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# Post-pandemic reconfiguration from global to domestic and regional value chains: the role of industrial policies\*

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## Abstract

The COVID-19 pandemic is expected to trigger a reconfiguration of global value chains according to four alternative trajectories: reshoring, regionalization, replication and diversification. This paper focuses on the first two scenarios. On the basis of a review of the extant reshoring literature and policies implemented in several major developed and emerging economies, we present a comprehensive framework to classify and analyse the evolution of such policies before and after the pandemic. The paper develops some policy recommendations suggesting that reshoring policies need to be supported by and combined with industrial policies enforcing the competitiveness and sustainability of production systems.

**Keywords:** COVID-19, global value chains, reconfiguration, back-shoring, near-shoring, industrial policy, reshoring

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## 1. Introduction

According to the World Health Organization, the COVID-19 pandemic had caused more than 113 million cases of contagion and more than 2.5 million casualties up to the end of February 2021 (World Health Organization, 2021). At the same time, the pandemic had – and continues to have – a high impact on business activities (Economist Intelligence Unit, 2020) due to the “The Great Lockdown”, as the International Monetary Fund called the containment initiatives implemented by several national governments (Baldwin and Evenett, 2020). This, in turn, hit global value chains (GVCs) heavily because of the disruption to transportation links, the closing of manufacturing plants due to the scarcity of materials and the impediments to personnel movement (UNCTAD, 2020a, b). In a recent contribution, Strange (2020) stated that the impact of the pandemic on GVCs is likely to be disruptive, since (a) it is a global phenomenon, so its effects are largely diffused, compared with localized natural disasters (e.g. the 2011 tsunami in Japan) or sector-specific events (e.g. financial crises); (b) it obliges policymakers to implement public health policies (e.g. lockdowns) with consequent negative impacts on economic activities (e.g. reduction of trade and gross domestic product (GDP), see Austermann et al., 2020); and (c) it is contagious not only in terms of public health but also in terms of economic effects, as national economies are interconnected and globalized. In this respect, Coveri et al. (2020) stated that GVCs are acting as the main transmission channel of economic contagion. Furthermore, Javorcik (2020) pointed out that the disruptive effects of the pandemic on GVCs’ configuration have been reinforced by the increased trade policy frictions, mainly between the United States and China.

The pandemic emerges as a trigger (Benstead et al., 2017; Boffelli and Johansson, 2020) that may induce companies to redesign their production footprint (Barbieri et al., 2020a, b). Therefore, the pandemic may encourage managers to revise and rethink the GVC paradigm. More specifically, four alternative trajectories of international production have been projected by the latest *World Investment Report* (UNCTAD, 2020b): diversification, replication, reshoring and regionalization. The last two trajectories (reshoring and regionalization) imply the shortening of GVCs as well as the relocation of manufacturing activities. Therefore, they are in line with the two so-called “relocations of second degree” phenomena described by Barbieri et al. (2019), namely the relocation of the already internationalized firms into either the home country (i.e. back-shoring, corresponding to the reshoring scenario in UNCTAD (2020b)) or the home macro-region (i.e. near-shoring, corresponding to the regionalization scenario in UNCTAD (2020b)).

In the last 30 years, international production has faced two decades of rapid growth followed by one of stagnation. More specifically, although the worldwide export of goods and services had been growing since the 1990s at more than double the rate of GDP, after the 2009 global financial crisis the growth rate of

international trade slowed down keeping pace with GDP. At the same time, GVC trade as well as the share of total trade declined (UNCTAD, 2020b; Zhan, 2021). Both UNCTAD (2020b) and Enderwick and Buckley (2020) recently investigated the causes of the slowdown of international production trends before the pandemic and found some key political, economic, technological and social factors (for a summary, see the literature review). Such pre-pandemic challenges were recently coupled with the pandemic, after which a huge debate on reconfiguration of GVCs has started to take place. More specifically, a growing number of academics (e.g. Baldwin and Evenett, 2020; Barbieri et al., 2020a, b; Contractor, 2020; Enderwick and Buckley, 2020; Gereffi, 2020; Miroudot, 2020a, b; Panwar, 2020; Strange, 2020; Zhan, 2021), institutions (Betti and Hong, 2020; UNCTAD, 2020b) and practitioners (Rice Jr., 2020; Van den Bossche et al., 2020) are discussing the hypothesis that the pandemic may induce companies to make their GVCs more regional and even more domestic, in order to reduce risks (Ciabuschi et al., 2019) and to adapt the manufacturing networks to the pre-pandemic phenomena that were already weakening the GVC production model. In other words, GVCs are likely to be partially reconfigured and recombined into regional value chains (RVCs) and/or domestic value chains (DVCs).

It is generally accepted that, after the pandemic, governmental decisions are likely to assume a critical role in fostering and boosting such relocation strategies by manufacturing companies. For instance, De Meyer (2020) recently pointed out that the pandemic renewed the primacy of politics over economics. Moreover, the World Economic Forum has specifically recommended managers to “aggressively evaluate near-shore options to shorten supply chains and increase proximity to customers” (Betti and Hong, 2020). Paraphrasing Rodrik (2008), the debate is not about whether governments should be involved, it is about how governments should go about running their post-pandemic policies.

