovered more slowly than the automotive sector. Production declined by 30 percent between the third and the fourth quarters of 2011. Globally, hard drive shortages drove up the price of a desk top HDD by 80-150 percent. Among the four major HDD makers in Thailand – Western Digital, Toshiba, Seagate Technology and Samsung – two never stopped producing, while one (Western Digital) restored operations after 46 days and another (Toshiba) resumed production after 114 days. Toshiba, however, was able to divert its production to the Philippines (OECD, 2020a). In the long term, the HDD industry remained concentrated in Thailand despite continued risks of flooding.

3.6 The 2020 COVID-19 pandemic

Trade has so far contracted sharply during the COVID-19 pandemic. In April, the WTO predicted that global trade would fall by 13-32 percent in 2020 (WTO, 2020a). WTO estimates for the second quarter indicate an 18,5 percent year-on-year drop for world merchandise trade (WTO, 2020b).

According to the latest (May 2020) forecast by the European Commission's DG Trade (2020), EU GDP will shrink by 7,4 percent in 2020, whereas global GDP will drop by 3,5 percent. The Commission expects extra-EU exports to fall in the range of 9-15 percent and extra-EU imports by 11-14 percent during 2020. According to the latest available trade data from Eurostat, extra-EU imports fell by 14 percent and extra-EU exports by 15 percent during the first five months of 2020 compared with the same period 2019 (Board calculation based on Eurostat data).

Extra-EU trade effects by sector

The fall in trade has affected some sectors more than others. During the first five months of 2020, EU imports of pharmaceuticals increased by 6,5 percent and EU exports of pharmaceuticals increased by 15 percent compared to the same period in 2019 (see table 1 and 2 of Annex 1). EU imports of food and agricultural products were largely unaffected (minus 0,5 percent) while EU exports of food and agricultural products increased by 3,5 percent. For most other sectors EU-imports contracted substantially during the first five months of 2020. Oil products and the automotive sector appear to have taken the biggest hit, while EU imports of electronic goods and telecom equipment have fallen less (table 1 of Annex 1). Similar patterns are visible for extra-EU exports (table 2 of Annex 1).

Intra-EU trade by sector

Intra-EU trade during the first five months of 2020 has followed similar patterns (see Table 3 of Annex 1). At the aggregate level, intra-EU trade has fallen 17,5 percent compared to the same period in 2019. Intra-EU trade in pharmaceutical products has increased by 11 percent while food and agricultural trade is largely unaffected (minus 1 percent). Trade in oil products, automotives and transport equipment, on the other hand, decreased in the range of 30-44 percent.

Online trade

Online trade has boomed in the wake of the pandemic. The OECD (2020b) reports that online orders of goods more than doubled (year-on-year) by the end of May 2020 in the US. In Europe they were up by 50 percent and in Asia-Pacific by 40 percent. While it's difficult to separate domestic online orders from cross-border online sales, OECD data indicate that increases in cross-border parcel trade has been the highest for electrical machinery, pharmaceutical goods and medical equipment (OECD, 2020b).

Trade in services

For services, The European Commission's DG Trade (2020) estimates show that up to 30 percent of EU cross-border (mode 1) exports and imports may be at risk during 2020. The impact differs a lot between sectors with air travel and tourism being hit the hardest whereas IT services experience an upswing.

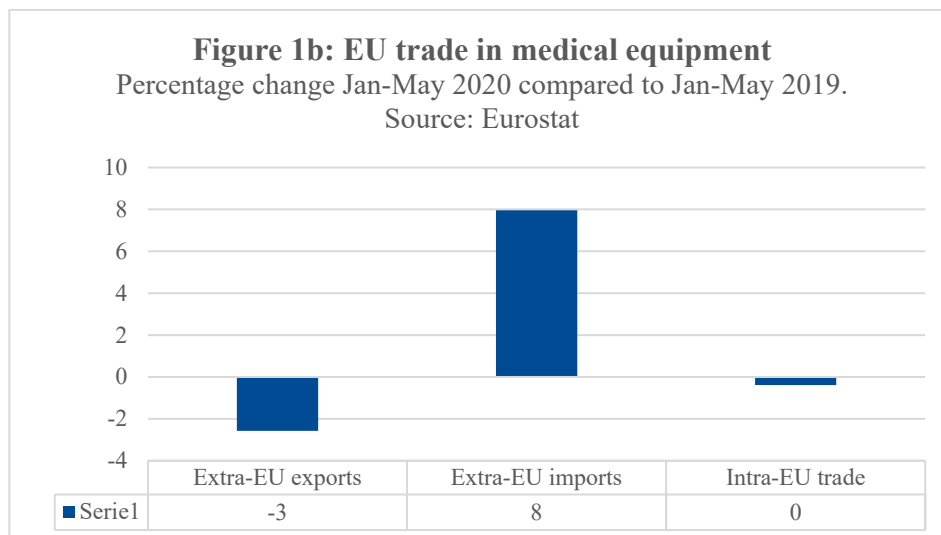
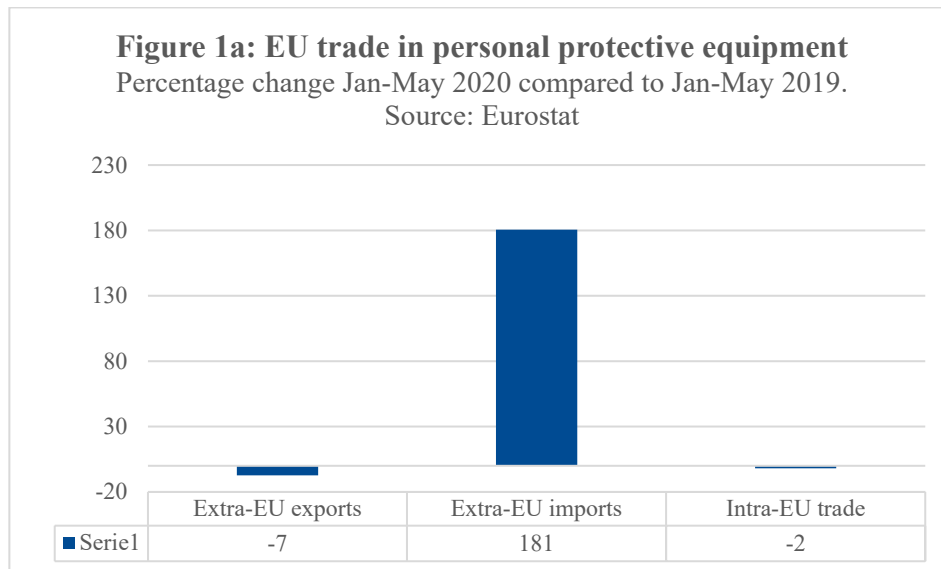
Since there has been a particular intense discussion of pharmaceuticals, medical equipment, personal protective equipment and agricultural products, during the pandemic we provide an overview of these sectors below.

