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The rising tensions between efficiency and resilience in global value chains in the post-COVID-19 world

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This paper explores the rising tensions between efficiency and resilience in global value chains (GVCs) in the post-COVID-19 world and discusses their potential implications for managing and coordinating GVCs. It considers efficiency and resilience in GVCs in relation to each other and explores the possibility of tensions between the two concepts. Particularly, it is argued that, while efficiency and resilience in GVCs may be at odds with each other in the short-term, they are not necessarily mutually exclusive in the long run. The paper adds to the discussions of trade-offs involved in managing contemporary GVCs and offers a new perspective on the interplay between efficiency and resilience. Embedded in the discussion of resilience vis-à-vis efficiency, we also provide a long-term perspective to prepare for and deal with global pandemics – or other risks – in an increasingly interconnected world. We lay out decisions and steps involved in finding the balance between efficiency and resilience, as both need to be maintained concurrently over longer periods.

Keywords: post-COVID-19, global value chains, efficiency, resilience

1. Introduction

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Globalization has so far enabled firms to optimize their value chains economically. Many firms have been able to fine-slice their value-creating activities, such as product or service design, branding, manufacturing, distribution and after-sale services, and allocate them across national borders, where they are executed in the most efficient way (Mudambi, 2008). Each supplier along the value chain has often elected to locate itself at the most cost-efficient point, running its activities in a most efficient way (Clarke & Boersma, 2017), i.e., maximizing their outputs to inputs ratio (Drucker, 1973). Multinational enterprises (MNEs) have been able to reap the benefits of the fragmentation and coordination of their global value chains (GVCs) by concentrating on their core competencies, saving money and achieving greater returns on their assets and investments (Beugelsdijk, Pedersen, & Petersen, 2009). However, the COVID-19 crisis has disturbed this pattern and revealed the vulnerability of firms' value chain optimization strategies.

Aside from its dramatic effects on the physical and psychological well-being of society, the pandemic exposed the vulnerabilities of many firms, especially those that procure raw materials or finished products from suppliers located across the globe. In particular, China's dominant role as the "world's factory" has escalated Western economies' dependence on the Chinese economy. Firms whose value chain strategies depend on Tier 1 (direct) or Tier 2 (secondary) suppliers in China and South-East Asian countries have experienced significant disruption. As a result, scholars and practitioners alike have highlighted the importance of resilience and the need for GVCs to move away from the efficiency imperative towards a resilience imperative (Birkinshaw, 2020).

From this vantage point, although scholars have observed that the globalization of value creation has brought notable growth and connectivity opportunities to many MNEs, they often have overlooked complicated aspects of GVCs (Mollenkopf, Stolze, Tate, & Ueltschy, 2010).

Research on GVCs has not paid significant attention to the possible risks associated with interdependence among globally dispersed business activities and how firms can respond when this interdependence is severely impeded. Likewise, in the pre-COVID-19 world, strategy research on GVCs predominantly focused on MNEs' economic practices and outcomes as leading actors in GVCs but overlooked the risks and vulnerabilities involved in GVCs and GVC structures (Gereffi & Lee, 2016). The recent spike in interest in resilience has sparked some ideas about how the world and GVCs could tackle global pandemics (Rai, 2020; Remko, 2020) but has also raised questions about the possible interplay between efficiency and resilience (Wolf, 2020). There have been a growing number of calls in practitioner outlets to move away from efficiency to resilience (Galston, 2020; Reeves & Varadarajan, 2020), with no definitive answer about whether efficiency and resilience are mutually exclusive and whether firms have to sacrifice one to achieve the other. Against this background, little is known about the potential implications of the resilience imperative for GVCs and the efficiency-driven management paradigm that has dominated the contemporary discourse on GVC expansion and governance.

