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EDITORIAL

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The Geoeconomic Turn in International Trade, Investment, and Technology

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Abstract

This thematic issue brings together a set of articles that empirically map the state of the ongoing geoeconomic turn in the global political economy from an international political economy (IPE) perspective. Changes in the modus operandi of the global political economy urge the development of new conceptual and theoretical tools to grasp the new geoeconomic reality of world affairs. At the same time, the contemporary study of geoeconomics remains theory-centred and focused on its security dimension, thereby underplaying the empirical nuances and variegated aspects of these developments. We therefore make the case for an empirically grounded study of concrete cases and instances of the geoeconomic turn, which can then deliver insights for further theory-building. Likewise, many aspects of the geoeconomic turn cannot be explained by security logics only, but have political economy roots that need to be brought to the foreground. Our thematic issue excavates these dynamics across four key challenges for the global economy: the role of states and firms in a geoeconomic world; global technological competition; the green transition; and implications of the geoeconomic turn for the non-Western world. Collectively, the contributions demonstrate that the geoeconomic turn is only starting to concretely (and partially) materialize and that these transformations, in many cases, tend to replicate existing power structures that prioritize capital(ist) interests related to profit-maximisation over societal interests, ecological sustainability, or social equity. We close by delineating prospects for further IPE research into the ongoing geoeconomic turn in the global political economy.

Keywords

geoeconomics; geopolitics; global economy; international political economy; investment; technology; trade

1. Introduction

The geoeconomic turn in the global political economy amounts by now to an established research program in the fields of international relations, international political economy (IPE), European studies, and economic geography (Babic et al., 2022; Herranz-Surrallés et al., in press; Poon, 2024; Rosén & Meunier, 2023). Following a period of rapid expansion in the 1990s and 2000s, the global economy experienced declining cross-border capital flows as well as slowing trade and investment growth in the aftermath of the global financial crisis of 2008 (James, 2018). This movement towards "slowbalization" (Linsi, 2021) coincided with the economic and political rise of China and other (re-)emerging powers, which chose to selectively integrate into world markets while at the same time rolling out alternative paths and rulesets to global governance, thereby challenging the notion of a universal liberal world order (de Graaff & van Apeldoorn, 2018). The global rise of economic nationalism and the coming to power of figures such as Trump and Bolsonaro, or the success of the Brexit campaign, further undermined teleological understandings of globalization. By the mid-2010s, these political tendencies had become increasingly pronounced: The US and China engaged in a trade and technology "war," leveraging tools of economic statecraft against each other (Germann et al., 2024); many European countries introduced inward investment screening mechanisms (Bauerle Danzman & Meunier, 2023); and state-directed industrial policy was resurging as a central element of economic policy-making in the OECD and beyond (Abels & Bieling, 2024; Bulfone, 2023; Gräf, 2024; Wigger, 2024). Compared to the preceding phase of neoliberal globalization, these aspects amount to a geoeconomic "turn" in the global political economy (Herranz-Surrallés et al., in press; Rosén & Meunier, 2023). In this thematic issue, we propose to unpack the contours of this turn in empirical terms and from an IPE perspective. We seek to bring to the forefront the global political economy dynamics that underpin and shape geoeconomic competition and hence drive much of the more security- and state-centred dynamics observed by other contributions.

Academic work on various aspects of this geoeconomic turn is proliferating but has traditionally centred on conceptual, theoretical, and historical work. Early contributions like Blackwill and Harris (2016), following the Luttwakian tradition, understood geoeconomics as a variation of economic statecraft, a re-articulation of the projection of state power across borders in a globalized economy. However, the political economy of geoeconomics is hardly reducible to great power competition. It involves a variety of actors other than states, including firms, social groups, and international institutions (Babic et al., 2022). More recent contributions have shifted focus on the regulatory aspects of the geoeconomic turn (Herranz-Surrallés et al., in press; Rosén & Meunier, 2023), in which state actors, however, remain central. They have introduced political and governance-related changes that potentially slow down or even reverse the logic of decades of economic integration. Yet, geoeconomic attempts at decoupling or derisking often clash with the realities of globalized economies, e.g., intertwined supply chains, complex corporate structures across multiple jurisdictions, or arcane financial networks reducing the effectiveness of tools of economic statecraft (see also Linsi & Gristwood, 2024). To more comprehensively understand the geoeconomic turn, it is thus necessary to complement a focus on the policy-regulatory level with the analysis of global economic structures. Such a re-thinking and broadening of the rubric of geoeconomics opens up a variety of new research avenues.

Our thematic issue picks this thread up and seeks to advance scholarship on the geoeconomic turn through an empirically focused IPE angle. In doing so, we endorse a diverse range of perspectives that allow us to assess the turn in light of the interplay between political and economic actors and changes (or the lack thereof) in the global economy. What does it mean when we say that firms, international institutions, and other non-state

actors become more central to global geoeconomic competition? In which way do we see value and supply chains transformed and what does this transformation bring about for various actors, regions and countries, also beyond the US–China–EU triad? How exactly are economic policy instruments and related strategies being adjusted and with what implications? If security is not the only driver and objective of renewed global rivalries, what are the sources and consequences of concrete geoeconomic engagement? In which sectors and segments of the global political economy do we see historical continuities and where can we detect change as a consequence of these developments? By focusing on concrete cases and instances of the geoeconomic turn, the articles in this thematic issue can help to answer these questions in an empirically substantiated way. Thematically, the collection foregrounds four contemporary challenges related to the geoeconomic turn: the role of states and firms in a geoeconomic world; global technological competition; the global green transition; and implications of the geoeconomic turn for the non-Western world.

Taken together, the empirical IPE lens adopted in this thematic issue delivers two main results: First, we observe that, in contrast to the preceding phase of neoliberal globalization, the geoeconomic turn at the policy-regulatory level indeed signals a potential sea change in the modus operandi of the global economy. Yet, the political changes and material effects (e.g., regarding corporate re-organization) are still in the process of being realized. They are subject not only to institutional inertia and path dependencies but also to political agency and contestation by various involved actors. The "regulatory phase" of the geoeconomic turn thus does not translate smoothly into, or correspond to changes in, economic structures. Instead, we observe uneven and partly contradictory outcomes. Second, we observe that the geoeconomic turn tends to replicate existing power structures that lend more weight to capital(ist) interests related to profit-maximisation as compared to societal interests. Moreover, confrontational state relations and the rise of security concerns make it even more difficult to orient the world economy towards societal interests such as ecological sustainability or (social) equity in international relations.

2. Four Challenges of the Geoeconomic Turn and This Thematic Issue's Contributions

2.1. States and Firms in a Geoeconomic World

The role of (multinational) corporations and their relationship to nation-states is a topic at the heart of the field of IPE (Strange, 1991). The rise of (mostly American) large corporations as core actors in global politics at the end of the 1960s was consolidated in the post-Cold War world of neoliberal globalization, where multinationals became powerful global actors, sometimes on par with the financial might of nation-states (Babic et al., 2017). At least since the outbreak of the Covid-19 pandemic in early 2020, themes such as "nearshoring," "reshoring," "decoupling," or "derisking" have dominated debates around corporate restructuring in a geoeconomic world (Linsi, 2021). In contrast to what proponents of economic nationalism sometimes suggest, however, our contributions show that the geoeconomic turn does not necessitate that corporations lose power to nation-states. Corporate and state power transform slowly in specific segments of world politics and a geoeconomic lens helps us trace these changes empirically.

The article by Linsi and Gristwood (2024) asks how far the anti-globalization backlash is reflected in actual corporate re-organization. They look at cross-border investment data, collected from different sources and at various levels from firm-level ownership information to FDI statistics. The article focuses empirically on the evolution of US FDI positions in China, which the authors identify as the most likely case of contemporary

deglobalization. Pushing back against conventional wisdom in news headlines and public debates, Linsi and Gristwood do not find compelling evidence for deglobalization or dwindling economic integration. Rather, their results reflect continuity and stability in this important economic relationship. Corporate actors seem to rethink and rewire their cross-border investments but create arguably "new forms of internationalization rather than the end of globalization" (Linsi & Gristwood, 2024, p. 1).

The contribution by Köncke and de Graaff (2024) complements this analysis by focusing on the China-EU investment relationship. The authors specifically focus on the Chinese ICT and automotive industries since 2000 and how their FDI and other collaborative ties with European firms developed under increasing geoeconomic competition. They draw on corporate data from Thomson Reuters and the Global China Investment Tracker and combine this firm-level data with a novel measure for the degree of party-state permeation of Chinese firms. Similar to Linsi and Gristwood, the authors find that the Chinese expansion into Europe is continuing, albeit in modified ways. More specifically, they find that the extent of adaptation is moderated by the degree of involvement by the Chinese Communist Party: Firms with high levels of state-permeation experience the geoeconomic turn much more directly than those with lower levels. These results again challenge simplistic narratives about deglobalization or decoupling between China and the rest of the world, and urge us to better understand empirical realities when it comes to studying the geoeconomic turn.

Germann et al. (2024) then bring together the geoeconomic "triad" of the EU, China, and the US by zooming in on a core case of contemporary technological competition, namely the German attempt to reconcile its "techno-dependency" on the US with its export-dependency on China. Drawing on firm-level ownership data, the article maps the German semiconductor network and finds strong ties to its domestic automotive industry—which is in turn highly dependent on the Chinese export market. This connection, the authors propose, helps to explain the reluctance of German policy-makers to comply with the US tech decoupling policies and illustrates the emerging complexity of global geoeconomic competition. The authors also empirically demonstrate the key role firms play as geoeconomic actors and how they wield power in variegated and cross-sectoral ways.

All these three articles deliver important empirical and firm-level insights on the state of the geoeconomic turn. Their findings suggest that the geoeconomic turn is a "work in progress," but also raise doubts about whether it will anytime soon fully materialize on the corporate level: scenarios such as deglobalization (Linsi & Gristwood, 2024), EU–China decoupling (Köncke & de Graaff, 2024), or derisking (Germann et al., 2024) are in reality fraught with tensions, contradictions, and complexities that render the feasibility of such political attempts questionable.

2.2. EU Industrial Policy in the Context of Global Tech Competition

The return of industrial policy in Europe and elsewhere constitutes one of the most visible signifiers of the geoeconomic turn. Existing literature has identified a notable shift away from the neoliberal market-making role of the state in policymaking (van Apeldoorn & de Graaff, 2022). Three contributions in the thematic issue deal specifically with this shift (Abels & Bieling, 2024; Gräf, 2024; Wigger, 2024), focusing on different—yet interrelated—aspects of the return of industrial policy in an EU struggling to position itself in the US–China tech rivalry (see also Germann et al., 2024; Weinhardt et al., 2022).

The contribution by Wigger (2024) points to the importance of the underexplored financing strategies underpinning the EU's (new) industrial policy. Offering a critical IPE analysis, Wigger places the financing of the EU's industrial policy in a broader historical perspective. The article emphasizes the role and interests of powerful financial and industrial capital and shows that the debt-financing strategies in contemporary EU industrial policy primarily benefit the interests of fractions of industrial capital in technology-intensive value chains and financial capital. In contrast, organized labor and wider society are largely excluded from these (re)investment decisions, which, Wigger concludes, does not bode well for the long-term ecological, economic, and social sustainability of the EU's new industrial policy.

The article by Gräf (2024) offers a complementary analysis which zooms into one of the new governance instruments in the toolkit of EU industrial policy: the so-called Important Projects of Common European Interest (IPCEI)—cross-country industrial policy projects in which firms from multiple member states collaborate on strategic key technologies and their value chains. Gräf interprets these IPCEI as novel vertical governance tools, representing a gradual and partial "regulatory-developmental turn" within EU industrial policy. Focusing on two Battery IPCEIs, the article unravels the complex interplay of public and private actors, funding, and governance instruments involved. The findings show how IPCEI can be seen as a novel type of state aid, yet also demonstrate fragmented and conflicting state activity across Europe. Moreover, the article illustrates how these novel governance tools can replicate asymmetric corporate power dynamics, benefitting lead firms in the automotive production networks while lacking strong social and environmental conditions due to their prioritization of technological and economic goals.

