



# Navigating industrial policy and global value chains in an era of disruptions

Gary Gereffi<sup>1</sup> · Pavida Pananond<sup>2</sup> · Fredrik Tell<sup>3</sup> · Tony Fang<sup>4</sup>

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## Abstract

In response to recent socio-economic, environmental, and geopolitical disruptions, governments have reoriented industrial policy from a prosperity-driven to a security-driven agenda based on strengthening strategic supply chains. We provide a framework that integrates the industrial policy and global value chain (GVC) literatures, redressing two research gaps: (1) an outdated view of industrial policy based on twentieth century trade patterns; and (2) inadequate appreciation of how twenty-first century GVC dynamics shape new security-driven policies. Four strategic orientations in industrial policy are identified based on two dimensions: level of economic development (advanced versus emerging economies) and geopolitical context (global integration versus geopolitical fragmentation). Under global integration, (1) advanced economies “create winners” through inside-out policies transforming domestic champions into global competitors; and (2) emerging economies “enable latecomer catch-up” via outside-in strategies leveraging foreign investment for technological accumulation. Under geopolitical fragmentation, (3) advanced economies “enhance economic security” through restrictive outside-in policies prioritizing domestic resilience; and (4) emerging economies “strengthen supplier resilience” with hybrid approaches that maintain global connections while reducing strategic vulnerabilities. We apply this framework to articles in this special issue on five cross-cutting themes: disruptions and resilience; GVC configurations; tensions and trade-offs; new drivers of industrial policy; and data and policy insights.

**Keywords** Geopolitical fragmentation · Resilience · Economic nationalism · Reshoring · GVC configurations · GVC upgrading · GVC governance · Policy trade-offs

## Introduction

Industrial policy has been a centerpiece of economic development since the onset of industrialization. Although the concept can be traced back to the infant industry arguments of United States (US) Treasury Secretary Alexander Hamilton in the eighteenth century and German economist Friedrich List in the nineteenth century, industrial policy

became widely debated and deployed in both developing and industrialized economies in the post-World War II period (Andreoni & Chang, 2019; Naudé, 2010). The expansion of international trade and production networks during the postwar globalization era provided ample opportunities for national governments to strengthen their domestic economies through various forms of import-substituting industrialization (ISI) and export-promoting industrialization (EOI) policies in the latter half of the twentieth century.

Pascal Lamy, former Director-General of the World Trade Organization (WTO), distinguished between the “old world” and the “new world” of trade (Lamy, 2018: p. xvii). In the old world of trade, production was national and trade mainly involved natural resources or finished manufactured goods. In the new world of trade, production of both goods and services is transnational, organized in global value chains (GVCs) where production is spread across a dozen or more countries, and there is value addition at every stage of the chain. These contrasting trade patterns correspond to

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✉ Gary Gereffi  
ggereffi@duke.edu

<sup>1</sup> Duke University, Durham, NC, USA

<sup>2</sup> Thammasat University, Bangkok, Thailand

<sup>3</sup> Uppsala University, Uppsala, Sweden

<sup>4</sup> Stockholm University, Stockholm, Sweden

traditional ISI and EOI industrial policies, respectively, of the late twentieth century, and both were associated with the prosperity agenda of the globalization era.

However, diverse disruptions in the early decades of the twenty-first century have prompted the emergence of new security-driven industrial policies motivated by concerns over the reshoring of production, strategic vulnerabilities in global supply chains, strategic autonomy in a multipolar world, and climate change rather than the prior emphasis on economic prosperity via expanded globalization. Recent disruptions include the 2008 financial crisis, the COVID-19 global pandemic, the rise of economic nationalism, regional conflagrations such as the Russia-Ukraine war (Pisani-Ferry, 2022) and Middle East conflicts involving Israel, Hamas, and Iran, and the increasingly antagonistic rivalry between the US and China (Tung et al., 2023). In response, industrial policies in the era of disruptions appear to be shifting from a prosperity-driven to a security-driven agenda. In this special issue we seek a deeper understanding of how GVCs and industrial policies are co-evolving in the process.

Industrial policies range from broad to narrow. “Generic” or horizontal industrial policies apply across all sectors (e.g., tax incentives, training centers), while “targeted” or vertical industrial policies focus on specific industries (e.g., subsidies for semiconductors or local-content requirements for autos), types of sectors (e.g., carbon credits for low-carbon-emission or “green” technologies), or categories of countries (e.g., industrial latecomers). Drawing upon his literature review, Warwick (2013, p. 16) proposes a general definition: “Industrial policy is any type of intervention or government policy that attempts to improve the business environment or to alter the structure of economic activity toward sectors, technologies or tasks that are expected to offer better prospects for economic growth or societal welfare than would occur in the absence of such intervention.”

Industrial policy during the initial decades of the post-World War II era sought to create strong domestic economies by enticing large firms (foreign and domestic) to make finished products locally. In the 1960s and 1970s, the state played a large and direct role in the ISI strategies in Latin America and elsewhere, where the tools of industrial policy included local-content requirements, mandatory joint-ventures, and export promotion schemes to induce multinational enterprises (MNEs) to set up local subsidiaries to make goods in relatively protected domestic markets (Gereffi, 1994). In Asia, so-called “developmental states” played a more limited and focused role in promoting EOI, where state enterprises rather than MNEs were used to build significant “upstream” industries such as petrochemicals, steel, and wafer-fabrication plants for semiconductors. Examples include Japan (Johnson, 1982), South Korea (Amsden, 1989), Taiwan (Wade, 1990), Hong Kong (Chiu et al., 1997), and Singapore (Cheang, 2022).

Today, industrial policy is back in mainstream debates. Although the neoliberal Washington Consensus of the 1980s and 1990s largely discredited the use of industrial policy (Gereffi, 2014a), the concept resurfaced since the mid-2000s as a response to the global financial crisis of 2008 and other disruptions (Chang & Andreoni, 2020; Cherif & Hasanov, 2019; Rodrik, 2023; Wade, 2018). China’s surge to become the leading export economy and second largest economy in the world (behind only the US) highlights the need to balance the attention given to advanced industrial economies with that given to emerging and less-developed economies in the Global South (Rasiah & Zhang, 2024; Tung, 2023).

The GVC framework has been overlooked in recent discussions of how to navigate the disruptions and shifting geopolitical context in the contemporary global economy. The security-driven narrative on economic resilience often emphasizes a country-level focus over other perspectives. However, GVC research shows that “resilience” is a multidimensional concept with different meanings at the firm level (operational efficiency), for supply chains (governance structures and strategies of lead firms), and for countries (national security) (Gereffi et al., 2022a, 2022b). An overly narrow interpretation of resilience in response to home-country geopolitical concerns can result in practices, like reshoring or divestment, that may not bode well for firms or host governments (Pedroletti & Ciabuschi, 2023; Pietrobelli & Seri, 2023).

We propose below a new integrative framework to more adequately link industrial policy to GVCs (Gereffi & Sturgeon, 2013; Pietrobelli et al., 2021). Development strategies in the twenty-first century require interactive industrial policy to navigate complex global trade and production linkages (Gereffi et al., 2021), unlike earlier eras when domestic industries were more self-contained (Rodrik, 2023). A modern industrial growth and innovation strategy must simultaneously address several related concerns: global economic competitiveness, national security, reliable international partnerships, and inclusive and sustainable economic growth (Bistline et al., 2023; Mazzucato, 2016; Patrucco et al., 2023; Sullivan, 2023). While global challenges like climate change, sustainable development, and demographic shifts require coordinated action, regions may offer the best setting to navigate supply-chain tradeoffs and conflicts, and negotiate stable global solutions (O’Neill, 2022). Thus, a GVC perspective on industrial policy provides a broader space to identify and manage synergies in economic, social, and environmental upgrading and the overarching economic goals of growth, innovation, and sustainability (Lee & Gereffi, 2021; Zhan, 2021).

