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Rising trade protectionism during the COVID pandemic and its impact on GVCs

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1. Introduction

The objective of this paper is to explore different facets of rising trade protectionism during the pandemic and how this is likely to impact the evolution of GVCs, especially in Europe. When the pandemic hit in early 2020, its global reach and the highly infectious nature of the COVID-19 virus quickly resulted in soaring demand for certain products, while widespread lockdowns reduced both supply and demand for many goods. Faced with shortages governments quickly responded with a raft of trade policy measures including both trade bans and export restrictions on the one hand and trade facilitation and tariff reductions on the other (Curran et al., 2021; Evenett et al., 2022). As the pandemic advanced, new technologies – especially testing kits and vaccines - to help to manage it emerged. They in turn became subject to trade policy interventions, further complicating the geo-political and economic landscape (Bown, 2022; Bown & Bollyky, 2022; Vo & Le, 2022).

Concerns about the security of supply of key pandemic products led to increased policy rhetoric on the risks of relying on Global Value Chains (GVCs) and the need for 'autonomy', 'self-reliance' and 'resilience' including in the US (Lighthizer, 2020) and Europe (Jacobs et al., 2023; Macron, 2023). In spite of extensive debate on whether reconfiguring GVCs would actually deliver greater resilience (Gereffi et al., 2022; Jean & Vicard, 2020; Miroudot, 2020; OECD, 2020a), many governments began to develop new policy interventions aimed at supporting the development of national or regional value chains in key products.

The intensive government support for the establishment and expansion of vaccine manufacturing capacity through programmes like Operation Warp Speed in the US became a precursor to a much more widespread embrace of industrial policy, with inevitable impacts on production structures and trade (Bown & Bollyky, 2022; Luo & Van Assche, 2023). Although these interventions are not 'trade policy' as such, the subsidization of local production capacity with the express intention of reducing trade, especially when support is dependent on the nationality of the manufacturer, can also be seen as 'trade protectionism'. Indeed, one of the key databases we explore in this paper – the Global Trade Alert – takes this wider approach to defining and recording measures which are aimed at restricting trade.

Although there is extensive research on GVCs and their evolution, much of this scholarship has focused on the firm level – seeking to understand the nature of inter-firm relationships and governance and the impact on upgrading (Gereffi, 1994; Ponte & Sturgeon, 2014). We know far less about the role of the state in GVCs and how such production structures might react to government interventions which consciously seek

to reshape them. Recently, Horner (2017) and Horner and Alford (2019) have deconstructed the varied manner in which government actions impact on GVC structures. Scholars have built on this differentiation to better understand how state actions during the pandemic have impacted both the geography and the resilience of GVCs. During the COVID crisis governments' direct role, as both producer and buyer, was undoubtedly very important. This has been explored by several authors, whose work we build on here (Dallas et al., 2021; Gereffi, 2020; Gereffi et al., 2022). However, the indirect role of the state and the manner in which its facilitation and regulation helps to structure the geography of production has been relatively little explored, both in GVC analyses more generally (Curran et al., 2019) and in relation to the pandemic in particular.

In this report we leverage new databases to explore specifically the manner in which states mobilised their role as regulator and facilitator during the COVID pandemic - through novel policy interventions with direct and indirect effects on trade. In terms of the regulatory state, we focus on trade policy interventions, especially in personal protective equipment (PPE) and explore how the GVC targeted reacted to these regulatory shifts. In terms of the facilitatory state, we focus our analysis on a set of projects subsidized under a French program to support reshoring. By exploring how public policy interventions seek to impact on GVCs, we contribute to this evolving literature on the role of the state in seeking to (re)structure GVCs and expand understanding of these interactions.

Better understanding of these roles is particularly important in the current context, when states are taking a more active role in the economy in many key markets. Regulatory interventions, including trade restrictions have continued to increase in the light of geo-political tensions and technological rivalry (GTA, 2023), while 'facilitatory' policies involving huge subsidies to key priority industries, like semiconductors and electric vehicles, have expanded rapidly globally, including in the US (Luo & Van Assche, 2023) and the EU (Ragonnaud, 2023). As the world enters a period of increasingly active industrial policy, better understanding the nature and potential impacts of these policies is vital.

2. Literature review

A key emerging vector of research in the GVC tradition is the question of how the state impacts on GVC structures and geography? This question had attracted surprisingly little attention in the literature. Although Gereffi's early work was focused on a sector – textiles – where government-imposed trade quotas were hugely influential in shifting the geography of production (Gereffi, 1994, 1999), much of the follow up work focused

on firms, especially in relation to their governance and upgrading (Horner, 2017). The State is peripheral to the inter-firm linkages at the heart of influential models of GVC governance. One recent influential conception only refers to 'regulatory factors' within a group of 'other macro-level determinants' (Ponte & Sturgeon, 2014: 214).

Recent work by Horner (2017) and Horner & Alford (2019) have distinguished between the state's direct role as producer (through state-owned enterprises) and buyer (through public procurement) and their indirect role as regulator (for example, through trade restrictions) and facilitator (for example, through subsidies). Scholars have built on this differentiation to better understand how the COVID pandemic and government responses to it has impacted on both the geography and the resilience of GVCs.

During the COVID crisis, governments' direct role, as both producer and buyer, was undoubtedly vital and has been explored by several authors (Dallas et al., 2021; Gereffi, 2020; Gereffi et al., 2022). In one of the first such papers, Gereffi (2020) focused on the US-oriented face mask GVC as the initial pandemic hit and highlighted that misalignment between government priorities and those of the industry led to costly disruptions. He concludes '…the US shortage of facemasks was more a policy failure than a market failure.' (op.cit: 287).

Dallas et al., (2021) explored how seven key medical GVCs reacted to state policy interventions at the height of the pandemic. They found wide variations in the capacity to adapt to the crisis across the products they explored. Their work highlights that there are important constraints on government intervention linked to two structural characteristics of GVCs – the geographic distribution of production and the technological attributes of the product. Although their work incorporates the impact of trade policy interventions at GVC level, empirically it mainly focused on analysing trade flows and unit prices.

Exploring how government intervention impacted on four key medical goods (rubber gloves, face masks, ventilators and vaccines) Gereffi et al., (2022) highlight the importance of variations across GVCs. Specifically, certain governance structures required different combinations of action at firm, industry and country level to support resilience. They note the need to take individual GVC structures into account and particularly that: '*…when state interventions interfered with the normal functioning of a value chain… resilience can be undermined by the ensuing bottlenecks and disruptions.*' (op.cit: 64).

The structure and governance of GVCs has important implications for its flexibility (Ponte & Sturgeon, 2014), thus before exploring the trade responses to the policy actions discussed above, it is important to understand the peculiarity of the PPE GVC. Given the high profile of these products during the pandemic, several prior analyses

inform our analysis. The OECD provides a useful description of the production process for face masks, highlighting its relative sophistication (OECD, 2020b). Although some stages are relatively basic and easy for a standard clothing factory to perform, others are quite technical and require specialized machines. Their analysis underlines that the main bottleneck in the GVC is the availability of 'melt-blown' medical grade polypropylene.

Analysis by the World Bank explored the structure of the industry highlighting how it continues to be dominated by developed country lead firms, like Honeywell and 3M in the US, as well as how the high standards required of medical quality PPE resulted in more limited outsourcing than other labour-intensive goods (Bamber et al., 2020). There are variations in GVCs across the sub-sector especially between medical grade masks (N95) and those more widely used by the public. Overall, production is geographically dispersed, as lead firms have not focused it within their home countries. Indeed, the number of PPE producers increased over the two decades prior to the pandemic, as many non-traditional suppliers in developing countries entered the GVC. In spite of this expansion, the core actors remain highly interdependent. It will become clear from our analysis below that exports of intermediate goods and final products largely come from the same countries, indicating a strongly interlinked GVC (a fact also noted in (OECD, 2020b)).

The key insights which emerge from these analyses are that government interventions which seek to restructure GVCs face very different contexts depending on their geography, governance and pre-pandemic structure; that reactions to the pandemic varied at firm, GVC and country level and that inappropriate public policy can do more harm than good. In terms of the PPE GVC, research has noted high levels of dependence between key actors, as well as the continued importance of Western lead firms, whose choices have important impacts on the geography of production.

Although prior in-depth analyses provide very useful contributions to understanding GVCs and how they might react to COVID-related state interventions, they have focused on the firm level and mainly explored the direct the role of the state as producer and buyer. In addition, they tend to focus on the context in the US (Gereffi et al., 2022; Panwar et al., 2022), with the notable exception of some limited work on the EU (Curran & Eckhardt, 2023a) and UK (Phillips et al., 2022) contexts. The indirect role of the state and the global and continental European context have been relatively little explored. This report will explore the indirect role of the state, as regulator and facilitator of GVCs. While the former analysis is at global level, for the latter we focus on the specific national context of France.

3. The overall context - COVID-19, trade policy and trade

The COVID-19 outbreak put huge pressure on healthcare systems across the world, as they struggled with unprecedented demand, especially for PPE and ventilators. It quickly became clear that essential workers (and ordinary citizens) were not being adequately protected from the virus, pushing the supply chain for such medical goods up the political agenda in many countries. The sudden realisation that these products, as well as testing kits and pharmaceuticals, had an unrecognised importance for national security led to a series of policy interventions, including outright bans on exports. At the same time, fears emerged about food shortages as a consequence of the pandemic, with farmers unable to reap their harvests and ports closed to traffic. This led to restrictions on the export of key commodities, like rice and wheat, while concerns about importing the virus led some countries to ban some, or even all, imports. In addition, several countries, especially in the OECD, provided extensive financial support to help the agricultural sector survive the pandemic (OECD, 2021).

By early May 2020, 90 countries had instigated trade restrictions in reaction to COVID. These are contrary to WTO principles (WTO, 2020b), as well as World Bank advice to governments on how best to leverage trade policy to address COVID (World Bank, 2020), yet they persisted. In addition, once vaccines became available in 2021, they became a further source of conflict, with governments using trade restrictions in an effort to secure domestic supplies (Evenett et al., 2021). At the same time much of the world was in lockdown, with major implications for supply and demand of standard consumer goods (Sheth, 2020). The result was both a large fall in trade and an important shift in its nature.

To provide a global overview of trade flows during the pandemic, we provide some indicative figures to set the scene for our more in-depth analysis below. In Figure 1 overall trends in trade are presented. We can see that global trade fell by almost 10% between 2018 and the first full year of the pandemic - 2020. The reasons for this fall are manyfold (including lockdown induced changes in supply and demand) (Ruta, 2022). Trade restrictions are just one of many explanatory factors and probably not the most important.

