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RESEARCH ARTICLE

Trade and Global Value Chains at the Time of Covid-19

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ABSTRACT
The pandemic we are experiencing is, despite its temporary nature, likely to leave a permanent sign on the global trade system. Measures to contain contagion have revealed the greater vulnerability of firms operating in global value chains (GVCs) and especially those located in first-hit countries. The risk is that production reshuffling made possible by automation will increase, and that nations will see incentives for changing the distribution of manufacturing around the globe. Furthermore, Covid-led trade restrictions may trigger a new wave of protectionism, impacting disproportionately on those countries without the manufacturing capacity to provide their populations with medical products.

KEYWORDS
globalisation; global value chains; Covid-19; protectionism

A global consequence of the Covid-19 pandemic is the enormous increase in the level of uncertainty (Baker *et al.* 2020). Almost all aspects of our lives have been conditioned by the outbreak, from the medical efforts to combat the pandemic to its economic impact and government interventions. Like the virus, uncertainty is not limited, not affected by national borders.

Trade is the hardest hit by this turbulence, given the integrated nature of global manufacturing. In recent months,[1] attempts to understand how global production will be affected are focusing on firms' adaptation strategies, as interconnections at the global level are in turmoil. But the financial crisis had already led policymakers and business leaders to question the globalisation phase that started in 1990. The contraction of the trade openness index, calculated at the global level, from 61.1 in 2008 to 53.5 in 2017, has led to the labelling of a new phase, Slowbalization (Irwin 2020), which reflects changes in the perspectives of global actors such as China and the United States. The Chinese government has started to focus on the indigenous development of key industries to achieve global technological predominance, while a protectionist cloud has emerged following Trump's attempt to 'make America great again'.

Also, doubts about the overall benefits of globalisation, already prompted by the "second unbundling" (Baldwin 2011), which started in the 1990s revolutionising the distribution of knowledge and therefore production, have strengthened over time. In fact, the co-existence of the push for free trade by the business world, associated with the establishment of global value chains (GVCs), and the renewed globalisation backlash is one of the fundamental tensions

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Supplemental data for this article can be accessed here.

characterising trade policymaking in the contemporary global economy. This backlash can be seen from the support for protectionist parties and candidates in many countries around the world, as well as the vigorous opposition to deep trade and investment partnerships such as the Transatlantic Trade and Investment Partnership (TTIP) and the Trans-Pacific Partnership (TPP) (Dür *et al.* 2020).

Following the categorisation by Andreas Dür *et al.* (2020), trade policy experts who mainly adopt a GVC perspective fear that a temporary shock, the pandemic, will have a permanent effect both on firms' strategic choices and on government preferences regarding world order, such that globalisation is likely to suffer the hardest blow since the end of the Second World War. The virus outbreak caused disruptions in production in Hubei province, which were immediately propagated beyond China through the integration of Chinese and foreign firms located there. Firms have been exposed to the fragility of a system "that requires all of its parts to work like clockwork" (Javorcik 2020). But in the same way that economic interdependence exacerbates the domestic contraction of production in each country, an integrated economy is a strong asset for mitigating the effects of a pandemic. Nevertheless, while international flows have helped nations to obtain medical supplies when scarce at home (Baldwin and Evenett 2020), attempts to regulate the movement of personal protective equipment have been witnessed in some cases even within national borders. Protectionist arguments have been raised by national and local governments to show the electorates their prompt reaction in the fight to contain the contagion.[2]

The results of Davin Chor's pool, submitted during a Centre for Economic Policy Research (CEPR) webinar on Covid-19, China and the Global Value Chains held in May 2020 (CEPR 2020), recorded that for slightly more than half of an expert audience, the pandemic had affected their views on trade policy. Although the large majority did not express the view that trade should be limited (even less so for medical supplies), 15 per cent of the specialised audience foresaw a change in the way production is currently distributed globally across space. The reason is the role of trade as a magnifier of national crises: shutdowns or lockdowns – stringent or not – have slowed the spread of the infection, but with enormous effects on production. The complexity of interconnections between national economies, which makes the 'made in the world' label appropriate for the great majority of manufactured goods, magnifies the consequences and adjustments of doing away with national borders.

In the wake of the epidemic, the dual role of China as the country in which the outbreak began and home to the world's largest share of manufacturing output, has made the argument crystal clear. Now the concern is that the world trade landscape will become increasingly siloed, even when international cooperation is able to ensure increased production at lower costs for all goods, including those needed to fight the virus. This point is crucial also in the event of subsequent waves of infection at the global level. Furthermore, it is related to another currently under-investigated issue (Eckhardt and Poletti 2018): How much power and what vision do institutional forces still have to structure the fragmentation of production across several borders (Gereffi *et al.* 2005)?

[2]See the cases of 3M, pressured by the Trump administration to limit its export of masks to Canada and Latin America, regardless of the position of Canada as one of the US' main trade partners, or Mölnlycke, a Swedish company producing surgical masks on which the French government placed an export ban during the first weeks of the pandemic in Europe.

Questioning whether there will be permanent effects when the pandemic is over is what international economists call 'hysteresis': broadly speaking, it is the effect of a temporary shock that continues even when the causes have been removed, permanently changing the initial equilibrium. Hysteresis depends on certain features of sectors, the most important being the level of competition (Dixit 1989): for example, markets that are characterised by high entry costs (sunk costs) could modify their domestic structure since firms that exit following a temporary shock are unable to recoup such costs on re-entry (Baldwin 1988). In such a case, the pandemic would only add a further element of fragility to a system already conditioned by the mounting distrust in trade benefits in the Western electorate, especially over the last two decades.

In this brief discussion, we intend to provide a framework for understanding the global trade system, currently a subject of heated debate as there is the risk of returning to higher levels of nationalism in production. The response of the authorities will be fundamental for effectively showing the advantages of cooperation. Indeed, it is essential that governments act together since, as mentioned above (Eckhardt and Poletti 2018), the business world does not leave domestic and international institutions much power to influence the way GVCs work. Incentive schemes preventing inward-looking national behaviour that would, however, have negative externalities on other countries, are necessary but difficult to implement. When shocks beset global trade, a common way to preserve major trading partnerships are preferential trade arrangements, especially in intra-bloc trade. However, the results can differ in timing and with respect to each specific area. Thus, the risk is that even trade relations consolidated in the past and negotiations relative to them may be affected by a temporary shock, such as a pandemic.

The discussion starts with an analysis of the diffusion of the Covid-19 pandemic and the distribution of economic activities throughout the world. We will then look at how multilateral economic relationships generate country interdependence globally and within macro-regions. Before looking at the policy implications, the specific features of this crisis which call for special measures will be identified. The last section provides recommendations for a coordinated response.