## Industrial policy and GVCs: current state of the literature and research gaps

The literature on industrial policy and GVCs shares common interests in the economic interdependencies arising from industrial transformation in developed and developing economies. Industrial policy emphasizes state-led interventions to foster national competitiveness, while GVC analysis focuses on how firms and countries strategically position themselves within global industries to set up and sustain value-adding cross-border supply chains. Despite their distinct orientations, both literatures see the state as playing an integral role in economic development (Juhasz et al., 2024; Pietrobelli et al., 2021). As policymakers embrace industrial policy for a wide range of objectives, from supply-chain resilience to green transition and geopolitical advantages, a more nuanced and realistic view of how countries and firms interact in GVCs is needed.

Traditionally the two streams of literature have little direct connection with each other. Two reasons explain this gap. First, the ideological underpinning of industrial policy has led to intense debates on the role of the state in economic development which may have previously inhibited the engagement of GVC scholars. Industrial policy typically entails government support for specific sectors or firms through subsidies, tariffs, tax incentives, or regulation. This goes against neoliberal economic ideology that favors free markets and minimal government interference. The divide between neoclassical economists and supporters of industrial policy focuses on the fundamental skepticism of *whether* governments should carry out industrial policy rather than *how* it should be done (Juhasz et al., 2024; Rodrik, 2009). Debates involve basic issues, such as the logic of infant industry versus the theory of comparative advantage, export promotion versus import substitution, and state failure versus market failure. Although industrial policy never went away, this highly charged context led to ‘decades of ideologically motivated willful neglect’ (Chang & Andreoni, 2020, p. 324) that hindered its applicability in other disciplines.

Second, the gap between the industrial policy and GVC literatures reflects their different locational emphases. While concrete policy measures have ranged from infant industry protection in the US (Hamilton in the eighteenth century) to the active role of the state in East Asian economies of South Korea (Amsden, 1989; Chang, 1994) and Taiwan (Wade, 1990), the industrial policy literature is characterized by a “within country” perspective. The goals of industrial policy range from stimulating innovation, productivity, and economic growth to promoting climate transition, good job creation, and diversified exports, but the choice by policymakers often boils down to whether and how “we promote X but not Y” in a particular place (Juhasz et al., 2024, p. 216).

The GVC literature, by contrast, takes a broader “between-country” approach. While traditional industrial policy implies that developing an entire industry domestically is crucial for economic development, the GVC perspective contends that countries and firms can upgrade by specializing and adding value in specific stages or niches in highly integrated global industries (Baldwin, 2012; Milberg et al., 2014). As Gereffi and Sturgeon (2013) observed, domestic industries no longer stand alone but are deeply intertwined in complex and overlapping business networks. This reality challenges traditional approaches while simultaneously creating new opportunities for strategic intervention (De Marchi & Alford, 2022; Horner & Alford, 2019).

Despite their commonalities, significant theoretical tensions persist between these two paradigms. Critics argue that GVC frameworks prioritize exports over local industry development, fail to generate sufficient national productivity and technological innovation, and miss the crucial role of state intervention (Hauge, 2020; Lauridsen, 2018). By contrast, the GVC view contends that globalized production requires new types of coordinated industrial policy at the levels of tasks, linkages, and firms (Pietrobelli et al., 2021) as companies, localities, and entire countries occupy specialized niches in GVCs (Gereffi, 2014b).

The current era of disruptions has sparked industrial policy’s resurgence in economic development discourse from the mid-2000s onward. Governments in advanced economies severely impacted by the 2008 financial crisis embraced industrial policy more openly to strengthen their economic foundations (Rodrik, 2010), while many middle-income countries turned to industrial policy as a strategic tool to overcome the “middle-income trap” (Felipe, 2015).

At the same time, perspectives on cross-country interdependence underwent a fundamental transformation, shifting from efficiency-driven objectives to security-laden concerns. These tensions have intensified in the current era of disruptions, where the COVID-19 pandemic, geopolitical conflicts, and technological shifts have fundamentally altered the landscape of global production. The surge in US economic nationalism in the first Trump administration (2017–2020) that accelerated rapidly in his second term (starting in January 2025) marked a decisive break from decades of trade liberalization that facilitated the spread of GVCs (Gereffi, 2023b).

The “mainstreaming of industrial policy” (Chang & Andreoni, 2020, p. 327) alongside the growing interest in GVCs creates fertile ground for cross-disciplinary dialogue on critical topics, such as the role of the state in GVCs (Horner & Alford, 2019), the multiple dimensions of GVC resilience (Gereffi et al., 2022a, 2022b; Gereffi, 2023a), sustainability in supply chains (De Marchi & Gereffi, 2023), and government policy’s impact on the geographic and organizational reconfiguration of GVCs (Gereffi et al., 2021)

in a multipolar world economy (Tung et al., 2023). The convergence of industrial policy and new challenges in GVCs addresses the two critical gaps that we seek to bridge in this special issue.

### An integrative framework

To develop more nuanced perspectives on how states navigate global interdependencies while pursuing diverse national objectives, we present an integrative framework that juxtaposes key themes relevant to both industrial policy and GVC research streams. Table 1 elaborates how industrial policy and GVC strategies have evolved across different economic and temporal phases, and also identifies key themes that articles in this special issue address.

The framework presented in Table 1 illustrates how industrial policy and GVC strategies have co-evolved since World War II. The framework is grounded in the intersection of two fundamental dimensions of the global economy: level of economic development (advanced versus emerging economies) and global integration versus geopolitical fragmentation. The resulting two-by-two matrix creates a comprehensive typology that captures the evolution of development strategies and GVCs across different economic contexts and time periods.

This framework identifies four strategic orientations that illustrate how the shift from global integration to geopolitical fragmentation alters strategic orientations available to

states and the logic governing GVC coordination. We distinguish between the “inside-out” and “outside-in” perspectives, based on the direction of policy influence and GVC mechanisms. The “inside-out” direction focuses on domestic actions that generate impacts beyond national borders. Conversely, the “outside-in” perspective examines how external activities can be channeled inward to create domestic effects. This distinction manifests through both supportive and restrictive measures, depending on industrial policy objectives. We now explore how this dichotomy yields four distinct strategic orientations based on the two dimensions of our integrative framework.

### First dimension: level of economic development—advanced versus emerging economies

The distinction between advanced and emerging economies reflects key differences in capability endowments, institutional capacity, and strategic priorities that are central to both GVC and industrial policy literatures. From the GVC perspective, advanced and emerging economies occupy different positions within global production networks. Advanced economies typically are home to “lead firms” that control and capture higher value-added activities, while outsourcing and offshoring the more standardized activities to countries with significant cost advantages. Emerging economies, on the other hand, traditionally specialize in lower-value-added activities,

**Table 1** Industrial policy & GVCs in an era of disruptions: an integrative framework

|                      |                    | Prevailing context  |  |
|----------------------|--------------------|---|--|
|                      |                    | Global Integration  | Geopolitical Fragmentation   |
| Level of development | Advanced Economies | <p align="center"><b>Creating winners</b></p> <p><b>Policy target:</b></p> <ul style="list-style-type: none"> <li>• Global competitiveness</li> <li>• Value capture (e.g., innovation)</li> </ul> <p><b>Policy tools: inside-out</b></p> <ul style="list-style-type: none"> <li>• Lead-firm support</li> <li>• Subsidies and tax incentives</li> <li>• Trade support</li> </ul> <p><b>GVC implications:</b></p> <ul style="list-style-type: none"> <li>• Outsourcing and offshoring</li> <li>• GVC orchestration</li> </ul>         | <p align="center"><b>Enhancing economic security</b></p> <p><b>Policy target:</b></p> <ul style="list-style-type: none"> <li>• Resilience and securitization of GVCs</li> <li>• Improvement of GVC social and environmental impact</li> </ul> <p><b>Policy tools: outside-in</b></p> <ul style="list-style-type: none"> <li>• GVC weaponization and chokepoint avoidance</li> <li>• Mandatory GVC due diligence</li> <li>• Tariffs and sanctions</li> </ul> <p><b>GVC implications</b></p> <ul style="list-style-type: none"> <li>• GVC reconfiguration: reshoring, friend-shoring, near-shoring</li> <li>• Internalization of value chain activities</li> </ul> |
|                      | Emerging Economies | <p align="center"><b>Enabling latecomer catch-up</b></p> <p><b>Policy target:</b></p> <ul style="list-style-type: none"> <li>• GVC participation and upgrading</li> </ul> <p><b>Policy tools: outside-in</b></p> <ul style="list-style-type: none"> <li>• Inward FDI incentives</li> <li>• Local content requirements</li> <li>• Technology transfer requirements</li> <li>• Trade support</li> </ul> <p><b>GVC implications:</b></p> <ul style="list-style-type: none"> <li>• Product, process and functional upgrading</li> </ul> | <p align="center"><b>Strengthening supplier resilience</b></p> <p><b>Policy target:</b></p> <ul style="list-style-type: none"> <li>• GVC securitization and supplier resilience building</li> </ul> <p><b>Policy tools: outside-in + inside-out:</b></p> <ul style="list-style-type: none"> <li>• Both inward and outward FDI promotion</li> <li>• Global sustainability standard adoption</li> <li>• Supplier-push and buyer-pull policies</li> <li>• Trade support</li> </ul> <p><b>GVC implications:</b></p> <ul style="list-style-type: none"> <li>• Revision of GVC integration strategies</li> </ul>   |