However, until now, scant attention has been paid to the role (if any) that industrial policies may have in boosting the transformation of GVCs into RVCs and/or DVCs (Bailey and De Propriis, 2014a, b; De Backer et al., 2016; Fratocchi et al., 2015; Piatanesi and Arauzo-Carod, 2019). This paper has two aims:

- a. To map industrial policies designed and implemented worldwide before and after the COVID-19 outbreak to support relocation of production activities
- b. To provide a comprehensive framework to classify and compare such industrial policies and to identify innovative trends

In order to reach these research aims, we couple the traditional perspective of back-and near-shoring scholars – who mainly refer to the single firm level – with one focused on the entire value chain – which has rarely been addressed in the extant literature (e.g. Ashby, 2016; Huq et al., 2016). In addition, following Weiss (2011, p. 14),

we rely on the concept of “modern” industrial policies by conceptualizing them “as widely as possible”. More specifically, such policies include “myriad objectives beyond conventional industrial development and structural transformation, such as GVC integration and upgrading, development of the knowledge economy, build-up of sectors linked to sustainable development goals and competitive positioning for the new industrial revolution” (UNCTAD, 2018, p. 146). It has been pointed out that such policies are now commonplace among developing and developed countries. However, whereas developing countries implement industrial policies with the aim of triggering a manufacturing-based and export-driven industrialization phase leading to a successful economic growth, developed countries aim both to restore their manufacturing base after the decline experienced during rapid globalization in the 1990s and 2000s and again after the global financial crisis, and to obtain better strategic positioning in technologically advanced industries (UNCTAD, 2018). Almost all the modern industrial policies that have been implemented include some specific measures that may assume a critical role in supporting the transformation of GVCs into RVCs and/or DVCs.

The remainder of the paper is organized in four sections. The first offers a review of the extant literature on GVCs, back-shoring and near-shoring. The next section focuses on a review of relocation policies implemented in several major developed and emerging economies. In the third section, we propose a comprehensive framework for analysing and classifying reshoring policies, by showing how they are changing after the COVID-19 outbreak and how they are more likely to evolve in the near future. The last paragraph presents policy recommendations and concluding remarks.

## **2. Literature review**

### **2.1 GVC production model: the main levels of analysis**

The concept of GVCs was introduced in the early 1990s by Gereffi (1994) to describe the organization of international production that involves spatially dispersed buyers and suppliers having an input-output relationship, or vertically integrated multinational enterprises (MNEs) having their production facilities dispersed all over the world. The main rationales underlying the formation of GVCs are cost reduction, market development, knowledge and resource augmentation, and risk diversification (Kano et al., 2020). Given that GVCs are a complex and multifaceted phenomenon, this topic has attracted the attention of several disciplines such as economic geography, economic sociology, international economics, regional and development studies, operations management, supply chain management and international business (De Marchi et al., 2020).

On the basis of an extensive review of the literature on international business centred on GVCs, Kano et al. (2020) propose a comparative institutional framework of GVC governance. They assume that such a production model is influenced both by micro-level issues that pertain to the individual (e.g. bounded rationality, cognitive biases and entrepreneurial orientation) and macro-level characteristics stemming from GVCs' external environment (e.g. quality and cost of production input, institutional quality, political stability and economic development). In order to be efficient and competitive, actors within a GVC (and the leading firm in particular) are requested to align the governance system to the micro and macro characteristics of the transactions (Antràs and Chor, 2013; Gereffi et al., 2005; Hennart, 1994; Kano et al., 2020). Therefore, the GVC's governance system needs to be periodically adjusted as a function of the evolution of the micro- and macroeconomic environments. Consequently, Kano et al. (2020) suggest carefully investigating, among others, the temporal dynamics of the GVC. Moreover, they state this type of investigation "will likely shed light on the issue of back-sourcing, inshoring, and reshoring [...] which also is not sufficiently addressed in extant research" (Kano et al., 2020, p. 613).

## **2.2 Challenging the GVC's production model: the pre-pandemic drivers**

As mentioned in the Introduction, UNCTAD (2020b) identified three megatrends shaping the future of international production, namely (i) technology, (ii) policy and economic governance, and (iii) sustainability. Within the first megatrend, attention is mainly focused on some of the technologies enabling the New Industrial Revolution/ Industry 4.0, which, among other benefits, allow companies to (a) reduce production costs and improve productivity (through industrial automation); (b) improve supply chain coordination (through cloud platforms) and traceability (through blockchain applications); and (c) implement mass customization strategies and widespread manufacturing locations close to the final customer (through 3D printing). As regards the policy and economic governance issue, the main trends are the higher interventionism in national policies – often based on a protectionist approach – and the growth of regional or bilateral trade deals – often focused on common-ground issues. Finally, companies increasingly face reputational risks and demand for goods and services that are produced in accordance with environmental and social sustainable criteria. At the same time, major "green" plans are implemented by national and macroregional governments.

Enderwick and Buckley (2020) identified six pre-pandemic phenomena that weakened and challenged the GVs production model. All of them refer to the three megatrends discussed earlier. More specifically, referring to the technology aspect, Enderwick and Buckle (2020) point out that although digitalization facilitates the connection among the different actors – thus favouring this production model (Coviello et al., 2017; Stallkamp and Schotter, 2019) – it also allows companies

to change their business model quickly and to substitute a human workforce with technology, thus easily excluding companies from production networks, especially when they do not belong to innovation hubs (Kano et al., 2020; Nambisan et al., 2019).

Referring to the policy and economic governance megatrend, Enderwick and Buckley (2020) first cite the weakening of the international institutions and agreements that were responsible for designing and enforcing the rules of globalization (e.g., the World Trade Organization, Trans-Pacific Partnership and North American Free Trade Agreement), and whose main consequence has been a general increase in global protectionism that is undermining the existence and nature of the GVC production model (Lawder and Freifeld 2018; Yacoub and El-Zomor 2020). Second, Enderwick and Buckley (2020) also refer to the battle for global leadership, which juxtaposes the United States and China, as shown by the trade wars – which further contribute to increase protectionism – and the race for technological standards. The main consequence is likely to be the polarization of global power between the two main contenders, thus making it difficult to organize value chains across these two geographic areas. Finally, Enderwick and Buckley (2020) mention the growth of nationalism and populism, which not only further challenges the leadership of the United States, but also pushes governments to adopt some specific measures favouring domestic products and the “made-in” effect, thus reducing the appeal of those products which are made across different countries (Walt, 2020).