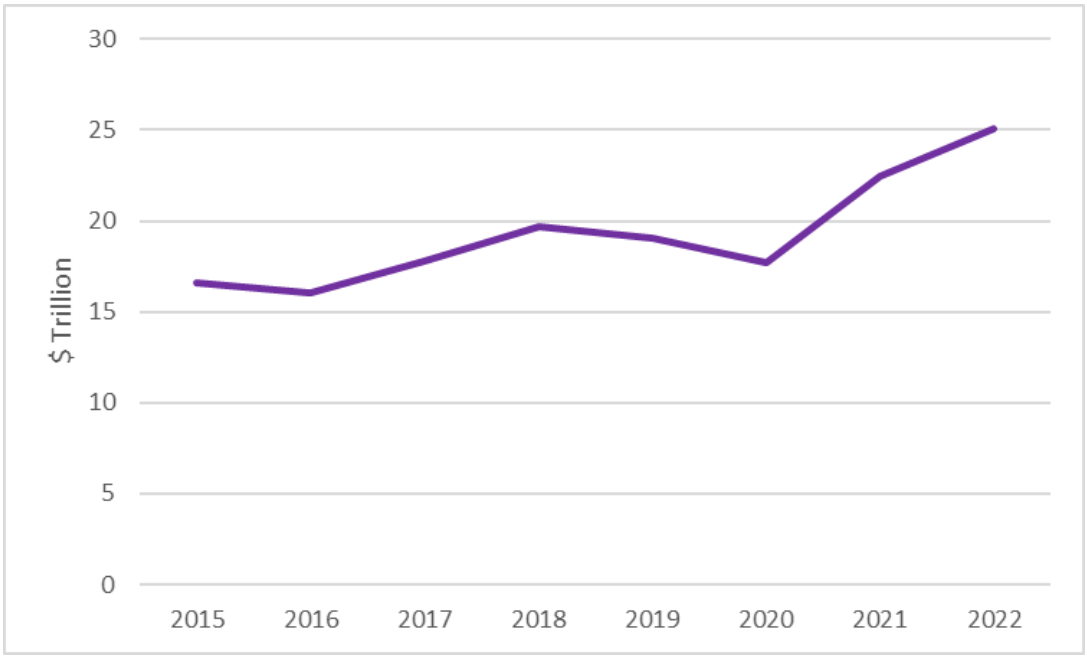

Figure 1 - Total global imports 2015-2022 ($Tr) – Source ITC

Although trade subsequently rebounded (in value terms), the effect of the pandemic has taken some time to ripple through the world economy and not all sectors have seen the same long-term growth. Figure 2 indicates how trade evolved in the top ten traded products prior to the pandemic (in 2018). The sector most affected by the fall in demand following the lockdowns was fuels, although trade values rebounded quickly, especially following Russia's invasion of Ukraine. Demand for electrical machinery – which includes computers – held up well, in contrast to the auto and mechanical devices sectors. Pharmaceutical trade was boosted by the pandemic, as was trade in precious stones and gold – the standard 'safe haven' investment in a crisis. Post-COVID we see that, in addition to fuels, demand for electrical machinery has continued to grow, while nuclear and mechanical appliances have rebounded well.

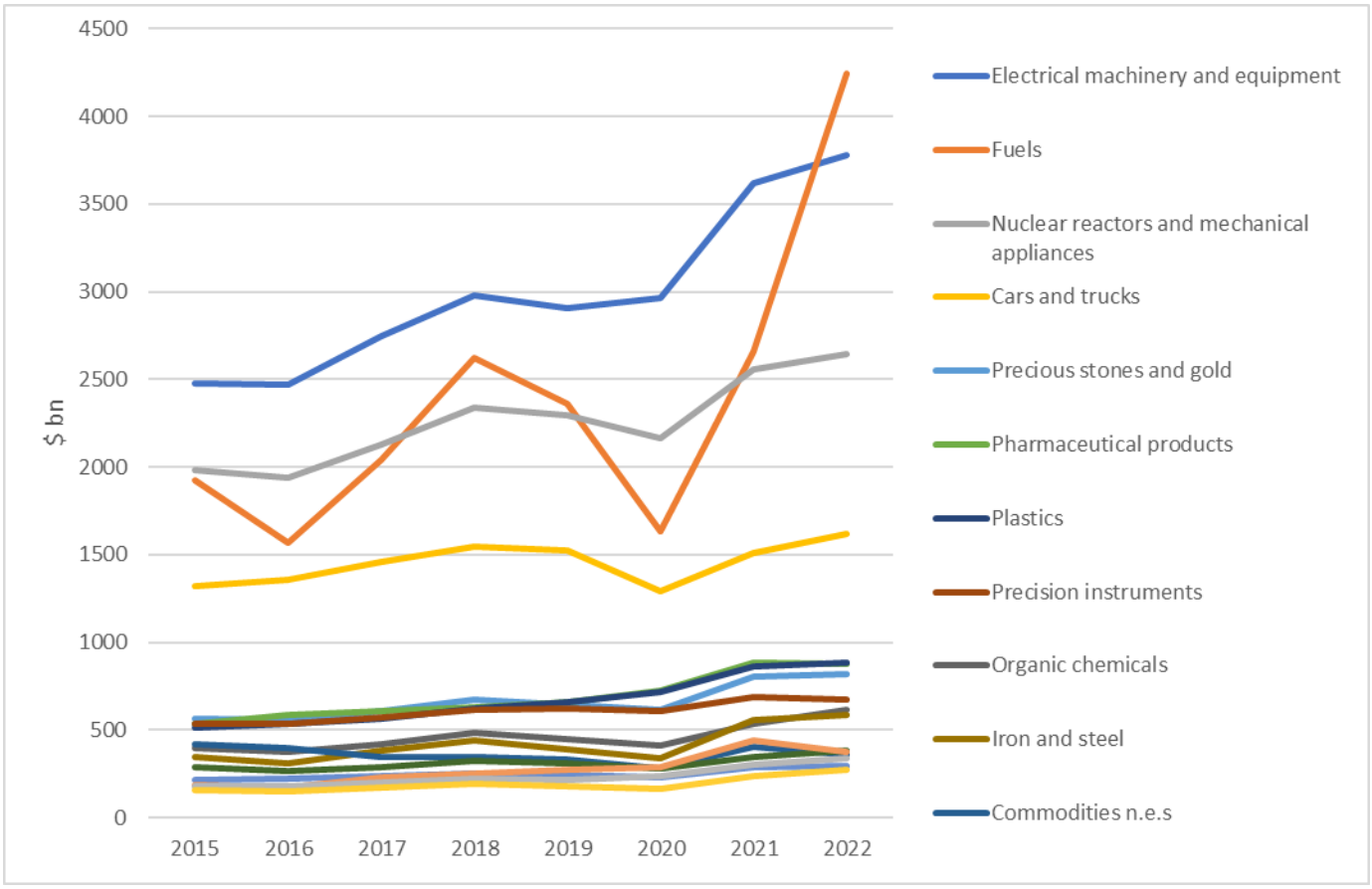

Figure 2 - Trends in global imports of top 10 traded goods (Source ITC)

These overall trade trends, although indicating a general return to growth in 2021-22 obscure important variations within sectors. Supply chain disruptions and changes in consumption habits led to major problems in several important GVCs, not only during the pandemic, but as the world emerged into the post-pandemic context. One key generic sector heavily affected by the pandemic was electronics – particularly semiconductors (part of the 'electrical machinery and equipment sector in Figure 2). In this sector, a combination of several factors led to major shortages of semiconductors in the auto sector in 2022. As a result of a combination of the effects of lockdown on production volumes, the fall in demand for cars and increase in demand for electronics, production had been reoriented to consumer electronics during the pandemic. When demand for cars rebounded, manufacturers found themselves unable to secure vital electronic components (Ramani et al., 2022).

These disruptions also affected several other sectors which rely on semiconductors. At the same time, it became increasingly obvious that reliance on digital communication and the adoption of new production systems based on Industry 4.0 technologies would further increase demand for these goods in the future (CEC, 2022). The realization of the strategic importance of electronics, especially semi-conductors, led to major policy shifts as governments from the US (Luo & Van

Assche, 2023) to Japan (Kamakura, 2022) to the EU (CEC, 2022; Ragonnaud, 2023) sought to support the development of domestic production capacity. There is much skepticism about the effectiveness of the widespread subsidization which is inherent in many of these schemes, not least because of the very high capital investments required (Curran & Eckhardt, 2023b; Hancké & Garcia Calvo, 2022; Kamakura, 2022). However, they are part of the new global reality of more interventionist industrial policy. In this context, Luo and Van Assche (2023) have noted a rise in 'techno-geopolitical uncertainty' for international business.

These evolutions will be explored further in later WPs. In this WP we focus on the short term, more immediate policy responses to the pandemic, rather than these longer-term shifts. However, it should be noted that these are part of a much wider move towards more interventionist policy, both in the EU and globally, which will likely have important long-term impacts on the geography and nature of many GVCs. Given this, the analysis in this WP exploring the nature of subsidies to support restructuring of GVCs is particularly pertinent moving forward.

4. Approach and methodology

Three years into the pandemic emerging research helps us to understand policy responses to the pandemic and their impacts. This report draws on this prior scholarship, especially from international economics, international political economy and international business. It aims to complement this earlier work through in-depth analysis of several novel databases which have been created in the context of the pandemic which help to shed light on emerging policy responses, as well as their effects.

4.1. Analysis of trade policy responses

In terms of public policy responses to the pandemic which sought to increase the supply of COVID-related products, data is available at global level from several novel databases. The most extensive are those from the International Trade Centre (ITC) and the Global Trade Alert (GTA). The ITC database monitored both restrictive and liberalising trade policy measures taken in response to the pandemic since spring 2020[1]. The GTA database[2] also monitored a wide variety of policy interventions related to the pandemic. Their definition of trade policy is wider than that of the ITC, including not just trade bans or restrictions, but also state aid and other policies with indirect impacts on trade. We use both sources to inform our analysis and ensure comprehensive coverage.

[1] https://www.macmap.org/covid19
[2] https://www.globaltradealert.org/reports/54

To provide an overview of trade policy interventions over time, we extracted data from the ITC COVID database regularly over the course of 2020-22. This gave us with an indication of the main trade policy responses and how they evolved. As countries reacted differently, depending on their national concerns (and position in key global value chains), we split the data between different types of country - EU28 (the UK was largely a member state during the period), other OECD, large emerging countries (the BRICS) and the rest of the world (RoW). We also distinguished between the type of goods targeted (medical supplies, food and other), the direction of trade (exports or imports) and the nature of the policy measure (restrictive or liberalising). For restrictions, we also noted whether they involved banning trade, the most draconian and unusual of trade policy measures (Curran et al., 2021).

For the detailed analysis of trade policy and flows, we focus on PPE. To identify both the final PPE products of interest and their intermediate inputs, we draw on the list of pandemic related products monitored by GTA during the pandemic (GTA, 2020). The list includes a wide range of products, including vaccines, medical instruments and food. We chose PPE because it has a relatively straightforward GVC, which was subject to extensive policy interventions in the beginning of the pandemic. In addition, several prior analyses of the GVC can inform our analysis (Bamber et al., 2020; Gereffi et al., 2022; OECD, 2020b).

To make the detailed analysis of policy measures and trade flows manageable, we only report figures for the most important historic traders in each grouping, ranked by their average quarterly trade flows in the years prior to the pandemic (2018/19). For the analysis of the specific policy measures taken by this restricted group, we use the March 2023 release of COVID policy measures from GTA which gives the most up to date longitudinal overview. For the trade data, we use quarterly figures and base our analysis on trade values (in $), as quantities are unfortunately not available for all key traders over the period. Prior analysis indicates that values nevertheless provide a good proxy for volumes in the sector (OECD, 2022). In order to compare countries with different levels of trade and get a better idea of relative shifts, for most of the analysis we index trade for each country on the basis of their average quarterly trade over the two years prior to the pandemic. We also explore trade within and to the EU. Here levels of trade are often quite similar across key countries, so for this analysis we use actual trade flows in $.

