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THE EU'S COVID-19 POLICY RESPONSE AND THE RESTRUCTURING OF GLOBAL VALUE CHAINS

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PANDEMIC SUPPLY CHAIN VULNERABILITIES AND THE GEOGRAPHY OF GLOBAL VALUE CHAINS

The COVID pandemic has highlighted the interdependence which the expansion of global value chains (GVCs) has fostered across the world economy. The pandemic put huge pressure on healthcare systems, as they struggled with unprecedented demand for Personal Protective Equipment (PPE), medicines, testing kits and ventilators. Perceived fragilities in the supply of these key products fostered a growing debate about the wisdom of high levels of reliance on overseas sources and (desirable) policy responses.

Several commentators have voiced concern that COVID will result in a major fall in trade, as the world moves towards 'de-globalization' (Economist 2020; Irwin 2020). Others have highlighted the dangers of overreacting to the concerns fostered by the pandemic (Kobrin, 2020), suggesting that greater regionalization is likely (Enderwick and Buckley, 2020; Javorcik, 2020; Zhan, 2021), and/or that the actual extent of any de-globalization will be limited (Financial Times, 2020), or vary substantially by sector (Baker McKenzie, 2020; UNCTAD, 2020). In terms of trends in trade, analysis indicates that globalization peeked before the pandemic, in the wake of the Global Financial crisis (Antras, 2020; Linsi, 2021), thus the reduction in the intensity of global integration predated the pandemic.

Existing work on the likely impact of the pandemic on the geography of GVCs has mainly looked at the desirability of de-globalization and of policy measures to encourage it. Some scholars and politicians have argued that GVCs will inevitably have to re-shore to reduce risk and increase resilience and that countries should adopt policies to encourage this (Alon, 2020; Hellendoorn, 2020). Others hold that, on the contrary, re-nationalization of supply chains will reduce resilience, which rather requires policy measures supportive of GVCs (Anukoonwattaka and Mikic, 2020; Guinea and Forsthuber, 2020; Strange, 2020; OECD, 2020; Evenett and Baldwin, 2020). As earlier work on GVCs has shown, states and their trade policies play a key role in the structure and geography of GVCs (Curran, 2015; Horner, 2017). In-depth analysis of the interaction between policy responses and GVCs is therefore vital to understanding the relationship between Covid-19 and de-globalization.

Analysis of the actual impact on GVCs of short-term policy responses to the pandemic, including widespread restrictions on flows of goods and people, indicates that these measures have done more harm than good. Pandemic related protectionist measures often worsened supply chain crises (Gereffi 2020), especially for low-income countries, which are typically not well integrated into GVCs and lack the manufacturing capacity to provide their populations with medical products (Pinna and Lodi 2021). More generally, pandemic protectionism has undermined the global trade rules on which GVCs rely, creating a more unpredictable and uncertain business environment (Curran et al. 2021). Whether the result is de-globalisation and/or a restructuring of existing GVCs has remained an open question, as most of these analyses were conducted at the height of the pandemic, when policy responses were shifting constantly.

Although the pandemic is far from over – and Covid-19 may in fact be with us forever (Katzourakis, 2022) - public policy reactions have evolved from short term 'panic' measures to more long-term strategic responses, which include measures to support GVC resilience. This paper looks at this changing policy environment and aims to answer the following question: how likely is it that policy responses to COVID-19 will result in a major reduction in the geographical reach of GVCs? Our central argument is that, although there is no doubt that production patterns in certain sectors or

products are likely to be fostered (and reinforced) by the pandemic and the policy responses, widespread 'de-globalization' is not inevitable. Specifically, we suggest that the extent of any de-globalization will vary significantly across countries and industrial sectors, depending not only on public policy, but on variations in the governance of GVCs themselves. That is, some GVCs will certainly reduce in geographic scope, becoming more regional or even national, while others will continue to operate at a global scale. We expect more significant shifts to GVC structures in industries which are considered 'strategic'. However, even there, variations across individual GVCs mean that impacts will vary. In sectors where existing structures are governed by long-standing relationships, where the differences in production costs and/or factor endowments are significant and technological alternatives limited, the geography of GVCs is likely to remain relatively stable, at least in the medium term.