particularly manufacturing and assembly, as an entry point into global industries. Through their analysis of functional specialization in cross-country trade, Timmer et al. (2019) provide evidence that supports this pattern.

This distinction reinforces the contrasting vantage points in the GVC framework: “top-down” (or global) and “bottom-up” (or local) (Fernandez-Stark & Gereffi, 2019). While the top-down view features the “governance” of GVCs and focuses mainly on lead firms and the organization of global industries centered in advanced economies, the bottom-up approach highlights “upgrading” as the key strategy used by less-developed countries, regions, and other economic stakeholders to maintain or improve their positions in the global economy. This positional difference between advanced and emerging economies in GVCs creates diverse upgrading trajectories that offer fertile ground for industrial policy insights.

From the industrial policy perspective, the developmental state literature emphasizes that countries at different development levels face distinct market failures and coordination challenges (Wade, 2018). Advanced economies focus on innovation-driven growth and maintaining technological leadership, while emerging economies emphasize structural transformation and technological catch-up (Rodrik, 2023). These challenges require different policy approaches and strategic orientations.

Consider innovation and knowledge accumulation, for example. While states in advanced economies may shift their role from “referee” (i.e., establishing the rules of the game) to becoming one of the “players” by coordinating among other market agents in creating acceptable rules of the game (Dobrinisky, 2009), their main concerns are focused on preserving innovation as the key to competitiveness for their firms (Lee & Gereffi, 2021; Pisano & Shih, 2009). The state in emerging economies, on the other hand, views technological accumulation as a learning-by-doing and capability-accumulation process (Lall, 1992) in which industrial policy is adopted to promote upgrading through capability formation (Ohno, 2009) and technology absorption (Pietrobelli & Rabellotti, 2007).

Similarly, governments across countries are promoting industrial policies that address a broad range of issues, from the green transition to supply-chain resilience, the creation of good jobs, and geopolitical tensions among the US and China (Juhasz et al., 2024). But the main concerns for policymakers in advanced versus emerging economies differ depending on their position in global industries. European Union (EU) policy, for example, mandates low-carbon, circular design standards for products from batteries to construction materials, shaping industry standards and market norms across and along global supply chains (European Commission, 2019; 2020). Despite their own green transition, governments in emerging economies also need to

consider standards in their policymaking. Thus, level of economic development forms a crucial dimension in our analytical framework.

## **Second dimension: prevailing context—global integration versus geopolitical fragmentation**

The temporal dimension captures the fundamental shift in the global economic order that has occurred in the postwar period. This periodization is theoretically grounded in key events and processes in the global economy. The multilateral trading system under the General Agreement on Tariffs and Trade (GATT) and its transformation into the WTO in 1995 helped sustain the liberalization process that propelled globalization. Lower trade costs enabled the separation of production and consumption, driving the growth of international trade in final goods. As improved communication and transportation technologies sharply reduced the time and cost of moving ideas and goods, an emerging global factory system facilitated the rise of foreign direct investment (FDI) (Buckley & Strange, 2015).

The globalization era (roughly 1980s to mid-2010s) was characterized by trade and investment liberalization and the deepening of GVC integration that facilitated the rise of trade in intermediate products (Baldwin, 2016; Gereffi, 2014a). The dominance of an efficiency-driven logic in economic policy enabled the cross-border supply chain integration that underpinned globalization. During this period, both advanced and emerging economies pursued strategies aimed at maximizing their integration into GVCs, with industrial policy often subordinated to competitiveness considerations.

The geopolitical fragmentation era (2010s to present) represents a fundamental reorientation toward resilience, strategic autonomy, and geopolitical considerations that threaten to weaken the interdependence between countries (Witt, 2019). The “great trade collapse” (Baldwin, 2009) during the Global Recession following the 2008 financial crisis triggered concerns about resiliency and over-reliance on trade, leading to a new age of protectionism (Evenett, 2019). This rise of economic nationalism created significant policy shifts, including the United Kingdom’s withdrawal from the EU and the US’s increasing use of industrial policy, ranging from Trump’s tariffs to Biden’s CHIPS and Science Act and the Inflation Reduction Act (Gereffi, 2023b).

Industrial policy has surged as governments prioritize national security alongside, or even above, economic efficiency considerations. Amplified by the resurgence of techno-nationalism (i.e., the concept and practices of linking technological capabilities directly to a country’s national security and geopolitical advantages) (Luo, 2022), security-driven industrial policy views economic interdependencies as zero-sum competition, in contrast to the positive-sum

logic of efficiency-driven interconnectivity that characterized the earlier phases of global integration.

Building on these dimensions, Table 1 outlines the motives underlying industrial policy and their implications for GVCs. The four quadrants of the two-by-two matrix depict strategic industrial policy orientations and their significance for GVCs in advanced and emerging economies under contexts of global integration versus geopolitical fragmentation. This table also provides an organizational framework that highlights how the seven articles in this special issue address industrial policy and GVC concerns in an era of disruptions, which will be further discussed in the final section.

## Framework quadrants

### Advanced economies under global integration—“creating winners”

Policymakers in advanced economies have historically used industrial policy to “create winners” that could enhance national competitiveness. Tools range from infant industry protection to broader technological development strategies, such as R&D consortia, technological platforms, and industry standards (Chang & Andreoni, 2020). Preferential support, such as subsidies given to firms like Airbus and Boeing, was common in strategic sectors like aerospace, telecommunications, and energy.

With the rise of GVCs, industrial policy in advanced economies shifted from creating an entire industry to capturing high-value segments on the “smile curve” of value creation, particularly in innovation, design, and branding (Van Assche, 2020). In this context, competitive advantage derives from controlling knowledge-intensive segments of GVCs rather than manufacturing activities only. This pattern reflects an “inside-out” approach where policies seek to transform domestic national champions into global competitors. Supportive interventions within home markets are the foundation for international expansion, projecting national competitive advantages globally.

The GVC literature was largely consistent with this “inside-out” perspective. Less ideologically oriented than the industrial policy approach, GVC research prioritized governance mechanisms from the standpoint of lead firms in advanced economies. Scholars examined how MNEs from developed countries structured their lead-firm governance to orchestrate global production networks, emphasizing their control over value-chain coordination while outsourcing manufacturing activities to suppliers in lower-cost locations (Gereffi, 1994). Research focused on GVC governance structures, supply-chain dynamics, innovation

systems, and technology-transfer mechanisms that lead firms adopted to strengthen their position in GVCs.

### Emerging economies under global integration—“enabling latecomer catch-up”

The “latecomer catch-up” strategy embodies an outside-in logic where emerging economies are the recipients and absorbers of advanced technological capabilities from industrialized nations. This approach aligns directly with both the developmental state literature in industrial policy and the upgrading focus in the GVC approach, showing how technological accumulation becomes a pathway to economic advancement. In both literatures, the process of catch-up is instrumental in enabling emerging economies and their firms to thrive under globalization. Earlier studies on the economic success of the newly industrialized economies in East Asia, particularly South Korea and Taiwan (Amsden, 1989; Wade, 1990), and current debates on China’s rise (e.g., Tung et al., 2023), emphasized the role of the state in supporting selected heavy industry sectors (e.g., petrochemicals, semiconductors, and machinery) through access to imported inputs for exporters, while guaranteeing local demand through domestic market protection (Gereffi & Wyman, 1990).