Finally, considering the sustainability megatrend, Enderwick and Buckley (2020) also refer to the rising concern about social inequalities and environmental changes. Both issues have been identified as consequences of globalization waves, since GVCs imply long-distance transportation – hence, high pollution and carbon emissions – and do not allow a tight control over suppliers, thus increasing the opportunity to take advantage of the poor conditions and less stringent rules regarding workers’ health and environmental protection in peripheral countries.

### **2.3 The future of GVCs: the post-pandemic trajectories**

The *diversification* of GVCs is the first alternative trajectory proposed by UNCTAD (2020b) with regard to the future of international production after the pandemic. It is based on a partial redundancy perspective to ensure GVC resilience. More specifically, companies will maintain their international network of production but will rely more on local companies within host countries to better customize products and to take advantage of the national policies that governments will adopt to recover from the economic crisis caused by the pandemics. In addition, the leading firms will leverage digital technologies (internet of things, blockchain, artificial intelligence) to improve coordination and control of partners, as well as exploiting teleworking and cloud computing technologies to manage activities from a distance.

The second trajectory is the *replication* of the GVCs, which is implemented through multiple facilities located in many countries, while the high value added activities (e.g. R&D) will be concentrated in just a few locations. This trajectory, however, is considered less likely by UNCTAD (2020b) owing to the high cost of replicating and dispersing activities across countries.

A third trajectory is the *reshoring* of the GVCs, which implies the relocation of production activities back to the home country (Fratocchi et al., 2014). This production model is alternative and opposite to GVCs, since it makes them both shorter and less fragmented, thus giving birth to DVCs. Also, in this trajectory, technology plays a crucial role since robotics-driven automation allows companies to substitute labour with technology, thus reducing the importance of cost arbitrage advantages. The concentration of production activities in the home country also allows companies to exploit economies of scale, to avoid trade barriers and tariffs when re-importing intermediate or final goods, to take advantage of nationalist and populist policies and of the made-in effect, and to leverage sustainability-related advantages, making the value chain all domestic and easier to control.

Finally, the fourth trajectory is the *regionalization*, which implies a geographic reconfiguration of the GVCs that would be shortened in the macro-regions, thus giving birth to RVCs. Technology still plays a crucial role, as it allows companies to improve coordination and control and to substitute labor with technology, thus making the role of emerging countries less relevant, including in advanced macro-regions such as the European Union (EU) and North America. RVCs can avoid the risks associated with the lack of free trade, and global leadership (e.g. because they are confined within the EU), can help to mitigate nationalistic and populist tensions (e.g. by distributing those activities of the value chain that were previously located overseas across the different countries of the macro-region) and can also partially meet the sustainability requirements (as they imply shorter transport and tighter control over suppliers; Fratocchi and Di Stefano, 2019).

Table 1 summarizes the interconnections between the four trajectories of international production identified by UNCTAD (2020b) and the pre-pandemic trends affecting the GVC production model (Enderwick and Buckley, 2020; UNCTAD, 2020b). According to Kano et al. (2020), these trends call either for an adjustment of the GVC governance structure or for a redesign and rethinking of the GVC production model itself. However, while digital technologies can potentially foster all four trajectories, the other megatrends (policy and economic governance and sustainability) can be mostly accommodated through the reshoring and regionalization trajectories. In addition, the pandemic is expected to further exacerbate the role of the pre-pandemic drivers, thus accelerating the reconfiguration of GVCs into DVCs and, above all, RVCs (as suggested also by Enderwick and Buckley, 2020; Pla-Barber, Villar and Narula, 2021; Zhan, 2021).

**Table 1. Impact of pre-pandemic megatrends on international production trajectories**

Megatrend	Trend/Pre-pandemic phenomena	Diversification	Replication	Reshoring	Regionalization
Technology	New Industrial Revolution/ Industry 4.0 enabling technologies	☑	☑	☑	☑
Policy and economic governance	More interventionism in national policies		☑ (only for home-country locations)	☑	☑ (only for home-country locations)
	Weakening of international institutions and agreements			☑	
	Return of protectionism			☑	☑
	More regional/ bilateral and ad hoc economic cooperation				☑
	United States–China war for global leadership			☑	☑
	Growth in nationalism and populism			☑	☑ (at least partially)
Sustainability	More green policies			☑	☑
	Market-driven changes in product and processes			☑	☑
	Rising concern for social inequalities			☑	☑
	Rising concern for environmental changes			☑	☑

Source: Authors' elaborations based on Enderwick and Buckley (2020); and UNCTAD (2020b).

The reshoring trajectory has also been supported by ad hoc policies in recent years and could even be accelerated by new policies that might be implemented after the COVID-19 pandemic. However, policies at a macroregional level might also contribute to the creation of RVCs. In the next section, we discuss the relocation policies designed and implemented before and during the pandemic.



### 3. Reshoring policies: a review

#### 3.1 Pre-pandemic policy initiatives

The back- and near-shoring scholars have rarely paid attention to the role of industrial policies as boosters of relocation decisions. Moreover, Srari and Ané (2016) and Zhai et al. (2016) stated that industrial policies are rarely the drivers of back-shoring strategies. At the same time, Fratocchi et al. (2016) found that only 28 out of 377 relocations were boosted by (host-country) governmental incentives and only 3 were encouraged by customs duties for re-import. Finally, the very small number of authors who have investigated the role of industrial policies in supporting back- and near-shoring initiatives mainly describe policies at a national level (Bailey and De Propriis, 2014a, b; De Backer et al., 2016; Fratocchi et al., 2015; Piatanesi and Arauzo-Carod, 2019). To the best of our knowledge, no previous authors have conducted an extensive analysis of the reshoring policies adopted by governments or evaluated their pros and cons and their connection with industrial policies. In this section, policy evidence regarding a group of major developed and emerging economies is summarized by separately analysing the pre- and post-pandemic initiatives, in order to define differences (if any) between the two time periods. Based on the collected evidence, in the next section, a comprehensive framework is proposed for classifying and analysing pro-reshoring (and industrial) policies.<sup>1</sup>