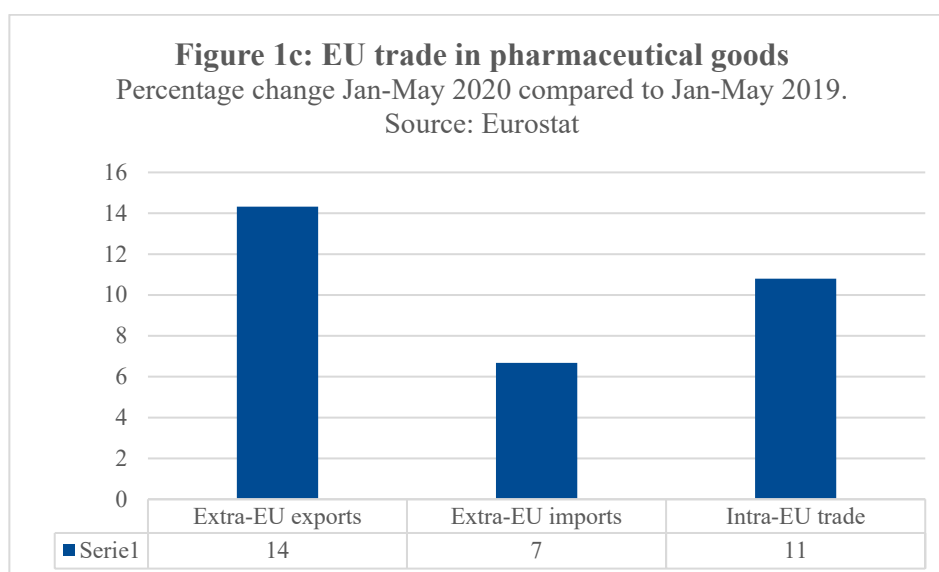
3.6.1 Trade in pharmaceuticals, medical equipment and personal protective equipment

The largest demand shock related to the COVID-19 pandemic occurred for medical equipment, personal protective equipment (PPE) and pharmaceuticals. As mentioned above, demand for certain products skyrocketed as the pandemic erupted. In the short term, there was no chance for supply (domestic or international) to keep up. As a consequence, many countries that experienced shortages imposed export restrictions on COVID-related goods and liberalised imports.

So how has EU trade in medical equipment, personal protective equipment and pharmaceuticals evolved during the first few months of the pandemic? Figures 1a-c describe the development for each category during January-May of 2020 compared to the same period in 2019. Particularly notable is the sharp rise in EU imports of PPE as well as the rise in EU exports of pharmaceuticals. EU imports of medical equipment have also greatly increased. The figures indicate that the EU has solved initial shortages in PPE and medical equipment through imports. The fact that intra-EU trade in medical equipment and PPE did not increase during the same time potentially suggests that the intra-EU supply response in those sectors has been weaker. (There could of course be a purely

domestic response in each EU member state that is not picked up by these figures, but that seems unlikely.) At the same time, EU firms have helped the world accommodate the global rise in demand for pharmaceuticals. Here, the intra-EU response to the increase in demand has also been stronger. In other words, ‘domestic’ EU producers also helped overcome shortages in the EU market.





The example of face masks

The statistical evidence in figure 1 is supported by an examination of a few individual products that have been in focus during the pandemic. The OECD (2020b) describes China's supply side reaction to the shortage of face masks during the early phase of the crisis as follows:

“In January 2020, China could produce 20 million masks per day, which was insufficient to meet a total demand estimated at 240 million masks per day to equip health, manufacturing and transport workers. As a result of extensive efforts by the government and companies, Chinese production increased six-fold and reached 116 million masks per day at the end of February and possibly 200 million per day at the end of March.”

After this was published (early May 2020), the China mask industry continued to boom for another month, but then demand and prices fell, indicating that world markets were already saturated by late spring 2020.¹¹ It should also be noted that some early shipments of face masks from China did not meet European standards, but this problem appears to have been reduced over time.¹²

¹¹ “Under COVID-19, China's Mask Market Surged. Now It's Gone Bust.”
<https://www.sixthtone.com/news/1005781/under-covid-19%2C-chinas-mask-market-surged.-now-its-gone-bust>.

¹² https://yle.fi/uutiset/osasto/news/finland_chinese_face_masks_fail_tests/11298914

The face mask example indicates an impressive degree of resilience in global supply chains. At the same time, it also illustrates a problem with robustness. After all, there were initial shortages. In the end, however, it's difficult to determine whether reshoring would have worked better from a robustness perspective. Such a counterfactual scenario is difficult to construct, but perhaps clues can be found in the following news report from Swedish Public Radio:

“Several Swedish companies that switched production this spring and started manufacturing protective equipment never got their products sold. [One firm] started to manufacture several 100 000 visors per month, but the orders did not materialize as purchases were instead made from China.”
 (“Dagens Eko”, 9 August 2020,)

While this is anecdotal evidence, the report indicates that foreign suppliers of visors were at least as quick to react as Sweden's domestic supply structure. The sharp rise in EU imports of PPE during the first five months of 2020 support this interpretation.

Similarly, *Le Monde* describes initial shortages and a big demand for face masks in France. Since mid-May, however, a large overcapacity has been built up due to Asian imports that crowded out increased domestic production. Again, it appears that international supply reacted about as quickly as domestic production.¹³ This later development in France also contrasts with the initial panic reaction. On 3 March 2020, France issued a decree that all domestic stocks of surgical masks would be seized. On 5 March, French authorities, consequently confiscated all surgical masks that the Swedish firm Mölnlycke had stored at its European distribution centre in Lyon, supplies which were destined to other EU countries. Mölnlycke immediately halted all Asian shipments of face masks to Marseilles and rerouted them to Belgium.¹⁴ Eventually, Mölnlycke's stockpile of face mask were released but the incident shows how short-sighted policies to seize domestic supplies can be when firms are able to adapt quickly.