In this perspective piece, we explore the rising tensions between efficiency and resilience in GVCs in the post-COVID-19 world and discuss their potential implications for the management and coordination of GVCs. In particular, we argue that, although efficiency and resilience in GVCs may be at odds with each other in the short term, they are not necessarily mutually exclusive in the long run. This paper thus adds to the discussion of trade-offs involved in managing contemporary GVCs and offers a new perspective on the potential interplay between efficiency and resilience. Embedded in the discussion of resilience vis-à-vis efficiency we also provide a long-term perspective to prepare for and deal with global pandemics – and other risks – in an increasingly interconnected world (Ahuja, 2000; Gimeno, 2004; Trkman & McCormack, 2009).

2. Theoretical background

Throughout the last four decades, the world has witnessed significant liberalization and deregulation of international trade and foreign direct investment (FDI), as well as remarkable advances in information and communication technologies. These developments have made it possible for MNEs to rearrange their operations, enabling them to adopt a model of fragmented and geographically dispersed business activities. *Efficiency*, simply referring to the ratio of outputs to inputs in a production or value creation system (Drucker, 1973), has been one of the most important, if not the most important, considerations for MNEs when expanding and coordinating their value chain activities across national borders. Such prioritization of efficiency has led to the rise of China and South-East Asian countries as the prime locations of manufacturing and amplified the dependence of GVCs on these countries for the supply of products (Contractor, Kumar, Kundu, & Pedersen, 2010; Dong et al., 2017).

Amid the rise of globalization and enabling technologies, a substantial corpus of research has emerged to understand how MNEs manage the global configuration of their value chain activities, in which countries each activity should be located, and how these activities should be spatially distributed and strategically managed in order to optimize the value created in and captured through GVCs (for a thorough review, see Kano, Tsang, and Yeung (2020)). Accordingly, it has been argued that new forms of GVC configurations have caused a profound transition for MNEs' boundary considerations. In particular, rather than internalizing business transactions within vertically integrated structures, MNEs have been outsourcing most of the business activities and paying more attention to coordinating and orchestrating spatially dispersed activities (P.J. Buckley & Ghauri, 2004; Mudambi & Venzin, 2010). This gave rise to a new organizational form called "the global factory" in which "companies with global operations have

learned to fine-slice their activities and to locate each stage of the activity in its optimal location and to control the whole supply chain, even when not owning all of it” (Peter J Buckley, 2011, p. 270). In this vein, the core premise of GVCs is that efficient value creation requires more than a single firm and resides in greater networks of interdependent actors, activities and resources.

With unprecedented levels of volatility, uncertainty, complexity and ambiguity wreaking havoc in the global business environment (Bennett & Lemoine, 2014), interest in the concept of resilience has grown rapidly across different contexts and levels of analysis (Linnenluecke, 2017; Williams, Gruber, Sutcliffe, Shepherd, & Zhao, 2017). With the ever-growing magnitude of environmental dynamism, volatility and disruptions, the relevance of resilience has played out repeatedly in the last three decades (Ali & Gölgeci, 2019; Christopher & Peck, 2004; Wieland & Wallenburg, 2013). In simple terms, resilience is viewed by many practitioners and thought leaders in practitioner outlets as the ability to return to normal operations after disruption (Miroudot, 2020; Wolf, 2020). In reality, resilience is embodied by the long-term survival of businesses and their supply chains amid adversity and disruptions (Gölgeci & Kuivalainen, 2020; Gölgeci & Ponomarov, 2013). In this paper, we define resilience in GVCs as the adaptive capability of the supply chain 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).

In one of the influential papers on resilience, Martin (2012) conceptualizes resilience in terms of the four dimensions of resistance, recovery, reorientation and renewal, which share underlying similarities with the definition of the concept above. Resistance refers to stamina and endurance in the face of disturbances and disruptions. Nonetheless, resistance is more about the ability of systems to absorb changes (Ponomarov & Holcomb, 2009), rather than their rigidity –

which may eventually lead to fragility – in the face of changes. Recovery refers to the speed and degree of readjustment and restoration in the aftermath of an external shock. Reorientation points to adaptive realignment and endeavors towards a new path of strategic action. Reorientation is especially germane to determine what is necessary to move beyond the recovery and take advantage of challenges as an opportunity for further development. Finally, renewal refers to recommencing a pre-disruption path or hysteretic alteration to a new growth trend (Martin, 2012). As such, the renewal dimension of resilience requires an innovative mindset and adaptive capabilities to not only resist and recover from adverse change but also leverage adversity and disruption to navigate towards renewal in the long run.