The “Blueprint for an America Built to Last” (White House, 2012) is generally recognized as the first political decision regarding back-shoring (De Backer et al., 2016; Fratocchi et al., 2015). In that document, the Obama Administration defined four pillars (manufacturing, skills, energy and values) that should support the renaissance of the United States economy (Barrentine and Whelan, 2014). Among them, five aimed to attract relocation decisions:

- a. reduction of tax rates (especially related to high-tech), introduction of tax deductions for reshoring costs and elimination of the ones previously recognized for costs related to offshoring strategies;
- b. investment in infrastructure;
- c. creation of 25 “manufacturing universities”, offering engineering curricula specifically aimed at the manufacturing sector;

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<sup>1</sup> Policies were sampled using appropriate keywords on internet search engines and checking the internet sites of governmental agencies for communications about attracting foreign investment from the most relevant developed countries. In general such agencies are requested to manage the implementation of reshoring policies.

- d. creation of 40 “manufacturing hubs” specialized in specific production technology and/or industries and aimed at promoting innovation-oriented collaboration among companies, universities and public administrations (Piatanesi and Arauzo-Carod, 2019); and
- e. reduction of energy costs.

Moreover, in 2012–2013 single states within the United States financed about 1,800 projects regarding relocation (mainly of manufacturing activities) within their borders, investing about US\$80 billion (Valsania, 2013).

More recently, the Trump Administration further underscored the widespread perception of a causal relationship between back-shoring initiatives and job creation (Vanchan et al., 2018), but it focused more on cutting production costs, rather than on providing incentives to innovate on products and production processes (Piatanesi and Arauzo-Carod, 2019). Moreover, President Trump implemented an aggressive trade policy, imposing duties on imports mainly from China, making it more competitive to manufacture in the United States.

In 2013, policy initiatives aiming to boost reshoring initiatives by manufacturing companies were also implemented by France and the Republic of Korea. The French policy was primarily based on a software-based questionnaire (Colbert 2.0) developed to allow small- and medium-sized enterprises (SMEs) to self-evaluate their readiness in terms of relocation strategies. After completing the document, potential candidates for back-shoring were supported through a customized support service including a single contact person for all the bureaucratic fulfillments. Moreover, financial aid was provided by a national fund financed through contributions requested from companies that have offshored their production activities. At the same time, huge attention was devoted to the creation of a positive “Made in France” effect, through the development of the “Origine France Garantie” brand. Finally, a national data set was developed to collect and show the advantages (e.g. availability of industrial areas and/or plants) offered by different French regions (Bellego, 2014). Some years later, however, the Colbert 2.0 software and the single-contact service were deactivated.

In August 2013, the Government of the Republic of Korea decided to support manufacturing by offering subsidies and tax reduction (Chang-Gyun, 2020). Apparently, however, this policy was not regarded as attractive enough, since only 68 firms relocated their production activities between 2014 and 2018. Moreover, only 38 of them are still in business. Such a poor performance has been explained on the basis of several criticalities (Chang-Gyun, 2020; Choi, 2019; Kyung-ho, 2017; Lim and Yeo, 2015):

- a. The national minimum wage was still much higher with respect to the Chinese labor market.

- b. Large companies were not adequately involved in the reshoring initiative; at the same time, Korean SMEs that offshored (mainly in China) to follow their large national customers were not motivated to return to the home country.
- c. The policy did not include subsidies for innovation and collaboration with universities and research centres.
- d. The policy was general purpose, meaning that it was not addressed to specific industries (e.g. the high-tech ones).
- e. Companies were requested to close all manufacturing activities earlier located in China, meaning that slicing reshoring initiatives (Baraldi et al., 2018) was not allowed.
- f. Reshoring incentives were not adequately communicated to Korean companies operating in China; moreover, the law contents were considered too complex.

In June 2016, the Government partially amended the initial policy scheme by introducing a five-year tax exemption for partial reshoring. Moreover, 11 sectors were defined as priority, including robotics, self-driving cars, biotech and health-related products. However, in the first six months after enactment of the law, only two companies took advantage of the new incentives (Chang-Gyun, 2020; Kyung-ho, 2017; Lim and Yeo, 2015). A survey implemented in July–August 2020 by the Korea Institute for International Economic Policy provided evidence that local companies had recommended that the Government lower the exit barriers for companies aiming to relocate their activities back from the “ASEAN Plus Three” countries (China, Japan and the Republic of Korea).

The United Kingdom was the fourth country to implement a reshoring policy in 2014 after Prime Minister Cameron’s speech at the World Economic Forum, in which he stated the following: “I think there is a chance for Britain to become the ‘re-shored’ nation” (United Kingdom Government, 2014, p. 67). More specifically, the “Reshore UK” policy asked the United Kingdom Trade and Investment (UKTI) Agency to support United Kingdom companies that were relocating in identifying local suppliers so as to (re-)develop a national supply chain. At the same time, the Manufacturing Advisory Service – an organization funded by the United Kingdom Government Department for Business, Innovation and Skills – offered advice on business strategies, innovative practices, efficiency of production processes and supply chain services to domestic SMEs aiming to become suppliers of reshoring companies. However, the Manufacturing Advisory Service was closed in 2015 and the UKTI service ended in 2016; since then, initiatives aimed at boosting reshoring initiatives have been partially included in the broader programme of the Innovate UK agency. Finally, support for suppliers’ selection has actually been promoted by the “Reshoring UK” initiative, which has been established as a private league of industrial associations.