The example of COVID-19 test kits

With respect to COVID-19 test kits, digitalisation in combination with international trade has helped overcome initial shortages. In early

¹³ https://www.lemonde.fr/planete/article/2020/08/22/masques-les-hauts-et-les-bas-d-une-nouvelle-production-made-in-france_6049632_3244.html#xtor=AL-32280270

¹⁴ Events as described in Fiorini, Hoekman and Yildirim, 2020.

January, Chinese scientists mapped the genome sequence of the virus and made it available world-wide on 10 January.¹⁵ This allowed scientists at Germany's Charité hospital in Berlin to develop a COVID-19 virus test within weeks, a test which became widely used around the world.¹⁶

Before the pandemic, South Korea was not among the top exporters of diagnostic tests. As the pandemic hit the country in February 2020, however, Korea quickly increased production and soon became one of the main exporters of covid-19 test kits. In late March, Korean firms started to win approval from the Food and Drug Administration for the US market for instance.¹⁷ By April 2020, 40 different Korean firms already served more than 100 countries with COVID-19 test kit. By then, just one firm – Seegene – produced 3 million test kits per week, with 90 percent available for exports (OECDa, Miroudot, 2020). As we saw with face masks, the world market for test kits became saturated in late spring/early summer and Korean exports therefore started to sink again. In this case, the supply-side response thus only took about two months and the steps taken from no knowledge of the virus to millions of exports of authorized test kits involved a lot of different tasks performed in multiple countries, i.e. a global value chain.

The example of pharmaceuticals

A common argument from supply chain critics suggests that OECD countries are too dependent on imports for a robust and resilient supply of medicines.

“One of the things that this crisis has taught us...is that we are dangerously over-dependent on a global supply chain for our medicines, like penicillin; our medical supplies, like masks; and our medical equipment, like ventilators.” Peter Navarro, Senior White House adviser quoted in White House press briefing on 3 April 2020¹⁸

In order to ascertain the EU's dependence on pharmaceutical imports, ECIPE (2020) collected data on imports and exports for different types of pharmaceuticals. Below, we republish their results for all pharmaceutical

¹⁵ <https://virological.org/t/novel-2019-coronavirus-genome/319>

¹⁶ https://www.deutschlandfunk.de/neues-coronavirus-diagnostischer-test-aus-berlin-weltweit.676.de.html?dram:article_id=468640

¹⁷ <https://www.reuters.com/article/us-health-coronavirus-southkorea-testkit/south-korea-says-three-korean-test-kit-makers-win-u-s-fda-pre-approval-idUSKBN21F0AJ>

¹⁸ <https://www.whitehouse.gov/briefings-statements/remarks-president-trump-vice-president-pence-members-coronavirus-task-force-press-briefing-17/>

imports, for imports of finished pharmaceutical products and for the import of vaccines.

Table 1: EU27 imports of all pharmaceutical products

Source: ECIPE. Year: 2019

	Share
EU27	63%
Switzerland	13%
US	9%
UK	4%
Singapore	2%
China	2%
India	1%
Israel	1%
Korea	1%
Japan	1%
Others	3%

Table 2: EU 27 imports of finished pharmaceutical products

Source: ECIPE. Year: 2019

	Share
EU27	68,1%
Switzerland	13,3%
US	8,3%
UK	4,8%
Singapore	1,7%
Canada	0,7%
India	0,6%
Japan	0,4%
Korea	0,3%
China	0,3%
Others	1,5%

Table 3: EU 27 imports of vaccines

Source: ECIPE. Year: 2019

	Share
EU27	80,9%
US	10,7%
UK	2,7%
Canada	0,7%
Singapore	0,4%
Mexico	0,3%
Australia	0,3%
Switzerland	0,2%
Others	3,8%

As a rule, other EU member states supply the EU27 with at least two thirds of their supply of pharmaceuticals. If we add the UK and Switzerland European “self sufficiency” rises to at least 80 percent. For vaccines, that number is even higher, more than 90 percent. In other words, EU import dependency is rather low for pharmaceuticals. In fact, as we showed above, EU exports of pharmaceuticals has helped accommodate the sharp rise in global demand during the spring of 2020 at the same time as intra-EU trade expanded quickly. The only country outside Europe that supplies a substantial share of EU imports of pharmaceuticals is the US. China only supplies small shares of the total international supply.

How diversified are Swedish imports of medical equipment, pharmaceuticals and PPEs?

In the management literature, it is frequently underlined that having access to a wide range of different suppliers improves the supply chain resilience of firms. Similarly, one could argue that a diversified import structure improves resilience for the whole economy since it is not dependent on just one or a few countries. A diversified import structure would therefore seem to be in line with the Commission’s open strategic autonomy objective.

To shed light on actual import sensitivity, the Board has calculated the degree of import diversification for Sweden for all three sectors discussed in this section. The index that we employ is the Herfindahl-Hirschmann Index, otherwise typically used to measure market concentration. A figure close to zero indicates maximal diversification, whereas 1 indicates that all imports originate in one single country.

For Swedish imports of pharmaceuticals the Herfindahl-Hirschmann index is 0,51, slightly above the 0,45 average for all goods. For both medical equipment and PPE, the index value is 0,28, i.e. well below the average for all goods. In other words, Sweden has a well-diversified import structure for medical equipment and PPE, whereas imports of pharmaceuticals are concentrated to fewer countries.

3.6.2 Trade in food and agricultural products

During the early spring of 2020, there were concerns that food supply chains would collapse and that hoarding would lead to food shortages in Europe and elsewhere.¹⁹ In the end, those fears never materialized. In early June, the OECD (2020c) therefore concluded:

“The COVID-19 pandemic introduced unexpected stresses on food systems, creating many immediate challenges. Yet what is remarkable is the speed with which supply chain actors have to date been able to reorganise themselves to ensure the continued availability of food... Policy makers have also so far mostly avoided the mistakes made during the food price crisis of 2007-8, and have also taken a range of other steps which have helped ensure the continued functioning of food supply chains”

The WTO (2020c) also reports that trade in agricultural products has remained robust during the crisis. During the first quarter of 2020 agricultural and food exports increased 2,5 per cent compared to the same period in 2019 and increased further in April. At the same time, the WTO notes, the COVID-19 crisis has put downward pressure on food prices and producer revenue. The WTO also notes that world food stocks and production levels for basic agricultural commodities such as rice, wheat and maize are at or near all-time highs. Despite that, the demand impact of the COVID-19 crisis (reduced employment and income) has increased the number of hungry people worldwide.