As can be seen in this conceptualization, resilience is more than mere recovery from disruption. Likewise, it is by no means a short-term-driven capability. Resilience requires the adoption of a long-term view and the maintenance of a survival mindset at center stage. Moreover, firms' success and survival cannot be assessed independent of competition, and one of the main outcomes of greater competition is the efficiency imperative (Reeves & Deimler, 2011), which, in turn, becomes critical for long-term survival. As such, competitors and competitive environments are an important benchmark for firms' activities and future strategy-making and have considerable implications for resilience over longer periods. This understanding of resilience has ignored implications for the interplay and possible trade-offs between efficiency and resilience, discussed next.

3. Global value chains, the COVID-19 pandemic and the (assumed) trade-off between efficiency and resilience

Firms operating as parts of GVCs are strongly influenced by the way GVCs are structured, coordinated and governed by multiple stakeholders (Clarke & Boersma, 2017; Gereffi, Humphrey, & Sturgeon, 2005). Firms rely on joining GVCs to integrate into the global economy successfully and on GVC governance mechanisms such as knowledge exchange and learning to adopt new practices that are not sufficiently internalized (Gereffi & Lee, 2016). Accordingly, GVCs are a fundamental phenomenon in international business (P.J. Buckley & Ghauri, 2004), viewed as “the world economy’s backbone and central nervous system” (Cattaneo, Gereffi, & Staritz, 2010, p. 7).

That said, the prevalence and power of GVCs have been challenged by a series of events that have been unspooling for the last few years. The first change bucking the trend of GVCs (at least in terms of product flow (Gupta, 2020), is the growing criticism of globalization and the growing distress over the social and economic sustainability of GVCs (e.g., Clarke & Boersma, 2017). Second, recent developments in big data analytics (LaValle, Lesser, Shockley, Hopkins, & Kruschwitz, 2011), digitalization of distribution channels (Hagberg, Sundström, & Nicklas, 2016) and shorter value chains (Kurpjuweit, Schmidt, Klöckner, & Wagner, 2019) have already been changing the extent and the nature of GVCs. More importantly, and unexpectedly, the COVID-19 pandemic brought about the virtual destruction of contemporary GVCs as we know them. As noted elsewhere, the pandemic has unveiled the fragility of modern GVCs. In particular, the lockdown of China during the initial phases of the outbreak has revealed that many MNEs, which have long been deeply entrenched in Chinese manufacturing, have experienced severe difficulties and interruptions in their production flows. The lack of flexibility in their supplier base and a high degree of interdependence between different links of the value chain have caused firms to question the sustainability and viability of extant GVC configurations. In other words, the very nature of

GVCs that made them cost-efficient has turned out to be a liability for MNEs when an unexpected crisis hit the global economy and trade.

These developments – especially in the aftermath of the COVID-19 pandemic – put resilience at odds with efficiency in the eyes of many academics and practitioners (e.g., Galston, 2020; Reeves & Varadarajan, 2020). For example, Galston (2020), in a recent *Wall Street Journal* column, asked, “What if the relentless pursuit of efficiency, which has dominated American business thinking for decades, has made the global economic system more vulnerable to shocks?” He argued that efficiency came through optimal adaptation to an existing environment, while resilience requires the capacity to adapt to disruptive changes in the environment. Optimal adaptation to an existing environment and adaptation to disruptive changes in the environment are seen in contradiction to each other. Likewise, Reeves and Varadarajan (2020) note that complexity grows as GVCs grow larger and become more connected. When that happens, hidden costs typically soar beyond costs that can be explicitly accounted for by efficiency improvements.

