

# RECONCILING EFFICIENCY, RESILIENCE AND SUSTAINABILITY: GLOBAL VALUE CHAINS IN A POST-COVID-19 WORLD

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## INTRODUCTION<sup>1</sup>

The COVID-19 pandemic and its disrupting effects on international trade (e.g., Kejžar et al. 2021) have intensified debates on the structure of global value chains (GVCs). Against a long tradition of almost exclusively focusing on the efficiency of GVCs, where production processes were fragmented and each production step was located to the place where production costs were lowest, the prominence of the concept of resilience of GVCs is a recent phenomenon (cf. Bogaschewsky 2020; Gölgeci et al. 2020). GVC resilience is generally understood as “the adaptive capability of supply chains to prepare for unexpected events, respond to disruptions and recover from them by maintaining continuity of operations at the desired level of connectedness and control over structure and function” (Ponomarov/Holcomb 2009: 131). Given the supply problems with respect to critical goods (e.g. pharmaceuticals, medical products) during the pandemic, and a growing awareness of import dependencies on a wide variety of intermediate and final products from East Asia (e.g. semiconductors from Taiwan, rare earths and solar panels from China), both the United States (US) and the European Union (EU) are currently aiming at fostering their strategic and technological sovereignty through policies that promote domestic production, re-shoring of production as well as “friend-shoring” of production to countries considered political allies.

A major drawback of the current discussion on GVC resilience, however, is that it is not sufficiently linked to the debate on how to increase the sustainability of post-COVID-19 GVCs. Against the ever more drastic consequences of climate change, the EU has recently introduced a broad set of policies under the European Green Deal program, which aim at a profound transformation of the prevailing model of production and consumption. This includes *inter alia* policies to decarbonize energy production and transportation, as well as to promote recycling and the circular economy. The debate on pro-

moting GVC resilience needs thus to be integrated with the debate on making GVCs more sustainable.

In this article, we aim at making both a conceptual as well as a policy contribution to this debate. In sections 2 and 3, the interlinkages and trade-offs between GVC efficiency, resilience and sustainability will be explored and a conceptual framework be introduced that provides a systemic way of thinking about the issues involved. Section 4 provides an overview of policies to promote resilience and sustainability that are currently implemented in leading economies of the Global North. Section 5 provides a concluding discussion on possible policy responses in the EU including the need for addressing the impact of such policies on the countries of the Global South.

## RESILIENCE AND SUSTAINABILITY DEFICITS IN TODAY'S GVCs

Today's global economy is dominated by GVCs, i.e. globally dispersed and decentralized production networks that are governed by multinational ‘lead’ firms (Gereffi 1995, 1994). In the last three decades, the expansion of GVCs, including offshoring and outsourcing processes, was dominated by efficiency principles and lean supply chain management, ultimately driven by the short-term perspective and shareholder-value orientation of lead firms. As a result, most GVCs can be characterized by relatively low levels of resilience and sustainability, even though the vulnerabilities, bottlenecks and key issues differ between sectors and products (Azevedo et al. 2008; Govindan et al. 2015; Grumiller et al. 2021).

## GVC RESILIENCE

There is a large number of different scientific fields conceptualizing resilience in different ways (IRGC 2018), including broader societal (OECD 2019) and more narrow supply chain perspectives. The supply chain

literature has a strong focus on firms and typically differentiates, among others, between lean, resilient, agile and green supply chain management strategies (Carvalho et al. 2011; Govindan et al. 2015). In this context, Ponomarov and Holcomb (2009) define resilience “as the adaptive capability of supply chains to prepare for unexpected events, respond to disruptions and recover from them by maintaining continuity of operations at the desired level of connectedness and control over structure and function”.<sup>2</sup>

In today’s GVCs, the major challenges with regard to resilience and supply security include (i) just-in-time manufacturing, (ii) single sourcing, and (iii) regional clusters (Reiner et al. 2022). As a result, just-in-time manufacturing became a widely used production and logistics model to reduce warehousing and capital costs, effectively reducing redundancies and thus the resilience in supply chains. Similarly, the trend towards single-sourcing, i.e. firms aiming to reduce or minimize the number of supplying firms (to only one supplier in extreme cases) to decrease supply-chain management costs, further increased the likelihood of today’s GVCs to supply shocks due to a lower degree of supplier diversification. The regional diversification of suppliers, in addition, was also reduced due to the emergence of regional clusters in light of intensifying international competition and the exploitation of competitive advantages as well as economies of agglomeration and scale benefits. However, in the last decade, and in the light of increasing GVC vulnerabilities, firms and the supply chain management literature have a new-found interest in resilient supply chain management strategies (Carvalho et al. 2011; Govindan et al. 2015; Scheibe/Blackhurst 2018).