The emergence of GVCs enabled latecomer industrial policy to encourage domestic firms to integrate into global production networks for technological accumulation and export expansion (Gereffi & Sturgeon, 2013). The approach employs an “outside-in” logic where policies attract FDI and supply-chain linkages to bring the necessary technological resources and capabilities that would be prohibitively expensive or time-consuming to develop independently. The GVC literature argues that vertical specialization enabled emerging market firms to integrate into lead-firm networks to benefit from their global access (Milberg et al., 2014; Morris & Staritz, 2019). Economic advances take place via product, process, functional, and inter-sectoral upgrading, with roles and trajectories analyzed based on comparative and longitudinal research (Gereffi, 2019; Humphrey & Schmitz, 2002).

Both industrial policy and GVC scholars agree that successful outside-in strategies require effective policy coordination. While GVC-based industrialization was an opportunity for emerging economies to catch-up in their economic development efforts, the state in emerging markets needs to ensure that foreign economic engagement systematically leads to local capability development rather than technological dependence. Policy instruments ranged from direct interventions, such as tax and financial incentives, local-content requirements, and technological transfer mandates, to indirect mechanisms, like training centers to enhance absorptive capacity. In the most successful latecomer economies (e.g., South Korea, Taiwan, Singapore, and China), outside-in

strategies utilize state orchestration to ensure that foreign economic engagement in global industries translates into domestic capability building through upgrading in GVCs.

The rise of China has in this respect been particularly dramatic. In 1978, China began opening its economy to the rest of the world. Over the years China's economic development was guided by its carefully devised industrial policy with the aim of modernizing China in industry, agriculture, national defense, and science and technology ("Four Modernizations"). More recently, the goal has been to increase China's international competitiveness in both production and innovation. Examples range from massive attraction of FDI to China under the state policy of "exchanging [Chinese] market for [foreign] technology" as illustrated in Sino-foreign business negotiations in the 1990s (Fang, 1999) to the program of "Made in China 2025" launched by the State Council in 2015 for the purpose of making China a green and innovative world manufacturing power by 2025 (The Economist, 2015). Recent research on the role of GVCs in China highlights that top-down state policies are complemented in practice by bottom-up policies of provincial and municipal governments, which has allowed for considerable flexibility in adjusting to technological changes in GVCs (Gereffi et al., 2022a 2018).

#### **Advanced economies under geopolitical fragmentation— "enhancing economic security"**

The contemporary policy shift to strengthen economic security through restricted global interdependence has altered the relation between industrial policy and GVC configurations. Moving away from an efficiency-driven logic that promotes the disaggregation of GVC activities based on comparative advantage, governments in advanced economies now perceive this interdependence as strategic risks and vulnerabilities to their national resilience (Witt, 2019; Zahoor et al., 2023). Economic security is perceived to derive from national autonomy and stronger control over supply chain activities.

This "economic nationalism" sentiment (or "techno-nationalism" in Luo & Van Assche, 2023) reflects an era in which national-security concerns shift economic policies toward protectionist measures ranging from increased tariffs on imports and inward FDI screening to direct bans of buying from or selling to selected companies. This is a sharp departure from previous "inside-out" policies to expand the foreign activities of domestic firms. Policymakers now adopt restrictive "outside-in" policies that screen and restrain foreign activities in the domestic arena, especially from countries that are considered geopolitical rivals. For example, the US Inflation Reduction Act made federal tax credits on low-emission vehicles dependent on where critical minerals

for EV batteries are extracted and processed (US Department of Treasury, 2023).

These security-driven policies directly reshape geographic linkages in GVCs as governments in advanced economies compel MNE lead firms to reconfigure their GVC networks (Gereffi, 2020; Juhasz et al., 2024). Policies to incentivize reshoring of strategic manufacturing and policy tools to selectively restrict FDI are adopted in the name of economic security. Advanced technology facilitates this shift through automation and the "servicification" (or "servitization") of manufacturing, which involves adding higher-value services to existing manufacturing activities (see Lee et al., 2021).

Security-driven policies directly affect the organization of GVC activities. As companies reevaluate their global footprints, alternatives like reshoring (bringing production back home), nearshoring (moving it closer to the end market), friendshoring (locating activities in countries that share common interests), or consolidating production in fewer locations need to be considered (Gereffi, 2023a). Lead firms in advanced economies whose GVCs are widely dispersed geographically are under the greatest pressure to act, and they adopt a variety of adaptive "switching" and "upgrading" strategies to maintain their competitiveness (Gereffi et al., 2021; Pananond et al., 2020).

In the economic-security scenario, GVC governance structures are transformed from primarily efficiency-oriented coordination mechanisms (Kano et al., 2020) to security-embedded governance mandates that are ideologically charged, with GVCs being weaponized to serve broader geopolitical interests (Luo & Van Assche, 2023, p. 1423). This "outside-in" restriction of selected foreign economic activities in GVCs contrasts sharply with the supportive "inside-out" policies during the global integration period.

#### **Emerging economies under geopolitical fragmentation— "strengthening supplier resilience"**

This quadrant represents a key strategic challenge for emerging economies, as they navigate between maintaining GVC integration while reinforcing resilience against geopolitical fragmentation. The "strengthening supplier resilience" theme highlights the vulnerability of emerging economies that cannot afford to decouple from rival global or regional superpowers but must enhance their strategic value within reconfigured GVC networks. As governments in advanced economies become increasingly concerned with securing control of critical stages in GVCs, policy measures to relocate those activities closer to home create direct risks for emerging economies. The relocation of foreign investment or finding substitute supply chains undermines their economic interests that were previously served by close integration into GVCs.

This challenge compels suppliers to strengthen their value proposition in GVCs, moving beyond traditional cost-based competition toward capability-based differentiation. This transformation requires a departure from the purely “outside-in” latecomer catch-up logic that characterized the global integration era, where emerging economies positioned themselves as passive recipients of lead firm directives and technology transfer. The new reality demands a more sophisticated hybrid approach that combines selective “outside-in” strategic coupling with proactive “inside-out” capability development.

One example of this process involves “green industries.” Emerging economies ensure that their upstream supply chains are visible and traceable given the need to strengthen their compliance with broader global standards. Unlike the previous era’s clear division between the “inside-out” winner creation strategy of advanced economies and the “outside-in” catch-up strategies of emerging economies, the fragmentation context requires emerging economy suppliers to simultaneously maintain global network ties while developing autonomous capabilities that reduce strategic vulnerabilities.

Emerging-market economies that rely on exports and inward FDI are particularly vulnerable; their dependence on lead-firm networks becomes a strategic risk when lead firms are considering relocation options. Firms and governments in emerging economies must rethink economic upgrading in GVCs based on their own security perspective. From passive dependence on serving lead firms through exports, proactive strategies like outward investment to diversify their geographic footprint become essential to support the GVC governance reconfigurations of lead firms (Luo & Tung, 2007, 2018).

Mexico, a highly diversified manufacturing export hub that passed China in 2023 to become the top US import trade partner, exhibits all the features of this challenging “strengthening supplier resilience” role. Mexico has long been a primary nearshoring option for the US economy, but its ability to maintain this role is becoming increasingly difficult (Gereffi, 2025). The re-imposition of US tariffs by the Trump administration in early 2025 has created considerable uncertainty with respect to the cost of imports from Mexico. Also, the large subsidies from the Biden administration to attract new semiconductor and electric vehicle manufacturers into the US raise major concerns over the scale and technology requirements for strategic inputs needed by companies building large new factories in the US (Gereffi, 2023b; Luo & Van Assche, 2023). In addition, while Mexico has succeeded in attracting major Chinese investments in Mexico’s automotive and electric vehicle sectors, this could become a liability amidst strong US pressures to prevent Chinese companies from using Mexico or any other location as a “backdoor” to the US market (Gereffi, 2025).