4.2. Analysis of the French 'Plan de Relance'

As highlighted in the GTA database, in addition to 'classic' trade policy actions initiated at the height of the pandemic, many countries started relatively quickly to undertake policy interventions which had indirect effects on trade, especially by encouraging 'reshoring' or reduced dependence, through financial support for specific projects in

key pandemic-related sectors. GTA data indicates that such interventions were undertaken both in series and in parallel with trade restrictions. Indeed, as discussed above, these initial 'facilitatory' actions were the precursor to even more extensive state support post-COVID.

If their core objective were to re-shore production or reduce dependence, these 'facilitatory' actions could have important impacts on GVCs. However much depends on how these broad objectives are interpreted in practice. Although databases exist on overall government spending during the pandemic, they provide data at very aggregate level. This is useful for some analysis, especially to compare countries' overall policy objectives. The Bruegel database, for example[3] has been used to explore how national governments sought to link their post-pandemic recovery plans to innovation (Serger et al., 2023). However, efforts to exploit it to identify efforts to restructure GVCs have found the details provided to be too limited (Curran & Eckhardt, 2023a).

We chose, therefore, to explore the interventions of one large government in detail. In order to get an insight into the nature of projects supported through recovery plans and how they might contribute to the wider objective of restructuring GVCs, we analysed a set of projects supported by the French state under their pandemic recovery plan in the context of a program focused on reshoring. We chose to focus on France because, since the pandemic, it has been the large EU member state that has consistently been the most articulate in its support of a more interventionist approach to restructuring of trade patterns and increasing the EU's autonomy (Curran & Eckhardt, 2023a; Macron, 2023). Its policy actions can therefore be seen as indicative of an increasingly state-led approach to developing key GVCs in the EU, linked less to classic tariff measures than direct support for priority sectors based on the geography of their production. The French government's support programme was also particularly transparent, with detailed information on the type of projects supported and their key objectives.

The projects we analysed were supported under the French 'Plan de Relance' (PdR). The PdR was a large-scale recovery program providing a range of subsidies covering several different objectives. One was a tranche on 'competitiveness/ independence', which included a specific objective - '(Re)localisation dans les secteurs critiques' or '(Re) shoring in critical sectors.' The call underlined that the objective of this part of the program was to reduce dependence and increase resilience by *'... supporting the creation, or recreation.. of certain strategic industries.*' in France (Government of France, 2020) own translation. The sectors identified as 'critical' were agro-food, essential industrial inputs, electronics, telecommunications/5G and health. We focused on these

[3] https://www.bruegel.org/dataset/european-union-countries-recovery-and-resilience-plans

projects, as they were the most relevant to the policy objective of changing trade patterns and restructuring GVCs.

The government maintained a database on all the projects funded under the plan[4]. This provides extensive details including the name, address and sector of the subsidized companies, together with a brief description. We base our analysis on projects funded in the first tranche made up of 405 distinct 'reshoring' projects (34 projects were listed twice, or multiple times, as there were several subsidiaries of the same company involved). Unfortunately, there are no details of the funding provided by project, but by early 2022 the overall public support had amounted to €731m - 27% of the total €2.7bn investment in the PdR. We analysed these projects in detail to identify their key objectives and the extent to which these were related to restructuring GVCs.

5. Shifts in trade and trade policy during the pandemic

In this section, we explore governments' initial reactions to the supply difficulties fostered by the pandemic. Faced with shortages of key goods, many turned to trade policy measures in an effort to increase domestic supply.

5.1. Trade policy responses – The rise of trade restrictions and liberalisations

As the pandemic spread, it quickly became evident that the combination of the impact of widespread lockdowns on industrial productive capacity and soaring demand for certain products vital to containing the pandemic, were causing shortages globally. Faced with this problem, many governments reacted with the most straightforward and blunt of policy instruments – export bans and import liberalisations. Concretely, governments sought to use trade policy to both prevent (or restrict) exports and to facilitate critical imports, through tariff reductions, reducing red tape and waiving previously imposed anti-dumping duties and other restrictions (Evenett et al., 2022).

By restricting the capacity of firms to export and making imports cheaper, policymakers hoped to increase local supply. As we will explore below, the success of these policy measures was muted, not least because they had contradictory effects: just as some markets were making imports cheaper, key producers were making goods more difficult to source. Although medical goods were often the key concern, exports of foodstuffs were also restricted by several countries (WTO, 2020a). 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 (Evenett et al., 2021).

[4] https://datavision.economie.gouv.fr/relance-industrie/21772400

In this section we explore in detail global trade policy responses to the pandemic and how trade evolved in reaction to these interventions. Firstly, we analyzed the COVID-related policy interventions detailed in the ITC and GTA databases discussed above and then we explore trends in trade in key PPE products. In terms of trade interventions, we first present the results for three key periods – in the height of the first wave (May 2020), as vaccines began to be widely rolled out after the second wave (June 2021) and during the fourth and most virulent wave (March 2022).

Restrictive measures, presented in Figure 3, were concentrated on controls on exports (exp in the figure) and focused on medical goods. As the figure shows, they were highest at the beginning of the pandemic in May 2020, when 91 measures were in place. They slowly fell over time, with 63 measures still in place in March 2022. It should be noted that the nature of these measures varied over the pandemic. While some restrictions persisted, many were removed (for example on PPE), although they were often replaced with new regulations (on vaccines). Most restrictive export trade policy interventions in OECD/EU countries were in medical goods. Restrictions on food exports were mostly undertaken by developing countries. Overall, bans on trade were surprisingly common. Although they also fell steadily over time, there were still 43 export bans in place in March 2022, mostly targeting medical goods or food.

Restrictions on imports (imp in the figure) were rare and primarily affected 'other' goods. They were mainly taken in developing countries. As highlighted by Curran et al., (2021) although these measures were not widespread, they were amongst the most problematic in trade policy terms, as they often seemed unlikely to be WTO-compatible.

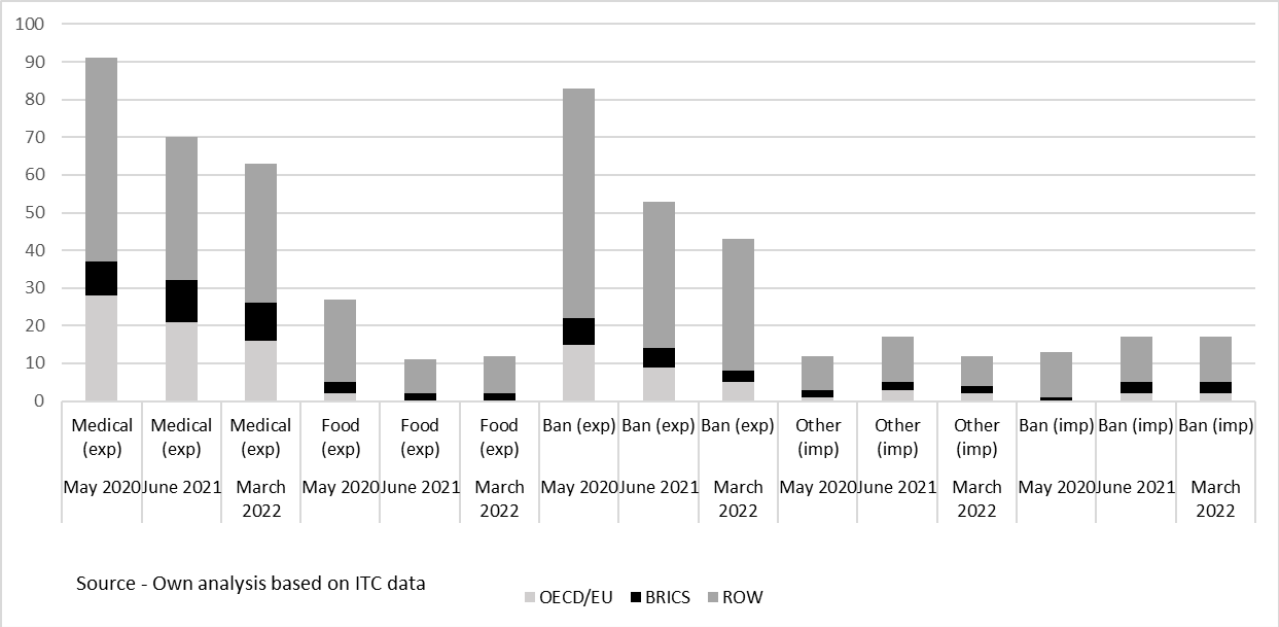

Figure 3 - Restrictive COVID-related measure: 2020-22

Liberalising measures are presented in Figure 4, these include simple facilitating measures like speeding up or waiving import controls, as well as more substantive tariff elimination on critical goods. Like restrictions, they were concentrated in medical goods, but focused on imports and were mostly taken in developing countries. It is also notable that, contrary to restrictions, they increased during the first year of the pandemic and remained high in 2022 (99 measures). The next most important set of interventions was in food imports. These were again concentrated in developing countries, although 'other' measures were almost as high in the two most recent periods. These included liberalization measures on iron and steel in India and the reduction of customs duties to 5% in the British Virgin Islands.

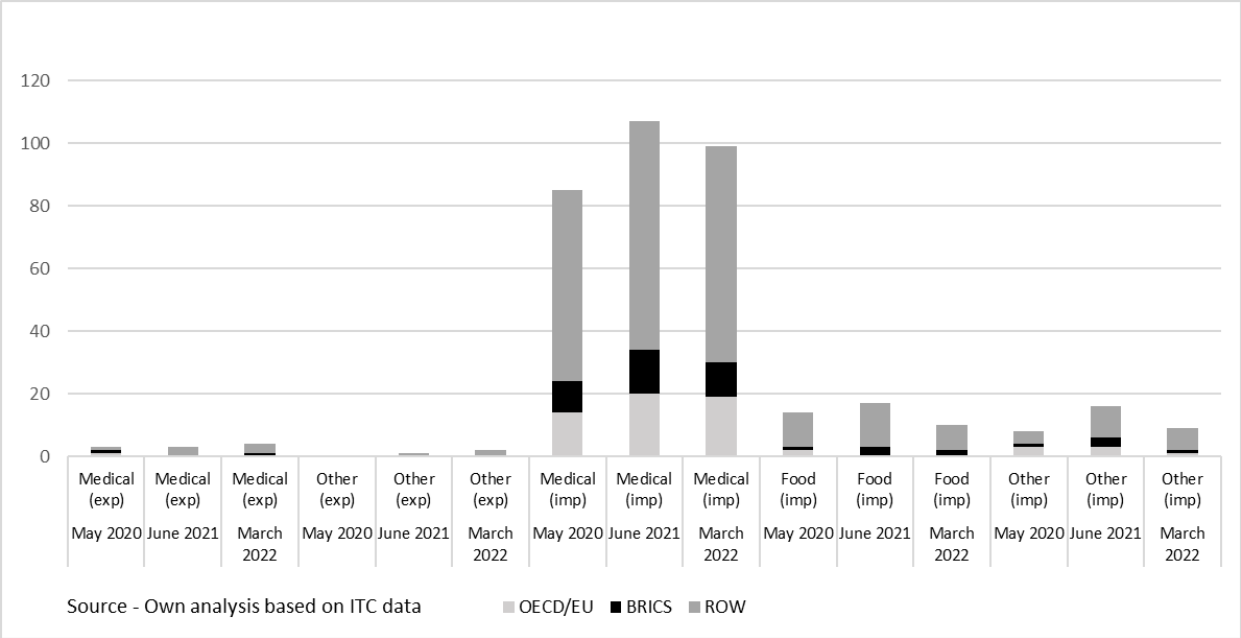

Figure 4 - Liberalising COVID-related measures: 2020-22

The first key finding which emerges from this analysis, is that many governments reacted to COVID by seeking to leverage trade policy to increase domestic supply of key goods. It is rather ironic that restrictions on exports emerged at the same time (and often in the same countries) as liberalisation measures aimed at increasing imports. While most measures focused on medical goods, several governments intervened to address food supply and other concerns.