Taiwan Province of China was the last economy to introduce industrial policies aimed at attracting reshoring companies just before the COVID-19 pandemic. More specifically, in 2019, it enacted a scheme addressing Taiwanese companies that were affected by the United States-China trade conflict and that have been investing in China for at least two years (National Development Council, 2021). More specifically, to be eligible, companies needed to meet at least one of the following requirements: (a) fall into sectors of the 5+2 Industrial Innovation Plan (i.e. intelligent machinery, Asia Silicon Valley, green energy, biomedicine, national defence and aerospace, new agriculture and the circular economy), (b) belong to industries involving high value added products and/or key components; (c) playing a critical role in the international supply chain; (d) promoting global marketing in private-label brands; and (e) relating the investment project to national key industrial policies (Invest Taiwan, 2021). The scheme offers 10-year financial loans at a subsidized interest rate, a single contact person at the Ministry of Economic Affairs to facilitate paperwork management, availability of industrial areas and further development of industrial parks and scientific parks, support in searching for local skilled workers and facilitation of immigration for foreign talent, and immediate and safe supply of industrial water and power. The proposed incentives and subsidies have been regarded as very appealing for Taiwanese companies, since 204 relocation requests have been accepted, as of October 2020, for a total amount of more than €250 billion and the creation of more than 65,000 new jobs (Invest Taiwan, 2021).

### **3.4 Post-pandemic policy initiative**

As noted by Policy Links (2020), governments have implemented three main “manufacturing policies” to cope with the COVID-19 pandemic, aiming to (a) ensure the continuing operation of manufacturing businesses, (b) mobilize manufacturing towards critical supplies, and (c) support post-crisis manufacturing growth. Among the third type of policies, some countries are implementing – or at least are designing – policies specifically addressed to stimulating the transformation of GVCs into either RVCs or DVCs. In this respect, specific attention has been reserved for health-related industries (e.g. drugs, ventilators, individual protection devices), given their relevance for the management of the pandemic response (Baldwin and Evenett, 2020; UNCTAD, 2020b). Drug production is articulated in several stages, most of which (i.e. starting materials and active pharmaceutical ingredients (APIs)) have been heavily offshored and outsourced to China and India in recent decades. Consequently, European countries and the United States depend heavily on Asia-based pharmaceutical GVCs. Within this scenario, it is interesting to note that India – which is the third-largest producer in the world by volume – was the first country to enact an industrial policy aimed at reducing the dependence of the national drug industry on imports of basic raw materials from China.

More specifically, in March 2020, the Government decided to approve two schemes (Government of India, Press Information Bureau 2020):

1. the promotion of three Bulk Drug Parks (the scheme finances common infrastructure facilities, such as solvent recovery plants, distillation plants, power and steam units and common effluent treatment plants)
2. support for six years to firms ensuring home-country manufacturing of critical starting materials and APIs

In April 2020, the Japanese Government decided to support the relocation of manufacturing activities earlier offshored to China either to the home country or to other Asian countries (Sim, 2020). More specifically, the policy finances the relocation costs to transfer production to the home country or region; in particular, for SMEs operating in health-related businesses and willing to relocate to Japan, incentives are up to 70 per cent. Therefore, it is more likely that low-cost products (e.g. surgical masks) will be transferred to South-East Asian countries, while more high-value products (e.g. ventilators, drugs) will be relocated to Japan. Despite some criticism based on the absence of incentives for R&D activities (Tajitsu et al., 2020), by July 2020, applications had been received for 87 projects (57 regarding back-shoring initiatives and 30 near-shoring ones) for a total amount of €535 million, about one third of the total budget approved in April (Denyer, 2020).

In June 2020, the French Government launched a three-year project to back-shore the entire paracetamol supply chain, a drug heavily requested during the COVID-19 pandemic (Le Figaro, 2020). Also, the European Commission is expected to define a new Pharmaceutical Strategy. As stated by EU officials, “[T]he initiative is to help ensure Europe’s supply of safe and affordable medicines to meet patients’ needs, also through relocations of offshored production activities” (Sarantis, 2020). In the United States, debate continues on the need to make the national drug industry (and others) independent from China and India exports (Wiley, 2020).

However, the health-related industry is not the only one supported by reshoring policies. For instance, in June 2020, the Government of the Republic of Korea decided to focus its efforts on high-tech companies by offering them these incentives (Chang-Gyun, 2020; Eun-Jee, 2020; Jung-a, 2020; Strangarone, 2020):

- a. subsidies for relocation expenses;
- b. further subsidies for reshoring companies investing in robotization and automation of the production processes;
- c. four years of total tax exemption plus a 50 per cent tax discount for the next two years (at the moment, the Parliament is discussing extending the exemption to five years and the tax reduction to the following three years); and
- d. facilitation of visa requests for highly skilled foreign workers.

At the same time, in September 2020, the French Government presented an articulated economic programme to boost the manufacturing sector, in which specific policy tools addressed reshoring companies:

- a. incentives addressed to specific value chains (drugs, aerospace, food, automotive, electronics, critical raw materials heavily adopted in the industry, industrial applications of 5G technology);
- b. tax reduction for micro and SMEs;
- c. administrative support for reshoring-related paperwork;
- d. a €150 million fund to support industrial investment (including the ones belonging to back-shoring initiatives) in different regions, on the basis of comparative advantages specifically owned by geographical areas; and
- e. a list of industrial plants available for new production activities.

According to the most updated data, the French Government has received applications for up to 3,600 projects for relocating production activities in the chosen industries; they refer to both back-shoring and “kept from offshoring” decisions (Les Echos, 2020). This performance may be, at least partially, explained by the simplification of procedures requested to access the subsidies implemented by the Minister of Economy after criticism by the Mouvement des Entreprises de France, the largest French association of entrepreneurs. Finally, it is worth nothing that only 180 relocations have been implemented in France in the last 15 years (Vittori and Hyppolite, 2020).

Further initiatives are under evaluation by other governments, for instance Australia (Smyth, 2020) and Italy (Fotina, 2020). Finally, the United States President Biden seems to be oriented to making supply chains less dependent on China imports, at least for the one involving products that are critical for key military technologies (e.g. semiconductors and rare earth elements) (Eversden, 2021).