Abels and Bieling (2024) focus on strategic infrastructure policies in the EU. Highlighting their historical link to industrial policy, they argue that the new triad competition between the US, China, and the EU over strategic infrastructure has led the EU to adopt a more state-interventionist approach that aims to assert greater control over transnational value chains and related spaces, including land, oceans, airspace, outer space, and cyberspace. Using critical geography and IPE concepts, Abels and Bieling analyze how four logics (geoeconomic, capitalist, ecological, and social-integrative) influence EU infrastructure policies and examine the political alliances of state and business actors involved. Based on a comparative case study of two major infrastructural projects—Gaia X, a federated data infrastructure project, and the Hydrogen Strategy—they find that although a geoeconomic design logic has been primarily driving these projects, it has been both supported and hampered by a capitalist logic. Especially in the case of Gaia-X, the article concludes, European and non-European transnational capital(ists) have been able to shape the geoeconomic turn in their favor, while the ecological and social-integrative design logics in both of these infrastructure projects were largely sidelined and subordinated.

Highlighting multiple dimensions of contemporary EU industrial policy, these three articles provide crucial empirical insights into the regulatory advancement of the geoeconomic turn, with a focus on how this plays out in Europe. A common thread is their attention to how (public) policy-making is grounded in structures of capitalist production and finance and how these interplay with state agency. While the EU's revival of industrial policy in the context of the geoeconomic turn signifies potentially crucial policy shifts, it also replicates and reinforces existing uneven and exploitative power structures that tend to prioritize capital(ist) over societal interests, and economic growth and profit over long-term ecological sustainability and social equity.

2.3. Green Transition

The climate crisis results from deeper causes that clearly precede the historical period analyzed in this thematic issue (Paterson, 2021). Yet, a greater sense of urgency on behalf of states and societies to avert a potentially catastrophic climate collapse temporally coincides and intersects with the geoeconomic turn. For one, the escalation of geopolitical tensions in the wake of Russia's full-scale military attack on Ukraine in February 2022 has reshaped the geography of fossil energy markets. But also state-led efforts to accelerate the energy transition through investments in green technologies are tainted with geoeconomic thinking, frequently emphasizing national competitiveness, and global rivalries more than the common good they are supposedly designed to achieve. Together, as several contributions to this thematic issue highlight, these developments at the nexus of geopolitics, energy, and technology have contributed to reshaping states' internal (domestic) and external (alliance-building) strategies in a global economy.

Adopting a realist perspective, the contribution by Ufimtseva et al. (2024) focuses on the strategies adopted by the US, as an incumbent hegemon, to push for the green energy transition without becoming too dependent on its main challenger, China, which dominates processing capacities for several critical minerals (e.g., lithium, cobalt, graphite, and rare earth metals). As the authors show, the US state has adopted both internal (e.g., investment screening mechanisms) and external strategies (e.g., the strengthening of the Five Eyes partnership) to undermine and counterbalance China's dominant position. While the intention at the policy-regulatory level seems clear, it remains to be seen whether these strategies will also be effective.

The contribution by Jerzyniak (2024) shifts attention from the US back to the EU. Analyzing EU strategies to reorient their global positioning in markets for natural gas, critical minerals, and hydrogen in the wake of the Ukraine war, the article argues that energy derisking may trigger important transformations in EU foreign policy. Since the lack of sufficient local energy resources does not allow the EU to derisk through turning inwards (e.g., by adopting protectionist tools), Jerzyniak demonstrates EU officials' deliberate strategy to rebuild and manage its ("clean") energy relationships in a way that avoids overt dependence on any one supplier. At the same time, EU clean energy derisking still expresses desirability and intentionality rather than tangible results (Jerzyniak, 2024). Furthermore, as the article also empirically shows, the targeted new energy partners include various authoritarian regimes and states with close relations to China, potentially fomenting new tensions between the EU's energy needs and political ideals.

In addition to reorienting its energy suppliers network, the EU has also adopted policy instruments aimed at supporting European businesses in their quest to become global green tech leaders. One key effort is the setting up of so-called Industrial Alliances designed to strengthen public-private collaboration, which is analyzed in the contribution by Bosticco and Herranz-Surrallés (2024). Drawing from theories of governed interdependence, the authors compare this novel type of EU industrial policy in the batteries, raw materials, hydrogen, and photovoltaic sectors. Their findings indicate that the initiatives have had some success (to varying extents across sectors) in facilitating coordination and information sharing among partners. At the same time, they emphasize how the multilevel character of the EU poses significant obstacles to their implementation and identify tensions between the EU's geostrategic narratives and commercial realities.

Together, these three articles demonstrate how policymakers on both sides of the Atlantic pursue domestic and foreign policies with the ambition to derisk their energy relations and give their companies an advantage in

shaping the clean energy technologies of the future. At the same time, they also emphasize the challenges that these strategies entail and how geostrategic narratives can clash with economic realities in globally intertwined economies. The vagaries of complex interdependence mean that attempts at derisking can, inadvertently, generate new risks. At the same time, the lead of China in critical minerals processing and green technology is currently so significant that attempts at decoupling may simultaneously hinder the West's ability to meet its climate goals (see also Hameiri & Jones, 2023).

2.4. Implications of the Geoeconomic Turn for the Non-Western World

Scholarly engagement with the concept of the geoeconomic turn has partly emerged from the observation that great powers increasingly use the policy-regulatory level to shape their power position vis-a-vis perceived rivals. However, we still know relatively little about how the geoeconomic turn plays out in regions of the world other than the US and EU. To uncover the global contours of the geoeconomic turn, scholarship also needs to become less Western-centric. The contributions of this thematic issue that focus on the Global South indicate that if we look beyond the West, political and governance-related changes and their impacts vary across regions and countries.

The contribution by Zelicovich (2024) points out that, in contrast to the assumption that only great powers can play active roles in geoeconomic trends, Latin American countries also make active use of economic statecraft. They use economic statecraft to promote values such as democracy and human rights, apply extra-regional sanctions, and resort to coercive strategies to exert pressure on third actors' policies that are perceived to contradict the strategic interests of the region. Precautionary defensive strategies are also emerging, as evidenced by Bolivia's president's call for a joint Latin American lithium policy in 2023. In contrast to the Asia Pacific, however, Latin America remains less involved in derisking and managing security externalities (see Breslin & Nesadurai, 2023).

Finally, the contribution by Weinhardt and De Ville (2024) reminds us that to assess the implications of the political and governance-related changes that take place in Europe, we need to look beyond great power relations. Many of the new defensive trade and investment instruments of the EU potentially impact trade relations with the developing world. Their analysis shows that sustainability-related defensive trade instruments such as the deforestation regulation or the carbon border adjustment mechanism are likely to be particularly detrimental for producers in (selected) developing countries. Yet, in their design, these instruments hardly include differential treatment provisions that could mitigate or offset negative effects on developing country exports to Europe. Reconciling different foreign policy objectives under this shifted geoeconomic paradigm has thus become more complicated, as new trade-offs between different goals may arise.

Overall, these contributions show that, at the policy-regulatory level, the geoeconomic turn is manifesting itself far beyond the West. Latin American countries have been using tools of economic statecraft and are beginning to enter the game of "defensive" geoeconomic strategies (e.g., in the case of lithium extraction). Moreover, the implications of the geoeconomic turn in policies of major trading powers, such as the EU, are likely to have consequences that—depending on the instrument at stake—may become costly, particularly for export-oriented firms in developing countries. Going beyond these insights, more empirical research is sorely needed to uncover the patterns of how the geoeconomic turn manifests itself beyond the West.

3. Conclusions: The State of the Geoeconomic Turn

As the contributions to this thematic issue collectively attest, the geoeconomic turn is reflected in changes at the level of policy and regulation that seek to slow down and at times reverse the logic of decades of economic integration. Ultimately, however, the substantive importance of the geoeconomic turn is also contingent on the extent to which transformations in policies reshape material realities, and hence structures of the global economy. Here, the contributions paint a nuanced and more complex picture. While some sectors (e.g., semiconductors) are subject to ringfencing efforts, global levels of trade and investment overall remain at historical highs. Whereas industrial policy tools have been revived, their use and effects reflect as many continuities as changes.

The geoeconomic turn hence signals what we refer to as a potential sea change in the modus operandi of the global economy, whose political effects and material changes are in the process of being realized, yet are in this process subject not only to institutional inertia and path dependencies but also to political agency and contestation. As many of the contributions indicate, it will be the outcome of those power struggles and conflicting interests and values—not only between states but also with and between non-state actors such as firms and civil society organisations (e.g., labour)—at the global, regional, national, and subnational level that will shape the concrete outcomes of the geoeconomic turn in investment, trade, and technology. We hope to inspire a research agenda that unpacks these outcomes in a geoeconomic global economy empirically, including how they affect and possibly reinforce existing (unequal) power relations and the interplay between political and corporate actors, capitalist and societal interests, but also between states that are in structurally different positions within the global economy.

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Conflict of Interests

The authors declare no conflict of interests.

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The Myth of Deglobalization: Multinational Corporations in an Era of Growing Geopolitical Rivalries

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Abstract

Globalization is past its peak, we are told. The rise of populist anti-globalization movements and the return of geopolitical rivalries among great powers in the 2010s has put an end to free-wheeling corporate global capitalism. Or has it? This article summons available data on cross-border corporate investments at the level of countries (balance of payments), firms (subsidiaries and affiliates), and corporate managers (industry surveys). It pays special attention to the period between 2015 and 2021, which spans the election of President Trump and the outbreak of the Covid-19 pandemic that have unsettled global politics. We analyze global patterns in foreign direct investment positions and in particular the evolution of investments by US corporations in China, arguably a "most likely case" for deglobalization. Our analyses find no evidence that economic cross-border integration is in decline. The global allocation of corporate investments across the world's major economic regions has remained stable. US corporations have not notably reduced their global activities. If anything, their aggregate investment position in China has increased during the Trump administration's trade war. Overall, the results cast empirical doubts on prominent narratives about the state of the global economy. Geoeconomic transformations in world economic infrastructures may well be underway, but they are better understood as new and adapted forms of internationalization rather than the end of globalization.

Keywords

decoupling; deglobalization; derisking; foreign direct investment; geoeconomics; multinational corporations

1. Introduction

Political forces critical of economic globalization have been on the rise over the past decade (Bisbee et al., 2020; Milner, 2021; Walter, 2021). Inward-looking economic strategies are spreading rapidly (Bauerle Danzman & Meunier, 2023; Meunier & Nicolaidis, 2019), and the American-led liberal international order is said to be in crisis (Lake et al., 2021; Trubowitz & Burgoon, 2020). Accordingly, many analysts have suggested that we have entered a period of "deglobalization" in which multinational corporations (MNCs) are in retreat as states reassert their control and production networks are being reshored. While there has been a lot of talk about supposed deglobalizing trends in the world economy, there is a lack of conceptual clarity of what deglobalization actually means, as well as a dearth of empirical analyses evaluating the extent to which related dynamics are materializing (cf. Drezner, 2023; Grosse et al., 2022).

Against this backdrop, this study combines statistical analysis of foreign direct investments (FDI) and corporate ownership networks data with insights from surveys of corporate managers to contribute to a better understanding of the material impact of the geoeconomic turn examined in this thematic issue, and its implications for the possible future trajectory of the global economy in an age of renewed inter-state rivalries. The study analyses the evolution of the territorial organization of global production networks through a systematic examination of global FDI patterns and the subsidiary structures of several thousand US corporations during the 2015–2021 period. We pay particular attention to the FDI relations between the US and China, which arguably constitute a "most likely case" of deglobalization.

At odds with prevailing discourses, it appears that Western MNCs have further increased their presence in China during this first stage of the US–China trade "war." We also find no evidence that US corporations have significantly re-shored corporate structures. Our findings from the case of FDI align with existing studies analyzing international trade flows over the same period, which also indicate stable or further increasing cross-border economic exchanges rather than a decline (Bown, 2023; Fajgelbaum et al., 2021; Goldberg & Reed, 2023). Together, the assembled data points suggest a notable gap between what states say and what firms actually do on the ground. Of course, it remains possible that Western decoupling from China will still happen in the future. But decoupling is distinct from deglobalization and could be a long and possibly more complicated process than imagined by many policymakers and geopolitical consultants in Western capitals. At the same time, the findings also raise bigger questions about states' actual grasp over corporate globalization and their capacity to steer it in their desired direction.