The second key finding is that governments did not hesitate to ban trade, although this is contrary to the principles of WTO, especially Article 11, which outlaws prohibitions and restrictions on trade. From a GVC perspective, trade bans clearly undermine the usual functioning of the value chain, regardless of their governance structure. If bans cover all trade, lead firms have limited leeway. If only some sources are hit (as in the case of initial restrictions on imports from China), depending on the

level of flexibility within the GVC, lead firms may be able to shift their sourcing structures in response.

5.2. The case of medical goods

In terms of how these trade policy interventions impacted on different GVCs, as highlighted above it would be impossible in this short paper to explore the impact of all these policy interventions. Most restrictive trade policy interventions in key markets were related to exports of medical goods, where licensing systems and even bans were widespread. Considering this fact, as well as the wider objectives of this WP, we chose to explore in more detail trade policy interventions in PPE and the intermediate products required for its production. Although, as mentioned above, some analysis has been done, especially on facemasks (Gereffi, 2020; OECD, 2020b), exploration of the PPE GVC which includes the raw materials required for production is lacking. For reasons of space, we focus only on export restrictions in this part of the report, as these are the interventions most likely to have strong impacts on GVCs in this context.

5.2.1. Trade restrictions in PPE

Firstly, we give an overview of the measures taken globally, before providing a more detailed analysis of the situation in the largest suppliers. Based on the data provided in the ITC database, we differentiated between restrictions on all PPE, those that targeted masks only, raw materials (RM) to produce PPE or masks and whether trade was banned.

The global results are provided in Figure 5. It is clear that interventions were more numerous in the first wave of infections in Spring 2020, when the number of bans was also high. Interventions fell gradually over the pandemic. By March 2022, most export bans that persisted were in the ROW group. These mostly affected countries that were, in any case, not significant exporters of PPE. Restrictions on the raw materials required for producing PPE were rare, even in the beginning of the pandemic and only one restriction (in Turkey) remained in the most recent data.

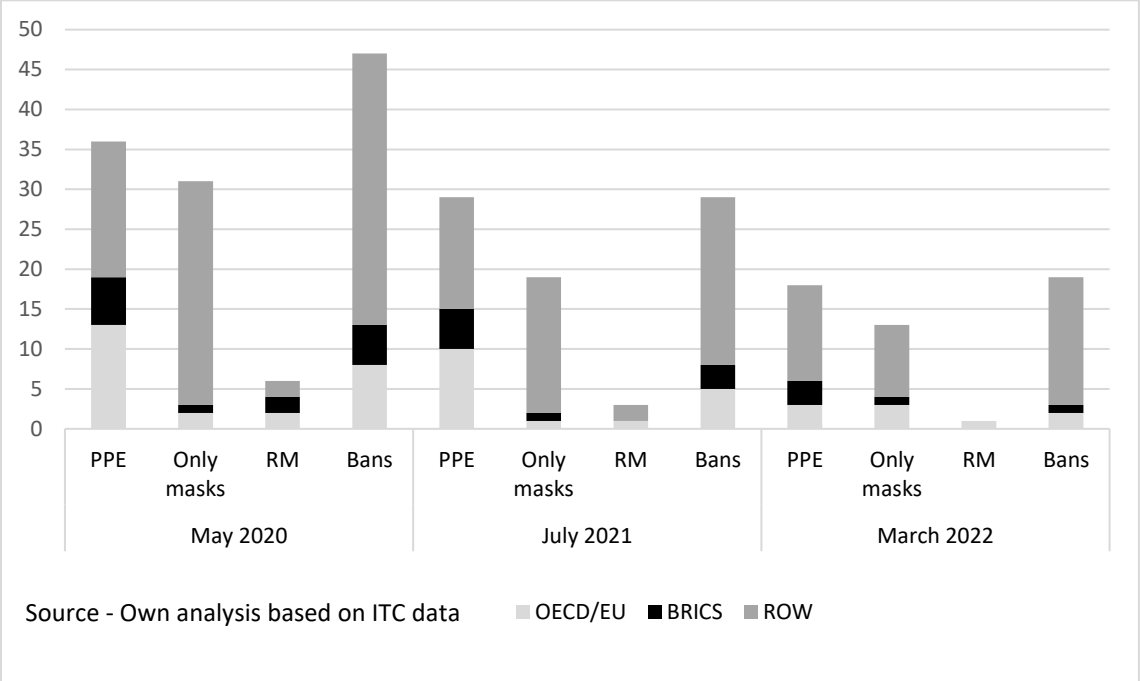

Figure 5 - Export trade restrictions on PPE - 2020-2022

Of course, trade restrictions only have major impacts on GVCs if they affect important suppliers. Banning exports of PPE from countries that have little or no production will not affect global supply. In our more detailed analysis of the trade policy context, we therefore focused on the restrictions imposed by key exporters. We included all exporters who represented more than 1% of global trade in PPE and its intermediate products prior to the pandemic (based on ITC TradeMap figures) and identified whether and how they had restricted trade in those goods during the pandemic. For this latter analysis we used mainly the GTA database, which provides the best details of the timelines of the various measures, but we cross referenced these details with those in the ITC database to ensure coherence and complete coverage.

Table 1 - Trade restrictions by key exporters of PPE – 2020-22

	% of av trade	restrictions	Date started	Date ended	Nature
China	27,4	yes	01/04/2020	24/04/2020	Export licensing PPE. After removal retained new certification requirements
Germany	11,8	yes - national and EU	04/03/2020	25/05/2020	Banned export of PPE, then required export licensing
United States of America	8,3	yes	03/04/2020	30/06/2021	Banned export of 5 PPE products
Italy	5,3	yes - national and EU	26/02/2020	25/05/2020	Export licensing PPE
France	4,2	yes - national and EU	04/03/2020	31/05/2020	Banned mask exports and Export licensing PPE
Netherlands	3,2	yes - EU	15/03/2020	25/05/2020	Export licensing PPE
Japan	2,5	no			
India	2,5	yes	31/01/2020	06/10/2020	Banned PPE export then imposed licence and export quota. Regulation changed 10 times in 10 months.
Mexico	2,4	no			
United Kingdom	2,1	yes - EU	15/03/2020	25/05/2020	Export licensing PPE
Belgium	2,1	yes - EU	15/03/2020	25/05/2020	Export licensing PPE
Poland	2,1	yes - national and EU	20/03/2020	25/05/2020	Export licensing PPE
Korea	1,9	yes	26/02/2020	11/12/2020	Restricted then banned then restricted face mask exports
Czech Republic	1,9	yes - EU	15/03/2020	25/05/2020	Export licensing PPE
Taiwan	1,8	yes	24/01/2020	30/06/2020	Banned face mask exports, then required licences, then banned again
Hong Kong	1,8	no			
Spain	1,7	yes - EU	15/03/2020	25/05/2020	Export licensing PPE
Austria	1,5	yes - EU	15/03/2020	25/05/2020	Export licensing PPE
Canada	1,4	no			
Thailand	1,4	yes	05/02/2020	04/02/2022	Banned face mask exports
Jordan	1,4	yes	20/02/2020	20/04/2020	Banned face mask exports
Switzerland	1,0	yes	25/03/2020	22/06/2020	Export licensing PPE

Source – GTA and ITC databases

In terms of the key exporters of PPE reported in

Table 1, many imposed restrictions on exports, although most were relatively short lived and many only targeted facemasks, rather than all PPE. China, the most important global source of PPE, briefly imposed an export licensing scheme in April, before shifting to certification requirements (ostensibly to ensure quality levels). The next most important global exporter, Germany, briefly banned exports of PPE, before moving in mid-March 2020 to the common EU licensing system, which itself only lasted until the end of May.

The key exporter with the most restrictive and long-lasting trade regime was the US. Their ban on five key PPE products (nine HS product codes including protective clothing and two different types of face masks) only expired in June 2021, although there were some exceptions allowed (OECD, 2020a). Several key exporters vacillated between bans and restrictions over a period of several months. India was the key exporter with the most variable regime. Their regulations changed 10 times in as many months, oscillating between banning exports, imposing quotas and licensing. Although India was one of the countries most heavily affected by the pandemic, such an unpredictable policy environment was clearly not conducive to trade.

In terms of restrictions on PPE intermediate inputs, the results of our analysis are presented in Table 2. These results are very different to those in final products. In reflection of the global situation reported in Figure 3, very few of the most important exporters of intermediate inputs restricted trade. Korea banned exports of melt-blown plastic (MBP) used to make medical grade masks for several months, while Taiwan briefly included mask filters in their trade restrictions, before concentrating only on masks. The longest running restrictions was India's ban on exports of non-woven fabric (NWF), an important input for many types of PPE.

Table 2 - Trade restrictions by key exporters of PPE intermediates - 2020-22

	% of trade	Restrictions	Date started	Date ended
China	13,9	no		
Germany	11,6	no		
United States of America	8,4	no		
Italy	6,5	no		
Korea	4,2	yes - ban MBP	06/03/2020	05/08/2020
France	3,6	no		
Belgium	3,2	no		
Poland	3,2	no		
Spain	2,8	no		
Netherlands	2,8	no		
Czech Republic	2,7	no		
Austria	2,4	no		
Taiwan	2,4	yes - ban filters	24/01/2020	23/02/2020
Thailand	2,3	no		
Japan	2,2	no		
Türkiye	2,2	no		
India	1,8	yes - ban NWF	19/03/2020	14/08/2020
Malaysia	1,7	no		
United Kingdom	1,6	no		
Singapore	1,6	no		
Canada	1,5	no		
Mexico	1,5	no		
Slovakia	1,2	no		
Hong Kong	1,1	no		
Hungary	1,0	no		
United Arab Emirates	1,0	no		

Source – GTA and ITC databases

Several key findings emerge from this work. Firstly, PPE and its intermediate inputs faced very different policy environments. Few key exporters imposed any restrictions on the export of intermediate inputs, while most exporters of finished products imposed some form of restriction. Secondly, these were often of relatively short duration and concentrated on a few products, especially face masks. Finally, exporters in several key PPE suppliers faced a very volatile trade policy environment, with frequent changes in the regulations, often at very short notice. Such a context would be expected to affect trade. In the following section, we explore trade flows in these goods to assess the extent to which trade was impacted, in the short and medium term, by the uncertain policy environment created during these first months of the pandemic.