Diffusion of Covid-19, world production and international trade

Covid-19 is the most severe pandemic of the last 100 years, as it has affected huge swathes of society practically worldwide. Together with the health crisis, it has plunged the world into a major economic crisis. The initial concern was how the spread of the virus would affect the biggest economies. More than half of the total confirmed cases in the world (as of 6 June 2020) were in the ten largest economies, which represent almost 70 per cent of total world manufacturing production (see Figure 1). From the beginning, the issue was evident: the distribution of the coronavirus mirrored, almost perfectly, that of production. While forecasts of the effects of the pandemic on global production are still being turned out, with no broad agreement as to the severity of the contraction, recent estimates by IMF foresee a global recession of -3 per cent due to the 'Great Lockdown': 90 per cent of the countries around the world will have negative GDP growth, and the advanced economies will be more seriously damaged (-6 per cent) than emerging markets and developing countries (-1 per cent) (IMF 2020).

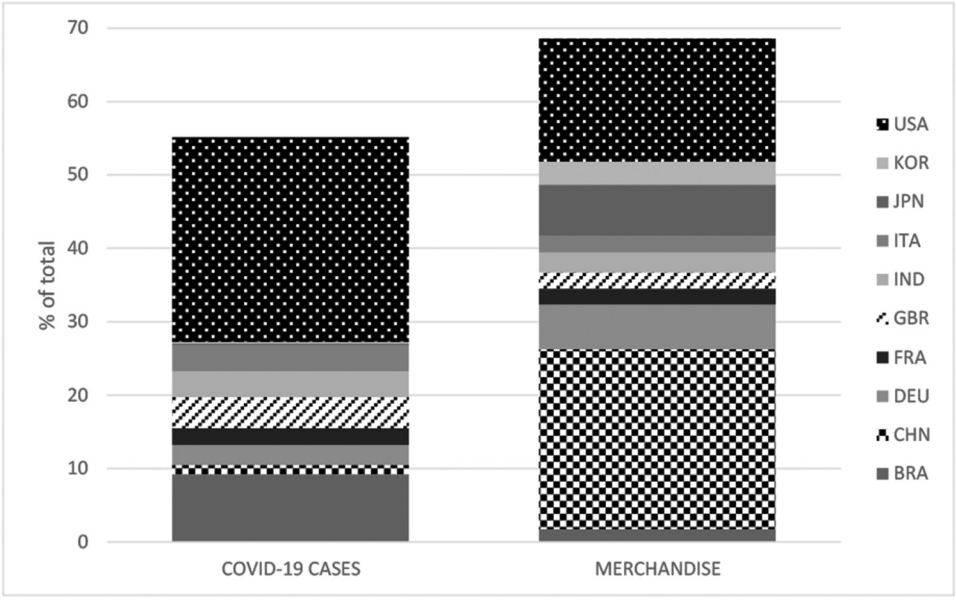

Figure 1. Countries' percentage of Covid-19 cases and contributions to world merchandise
Source: Authors' elaboration on WHO (Covid-19 cases) and OECD 2015 Trade in Value Added (TiVA) (contribution to world merchandise) data.

The recession in the Euro area could be worse than in the US and Japan (see Figure 2). Eurostat's flash estimate of May 2020 calculated a GDP decrease of 3.8 per cent in the first quarter of 2020 for the Euro area. Accurate forecasts were difficult to make at that time because the factors that contributed to making an estimate were very heterogeneous. A study by Sophia Chen *et al*. (2020) reported that weekly electricity usage was about 5 per cent lower than in 2019, increasing to 15 per cent lower in mid-April. According to the energy elasticity estimates by the same authors, during a crisis, a 1 per cent drop in electricity usage is associated with 1.3 to 1.9 per cent lower output.[3]

Global supply chains are a central feature of today's world economy. In 2008, more than 55 per cent of global manufacturing imports and exports took place within global production networks (Figure 3). But before moving on, it is important to define GVCs and the way they are measured. GVCs are the sequence of steps, each one generating an added value, required in the production of goods and services with at least two of these steps (such as research and development, raw materials and labour force, or the consequent assembly and distribution) in different countries. The typical structures are spiderlike when intermediate goods (parts and components) from different locations are assembled in a plant, and snakelike when the value is produced sequentially in every step. An example that helps understand this complexity is the bike industry, where the brand concept is, for instance, created by an Italian company (Bianchi), the components come from Asia (China for frames, saddles, wheels and pedals; Singapore, Malaysia and Japan for brakes, such as

[3]On the other hand, the CEPR-EABCN Euro Area Business Cycle Dating Committee at the time of writing reports that economic activity in the Euro area will almost certainly be substantially lower in 2020Q1 and 2020Q2 than in 2019Q4, but the cyclical designation of this period will depend on which of the possible future paths the Euro area will take thereafter, for which the Committee does not have data (Weil *et al*. 2020).

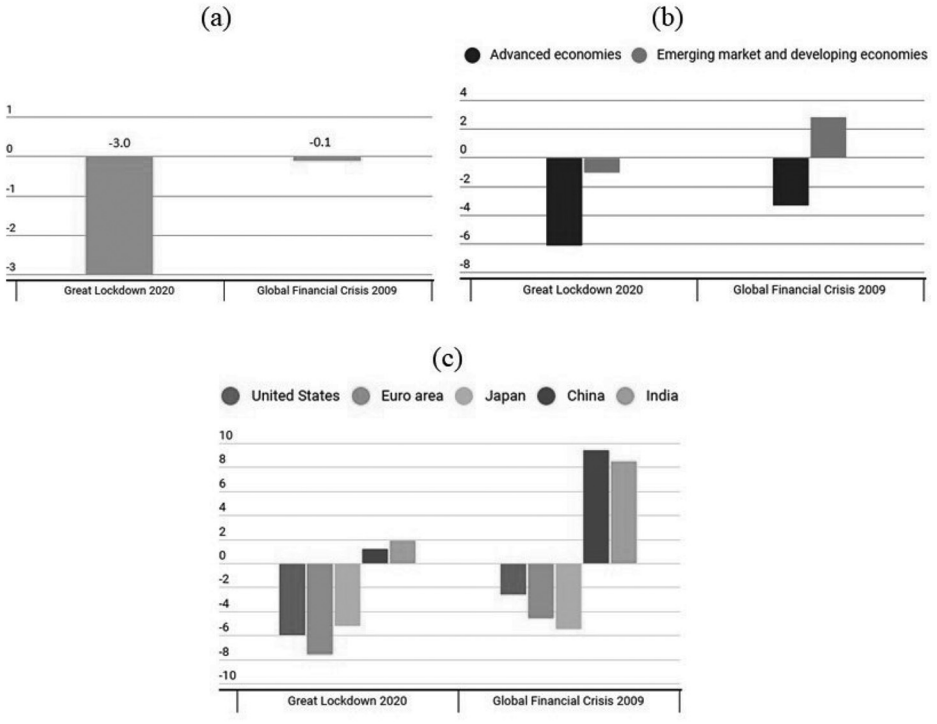

Figure 2. IMF forecast: comparison of GDP growth between Great Lockdown 2020 and Global Financial Crisis 2009

Note: All graphs refer to real GDP growth year-on-year per cent change. Graph (a) refers to global GDP growth.