We will answer our research question and test the plausibility of our argument through an in-depth analysis of policy responses to the pandemic, especially those of the EU. The European Commission proposals for post-COVID recovery underlined '…*the need to reduce dependency and strengthen security of supply, notably for things like pharmaceutical ingredients or raw materials*' (CEC, 2020a). This policy shift is yet to be fully operationalized, but clearly one underlying aim is to increase EU independence in key sectors, with implications for the global geography of production. It comes on top of several EU policy actions related to long term sustainability concerns, especially the Carbon Border Adjustment Mechanism (CBAM) and the proposed legislation imposing due diligence (DD) in supply chains, as well as the proposition to develop tools – like the Anti-Coercion Instrument – to better defend European interests in the context of more 'assertive' trade policy (CEC, 2021). In addition, individual EU member states have also taken policy measures to protect their economies and reduce dependency.

Although these policy shifts have clear impacts on the costs and risks of EU companies dependent on GVCs, our aim, as indicated above, is to assess whether such policy measures are likely to actually lead to significant changes in the geography of GVCs. We do so by combining the analysis of empirical data on recent policy shifts in trade and EU industrial policy in response to the pandemic with GVC governance theory. That is, we firstly explore short term trade policy responses across the globe to put the EU's response in its wider context, before analysing the more specific measures taken by the EU and its member states. The data shows that although these interventions were extensive, they were focused on a few critical sectors. We then analyse long-term government support programs, especially in the EU. Although these have ambitious objectives, they often appear to be limited in scope. Finally, we leverage GVC theory to highlight the important differences in governance which exist across GVCs and underline how the resulting variations in supply chain flexibility have implications for the ability and willingness of firms in certain sectors to 'de-globalize' their production processes.

POLICY RESPONSES TO COVID-19 AND THEIR IMPLICATIONS FOR GVCs

As COVID-19 spread, the question of securing access to vital medical supplies quickly rose up the political agenda. Many affected countries responded to shortages with export restrictions or even bans on trade in key medical supplies. For example, both the EU and China made exports of PPE subject to prior approval, while the UK banned the export of 80 drugs. As vaccines started to emerge at the end of 2020, they became a further source of conflict, with several governments enacting direct and indirect restrictions on their trade. Government also introduced fiscal measures to protect their economies and, subsequently, policies to foster post-COVID economic recovery. In this section we explore these policies and discuss the threat they pose to GVCs.

Short- and long-term pandemic policy responses

To explore policy interventions, we extracted data from a database of trade policy responses to COVID complied by the International Trade Centre (ITC) in the midst of the first wave (in May 2020), the second wave (in November 2020) and after the third wave and the emergence of vaccines (June 2021).

We differentiated measures by the type of goods targeted (medical goods, food and 'other) and the nature of the measure (whether applied to exports or imports and whether it involved banning trade). A summary of the findings is presented in Table 1. Initial trade restrictions during the first wave were widespread, but mainly affected exports and focused on medicines, although restrictions on food were also important, especially in developing countries. A substantial number of measures involved banning trade, including imports of 'other' products like used clothing and cement, whose link to COVID-19 was tangential. Such major trade restrictions are rare, and, as highlighted by Curran et al. (2021), difficult to justify under WTO rules. In addition, restrictions persisted over time. Even in February 2022, two years after the pandemic started and over a year after the vaccine rollout began, 98 countries were still applying 'temporary' export restrictions/bans on a variety of goods[i]. Such widespread recourse to persistent measures of dubious legality further fragilizes the global trading system (Weiss, this volume).

Table 1 - COVID trade restrictions by type over time						
	Type of good			*Type of measure*		
	Medical	Food	Other	Exports	Imports	Bans
May 2020	83	27	10	107	15	82
November 2020	75	17	19	84	30	71
June 2021	77	17	19	83	30	70

Source – Authors calculations based on ITC COVID trade measures database

In addition to these trade policy measures, governments intervened heavily to protect their economies. COVID fiscal interventions were documented by Bruegel, an EU think tank in a dataset available on their website[ii]. Fiscal support in 2020 in response to COVID-19 was significant – ranging from 6.4% of GDP in Greece to 48.7% in Italy. However, much of this funding was focused on shoring up the hardest hit parts of the economy and supporting workers who were furloughed. Policies aimed at re-shoring production and reducing dependence on global sources has not been widespread.