2. What Do We Talk About When We Talk About Deglobalization?

2.1. Discourses of (Hyper-)Globalization

The collapse of the world economy in the inter-war period was followed by a rapid rebound and deepening of international economic integration after the end of the Second Cold War. The expansion of MNCs lies at the heart of these developments (Baldwin, 2016; Frieden, 2020). The roots of MNCs go back centuries, but their most significant expansion occurred in the 1950s–1980s (Jones, 2005)—a period of profound geopolitical conflict in the form of the Cold War. In this sense, geopolitics stood central to MNCs' rise to global power (Gilpin, 1975). The consolidation and deepening of global production networks in the 1990s–2000s (Baldwin, 2016; Rodrik, 2011), in contrast, played out in a context in which governments'

economic concerns had, at least discursively, become largely detached from their security considerations. Political commitment to the principles of international cooperation and open economies was largely taken for granted (Trubowitz & Burgoon, 2020).

The expansion of the world economy in the 1990s and 2000s, in retrospect, was frequently described as an era of hyper-globalization (Rodrik, 2011), underpinned by material as well as discursive developments. Although the importance of international trade and investment as a share of global economic output grew rapidly during this period, they remained more constrained than globalization discourses prominent in the 1990s and 2000s could have made one believe (Cameron & Palan, 2004; Linsi, 2020). To an important extent, descriptions of MNCs as "globally footloose" organizations and of the world economy as "one global market" (e.g., Ohmae, 1990; Reich, 1992; Stopford et al., 1991) remained economic imaginaries rather than accurate descriptions of material realities (Cameron & Palan, 2004; Linsi, 2022). Even though MNCs undeniably did expand their transnational networks and operations, their organization remained tied to a regional (instead of truly global) spatial logic (Doremus et al., 1999; Rugman, 2005). Rather than imposing themselves upon the state (as many globalization narratives claimed), their expansion occurred in co-evolution with the state (van Apeldoorn, 2002; van Apeldoorn et al., 2012).

Paradoxically, now that the neoliberal pro-globalization consensus of the 1990s and 2000s seems to be unravelling, the disconnect between discursive and material developments in the world economy may be moving to the other extreme. Over the past years, growing tensions between the US and China, in particular, have led to a gradual (re-)securitization of economic policy discourses, as narratives about the need to "decouple" or "derisk" the world's largest two economies have taken a hold in global economic policy circles (Babic, 2021; Bauerle Danzman & Meunier, 2024; Gertz, 2021; Meunier & Nicolaidis, 2019). While the strategies proposed by different actors vary, they share a renewed emphasis on geoeconomics, understood as an increased "securitization of economic policy and economization of strategic policy" (Wesley, 2016, p. 4). French President Emmanuel Macron has called to "take back control of our supply chains" (Macron, 2023); US President Joe Biden vowed to "rebuild domestic manufacturing capacity" (Biden, 2021); and the Chinese Communist Party's dual circulation strategy emphasizes the need for greater economic self-sufficiency (The People's Government of Fujian Province, 2020). In response, there has been an uptake of alarmist accounts in public commentary and financial news of the apparently imminent "collapse" (Zeihan, 2022), "end" (Posen, 2022), or "death" (Manners-Bell, 2023) of globalization.

2.2. Scenarios of De- and Re-Globalization

Against this backdrop, this article forwards three arguments: Firstly, discourses about the supposed end of globalization lack conceptual clarity. Concepts such as "deglobalization," "decoupling," or "derisking" are often used interchangeably, but in fact refer to rather different scenarios, some of which are more compatible with continued globalization than others. To the extent that *deglobalization* represents the counter-movement to globalization, we propose to operationalize it as net decreases in volumes of cross-border trade and investments as a share of world GDP. It thus only occurs when the relative importance of cross-border activities in the global economy as a whole declines. *Decoupling*, in contrast, captures decreases in trade and investment between certain economic blocs, most importantly the "West" (predominantly the US and Europe) and China. To the extent that it is happening, a growing (re-)bifurcation of the world economy may lead to less economic exchanges between, but also a deepening of exchanges

within the emerging blocs (Linsi, 2021). In that sense, decoupling is theoretically not incompatible with more globalization in the aggregate (cf. Smith, 2023). *Derisking*, finally, refers to attempts to reconfigure productive and financial networks to make them more resilient to geopolitical or environmental shocks (Fajgelbaum et al., 2021; Jerzyniak, 2024). To the extent that it revolves around greater geographical diversification—or the duplication of supply chains in parallel regions—to avoid over-reliance on suppliers in any one potential bottleneck zone, derisking should in principle entail more rather than less globalization overall. In other words, the global economy can adapt to growing geopolitical pressures in a variety of ways and they do not necessarily imply decreases in cross-border activities at the aggregate level.

Secondly, the article argues and empirically shows that deglobalization proper has so far not materialized—and that we should be wary of "false necessities" (Herrigel, 2020) promoted by deglobalization narratives. Historically speaking, the collapse of the first "golden" era of globalization in the early 20th century surely serves as a useful reminder that deglobalization is a possibility (Frieden, 2020). At the same time, webs of cross-border economic interdependence today are deeper and more complex than they were 100 years ago. As the "opportunity costs of closure" (Frieden & Rogowski, 1996) have grown, political willingness to prevent the collapse of the world economy may be stronger too. Although a major direct military confrontation between the world's great powers is not unthinkable, there are also reasons to be hopeful that it can still be avoided (Christensen et al., 2022). Barring the realization of such catastrophic scenarios, corporate globalization may very well continue to flourish in the years to come.

Thirdly, although deglobalization is a misleading description of the current state of the global economy, this is not to deny that important transformations in the world economy may be underway. Persisting changes in widely shared intersubjective beliefs normally do have consequences, not least because they can be partly self-fulfilling (Cameron & Palan, 2004; Drezner, 2023). Yet, the material implications of ideational shifts are oftentimes more nuanced and complex than the discourses themselves suggest (Oatley, 2019). This general observation also appears to apply to this case. As we will show, MNCs are in the process of adapting their strategies to a context in which geopolitical dynamics are again becoming more central to their operations. The nature of these responses, however, is multi-layered, strategic, and sophisticated (cf. Butollo et al., 2024). *Re-globalization* rather than de-globalization, we suggest, is therefore a more meaningful and accurate description of the dynamics currently transforming the global political economy.

2.3. Objectives

At the time of writing, a bit more than seven years have passed since the election of President Trump and the Brexit referendum in 2016; five years since the escalation of the US–China trade "war" in 2018; and close to four years since the outbreak of the Covid pandemic. Although it is still too early to study the long-term consequences of these upheavals, enough data is gradually becoming available to evaluate the shorter-term implications of these shifts. Analyses of these early trends are paramount, not least because they are bound to lay the foundations for how geoeconomic rivalries are going to play out in the decades ahead.

The study's focus is on the evolution of FDI positions and the underlying structure of MNCs' networks of subsidiaries and affiliates. For that purpose, the project collects and analyses data from the IMF's Coordinated Direct Investment Survey, the US Bureau of Economic Analysis, Bureau van Dijk's Orbis database, as well as surveys conducted by the American Chamber of Commerce. The main objective of the research is to assess

key trends in the territorial organization of global production during the growing backlash against globalization in the 2015–2021 time window.

Along with international trade, portfolio capital, technology, and migration flows, FDIs constitute only one dimension of economic globalization. Yet at the same time, the structures of MNCs are a central factor underpinning many of these other aspects of globalization. They also remain relatively understudied compared to international trade where deglobalization claims have already been effectively challenged in existing empirical work (e.g., Bown, 2023; Fajgelbaum et al., 2021; Goldberg & Reed, 2023).

In the first step, our empirical analyses focus on global patterns (Sub-section 3.1). Subsequently, we zoom in on US direct investments in China (Sub-section 3.2). Together, the US and China account for over 40% of the global nominal GDP (World Bank, 2024). Their bilateral relationship lies at the heart of global economic tensions, and thus arguably the level of analysis at which deglobalization would be most readily visible, if it is materializing. Moreover, it has been argued (Smith, 2023) that FDIs, more so than trade, are also the aspect of the global economy in which deglobalization dynamics should become detectable first. In these regards, the analysis of US–China FDI can also be seen as a "most likely case" of deglobalization. In other words, if deglobalization is not happening (yet) in this particular case, it is also unlikely to have materialized in most other parts of the world economy.

3. FDI Data

We start our analysis with an examination of global patterns in FDI data. The measurement of FDI faces many challenges, not least the difficulty in distinguishing between "real" and "financial" FDI (Beugelsdijk et al., 2010; Casella et al., 2023; Damgaard et al., 2019; Kerner, 2014; Linsi, 2018). On the other hand, unlike firm-level data, they are designed to estimate the entire universe of investment positions between countries and their compilation is based on detailed transparent methodologies. Although FDI point estimates should not be taken at face value, they can serve as useful indicators of broad trends in the world economy.

3.1. Global Allocation of FDI

To map the global picture of FDI, we rely on data from the IMF's Coordinated Direct Investment Survey. The dataset provides all available estimates of country-by-country direct investment positions. At the time of conducting the analysis (July 2023), country-by-country Coordinated Direct Investment Survey data is available for the years 2009–2021. We focus in particular on the years 2015–2021. Unless noted otherwise, we work with period-median values of estimated FDI. We first examine the relative allocation of FDI in the economic regions accounting for the largest shares of global FDI flows.

Our analysis of the big picture of the global distribution of FDI, summarized in Appendix A of the Supplementary File, shows that the US, Europe, China, and Japan are the main senders and receivers of FDI in the global economy. To evaluate whether there have been important changes in the global structure of FDI during the 2016–2020 Trump Presidency, we compare the relative allocation of FDI positions in 2015 and 2021 across six economic areas: the US, Europe (excluding tax havens/special-purpose entity [SPE] conduits), Japan, China (including Hong Kong), tax havens/SPE conduits (as defined in Appendix A of the Supplementary File), and the "rest of the world." For each of these regions (in rows in Table 1) we then

calculate the relative size of its investment position in each of the other five regions (in columns in Table 1) as a share of the (row) region's total outward FDI position (inferred from inward FDI mirror data), in 2015 and 2021.

The analysis yields several interesting insights. Firstly, it corroborates that a large share of global FDIs are formally owned by legal entities in tax haven jurisdictions. The practice appears to be particularly widespread among US corporations, for which more than half of all registered foreign investments are channelled through SPE conduits. Secondly, the analysis indicates that, in the bigger picture, the global market for FDI is still strongly dominated by North-Atlantic relationships. The US and Europe remain the most important senders and receivers of FDI in the early 21st century. In comparison, China is still a relatively small player in global markets for FDI. Thirdly, Japanese companies' foreign investments are concentrated more in the US than in Europe, while Chinese companies are somewhat more strongly invested in Europe than the US (assuming that there are no systematic differences in flows channelled through SPEs). At the same time, the corporate structures of Chinese companies appear to be geographically more diversified than those of the triad US–Europe–Japan, for which the residual category "rest of the world" accounts for a significantly smaller share than it does for Chinese companies. Lastly, and most importantly for our analysis, the cross-tabulation does not indicate that the US–China trade war had a major impact on the geographic structures of MNCs. In relative terms, the allocation of Chinese investments in Europe and the US is fairly stable over the 2015–2021 period. US investments in China have marginally decreased in relative terms (from 0.028 to 0.024)—yet increased in absolute volumes (see Sub-section 3.2)—while they have grown notably for European companies in China.

The remainder of this article digs deeper into this apparent lack of response on behalf of Western MNCs to deglobalization pressures. Given their centrality to this debate, our analysis pays special attention to US corporations and their investment positions in China.

3.2. US–China FDI Relations

To analyze patterns in direct investments by US MNCs we work with data made available by the US Bureau of Economic Analysis. In addition to conventional FDI figures, the US Bureau of Economic Analysis also produces

Table 1. Relative shares of investment positions in the global economy.