Notwithstanding recent opinion pieces during the COVID-19 pandemic, research in operations management has already highlighted potential trade-offs involved in achieving resilience versus efficiency (Ivanov, Sokolov, & Dolgui, 2014). Likewise, in one of the early and influential pieces on supply chain resilience, Pettit, Fiksel, and Croxton (2010) argued that excessive attention to efficiency in supply chains increases GVCs’ and member firms’ exposure to vulnerabilities, which in turn erodes supply chain resilience. In contrast, maintaining slack resources, which runs against the underlying principles of efficiency, may enable firms and GVCs to find a better balance in achieving resilience (Pettit et al., 2010). In a similar vein, research on resilience in entrepreneurship revealed that slack resources, despite creating inefficiencies in value-creating systems, function as a buffer in periods of crisis (Tognazzo, Gubitta, & Favaron,

2016). As such, a number of studies in supply chain management and entrepreneurship have pointed out that trade-offs might be involved in achieving and maintaining efficiency and resilience in GVCs.

While acknowledging the contributions of earlier research in this stream on the tensions between efficiency and resilience, we also note that it has mostly been concerned with supply and value chains at large, without explicit attention to the global aspects of the picture. Likewise, despite the hike in attention to resilience over efficiency in the early part of 2020 as the pandemic rages (Birkinshaw, 2020; Rai, 2020; Reeves & Varadarajan, 2020; Remko, 2020), scholars such as Fiksel (2003) highlighted nearly two decades ago that resilience is one of the major characteristics of durable systems – along with diversity, efficiency, adaptability and cohesion. Thus, there might be more to the interplay between efficiency and resilience than an assumed trade-off, once the long-term perspective is adopted and the global aspects of the business environment are accounted for.

In the section that follows, we extend the discussion to the factors that could influence the extent to which MNEs lay emphasis on efficiency and resilience, without necessarily foregoing one for the other. Thus, unlike extant studies that consider the trade-off between efficiency and resilience as inherent and inevitable, we make the case that firms can, in fact, maintain both of these priorities in the long run.

4. Understanding the nature of tensions between efficiency and resilience

GVCs have been developed in response to the ever-increasing momentum of competition in local and international markets. In other words, part of the supremacy of MNEs in the contemporary global economy could be attributed to their ability to effectively coordinate activities and actors across multiple production locations in different parts of the world. As noted by Kano et al. (2020),

this requires MNEs to achieve three things: (1) manage the bounded rationality of the parties involved – i.e., deal with information asymmetries and limited information processing capabilities, (2) manage the bounded reliability of the parties involved – i.e., alleviate the risks of limited efforts to fulfill open-ended or incomplete contracts and (3) create an organizational context that can support both innovation and capability generation.

That said, many MNEs are compelled to make difficult choices i.e., in the trade-offs involved in GVC design and governance, in order to cope with hyper-competition in local and international markets. These difficult choices could be between exploration and exploitation (March, 1991), standardization and adaptation (Theodosiou & Leonidou, 2003), or efficiency and effectiveness (Esper, Ellinger, Stank, Flint, & Moon, 2010). As stated above, efficiency and resilience are increasingly being pitted against one another amid the growing prevalence of major uncertainties and disruptions (Rai, 2020; Reeves & Varadarajan, 2020; Remko, 2020). Most major disruptions are unexpected (Craighead, Blackhurst, Rungtusanatham, & Handfield, 2007; Pettit et al., 2010), create discontinuities along GVCs (Rai, 2020; Remko, 2020) and force important trade-offs on GVC participants. Nonetheless, surviving actors in the aftermath of major disruptions like the COVID-19 pandemic are also required to adapt to (a new) normal in the long run. Doing so still entails making minimal use of resources to attain maximum outcomes to respond to and survive competitive forces.

Against this backdrop, we suggest that MNEs have both the possibility and the imperative to rise above the short-term tensions between efficiency and resilience in their GVCs and achieve both in the long run in order to survive both fierce market demands and unexpected disruptions. Kano (2018) identifies social mechanisms that could economize on bounded rationality and

reliability and foster capability development in the GVC system, which would collectively increase and sustain intended efficiency outcomes.