Much of the literature generated on GVC resilience in the wake of the COVID-19 pandemic focused on the trade-off between resilience and efficiency (Gölgeci et al. 2020), underlining the need for flexibility, diversification and redundancies with regard to the number of suppliers and supplying regions, the creation of emergency/excess capacities, the size of inventories, and more. However, this body of literature says little about how measures to increase resilience are interrelated with the sustainability of GVCs. The contradictions and compatibilities between resilience and sustainability thus remain undiscussed, and options for firms and policy-makers to combine these two goals under-explored.

## GVC SUSTAINABILITY

From a sustainability perspective, and following the UN’s 2030 Agenda for Sustainable Development, we can generally differentiate between economic, social, and environmental sustainability issues in the context of GVCs (cf. Blumenschein et al. 2017). The role of sustainability issues in the GVC and supply chain management literature was only integrated gradually during the last two decades (Bair 2005; De Marchi et al. 2019), and particularly discussed in the context of upgrading concepts<sup>3</sup>, focusing on solving the problems of GVCs, within GVCs.

However, in how far GVCs are contributing to solving, or creating and exacerbating many of today’s sustainability issues is the subject of critical debate. Defenders of GVCs generally highlight the benefits and opportunities of GVCs, in particular with regard to the prospects of export-oriented industrial development in the Global South, employment creation, and the opportunity to ‘learn’ from innovative lead firms – generating productivity growth (cf. Gereffi et al. 2001; World Bank 2020). More critical authors, in contrast, highlight that GVCs may also lead to economic, social, and environmental “downgrading” in the Global South, pointing to the issue of bad working conditions and environmental pollution in the context of exploitative multinational firms and weak regulations (e.g., Rossi et al. 2014; Selwyn 2019). A major issue in this context is that ‘learning’, productivity generation, and upgrading by firms in the Global South is often blocked by multinational corporations, who have an interest in protecting their know-how and value-generating activities. Multinational corporations, in addition, stand to benefit from low wages and weak environmental protection in case consumer awareness and regulation in the Global North is not sufficiently developed.

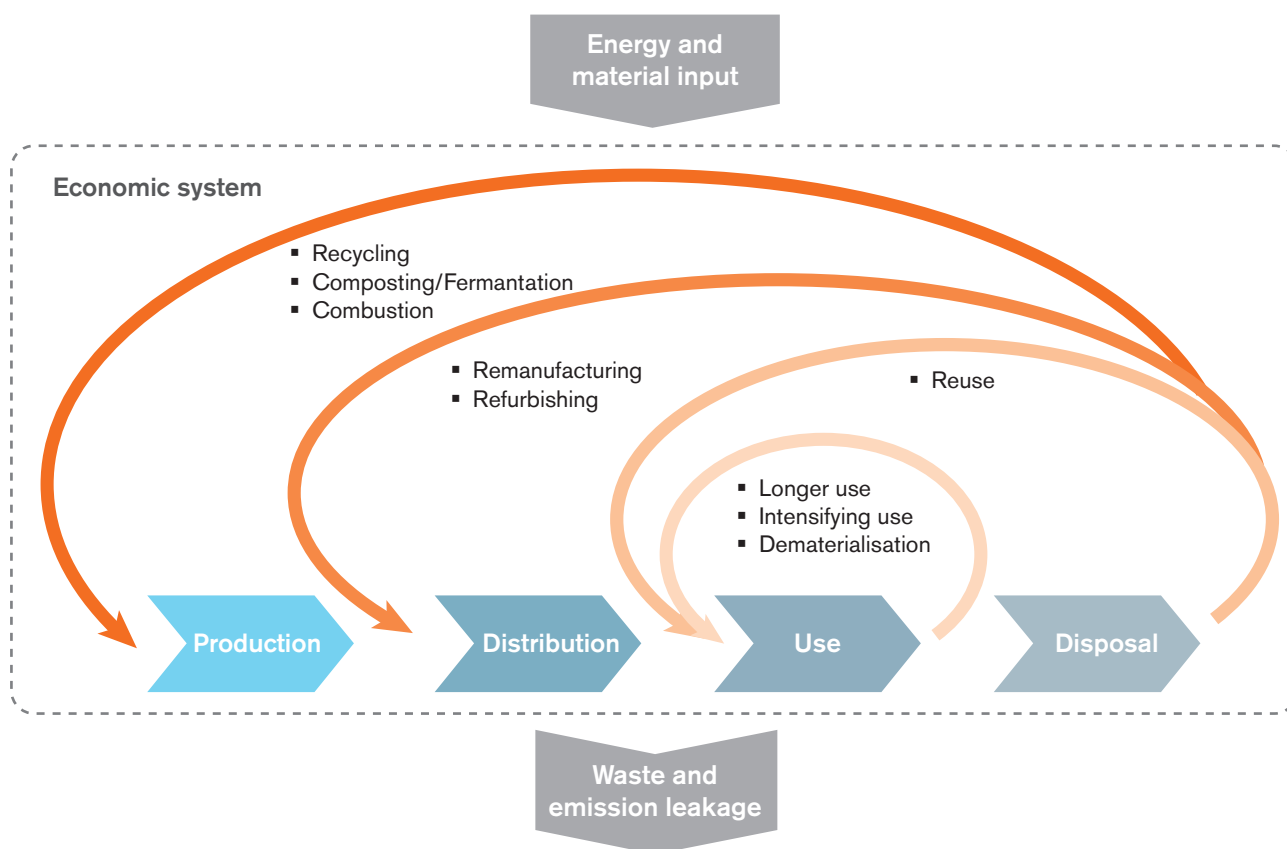
Independently of one’s stance on the general impact of GVCs on global development, it is clear that the strong growth of international trade has negative effects on the environment, and that a large variety of social sustainability issues are still pertinent. For instance, CO<sub>2</sub> emissions from global freight transport account for about 7 % of global emissions and are expected to increase by a factor of about four till 2050 (OECD, ITF 2016). There is, thus, a general agreement that today’s GVCs need to be more socially and environmentally sustainable.