Governments furthermore appear to have learned from the experience during the 2007-2008 food price crisis. During that time, efforts to increase self-sufficiency and shorten the value chains in agriculture led to the introduction of export restrictions in many countries. These measures resulted in increases in the world price of many agricultural commodities. For instance, the price of wheat and rice rose by 30 and 45 percent respectively as a result of export restrictions and other measures that countries took to insulate themselves (Martin and Anderson, 2011).

¹⁹ “Europe’s fresh food supply is being threatened by coronavirus”
<https://www.weforum.org/agenda/2020/03/fresh-produce-europe-coronavirus/>

When modelling the impact of export restrictions on world food markets, Espitia, Rocha and Ruta (2020) furthermore found that “escalating export restrictions would multiply the initial shock by a factor of three, with world food prices rising by up to 18% on average. Import food dependent countries, which are in large majority developing and least developed countries, would be most affected.”

The early phase of the COVID-19 crisis witnessed the introduction of a number of export restrictions on agricultural and food products, but by the time of writing (late August 2020), only two countries (Turkey and Kyrgyzstan) still maintained food export restrictions, according to the IFRPI food export restrictions tracker.²⁰ As explained by Glauber et al. in March 2020, world food markets were in a better shape from the outset in 2020 compared to 2007-08. Agricultural stocks were higher and prices were stable. This probably also helped avoid repeating the mistakes of 2007-08.

While the supply of staple goods, seed, pesticides and fertilisers were never disrupted, bottlenecks still appeared because of limitations on the movement of people and in transport and logistics (OECD, 2020c). In Europe, there was a brief period when cross-border road transportation became a problem, but as the European commission responded to this by creating green lanes, the logistics problems were also reduced. Overall, therefore, transport and logistics of food and agriculture in Europe remained robust during all phases of the crisis. This also points to the importance of ensuring the proper functioning of the single market and preparing for strong coordination and cooperation between EU member states, even in times of crises.

In Europe, the COVID-19 crisis did not have a large impact on agricultural production or on aggregate demand. At the same time, the crisis led to a major realignment in *how* people consume food, shifting demand away from restaurants and toward online purchases and consumption at home. This, in turn, required quick accommodation in how food supply chains operate (OECD, 2020c).

While EU food supply chain thus continued to function without interruption during the crisis (i.e. they were robust), the poor in many developing countries remain very vulnerable as a consequence of the loss in income due to lockdowns and other restrictions. We will return to this issue in section 4.

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<https://public.tableau.com/profile/laborde6680#!/vizhome/ExportRestrictionsTracker/FoodExportRestrictionsTracker?publish=yes>

3.6.3 Model simulations of the COVID-19 pandemic regarding the relationship between supply chains and resilience

To date, there is understandably little empirical research available on the relationship between the COVID-19 pandemic and supply chains. As we saw above, the pandemic has had a huge impact on most economic sectors, but we still don't have empirical evidence in the stricter sense that tells us whether domestic production or international supply chains have been more robust/resilient during the pandemic.

However, according to model simulations there is no correlation between the level of fragmentation of production – a typical measure of supply chain integration - and the severity of the economic impact of COVID-19 (Miroudot, 2020). Work by Bonadio et al. (2020) provides further support for this view and suggests that the GDP contraction would have been worse with nationalised supply chains compared to the current level of international economic integration.

The most ambitious attempt to model the impact of shocks and risks on global supply chains has been made by the OECD (2020d). In their METRO model simulation, they compare two stylised versions of the global economy: one version where the world is made up of *localised economies* and another version where economies are *interconnected* (at the current level of economic integration).²¹ The localised version differs from the interconnected version in that global value chains are shortened through a 25 percent global increase in import tariffs and an increase in domestic subsidies equivalent to 1 percent of GDP, compared to the current situation. In the localised version, firms were also more constrained in switching between different sources of supply. According to their results, the localised regime “has significantly lower levels of economic activity and lower incomes. Increased localisation would thus add further GDP losses to the economic slowdown caused by the COVID-19 pandemic.” This result is what one would expect when going from a higher to a lower level of economic integration worldwide. More importantly for our analysis, however, is the result that “a localised regime is found to be more - not less - vulnerable to shocks”. The reason is that the localised regime provides fewer opportunities for adjustment to foreign shocks. Domestic shocks, on the other hand, are “magnified in the localised regime, where there are fewer options to cushion impacts through trade.” The final reason why the localised regime is more vulnerable to disruptions than the interconnected regime is the fact that localisation creates “reliance on fewer sources of - often more expensive - inputs. In this regime, when a disruption occurs somewhere in the

²¹ COVID-19 shocks were captured by the interconnected economies version.

supply chain, it is harder, and more costly, to find ready substitutes, giving rise to greater risk of insecurity in supply.”

The evidence we have from model simulations thus suggest that an integration approach to resilience is more effective compared to a reshoring approach. In other words, on a strategic level resilience is best promoted via a trade policy based on economic integration.

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So far, the evidence indicate a ‘slam dunk’ for an integration approach to resilience. It is possible, however, that the supply side response with respect to critical goods had been even quicker if we had had sufficient production in place in Europe. That assumes that European production and value chains are unaffected during a crisis, something that clearly hasn’t been the case during the COVID-19 pandemic. For an example of this, we need not look further than to Scania, which had to close production because of lockdown measures in France. In addition, it would require rather strong protectionist measures to reach a point where supply chains are all (or nearly all) European. And if we ever reach that point, at the cost of lower overall EU welfare, the problem discussed in section 2.3 comes into play: with initial import restrictions in place we are even more vulnerable to a disruption at home since firms don’t have the flexibility to change quickly to alternate non-EU suppliers.

All in all, the empirical evidence tells us that an integration strategy is better from a resilience perspective and that it is not clear that a reshoring strategy would have worked better than an integration strategy from a robustness perspective. Maintaining stocks of some goods in preparation for a potential crisis is another matter that we will return to in the concluding section.

4 The impact of different EU trade strategies for resilience on the WTO and sustainability

Up to this point, the analysis has focussed on how two different EU trade policy approaches might help or hinder EU economic resilience. Many would object that this perspective is too narrow and that the EU is a global actor with global interests and values to protect. Therefore, we will also consider the effects of different EU trade policy strategies for resilience on at least two more key policy objectives (1) the integrity of the multilateral trading system, and (2) the achievement of sustainable development goals under Agenda 2030.

Beyond that, there are a range of other potential priorities that are relevant in the context of the EU trade policy review. Among them are reduced global protectionism, sustainable economic growth, effective competition that promotes single market integration and the spread of technological innovation. These are outside the scope of this analysis, however, since they involve broader trade policy objectives than improved resilience.