5.2.2. The response of the PPE GVC to policy interventions.

We now report the analyses of trade trends over the period of the pandemic, mainly by indexing trade flows compared to historical quarterly flows. To put these figures into context, Figure 6 provides an overview of global trends in trade (in $Bn) in the sector (differentiated by final goods and inputs) over the period we cover. Clearly the restrictions detailed above did not prevent a huge surge in exports of PPE, which more than doubled in value between Q1 and Q2 in 2020, before stabilizing at a relatively high level compared to pre-pandemic levels. In terms of the GVC, it is interesting to note that trade in intermediate inputs actually fell in Q2 of 2020, before rebounding in Q3 and increasing to well above pre-pandemic levels up to mid-2022. Given that there were few trade restrictions on raw materials in place, it seems unlikely that the short-term reduction in trade was related to government intervention. It could be related to the effect of lockdown measures and difficulty securing supply in a rather chaotic market context. Trade in the latter two quarters seems to have fallen, but not all countries have yet declared trade, so it is difficult to draw firm conclusions on whether trade will return to pre-pandemic levels. We will explore detailed trends in this sub-sector below[5].

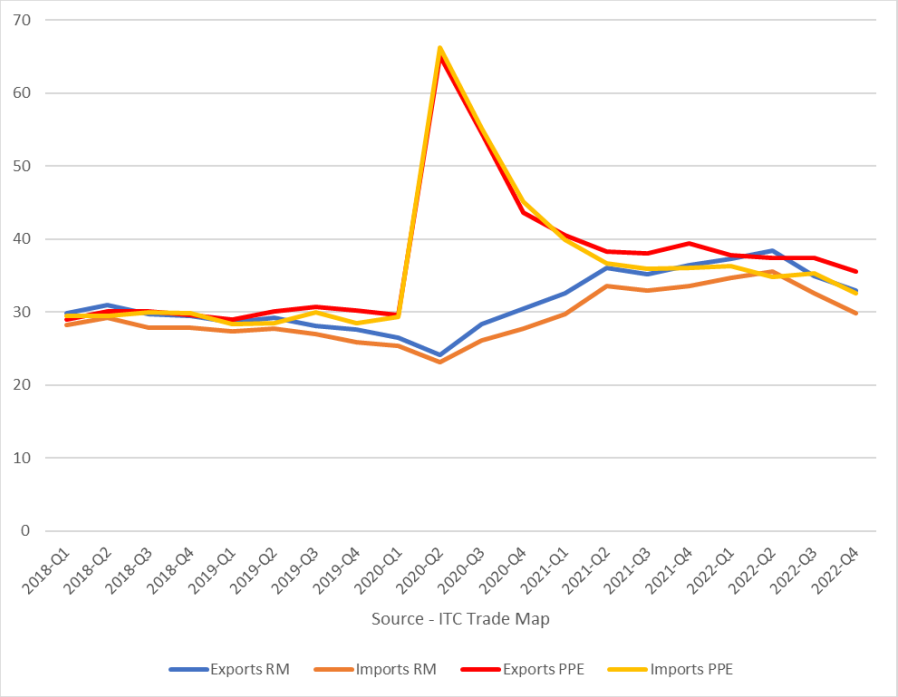

Figure 6 - Trends in trade in PPE and its intermediate inputs ($Bn)

[5] It is notable that export figures are higher than import figures. This is the opposite of what would be expected, given that exports are usually declared without transport costs (FOB), in contrast to imports (CIF). While the explanation is likely to be partly related to the fact that some smaller importers do not declare trade regularly to the UN, it is interesting that during the pandemic, when trade was highly regulated and subject to export licensing in many countries, imports and exports of PPE were almost exactly the same.

We now look at trends in trade in more detail. For this analysis, in order to better compare countries with quite different trade values, we index trade on the basis of the average quarterly trade levels in the 2 years prior to the pandemic. In terms of key suppliers, Figure 7 presents the findings on trends in exports of PPE. EU countries are reported together, as they were very quickly subject to the same trade restrictions under the common commercial policy. The largest increases were clearly in China, where the new licensing requirements do not seem to have prevented a rapid expansion of exports and Hong Kong, which had no trade restrictions. The three countries subject to long-lasting bans all saw temporary reductions in their exports in the first wave in 2020, but these were much more significant in India (where exports were only 37% of prior levels in Q2 and 79% in Q3) than in the US (a fall to 87% of average exports in Q2 and 97% in Q3) and Thailand (81% in Q2 and 91% in Q3). Of the three, only the US has seen significant increases in exports since, with both India and Thailand maintaining levels at those prior to the pandemic, in contrast to most other suppliers.

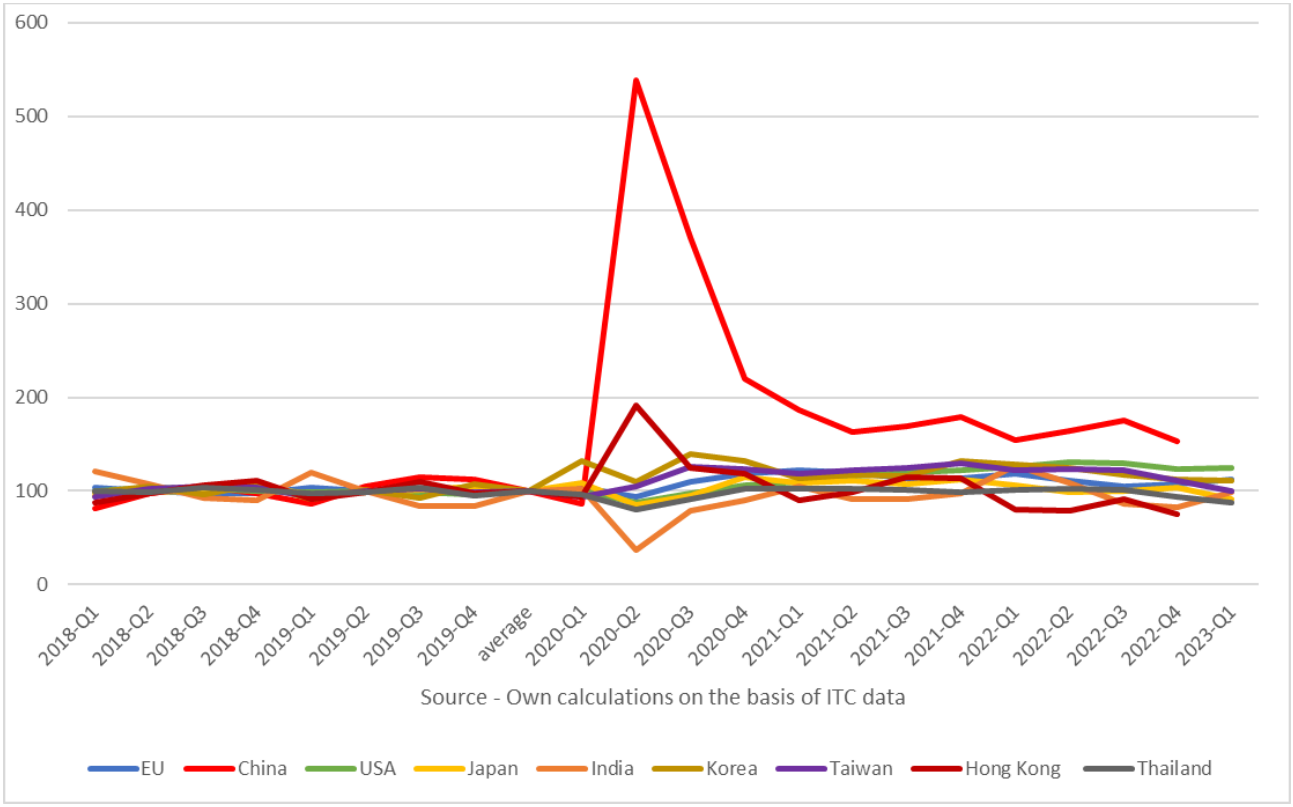

Figure 7 - Trends in PPE exports from key sources (Av 2018-19=100)

Trends in other countries are less extreme. In terms of the EU grouping, apart from a slight fall in Q2 (to 94% of average levels), exports from the block have consistently been higher than prior to the pandemic, peaking at 22% higher in 2021 Q1. Exports from the two key suppliers which vacillated between bans and restrictions – Korea and Taiwan – don't seem to have been strongly affected by this policy environment. Both

increased during the pandemic, peaking at 39% for Korea in 2020Q3, despite continued restrictions.

Overall, these figures indicate that although trade restrictions seem to have affected trade in certain countries, especially those that imposed export bans (US, India), nevertheless, supply was rapidly ramped up, especially in China and most countries have seen consistently higher levels of exports since. They also indicate that, although trade levels are generally higher than prior to the pandemic, this effect is only significant in China. Given that China is the biggest supplier of PPE, this nevertheless translates into large increases in volumes.

For the intermediate products required to produce PPE, figures for key exporters are presented in Figure 8. Trade in these products is less concentrated than for final products and trends in exports are very different. Although exports of these products from most traders (except China) fell just after the pandemic hit, since the end of 2020 exports have tended upwards, particularly from China, Turkey and (until 2022) Korea. The latter was one of the few exporters to restrict RMs, yet trends in their exports in the height of the pandemic were not very different to those of other key traders. Although export levels have been lower in recent quarters, most key suppliers of intermediates consistently increased their exports over the course of the pandemic. Thailand is the only key supplier whose export levels have consistently been lower.