Arguably, the most important concepts that shaped the debates on how to promote environmental sustainability in the economy and GVCs in the last decade is that of economic regionalization and circularity. In the field of economic geography, regionalized or deglobalized production models have long been debated as more environmentally sustainable and – potentially – also more resilient (e.g., Hudson 2010, 2007). Economic circularity, for which various definitions exist (Geissdoerfer et al. 2020; Kirchherr et al. 2017), was popularized by reports of the Ellen MacArthur Foundation, in collaboration with McKenzie (EMF 2015, 2014, 2012). The rather prominent work of Geissdoerfer and collaborators define circularity as an “economic system in which resource input and waste, emission, and energy leakages are minimised by cycling, extending, intensifying, and dematerialising material and energy loops” (Geissdoerfer et al. 2020: 3, see also 2017). From a sustainability perspective, the goal is

thus to ‘close the loop’, i.e. transform linear and wasteful production models into circular ones (see Figure B).

The structures and dynamics of today’s GVCs are contradictory to the ideas of regionalization and are a key challenge for the realization of circularity (Hofstetter et al. 2021). This is because GVCs are globally dispersed, fragmented and ‘linear’ (i.e. non-circular) production networks, in which independent yet interconnected firms cooperate. From a sustainability perspective, the goal is thus to transform linear and wasteful production models into circular ones. However, the main challenge for firms is that transforming linear production models is costly, risky and potentially uncompetitive/unprofitable, which is why the promotion of circularity often requires policy-support. In the EU, the circularity concept has been taken up by the European Green Deal (EGD) and the Circular Economy Action Plan (CEAP).

Figure B: The circular economy



Source: Geissdoerfer et al. (2020: 4)

## PROMOTING GVC RESILIENCE AND SUSTAINABILITY IN A POST-COVID-19 WORLD

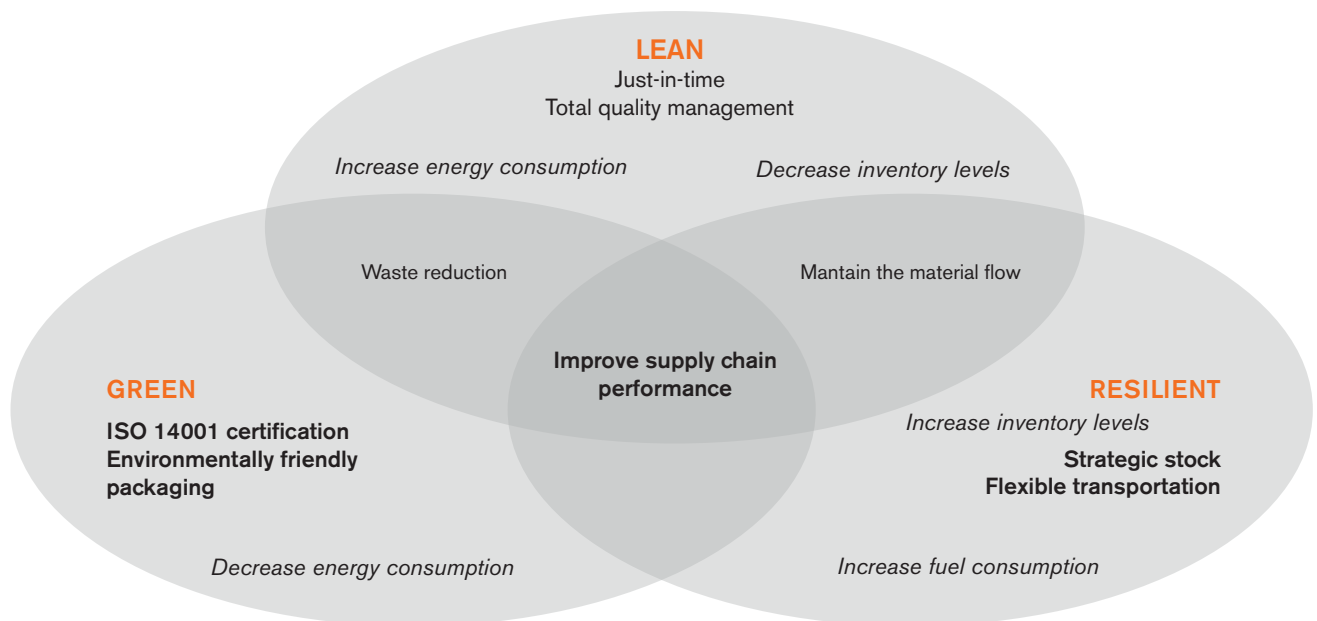
### CONCEPTUALIZING TRADE-OFFS AND COMPATIBILITIES