## **4. Towards a framework for GVCs reconfiguration policies**

### **4.1 A comparison between pre- and post-pandemic reshoring policies**

The policies reviewed earlier allow us to compare pre- and post-pandemic reshoring policies implemented at a global level. In this respect, table 2 summarizes the most relevant characteristics of the sampled initiatives according to policy targets (e.g. type of industry or company, type of relocation) and benefits (e.g. economic and financial versus human capital).

**Table 2. Characterization of sampled reshoring policies**

Year/Period	Pre-pandemic policies						Post-pandemic policies				
	2012–2016	2013	2014	2016	2016–2020	2019	2020	2020	2020	2020	
<b>Country</b>	United States	France	Republic of Korea	United Kingdom	Republic of Korea	United States	Taiwan Province of China	India	Japan	France	Republic of Korea
<b>Policy targets</b>	Single companies	Single companies	Single companies	Single companies	Single companies	Single companies	Single companies	Single companies	Single companies	Single companies and consortia	Single companies
	Single companies	Single companies	Single companies	Single companies	Single companies	Single companies	Single companies	Single companies	Single companies	Single companies and consortia	Single companies
	Back-shoring	Back-shoring	Back-shoring	Back-shoring	Back-shoring	Back-shoring	Back-shoring	Back-shoring	Back- and near-shoring	Back-shoring	Back-shoring
	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
<b>Cost and financial issues</b>	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
<b>Supply chain</b>	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
<b>Public administration</b>	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

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Table 2. Characterization of sampled reshoring policies (Concluded)

Year/Period	Pre-pandemic policies										Post-pandemic policies		
	2012-2016	2013	2013	2014	2016	2016-2020	2019	2020					
Country	United States	France	Republic of Korea	United Kingdom	Republic of Korea	United States	Taiwan Province of China	India	Japan	France	Republic of Korea		
<b>Infrastructure</b>	Development of production infrastructure (e.g. industrial areas, scientific parks)						✓						
	Other infrastructure (e.g. railways, motorways)	✓											
	Information on availability of plants		✓				✓			✓			
	Plant utilities continuity						✓						
<b>Innovation</b>	Innovation policy (e.g. collaboration with universities, support service for innovation technology)												
	Human capital development (e.g. academic curricula)	✓			✓								
<b>Human capital</b>	Human capital availability (home-country residents and foreigners)	✓										✓	
	Home-country "made in" brand image		✓										
<b>Protectionism</b>	Duties and tariffs on imports											✓	

Source: Authors' elaboration based on multiple sources.



It emerges immediately that the pandemic has pushed policymakers to design and implement reshoring initiatives; more specifically, while five countries developed national policies in the eight years before the pandemic, four have developed new policies within only seven months of the pandemic outbreak. This evidence confirms the idea that with the pandemic a renewed primacy of politics over economics has emerged (De Meyer, 2020).

At the same time, it is worth noting that post-pandemic initiatives have been enacted both by nations that already experienced reshoring policies (France and the Republic of Korea) and by countries that never developed them (Japan and India). Moreover, the initiatives considered all address specific industries, mainly health-related and high-tech ones. In this respect, the decision to focus on specific target industries was implemented for the first time in 2016 by the Government of the Republic of Korea when it redesigned its initial 2013 policy in the face of the poor effects in terms of the number of back-shored companies. Subsequently, the policy focalization was implemented by the Taiwanese Government, which was the last government to implement a reshoring policy before the pandemic.

In terms of benefits, no relevant differences emerge between pre- and post-pandemic policies, the effects related to cost and financial aid being more diffused – as is usual in industrial policies (UNCTAD, 2018) – followed by the ones regarding infrastructure and relationships with public administration. It is worth noting that the majority of the policies considered include a variety of tools, spanning two or more of the categories proposed in table 2. This seems to reflect the need for a broad perspective in designing a reshoring policy, in order to account for the vast array of reshoring motivations (Barbieri et al., 2018; Boffelli and Johansson, 2020; Fracocchi et al., 2016), and to tackle the barriers hindering relocation initiatives (Engström et al., 2018a, b). Concerning the latter, scholars have devoted specific attention to the lack of skilled human resources (e.g. Bailey and De Propriis, 2014a, b; Engström et al., 2018a, b; Nujen et al., 2018; 2019) and the availability of specialized suppliers (Ashby, 2016; Robinson and Hsieh, 2016). In this respect, the experience of the United Kingdom deserves a special note, as British companies aiming to reshore were supported in finding national suppliers. Moreover, local SMEs were specifically supported in implementing process and managerial innovations in order to become more attractive to relocating companies. At the same time, the presence of incentives related to human capital appears noteworthy (i.e., policies of the United States and Taiwan Province of China before the pandemic and the Republic of Korea since the outbreak). All this evidence is consistent with Srαι and Ané’s (2016) expectations of better comprehension of relocating companies’ needs by policymakers.

When considering the role of reshoring policies for post-pandemic reconfiguration of GVCs, two main and relevant elements emerge as evolutionary with respect to previous policies. The first one is with regard to the “geographic horizon” of the

policies analysed, as shown by the Japanese initiative, which specifically addresses the near-shoring alternative by offering economic support for companies aiming to relocate in other Asian countries those manufacturing activities they earlier offshored to China. Generally, policies implemented by single countries aim to relocate manufacturing activities to the home country, in order to both make the (domestic) value chain stronger and positively affect employment and GDP growth. Therefore, the creation of RVCs through support for near-shoring firms' strategies would be more likely to be supported by supranational (i.e. macroregional) institutions, such as the EU, than from single countries.