Proactively ensuring visibility and traceability for upstream suppliers creates significant value for GVC lead firms; it transforms suppliers from passive order-takers into strategic partners. Expansion into upstream activities and domestic and regional markets may compel supplier firms to expand internationally to extend their own external supply chains, as South Korean apparel firms have done in Central America and elsewhere (Lee et al., 2023). Alternatively, suppliers can focus on developing task-specific capabilities that can be leveraged across industries and geographic locations. For example, Thai Union, one of the world’s largest seafood companies headquartered in Thailand, has capitalized on its skills in canned tuna manufacturing to expand into pet food processing capabilities as well as higher value-added protein-based supplements such as fish oils and collagen (Pananond, 2016).

These strategic options all require emerging-economy suppliers to move beyond passive dependence on lead-firm-driven upgrading toward a more proactive, technologically intensive yet cost-competitive approach. Foxconn’s evolution from pure contract manufacturer to technology solutions provider (Bergström, 2025), for example, revamps standard supplier upgrading trajectories and creates higher value-added resilience capabilities that combine strategic “outside-in” positioning with autonomous “inside-out” capability development. The upside of this process is that it transforms emerging economy suppliers from vulnerable cost-based suppliers into crucial capability-based partners (Raj-Reichert, 2019).

In short, the framework presented in Table 1 synthesizes how the industrial policy and GVC literatures address contemporary disruptions, which fundamentally alter the challenges facing policymakers and company executives in the global economy. Building on this framework, our third section highlights key findings of the articles in this special issue, while the fourth section will discuss how they contribute to ongoing debates in the industrial policy and GVC fields.

### Summary of the special issue articles

The seven articles included in our special issue vary widely in the number and types of countries and industries they cover. Three of the articles focus on single countries (Sweden, Italy, and Kazakhstan), three use databases that allow them to look across a relatively large number of countries at different levels of development, and one article compares three mining-intensive countries. The large-N articles include: 66 countries that supplied products to EU countries in five industries (45 specific products) in 1995–2018 (Lopez et al., 2025); 20 latecomer economies in the low-emission hydrogen (LEH) GVC (Altenburg & Strohmaier, 2025); and 12 middle-income countries participating in renewable

energy value chains with a focus on three industries (solar photovoltaic (PV), wind, and bioenergy) (Lema & Rabelotti, 2025)

The single-country articles deal with varied mixes of industries and policies: the article on Sweden analyzes six industrial policies to reduce antibiotics shortages for 138 generic antibiotics sold in the country (Baraldi et al., 2025); a study on Italy looks at reshoring decisions among micro and small enterprises (MSEs) in the Italian fashion industry (garments and footwear) during the 2008–2015 period (Canello et al., 2025); and an article on Kazakhstan examines state policies before and after the shocks of the Russia-Ukraine war and the COVID-19 pandemic in two contrasting GVCs: uranium and medicines (DeRemer et al., 2025). The mining sector study introduces a new taxonomy of industrial policies that is applied to Australia, Chile, and South Africa over the last two decades (Anzolin & Pietrobelli, 2025).

In the thumbnail sketches below, we provide additional details on the main research questions, methods and findings of each article. Later, we discuss how five cross-cutting themes in the articles relate to our integrative framework.

In their study on industrial policies to reduce antibiotics shortages in Sweden, Baraldi et al. (2025) identify six policies currently under discussion by Swedish policymakers that have the greatest potential to ameliorate chronic antibiotic shortages in the country. Three specific policies—mandatory parallel sourcing, relocation of antibiotics production near the end market, and new reimbursement models—have the strongest expected effects on the geographic and organizational configuration of generic antibiotics GVCs in Sweden. The article discusses three key mechanisms (reinforcing single GVCs, gathering GVCs to bring them geographically closer to policymakers, and multiplying or diversifying GVCs) that explain how the selected policies can support GVC resilience. Scale issues are addressed to assess differences in the likely impact of the six policies if they are applied at the national (Sweden) and supranational (EU) levels. This article illustrates policy insights for small high-income countries that are highly dependent on GVCs and seek to promote partnerships between private and public actors in terms of core social values.

The article on MSEs in the Italian fashion industry analyzes the determinants and consequences of reshoring decisions during the 2008–2015 period, which was marked by the enactment of “Made-in-Italy” policies. The Made-in-Italy legislation was introduced in the 2000s by Italy to counter global sourcing with place-based branding that emphasized the authenticity and quality of locally made products. A key finding of the Canello et al. (2025) study is that reshoring does not automatically lead to better firm performance or national benefits compared to Italian MSEs that maintain offshore operations. Rather, the main impact of Made-in-Italy legislation may be indirect, given

that MSEs that fully reshore are most likely to improve their performance if they are re-embedded in dense local subcontracting networks. Thus, to mitigate the negative consequences of reshoring by MSEs with limited resources and capabilities, policymakers should consider reshoring as a proactive strategy that includes policies to strengthen the home-country ecosystem to enable reshored firms to perform better.

The article on Kazakhstan focuses on a resource-rich, state-controlled Central Asian economy with close ties to Russia (DeRemer et al., 2025). These characteristics provide a unique setting for examining how state policies shape the country’s dual objectives of economic diversification and GVC resilience in two strategic sectors, uranium and medicine, before and after the shocks of the Russia-Ukraine war and the COVID-19 pandemic. Kazakhstan (which became independent in 1991) has followed a multi-vector foreign policy in the post-Soviet period in pursuit of “pragmatic inclusivity”, i.e., the goal of advancing national interests while maintaining cooperation with major global players. A novel contribution of this article is a typology of state-owned enterprises (SOEs) and sovereign wealth fund (SWF) firms, either fully state-owned or with minority private ownership, that is applied to the uranium and medicine GVCs. By examining contrasting resource-based (uranium) and non-resource-based (medicine) industries, the authors show how different state roles in GVCs (regulator, facilitator, producer, and buyer) created unintended consequences of state intervention in the pre-shock and post-shock periods that impacted the resilience and upgrading outcomes for firms in both GVCs.

While GVCs have been discussed from geopolitical and macroeconomic perspectives, the article by Lopez et al. (2025) shows that GVC reconfigurations also reflect sustainability and development concerns. Sustainable GVCs not only involve improving, shortening, and diversifying supply chains, but also incorporating suppliers with low carbon intensities that reduce emissions generated directly and indirectly. This article addresses how the reshoring of GVC activities in five strategic sectors (antibiotics, vaccines, batteries and electric motors, iron and steel, and chips and circuits) affects the carbon footprint of these GVCs. Drawing upon inter-country input-output data for 66 countries from 1995 to 2018 combined with data for carbon dioxide emissions embodied in international trade, the authors conduct a scenario-planning analysis that evaluates net carbon emission from three different diversification strategies: intra-EU (backshoring); extra-EU (nearshoring/friendshoring); and a mixed integral strategy. The findings suggest that reshoring could shorten GVCs but increase direct emissions within the EU (backshoring) and its close partners (nearshoring/friendshoring), while reducing indirect emissions along the EU’s supply chain. There are heterogeneous effects between

industries and across countries. While reshoring to more developed economies reduces carbon emissions in GVCs, developing economies risk being bypassed if they cannot comply with higher environmental standards required in lead-firm economies.

The article by Altenburg & Strohmaier (2025) focuses on low-emission hydrogen (LEH) as a case study for examining GVC upgrading by latecomer economies. The authors use published national hydrogen strategies of 20 latecomer countries, with status determined by an economic complexity index derived from trade data, to identify a novel typology of four industrial development pathways along the LEH value chain. Each pathway, which is analyzed in terms of its initial conditions, the industrial activities involved, the main entry barriers and risks, and specific upgrading opportunities, ultimately leads to different GVC configurations. The pathways are often combined in practice, and most country-level LEH strategies integrate several of them. Each pathway is defined by its mix of three types of industrial policy: generic, latecomer-specific, and greening-specific. The comparative assessment of these pathways and policies draws on scientific literature as well as qualitative insights derived from country case studies and interviews. Using the GVC framework, the article maps different stages in which latecomer economies can join the LEH value chain, and it assesses the potential challenges and trade-offs that latecomer countries may face in efforts to maximize their development gains.