Source: International Monetary Fund (IMF), World Economic Outlook 2020, extract from G. Gopinath, The Great Lockdown. Worst Economic Downturn since the Great Depression. *IMF Blog*, 14 April 2020. https://blogs.imf.org/2020/04/14/the-great-lockdown-worst-economic-downturn-since-the-great-depression (reproduced with permission).

Shimano) or European countries (Italy, France and Spain for saddles, frames and wheels) and are then assembled, distributed and sold all over the world (World Bank 2020).

The complexity of GVCs structures is reflected in the way they are measured. They can be analysed at both the macro (country) and micro (company) level. Here and in the graphs below, the macro point of view prevails. GVC measurements intend to capture both where and how goods and services are produced, which means tracing value-added flows across countries.[4] For a good estimate of participation, generally defined as the share of world exports that flow through at least two borders, two kinds of GVC trade have to be kept in mind: 'backward GVC participation', which represents domestic value-added exports generated by previous imports from another country, and 'forward GVC participation', when a country exports domestically produced inputs to other countries that carry out the downstream production stages (World Bank 2020).

[4]The main statistics have been created using input-output tables; the ones containing cross-country information are: World Input Output Database (WIOD) from the University of Groningen, EORA from the University of Sydney and Trade in Value Added (TiVA) by the OECD (World Bank 2020).

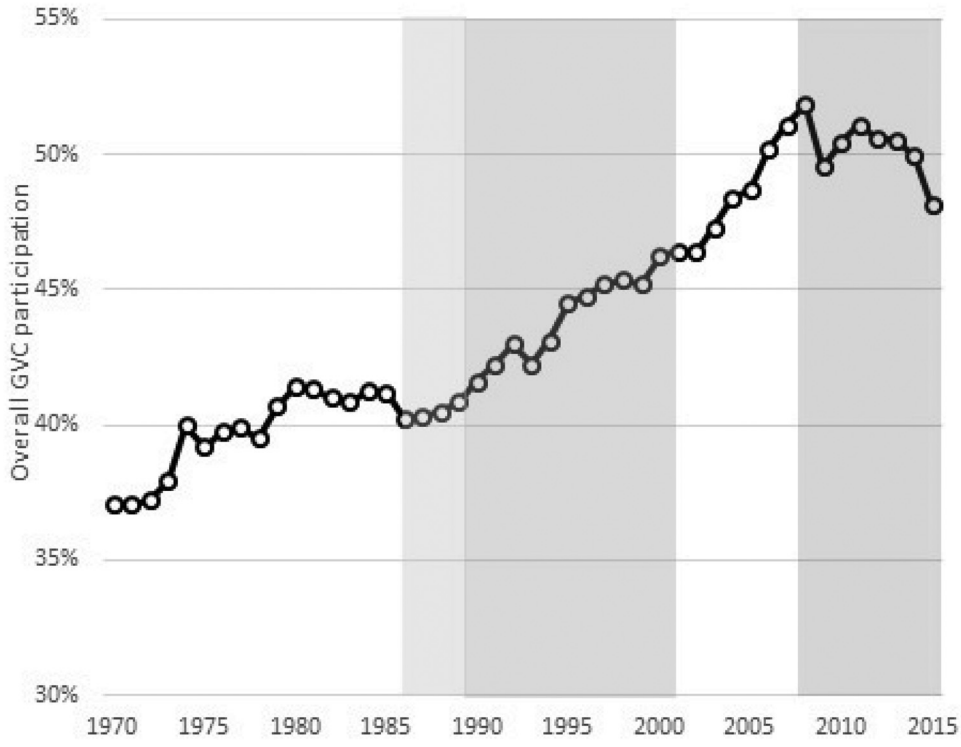

Figure 3. GVC participation, 1970-2015
Note: The Figure combines two measurements from 1970 to 1990 and refers to VAX, which is a previous measure of export value-added and GVC participation which can be computed from the 1990 data. *Source*: Authors' replication of World Bank, World Development Report 2020: Trading for Development in the Age of Global Value Chains. Washington, DC, 2020: 19. DOI: 10.1596/978-1-4648-1457-0. License: Creative Commons Attribution CC BY 3.0 IGO.

Adopting these measures, the weight of global value chains in total trade has been decreasing since the 2008 financial crisis (see Figure 3). There are various reasons for this: the 2011 earthquake and tsunami in Japan that halted the supply of components to US firms and revealed the weakness of their dependency on imported inputs; the increasing automation of production processes which can replace cheaper foreign factors of production with robots and machines (World Bank 2020; Antràs and de Gortari 2020); shifts in national perspectives by global actors (US and China); the recent trade tensions between the US and China and the unilateral protectionist measures promoted by the former and causing retaliation by the other economies. 'America first' has gone global, and now 'Others first' have started to get a grip in trade policy decisions and global discussions.

A measure of how the spread of the Covid-19 pandemic has affected trade flows is equally important. In September 2020, the Chinese economy was recovering, while the rest of the world remained in the throes of the coronavirus. An attempt to estimate the real-time effect of the pandemic on trade was made analysing the data on vessels and cargo ships, which showed that China's exports had dropped sharply (Figure 4) at the beginning of the lockdown in early February, but slowly seemed to be rising again. On the other hand, at the