Supply chain strategies and policies can emphasize efficiency, resilience and sustainability to different degrees, and even though these concepts are to some extent conflicting and involve trade-offs, they have also elements of complementarity. Much of the debate that evolved during the COVID-19 crisis, however, focused on the perceived contradictions between efficiency and resilience (Gölgeci et al. 2020). In a Wall Street Journal commentary, for example, Galston (2020) argues that firms have focused too much on efficiency during the last decades. The latter was achieved through the optimal adaptation to the existing environment, undermining resilience, which requires the capacity to adapt to shocks and changes in the environment. According to this understanding, optimal adaptation to the existing environment is understood to undermine the capacity to adapt to disruptive changes (Rai 2020; Reeves/Varadarajan 2020; Remko 2020). Gölgeci et al. (2020), in contrast, argue that much of the debate on the trade-offs between efficiency and resilience is re-

lated to a focus on the short-term, whereas in the long-run, firms need to achieve both: coping with fierce market competition as well as unexpected disruptions.

The supply chain management literature (Carvalho et al. 2012, 2011; Govindan et al. 2015), in addition, discusses the contradictions and complementarities between efficiency, resilience and environmental sustainability from a firm perspective and based on the concepts of lean, green and resilient supply chain strategies (Figure C). Within this framework, resilience-oriented strategies accept a lower degree of efficiency and sustainability in order to achieve more resilience. As a result, and from a firm perspective, resilience-oriented strategies may aim for higher buffer stocks or for more diversified supplier networks, and hence depend on a lesser degree on single sourcing or just-in-time solutions that are often preferred by lean strategies. Similarly, resilience-oriented strategies may accept more resource and energy consumption to ensure supply chain security compared to strategies that put a greater emphasis on sustainability. There are, nonetheless, important compatibilities between the strategies. This is because, for example, lean and sustainable strategies may both have an interest in the reduction of wastage to decrease costs and the environmental footprint. Similarly, resilience-oriented strategies may aim to ensure resilience with the lowest environmental footprint (Carvalho et al. 2012, 2011; Govindan et al. 2015).