	US		Europe (excluding tax havens)		Japan		China (including Hong Kong)		Tax havens		Rest of the world	
Year	*2015*	*2021*	*2015*	*2021*	*2015*	*2021*	*2015*	*2021*	*2015*	*2021*	*2015*	*2021*
US			0.15	0.19	0.01	0.01	0.03	0.02	0.57	0.54	0.23	0.23
Europe (excluding tax havens)	0.25	0.24			0.01	0.01	0.03	0.06	0.47	0.45	0.24	0.24
Japan	0.33	0.36	0.10	0.11			0.15	0.13	0.15	0.15	0.27	0.24
China (including Hong Kong)	0.06	0.07	0.10	0.09	0.02	0.03			0.42	0.41	0.40	0.41

Notes: Positions held by row region in column region; Ratios indicate shares as a percentage of row region's total positions in the world; Based on inward FDI stock data (mirror); Rows sum to 1, excluding rounding errors. Source: Own calculations, based on Coordinated Direct Investment Survey (International Monetary Fund, 2023).

bilateral FDI estimates on a sectoral level that separates out SPE FDI. We downloaded the data in July 2023 when official estimates up to 2021 were available (2022 figures are provisional).

3.2.1. Aggregate US Outward FDI

Before delving deeper into the China–US relationship, we analyze the evolution of the aggregate outward FDI position of all US companies over the past two decades. To the extent that the deglobalization scenario is accurate, we would expect the aggregate outward FDI position held by US companies to have decreased over the 2015–2021 period. The statistics, plotted in Figure 1, indicate that there was indeed a slight fall in total outward FDI after 2017. However, this decline seems to be driven primarily by a fall in SPE FDI, which is likely related to the controversial tax inversion deal implemented by the Trump administration in 2017. If we zoom in on the outward FDI stock excluding SPE FDI (purple bars in Figure 1), it has steadily increased throughout the period at roughly the same pace as US GDP. In absolute terms, the non-SPE FDI stock held by US corporations grew from $2.6 trillion in 2015 to $3.0 trillion in 2021 and $3.1 trillion in 2022 (total FDI from $5.3 to $6.1 and $6.4 trillion). In relative terms, the non-SPE outward FDI stock is fairly stable, hovering around 14% of the US GDP since 2008. US corporations thus do not appear to have notably reduced their holdings overseas over the past years. While there is some indication of stabilization or saturation ("slowbalization") in total US outward FDI, contrary to deglobalization scenarios, we observe no evident decline.

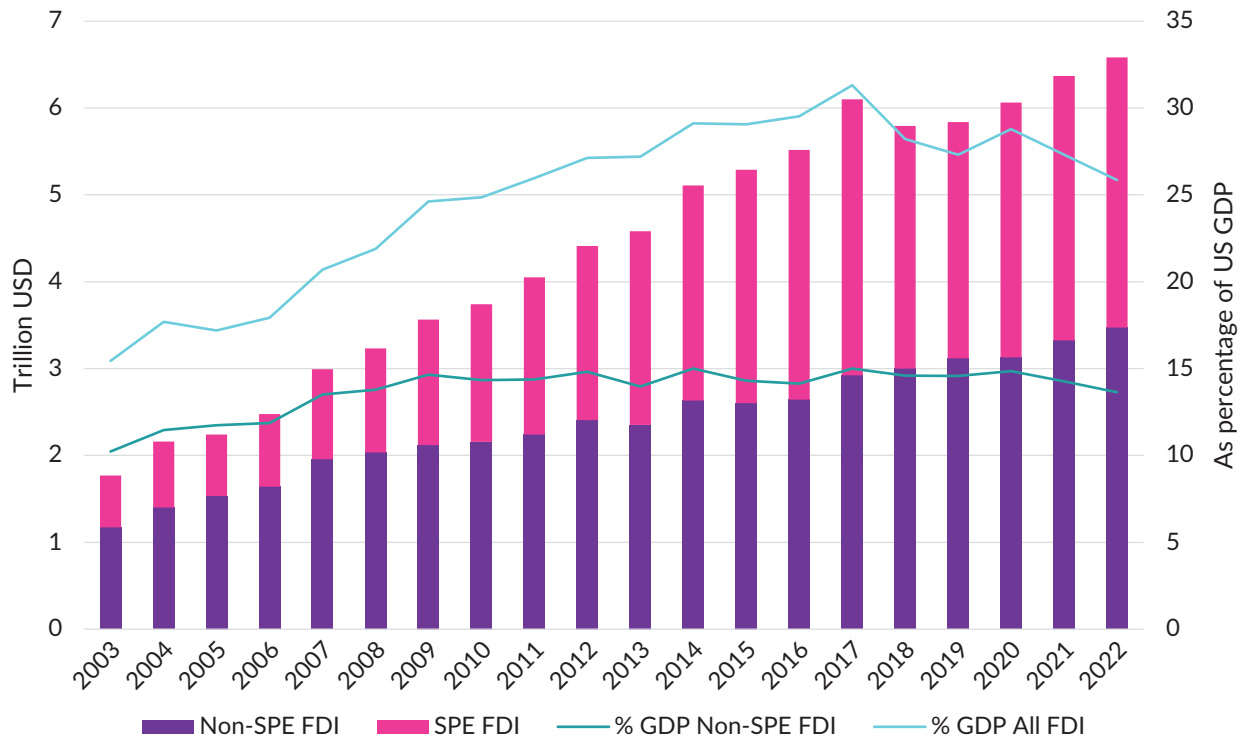

Figure 1. Evolution of aggregate outward FDI position held by US corporations. Notes: Investment position at estimated historical cost; Figures for 2022 are provisional estimates. Source: Own calculations based on data from the US Bureau of Economic Analysis (2023).

3.2.2. US–China FDI

Next, we zoom into the US–China FDI positions. The left panel in Figure 2 shows the evolution of the US FDI stock in China (including Hong Kong) in absolute levels; the right panel indicates the evolution of sectoral shares in relative terms. At odds with decoupling narratives, the US Bureau of Economic Analysis's data indicates that, at historical cost, the total US direct investment position in China and Hong Kong grew by about $47 billion between 2015 and 2021—from $162 to $208 billion. In terms of sectoral shares, there appears to be a contraction of US FDI in the Chinese information sector (including media, film and music, telecommunications, and IT services industries; see US Bureau of Economic Analysis, 2022). Otherwise, sectoral patterns are fairly stable over the period presented.

Somewhat surprisingly against the background of rapidly growing geoeconomic tensions in government discourses during the Trump Presidency, the analyses presented so far indicate that (a) corporate investments across the major regions have remained fairly stable, (b) US corporations have not notably re-shored production to their home market, and (c) have, in absolute terms, further increased their exposure to China. In contrast, as detailed in Appendix B of the Supplementary File, Chinese investments in the US are still small in comparison to US investments in China and have stagnated over the past few years. In the sections that follow we shift the level of analysis from countries (balance of payments) to the firms who are behind the FDI data presented so far. Firm-level data is valuable because it sheds light on the actors actually "doing" FDI, as well as circumventing some of the measurement problems with tax haven FDI (Linsi, 2018; Linsi & Mügge, 2019). Our focus remains on the activities of US MNCs in China.

4. Firm-Level Ownership Data

Our analysis of firm-level ownership positions relies on data made available in Bureau van Dijk's Orbis database. We initially collected the data for a list of more than 7,000 large multinational enterprises, which have been estimated to control more than 50% of global GDP (ter Burg et al., 2022) in 2015 and 2021. The dataset, which includes 2,484 US-based multinationals, was downloaded in December 2021.

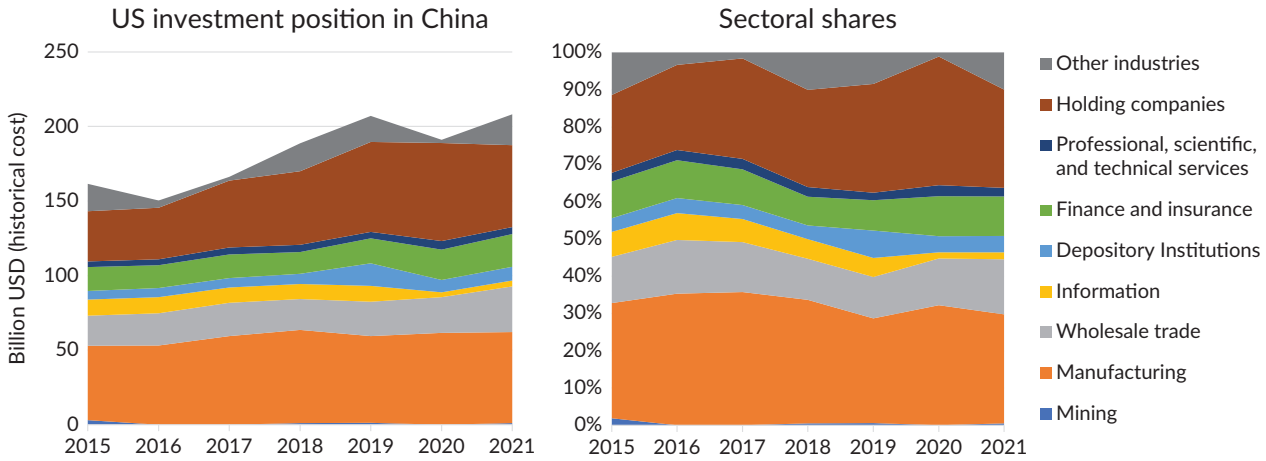

Figure 2. US FDI position in China (including Hong Kong) 2015–2021. Source: Own calculations, based on data from the US Bureau of Economic Analysis (2023).

Based on the information in Orbis, we created a dataset that codes, for each multinational company in the dataset, the number of (a) subsidiaries (ownership stake of at least 50%), (b) affiliates (ownership stake between 10% and 50%), and (c) minority stakes (ownership stake less than 10%) it holds in a country.

The data has important limitations, which are further described in Appendix C of the Supplementary File. At the same time, it provides rich and fine-grained information about the structure of individual companies, which makes it possible to analyze the transnational corporate structures that underlie and drive more abstract aggregate levels of FDI.

4.1. US Corporations' Investments in China

In a first step, to examine the implications of potential deglobalization at the level of US firms, we plot the share of recorded subsidiaries and affiliates as well as minority stakes owned by these companies in the US and abroad. The analyses, summarized in Appendix D of the Supplementary File, show no evidence of significant reshoring or near-shoring. On the contrary, the share of recorded subsidiaries held outside of the US relative to domestic ones appears to have increased from 2015 to 2021 among firms in our sample.

Next, we turn to ownership stakes of US firms in China. We start by plotting the relative share of US corporations' ownership positions in China as a share of all their recorded ownership positions held outside of the US. As shown in Figure D3 of the Supplementary File, for a majority of companies in the sample the share of China-based positions (both minority stakes and subsidiaries and affiliates) account for less than 20% of their non-US holdings. Overall, the share tends to be higher for subsidiaries and affiliates than minority stakes. Some outliers with a high concentration of minority stakes in China are YUM China Holdings, Assembly Biosciences, Booking Holdings, Casi Pharmeuticals, Erin Energy, and Fluent.

Table 2 lists a subset of US companies in the Orbis sample by their relative exposure to China: their number of subsidiaries and affiliates located in China or Hong Kong as a share of their total number of recorded subsidiaries and affiliates. We further divide them into companies whose overall network structure is primarily domestically oriented (holding a majority of subsidiaries and affiliates in the US) and those that show a more clearly global orientation. We limit the sample to firms with at least one hundred recorded subsidiaries or affiliates, and at least one recorded entity in China.

The resulting two-by-two matrix illustrates a variety of cases: in the top left we observe some large US multinationals such as Hamilton Lane, United Health Group, or Berkshire Hathaway who own many subsidiaries and affiliates in the US and few in China. The bottom left lists some companies with many subsidiaries and affiliates outside of the US, but only a few in China. The top right shows companies that have a strong presence in the domestic economy, but also have a strong exposure to China (e.g., Tesla). The bottom right shows a group of companies with a global network structure that is fairly strongly concentrated in China (e.g., Equitable Holdings or Intel). Again, these are estimates derived from subsidiaries and affiliates recorded in the database and we cannot be sure if they cover the entirety of firm networks, which can be further obscured by complex legal structures (cf. Robé, 2020). Nonetheless, the tabulation showcases the variety of actors underlying aggregate FDI figures. Many large US corporations are domestically oriented, while others pursue transnational business models. Among the latter, some are strongly exposed to China, while others with significant investments outside of the US are barely present in

Table 2. Cross-tabulation of US corporations' exposure to China and Hong Kong.