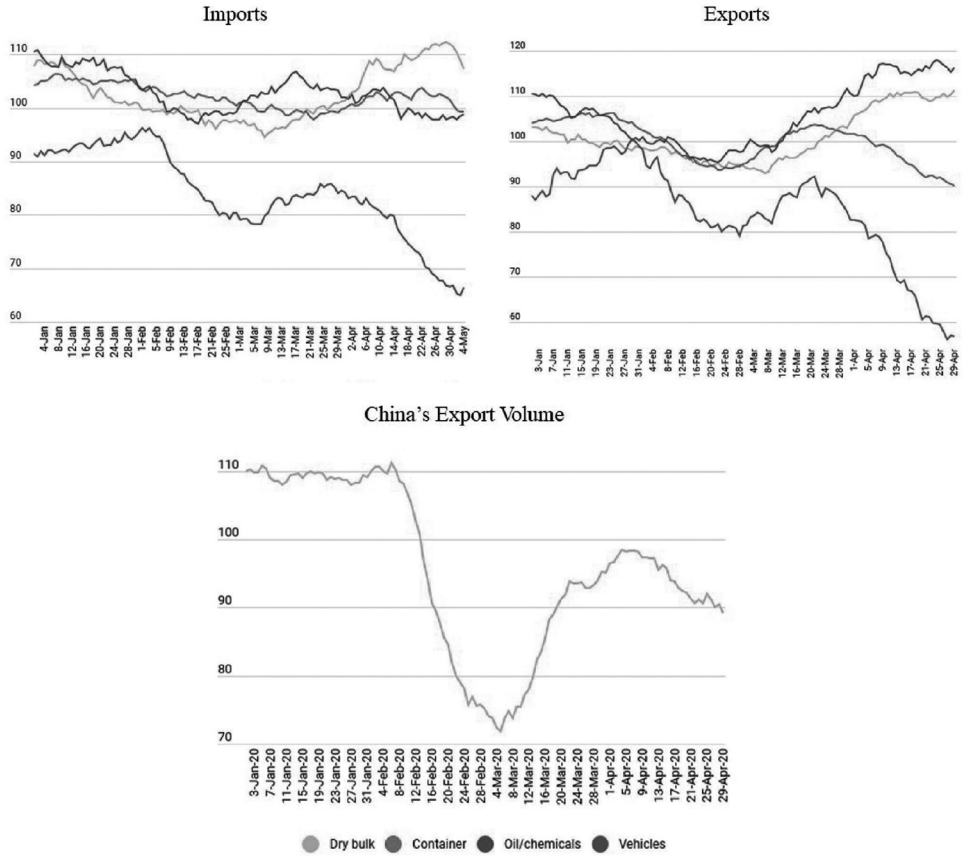

Figure 4. Real-time estimates on trade flows after the outbreak of Covid-19
Note: Imports and exports refer to real-time estimates of world trade relative to the 2017-2019 average, and China's exports to the real-time estimate relative to the 2017-2019 average. All graphs are measured using 30-days moving averages, base years adjusted to the Lunar New Year.
Source: D. Cerdeiro, A. Komaromi, Y. Liu, and M. Saeed, Tracking Trade During the COVID-19 Pandemic. *IMF Blog*, 14 May 2020. https://blogs.imf.org/2020/05/14/tracking-trade-during-the-covid-19-pandemic/ (reproduced with permission).

global level, sectors such as the automotive industry were seeing a dramatic downturn as of the end of March. Data available could only paint a partial picture of what was happening.

Moving to the bilateral level, Davin Chor[5] provided evidence showing that imports from China to the US dropped by almost USD 13.47 billion between January and March 2020, of which USD 10.47 billion in February alone. This was a much larger decline compared to other partners, such as the EU, the UK and NAFTA area countries, which recorded a reduction of between USD 0.06 and 2.43 billion in the same period. Moreover, China was the only country that did not recover in March, losing another USD 3 billion, while EU-27 exports to the US jumped from USD 32.65 billion in February to USD 41.59 billion in March.

[5]Results presented at the recent CEPR webinar on Covid-19 mentioned earlier (CEPR 2020).

Global interdependence

Trade-linked contagion is transmitted through different channels: a supply disruption in one nation's production shows up as a reduction in its exports to its trade partners (supply effect), while a drop in one nation's income will reduce its imports from its trading partners (demand effect) (Baldwin and Freeman 2020a). Since the mid- to late 1980s, international supply chains have multiplied (Figure 3). This amplifies the propagation of shocks as the ripple effects in manufacturing depend on nations' exposure to other nations' manufacturing sectors. The critical point therefore is the extent to which the pandemic will lead to a major shift in the international economic architecture.

From the beginning of the emergency in China, supply-chain contagion exacerbated the direct supply shocks in China, exporting it through the activity of multinationals. Manufacturing sectors in those countries that at the height of the epidemic in China were not yet affected (US and Europe) started to find it harder and/or more expensive to acquire the necessary industrial inputs imported from the hard-hit nation. The chain of transmission imposing a further layer of vulnerability on domestic economies was evident from the beginning.

Worldwide production is in fact characterised by an increasing reliance on intermediate goods produced outside of national borders. China has seen an increase in its participation in world manufacturing in the last decade, and is now the main source of inputs for the top manufacturing countries (US, Japan, Germany) (Figure 5). At the same time, though,

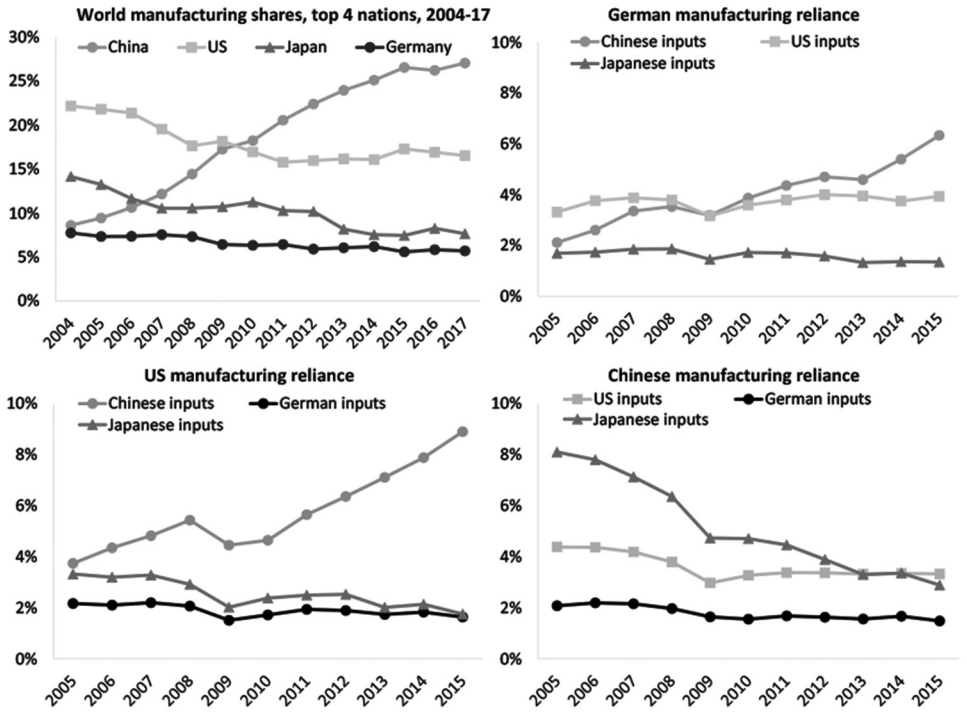

Figure 5. Total reliance of GVC hubs' manufacturing production on top manufacturing nations' inputs, and world manufacturing shares
Source: R. Baldwin and R. Freeman, Trade Conflict in the Age of Covid-19. *VoxEU.org*, 22 May 2020. https://voxeu.org/article/trade-conflict-age-covid-19 (reproduced with permission).