Figure C: Lean, green and resilient supply chain management

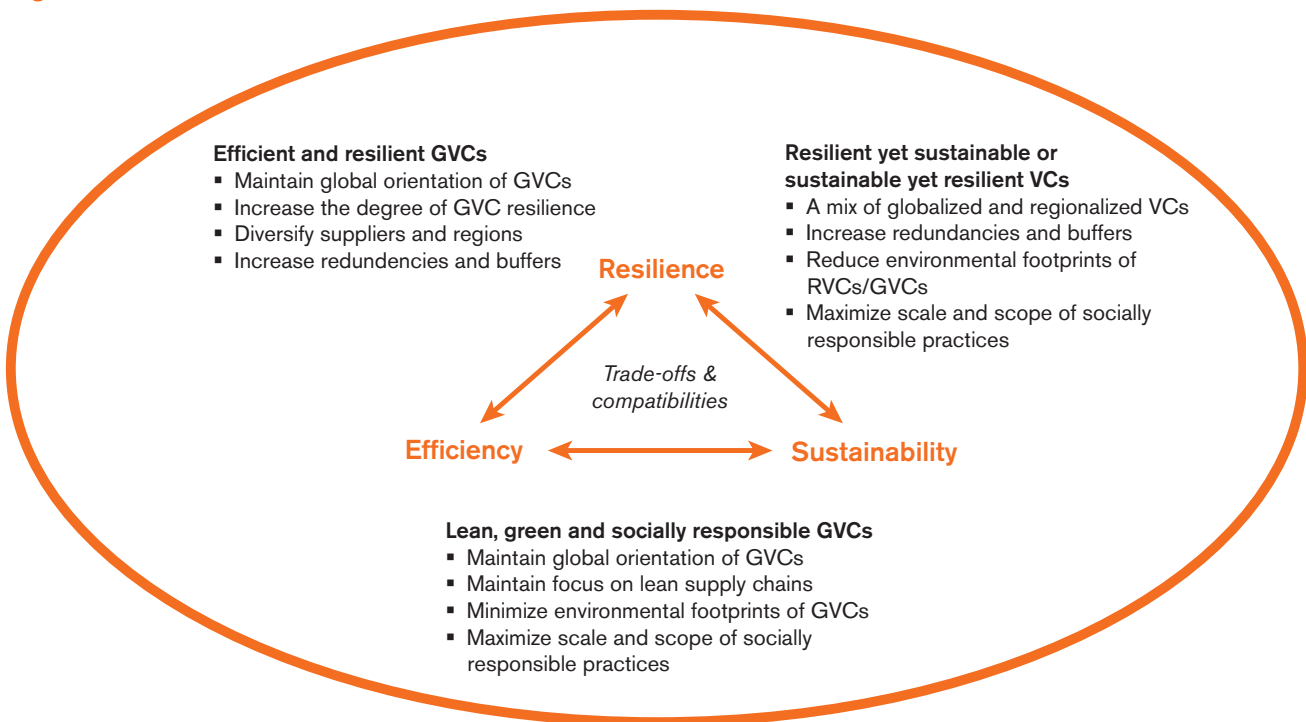


Source: Govindan et al. (2015: 17)

However, it is important to note that resilience and sustainability from a societal and thus policy-perspective can have a very different meaning compared to firm-centered approaches. This is because policy-makers and firms may hold different perspectives on the costs of supply chain disruptions or environmental pollution as well as the benefits of security of supply and sustainability. The perspective on efficiency, in addition, may also differ between policy-makers and firms, since the latter generally do not account for negative externalities in their cost-calculations. The mismatch between societal and firm perspectives, and the fact that increasing the resilience and sustainability of supply chains can be very costly and go beyond the capacities of individual firms, are the major justifications for policy interventions targeting supply chains.

The optimal policy response to promote both resilience and sustainability in GVCs, thus, heavily depends on the specific policy objectives and on how policy-makers assess the trade-offs between efficiency, resilience, and sustainability. From a policy-perspective, the emphasis put on these three policy goals is likely to differ between specific sectors and products, given that, for instance, the resilience of pharmaceutical and medical products GVCs might be considered more important than that of luxury goods GVCs. In this context, we propose a typology with respect to the efficiency, resilience and sustainability of GVCs, which allows us to systematically think about both the trade-offs and compatibilities between the three policy-goals of promoting/maintaining efficiency, increasing resilience and promoting GVC sustainability, and to identify GVC models that to varying degrees promote the policy-goals and thus could be adopted by firms under specific circumstances (Figure D).

Figure D: GVC models



Source: Own elaboration

A strong focus on efficiency and sustainability, for example, does not necessarily change the global orientation of supply chains, but is likely to result in socially responsible and green(er) GVCs by reducing the environmental impact of the current global production system through e.g., increasing input efficiency, better waste management, and circularity. Increasing GVC

sustainability can have positive and negative effects on GVC efficiency. Furthermore, a strong focus on efficiency and resilience aims to make GVCs more resilient through the diversification of suppliers and regions and by increasing redundancies and buffers. Overall, increasing GVC resilience is however likely to reduce GVC efficiency.

A strong focus on resilience and sustainability, likely at the cost of efficiency, can result either in GVCs characterized by *resilient sustainability*, or by *sustainable resilience*. This is because increasing the degree of diversification and redundancies negatively affects the environmental sustainability of production since, for example, more production or storage facilities need to be built. *Resilient sustainability* prioritizes sustainability over resilience, i.e. one optimizes the resilience of a supply chain given a defined level of sustainability, and is thus characterized by low carbon-emissions of trade and thus shortened supply chains, circularity and high sustainability standards, which is why this model tends to be highly regionalized or localized. Subsequently, a certain degree of redundancies and possibly diversification in order to withstand certain shock is introduced to these regional value chains (RVCs). Regionalization or localization may thus benefit supply chain resilience in the case that during a crisis global trade is disrupted, export restrictions on critical products are introduced by major producing countries, and thus access to critical products via imports is curtailed (Raza et al. 2021). However, regionalization may also decrease GVC resilience in case the regionalization process goes hand in hand with reducing the diversification of suppliers and regions (OECD 2021). The increasing exposure of RVCs to regional shocks could be reduced to the extent that multiple RVCs exist alongside each other.