The most notable intervention was in France where, as part of its Revival Plan (*Plan de Relance*) to reboot the economy, the French government announced plans in 2020 to spend €600m on a specific program for 're-shoring'[iii] strategic supplies. The government considered that COVID-19 highlighted the fragility of GVCs and called for *'…the building, or rebuilding, of certain strategic industries in the territory.'* (French Government, 2020: 139. Own translation). Public support covers a maximum of 50% of the costs of reshoring and is generally capped at €800k per enterprise (Ministère Chargé de l'Industrie and BpiFrance, 2020). By the end of 2021, €731m had been awarded to 441 reshoring projects through this and related regimes[iv], while €530m had been awarded to 48 projects to create production facilities for products linked to the pandemic.

In line with these interventions, France has emerged as a key standard bearer within the Union for increased autonomy. President Macron explained it as *a matter of conceiving the terms of European sovereignty and strategic autonomy, so that we can have our own say and not become the vassal of this or that power*' (GEG, 2020). Other EU member states have been less explicit on their preferences for the future geography of GVCs. The German post-COVID revival strategy does not refer specifically to reshoring, although it does include support for greater energy security through increased national hydrogen production capacities, the development of AI 'made in Europe' and the assurance of 'digital sovereignty' (Bundes Finanzministerium, 2020).

As governments shifted their focus from short term protection of their economies and populations to the long-term challenges of reconstructing their economies, they began to develop more extensive plans for the post-COVID recovery. The EU has provided an unprecedented level of support for this process, especially under the Recovery and Resilience Facility (RRF), which will provide grants of up to €312.5 billion and loans of €360 billion. Bruegel has developed a database detailing the national

plans to use this funding, classifying them by policy objective[v]. Overall, the EU26 (in June 2022 the Netherlands had not yet submitted their plans) proposed to spend over 46% of these funds on 'green' objectives and nearly 32% on digital rollout and skills.

To explore the extent to which reshoring projects were important to the members states' post COVID recovery, we analysed the Bruegel data and looked specifically at projects classified as related to the pillar 5 of the RRF regulation: '*Health, and economic, social and institutional resilience, with the aim of, inter alia, increasing crisis preparedness and crisis response capacity*.' EU member states are proposing to use €50 bn in grants for this objective, covering 212 projects. Most were related to upgrading medical infrastructure, crisis management infrastructure, investments in public services and digitization. We only identified one project to support reshoring. This was a €300m Polish project on '*Development of the potential of the pharmaceuticals and medical devices sector – investments related to production in Poland*.' Overall, this data indicates that EU governments are not prioritizing restructuring production in their plans for post-pandemic resilience. There is thus no evidence that debates in the EU have (yet) led to major distortionary financial aid programs for re-shoring. At least not in relation to the use of EU funds.

Of course, this situation may change in response to broader geo-political shifts, especially the invasion of Ukraine and the actions of other world powers. Developments in the US will be particularly important, as the EU seeks to develop a common transatlantic approach to global challenges (Kerremans, this volume). President Biden placed supply chain vulnerabilities alongside trade, taxes and immigration as key planks of his strategy for 'managing' globalization (Gertz 2020). His Executive order on 'America's Supply Chains' calls for more resilient supply chains : '*…facilitating greater domestic production, a range of supply, built-in redundancies, adequate stockpiles, safe and secure digital networks, and a world-class American manufacturing base and workforce…'* (White House, 2021). The CHIPS Act, signed in August 2022, foresees $52bn to support US semiconductor production and includes a requirement that recipients should not expand manufacturing in China *'..or in other countries of concern*.'[vi] China has strongly criticized the program which it considers to be WTO-incompatible (Bloomberg, 2022). In this rapidly evolving and increasingly interventionist context, the EU may feel compelled to intervene more strongly and indeed has recently proposed its own €43 bn 'Chips Act' package (CEC, 2022).

The Long-term Impact of COVID-19 Policy Measures on GVCs

The short- and long-term policy responses discussed above could be considered a threat to the future of GVCs. Restricting exports in PPE and supporting the emergence of more 'resilient' and self-sufficient supply chains may herald a turn towards 'de-globalization'. However, the EU insists it remains committed to a balanced approach. The Commissioner for Trade indicated that 'Open Strategic Autonomy' *'...means reaffirming our commitment to free and fair trade, and taking a tougher, more assertive approach to protect our businesses and consumers…*' (Dombrovskis, 2020). The need for balance was further underlined in a joint French-German non-paper on industrial policy: '*While rejecting protectionism, we must adapt to new developments and address our vulnerabilities where warranted in a WTO-compatible way…'.* (FMEAE, 2021a). Although achieving this will be difficult, openness is still prioritized, while several member states have been at pains to underline that any post-crisis measures should be proportionate and: *'…avoid even the perception of protectionism'* (Council of the European Union, 2020).