China's reliance on Japan, EU and US inputs is instead lower and decreasing. This is the result of the cogent asymmetry in the way the phases of production are distributed across countries: China takes care of the production of parts, components and inputs that are sold outside its borders comparatively more, while its reliance on foreign inputs is much lower.

What the pandemic has shown is that it may not be a wise strategy for a firm to put too many eggs in the same basket. Doing so may increase the effects of temporary shocks. For example, firms seem to be tempted to follow current trends to reshore production by increasing investments in automation, a trend that emerged in the US after the 2008 financial crisis (Baldwin 2019). Yet, it is not clear whether supply chain renationalisation will make national economies more or less resilient to pandemic-type shocks in the future.

Digging deeper into GVC trade patterns, a regional (intra-bloc) interdependence emerges. Particularly, this regards intermediate goods (Figure 6) that mostly have to do with intra-firm trade. Some areas are dominant in a specific sector, and most of their exports go to neighbouring countries. European and Central Asian countries (i.e. EU 27 and Russia), for example, exchange almost half of global trade in incomplete vehicles, while Eastern countries, with China in the lead, together manufacture more than two-thirds of electronic components. Moreover, in both cases, the greater part of the exports take place between neighbouring countries.

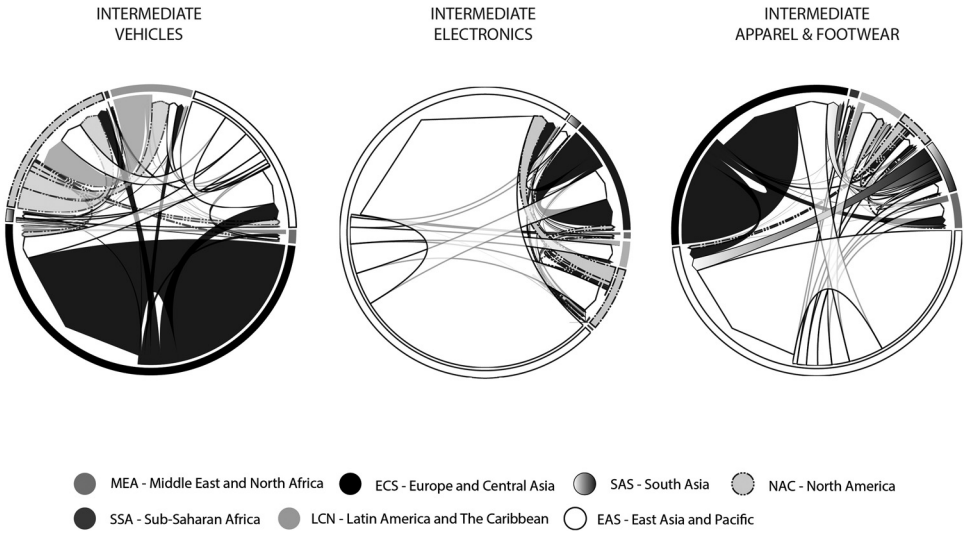

Figure 6. GVC: gross exports of intermediate goods by sectors and regions, 2018
Note: The chord diagrams show the connection in terms of gross exports between seven macro-regions. The outer part represents the source regions; the arcs that connect the regions are proportional to the gross exports value. The arcs start close to the outer border and are directed (the end is a stylised arrow) towards the destination of the flows. Since each region contains the bilateral flows within the relative countries, the arrows of the arcs also point to the source region. The country groupings are those proposed by the World Integrated Trade Solutions (WITS) of the World Bank (https://wits.worldbank.org/Default.aspx?lang=en). See the online Appendix for details.
Source: Authors' elaboration of World Integrated Trade Solutions (WITS) GVC Indicators.