*Sustainable resilience*, in contrast, prioritizes resilience over sustainability and thus focuses on increasing the resilience of (global) value chains in the most sustainable way. This could be achieved, for example, by increasing the diversification of suppliers while at the same time promoting the resource-efficiency of production of the various suppliers. Focusing on sustainable resilience, in addition, could also affect the product-specific assessment of different measures or policies that aim to increase the security of supply (e.g., stockpiling, diversification & redundancies, emergency capacity, reshoring, etc.).

It must, however, be emphasized that the three policy-goals and associated GVC models, do not represent a classical trilemma, since one can, for example, increase the resilience of today's efficient GVCs in a sustainable way (e.g., by sourcing from more energy and resource efficient and at the same time geographically diversified production units/suppliers). The efficiency, resilience and sustainability of GVCs are thus better understood in relative terms, and not in absolutes. For this reason, the concept of sustainable

resilience is of particular relevance since the regionalization of GVCs is currently not feasible in many cases due to the expected large efficiency losses. In these instances, policy-makers should aim to promote the sustainability and resilience of GVCs by focusing on the reduction of the environmental footprint and by increasing social sustainability standards as well as by promoting supply chain diversification and redundancies, respectively.

**Current policies on GVC resilience and sustainability**  
As of mid-2022, a variety of different policies targeting GVC resilience and sustainability in the Global North are negotiated or already in the process of implementation. Policies on GVC resilience are generally motivated by the COVID-19 pandemic but increasingly also by geopolitical considerations. Strategies like the US Executive Order 14017, the EU's open strategic autonomy concept, and the regional Supply Chain Resilience Initiative (SCRI) by Japan, Australia, and India are all linked to geopolitics, and in particular to the rivalry with, and import-dependencies from China. In contrast, sustainability policies such as the European Green Deal and due diligence/supply chain laws have traditionally been motivated by public pressure as well as consumer preferences for promoting social justice and environmental standards, the latter being reinforced more recently by the climate crisis.

In general, these policies do not link GVC resilience and sustainability in a comprehensive and systematic way (Table A). Instead, most policies focus either on GVC resilience or on GVC sustainability (see Grumiller et al. 2022 for more details). The most important exception is the US supply chain strategy under Executive Order 14017, which integrates elements of resilience as well as social and environmental sustainability. In contrast to most efforts in the EU, the strategy has a strong focus on promoting domestic manufacturing and reshoring for strategically important and critical products (e.g., batteries, active pharmaceutical ingredients (APIs), semiconductors, various minerals). The selection of strategically important products has various reasons, but also reflects sustainability concerns (e.g., the promotion of battery production and the transformation towards electric vehicles). Notably, the strategy comprises a comprehensive set of instruments, including, amongst others, (i) financial support to promote domestic investment in manufacturing, R&D and workers' skill development, (ii) consumer rebates and tax incentives to expedite consumer adoption of electric vehicles, (iii) adjustments of public procurement to strengthen US supply chains (e.g., domestic

production requirements), (iv) increasing of US strategic stockpiles, (v) improving the transparency of selected GVCs, and finally (vi) potentially profound institutional changes to strengthen the public management of GVC resilience. In addition, the strategy also stresses the importance of trade policy and international cooperation in tackling bottlenecks in GVCs during crisis situations.

In contrast to the US, though the EU’s “open strategic autonomy” – concept incorporates some aspects of GVC resilience, so far extensive measures to promote GVC resilience (in terms of diversification and redundancies) are missing. Instead, the EU’s focus is on creating opportunities for diversification through trade policy. Only in the case of some sector-specific strategies such as the EU pharmaceutical and chemical strategies, more extensive measures to promote GVC resilience, security of supply, and potentially reshoring, are being discussed. With the notable exception of strategic stockpiling, it remains thus unclear how the EU wants to promote GVC diversification and redundancy.

The supply chain and due diligence laws, in contrast, are arguably the most important initiatives to promote GVC sustainability. In this context, the UN, OECD and various national initiatives – such as Section 1502 of the Dodd-Frank Act, or the German *Lieferkettengesetz* – have implemented due diligence laws, though with notable differences. In the EU, the most important initiative towards increasing environmental sustainability is undoubtedly the European Green Deal, with important implications for EU policies in general, including industrial and sector-specific strategies. Even though the specifics and thus the effectiveness of most of these policies remains to be seen, preliminary lessons drawn from those sustainability initiatives already in place, such as the French *Loi de Vigilance* or the EU Conflict Minerals Regulation, highlight that the scope of the respective regulation, as well as liability issues and sanction mechanisms are particularly challenging in designing such policies. In many cases, the effectiveness of policies is curtailed due to their limited scope and low liability obligations for firms.