	Weak presence in China and Hong Kong				Strong presence in China and Hong Kong			
	Name	*Subsidiaries and affiliates in China*	*Subsidiaries and affiliates*	*Ratio*	*Name*	*Subsidiaries and affiliates in China*	*Subsidiaries and affiliates*	*Ratio*
Domestically oriented (bottom 25th percentile with more than 41% of subsidiaries in the US)	Hamilton Lane Inc	3	717	0,4%	Tesla	23	129	17,8%
	United Health Group	4	918	0,4%	SVB Financial Group	55	338	16,2%
	Berkshire Hathaway	4	788	0,5%	Leggett & Platt Inc	23	178	12,9%
	Fifth Third Bancorp	3	591	0,5%	American Express	66	537	12,2%
	Blackstone Group	6	1095	0,5%	MGM Resorts International	21	181	11,6%
	Newmark Group	1	147	0,7%	Raymond James Financial	12	108	11,1%
	Fluor Corp	4	544	0,7%	Global Payments Inc	9	101	8,9%
	Hertz Global Holdings	1	118	0,8%	Campbell Soup Co	10	121	8,3%
	Heico	1	117	0.9%	Ascena Retail Group	10	132	7,5%
	Ezcorp	1	112	0.9%	Graham Holdings	25	333	7,5%
	Nelnet	1	100	1,0%	Textron Inc	11	160	6,9%
	Viacom CBS	11	945	1,2%	Ametek Inc	16	240	6,6%
	Goldman Sachs Group	11	850	1,3%	Broadcom Inc	17	258	6,6%
	Quest Diagnostics Inc	2	152	1,3%	Gamco Investors	10	153	6,5%
	Iheart Media	4	291	1,4%	Charles Schwab	14	219	6,4%

Table 2. (Cont.) Cross-tabulation of US corporations' exposure to China and Hong Kong.

	Weak presence in China and Hong Kong				Strong presence in China and Hong Kong			
	Name	*Subsidiaries and affiliates in China*	*Subsidiaries and affiliates*	*Ratio*	*Name*	*Subsidiaries and affiliates in China*	*Subsidiaries and affiliates*	*Ratio*
Globally oriented (top 25th percentile with more than 86% of subsidiaries outside of the US)	McKesson Corporation	1	444	0,2%	Equitable Holdings	157	179	87,7%
	Stifel Financial	4	564	0,7%	Walgreens Boots Alliance	242	278	87,0%
	Moelis & Company	5	655	0,8%	Federated Hermes	395	550	71,8%
	Resideo Technologies	1	125	0,8%	Intel	228	361	63,1%
	Principal Financial	3	291	1,0%	Booking Holdings	389	657	59,2%
	Philip Morris	3	271	1,1%	Mosaic Company	152	398	38,2%
	Digitalbridge Group	6	499	1,2%	Eastman Kodak	38	121	31,4%
	Walmart Inc	6	430	1,4%	Air Products & Chemicals	100	385	26,0%
	Delta Air Lines	6	407	1,5%	Qualcomm	79	318	24,8%
	Interpublic Group	6	396	1,5%	Diodes	33	153	21,6%
	Uber Technologies	5	306	1,6%	Autoliv	23	111	20,7%
	Sculptor Capital	4	242	1,7%	Altria Group	58	313	18,5%
	CBRE Group	9	502	1,8%	Amgen Incorporated	20	108	18,8%
	SEI Investments	9	497	1,8%	Hyster-Yale Materials	16	100	16,0%
	Genuine Parts	3	160	1,9%	Minerals Technologies	21	138	15,2%

Notes: Sample restricted to firms with at least 100 recorded subsidiaries in total and at least 1 in China. Source: Own calculations, based on Orbis data from 2021.

China. To better understand the transnational politics of geoeconomics, these apparent heterogeneities in firm network structures—and how they affect firms' perceptions of geopolitical risks—offer a productive avenue for future research (cf. Germann et al., 2024; Koencke & de Graaff, 2024).

5. What Explains the Resilience of US Investments in China Despite Political Pressures to Leave?

What may explain the divergence between growing calls by politicians in Western capitals to retreat from China, and growing corporate investments on the ground? At least four different explanations are possible. Firstly, corporate leaders may simply be ignoring these demands. Western businesses may be naively prioritizing profit growth and shareholder returns without considering the geopolitical risks accumulating on their balance sheets. Businesses are focused on profitability, and if it is financially attractive to invest in the economy of rival powers they will do so, independently of their home country's government's geoeconomic strategy. This is what we call the *geopolitical naïveté* hypothesis. Secondly, they may want to disinvest from China, but it is very difficult to do so in practice. Whereas low-cost labor can be sourced in many countries, the sophisticated ecosystem of suppliers in China, as well as its growing consumer market, currently cannot be matched by any other country (Hejazi & Blum, 2023). This is what we call the *TINA* (there is no alternative) hypothesis. Thirdly, there may simply be a *time-lag*. Maybe US firms are responding to political demands to retreat from China and they have already started to disinvest, but it takes time to unwind existing operations. US companies may thus already be leaving China; it just does not show up in the data yet. Finally, it is possible that US firms are taking geopolitical tensions into account, but that they adopt *more complex responses* than simply exiting China. Rather than winding down their Chinese operations, they may be in the process of insulating them (what some commentators label the "China for China" strategy, see Yang & Nilsson, 2023). Or they may maintain their operations in China, but simultaneously be in the process of duplicating their China operations in third countries to make their supply chains more resilient (sometimes called the "China plus one" strategy).

Dominant modes of response may of course differ, both across and within firms, in line with patterns detected in Table 2. It is plausible that the four hypotheses overlap at times. There may also be political conflict within firms about how to best respond to geopolitical uncertainty. The task of tracing down the complex mechanisms behind corporate investment decisions—and how geopolitical considerations feed into these processes—must be left to future research. Nonetheless, to at least probe these mechanisms, the remainder of this section delves deeper into the results of opinion surveys of managers of US firms operating in China, published annually by *AmCham China*, the American Chamber of Commerce in the People's Republic of China.

5.1. Insights From Industry Surveys

AmCham China is a non-governmental organization representing the interests of more than 1,000 American member companies with operations in China (AmCham China, n.d.). Every year the organization surveys its members with the results being summarized in its annual *China Business Climate Survey Report*. We review all the reports published between 2015 and 2023.

The results from the surveys do not support the *geopolitical naïveté* hypothesis. From 2019 onwards, geopolitical tensions consistently rank among the top three challenges managers identify. From 2021 onwards it is even ranked as the primary challenge (followed by "rising labor costs" and "inconsistent regulatory interpretation") encountered when operating in China (AmCham China, 2023, p. 4). Managers also indicate that American companies in China face "increased pressure." Yet, interestingly, twice as many respondents identified the Chinese, rather than the US, government as the primary source of hostility (66% vs. 32% in 2021; 57% vs. 26% in 2022; see AmCham China, 2023, p. 65).

At the same time, although a majority of respondents seem to agree that it has become more difficult for US companies to operate in China, surprisingly few of them are considering leaving the country. As the summary in the 2023 report puts it: "The majority of our members are not considering relocating their supply chain. Many of our member companies have been in China for decades and the majority of them continue to have a long-term commitment to the China market" (AmCham China, 2023, p. 2).

While the proportion of respondents indicating that their company is "considering, or has already begun the process of relocating manufacturing or sourcing outside of China" (AmCham China, 2022, p. 67) has increased marginally over the years, they remain a minority. In the latest survey, only 12% of respondents indicated to have started relocation outside of China (up from 7% in 2020 and 2021, but lower than 15% and 14% recorded in 2015 and 2014, respectively; see AmCham China, 2015, 2021, 2022, 2023), with another 12% saying to be considering it but not having undertaken any active steps (AmCham China, 2023, p. 55). 74% of respondents said that they are not considering the option to leave. The commitment to stay appears somewhat weaker in the technology sector (where 70% are planning to stay), while it is strongest in the consumer goods industry (where 82% are indicating to stay; AmCham China, 2023, p. 55).

The reasons given are mostly economic. Companies indicate that it is difficult to find alternatives to China ("input costs") and that they want to secure access to the growing consumer market, with the "growth in domestic consumption/rise of an increasingly sizable and affluent middle class" being highlighted as the most important attractions of the Chinese market to US businesses (AmCham China, 2023, p. 39). The most frequent reasons given by the minority of companies who are considering leaving are "risk management," "rising costs, including labor," and "COVID-19 prevention measures." Less than half of those considering exiting mention "US-China trade tensions" or "geopolitical tensions rising" as a factor (AmCham China, 2023, p. 56). In other words, the companies who are considering exiting appear to be pushed (by conditions in the Chinese market) rather than pulled (by the US government) out.

Asked "how are tariffs and US-China trade tensions impacting your business strategy," less than 3% responded "considering exiting the China market" or "relocating to the US," as opposed to 7% who said by "increasing China investments." The most frequent answers were "no impact" (44%), "delay investment decisions" (13%), and "adjusting supply chain by seeking to source components and/or assembly outside the US [China]" (11% and 10% each, 21% together; AmCham China, 2021, p. 95).

Overall, while the marginal increases over time in respondents considering relocation may indicate the existence of a *time-lag*, the phenomenon appears to be limited and, barring a direct military confrontation or other sharp escalation of US–China tensions, unlikely to increase dramatically in the years to come. Both the *TINA* (in terms of supplier ecosystem and growing consumer market) and the *complex response*

hypotheses appear relevant to explain the growing gap between political rhetoric and corporate actions. Perhaps most intriguingly, firms' apparent preference to insulate or duplicate their Chinese operations (rather than abandoning or reshoring them to the US), may imply that, somewhat counterintuitively, growing geoeconomic tensions among great powers may also end up fostering more, rather than less, corporate globalization.

6. Conclusions

This study analyses the distribution of measured global FDI and the number of recorded subsidiaries and affiliates owned by large US MNCs between 2015 (before the election of President Trump) and 2021 (aftermath of the first Trump Presidency). Data on corporate cross-border investments faces many measurement challenges and neither FDI statistics nor corporate ownership information is problem-free. Yet to the extent that we can rely on these estimates, they suggest several interesting patterns that add nuance to the current buzz about deglobalization.

Firstly, Western companies from the US and Europe still dominate global markets for FDI. Earlier research has questioned the "persistent myth of lost hegemony" (Starrs, 2013; Strange, 1987; Winecoff, 2020). Our findings corroborate that also by the early 2020s, at least in markets for FDIs, shifts in global economic power over the past decades may have been less consequential than widespread accounts of the economic decline of the West suggest. Secondly, contrary to alarmist narratives about China's penetration of the US economy, the statistics suggest that the Chinese FDI position in the US is still small (comparable in size to that held by companies from Sweden) and stagnating. In contrast, the US FDI position in China is about four times as large as the Chinese position in the US (and continues growing). Thirdly, we find no clear indications of significant decoupling or deglobalization during the political upheaval against economic globalization brought about by the 2016–2020 Trump Presidency. While investments by Chinese companies in the US remained stable, US companies' stakes in China appear to have increased throughout the period.

Together, these data points suggest a notable gap between *what states say* and *what firms do* on the ground. Of course, it remains possible that Western decoupling from China will still happen in the future, but the findings indicate that it would be a long and arguably more complicated process than it is sometimes imagined to be. At the same time, it is equally possible that, through supply chain insulation and duplication strategies, geoeconomic tensions will end up fostering more, rather than less, transborder corporate investments. In either case, the findings highlight that corporations' reactions (or the absence thereof) to governments' shifting geopolitical strategies deserve more attention in International Political Economy. After all, in many cases, governments themselves cannot directly impose economic policies. They ultimately must be implemented by firms. It is therefore not sufficient to study the geoeconomic strategies of either states or firms in isolation. It is the interaction between them that are key to improve our understanding of the current state, and possible future(s), of the global political economy.

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Conflict of Interests

The authors declare no conflict of interests.

Data Availability

The underlying data is made available on Harvard Dataverse (shareability restrictions apply to firm ownership data from Bureau van Dijk's Orbis database, which were used under license): https://doi.org/10.7910/DVN/CXZWMA

Supplementary Material

Supplementary material for this article is available online in the format provided by the authors (unedited).