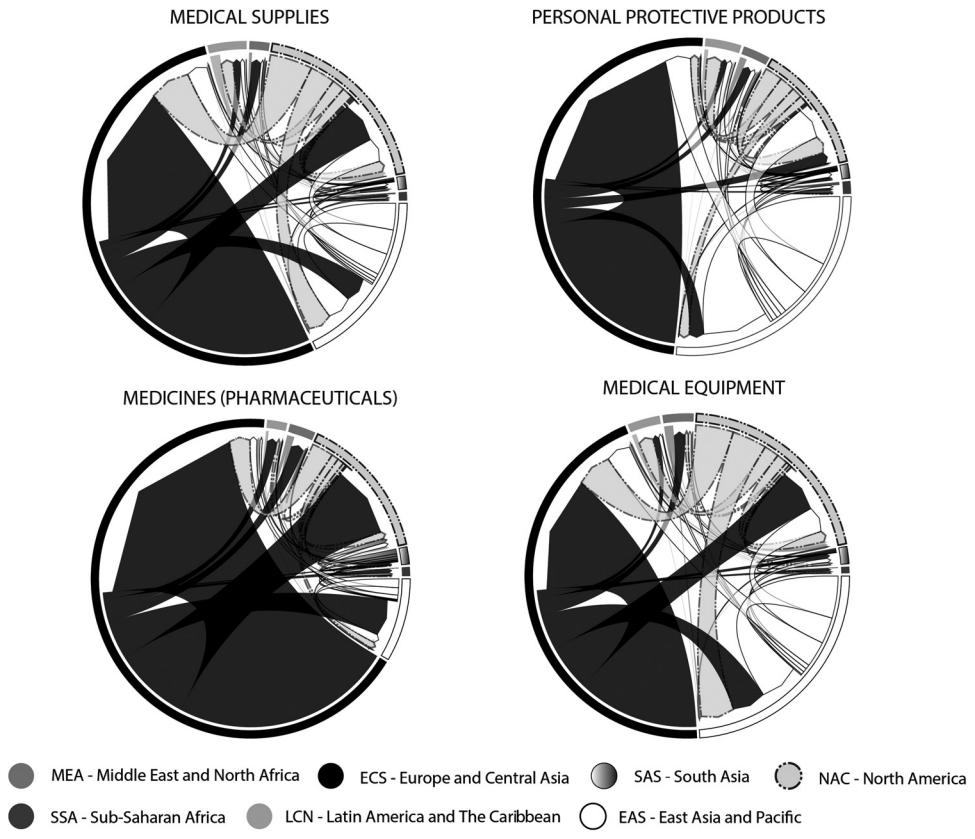

Figure 7. Gross exports of medical and related goods by region, 2018
Note: The chord diagrams show the connection in terms of gross exports between seven macro-regions. The outer part represents the source regions; the arcs that connect the regions are proportional to the gross exports value. The arcs start close to the outer border and are directed (the end is a stylised arrow) towards the destination of the flows. Since each region contains the bilateral flows within the relative countries, the arrows of the arcs also point to the source region. The country groupings are those proposed by the World Integrated Trade Solutions (WITS) of the World Bank (https://wits.worldbank.org/Default.aspx?lang=en). See the online Appendix for details.
Source: Authors' elaboration of World Integrated Trade Solutions (WITS) data, HS 2017 nomenclature, using WTO classification for grouping products.

Given the nature of the pandemic, it seems interesting to focus specifically on medical products. Global interdependence is relevant here too, although in this sector intraregional trade is dominant. Figure 7 reveals how intercountry trade within the same region involves a significant portion of commercial flows.

Compared to the GVC patterns in Figure 6, the dominant blocks for all the main markets are Europe and Central Asia, East Asia and the Pacific, and North America. For pharmaceutical products, trade between the EU 27 and neighbouring countries prevails. While East Asian countries occupy a prominent position in the manufacture of personal protection products, such as hand soap and masks, much of their production goes to Europe and North America. Equally, medical supplies and equipment produced in North America, one of the regions with a low level of internal trade, are purchased mainly by

Table 1. Top exporters of medical products to the US, Germany and China

Importer	Exporter	Import values (million USD) 2017	2018	2019	Average	Share (%)
United States	1. Ireland	25,973	29,070	28,750	27,931	17
	2. Germany	16,455	20,160	22,390	19,668	12
	3. Switzerland	13,162	15,560	17,163	15,295	9
	4. China	12,499	13,921	14,182	13,534	8
	5. Mexico	9,124	9,747	10,783	9,885	6
Germany	1. Netherlands	11,356	11,804	15,863	13,008	16
	2. United States	13,067	12,604	8,004	11,225	14
	3. Switzerland	10,016	11,329	7,987	9,777	12
	4. Ireland	4,471	5,236	4,764	4,824	6
	5. Belgium	3,291	3,335	7,207	4,611	6
China	1. Germany	9,582	9,792	11,918	10,430	20
	2. United States	8,685	10,483	10,259	9,809	19
	3. Japan	4,974	5,615	5,659	5,416	10
	4. France	2,894	2,864	3,338	3,032	6
	5. Italy	2,146	2,152	2,309	2,203	4

Source: World Trade Organization (WTO), Trade in Medical Goods in the Context of Tackling Covid-19. 3 April 2020: 4. https://www.wto.org/english/news_e/news20_e/rese_03apr20_e.pdf (reproduced with permission).

European and East Asian countries. Forty per cent of personal protection products (i.e. hand soap, other cleaning products, hand sanitisers, face masks, protective eyewear) are exported by China, Germany and the US (WTO 2020a). These countries are also major importers of medical products as a whole, and their main sources (see Table 1) are either from the same macro-region or spread worldwide. The regional dimension plays a significant role and could open up opportunities for other countries in the same region, giving them the potential to serve nearby economies while supplying their own needs from distant countries. Going back to Figure 1, the countries first affected by Covid-19, which account for 70 per cent of global manufacturing production, play the most important role here.

Global interdependence can also be measured from a different angle, considering how top traders are crucial partners of smaller countries. Just looking at consumer goods trade, as in Figure 8, the United States is one of the top partners of many 'small island and developing states'; and even if EU member states (Italy and Germany in the graph) trade mostly with neighbouring countries, they are also the top destination countries for products manufactured in emerging and small neighbouring economies.

The implications of such interconnections are easy to predict: a drop in GDP in the developed world will reverberate throughout neighbouring areas, undermining their economic stability. The domino effect that this crisis is likely to have on economies of all sizes can easily be underestimated by pivotal international players and, therefore, a coordinated response from both domestic and international institutions is required. On the other hand, should current events promote a deep restructuring of global supply chains (shortening chains takes time but can be achieved by business reshuffling), the links in the graph of Figure 8 associated to shorter geographical distances provide a glimpse of how GVC legs can be shortened with closer alternatives to East Asian production sites.

To sum up, interconnectivity at the global level is strong and complex, although the financial crisis has already shown how globalisation can grind to a halt and that the increase in global sourcing is not an endless process. Trade is both a magnifier of the consequences of the current pandemic and a driver of a faster recovery.