**Table A: Overview on resilience- and sustainability-focused strategies**

		Resilience	Sustainability
<b>Resilience-focused initiatives</b>			
Executive Order 14017: America’s Supply Chains	US	+++	+
Open Strategic Autonomy	EU	++	o/+
Supply Chain Resilience Initiative	Japan, Australia, India	+++	o
<b>Sustainability-focused initiatives</b>			
European Green Deal and the Circular Economy Action Plan	EU	o/+	+++
Supply chain and due diligence laws	Various	o	+++
<b>Sector-specific EU strategies</b>			
Pharmaceutical Strategy	EU	?	+

Source: own elaboration

Note: +++ = strong focus; ++ = medium focus; + = low focus; o = no focus; ? = to be negotiated

## POLICY IMPLICATIONS FOR THE EUROPEAN UNION

It is becoming increasingly evident that the traditional focus of lead firms on supply chain efficiency and their disregard for resilience and sustainability is becoming untenable, for geopolitical, ecological and security of

supply considerations alike. From a policy perspective, the mismatch between firms’ and societal perspectives on the desired levels of efficiency, resilience and sustainability will require a comprehensive policy-mix (Grumiller et al. 2022, 2021). This policy-mix needs to take account of sector- and product-specific characteristics. In general, policy interventions should be more comprehensive

in case of strategically important and critical sectors and products. In this context, the emphasis on GVC efficiency, resilience and sustainability, respectively, needs to be calibrated according to the specific strategic goals. In the case of critical products required during crises such as a pandemic, for example, policy-makers could opt for a strong emphasis on resilience, but still seek to adopt measures that minimize negative impacts on efficiency and sustainability (*efficient and sustainable resilience*). Contrariwise, the promotion of more sustainable production systems and GVCs, as envisioned in the European Green Deal, should ensure to the extent possible that a defined sustainability standard is achieved in the most efficient way, and that the sustainability measure employed, such as e.g. re-use, recycling, or product quality standards, add to the resilience of the production process (*efficient and resilient sustainability*).

Policy-makers will not be able to avoid trade-offs, because, for example, promoting resilience through a diversification of suppliers and increasing redundancies will very likely have negative impacts on sustainability and efficiency. Policy-makers will thus need to accept certain efficiency losses and costs arising through policies that increase resilience and/or sustainability in selected GVCs. In this context, policy-makers should aim to exploit the compatibilities between efficiency, resilience and sustainability. A diversification of suppliers, for example, could go hand in hand with measures to promote a higher level of energy efficiency in new production facilities. Moreover, increasing GVC sustainability could be combined with regionalization processes that reduce CO<sub>2</sub> emissions in transport (and potentially also in production), but also support security of supply for critical products in case of crises and global trade disruptions.

For most products, including, for example, a large variety of potentially critical medical and pharmaceutical products, supporting diversification and redundancies will be key to increase security of supply, given the high cost of stockpiling as well as of re- and nearshoring. In this context, it needs to be stressed that diversifying suppliers to counter bottlenecks such as regional clusters and single sourcing can also be – depending on the product/sector/GVC – extremely costly and challenging. Overall, it is likely that government support will need to be larger in cases where firms currently do not have a strategic interest to adjust their sourcing practices, even though societal interest in increasing security of supply does exist. According to Flach et al. (2021), and based on a survey

of 5,000 firms in Germany, 41 % of manufacturing firms plan to adjust their sourcing strategies, including through the diversification of suppliers (29.5 %), the increasing transparency of the supply chains (26 %), an increase in stockpiling (23 %), the expansion of domestic sourcing (12 %), and the insourcing of production (6.9 %). The study also indicates that sectors affected by raw material shortages are particularly inclined to change their sourcing strategies. However, the scope of the resilience measures implemented by these firms remains unclear. The results of this study also indicate that supply chain diversification is particularly costly for SMEs, limiting their room of maneuver, and that the majority of manufacturing firms are currently not considering to adjust their sourcing strategies. Whether the latter indicates that there are no threats to the supply chains of these firms or that firms do not correctly assess the issue, remains open.

Overall, the available empirical literature suggests that increasing GVC resilience for selected critical products according to a publicly defined security of supply standard will require substantial governmental support, and that companies by themselves are unlikely to take the necessary steps in many instances. This is particularly evident, for example, in the medical products GVC that is characterized by stringent product regulations and – in the case of medical devices – by highly complex buyer-supplier relationships. The prevailing GVC structure in medical products has not yet changed, and the establishment of COVID-19 induced local manufacturing in the EU is likely to become outcompeted by traditional imports in the near future without additional public support.