4.1 Impact of EU trade policies for resilience on the multilateral trading system

Multilateralism is one of the main principles for external action listed in article 21 of the Treaty on European Union. Consequently, the EU is supportive of the WTO and has committed to the reform and strengthening of the organization. The EU is an important actor in the WTO and the Commission is often able to play the role of honest broker in the organization.

The potential impact of the two different strategies for resilience must therefore be evaluated, not only on whether they are compatible with WTO rules, but also on whether they contribute to the EU objective of strengthening the multilateral trading system. In addition, an evaluation should consider their impact on the EU's position in the WTO and the Union's ability to pursue its multilateral objectives.

Strengthening the multilateral trading system requires choosing multilateral solutions as the first option and thus promoting the WTO's role as a negotiation forum. According to the Board, an integration approach to resilience is superior from this perspective. Policies to shorten supply chains and reshore production - for instance by introducing tariffs, local content requirements, subsidies, and non-tariff

measures that are discriminatory or more trade restrictive than necessary - would undermine the EU's ability to take a constructive role at the WTO. Even steps to enlarge the EU's unilateral trade policy toolbox could weaken our position in the WTO irrespective of whether those tools are widely used.

By contrast, the successful negotiation of multilateral or plurilateral agreements on trade liberalization or rule-making would strengthen the organization. It is therefore important to avoid EU policies and legislation that restrict the EU's negotiating position and limit the possibility to achieve progress at the WTO.

Requiring exemptions or advocating that trade rules apply differently to different members of the WTO is a controversial notion within the organization and one that has made progress difficult in several negotiations. Any EU measures to improve resilience should therefore not require exemptions from the multilateral framework.

Several initiatives within the WTO related to the COVID19-pandemic have already been announced, some of them touching on the issue of resilience. This indicates that there is interest in the global community for reaching multilateral or plurilateral agreements on continued economic integration as a response to the crisis. In particular, the EU's health initiative is worth mentioning in this context.²²

Multilateral and plurilateral agreements also do not require as much red tape for firms to utilize as regional trade agreements and they are therefore particularly beneficial to small and medium-sized enterprises – another important EU trade policy objective. Cadot et al. (2006), for instance, found that administrative compliance costs related to rules of origin were 2 percent of the transaction value under the North American Free Trade Agreement (NAFTA).

Finally, a reshoring strategy for resilience could also impact the EU negatively over time as other countries follow our example and adopt their own strategies for greater self-sufficiency. Under such a scenario, EU exports would fall, both because EU production factors are increasingly allocated in domestic production and because our trading partners close their markets.

²² https://ec.europa.eu/commission/presscorner/detail/en/IP_20_1042

4.2 Impact of EU trade policies for resilience on sustainable development goals

Policies that promote sustainability, globally recognised through the UN's 17 sustainable development goals (SDGs), can themselves be regarded as a strategy to improve economic, social and environmental resilience. In this case, however, resilience goals apply not just to the EU, but to all countries. As the 2030 Agenda identifies trade as an engine for inclusive economic growth and an important tool to implement the SDGs, it is important to consider how the COVID-19 crisis and an increased trade policy focus on resilience affect the ability of trade policy to deliver on SDGs.

The COVID-crisis poses an unprecedented challenge to the global economy and sustainable development, and it affects the capacity to implement all seventeen SDGs. A particular focus, in the context of the impact of alternate EU trade policy strategies for resilience from a COVID-19 perspective, should be put on SDGs that relate to poverty (SDG 1), hunger (SDG 2), health (SDG 3), decent work and economic growth (SDG 8), inequality (SDG 10) and implementation (SDG 17).²³ It would not be feasible, in the framework of this study, to discuss all of them in detail, but we provide a few examples below in order to illustrate our conception of links and interdependencies.

In terms of poverty and food security, for example, an IFPRI study estimates that over 140 million additional people could fall into extreme poverty (measured against the \$1.90 poverty line) in 2020—an increase of 20 percent from present levels (Laborde, Martin and Vos, 2020). This includes 80 million in Africa and 42 million in South Asia. The recession that we see in Europe and the U.S. is expected to depress economic activity in developed countries by 6% on average in 2020, and spill over to the rest of the world through lower demand and lower commodity prices. Food insecurity could rise along with poverty. Aside from social and economic mitigation measures, such as fiscal stimulus, expansion of social safety nets and, in some cases, disaster and hunger relief, trade plays an important role in addressing this crisis. In this context, IFPRI experts call for concerted efforts to keep trade channels open, in line with

²³ Particularly relevant in the context of trade policy and trade's contribution to sustainable development are target 17.11: Significantly increase the exports of developing countries, in particular with a view to doubling the least developed countries' share of global exports by 2020; as well as target 17.12: Realize timely implementation of duty-free and quota-free market access on a lasting basis for all least developed countries, consistent with World Trade Organization decisions, including by ensuring that preferential rules of origin applicable to imports from least developed countries are transparent and simple, and contribute to facilitating market access.

SDG targets 17.11 and 17.12, in order to avoid adding a food price crisis to the health and economic crisis (Laborde, Martin and Vos, 2020).

Due to the combined supply and demand shocks on trade and the large decline in trade projected for 2020, the International Labour Organization (ILO) predicts that the employment impact of the COVID-19 crisis is likely to be more severe than during the 2008-9 global financial crisis (ILO, 2020a). In March 2020, the ILO estimated that the COVID-19 crisis will result in a rise of global unemployment of between 5.3 million in a 'low' scenario, and 24.7 million in a 'high' scenario (ILO, 2020b). While decreased exports have an immediate impact on employment, a more profound challenge for developing countries may result from the possible restructuring of global supply chains. If such restructuring is based on reshoring or near-shoring of production by developed countries, it could reduce employment and increase poverty in developing countries. On the other hand, "multiple sourcing" that increases supplier diversity in developed countries, could preserve and create new opportunities for developing countries to participate in global trade (ILO, 2020b).

Considering the implications of different trade policy reforms aimed at resilience, there is a need for careful consideration of their impact on sustainable development and the ability to achieve the SDGs. A helpful tool in this regard could be sustainability impact assessments that help identify the economic, social and environmental implications of different trade reforms.