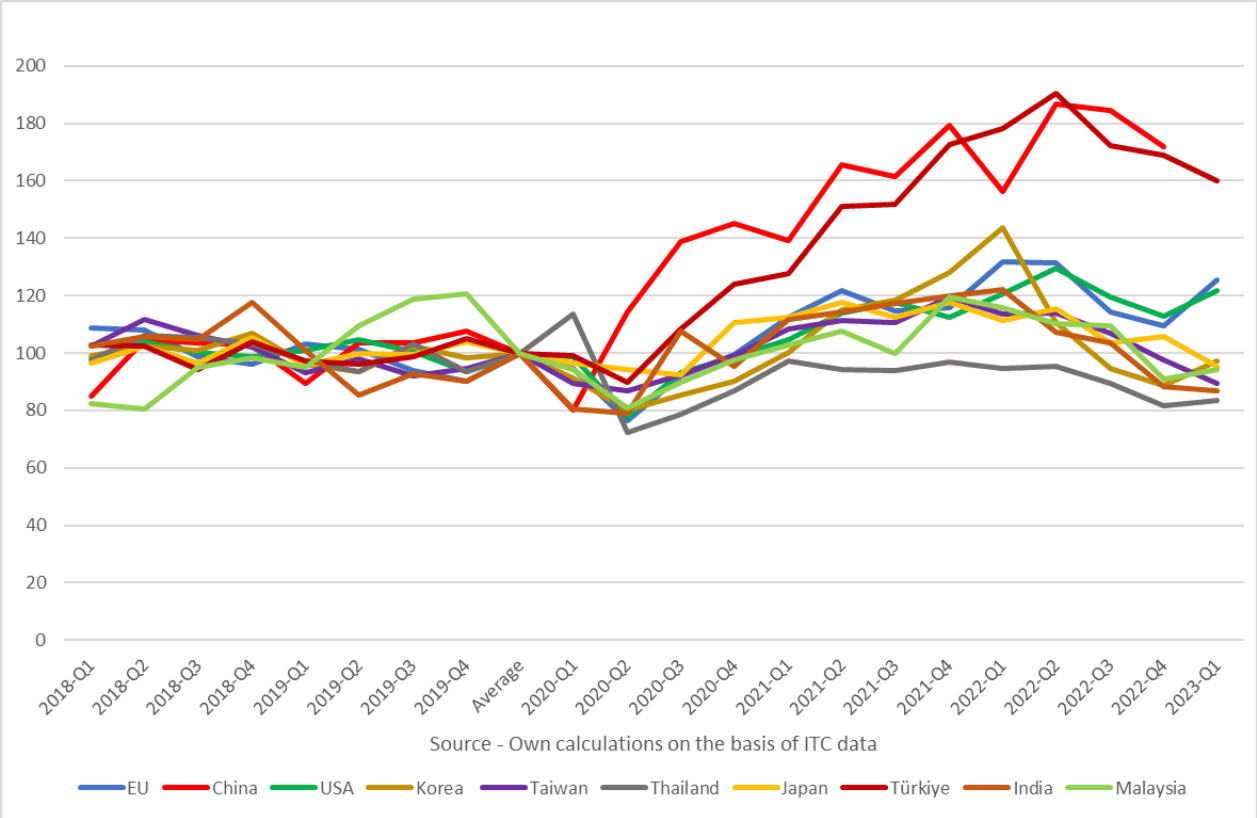

Figure 8 - Trends in PPE Intermediate exports - key sources (Average 2018-19 = 100)

In order to get a better overview of the geography of PPE production, we also explore the key destinations of these intermediate products - presented in Figure 9. The data indicate that, following below average imports in the first year of the pandemic (except in Korea and China), several countries (although not China) have experienced large increases since. These include Turkey (peaking at 48% above average in 2022Q1), the US (+54% in 2022 Q2) and the EU (+38% in the same quarter). The latter has become, by far, the most important market for PPE inputs, representing 52% of world imports in 2022Q2 compared to an average of 45% before the pandemic. Although trends have been fairly stable in Japan, Korea has imported between 11-23% above average since 2021Q1. Trends in India are curious. Imports were very low in the first year of the pandemic, before picking up in the second year and remaining high in 2022.

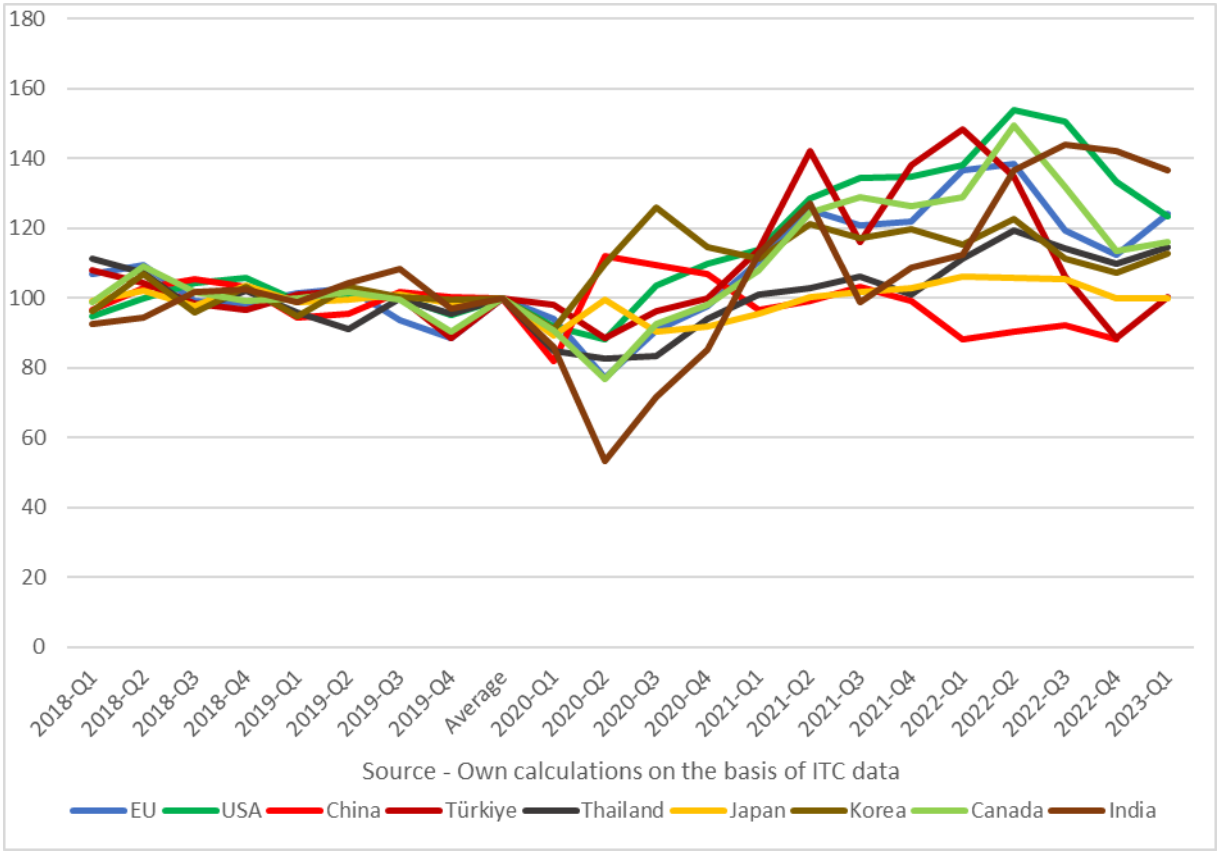

Figure 9 - Trends in PPE intermediate imports in key markets - average 2018-19 = 100

In general, these figures indicate that, while increased trade in final products was concentrated in the first few quarters of the pandemic, demand for intermediates has continued to grow in the more recent quarters. This strongly suggests that over time, the GVC of PPE has diversified, reducing the initial high levels of dependence on China and increasing production elsewhere, especially in the EU. This is reflected in the widespread increased demand for the intermediates required to produce these goods. Thus, the medium-term impact of these widespread short-term 'regulatory' policy interventions seems to have been a diversification of the GVC away from its previous

high dependence on China. In as much as diversification improves the resilience of a GVC by providing greater choice in times of crisis or stress, this could be seen as a positive outcome for policy makers.

6. Evolutions in PPE trade within the EU

In order to better understand how these evolutions impacted on EU trade and its GVCs, in this section we briefly explore how trade in PPE evolved in the region during the pandemic. For this analysis, which will set the scene for later WPs, we focus on the EU27. As for other regions, trade in PPE increased significantly during the pandemic, with China a key source, particularly in the early quarters. EU imports from China by value peaked at over 8 times pre-pandemic levels in 2020-Q2 and remained high until 2023 where the latest trade figures (2023 Q1 and 2) indicate that they are back to pre-pandemic levels. The next most important source for the EU was, and remains, Germany, which represents almost 18% of all imports in the most recent figures (Q1+Q2 of 2023) and about 30% of intra-EU trade over the period. Prior to the pandemic, Germany's exports to its EU partners were close to those of China, although the effect of COVID on trade was much less significant for the former. After a drop in 2020-Q2 also evident in Italy and France, the other two important internal sources, exports were consistently higher than pre-pandemic levels, peaking at 26% higher in 2021-Q1.

Overall, the top 3 intra-EU sources of PPE are Germany, France and Italy, which together made up almost half of intra imports in 2022. In order to get an overview of the geography of key GVCs in this sector, we explored trends in imports of PPE inputs to these key EU sources. Figure 10 shows trends in their imports of the raw materials for PPE, which clearly increased over the pandemic. In Germany, in particular, imports increased significantly to between $3 and $3.5bn per quarter from 2021 onwards.

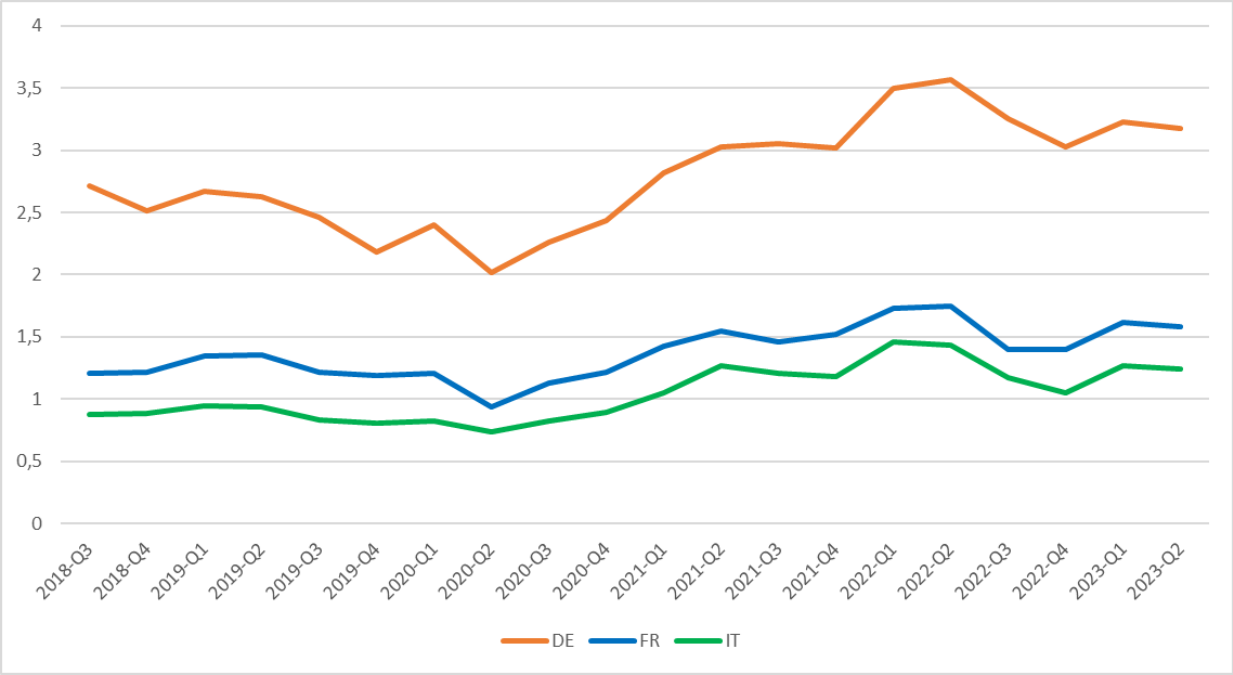

Figure 10 - Imports of raw materials for PPE ($bn)

We look in more detail at trends in the sources of these imports below. Trends in Germany are presented in Figure 11. Here we see large increases in imports from China, but also from regional sources both within the EU (Italy, Poland , Czechia and Austria) and its close neighbors (Turkiye). Clearly the Germany PPE GVC is strongly focused on the EU and its neighbourhood.