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ARTICLE

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Chinese Multinationals and Europe's Geoeconomic Turn: The De-Globalization of the Chinese ICT and Automotive Industry?

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Abstract

Amid increasing geopolitical tensions between Western powers and China over the alleged state-capitalist nature of Chinese corporate internationalization, European governments have introduced a set of political measures tightening their trade and investment regimes on grounds of national security and economic competitiveness. This article analyzes how this "geoeconomic turn" in Europe affected the internationalization of (state-backed) Chinese firms into Europe and hence the establishment of Sino-European corporate relations. With a focus on the Chinese ICT and automotive industries, we zoom in on corporate internationalization by distinguishing two modes: (a) outward foreign direct investments (greenfield investments and mergers and acquisitions) and (b) the formation of collaborative ties (strategic alliances and joint ventures) with European companies—a hitherto underexplored form of Sino-European corporate relations. Our analysis is predicated on a comprehensive dataset consolidating information on both modes of internationalization for the period 2000–2023. We show that, in relation to investment numbers, Chinese companies continue to expand into Europe, even if values are decreasing. We also find that the formation of collaborative ties (strategic alliances and joint ventures) has not halted but increased in the wake of Europe's geoeconomic turn, indicating a further intensification of Sino-European corporate relations, though under the radar of tightening investment policies and mechanisms. When unpacking the variegated impact of the geoeconomic turn on Chinese companies' internationalization strategies in Europe, our study also finds, however, that its ramifications vary substantively—not only per sector but also among companies exposed to varying degrees of party-state permeation. Applying a novel fine-grained measure to party-state permeation, the article shows that the geoeconomic turn seems to have affected predominantly those leading Chinese firms with a high party-state exposure.

Keywords
China; corporate networks; European Union; geoeconomic turn; geopoliticization; joint ventures; OFDI; state capitalism; strategic alliances

1. Introduction

China's hybrid (party-)state capitalism has become highly globalized since the 1990s, and Chinese multinational companies—both private and state-owned—maintain extensive international corporate networks today. This has generated a wealth of studies in both international political economy and business literature (Fitzgerald & Rowley, 2016; Lee, 2018; Meunier, 2019) on the nature of Chinese (party-)state capitalism (Jungbluth, 2018; Lee, 2018) and how this mediates the particularities of Chinese corporations and their globalization strategies and trajectories (de Graaff, 2020; de Graaff & Valeeva, 2021; Leutert & Eaton, 2021; Liu & Dixon, 2021). More recently, geopolitical and geoeconomic dynamics seem to intersect with the evolution and expansion of Chinese capitalism and its partial integration into the global political economy. Indeed, economic relations (in trade, investment, R&D) have become increasingly securitized and (geo)politicized, mostly driven by the interplay of American rivalry in response to China's strategic shift towards a much more assertive foreign policy ("striving for achievement"; Yan, 2014) and its rapidly growing global economic and political footprint. This dynamic has also spilled over into Sino-European relations and China's economic engagements with Europe.

Indeed, the empirical patterns and phases of Chinese investment in Europe have changed significantly over time: Chinese investment in Europe soared after the euro crisis in 2008 and peaked in 2016, with a massive amount of 47.4 billion EUR of Chinese capital pouring into Europe. After that, however, it decreased to an eight-year low of 7.9 billion EUR in 2022 (Kratz et al., 2023a, p. 5). An increasingly large proportion of these were mergers and acquisitions (M&As), often in technologically advanced sectors. This trend has sparked concerns about a sell-out of European high-tech companies to Chinese (state-backed) investors (Jungbluth, 2018) and a growing perception of Chinese investments as a potential threat to national security, given their (alleged) state-driven nature (Babić & Dixon, 2022). In addition, many European businesses and policymakers complained about market-distorting state subsidies for Chinese companies and the "unlevel playing field" between Chinese and EU companies (European Commission, 2019). All of these can be seen as manifestations of what this thematic issue refers to as the "geoeconomic turn" in Europe (Babić et al., 2022; Matthijs & Meunier, 2023).

Against this turbulent background, our article analyzes different modes of Chinese companies' internationalization into Europe and the potentially *variegated* way in which these may be impacted by the geoeconomic turn. While studies abound on Chinese outward foreign direct investment (OFDIs) and economic engagement in Europe (for an overview, see Henderson & de Graaff, 2021; and for the data and trends, see e.g., Kratz et al., 2023a), insufficient attention is still being paid to the variation in strategy, in particular as related to the level of (party-)state permeation of Chinese firms. In addition, no academic study investigating the impact of the geoeconomic turn on Chinese economic investments and corporate relations with(in) Europe exists yet. Are we witnessing a de-globalization of Chinese (party-)state capitalism unfolding in Europe? In terms of investment value, the decrease in Chinese OFDIs seems to suggest this, but we argue that such a reading overlooks a much more counterintuitive reality, at least for certain companies and

industries. To analyze this, we (a) employ a nuanced and novel categorization of degrees of (party-)state permeation in Chinese firms (Köncke et al., 2022) to explore how the geoeconomic turn has affected the investments of Chinese companies with different levels of exposure to the Chinese party-state; and (b) propose to investigate modes of Sino-European corporate relations that have so far been overlooked in the literature. First of all, we show that a very different trend emerges for certain companies and industries when we look at the *number* of investment ties rather than the *value* of the investment, the latter which has been the approach in the literature so far. Looking solely at the investment value yields an incomplete picture since, for many Chinese investments in Europe, the value of the transaction remains undisclosed. This means that the range of activity in terms of Chinese OFDIs might be (much) larger than is indicated by the investment values. Second, beyond M&As and greenfield investments, a whole subfield of intercorporate cross-border relations is unfolding, through joint ventures (JVs) and strategic alliances (SAs), that have so far flown under the radar of both policy and academic debates regarding China's presence in Europe. The latter forms of cross-border corporate relations also evade investment screening mechanisms and have not (yet) been subject to securitization and politicization the way investments from China have (Rogelja & Tsimonis, 2020). Nonetheless, such Sino-European corporate partnerships provide firms with opportunities to pool resources, reduce costs, combine expertise, and enter foreign markets and distribution networks. Focusing on these underexposed modes of corporate relations between Chinese firms and European partners thus reveals a nuanced and comprehensive picture of the state of the Chinese economic presence in Europe and how this has been mitigated by the geoeconomic turn. This article is structured as follows. In Section 2, we review the literature on Europe's geoeconomic turn and Chinese (party-)state-capital relations before discussing our research design in Section 3. Sections 4 and 5 present our key findings on the (variegated) impact of Europe's geoeconomic turn on Chinese companies' globalization via OFDIs and JVs and SAs. Section 6 summarizes and reflects on our findings.

2. The Geoeconomic Turn and the Globalization of Chinese (Party-)State-Capitalism

Debates about a geoeconomic turn in global capitalism have long been dominated by the intensifying US–China conflict (e.g., de Graaff et al., 2020; McNally, 2020). In recent years, however, analyzing the role of Europe and its so-called "geoeconomic turn" has gained traction (Abels & Bieling, 2023; Babić et al., 2022; Matthijs & Meunier, 2023). Scholars argue that the emergence of Europe's geoeconomic turn is closely connected to major material shifts in global capitalism since the beginning of the millennium, specifically to the rise and internationalization of Chinese state capitalism and the emergence of a "new triad competition" (Abels & Bieling, 2023, p. 517). The political responses by the EU and many of its member states to the rising (systemic) competitor China are multifaceted, including a securitization of foreign, trade, and investment policy (Meunier & Nicolaidis, 2019; Mügge, 2023); most notably, the implementation of EU investment screening mechanisms and instruments of vertical industrial policy (Gräf & Schmalz, 2023); and a corresponding techno-nationalism (Starrs & Germann, 2021). Various scholars in the field of international political economy have highlighted the globalization process of Chinese (state-owned and private) companies and, in particular, the role of Chinese (state-backed) OFDIs in Europe as a crucial dynamic instigating Europe's geoeconomic turn (Babić & Dixon, 2022; Gräf & Schmalz, 2023; Meunier, 2019). On an ideational and discursive level, European elites called for a (geoeconomic) turn to "open strategic autonomy" (Schmitz & Seidl, 2023)—especially by China. At the same time, the European Commission also established a policy of "de-risking" by reducing its economic dependencies vis-à-vis China (European Commission, 2023a), driven by a (perceived) threat that the Chinese party-state could make use of strong economic ties and

dependencies for exploiting opportunities of "weaponized interdependence" (Farrell & Newman, 2019). This "selective fortification" (Lavery, 2023) of European capitalism(s) is therefore inextricably linked to the rise of the Chinese (party-)state capitalist model and unfolds in the context of intensifying competition between European, Chinese, and American companies, in particular in strategic high-tech sectors (Hung, 2022; Pearson et al., 2022). Given the preceding era of growing economic engagement between Europe and China (Henderson & de Graaff, 2021), including record levels of Chinese investments on the continent (Kratz et al., 2023a), the question arises what the implications of this European "geoeconomic turn" are for Chinese economic enterprises.

As indicated, it is the *state-capitalist* nature of China's growing geoeconomic power in particular that is inciting a European geoeconomic response (or "turn"; Babić & Dixon, 2022; Gräf & Schmalz, 2023; Meunier, 2019; Starrs & Germann, 2021). Due to the strong (party-)state–business ties in Chinese capitalism, high geoeconomic power resources are attributed to China because the Chinese government can make use of its domestic (state-owned and private) companies to advance its geoeconomic interests abroad (Blackwill & Harris, 2016; Ferchen & Mattlin, 2023; Gertz & Evers, 2020). At present, however, we now have a rich strand of studies (e.g., de Graaff, 2020; Jones & Zou, 2017; ten Brink, 2019; J. Zhang & Peck, 2016) indicating it would be misleading to conceive of Chinese state–capital relations as monolithic. State capacities exhibit a high degree of fragmentation and decentralization. The interests of the party-state can diverge and even clash across different bureaucratic divisions, administrative tiers, and regulatory bodies. As a result, studies indicate that there is quite some variation in the degree to which different economic sectors, and companies within the same sector are permeated by the Chinese party-state via ownership ties or party control and possess very different degrees of autonomy (Köncke et al., 2022; Weber & Qi, 2022). Given this fragmented (party-)state authority and complex entanglement of (party-)state–capital relations, a question that has not been sufficiently addressed in the literature is how and to what extent variation exists in the globalization strategies of Chinese firms and investments in Europe related to their level of (party-)state permeation. The subsequent question, in light of the geoeconomic turn, is whether and how the latter impacts the globalization strategies of Chinese firms and investments in Europe in different ways.

The few existing studies that have systematically measured how Europe's geoeconomic turn affected Chinese investment in Europe and how this impact varies among Chinese companies with different degrees of party-state permeation have been produced by think tanks (Kratz et al., 2023a, and also other work from previous years), demonstrating an overall massive decline in Chinese investments since 2016 that culminated in an eight-year low of 7.9 billion EUR in 2022 (Kratz et al., 2023a, p. 5). These studies, however, focus solely on the *value* of investments. To the best of our knowledge, there is yet no study shedding light on the variegated development of Chinese OFDIs in Europe based on the *number* of investments. This is significant because, for many Chinese investments, the value of the transaction remains undisclosed, which implies that the scale and scope of Chinese OFDIs might be (much) larger than suggested by those investment values. Focusing merely on the value of investment might hence provide an incomplete picture of the impact of Europe's geoeconomic turn on Chinese investments. In addition, with the focus of existing literature being primarily on the role of Chinese investments, what has been less analyzed so far is the establishment of other forms of corporate relations such as international SAs or JVs. These corporate relations are formed for purposes such as pooling resources for R&D activities, technology exchange, coproduction, the provision of marketing and sales services, or gaining access to foreign markets (cf. Y. Zhang et al., 2012, pp. 105–108). The establishment of SAs and JVs with European firms may provide

Chinese companies (and vice versa) an opportunity to enter new markets and acquire technology, (strategic) knowledge, or sensitive assets. Both organizational forms can thus be used to achieve the goals typically associated with M&A deals or greenfield investments. Although JVs are generally regarded as a special type of OFDI in the international business and political economy literature (e.g., Duarte & García-Canal, 2004; ten Brink, 2015), in this article we intentionally differentiate between investments (brownfield and greenfield) and collaborative corporate ties (JVs and SAs).