Another important avenue to explore is increased focus on responsible business conduct (RBC). During the COVID-19 crisis, many firms all over the world have experienced disruptions in their supply chains. In particular, their disaster preparedness has been tested, but the crisis has also exposed vulnerabilities in employment and working conditions. An RBC approach to post-COVID recovery can help ensure that a focus on resilience will go hand in hand with guaranteeing responsibility and sustainability of the economic operations of firms. OECD studies have found that companies that apply RBC policies and conduct structured due diligence, can benefit during disruptions such as the COVID-19 crisis. The reason is that they already apply greater transparency and risk management linked to the implementation of RBC standards and principles. Companies that take a proactive approach to address COVID-19 related risks by mitigating adverse sustainability impacts through RBC are therefore likely to build more long-term value and resilience (OECD, 2020e).

5 Conclusions

To begin with, it is once again important to emphasize that the analysis only concerns government policy. How firms build operational resilience/robustness is a management question that depends on the individual situation of the firm.

An integration approach to resilience is better than a reshoring approach

Overall, theoretical considerations as well as empirical evidence indicate that an integration approach to *resilience* is better than a reshoring approach. An open trade policy that allows for cost-effective sourcing from many different parts of the world provides firms with greater flexibility during economic disruptions, be they domestic or global. When aggregated to the entire EU economy, such firm-level flexibility with respect to sourcing supports the European Commission's open strategic autonomy objective. By contrast, a reshoring approach provides fewer opportunities for firms to adjust to shocks. This conclusion is in line with the assessment by the European Commission's chief economist unit that an "open trade policy will ensure that firms with highly interconnected and diversified GVCs that produce easily substitutable goods are better prepared in times of economic uncertainty" (European Commission DG Trade, 2020).

Empirically, our analysis shows how supply recovered quickly after the 2011 natural disasters in Japan and Thailand as well as during the current COVID-19 crisis. Model simulations moreover suggest that a reshoring approach to resilience is more vulnerable to shocks than an integration approach.

Our conclusion regarding the benefits of an integration approach also applies to essential goods. In cases where the EU is dependent on one or just a few countries for the supply of essential goods or raw materials, the policy objective must be to *diversify* supply networks within a broader integration approach. As the European Commission (2020b) writes in its recent Communication on Critical Raw Materials Resilience, the "EU's open strategic autonomy in these sectors will need to continue to be anchored in diversified and undistorted access to global markets for raw materials". The Commission also recommends improved efforts to recycle used critical raw materials and to use resources more efficiently.²⁴

²⁴ <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52020DC0474>

Robustness

With respect to *robustness*, the empirical analysis shows that economic disruptions can hit supply lines hard and, in some cases, close individual plants for 2-3 months. This was the case in Japan and Thailand in 2011, as well as in some sectors during the early phase of the COVID-19 pandemic.

Whether a reshoring or an integration approach to improve robustness would work better, however, depends on the geographic origin of the disruption. At the same time, the overall risk that supplies will be interrupted altogether is reduced under an integration approach, since it allows more diversified supply lines.

During the COVID-19 pandemic, there has been no evidence of correlation between the level of fragmentation of production in a sector (a traditional measure of global value chain integration) and negative economic impacts from the disruption in that sector. Such evidence is a necessary condition for the conclusion that a reshoring approach would be more effective from a robustness perspective. Empirical evidence from the early phase of the COVID-19 pandemic also indicate that international supply reacted at least as quickly to reduce shortages as domestic production. On balance, therefore, an integration approach therefore also appears preferable from a robustness perspective.

Medical supplies, personal protective equipment and pharmaceuticals

Medical supplies, personal protective equipment and pharmaceuticals experienced shortages during the initial phase of the COVID-19 crisis. The shortages were not due to foreign supply problems, however, but to the extraordinary spike in demand. During the spring of 2020, supply expanded quickly and by summer there were no longer reports of shortages in Europe. The initial shortages in personal protective equipment were accommodated through imports from Asian countries that were less severely hit or had already passed through the acute phase of the medical crisis.

For pharmaceuticals and vaccines more than 80 percent of our imports already originate in other European countries, making a reshoring strategy largely superfluous. In fact, EU exports of pharmaceuticals helped reduce foreign shortages during the early phase of the COVID-19 crisis. The only country outside Europe that supplies a substantial share of EU imports of pharmaceuticals is the US. China only supplies a very small share of the international supply of pharmaceuticals in EU markets.

Food and agriculture

In Europe, agricultural food chains were uninterrupted, i.e. robust, during the initial phase of the COVID-19 crisis. Compared to the 2007-08 food price crisis, relatively few export restrictions were introduced on agricultural products globally and most of them have already been removed. Lessons from the 2007-08 crisis appear to have been learned.

The multilateral trading system

An integration approach to resilience is superior if the EU wants to reform the WTO and strengthen the multilateral trading system. Policies to shorten supply chains and reshore production would undermine the EU's ability to take a constructive role at the WTO. Any EU measures to improve resilience should not require exemptions from the multilateral framework. Instead, multilateral initiatives such as the EU's health initiative should be promoted.

A reshoring strategy for resilience could also impact the EU negatively over time as other countries follow our example and adopt their own strategies for greater self-sufficiency.

Sustainability considerations

If developed countries such as the EU restructure supply chains by reshoring production, it could reduce employment and increase poverty in developing countries. On the other hand, an integration strategy that increases supplier diversity could create new opportunities for developing countries to participate in global trade. Consequently, the impact of different trade policy strategies for resilience on SDGs should be carefully analysed. A helpful tool in this regard could be sustainability impact assessments.

The single market as a source of resilience/robustness

The single market is in itself a source of improved resilience/robustness from the perspective of individual EU member states. As we saw with the example of pharmaceuticals, Europe provides individual EU member states with at least 80 percent of their foreign supply of pharmaceuticals. At the same time, such a perspective requires EU solidarity in times of crisis. If we are to rely on supplies from other EU member states at all times, there cannot be any more "Mölnlycke moments" during future crises.

6 Policy recommendations

Apart from recommending an EU trade policy that promotes economic integration with other countries, the Board advocates the following measures that can improve EU resilience through trade policy.

No new protectionist measures

To begin with, an integration approach to resilience implies that the EU should avoid introducing new unilateral trade-distortive measures in the shape of tariffs, subsidies, export restrictions or (other) non-tariff measures that are discriminatory or more trade-restrictive than necessary.

Remove unnecessary trade restrictions before a crisis occurs

The EU should use the time until the next crisis to identify (internal and external) barriers that should never be there in the first place. Next time, we shouldn't have to begin crisis management by removing trade restrictions. A good first step in this direction would be to avoid reintroducing internal or external barriers that were temporarily removed during the COVID-19 crisis.