In addition, the EU has strict rules on state aid. While exceptional emergency support to tide over businesses forced to close during the worst of the crisis was widespread, aid to develop specific sectors in the rebuilding phase will fall within the existing state aid rules (CEC, 2020b). In addition, WTO members are restricted by the Agreement on Subsidies and Countervailing Measures (SCM). Article 3 of this agreement prohibits: '*subsidies contingent, whether solely or as one of several other conditions, upon the use of domestic over imported goods.'* There are flexibilities within the agreement, which includes a list of non-actionable subsidies in areas like R&D and environmental protection

(Sekine, 2020). These limitations have not stopped subsidies, which have rather tended to increase in recent years (Horlick and Clarke, 2010: 859) and, as indicated above, the recent US Chips Act seems to contradict these requirements.

Notwithstanding the persistent existence of exceptional support measures globally, WTO members have not hesitated to challenge policies which threaten their interests. Commitments under the SCM agreement have been the basis for many disputes at the WTO, including the long running case between the EU and the US on their support for Airbus and Boeing respectively[vii]. Widespread subsidisation of the re-shoring of production would clearly be counter to WTO commitments and would expose any member who chooses to pursue such a strategy to a challenge from trade partners. In the case of a large market like Japan, the US or the EU, one could imagine that several would be motivated and willing to mount such a challenge. In addition, expanding the role of the state in their own economies sits uneasily with the Western powers frequently expressed concern about the distortive effect on global trade of government subsidies and state-owned enterprises (SOEs) in emerging countries, especially China (McDonagh and Draper, 2020). Although the WTO dispute settlement system is currently blocked, the EU is committed to continued respect of its rules, while simultaneously seeking to strengthen the institution and address trade distorting subsidies and SOEs within this context (CEC, 2021). Balancing defence of core trade rules with the need to protect key strategic industries will certainly be a challenge in the post-Covid context.

THE MODERATING EFFECT OF GVC GOVERNANCE

As indicated in the introduction, our core focus in this paper is to explore whether the various political efforts described above to restructure and reorient GVCs in response to COVID-19 will indeed result in major shifts in their geography. The existing literature tends to focus on the question of which sectors and chains are 'strategic', while little research has explored any intrinsic differences across these chains (Baker McKenzie, 2020; CEC, 2020a; Government of France, 2020). This is curious, as such variations can have important impacts on the extent to which policy shifts by concerned governments actually change company behaviour in the desired direction. Several authors have pointed out that GVC governance will affect how COVID policy interventions impact on supply chains (Miroudot, 2020; Strange, 2020; Curran and Eckhardt, 2021; Gereffi et al, 2021), yet there has been little detailed exploration of these interactions. In this section we draw on GVC governance theory to elucidate the question of how the impact of post-pandemic policy interventions may vary across sectors.

Differences in the way that GVCs are governed relate to variations in power asymmetry and degrees of coordination. These differences will make some types of chains more resistant to post-pandemic policy efforts to reduce their geographic scope than others. Gereffi, Hyun-Chin and Lee (2021) have recently underlined how firm-level strategic responses to trade policy measures which seek to impact on GVC configurations can result in consequences that are unintended and sometimes undesirable (at least from the policy makers point of view). Depending on the governance of their GVCs, firms can react to new policy measures by changing supply and demand locations; switching supply-chain partners; and/or upgrading value chain activities. Their chosen combination of strategic responses dictates how new policy measures actually change the geography of GVCs. Better understanding of these difference governance structures is therefore vital to informing the development of policy measures that seek to impact on these geographies.

In their seminal paper, Gereffi, Humphrey and Sturgeon (2005) identified five types of GVC governance – market, modular, relational, captive and hierarchy. These categorisations were based on differences in the complexity of transactions, the ability to codify them and the capabilities of the supplier base. Ponte and Sturgeon (2014: 204) built on these conceptualisations to further develop the theory behind variations in GVC governance, highlighting, in particular, differences in the level of coordination required, tolerance of distance and supplier switching costs. Figure 1 recalls these

variations. In the context of policy interventions seeking to 'reshore' or otherwise reshape GVCs, the latter factor of the cost of switching between suppliers is vital to understanding impact.