The creation of SAs and JVs does not usually involve the acquisition of an equity stake in an existing company. It is therefore an important distinctive characteristic of those organizational forms that the collaborating companies keep managerial autonomy. Consequently, the establishment of SAs with a third-country party is not covered by EU member states' investment screening regulations; neither are JVs covered by the scope of many national investment screening regulations (cf. OECD, 2022, pp. 55–56). JVs and SAs can thus be used as instruments to achieve similar goals as investments while bypassing national investment screening mechanisms. It is widely known that Western companies, especially those in the automotive sector, initiated JVs with domestic companies in China to gain access to the Chinese market, spurring concerns about the potential risk of technology transfer that could undermine European efforts to achieve "strategic autonomy" (Korteweg et al., 2022). Several studies in international business literature have shown that Chinese companies also used outward SAs and JVs for their international expansion to acquire technologies and enter new markets (Duysters et al., 2007; Wu & Callahan, 2005; Y. Zhang et al., 2012). But the potential impact the geoeconomic turn may have on this particular type of Sino-European intercorporate relations in Europe still has to be investigated.

In this article, we aim to fill this gap by analyzing the variegated impact of Europe's geoeconomic turn on Chinese corporate internationalization and the formation of Sino-European corporate relations via (a) the number of OFDI (M&As and greenfield) ties and (b) SAs and JVs in the period from 2000 to 2023. As described above, these modes of internationalization are expected to be affected differently by the regulatory measures introduced in the course of Europe's geoeconomic turn. Comparing the evolution of both forms thus provides a comprehensive picture of how the geoeconomic turn affected the formation of Sino-European corporate relations. To account for differences in terms of the ownership and state–business relations of Chinese globalizing firms, our study also includes variation in terms of the degree of what we call "party-state permeation" (Köncke et al., 2022). This allows us to give a granular assessment of whether Chinese companies' close ties to the party-state actually have an impact on the evolution of Sino-European corporate ties amid the geoeconomic turn. Given that European investment screening instruments are designed to filter out "market-distorting" state-capitalist influences in Chinese OFDIs (Gräf & Schmalz, 2023), we expect the activities of highly party-state permeated companies to be particularly impacted. In this article, we assess the variegated impact of Europe's geoeconomic turn on Chinese companies with varying degrees of party-state permeation in two economic sectors that are key to Europe's economic competitiveness and national security: the automotive sector and the ICT sector. We will elaborate upon this in the next section.

3. Research Design and Case Selection

Employing network visualization techniques and descriptive quantitative and qualitative analysis, this study will compare the (variegated) impact of Europe's geoeconomic turn on the internationalization trajectories

into Europe of the largest Chinese firms in the ICT and automotive industries, as ranked in the Chinese Top 500 list (published by the China Enterprise Confederation). Recent research has shown that Chinese investment in Europe is concentrated in the hands of a small number of companies (cf. Kratz et al., 2023a), which predominantly belong to the Chinese Top 500 list. It should be noted, however, that while our sample includes China's largest globalizers, it excludes the investments and corporate activities of numerous small and medium-sized Chinese companies.

The choice for the ICT and automotive sectors is motivated by the following considerations:

- The "going out" of these industries was intensively promoted by the Chinese government with industrial policy measures (Jungbluth, 2018), which is why Chinese ICT companies—in particular telecommunication giants such as Huawei and ZTE—are strongly globalized. Meanwhile, automotive companies not only expanded into Europe (e.g., Geely acquiring Volvo, BYD moving significant production and sales to Europe) but also formed JVs with major European companies such as Volkswagen and BMW—in both China *and* Europe.
- For Europe, these are two key sectors in terms of its economic competitiveness vis-à-vis China and—in particular with regard to the ICT sector—also for national security concerns. Whereas the ICT sector, in particular Huawei, has become severely politicized and securitized within Europe (Calcara, 2023; Friis & Lysne, 2021; Mügge, 2023), the automotive industry has just recently been caught up in the crossfire of Sino-European economic competition. In particular, the latter happened in the context of the transition to electric vehicles, as evidenced by the ongoing anti-subsidy investigations of the European Commission against Chinese electric vehicle producers (European Commission, 2023b).
- Both sectors are comprised of large companies that demonstrate different degrees of party-state permeation (see Table 1).

Focusing on these sectors and companies thus provides insight into the extent to which Europe's geoeconomic turn affects Chinese companies' internationalization strategies, and how this impact varies according to sector and between companies with different degrees of autonomy from the party-state.

Our analysis is based on two sample selections: We first selected all relevant firms in the Top 500 list—which consists of China's largest "globalizers"—in the respective sectors with corporate ties in Europe, which generated 29 cases (13 automotive companies; 16 ICT companies; see Table 1). From this "full sample," we subsequently selected four cases per sector, one for each level of party-state permeation, constituting our "small sample" (see Table 2). This "small sample" includes the geoeconomically most salient Chinese companies. Since geoeconomic salience is determined both by the level at which firms are perceived as an economic competitive challenge as well as a (national) security threat, we selected the companies for this "small sample" based on three criteria: (a) their technological dominance in business fields key to the economic competitiveness of European core countries; (b) the risk these companies (might) pose to national security and critical infrastructure, as perceived by European policymakers and reflected in political discourse and concrete policy measures amid the geoeconomic turn; and (c) their level of economic activity in Europe as indicated by Thomson Reuters' SDC database (Thomson Reuters, 2023). These factors have been prominent in the ideational shift of European policymakers towards a more restrictive approach to Chinese investment in Europe, and thus affected the "geoeconomic turn." Alongside companies with fairly high levels of corporate activity in Europe (China Unicom, BAIC Motor, Geely, Tencent) which engaged in

strategic acquisitions that attracted public attention (e.g., Geely's and BAIC's acquisition of stakes in Daimler), the small sample comprises the geoeconomically most sensitive Chinese high-tech companies that are commonly seen as the primary drivers behind Europe's geoeconomic turn. This includes high-profile ICT companies such as Huawei and ZTE whose international activities have become securitized in the US and Europe (Calcara, 2023; Friis & Lysne, 2021; Starrs & Germann, 2021), and automotive companies such as BYD or CATL whose activities are becoming increasingly "geopoliticized" (Kratz et al., 2023b; Meunier & Nicolaidis, 2019) due to their technological dominance in business fields key to Europe's economic competitiveness (New Energy Vehicles and batteries). While the full sample facilitates a comprehensive analysis of aggregate dynamics and sectoral comparisons, the small sample goes beyond that sectoral level by allowing for more in-depth insight into how Europe's geoeconomic turn has affected the evolution of Sino-European corporate relations.

Table 1. Full company sample.

Company	Sector	Degree of party-state permeation
BAIC Motor	Automotive	High
BYD	Automotive	Medium
CATL	Automotive	Low
China FAW	Automotive	High
Dongfeng Motor	Automotive	High
Geely	Automotive	Low
Great Wall Motor	Automotive	Medium
JAC Motors	Automotive	Medium
Jianglin Motors	Automotive	High
Ningbo Joyson Electronics	Automotive	Low
SAIC Motor	Automotive	High
Weichai Power	Automotive	High
Wanxiang	Automotive	Medium
Alibaba	ICT	Low
Baidu	ICT	Low
China Electronics Technology	ICT	High
China Mobile	ICT	High
China Telecom	ICT	High
China Unicom	ICT	High
GoerTek	ICT	Low
Hengtong	ICT	Medium
Huawei	ICT	Low
Luxshare	ICT	Low
NetEase	ICT	Low
Skyworth	ICT	Medium
Tencent	ICT	Low
Wingtech	ICT	Medium
Xiaomi	ICT	Low
ZTE	ICT	Medium

Table 2. Small company sample.

ICT	Automotive	Degree of party-state permeation
China Unicom	BAIC	High
ZTE	BYD	Medium
Huawei	Geely	Low: high ownership concentration
Tencent	CATL	Low: dispersed ownership structure

Another main research aim of this study is to unpack the differentiated impact of the geoeconomic turn on companies with varying degrees of party-state permeation. Building upon previous research, we determined the degree of party-state permeation for each company using two variables: (a) ownership type, based on the share of state-controlled capital in companies' equity, and (b) party control as measured by a "party influence index" which determines the degree to which the Communist Party of China is institutionalized at the corporate level (see the Supplementary File for details on how we operationalized and measured ownership type and party control, drawing upon Köncke et al., 2022). Using these two variables, we classified each company's degree of party-state permeation as high, medium, or low, with state ownership and party control given equal weight. Our classification overcomes the limitation of many studies on Chinese companies determining their exposure to the party-state based solely on the ownership type and thus overlooking the various ways the Communist Party of China is institutionalized even within private companies (Milhaupt & Zheng, 2015; Pearson et al., 2023). Though we found that state ownership and party control were correlated, there are several notable instances where party control extends into the private sector (Köncke et al., 2022). For example, BYD is often classified as a private company, suggesting a high degree of autonomy from the Chinese party-state. Based on our operationalization of party control, however, BYD is subject to a high degree of party control and thus exhibits a medium degree of party-state permeation (ownership type: private; party control: high).

We retrieved the data on M&As and JVs/SAs from Thomson Reuters' SDC database (Thomson Reuters, 2023) and data on greenfield investments (valued at least 100 million USD) from the China Global Investment Tracker published by the American Enterprise Institute (2023), in both cases for the period 2000–2023. From the SDC database, we retrieved M&A data that includes not only the European investments made by Chinese parent companies but also those made by their foreign subsidiaries. For M&As where no transaction value was provided in the SDC database, we supplemented the data with values from the companies' press releases if available. It should be noted, however, that for a third of all European investments by the companies in our full sample, no transaction value has been disclosed in the SDC database, the companies' press releases, or media reports. We stopped collecting data in June 2023.

4. Impact of Europe's Geoeconomic Turn on Chinese ICT and Automotive Investment

For our analysis, we locate Europe's geoeconomic turn in what in Germany has been called the "Kuka-Moment," which led to amendments in 2017 to the German Foreign Trade and Payments Act, tightening cross-sectoral investment control (Gräf & Schmalz, 2023). In 2017, Germany, France, and Italy also launched an initiative to establish investment screening in Europe, which later resulted in the EU Regulation 2019/452 (Chan & Meunier, 2022, pp. 525–535). We structure our analysis along two sets of results: (a) the impact of Europe's geoeconomic turn on the aggregate investment of the Top 500 Chinese

ICT and automotive companies investing in Europe, and (b) its variegated impact on the two sectors and along varying degrees of the firms' party-state permeation (see Section 3).

4.1. Impact on Aggregate Investment of ICT and Automotive Companies

Figure 1 shows that the aggregate value of investment (M&As and greenfield) by Chinese ICT and automotive companies peaked at 19.6 billion USD in 2018. This peak occurred as European governments began shifting their stance on Chinese investment. In the following years, the investment steadily declined, dropping to less than 4 billion USD in 2021 before experiencing a slight recovery in 2022. This recent surge in investment, however, is due primarily to a single significant investment: CATL's 7.6 billion USD investment in a battery plant in Hungary, which produces batteries for companies such as Volkswagen, BMW, and Mercedes. Overall, the data on investment *value* indicate that Europe's geoeconomic turn has curtailed aggregate Chinese ICT and automotive investment.

Interestingly, a different picture emerges for the *number* of investments per year: Here, perhaps counterintuitively, OFDIs of the largest Chinese automotive firms, and notably also ICT companies, in fact *increased* in the wake of Europe's geoeconomic turn. This divergence between the value and the number of investments is first and foremost a consequence of the fact that—as mentioned in Section 3—a transaction value has not been disclosed for a third of all investments made by the companies in our full sample. Our data on investment numbers reveal that China's largest ICT companies such as Tencent, Alibaba, and NetEase, and automotive giants such as Geely, Weichai, and Great Wall Motor have continued to invest heavily in Europe even after the geoeconomic turn. The transaction parties did not, however, disclose financial information on the investment deals. Analyses based solely on the values of investments thus seem to present an incomplete picture, whereas looking at the investment number illustrates that—rather unexpectedly—Chinese ICT and automotive investments in Europe remained highly dynamic.