Distinguishing between deployment and manufacturing GVCs, the article by Lema and Rabellotti (2025) investigates how middle-income countries can leverage industrial policies to participate and upgrade within renewable energy GVCs. The authors examine three sectors—solar PV (photovoltaic), wind, and biomass power—across 12 countries, encompassing three types of industrial policies (demand-side, supply-side and technology-focused). Using a mix of quantitative and qualitative data collected on country-specific combinations of national preconditions and policies, the authors employ fuzzy-set Qualitative Comparative Analysis (fsQCA). The analysis identifies key configurations that enable different participation and upgrading trajectories in GVCs. While participation is widespread in both deployment and manufacturing GVCs, upgrading is more prominent in deployment chains, which present lower entry barriers. In contrast, upgrading in manufacturing chains requires stronger sectoral knowledge, larger markets, and robust technology policies. A key policy insight is that targeted and context-specific industrial policies are essential to seize “green windows of opportunity” in renewable energy GVCs. However, the article refines this insight by distinguishing complementary and substitution effects of industrial policy in emerging economies: whereas complementary policies require robust existing capabilities, other

policies (particularly on the supply-side) can substitute for weak preconditions.

Anzolin & Pietrobelli (2025) propose a taxonomy to analyze industrial policies in mining value chains. The two main dimensions in the taxonomy are demand versus supply policies and market-based interventions versus public goods provision, with a further classification of the latter between skills development, innovation infrastructure, and R&D platforms. The applicability of the taxonomy is illustrated through case studies of Australia, Chile and South Africa from the early 2000s to 2019, with a focus on the coherence of the policy packages adopted in each country’s mining industry. Australia showcases an interventionist mining approach, with a supply emphasis on supporting R&D and demand mechanisms focusing on aiding small and medium enterprises (SMEs) and service providers to reach large mining customers and fulfil certain local sourcing criteria. South Africa also has an interventionist policy approach but combines both industrial development and socio-economic goals in its policy agenda. Chile, in contrast, has a softer approach to mining industrial policy, where demand-side policies to help develop suppliers failed to support uncertain innovation investments. Recently the Chilean government has been more active in industrial policy to promote value-adding activities.

Table 2 illustrates how the articles in the special issue connect to our integrative framework. Since the industrial policies and GVC trajectories in several of the articles span specific disruptions and the global integration and global fragmentation eras, they may appear in more than one quadrant of the table.

## Discussion of cross-cutting themes

The articles chosen for the special issue make several theoretical, methodological, and empirical contributions to the industrial policy, GVC, and international business fields. As already noted, they vary significantly in their geographic and industrial scope, but they all contain rich empirical findings, rigorously constructed datasets and innovative methods, novel typologies of industrial policies, and constructive policy insights to guide policymakers in both advanced and developing economies. The empirical evidence from these seven articles provides insights into how our integrative framework operates in practice, revealing both the explanatory power and the evolving complexity of industrial policy-GVC interactions across different economic contexts. We illustrate below some of the takeaways from the special issue in five thematic areas, demonstrating how each theme reflects the strategic tensions and transformations captured in our framework.

**Table 2** Industrial Policy & GVCs in an Era of Disruptions: Case Illustrations

|                      |                    | Prevailing context  |  |
|----------------------|--------------------|---|--|
|                      |                    | Global Integration  | Geopolitical Fragmentation   |
| Level of development | Advanced Economies | <p style="text-align: center;"><b>Creating winners</b></p> <ul style="list-style-type: none"> <li>• <b>Canello et al. (2025)</b>: Passage of “Made-in-Italy” legislation to counter global sourcing with place-based branding to emphasize the authenticity of locally made products.</li> <li>• <b>Anzolin &amp; Pietrobelli (2025)</b>: Taxonomy of active industrial policies, such as supply-side R&amp;D support and demand-side support to SMEs, to increase integration and coherence of mining GVC in Australia, Chile, and South Africa.</li> </ul>  | <p style="text-align: center;"><b>Enhancing economic security</b></p> <ul style="list-style-type: none"> <li>• <b>Baraldi et al. (2025)</b>: Identification of six policies and three policy mechanisms (reinforcing, gathering, and multiplying, GVCs) to ameliorate the impact of Sweden’s antibiotic shortages.</li> <li>• <b>Lopez et al. (2025)</b>: Potential synergies of GVC resilience and climate change goals resulting from reshoring of GVC activities, creating a net saving in the EU’s carbon footprint in five strategic industries.</li> </ul>   |
|                      | Emerging Economies | <p style="text-align: center;"><b>Enabling latecomer catch-up</b></p> <ul style="list-style-type: none"> <li>• <b>Altenburg &amp; Strohmaier (2025)</b>: Typology of industrial development pathways that facilitate entry of 20 latecomer economies into low-emission hydrogen (LEH) GVCs.</li> <li>• <b>DeRemer et al. (2025)</b>: Kazakhstan’s use of state-owned enterprises (SOEs) prior to Russian-Ukraine war to integrate into uranium and medicine GVCs.</li> <li>• <b>Lema &amp; Rabellotti (2025)</b>: Conditions and policies for participation and upgrading by 12 middle-income countries in renewable energy deployment and manufacturing GVCs.</li> </ul> | <p style="text-align: center;"><b>Strengthening supplier resilience</b></p> <ul style="list-style-type: none"> <li>• <b>Altenburg &amp; Strohmaier (2025)</b>: Policy mixes in each greening-specific pathway that create value addition in LEH GVCs.</li> <li>• <b>DeRemer et al. (2025)</b>: Post-shock policies created unintended consequences that hindered the resilience of firms and economic diversification in Kazakhstan’s uranium and medicine GVCs.</li> <li>• <b>Lema &amp; Rabellotti (2025)</b>: Context-specific policy mixes for middle-income countries needed to seize green windows of opportunity in three renewable energy GVCs.</li> </ul> |

**Disruptions and resilience**

The overarching theme of this special issue is how industrial policy shapes GVCs in an era of disruptions. As outlined above, multiple disruptions indeed characterize the contemporary period, the most dramatic of which was the COVID-19 global pandemic in 2020–2022. The global financial crisis of 2008 marked the end of nearly five decades of continuous expansion in the global economy, and in the 2010s and 2020s we have witnessed the rise of economic nationalism, the outbreak of regional conflicts, and broad geopolitical shifts toward multipolarity that stimulated the emergence of new types of industrial policies and a corresponding reconfiguration of GVCs. As outlined in our integrative framework, these disruptions fundamentally altered the strategic orientations of both advanced and emerging economies, compelling states to move beyond the traditional efficiency-driven logic of the globalization era toward the security-embedded approaches that characterize the current multipolar, geopolitical fragmentation era.

The articles in the special issue provide compelling evidence of this transformation across the framework’s four quadrants. Most notably, they demonstrate the shift from the “global integration” context to “geopolitical fragmentation,” where both advanced and emerging economies must navigate increasingly complex hybrid strategies that blend inside-out and outside-in logics.

Among the articles in this special issue, the one that most clearly incorporates explicit disruptions in its research design is the study of industrial policy in Kazakhstan’s uranium and medicine GVCs, before and after the disruptions of the Russia-Ukraine war and the COVID-19 pandemic, respectively (DeRemer et al., 2025). Kazakhstan’s pursuit of “pragmatic inclusivity” (maintaining cooperation with major global players while advancing national interests) demonstrates the hybrid inside-out and outside-in logic that emerging economies must adopt to strengthen their resilience. The other articles are less concerned with specific disruptions than recurring challenges, such as antibiotics shortages in Sweden (Baraldi et al, 2025) or periodic reshoring initiatives to counter the centrifugal pull of global sourcing (Canello et al., 2025).

Sweden’s approach to chronic antibiotic shortages illustrates how advanced economies can “enhance economic security” through detailed policy mechanisms that reinforce security-embedded GVC governance structures in critical sectors. This exemplifies our framework’s proposition that advanced economies under geopolitical fragmentation adopt increasingly selective and restrictive outside-in policies that screen and constrain foreign activities in favor of domestic economic security, such as sufficient antibiotic supply in the Sweden case.