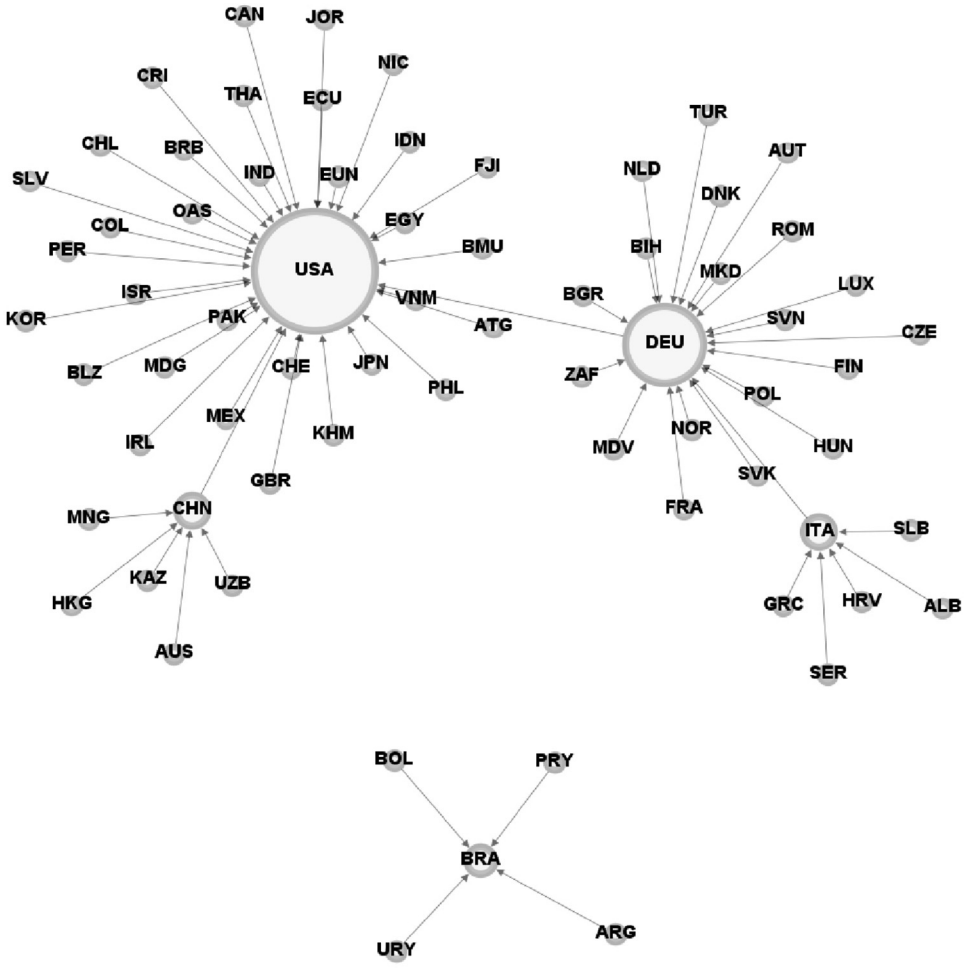

Figure 8. Network of consumer goods (max export flows, 2018) exporters to Brazil, China, Italy, Germany and the United States
Source: Authors' elaboration of UN-COMTRADE data accessed from World Integrated Trade Solutions (WITS), referring to H1-UNCTAD-SoP3 classification for consumer goods.

Why is today's crisis different?

The impact that the great lockdown seems to have had up to now is far more severe than the previous recession. IMF calculates that if, during the financial crisis, the share of countries with negative GDP growth rate was more than 60 per cent, it is now 90 per cent. Also, emerging economies have been seriously affected, whereas they maintained a positive growth trend during the previous financial crisis (see (b) in Figure 2). Moreover, India and China (see (c) in Figure 2), which recovered faster in 2009, are now facing more difficulties (IMF 2020; Gopinath 2020). Also the effect on trade is expected to be greater compared to 2008: the optimistic scenario of WTO forecasts a drop of 13 per cent in 2020 trade volume, while the worst-case scenario estimates a decrease of as much as 32 per cent (WTO 2020b) if recovery is not immediate.

The contraction in economic activity is the inevitable result of the first, drastic stay-at-home measures, which reflected both voluntary and coerced social distancing. Given the level of interconnectivity discussed above, economies that chose less stringent measures to contain the risk of contagion are also undergoing a severe worsening of their GDP. The unique features of this crisis, which are already evident, can be attributed to an unprecedented combination of domestic and external shocks:

- The level of uncertainty injected into the system, as it is linked to the evolution of the health emergency and the efforts to combat the virus, is unparalleled with respect to any previous event (Baker *et al.* 2020).
- The countries first affected by the spread of Covid-19 form the global manufacturing heartland (China, Germany, Italy, France and the US).
- A multi-channel feed mechanism; this is a joint supply and demand shock; furthermore, it is magnified by the presence of the complex mechanism of interconnections across countries illustrated above. Also nations initially less affected by the virus will eventually succumb because of their interconnections in the global market (Baldwin and Freeman 2020a).
- The supply-side impact at the national level, propagated with tremendous speed, has caused an unprecedented downturn in business activity. Welfare state and income support measures have been aimed at supporting household demand for basic goods. Measures targeting businesses have tried to respond to their credit demand in order to prevent immediate closure.
- Sequential patterns of contagion may be self-reinforcing in their economic impact (Baldwin and Freeman 2020a).
- For the first time since the Great Depression, advanced nations, emerging markets and developing economies are all entering a recession at the same time.

To sum up, the global pandemic we are experiencing has created an instant economic crisis, the likes of which we have not experienced since the 1930s, making the 2008 financial crisis look trivial. The financial and pandemic crisis are not only global but fused and interlinked, making the case for exceptional measures to handle them.

An exceptionally cooperative approach is needed

The crisis we are currently experiencing is both exceptional and global. Therefore, the response also has to be exceptional and strongly coordinated at the global level. At the moment, global actors are allocating substantial resources to mitigate major economic strains, but these are mainly for the people living within their borders. In the Euro area, the European Central Bank (ECB) has reacted with strong monetary policy and supervisory measures. Rules concerning European state subsidies and fiscal instruments have been suspended. Governments have started to implement various fiscal measures to contain the economic fallout (Anderson *et al.* 2020). The US, UK, Japan and Korea are following a similar path.[6]

[6]USD 1,940 billion in the US alone, GBP 105 billion in the UK for increasing public spending to purchase medical supplies, help SMEs and protect jobs. In April, Japan announced a package worth almost USD 1 trillion (Bremmer 2020). South Korea allocated 40 trillion Korean *won* (USD 32 billion) for industries mostly damaged by the pandemic as well as an additional job protection program worth 10 trillion (Choudhury 2020).

At this stage, plans promoting a global response are limited to research in an effort to combat the pandemic and decrease morbidity and mortality. They come from government collaboration and actions by international organisations.[7] The scientific coordination put in place is a direct reflection of the global nature of the pandemic. The World Health Organisation (WHO) itself, when declaring the Public Health Emergency of International Concern (PHEIC), recommended not to introduce "any travel or trade restrictions" (WHO 2020a). Limiting restrictions is a fundamental message on how states can respond to a pandemic in a coordinated way, yet, looking at the organisation of production, the world is already moving away from global economic integration. Nations are taking action to restrict cross-border trade since it seems natural that a government will first try to secure the goods that are fundamental for the health of its citizens. In this way, the protectionist argument is spreading and can easily be replicated for other products, precisely at a time when the gains from economic integration should be used in the fight against the pandemic. Trade policy ought to facilitate, not impede, national responses to the pandemic. The crisis presents an exceptional opportunity to learn about the potential and the limits of multilateral cooperation.

As clearly stated in a recent report by Richard Baldwin and Simon Evenett published in the CEPR Policy Portal, "turning inward won't work: it won't help here and now in the fight against the pandemic and it won't foster economic recovery" (Baldwin and Evenett 2020, 2). The WHO (2020b) already at the onset of the first wave of the pandemic estimated that the output of personal protective equipment (PPE) needs to increase by 40 per cent globally to equip medical staff with what they need to care for Covid-19 patients. The future of the epidemic will likely see a surge in the demand for essential medical products, as well as drugs and a future vaccine. Given the enormity of these numbers and the way production is distributed across the globe, international supply chains are critical in dealing with an event which is global by definition. The presence of delays in the spread of the disease could help in the fight against the pandemic if trade is not restricted. The fact that the Covid-19 pandemic hit different nations at different times implies that buyers can switch between suppliers and thereby reduce the risks of depending on any one of them. Having production localised in more than one place for several steps of the process, accessible to a large number of countries, will help to reduce the risk of depending on a concentrated, national or foreign, production site.