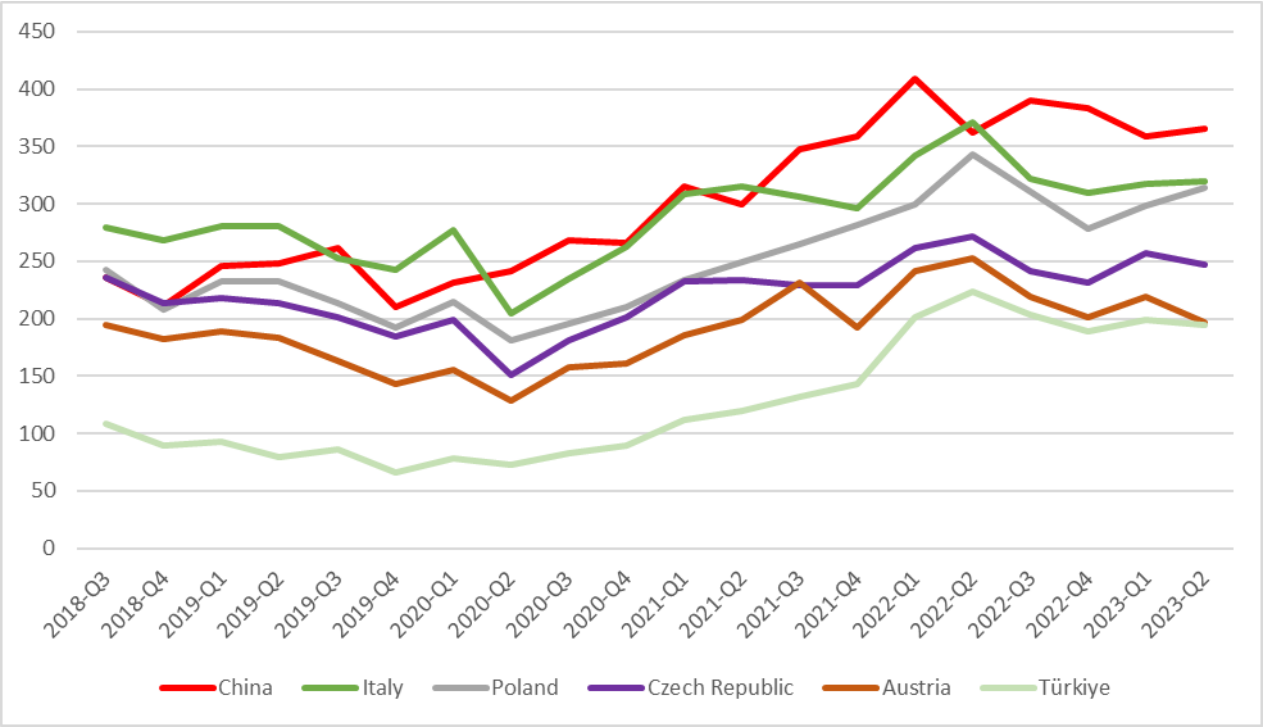

Figure 11 - Imports of PPE raw materials to Germany ($m)

The equivalent figures for France are shown in Figure 12. Here we see an even greater predominance of EU sources. Although imports of PPE inputs from China increased over the pandemic, Germany, Spain and Italy were almost always more important suppliers. The PPE GVC of France is clearly very linked to its neighboring EU states.

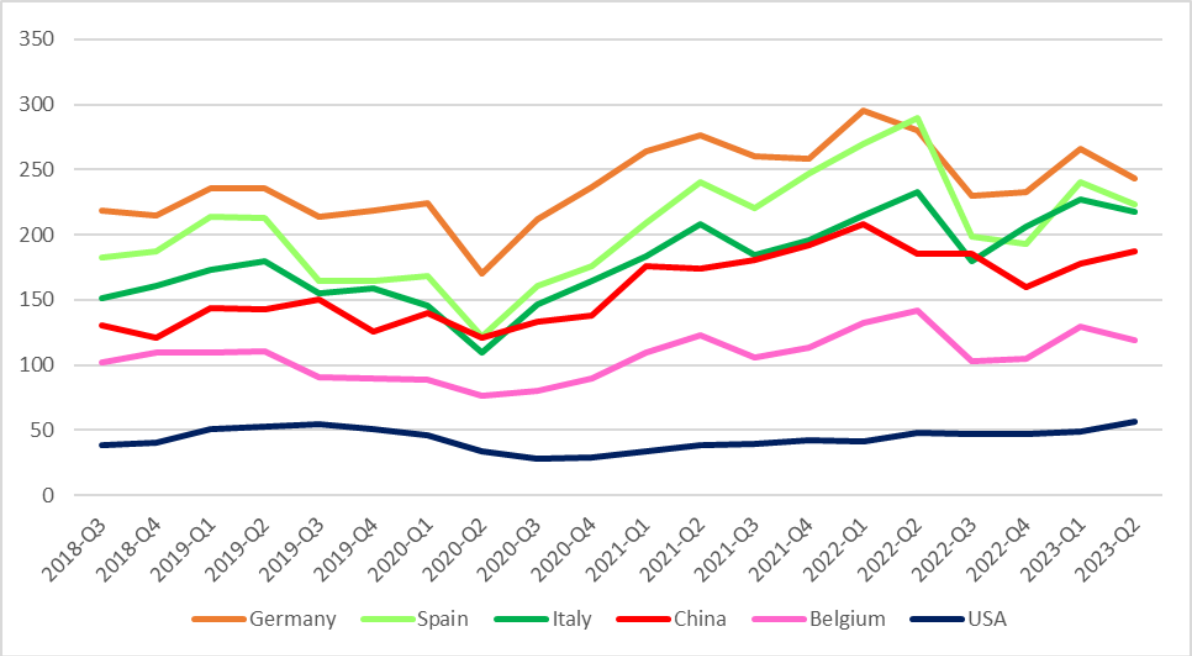

Figure 12 - Imports of PPE raw materials to France ($m)

Finally, Figure 13 presents trends in Italy, where Germany has consistently been the key supplier, with large increases over the pandemic. Although China was the second most important source, levels were well below those of Germany. Although trade increased from most other sources, they were less significant. Overall, the Italian PPE GVC seems to be highly integrated with Germany, as well as other Western EU states. Although Turkiye is still a rather marginal supplier their exports of PPE inputs to Italy more than doubled over the period, in line with the more general increase in Turkiye's trade in the sector evident in Figure 8.

It is notable that Italian imports of PPE raw materials from most key sources fell little (or not at all) in 2020-Q2 , while Germany and France both saw important reductions in imports in that quarter (a fall also noted globally in Figure 6). It would be interesting to explore why this might have been the case. Trade policy seems unlikely to be a factor, as all EU countries rapidly adopted the same policies and, in any case, the EU did not intervene in the market for raw materials. Italy's PPE GVC may have a slightly different structure/sectoral make up to the other two key EU producers.

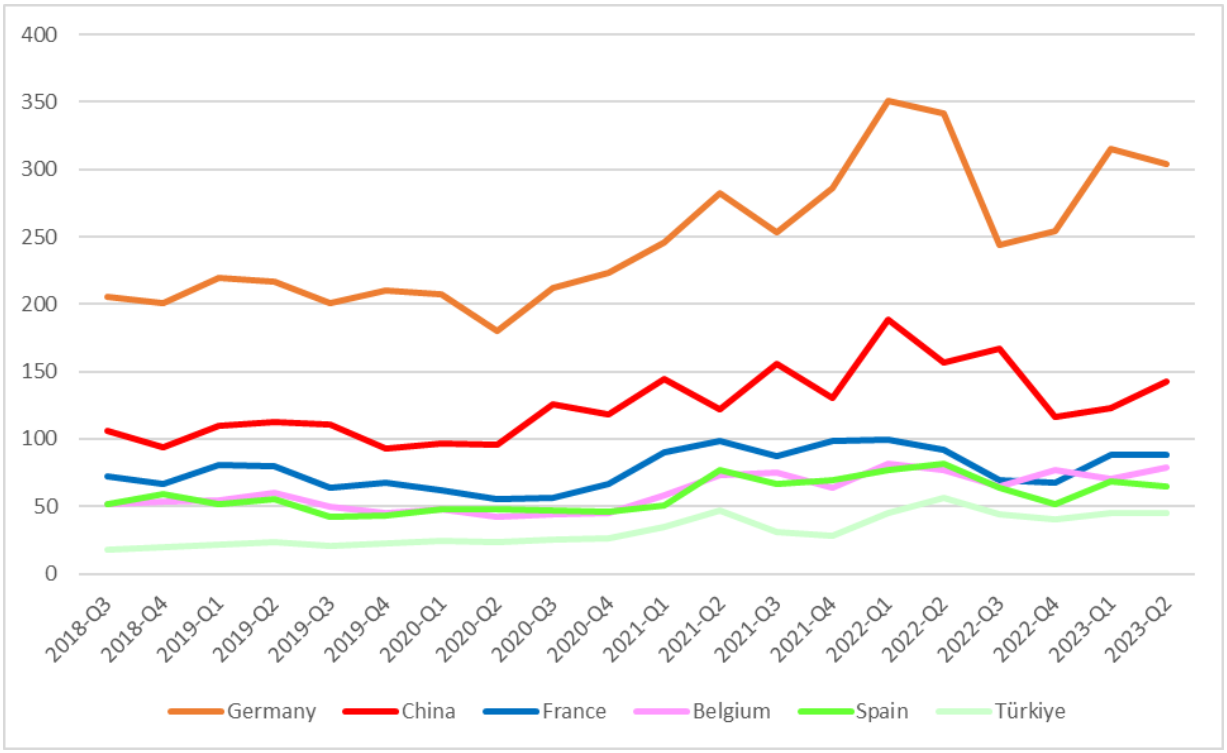

Figure 13 - Imports of PPE raw materials to Italy ($m)

Overall, these figures indicate that the EU PPE value chain is still strongly regionally focused. With the exception of the first quarters of the pandemic, well over half of PPE has consistently been sourced within the EU, while raw material sourcing is also strongly regional. Although China played a vital role in the early quarters of the pandemic, especially as a source of final products, only in Germany was it the largest supplier of PPE raw materials and even there, other regional sources were also very important, with several showing strong growth. Before the pandemic and even more so since, intra-EU trade in PPE and its raw materials has been intensive. Thus, if there were to be a political effort to develop more EU-focused production structures in this sector, there is clearly a strong pre-existing basis for a regional value chain.

7. Policies with an impact on trade – support for 'reshoring'

7.1. The case of France

In this section, we turn to an analysis of 'facilitatory measures' by governments. This analysis is more qualitative and by nature limited in its coverage. As explained above, we focus on those projects which were selected for post-pandemic support by the French government under the objective of 'resilience and reshoring'. The details provided in the database of projects described above usually included an overview of the objective, the means to achieve it and the expected outcome, including, in some cases, in employment terms (the creation or maintenance of employment was one of the criteria for project selection) (Government of France, 2020). We analysed the details

for each of the projects funded to explore the extent to which they supported 're-shoring' and GVC restructuring more generally. This analysis provides us with an indication of both the priority sectors targeted by a key EU government in its post-COVID relaunch strategy and the manner in which support for re-shoring was conceptualised by the project proposals supported under the scheme and indeed by the government, through their choice of these proposals for funding.