Ensure the proper functioning of the single market

The single market provides consumers and producers in EU member states with a broad range of choice regarding consumption, suppliers and production locations. With its deep level of integration, it offers EU member states a larger “domestic” market, thereby improving competition and making each member state less vulnerable to external shocks.

The single market is a key enabler of productivity and competitiveness for European firms. From a resilience perspective, a well-functioning single market makes it easier for both firms and consumers to adjust to economic disruptions. It is therefore crucial to ensure the proper functioning of the single market, by actively working for compliance of the existing rules and by removing remaining barriers and promoting further integration

Multilateral liberalisation

Multilateral or plurilateral agreements improve supply-chain flexibility for EU firms. Multilateral solutions also mean that we don't put all our eggs in the same geographic basket. This, in turn, contributes to the open strategic autonomy objective. Consequently, multilateral or plurilateral solutions are our preferred external policy option.

Unilateral liberalisation

If multilateral or plurilateral efforts fail, the EU can still support the diversification of its supply networks within an integration approach to resilience. One option is to liberalise the imports of raw materials and intermediate goods unilaterally. This is something Canada has previously done.²⁵ According to research liberalisation of intermediate goods improves firm level productivity, thus strengthening competitiveness.²⁶ During a time when the US and China are reluctant to embrace open trade policies such an initiative would strengthen Europe's position as the hub of global trade. Beyond improved resilience for goods, the economic dynamism that come with such an approach is clearly in our interest.

Regional and interregional integration

Another option if multilateralism fails is to continue to diversify our network of regional trade agreements and to make them more interregional. Again, the metaphor of not putting all our eggs in one basket comes to mind. The long-term objective would be to multilateralize mutually agreed commitments in EU RTAs. The EU-MERCOSUR agreement, for instance, connects Europe with a region that is not part of the two other supply chain hubs - Asia-Pacific and North America - thus contributing to the open strategic autonomy objective. Efforts to link up the EU with ASEAN as well as the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP) serve a similar strategic purpose. When the US, China and India all struggle to embrace multilateral liberalisation, an attractive option for the EU is to build multilateral building blocks from RTAs. Just like the GATT started out with just 23 countries, a multilateralism for the 21st century could be built 'inside out' from a solid base of like-minded countries. Because of its economic size and commitment to multilateralism, the EU has a particular responsibility to lead such a development.

Sharing the responsibility of maintaining stocks for essential goods

As we have seen, domestic and international production can both be affected by an economic disruption. For goods that EU member states cannot accept even a short interruption of supplies, the only way to assure robustness is therefore to maintain stocks. While the Board does not make recommendations regarding domestic stockpiling, it is worth noting that we found few examples of production that took longer than two months to resume (at the original or an alternate site).

²⁵ https://www.wto.org/english/news_e/news10_e/nama_29apr10_e.htm

²⁶ See for instance, Amiti and Konings (2007)

Assuming a common understanding by member states, the EU could agree on a division of labour with respect to stockpiling of essential goods. Such an agreement would require EU legislation that restricts member states from confiscating essential goods during a crisis. It would also have to consider the individual needs of member states and national stockpile preparations during times of crises, conflict or war.

Support knowledge sharing platforms and develop stress tests

The OECD (2020a) recommends that governments help support knowledge sharing platforms to identify best practices, mitigate risks and build resilience. Similarly, governments could support firms in developing stress tests for their supply chains. The Broad generally supports these recommendation, but emphasizes that such efforts should be limited in scope and not shift responsibility for supply chain resilience from firms to governments. For instance, governments should not oblige firms to share information on supply chain structures since such information can be part of their competitive advantage. It would also involve steps toward a degree of government control and supervision of entire supply chain structures, steps that are not necessarily compatible with broader European values about free enterprise.

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Sammanfattning av rapporten på svenska

I rapporten jämförs olika handelspolitiska strategier för försörjningstrygghet som EU kan tillämpa. Skapar kortare försörjningskedjor och hemtagning av produktion bäst försörjningstrygghet eller är ekonomisk integration med övriga världen en bättre strategi? Syftet med rapporten är att bidra till diskussionen om handel och försörjningstrygghet i kölvattnet av Corona-pandemin. Det är även vår förhoppning att resultatet kommer att fungera som ett faktabaserat bidrag i översynen av EU:s handelspolitik.

I rapporten använder kollegiet två relaterade begrepp som tillsammans representerar försörjningstrygghet. *Resiliens* fokuserar på företags förmåga att återuppta verksamhet snabbt efter att en störning har uppstått, medan *robusthet* har att göra med förmågan att bedriva verksamheten utan avbrott under en kris.

Resiliens

Teoretiska överväganden och empiri stödjer synen att en integrationsstrategi för försörjningstrygghet är bättre än en strategi som bygger på att hämta hem produktion till EU. En handelspolitik som möjliggör kostnadseffektiva inköp från olika delar av världen ger EU-företag större handlingsfrihet vid en ekonomisk chock. När denna handlingsfrihet på företagsnivå aggregeras upp till hela ekonomin stödjer den även EU-kommissionens mål om öppen strategisk autonomi för Unionen som helhet. Omvänt ger en strategi som bygger på att hämta hem produktion företagen färre möjligheter till anpassning. En sådan strategi skulle också minska sysselsättningen och öka fattigdomen i utvecklingsländerna och därmed undergräva Agenda 2030-målen för hållbar utveckling. Det skulle också skada EU:s ansträngningar att reformera WTO.

Robusthet

Huruvida en integrationsstrategi eller en strategi för att hämta hem produktion är mer robust (i den mening vi använder termen här) beror på den ekonomiska störningens geografiska ursprung. Samtidigt minskar den övergripande risken för att produktion eller leveranser avbryts med en integrationsstrategi, eftersom den möjliggör mer diversifierade försörjningskanaler. När det gäller Corona-pandemin specifikt har forskare inte heller funnit någon korrelation mellan graden av fragmentering av produktionen inom en viss sektor - ett traditionellt mått på integration i globala värdekedjor – och negativa ekonomiska effekter

inom samma sektor. Överlag bedömer vi därför att en integrationsstrategi är att föredra även ur ett robusthetsperspektiv.

Slutsatser på sektorsnivå

Ökad efterfrågan på medicinsk utrustning och personlig skyddsutrustning ledde till allvarlig brist inom flera EU-länder under den inledande fasen av Corona-krisen. Under våren expanderade dock det internationella utbudet snabbt och under början av sommaren hade den värsta bristen avhjälpats med hjälp av import från länder som redan hade passerat den mest akuta fasen av krisen.