GVC Type	Need for coordination	Tolerance of distance	Supplier switching costs
Market	Low	High	Low
Modular			
Relational			
Captive			
Hierarchy	High	Low	High

Figure 1 – GVC Governance characterises (adapted from Ponte and Sturgeon, 2014: 204)

The emerging policy responses discussed above indicate that several sectors are likely to be affected by concerns about resilience and over-dependence on foreign sources. Healthcare is obviously one, however a far wider range of sectors has been discussed. The priority sectors in the French revival program are health supplies; critical intermediate products; electronics; agro-food and telecoms (French Government, 2020). The aforementioned joint French-German initiative refers to the launch of three major pan-European projects, so called Important Projects of Common European Interest (IPCEIs), in hydrogen, cloud computing and microelectronics (FMEAE, 2021b). Although there is the potential for government action to influence the structure and reach of a wide range of GVCs, in practice the most likely sectors are agro-food, health, electronics and digital technologies more broadly.

In the rest of this section, we briefly seek to leverage the insights from GVC theory recalled above to highlight some key differences across these 'strategic' sectors. In this short paper it would be impossible to undertake an analysis of all potentially affected sectors. In addition, recent research focused on healthcare GVCs in the pandemic has already highlighted the extensive variation across different sub-sectors in that industry (Gereffi et al, 2022; Ryan et al. 2022). Here we will therefore focus on two other GVCs likely to be prioritised for policy action post-Covid: agro-food and electronics. Our objective is not to provide an exhaustive analysis, but rather to illustrate our key point that there are wide variations in governance both across and within GVCs, such that they may react to policy stimuli in quite different (and unintended) ways.

Agro-food GVCs are often *market*-based, with exchanges primarily based on price. Actors can be geographically far distant and the cost of switching between suppliers is often low for the lead firm (Gereffi et al, 2005). It is this latter factor which means that public policy interventions can relatively easily impact on linkages in an ideal type 'market based GVC', by making international trade more expensive (tariffs), or supporting local production to make it more competitive (subsidies). However, the need to secure certain minimum quality and production standards has meant that many agro-food GVCs now more closely resemble *captive* value chains, where suppliers are captive to much larger lead firms. Control is exercised through intensive monitoring, leveraging codes of conduct and/or certification systems. Although, in theory, many alternative suppliers may exist, in practice the need for certification means that switching costs may be high for lead firms.

Furthermore, many such captive GVCs have evolved in recent years to more *relational* structures, based on strong relationships between business partners creating *'…mutual dependence and high levels of asset specificity*.' (Gereffi et al. 2005: 84). Here suppliers take increasing responsibility for a wider range of tasks, like packaging and quality control in the case of fresh vegetables (Dolan and Humphreys, 2000). Although such 'upgrading' of capacities and responsibilities within the chain does not insulate producers from potential substitution with cheaper or more proximate sources, these GVCs are nevertheless much more relational in their operations than the market-based exchanges historically found in basic commodities (Dolan and Humphries, 2000). Thus, switching suppliers in agro-food GVCs often requires that the substitute producer can provide the quality, price and added-value tasks

demanded by the lead firm, as well as the assurance that labor and environmental standards have been respected along the value chain. Breaking these relational and captive linkages in response to policy interventions may not be straightforward.

Finally, the structure of GVCs in this sector varies widely, as was underlined in analysis of the impacts of the pandemic on the pork, turkey and eggs GVCs in the US. How the pandemic impacted varied widely depending not only on the governance of the sector, but also its market structure, especially the extent to which markets were highly differentiated between the hospitality sector and supermarkets (Hayes et al. 2021). It is therefore clear that public policy interventions in agro-food will 'land' in a GVC context where governance varies widely across foodstuffs, such that the outcomes of generic policies will be heterogeneous.

In contrast to agro-food, the electronics GVC is a classic *modular* value chain, based on a division of labour enabled by the exchange of codified specifications. Such codification enables the lead firm to clearly define their requirements, while ensuring that it is their suppliers who invest in machinery and materials (Gereffi, et al, 2005). The extent to which lead firms can easily shift between suppliers depends on whether alternative producers can manufacture to these codified specifications. Thus, although increasing the costs of trade and/or supporting local industry may have an impact on such GVCs, supplier shifting would not be automatic, as much depends on the flexibility of production structures within the sector and even the individual supply chain.