First, by being selective when choosing their GVC partners, MNEs can lower knowledge exchange and monitoring costs, reduce knowledge processing complexity, avoid unintended knowledge dissipation and manage the quality of ties among fewer actors, who would be more likely to share knowledge for the generation of collective capability.

Second, with the inclusion of non-business organizations and actors that relate directly to the immediate value chain, MNEs can increase their access to knowledge that goes beyond the localized or specialized knowledge domain of traditional GVC participants. In this vein, using non-business strategies and engaging with institutions can also erect barriers against undesired knowledge dissipation, fill institutional gaps and create a more suitable environment for innovation.

Third, by decentralizing decision-making and undertaking strategy as a joint activity, MNEs can better engage different GVC partners, which would in turn reduce knowledge asymmetries, curb opportunism by aligning parties' interests and create a common identity that would be conducive to knowledge sharing and joint capability generation. Such decentralized decision-making and collaborative strategy formulation could help MNEs identify local domains of efficiency improvements and be more responsive to unexpected disruptions in different locations in GVCs.

Fourth, generating social and relational capital by instituting common norms would help MNEs maintain a more efficient flow of tacit knowledge, promote social safeguards against opportunistic behavior and strengthen different parties' willingness to contribute to the common goals of the socially cohesive GVC network. In fact, recent research has found that social capital

can be a critical source of both resilience in times of crises and disruptions (Gölgeci & Kuivalainen, 2020) and efficiency under calmer conditions (Sözbilir, 2018).

Finally, by establishing multilateral feedback mechanisms and distributing value equitably among GVC partners, MNEs can erect further safeguards against the risks of incomplete and/or asymmetric information distribution, and thereby economize on bounded rationality and reliability. Increased visibility of system-wide value-creating activities and interorganizational justice among GVC partners results in greater alertness to external threats and better interorganizational governance (Gligor, Gligor, Holcomb, & Bozkurt, 2019; Griffith, Harvey, & Lusch, 2006; Malagueño, Gölgeci, & Fearne, 2019). Consequently, MNEs can bolster their GVCs' ability to withstand disruptions while maintaining the efficacy of their operations through visibility and equitability, thereby simultaneously maintaining the efficiency and resilience of their operations.

Although less formal and mechanical than other proactive management tools prevalently discussed in the literature on supply chain management, these social mechanisms could not only foster GVC efficiency but also increase GVC resilience in the wake of turbulent changes emerging from unforeseeable crises. Indeed, GVCs' vulnerability stems from their complex nature, given that they entail multiple products, processes and actors located in different parts of the world. This inherent complexity makes it difficult for them to remain flexible and absorb turbulent change. As noted by Gunasekaran, Subramanian and Rahman (2015, p. 6812), "because complexity usually accompanies high degrees of freedom in a system from a control-theoretic perspective, managers cannot attempt to control all elements in the system simultaneously but need to address them selectively in an incremental approach. The greatest weakness of risk management is its inability to adequately characterize low-probability, high-consequence events." To deal with this

complexity, Gunasekaran et al. (2015) suggest a myriad of strategies such as ensuring continuous monitoring, flow and communication of knowledge among different parts of the GVC; increasing transparency and knowledge sharing; and fostering cooperation and collaboration between different partners and actors inside the GVC system. Clearly, these suggested remedies to reduce complexity and increase the resilience of GVCs are quite aligned with the efficiency-generating mechanisms discussed above. In other words, working with a select set of actors who are actively involved in making strategy and with whom common relational norms are in place, MNEs can mitigate or better prepare for potential risks by closely collaborating with their partners and benefitting from extended access to local knowledge in different parts of the GVC system. This is especially important for preparing contingency plans that consider possible risk scenarios that would be otherwise difficult to foresee, if MNEs were to act on their own, without the involvement of their GVC partners. Furthermore, as a socially cohesive and unified entity, GVCs would have the flexibility and coordination capacity to better act on such contingency plans when a crisis unfolds.