However, a central topic in several of our articles is the theme of sustainability and climate change. This includes

measuring the impact of EU carbon emissions (Lopez et al., 2025), tracing industrial pathways in 20 latecomer economies to green hydrogen GVCs (Altenburg & Strohmaier, 2025), and analyzing the policy determinants of participating and upgrading in three renewable energy GVCs in 12 middle-income countries (Lema & Rabellotti, 2025). From a planetary perspective, climate change is clearly a major global disruption, but it plays out on a longer and more volatile temporal and geographic horizon. The policy challenges are complex, which frequently lead to major “implementation deficits” in sustainability efforts to date (De Marchi & Gereffi, 2023). Nonetheless, the three articles on industrial policies that promote clean energy GVCs reveal considerable progress in both measurable outcomes and effective policy designs across relatively large samples of country cases.

The multilevel resilience concept applied to more acute disruptions like the global pandemic (Gereffi, 2020; Gereffi et al., 2022a, 2022b) is still relevant to clean energy GVCs, but the originality of the latter articles lies in how effective policy design and impact are measured and explained in diverse empirical settings. These studies show how climate change creates additional layers of disruption that require hybrid strategic responses. Given higher standards and practices required to engage with and operate in advanced economies, firms and governments in emerging countries must simultaneously pursue environmental objectives while strengthening supplier resilience, highlighting the complexity of contemporary industrial policies across countries.

### GVC configurations

The second theme demonstrates how GVC configurations are being transformed by the shift from efficiency-driven coordination mechanisms toward security-embedded governance structures. Given the debates around how GVC concentration could lead to greater vulnerability and risks, the articles in this special issue provide more nuanced views on multiple factors that policymakers and managers should consider. The traditional view that GVC geographic and organizational configurations reflect purely economic rationales has been challenged across multiple sectors and contexts examined in our special issue.

The disaggregation of value chain activities based on the economic rationale of comparative advantage may not be the best option when control is spread along the value chain. As governments and firms seek greater control over GVCs, having multiple value chains and locating them closer to home are attractive GVC configuration options. Lopez et al. (2025) provide a comprehensive analysis of this transformation, examining how reshoring strategies in five strategic sectors (antibiotics, vaccines, batteries and electric motors, iron and steel, and chips and circuits) reflect the EU’s shift toward “enhancing economic security”. This represents a decisive

turn from the inside-out “creating winners” approach of the global integration era to the outside-in restrictive logic that prioritizes economic security over global market expansion

Insights can also be drawn from the influence of industrial policies on GVC dynamics. Where lead firms previously orchestrated GVCs primarily through efficiency-oriented governance structures, the articles show how government policies shape GVC dynamics through security-embedded considerations. Governments can set standards that directly influence GVC configurations, ranging from environmental standards (Lopez et al., 2025) to local-content requirements, underscoring our framework’s emphasis on growing state intervention in GVCs.

While the traditional industrial policy view prioritizes the transformation of economic structures at the industry and country levels, this special issue reveals that industrial policies may have cascading impacts on countries, industries, and firms (Gereffi et al., 2022a, 2022b). The Italian fashion industry case (Canello et al., 2025) provides important insight for our framework by showing that the shift toward “enhancing economic security” supports complementary ecosystem development beyond simple relocation incentives.

### Tensions and trade-offs

The tensions and trade-offs identified across the articles directly reflect the paradigm shift captured in our framework: the weakening of the efficiency-driven logic from the global integration era vis-à-vis the security-embedded logic in the global fragmentation period. These tensions are manifest at multiple levels and across different stakeholder groups, creating asymmetric vulnerabilities and tensions.

Baraldi et al. (2025) and Canello et al. (2025) exemplify how policy implementation at national and regional levels requires coordination at local and subregional levels, reflecting challenges that are not country-specific. But country-to-country tensions become particularly pronounced when national security concerns drive GVC alignments, as demonstrated in the Kazakhstan case where geopolitical considerations regarding a powerful neighbor (Russia) overshadow more attractive potential economic partnerships with the EU (DeRemer et al., 2025).

More significantly, advanced versus emerging economy interests diverge along GVCs when overall efficiency is no longer a shared goal. This divergence is particularly evident in GVC reshoring initiatives, which may not provide win-win solutions since suppliers in emerging markets stand to lose out when production shifts back to developed countries, as occurs in EU carbon emission policies (Lopez et al., 2025). Thus, emerging economies must navigate between maintaining essential global connections and developing capabilities to reduce strategic vulnerabilities, which is the

core challenge of the “strengthening supplier resilience” strategy.

The success of emerging economies in dominating key GVC niches, once celebrated as upgrading success stories, now raises security concerns in advanced economies, creating what our framework identifies as a fundamental tension between the “promoting economic security” and “strengthening supplier resilience” quadrants. These shifting power dynamics create recurrent industrial policy tensions. The articles in this special issue offer potential solutions on how emerging economies can navigate this politically sensitive terrain. Altenberg & Strohmeier (2025) and Lema & Rabelotti (2025) provide insights on how middle-income economies can leverage renewable energy GVCs through different pathways, using latecomer- or greening-specific objectives. Anzolin & Pietrobelli (2025) stress coherence and consistency in policy implementation as instrumental in mining value chains, a key sector for many emerging economies. These articles demonstrate that complex hybrid approaches may be necessary for emerging economies in the fragmentation era.

### New drivers of industrial policy

The new drivers of industrial policy identified across the articles align closely with our framework’s emphasis on the fundamental shift from efficiency-driven to security-embedded logics in the geopolitical fragmentation era. Multipolarity, strategic autonomy, and weaponized interdependence emerge as defining features that validate our framework’s comparative and longitudinal analytical scope.

The EU’s push for “strategic autonomy” and its focus on “strategic value chains” in clean vehicles, smart health, low-carbon emission industries, and cybersecurity (European Commission, 2019, 2020) illustrate how advanced economies implement “promoting economic security” strategies. The articles on green and clean energy GVCs (Altenberg & Strohmeier, 2025; Lema & Rabelotti, 2025; Lopez et al., 2025) provide concrete examples of how these objectives reshape both domestic capabilities and international partnerships.

A key consideration in regional settings is the extent to which national industrial policies align or conflict with similar policies at the regional level. This is an explicit concern addressed by Baraldi et al. (2025) in their analysis of policies to prevent antibiotics shortages in Sweden, and it is also addressed through comparison of “Made in Italy” policies with similar “Made in” policies in neighboring countries (Canello et al., 2025).

The theme of “weaponized interdependence” (Farrell & Newman, 2019) validates our framework’s emphasis on the security-embedded governance structures that characterize the fragmentation era. This view highlights how states can

manipulate the inherent power imbalances within interconnected global networks (economic, financial, or informational) to gain strategic leverage or coerce others. The mining GVC analysis (Anzolin & Pietrobelli, 2025) and the Kazakhstan case study (DeRemer et al., 2025) demonstrate how states can manipulate power asymmetries for strategic gain in ways that challenge the positive sum logic of efficiency-driven connectivity that characterized the global integration period.

A final new driver for industrial policies in GVCs is the growing intensity of regional conflicts. One of these, the Russia-Ukraine war, directly influences Kazakhstan’s policy considerations in the uranium and medicine GVCs, where SOEs in Kazakhstan and Russia vie for control over critical technologies and access to strategic inputs and external markets (DeRemer et al., 2025). This case reinforces how geopolitical fragmentation compels emerging economies to develop more sophisticated capabilities to strengthen their resilience. The ongoing tension between China and Taiwan similarly turns semiconductor chips into one of the critical strategic industries that shape industrial policies in many countries, particularly the US (Miller, 2022).

### Data and policy insights

The articles in this special issue utilize an impressive range of approaches in terms of data, research designs, and analytical tools. This plurality is necessary to further our knowledge about industrial policies and GVCs in disruptive times, but complexity remains a key challenge in analyzing industrial policy and GVCs in the current era. Detailed high-quality data and rigorous methods yielded numerous policy insights in both large-N and small-N studies.