In addition, as many governments have recently realised, the capital requirements for electronics manufacture are very high and lead times for creating capacity are long. This is precisely why many Western companies chose to outsource production in the first place. In effect, initiatives like the US Chips Act are seeking to encourage these companies to replace modular chains with *hierarchical* GVCs characterized by vertical integration within the firm. Given these involve high levels of sunk capital, they are the most inflexible type of GVC. Balancing flexibility with security of supply will be a key issue for companies in this sector. Although government support will certainly affect the calculation, supply chain difficulties related to the pandemic resulted from a complex series of factors, only some of which are related to geography (Ramani et al. 2022), while an in-depth study of the likely impact of Japanese government subsidies highlighted that there are several market and technological barriers to reshoring production, regardless of public support (Kamakura, 2022).

Finally, the electronics GVC has a long history of government intervention which did not always produce the desired results, as lead firms shifted between production locations and GVC structures in reaction to various efforts to discourage sourcing in certain countries (Gereffi et al. 2021). Indeed, although recent US-China trade frictions may have encouraged moves away from China, these are not necessarily towards the US (op.cit), just as post-pandemic diversification from China may not imply reshoring (Linsi, 2021). Policy makers would do well to draw inspiration from past experiences.

TRADE, INDUSTRIAL POLICY AND GVCs POST-COVID

In this closing section we will seek to highlight the key factors that emerge from this analysis and lead us to conclude that the supposed shift towards more local or regional value chains post COVID-19 may be exaggerated. Firstly, although the imposition of widespread export restrictions in reaction to COVID-19 was concerning and a relatively small number of WTO incompatible measures remain in place, most restrictions were in conformity with WTO rules (Curran et al. 2021). The risks of blockages in vaccine trade were real, but high levels of mutual interdependency along the vaccine GVC seem to have discouraged governments from using the 'nuclear option' of outright bans (Evenett et al. 2021). Overall, despite major tensions, the global trading system continues to function and the Biden administration has tended to privilege WTO reform over blockage (Evenett and Baldwin, 2020).

Secondly, although the weaknesses which COVID-19 exposed have fostered new concerns amongst governments about securing supply chain resilience, policy responses have mainly affected certain

priority sectors. Although public policy can, and does, impact on strategic decision making by increasing the costs of imports, blocking exports and subsidizing local production, government budgets are under pressure and there are legal limitations on trade-distorting interventions. Informed choices on target sectors, the medium and long-term effect of public policy interventions on trade and GVCs and the avoidance of unintended consequences, will be key issues for policy makers and academic analysts going forward.

Thirdly, as we have highlighted above, policy interventions will be confronted with the reality of highly variable GVC linkages on the ground. In certain types of GVC, notably those characterized by limited relational and financial interlinkages, shifting between suppliers may be relatively straightforward. However, in others, including many which have been identified as 'strategic' in the post-pandemic context, reconfiguring production networks to reduce foreign inputs would be both highly disruptive and potentially counter-productive. Of course, much depends on the public policy response, as GVC actors can react in quite a varied manner to different types of interventions (Gereffi et al, 2021). Trade bans are extreme measures which have major impacts, forcing the hands of companies, whereas increases in tariffs and domestic subsidies change relative competitiveness, but may either not result in major shifts, or encourage shifts in unintended directions.

Finally, there are strong and persistent arguments against knee-jerk reactions to 're-shore' production. The OECD has published an analysis of the costs and risks of a return to a more 'localized' regime, which highlights that both are substantial (OECD, 2020). They argue that the retrenchment of GVCs into more local structures will not only substantially increase costs, but also risks, heightening, rather than reducing, vulnerability. This is because local production structures create fewer opportunities to adjust to shocks, whether external or domestic, a point also underlined by Anukoonwattaka and Mikic (2020). In a note for the French Council for Economic Analysis Jaravela and Méjean (2021) also highlighted the importance of a carefully targeted approach to intervention. Out of the 10,000 products traded internationally, they identify 122 products where France may be vulnerable and propose to focus analyses on these.

In-depth analysis also informs our understanding of the fragilities exposed by the pandemic and indicates that GVC dependence was not the main reason for shortages of supply of key products (Evenett, 2021; Gereffi, 2020; Ramani et al. 2022). In the case of the EU, much of this trade is not with far away Asian suppliers, but within the region (Guinea and Forsthuber, 2020; Reshef and Santoni, 2020). Similarly, in healthcare, concerns were expressed about the concentration of production of active pharmaceutical ingredients (APIs) in a few countries (notably China and India), yet as Norberg (2021) recently pointed out, over a quarter of global production facilities for API are in the EU, with a similar share in the US. As a result, over 70% of the EU's imports of API are from *within* Europe. Thus, in many contexts, concern about over-dependence on far away sources is misplaced.