Reading through the project descriptions it became clear that they were not all primarily, or even indirectly, focused on re-shoring, in the classical sense of bringing back production processes that had previously been sub-contracted to overseas suppliers. We noted some such projects, but there were many projects that sought to develop production capacity in key areas where France was considered to be lagging behind other world regions and/or to be too dependent on foreign sources. Although these are not related to 're-shoring' as such, but rather restructuring GVCs to reduce dependence, for simplicity we categorised them as aimed at reshoring, in the broad sense of increasing the share of a given GVC which is produced in France. Indeed, this is coherent with the broad conception of reshoring provided in the call for projects (Government of France, 2020).

However, there were many projects supported under this programme which were not related to bringing back, or creating, French production and thus could not be characterized as aimed at 'reshoring' even in a broad sense. We analysed all the project descriptions and coded them in terms of their core objectives. Having undertaken this exercise, we found that most of these projects fitted into one of three other categories: modernisation, upscaling and innovation. We classified as 'modernisation', projects whose primary objective was the upgrading of production technology and/or the deployment of so called 'Industry 4.0' technologies, like robots, 3D printing, Artificial Intelligence (AI) and the Internet of Things (IoT). 'Upscaling' projects involved investing in production facilities to increase output in French factories and respond to anticipated increases, or shifts, in demand. 'Innovation' projects were primarily R&D based and focused on developing new products/processes or improving existing ones.

Finally, there were a small number of projects that did not fit into any of these four categorisations. Some were less about developing new products or processes than demonstrating their feasibility. We classified these as 'pilot projects' (18 projects, 11 of which were related to the 5G rollout). Others were related to developing French production in key new emerging sectors. While related to re-shoring, we considered these could not be classified as such, as in such novel products there was no prior or overseas production to 'bring back'. There were 16 such projects, the majority of which were in healthcare and intermediates. Finally, there were a small number of projects related to maintaining existing production in France (11 projects in health, electronics

and critical intermediates) and 10 projects focused on recycling, all but one of which were in critical intermediates. These projects will certainly contribute to reducing dependence on virgin raw material extraction and increase domestic supply of key inputs. Although not related to reshoring or restructuring the supply chain as such, they are certainly related to increasing autonomy and reduced dependence.

In terms of the split across the sectors supported, perhaps unsurprisingly, projects in the health sector were the most numerous (115). These covered a wide range of objectives, many of which were unrelated to the pandemic. Somewhat surprisingly, only one of these projects were related to PPE – a project to develop local production of disposable gloves – although several others were focused on developing production capacity for pandemic-related products like virus testing kits and vaccines. The next most numerous were in electronics and critical intermediates (95 each). There were slightly less projects in agro-food, with 78 projects supported. The smallest number of projects was in telecom/5G (22), although several electronics projects were focused on inputs to this sector.

Although, as indicated above, the budgets are not provided, the size of the different projects varied extensively. The number of jobs expected to be created ranged from 2 to 350, although many projects did not detail expected employment impacts and, in the case of modernisation/robotisation projects, it may even be that these could be negative.

The results of our analysis for the four key categories of project are presented in Table 3. Although, as mentioned above, the declared objective of the support programme was 'reshoring', we only categorised 90 projects as being primarily focused on that goal, with 29 each in the health sector and electronics. The others were in critical intermediates (19) and agro-food. Of these, most project descriptions didn't indicate from where production would be reshored, with vague indications like 'foreign' or, more rarely 'extra-European'. Where the source was identified, it was most often Asia (12 projects), or specifically China (5), although others mentioned the US (6) and in one case each, Japan, Tunisia and the Dominican Republic.

Table 3 - French projects to support 'reshoring' - Key objectives across targeted sectors

	Health	Agro-Food	Electronics	Intermediates	Telecom/5G	Total
Innovation	26	21	30	25	9	111
Upscaling	32	29	14	21	0	96
Reshoring	29	13	29	19	0	90
Modernise	15	10	17	10	1	53

Source – Own analysis based on French official data

Upscaling projects were mainly aimed at increasing domestic capacity. Depending on the sector, ensuring stable domestic demand for this new capacity may not be easy. In the agro-food sector, the war in Ukraine has rapidly reduced supply of a variety of agricultural inputs and enhanced capacity is likely to be very welcome, both in France and elsewhere (FAO, 2022). In addition, several projects involve the upscaling of novel agro-products, including animal feed made from insects and vegetarian protein from a variety of sources. These should enhance product diversity, which is important to resilience. Indeed, one project talks of increasing France's 'protein autonomy'.

Modernisation projects, especially those that deploy AI and IoT technologies should improve information sharing and visibility along GVCs, improving responsiveness and resilience. Like upscaling, they will also often increase capacity. While increasing redundancy, depending on the sector, companies may struggle to secure short-term demand for such goods. They may also help to maintain employment for production which is subject to intense global competition. Indeed, this was sometimes a key argument, for example in the case of a project to modernise an aluminum smelter, increasing capacity by 10% and securing the future of 600 employees. In this and other projects, modernisation was also intended to increase energy efficiency, reducing dependence on imported fuel. Although this was not their primary objective, in retrospect, these projects will likely increase resilience to current and future fuel shortages.

Innovation projects covered a very wide range of initiatives, some of which may contribute to autonomy by creating new technologies and diversifying the industrial base. Given the increased awareness of the need for new technologies to deal with pandemics, support for innovation in the healthcare sector should support autonomy and reduce dependence in the long term. Other projects covered a variety of objectives, with several focused on developing new types of food packaging, combining environmental and health concerns, with reduced dependence on imported hydrocarbons.

Overall, the projects we explore here seem likely to have quite varied impacts on both the geography and structure of the GVCs in which the recipient companies are nested. Although the declared objective of the programme was defined as 'reshoring' and many projects did indeed focus on this objective, they were not the majority. For most of the projects supported by the PdR, the restructuring of GVCs was, at most, a secondary objective. Indeed, several projects seem less related to reshoring than to supporting resilience and autonomy in other ways. For example, projects developing novel technologies and food sources provide a wider range of options in times of stress and thus increase redundancy across GVCs.

Thus, even in the very 'dirigiste' French context, the rhetoric on reducing reliance on overseas production and 'bringing back' production doesn't seem to have been strongly reflected in the nature of supported projects, at least in the initial funding round. In this phase, support for the post-pandemic restructuring of GVCs seems to have been less focused on supporting actual reshoring of overseas production than encouraging the modernization of industry and the development and deployment of new technologies and solutions to improve resilience and autonomy.

8. Conclusions and further research

Several key conclusions about trade protectionism and its impact on GVCs emerge from this work. Firstly, in terms of regulatory policies, trade policy interventions in the face of COVID were extensive across different countries and they persisted over time. Most targeted medical goods, although food security concerns also fostered intervention in that sector and some governments restricted trade in goods completely unrelated to the pandemic. In the specific sub-sector of PPE, many trade restrictions were targeted specifically at masks and bans were common, especially in the early months. The raw materials needed for PPE production faced a very different policy environment, as very few governments placed trade restrictions on these goods. Thus, in terms of the perceived need to foster supply of PPE, governments overwhelming ignored their extensive GVCs, focusing only on the final products. This decision had the side effect of enabling supply of raw materials to expand rapidly, supporting an apparent diversification of global PPE production.

Our exploration of trends in trade in goods related to the pandemic indicates that exports increased substantially, in spite of restrictions. Although exports fell in certain countries, especially those where trade in certain goods was banned (US, India), overall production seems to have expanded extensively, especially in China, resulting in a huge increase in trade, especially in the early quarters. While trade has stabilized since the height of the pandemic, in many countries, flows continue to be higher than pre-COVID levels.

Trade expanded less quickly in the intermediate products needed to produce PPE, but it has persisted at significantly higher levels than prior to the pandemic. The EU, in particular, has expanded its sourcing of these inputs, indicating an increase in domestic capacity building. Detailed analysis of EU trade in PPE and their inputs indicate that the GVC is still strongly regionally oriented. Specifically, over half of imports comes from within the EU and analysis of the sourcing of the key intra-EU sources of final products – Germany, France and Italy – indicates they are strongly rooted in regional value chains.

These figures suggest that the pandemic, and the regulatory response of many governments, has fostered a diversification of the PPE GVC, potentially reducing dependence on overseas production, at least of final goods. Given that the objective of these trade policy interventions was to support the security of supply of pandemic related products, the post pandemic trade figures suggest that, at least to some extent this objective has been secured. Although, unsurprisingly, not in the timescale required to react to the huge demand surges of the first wave of infections. The overall findings of this part of the research are highlighted in Figure 14.

Figure 14 - Overall findings on COVID trade policy restrictions and their impact

Our exploration of facilitatory actions focused on projects supported by the French state in the early period of post-pandemic recovery. Our analysis indicates that, even those projects which were funded under the objective of 'reshoring', were not primarily focused on that aim, but were rather linked to wider goals of supporting modernization of industry, diversification of technologies and upscaling existing structures to meet evolving demand. Although such projects may contribute to long term autonomy and strengthen industrial capacity going forward, in general few projects were ostensibly oriented towards reshoring production to France. The findings of this part of the research are highlighted in Figure 15.

Figure 15 - Summary of findings on French Projects supported under 'reshoring' objective

Whether the limited focus on reshoring we observed was linked to the fact that there were not enough project submissions that truly focused on that objective, or rather reflected a conscious choice by the state to select projects oriented towards other goals, is impossible to know in the absence of details about the project submissions that were unsuccessful. However, what our findings do indicate is that, even in a key EU member state which has been particularly vocal in calling for greater productive autonomy, the actual level of financial support for reshoring in their recovery plan was rather limited compared to other post-COVID priorities.

These conclusions only relate to the initial French programme for recovery and don't necessarily hold in the longer term. Since the early years of the pandemic much has changed in terms of perceived dependence and priorities for recovery. Policy interventions that affect trade have shifted from more visible 'regulatory' trade policy

tools like tariffs and bans, to more 'facilitatory' tools like industrial policy and subsidies. Evenett and his co-authors have been warning for some time that subsidies, especially those that discriminate against foreign actors, amount to 'murky protectionism' (Baldwin & Evenett, 2009). The rapid expansion in the coverage of such state actions since the pandemic, through the Inflation Reduction Act (IRA) in the US and the EU's Green Deal Industrial Plan raises questions about the long term impacts of this massively increased government intervention on trade and key GVCs (Scheinert, 2023). In the EU, concerns about its long-term capacity to secure vital supplies in core technologies like electric batteries (Arroyo & Coletti, 2023; ECA, 2023) and electronics (Hancké & Garcia Calvo, 2022) are fostering extensive 'facilitatory' policy responses, including €20bn subsidies for chipmaking in Germany (Alkousaa & Mukherjee, 2023), and up to €1.5bn in state support for just one battery factory in France (Henley, 2023). Later WPs will need to explore how these massive interventions may impact EU-focused GVCs going forward.

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