To provide EU policymakers with precise measurements of the carbon footprint for the reshoring of five strategic products, Lopez et al. (2025) employed a sophisticated multi-regional input-output model for 66 countries over more than 20 years (1995–2018) to trace the global environmental impact of reshoring strategies by country, industry, and type of product (intermediate inputs or final goods). This detailed analysis involved multiple simulated production relocation scenarios, which permits EU policymakers to understand under which conditions carbon emission savings would be greatest, and who the winners and losers of the process would be.

Making generalizable causal estimations and claims is easier in large-N studies, which require appropriate indicators and instruments to utilize tools such as event-history analysis or (quasi-)experimental designs. Micro data on GVC-and industrial policy variables can also be employed to conduct social network analyses. In their article on the Italian fashion industry, Canello et al. (2025) used data on the reshoring decisions of over 750 MSEs during the

2008–2015 period for a multivariate, hypothesis-testing analysis of whether Made-in-Italy policies benefitted the reshored MSEs as much as expected, and if not, who the actual winners and losers of this policy are. As showcased in the special issue, QCA analysis (Lema & Rabellotti, 2025) and simulations (Lopez et al, 2025) are other useful methodologies.

In small-N studies, rigorous data collection and value chain mapping are especially important. Although the article on Sweden's antibiotics industry seems like a relatively simple one-country, one-industry study, the authors created a dataset of 138 generic antibiotics supplied by three main types of companies in 367 formats. During 2018–2024, Sweden experienced 337 antibiotic shortages with an average length of 150 days, affecting over three-quarters of the country's antibiotics products (Baraldi et al., 2025). With this level of empirical detail, the assessment of expected policy impacts can be carried out with a relatively high level of confidence.

Taken together, the articles in this special issue provide substantial theoretical and empirical support for our integrative framework. The core insight is that the shift from global integration to geopolitical fragmentation has fundamentally altered both the strategic orientations available to states and the logic governing GVC coordination. Most importantly, the articles demonstrate that GVC and industrial policy decisions in the era of disruptions requires complex approaches that transcend the simpler inside-out versus outside-in distinctions that characterized the earlier globalization period. Being aware of these complexities should assist stakeholders in both the public and private sectors to make better decisions on industrial policy and GVC trends.

## Future research directions

The heightened interest in industrial policy and GVCs should continue to grow. In the context of multipolarity, economic nationalism, weaponized interdependence, and territorial conflicts, the volatility and disruptions that fuel industrial policy show no signs of abating. The research on a broad range of GVCs in this special issue indicates that firm strategies will continue to shift in response to the changing global context, and adaptive GVC configurations will emerge.

The reality of twenty-first century industrial policy is that national self-sufficiency is an unachievable goal, even for relatively simple products. This is even more true for overly ambitious objectives like decoupling from China (Farrell & Newman, 2020). That said, there is a lack of research on China's seemingly quiet decoupling from the West (Newsweek, 2025) as scholarly attention

has disproportionately focused on Western strategies of decoupling and de-risking from China (e.g., Witt et al. 2023). However, there are numerous topics on which new research needs to be carried out. Efforts to reshore production will continue in many countries, not only to enhance national security but also as a hedge against supply-chain risks. A key issue is not *whether* to reshore, but *what* to reshore. GVC analysis is crucial in identifying the relative value of goods and services along a value chain, but industrial policy will be tasked with deciding what parts of a value chain are strategic priorities, how the reshoring might take place, and the impacts of reshoring across GVCs.

Another topic is the inherent connections between industrial policy and trade policy. Even before the recent US-China trade wars it was clear that trade policies, both trade restrictions (like tariffs, quotas, and export controls) and trade agreements (bilateral, regional, or multilateral), have numerous unintended consequences in a supply-chain world (Gereffi et al., 2021). Unpacking these interdependencies and modeling the likely consequences of the weaponization of trade is of utmost priority for a stable international order.

Effective industrial policy operates at different territorial scales. One can emphasize the national economy (reshoring), regional integration (nearshoring), strategic partnerships (friendshoring), geopolitical rivalries (security-shoring), and sub-national industrial policies (local clusters). Learning which policies work or fail, and why, requires exploring multiple scales. In addition, the broader gains that can be achieved from innovation policy often require international collaboration and partnerships. Restoring these broken or missing links will make the synergies between industrial policy and GVCs much tighter and more resilient.

The pace and volatility of political and technological changes in the global economy continue to accelerate, and multipolarity guarantees that geopolitical fragmentation will persist for the foreseeable future. In a GVC-oriented world, industrial policies provide countries with tangible opportunities to strengthen a country's position along value chains that encompass a wide array of resource-based, manufacturing oriented, and knowledge-intensive activities (Van Assche, 2020). However, both advanced and emerging economies have moved beyond the efficiency-based logic of the globalization era to support value creation activities related to broader goals such as the green transition and securing strategic goods where selective reshoring of production can enhance both economic security and prosperity.

The escalating tension between geopolitical imperatives to deglobalize, decouple, and derisk, and the concurrent need for cross-border collaboration to address pressing societal and planetary challenges, presents a critical paradox that

demands scholarly examination. To enhance the effectiveness of industrial policies, the articles in this special issue and the broader GVC literature highlight the importance of combining high-quality detailed data, clear and manageable goals, capable domestic firms, an appropriately skilled workforce, and coordination with related GVC suppliers and buyers to lower supply-chain risks and add value in an era of disruptions in the twenty-first century. A GVC perspective on industrial policy allows us a broader space to examine its wide-ranging impacts on social and environmental upgrading and the overarching goals of growth and sustainability.

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**Gary Gereffi** (Ph.D., Yale University) is Emeritus Professor of Sociology and Founding Director of the [Global Value Chains Center](#) at Duke University. He is an originator of the global value chains (GVC) framework. Gereffi has published over a dozen books and numerous articles on globalization, economic sociology, economic, social, and environmental upgrading, and the impact of industrial and trade policy on GVCs. Recent books include G. Gereffi, P. Bamber, & K. Fernandez-Stark (Eds.), *China's new development strategies: Upgrading from above and from below in global value chains*, (Palgrave Macmillan, 2022); S. Ponte, G. Gereffi, & G. Raj-Reichert (Eds.), *Handbook on global value chains* (Edward Elgar Publishing, 2019); and G. Gereffi, *Global value chains and development: Redefining the contours of twenty-first century capitalism* (Cambridge University Press, 2018).

**Pavida Pananond** (PhD, University of Reading) is Professor of International Business at Thammasat Business School and Alan Rugman Research Fellow at the University of Reading's Henley Business School (2024–2025). Her research focuses on global strategy, emerging market multinationals, and global value chains. Her work has appeared in leading journals including *California Management Review* and *Global Strategy Journal*. She regularly contributes opinion editorials to regional media outlets, including *Nikkei Asia*, and *Global Asia*. Pavida serves on editorial boards of several academic journals, including as Area Editor for the *Journal of International Business Policy*.

**Fredrik Tell** (PhD, Linköping University) is Professor and Chair in Business Studies at Uppsala University, where he is also affiliated with the Uppsala Centre for Business History. He is a Fellow of the Royal Swedish Academy of Engineering Sciences and the Royal Society of Sciences at Uppsala. His present research on innovation involves patent history, intellectual property rights and markets for technology, digitalization and changing organizational routines, temporary and distributed organizational forms, multinational management during change, and strategic temporal work. He co-edited *Managing knowledge integration across boundaries* (with Christian Berggren, Stefano Brusoni and Andrew Van de Ven, Oxford University Press, 2017). Fredrik Tell also serves as one of the editors for *Industrial and Corporate Change*.

**Tony Fang** (PhD, Linköping University) is Professor of Business Administration at Stockholm Business School, Stockholm University. His research interests include culture, cross-cultural management/ leadership/communication/innovation, negotiation, emerging markets, global sustainability, Yin Yang thinking, non-Western approach, Global South versus Global North, and futurism. He is the author of *Chinese Business Negotiating Style* (1999) and papers including “A critique of Hofstede's fifth national culture dimension” (2003), “From ‘onion’ to ‘ocean’: Paradox and change in national cultures” (2005–2006), and “Yin Yang: A new perspective on culture” (2012). Tony Fang serves on the editorial boards of several academic journals, including his role as an Area Editor for the *Journal of International Business Studies* (JIBS).