Another key argument against widespread re-shoring, particularly pertinent in the context of achieving the Sustainable Development Goals, is the potential negative impacts of such a shift on developing countries embedded in GVCs, especially Least Developed Countries (LDCs). COVID-19 disruption hit LDCs hard, as demand collapsed for key consumer goods, supply chains seized up and medical goods became hard to access (Anukoonwattaka and Mikic, 2020; Pinna and Lodi, 2021; Pananond et al. 2020). While diversification out of China may bring opportunities for some larger developing countries, many smaller ones risk losing a key source of employment and upgrading (Anukoonwattaka and Mikic, 2020). In a context where global inequality is already rising significantly as a result of the pandemic, the negative effects on the world's poorest countries of Western efforts to 'nudge' or 'push' production home cannot be ignored.

CONCLUSION

In the post-COVID context, the international trading system is fragilized and will take some time to recover, while governments are paying increased attention to the supply chains of a wider range of 'strategic' goods and in several cases, stand ready to intervene, or have already done so. Against this background, it would be surprising if trade and globalization continued to expand in the post-COVID context and indeed we don't expect this to be so. However, in this paper we have argued that, in spite of these rising pressures, many GVCs will continue to operate across the global economy. This is likely to be especially so in sectors where existing GVC structures are governed by long standing and enduring relationships, either within or between companies, and where cost differentials or differences in factor endowments are extensive and technological alternatives limited. Some GVCs, where policy imperatives are strong and/or duplication of production structures feasible, may restructure on a national basis. High tech and medical products seem the most likely targets for intensive policy intervention (Baker McKenzie, 2020; CEC, 2020a; Government of France, 2020), while chemicals have also been highlighted as a sector with important vulnerabilities (Jaravela and Méjean, 2021).

Overall, there will probably be an acceleration of the trend towards restructuring in GVCs in contexts where lead firms were already adapting their strategies for a variety of business reasons – rising costs in emerging markets, increasing sustainability requirements, the rise of digital platform and the availability of the type of new technologies encapsulated in Industry 4.0 (BofA, 2020; De Backer and Flaig, 2017; Evenett, 2021; Zhan, 2021). However, the global impact of such shifts, combined with the policy responses to COVID-19, seem likely to be a modest, if steady, retrenchment. Much depends on how key world powers, especially China, react to current tensions as well as the long-term impacts of the war in Ukraine. In relation to the former, if the recent aggressive turn in Chinese diplomacy presages a more isolationist turn (Martin, 2021), restructuring may accelerate.

Finally, there are many good reasons why MNEs have chosen to participate in GVCs in the first place and they have invested substantial sunk costs in existing structures (Linsi, 2021; Strange, 2020). As Jaravel and Méjean (2021) point out, the annual consumer gains from GVCs have been extensive, with one estimate putting them at €1000 per household in France. Although the pandemic has highlighted the importance of previously underrated factors like resilience and diversification of risk, it does not completely change the economics. Differential cost structures, government policy and the specific governance of each individual GVC will all impact on the extent to which these chains become less global and more regional, or local. While some lead firms will see the wisdom of strategies which reduce the geographic reach of their GVCs, others will consider their sunk costs and the risks associated with change and choose to largely retain their existing structures. Whatever strategies firms chose will have potentially major impacts on developing countries dependent on GVCs (Anukoonwattaka and Mikic, 2020; Pananond et al, 2020). Policy makers need to be mindful of all these factors and the interactions between them when seeking to nudge (or push) lead firms towards certain geographies of production.

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[i] https://www.macmap.org/covid19
[ii] https://www.bruegel.org/publications/datasets/covid-national-dataset
[iii] The term used is 'relocalisation' which is the opposite of 'delocalisation', the French term for offshoring.
[iv] https://datavision.economie.gouv.fr/relance-industrie?slide=21797110
[v] https://www.bruegel.org/dataset/european-union-countries-recovery-and-resilience-plans
[vi] https://www.commerce.senate.gov/2022/8/view-the-chips-legislation
[vii] DS316 on Airbus and DS353 on Boeing

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