För läkemedel och vacciner har mer än 80 procent av EU-ländernas import redan sitt ursprung i andra europeiska länder, vilket gör en strategi för att ta hem produktion överflödigt. Beträffande jordbruksprodukter och livsmedel har försörjningskedjorna i Europa hittills varit robusta under Corona-krisen.

Policyrekommendationer

Kollegiet lämnar följande rekommendationer med anledning av analysen.

- EU bör undvika att återinföra handelshinder som tillfälligt har tagits bort under Corona-krisen
- Multilaterala eller plurilaterala handelsavtal gör försörjningskedjorna mer flexibla för EU-företag. Multilaterala lösningar innebär också att vi inte lägger alla ägg i samma geografiska korg. Det bidrar i sin tur till EU-kommissionens mål om öppen strategisk autonomi. Följaktligen föredrar kollegiet multilaterala eller plurilaterala lösningar för ökad försörjningstrygghet.
- Om multilaterala eller plurilaterala förhandlingar misslyckas skulle EU istället kunna liberalisera importen av insatsvaror ensidigt. Detta skulle öka handlingsfriheten för EU-företag. Kanada har redan genomfört en sådan reform och studier visar att importliberalisering av insatsvaror förbättrar företagets produktivitet. I en tid då USA och Kina är ovilliga att omfamna frihandel skulle ett sådant initiativ kunna stärka Europas position som det geografiska navet i världshandeln.
- Ett annat alternativ om multilaterala förhandlingar misslyckas är att EU diversifierar sitt nätverk av regionala handelsavtal och att avtalen görs mer interregionala. Långsiktigt bör målet vara att multilateralisera åtaganden i EU:s regionala handelsavtal. EU-MERCOSUR-avtalet skulle t.ex. förbinda Europa med en region som inte ingår i de två andra regionala nätverken för internationella värdekedjor - Asien och Nordamerika. Ansträngningar att koppla

samman EU med *the Comprehensive and Progressive Agreement for Trans-Pacific Partnership* tjänar ett liknande strategiskt syfte.

- För varor som EU-länderna inte kan acceptera ens korta avbrott i produktion och leveranser, är lagerhållning det enda sättet att garantera robusthet. Förutsatt att medlemsstaterna har en samsyn, skulle EU kunna komma överens om en arbetsfördelning när det gäller lagring av nödvändiga varor. Ett sådant avtal kan kräva EU-lagstiftning som hindrar medlemsstaterna från att konfiskera nödvändiga varor under en kris. Det måste också ta hänsyn till medlemsstaternas individuella behov och nationella förberedelser för lagring under kris, konflikt eller krig.

- - -

Ärendet har avgjorts av generaldirektören Anders Ahnlid i närvaro av enhetschefen Michael Koch, chefsjuristen Jonas Jeppson, chefekonomen Patrik Tingvall, kommunikatören Lena Gustavsson, ämnesrådet Karolina Zurek, utredarna Isaac Ouro-Nimini, Anna Graneli, Hannes Jägerstedt och Nils Norell, samt ämnesrådet Per Altenberg, föredragande.

Anders Ahnlid

Per Altenberg

Annex I

Table 1: Change in extra-EU27 imports per sector Jan-May 2020 compared to Jan-May 2019

Own calculations. Source: Eurostat (Easy Comext). Product sectors in SITC format

Product group	Percentage change Jan-May 2020 compared to the same period 2019
Medical products and pharmaceuticals	6,5
Chemicals	4,8
Textiles	1,6
Food and agricultural products	-0,5
Electronics and telecom equipment	-4,9
Metal ores and Scrap	-5,3
Scientific, control instruments	-6,0
Paper And Paperboard	-6,6
Wood products	-10,9
Processed metal products	-11,6
Furniture	-12,0
Plastic products	-13,1
Machinery and equipment	-14,0
Non-Ferrous Metals	-14,2
Rubber and rubber products	-16,1
Motor Vehicle parts and components	-20,2
Iron Ore	-21,4
Road vehicles	-22,9
Other transport equipment	-24,5
Motor vehicles for persons	-24,5
Iron And Steel	-24,9
Paper pulp	-28,2
Petroleum products	-31,2
Crude Oil	-34,4
Motor vehicles for goods	-35,6
Total change (%)	-13,8

Table 2: Change in extra-EU27 exports per sector Jan-May 2020 compared to Jan-May 2019

Own calculations. Source: Eurostat (Easy Comext). Product sectors in SITC format

Product group	Percentage change Jan-May 2020 compared to the same period 2019
Iron Ore	39,2
Medical products and pharmaceuticals	15,1
Food and agricultural products	3,4
Chemicals	2,9
Non-Ferrous Metals	1,7
Wood products	-5,4
Plastic products	-6,3
Electronics and telecom equipment	-6,7
Paper And Paperboard	-8,8
Scientific, control instruments	-10,4
Metal ores and Scrap	-12,2
Processed metal products	-12,8
Machinery and equipment	-15,0
Rubber and rubber products	-18,6
Paper pulp	-19,9
Furniture	-22,0
Textiles	-23,9
Motor Vehicle parts and components	-25,6
Iron And Steel	-25,7
Road vehicles	-31,4
Motor vehicles for persons	-33,5
Petroleum products	-36,5
Motor vehicles for goods	-38,5
Other transport equipment	-39,2
Crude Oil	-51,7
Total change (%)	-14,6

**Table 3: Change in intra-EU27 trade (imports) per sector
Jan-May 2020 compared to Jan-May 2019**

Own calculations. Source: Eurostat (Easy Comext). Product sectors in SITC format

Product group	Percentage change Jan-May 2020 compared to the same period 2019
Medical products and pharmaceuticals	10,8
Food and agricultural products	-0,8
Electronics and telecom equipment	-10,3
Paper And Paperboard	-10,3
Other transport equipment	-11,2
Non-Ferrous Metals	-11,3
Processed metal products	-12,4
Chemicals	-13,6
Scientific, control instruments	-14,3
Plastic products	-15,5
Metal ores and Scrap	-16,0
Wood products	-16,0
Textiles	-17,2
Iron Ore	-18,0
Machinery and equipment	-21,0
Furniture	-21,7
Paper pulp	-24,4
Iron And Steel	-25,3
Rubber and rubber products	-25,7
Petroleum products	-28,8
Crude Oil	-31,3
Motor Vehicle parts and components	-33,1
Road vehicles	-33,4
Motor vehicles for persons	-33,5
Motor vehicles for goods	-43,8
Total change (%)	-17,5