However, the pandemic also induced a single country, namely Japan, to design industrial policies that also incorporate international relations within the home region. The interconnection between reshoring and foreign policies' aims was already at the basis of the 2019 Taiwanese Government's decision to specifically address manufacturing companies offshored in China that were negatively impacted by the trade war between the United States and China. Moreover, it was also the basis of the 2020 initiative by the Republic of Korea that aimed to reduce the dependency of national manufacturers on both Chinese and Japanese exports (Eun-Jee, 2020). All this evidence has prompted some experts to conceptualize the back-shoring initiatives as a form of protectionism, inducing a growing negative judgment on reshoring policies (see, for instance, Stellingner et al., 2020), as they are likely to create difficulties in political relationships at the worldwide level (Oxford Analytics, 2020), and increase costs when compared with offshored production (Guinea and Forsthuber, 2020).

The second main evidence arising from the analysis of post-pandemic policies is regarding their "reshoring targets". As already noted, since the 2016 Korean initiative and the 2019 Taiwanese initiative, policymakers have focused their efforts on specific industries, mainly the most technological and innovative ones. The "verticalization" of industrial policy is consistent with Rodrik's (2008) advice and with evidence collected by UNCTAD, which found that 40 per cent of sampled industrial policies contain "vertical policies for the build-up of specific industries" (2018, p. xiv).

However, the post-pandemic policy enacted by France provides evidence of a further focalization of the policy targets. More specifically, the French initiative initiated a shift from the traditional single company target to the consortia and the entire supply chain. For instance, Salomon, Millet and Babolat, three competitors in the sports footwear industry, decided to build a joint production facility (Advanced Shoe Factory 4.0) in the Auvergne-Rhône-Alpes region to manufacture up to 500,000 pairs of shoes per year by mid-2025. The facility was expected to start production by mid-2021 and will offer several benefits to founding companies, such as (a) greater speed to market and

reaction to demand changes; (b) greater flexibility in the development of brands' product lines (e.g. small-volume models); (c) reduced carbon footprint of production activities; and (d) reduced production costs, thanks to a streamlined assembly process with the use of robotics in the factory (Snow Industry News, 2020).

In other words, it seems that the pandemic has made it clear that the relocation of a specific product (e.g. paracetamol) often requires a broader (re)construction of the entire value chain and it is not limited to a single company. This is also consistent with one of the criticisms of the pre-pandemic policy in the Republic of Korea, which did not pay enough attention to the leading company, whose reshoring decision would activate the same decision by all the SMEs in its supply chain. In turn, such a value chain-based approach calls for an "orchestrator" who carefully manages the complex set of interdependencies among different actors. In this respect, it is more likely that this coordination will require a longer timespan if managed only by companies, while it would be speeded up if boosted by industrial policy initiatives. Once again, the renewed primacy of politics over economics after the COVID-19 pandemic clearly emerges (De Meyer, 2020).

## **4.2 A framework for GVCs' reconfiguration policies**

Based on the earlier discussion, we propose to classify reshoring policies according to two original insights that emerged when comparing pre- and post-pandemic reshoring policies: geographic horizon and reshoring target. More specifically, the geographic horizon regards the destination of the relocation strategy, namely either the home country (back-shoring) or the home region (near-shoring). In contrast, the reshoring target regards either single companies or the value chains; however, it seems useful to further articulate the former alternative within two sub-aggregates, according to the policy focus (if any) on specific industries. Combining these two dimensions in a 2 by 2 matrix, it is possible to characterize and compare all the sampled reshoring policies (figure 1).

As shown in figure 1, currently no policy addresses the lower right quadrant, the one referring to policies aimed at relocating entire value chains in the home region. However, in the very near future this gap could be filled either by agreements among single countries or by supranational (i.e. macroregional) institutions. As far as the former is concerned (agreements among single countries), in September 2020 the trade ministers of Japan, India and Australia agreed to develop a "Supply Chain Resilience Initiative". The project – which in perspective could be enlarged to other Indo-Pacific countries – aims to reduce the dependency of industries in the three countries on China by creating alternate supply chains "based on trust and stability", as recently stated by Indian Prime Minister Modi (Rajagopalan, 2020).

**Figure 1. Proposed framework for reshoring policies classification**



Sources: Authors' elaboration.

Note: Data in italics refer to post-pandemic industrial policies.

Moreover, within an integrated area (such as the EU), a macroregional industrial policy (or at least, the coordination of the national ones) is likely to be even more effective in re-attracting multiple firms in complex value chains articulated in several production stages. By adopting a regional perspective, it is possible to leverage cross-country heterogeneity in terms of owned manufacturing competences and production capabilities to recreate the GVCs within the home region, thus giving birth to RVCs. In this respect, two initiatives deserve a special note within the EU context. The first one concerns the EU-financed Tex-Med Alliances, which involves textile and fashion industrial districts located in the Mediterranean countries (Spain, Italy, Greece, Tunisia, Egypt, Jordan and Palestine). The project – started in February 2020, just before the pandemic explosion in Europe – may have a major role in supporting back-shoring and near-shoring strategies based on higher product quality and shorter delivery times compared with imports from Asia. The second initiative has been recently proposed by the chair of Fondazione Altgamma (an Italian association of 107 brands operating in the high-end fashion and luxury industries). He recently suggested developing a relocation project aimed at creating a pan-European RVC for technical fabrics (Crivelli, 2020). Both initiatives involve interplay among a plurality of actors; therefore, their implementation entails some barriers that need to be addressed by firms, policymakers and companies' networks. Indeed, the near-shoring of entire value chains requires coordination and integration efforts that are likely to be significant, as this process involves not only multiple firms but also different countries, which might exercise opportunistic behaviours and create a race for hosting as many relocation initiatives as possible.

Therefore, supranational institutions belonging to macro-regions emerge as the natural leading actors for such complex projects. This is the reason why, in March 2021, the European Parliament published an extensive study analysing the GVC reshoring scenario and policies supporting the return of production back to Europe, with a focus on four strategic industries, i.e. pharmaceuticals, medical products, semiconductors and solar energy (Raza et al., 2021).