The current EU policies on resilience put a strong emphasis on trade policy and international cooperation. Given, however, the preponderance of national interests during the early phases of the pandemic, the proliferation of export restrictions has demonstrated that the EU should not rely too strongly on global cooperation during crisis situations (Raza et al. 2021). This argument has become even more pertinent since the outbreak of the war in Ukraine and the escalating geopolitical competition in its wake. Import-dependencies for selected critical products need to be reduced through the creation of production capacities in the EU, and through building-up reserve capacities, similar to the current US strategy. In view of the high cost of government-induced re- and nearshoring policies, this is likely to be possible for a small number of products only, unless of course the EU and national governments designate this as a top priority. Recent assessments



have shown that problematic EU import dependencies exist only for a rather limited number of products and inputs (for more details see, e.g., EC 2021; Reiter/Stehrer 2021). The promotion of re- and nearshoring should thus be financially viable for some selected critical products (e.g., active pharmaceutical ingredients, semiconductors, and various other products, in particular those related to digital and ecological transformations). In this context, the EU needs to ensure that the promotion of GVC resilience, re- and nearshoring, or stockpiling is done in the most sustainable way (sustainable resilience), for example by linking financial incentives to promote resilience to environmental sustainability requirements.

Policies on GVC resilience and sustainability in the Global North may have non-intended effects on third countries, including the Global South. Due diligence laws, for example, can lift sustainability standards along the supply chain, but also make GVC integration more challenging for countries with low sustainability standards. In the case of re- and nearshoring to the EU, the non-intended effects are likely to be particularly severe, depending on countries' position in the respective GVCs. For instance, reshoring of production of critical products can have a negative impact on income and employment levels in the producing countries, since the additional build-up of EU production could also create overcapacities and reduce prices and thus the profitability of existing companies. A displacement of some of these companies is also probable. On the other hand, import-dependent countries, e.g. in large parts of Sub-Saharan Africa, could benefit from policy-induced overcapacities if this reduces prices and procurement costs. In addition, some countries with geographical proximity to the EU, e.g. in North Africa, could benefit from nearshoring strategies of European companies (i.e. strategies that promote reshoring to regions close to the EU) and build up or expand production for EU export.

In this context, it should also be noted that countries in the Global South have limited influence on lead firms' strategies, and thus upon the structure and dynamics of GVCs. EU policies that require lead firms headquartered in the EU to improve on their resilience or sustainability will thus have repercussions upon suppliers in third countries, with the latter having to bear the associated adjustment costs. If the EU thus is to fulfil its commitment to promote policy coherence for development, that is, to account for development objectives in policies likely to affect countries in the Global South (EC 2019), it must

consider these aspects when formulating any strategy on GVC resilience and sustainability. The EU should thus aim at mitigating potentially negative economic impacts on the countries of the Global South and enhance positive effects.

In addition, the EU should actively promote that supply security of critical goods can be ensured on a global level. Since national strategies often gain the upper hand in times of global crises, lessons should be learned from the COVID-19 pandemic to increase the Global South's supply security of medicines and other critical goods. This may include expanding stockpiling efforts by international organizations such as the World Health Organization (WHO), the availability of crisis facilities at international financial institutions for the procurement of urgently needed goods, or medium- and long-term support for the development of national production and stockpiling capacities in the Global South. Clearly, measures to strengthen public health should be given a higher priority in European development cooperation post-COVID-19.

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- 1 This contribution is based on Grumiller et al. (2022).
  - 2 Some authors more closely linked to the risk management literature, in addition, contrast the concept of resilience with that of robustness. While resilience is defined as the ability to return to normal operations over an acceptable period of time post-disruption, robustness is the ability to maintain operations throughout a crisis (Brandon Jones et al. 2014; Christopher/Peck 2004; Miroudot 2020; Sheffi 2005).
  - 3 Economic upgrading describes processes through which economic actors move from low value to relatively high-value activities in GVCs (Gereffi 2005; Gereffi et al. 2001; Humphrey/Schmitz 2002). Economic downgrading happens if the opposite is the case. GVC integration in the Global South can strengthen the workers' position, but – and depending on respective business practices – it must not necessarily be linked to an improvement of working and living conditions (social upgrading), but also to their worsening (social downgrading) (Barrientos et al. 2011). Environmental upgrading is understood as a process by which economic actors move towards a production network that avoids or reduces environmental damage, but GVC integration may also be linked to environmental downgrading (De Marchi et al. 2019, 2013).