5. Concluding remarks and implications

In this perspective piece, our objective was to highlight the need for MNEs to find a balance between the efficiency and the resilience of their GVCs in the post-COVID-19 era. On the one hand, MNEs often face fierce competition in multiple markets, which compels them to rationalize their GVC activities to make sure they keep the efficiency of their operations at an optimal level. On the other hand, the COVID-19 outbreak has revealed that an exclusive focus on efficiency could, in fact, be myopic and leave MNEs vulnerable and paralyzed once some links of their GVCs get interrupted by a low-probability, high-impact event. These conflicting demands on GVCs appear to lead to tensions between efficiency and resilience.

However, although efficiency and resilience considerations may at first appear to be at odds with each other, the core premise of our paper is that efficiency needs to be sustained to achieve long-term resilience and survival. We point out that although resilience may have to be prioritized over efficiency in GVCs in the wake of severe disruptions, especially in the absence of contingency planning and risk mitigation or disaster recovery mechanisms (Sahebjamnia, Torabi, & Mansouri, 2018; Tomlin, 2006), both efficiency and resilience need to be maintained concurrently over longer periods. Accordingly, we posit that MNEs may be able to develop and establish social mechanisms that would maintain efficiency and resilience simultaneously. Drawing on Kano (2018) and relevant international business research on GVCs, we lay out decisions and steps involved in finding the balance between efficiency and resilience instead of focusing exclusively on one over the other.

Clearly, the pandemic is not the sole factor that determines the future of GVC structures and strategies. For example, the recently increasing tension with the United States has caused China to lose a substantial share of its global export market, and the trend of non-Chinese firms' moving their production to other low-cost production sites (or back to their home base) is expected to accelerate during the post-COVID-19 period (Hedwall, 2020). This has several important implications for GVCs, especially on the efficiency front. For MNEs, possible shifts in value chain activities require companies to rethink their financial and non-financial commitments to other actors in their GVC ecosystem. Such transitions in GVC structuring and mapping are likely to curb efficiency in the short run, as a result of the unsettling changes in the system components of value chain activities and the learning curve of the new actors participating in GVCs.

Likewise, the social mechanisms outlined earlier in the paper require time and effort to develop and take full effect. This means that MNEs cannot easily change their GVC partners

without compromising the effectiveness of social safeguards that have the capacity to simultaneously maintain efficiency and resilience. In other words, MNEs need to take on a long-term perspective while preparing and engineering their GVC strategies.

Furthermore, lessons learned in one low-cost host country might be unusable – or even destructive – when moving to another host country. For instance, while making a case for India as an alternative sourcing site for those companies that plan to partially withdraw their operations from China, Govindarajan and Bagla (2020) draw attention to the key political, economic, social and cultural differences between the two countries. Unless MNEs remain aware of the potential “liability of past experience” while restructuring their GVCs, actions and decisions taken in the pursuit of resilience and efficiency might backfire.

Could curtailing the global aspect of value chains and moving operations back to a home country or region be a solution for remaining resilient to future shocks? Even though this option has been prevalently pronounced in ongoing public policy debates, a recent paper by Bonadio et al. (2020) suggests that repatriation of value chains could, in fact, be a bad idea. Their quantitative assessment and simulation studies suggest that the negative effects of pandemic-style input shocks could be more severe if supply or value chains were totally repatriated. This is because if firms’ operations rely purely on domestic inputs, future lockdowns in their home countries or regions would render MNEs even more paralyzed. When countries and their value chains are cut off from the rest of the world, such incidents are likely to hurt resilience even more severely than glitches in the interconnected web of activity and resource flow, where finding contingencies might be more probable (Wolf, 2020). Nevertheless, in their further analysis, Bonadio et al. (2020) also show that this likelihood depends on the severity of the domestic lockdown, where countries that adopt more stringent lockdowns would experience pandemic-induced input shocks more acutely

than those that imposed less stringent measures. This suggests that MNEs need to consider the responses and policies of their home-country regulatory bodies when deciding which of their future GVC activities could be relocated to their home country or region.

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