The wall of resistance to using global value chains as an asset for combatting the virus and speeding recovery is made up of several factors. In the last decade, trade policy discussions have already been affected by a populist anti-globalisation surge. Trade and skill-biased technological progress are blamed for the sweeping misfortunes of unskilled workers in developed countries. Restricting the movement of goods across borders is the easiest policy to tackle the issue, even if for over thirty years the Organisation for Economic Cooperation and Development (OECD) has been suggesting policies that equip workers across all sectors with the necessary knowledge to stay in a globalised market. International competition is a blessing for businesses that can innovate and then produce for foreign markets. Developed economies have seen huge increases in productivity in their manufacturing sectors as a result of the internationalisation of their firms.

Yet, since the financial crisis, the importance of global value chains in total trade has decreased. Trade is still growing, but at a lower rate with respect to the tremendous

[7]See UNESCO (2020) and UNCTAD (2020).

expansion in previous decades. There is no law that says that globalisation has to grow indefinitely. Future developments in technology are likely to reshore production hitherto located in foreign countries. The information technology revolution and the consequent increase in automation will play a major role in the new logistics of production networks (World Bank 2020), affecting trade costs (Antràs and de Gortari 2020). The pandemic is raising issues of either a return to the nationalisation of supply chains (US) or diversification of production sites (Europe) so as to ensure better security of supply and safe delivery. If changes in the geography of production are expected, the relocation of international supply could benefit less common investment destinations giving them the opportunity to expand their participation in global value chains. As suggested by Beata Javorcik (2020), many countries in Eastern Europe and the eastern and southern Mediterranean have a comparative advantage in products now exported to the EU by China. Therefore, there is a potential for re-designing GVCs in the direction of shortening their legs. They will have to make some effort to inform potential investors about business opportunities. Political leadership is what is needed in order to secure "real commitment to fair treatment, stable and transparent rules, and an investor-friendly attitude" (114).

Looking at the possibility of investing in automation, it is not clear whether supply-chain renationalisation will actually make national economies more resilient to pandemic-type shocks in the future. Early simulations of the pandemic-induced GDP change in a world with interconnections and in one where supply chains have adjusted to using only domestic inputs (Bonadio *et al.* 2020) show that nationalised supply chains would be comparatively more resilient only in those countries that implemented less stringent lockdown measures. Countries where lengthy closures have been enforced risk more serious effects on their GDPs if their production process is entirely domestic. Also, a radical renationalisation to reduce import dependency could potentially damage consumer choices in terms of quality and variety of goods and competitive prices. This could also have a detrimental impact on public health and for health systems in general when rapid responses to crises, such as the one we are facing, are required. Today, the R&D activities of production networks of medical supplies are mostly split between the EU and the US, while manufacturing is carried out in China and other developing, emerging and newly industrialised countries, such as Mexico, Singapore, Costa Rica, the Dominican Republic and Malaysia, making the numerous medical products needed in large-scale health programs available at reasonable prices (Stellinger *et al.* 2020). Export restrictions on these products, such as those witnessed in recent months, are a costly form of trade policy: they increase international prices and have important distributional implications between countries, affecting both importing and exporting countries. On the one hand, such restrictions benefit, at home, those countries which have a production capability that meets domestic demand; on the other, they impose upon the same countries the cost of not allocating their total production where needed abroad. Those costs have to be added to the costs faced by countries with insufficient production capacity.

The countries most vulnerable to the limiting of cross-border movement of goods are those without the manufacturing capacity to provide their populations with medical products: a good number of developing economies and most small and poor countries. Relying on their own production capacities simply implies limited access to life-saving resources. If the ethical aspects of not allowing poor economies to access necessary health treatments are

not enough, the self-interest argument may be more trenchant: failure to snuff out the virus in the Southern hemisphere increases the likelihood of further waves of infection in the North.

In order to face the risk of a backlash in the global trade system, justified by the unprecedented situation generated by Covid-19, some recommendations have been put in place. A first set concerns the global value chain producing medical supplies:

- A global mechanism, to which all countries depending on their level of development should contribute, has to be set up to tackle shortages of medical products. The mechanism should identify excess demand for products during the waves of the pandemic; organise what is needed to create a global reserve of products and medical personnel; finance production expansion and facilitate cross-border movements after defining regulatory standards (Evenett 2020).
- Business conversions and access to information on regulatory standards on medical products have to be supported, allowing firms to have access to information on applicable products and production standards, obtain rapid certification of prototypes and production facilities, and be able to source requisite inputs – including from foreign suppliers (Fiorini *et al.* 2020).
- There has to be a shift from rigid enforcement of national standards to a system of regulatory regimes that are more flexible in targeting the need for safe products in global production while maintaining the advantages of an efficient supply chain.

Turning to trade as a whole and GVCs, existing preferential trade agreements (PTAs) and deep trade agreements (DTAs) help to identify which countries (mainly non-members) are more likely to suffer from the introduction of tariffs, export restrictions, countervailing duties and regulatory protectionism as a national response to the pandemic. Developing countries tend to have relatively fewer substantive commitments in PTAs (even less in Deep Trade Agreements),[8] making them even more vulnerable to the effect of the new protectionism wave. Also, the design of the agreement is likely to matter: PTAs with provisions which include rules of origin not only for trade but also for investment can create more open regionalism (Mattoo *et al.* 2020). Notably, the first question we address in this article, that is, where and how GVCs will reorganise, depends on the existing PTAs which define the geography of business opportunities for firms controlling the production chain.

The last recommendation focuses on the workings of the World Trade Organisation (WTO), which should take a lesson from this emergency and try to boost the potential of plurilateral cooperation on technical regulations and related production processes. Trade monitoring is essential, now more than ever. If governments are restricting the movement of goods with the clear intention to secure goods within their borders, measures need to be made more transparent and visible. This enhances trust and enables countries to learn from one another, re-establishing collaboration. The trade impact of the pandemic should be studied considering that announcing rapidly evolving trade policy measures in near real-time is a challenge that has to be confronted, as Robert Wolfe (2020) proposes. It may finally be the right time for WTO reform, repeatedly called for in the last few years.

[8]The database https://www.designoftradeagreements.org is a fundamental tool for investigating the evolution of PTAs in recent decades and the strength of each agreement.

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