## **5. Conclusions, policy implications and recommendations**

The COVID-19 pandemic is likely to act more as an accelerator than as a driver of those pre-pandemic forces that were already changing the macroeconomic context, thus inducing companies to shorten their GVCs through either near-shoring or back-shoring initiatives, corresponding to the regionalization and reshoring scenarios proposed by UNCTAD (2020b). Based on such a conceptualization, in this paper, policies supporting such firms' strategies at the worldwide level were identified, analysed and compared. In this respect, it clearly emerges that these policies, whether implemented before or after the pandemic, are consistent with a modern perspective, since they also cover topics such as innovation (e.g. the United Kingdom and the United States under President Obama's Administration), transportation infrastructure (United States) and human capital (United States and Taiwan Province of China). However, the COVID-19 crisis motivated national governments to further develop such policies by introducing some novelties with respect to the ones enacted before the pandemic. First, the new policies are all focused on specific industries, whether related to health needs or high-tech. At the same time, evidence was found of an enlargement of the policy targets, including consortia of firms and even entire value chains. Moreover, the post-pandemic policies considered provide evidence that single countries decided to support not only relocations to those home countries but also to the home region, enlarging the geographic horizons of policies.

From this evidence, we developed a framework for the classification of reshoring policies, which also offers some insights on the possible evolution of the reshoring policies, i.e. the near-shoring of the entire value chain in the home region. While no evidence of such policies is currently available, future implementations are likely to occur in very soon. In this respect, policymakers should carefully evaluate the set of tools to be made available for (groups of) firms involved in the relocation initiative, to boost their willingness to relocate to the home region.<sup>2</sup> Until now, governments have offered mainly financial and fiscal incentives,

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<sup>2</sup> Some of the policy instruments proposed in this section can be part of wider investment promotion activities.

since these are the most attractive and easiest tools to be applied in the short term. However, such subsidies might not be enough to boost a real wave of second-degree relocations, as in the case of the Korean policy initiatives (Choi, 2019). Therefore, following UNCTAD (2020b), policymakers aiming to develop pro-reshoring initiatives should carefully evaluate how to improve the success rates of their initiatives by matching reshoring policies with others aimed at re-establishing manufacturing skills and infrastructure. In this respect, as pointed out by Srari and Ané (2016, 7209), “[F]uture policy initiatives of developed countries should align with firm strategies for responsive supply, emphasising local brand and quality attributes and actively engaging with firms considering restructuring projects”. Moreover, policymakers should carefully evaluate barriers (Engström et al., 2018a, b) and risks (UNCTAD, 2020b) that might characterize the implementation of back- and near-shoring initiatives. Among these, specific attention should be given to the lack of skilled human resources (Bailey and De Propriis, 2014a, b; Engström et al., 2018a, b; Nujen et al., 2018; 2019) resulting from previous decades of offshoring, which gave rise to de-industrialization phenomena in several Western countries. Therefore, policymakers should support the training and education sector in revising curricula, thus stimulating collaboration between universities, educational institutions and companies.

Furthermore, relocation policies need to be supported by and combined with industrial policies that enforce the competitiveness of the home country's or macro-region's production system, by boosting innovations aimed at improving product value (differentiation strategy) and/or reduce production costs (efficiency-seeking strategy). In this respect, specific attention should be given to technologies enabling the Industry 4.0 phenomenon (UNCTAD, 2020b), since they may support both differentiation (e.g. through the internet of things) and efficiency-seeking (e.g. through automation) strategies; furthermore, it has recently been shown that they may support back- and near-shoring strategies (Fratocchi and Di Stefano, 2020).

Finally, as recently pointed out by Aernoudt (2020), reshoring policies should be based on both an evidence-based approach – which involves a combination of scientific, pragmatic and value-led knowledge (Ehrenberg, 1999; Flyvbjerg, 2001) – and a foresight-based perspective – which implicates the aim to reshape the future. Consequently, relocation policies should link tangible (e.g. infrastructure) and intangible (e.g. mindset towards industry and vocational training) aspects. In this respect, the role of supra-national policymakers (e.g. the EU) deserves a special note. Indeed, these actors should pay attention to matching reshoring initiatives with other industrial policies aimed at re-establishing manufacturing skills and infrastructure. This requires a careful selection of industries worthy of being relocated within the European macro-region (Damen, 2020). In this respect, APIs and medical devices seem to be two of the most promising options.

Other relevant industries should be solar energy and electric car batteries, since the EU Commission aims “to establish a competitive and sustainable European battery value chain” (European Commission, 2018). It is worth noting that this policy simultaneously aims to create RVCs and promote environmental sustainability issues addressed by the EU Commission project called the Green New Deal. A final value chain that the EU Parliament is considering to back-shore to Europe is the semiconductor industry, in order to decrease the technological dependence of the EU on other geographic areas. However, as pointed out by UNCTAD (2020b, p. 162), “regional value chains are not easy to establish ... [therefore] while the political momentum for a shift to regionalism is mature, the implementation will not be immediate”. Moreover, a completely European strategic autonomy is unlikely to be possible; therefore, the EU should adopt an “open” strategic or “smart” reshoring perspective (Damen, 2020).

This paper also offers a stimulus for future research. In this respect, scholars should develop theoretical and empirical evidence that can be useful in evaluating the outcomes of the relocation policies implemented by different countries and by supranational policymakers (if any) after the COVID-19 pandemic. More specifically, they should verify whether the initiatives supported by and combined with industrial policies (e.g. Industry 4.0, environmental and training policies) are more effective than those that are merely reshoring-oriented, and whether those that aim to foster the switch from a production model based on GVCs to a new one based on RVCs and DVCs are more effective than reshoring policies that target single firms. Future research should include analysis of reshoring policies of a broader population of emerging economies, as well as policy responses in developing countries in the wake of reconfigurations of GVCs in the post-pandemic world.

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