It is also interesting to note that, at an aggregate level across the full sample, we did not find the geoeconomic turn to have produced any major shifts in either the geographical orientation or size (value) of Chinese investment projects in Europe. While some companies, notably Tencent, Alibaba, and to a lesser extent CATL, which had diversified their European investments geographically during the 2010s, increased

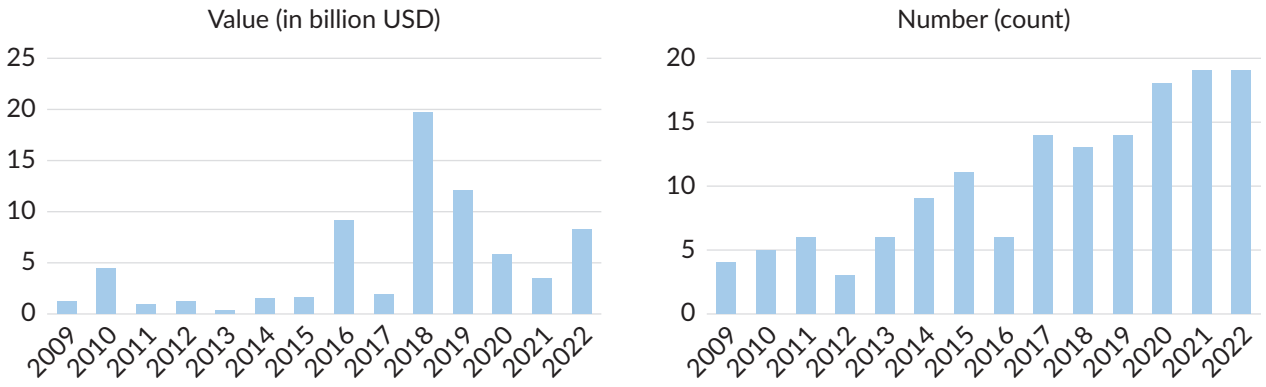

Figure 1. Development of OFDIs by Chinese ICT and automotive companies in Europe, value and number compared (value in billion USD). Source: Authors' calculations based on the SDC database (Thomson Reuters, 2023) and the American Enterprise Institute (2023).

their investments in Eastern Europe following the geoeconomic turn; others, such as Geely (Scandinavia, UK, Western Europe), Ningbo Joyson Electronics (Germany, Austria, Norway), and GoerTek (Denmark), have historically focused their investments on specific European countries and regions and reinforced this geographical concentration by further investing in these regions in recent years. Overall, we thus found no evidence of a general tendency for Chinese investments to relocate to certain European regions. Looking at the aggregated data across the full sample also indicates that there are no signs of a substantial change in the size (value) per investment projects: Single companies such as China Unicom (Spain), Dongfeng Motor (France), or Geely (Sweden, UK) invested large sums in individual European investment projects immediately after the euro crisis, but have stopped investing in Europe ever since (China Unicom, Dongfeng Motor), and in the case of Geely, values for the investments have been increasingly undisclosed. Instead, high-tech companies such as the partly state-owned semiconductor producer Wingtech (full takeover of the Dutch firm Nexperia in 2020; 4.5 billion USD in total) or CATL (large greenfield investments in Germany and Hungary), increasingly entered the European stage with large-scale investments. We thus note that although there have been substantive shifts in the investment patterns of individual firms, this has not resulted in an overall shift at the aggregate level.

Due to the divergence between investment value and number, the following analysis focuses solely on the investment number.

Focusing on the investment number of our smaller sample (Figure 2), we find that Chinese investment in the ICT and automotive sectors is heavily concentrated in a few firms.

Geely and Tencent, in particular, continue to invest in European companies. Tencent targets predominantly software and gaming firms all over Europe, whereas Geely invests in European car suppliers and dealer networks, as well as luxury car brands such as Aston Martin, with a regional focus on the UK and Scandinavia. Likewise, the automotive firms CATL, BAIC, as well as—notably—Huawei, continue to establish investment ties.

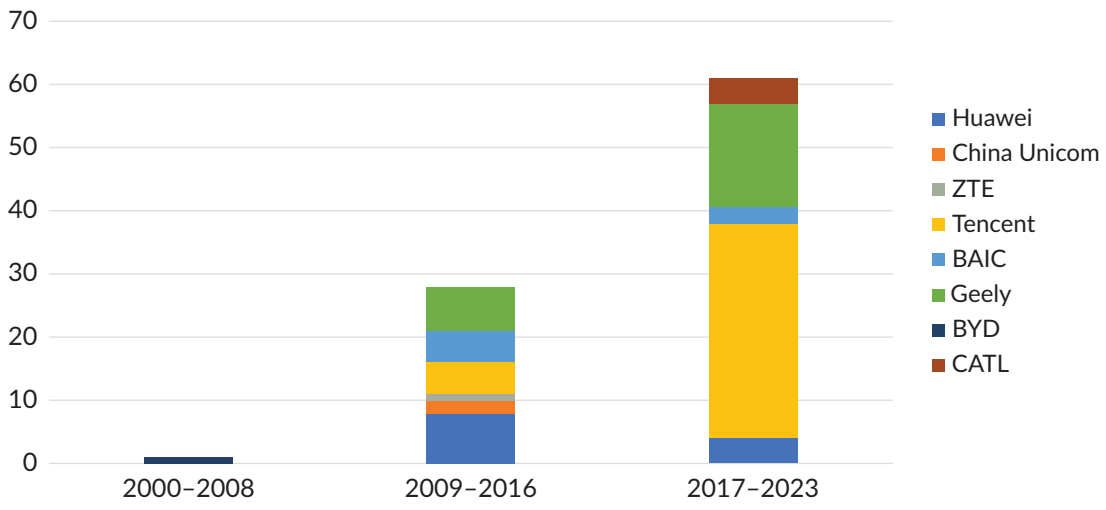

Figure 2. Periodization of OFDI number by selected companies (small sample). Source: Authors' calculations based on the SDC database (Thomson Reuters, 2023) and the American Enterprise Institute (2023).

Huawei is particularly noteworthy in this regard as it was subject to the fierce geopoliticization of the market for 5G networks and the rising efforts by, among others, the French and UK governments, to phase Huawei out of its 5G network market (Calcara, 2023, pp. 446–447; see also Friis & Lysne, 2021). Nonetheless, Huawei is currently setting up a French factory to produce mobile network equipment serving the European market, thus further intensifying the corporate ties between Huawei and its European customers, and has for example, made further greenfield investments in Ireland and Italy. Overall, our data reveal that the geoeconomic turn so far has neither diminished the aggregate number of OFDIs by top Chinese ICT and automotive companies nor halted investment by highly geopoliticized companies such as Huawei.

4.2. Sectoral Variation and Degree of Party-State Permeation

Investigating the sectorally variegated impact of Europe's geoeconomic turn based on the investment number across the full sample, our analysis indicates that investments in the highly geopoliticized ICT sector have maintained an upward trajectory (Figures 2 and 3). This contrasts sharply with the results by Kratz et al. (2023a, p. 23) who detected a shrinking share in ICT investments based on the investment *value*. In fact, as Figure 3 shows, the number of ICT investments for the companies in our sample has risen steadily since 2014 and peaked in 2021, whereas it declined in 2022 but remained at a high level.

Geographically, ICT investments are focused mainly on France, the UK, the Netherlands, Sweden, and Finland. Tencent, Huawei, and Alibaba, as well as NetEase and Wingtech, are among the largest Chinese ICT investors in Europe. For the automotive sector, which only recently started to become geopoliticized, the picture is mixed. Investments exhibited a downward trend since 2017, but have shown signs of recovery in 2022. Apart from the significant greenfield investment by CATL in Hungary, 2022 witnessed a surge in investments driven notably by M&A activities from Geely (UK, Sweden, Western Europe) and Weichai (Austria, Italy).

Throwing light on the differentiated impact of Europe's geoeconomic turn on companies with varying degrees of party-state permeation, we clearly observe that investments by companies with a high degree of party-state permeation have dropped, whereas investments by companies with a low degree of party-state permeation have soared (Figure 4).

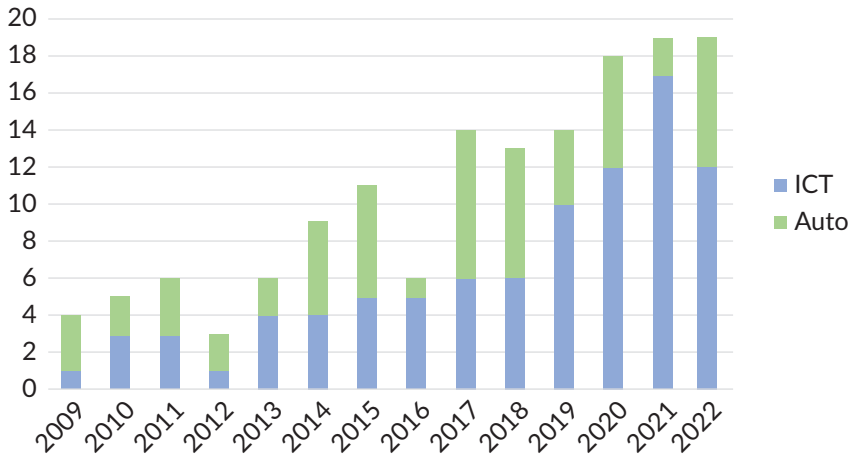

Figure 3. Sectoral comparison of the number of OFDIs (full sample). Source: Authors' calculations based on the SDC database (Thomson Reuters, 2023) and the American Enterprise Institute (2023).

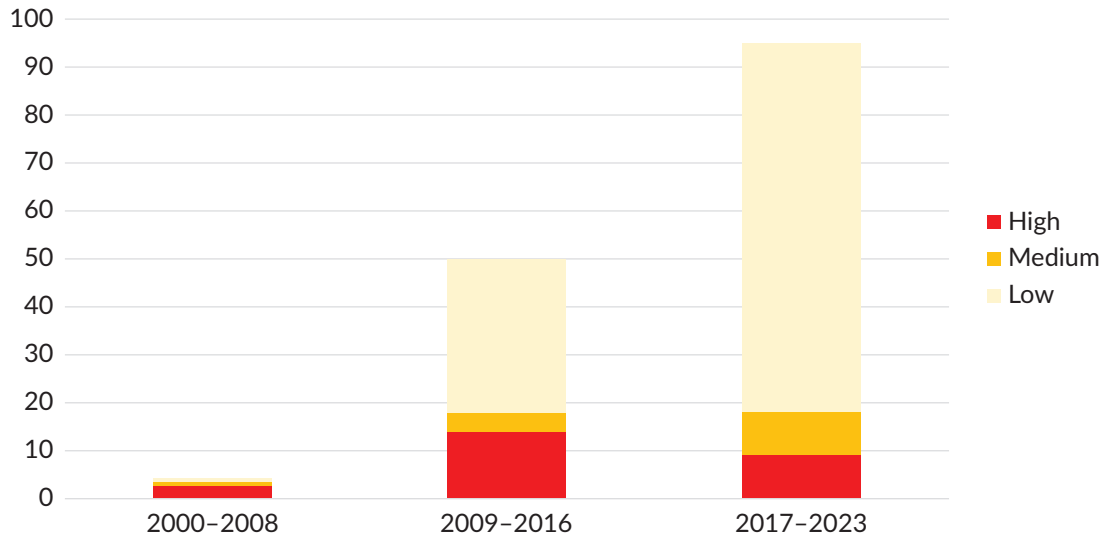

Figure 4. Periodization of OFDIs (number) based on degree of party-state permeation (full sample). Source: Authors' calculations based on the SDC database (Thomson Reuters, 2023) and the American Enterprise Institute (2023).

Because European investment screening policies are designed not only to specifically target investments in strategic industries but also to mitigate "market-distorting" state-capitalist influences (Gräf & Schmalz, 2023), this result is rather unsurprising and aligns with previous empirical analyses of Chinese investments in Europe (Kratz et al., 2023a). The geoeconomic turn in that sense clearly impacts Chinese firms with a high degree of party-state permeation, which made only a handful of investments after 2019—China Unicom in Germany (2021), Weichai in Austria (2020), and Italy (2022, 2023). In contrast, investments by companies with a low degree of party-state permeation—and, to a lesser extent, companies with a medium degree of party-state permeation—remain highly dynamic and thus seem much less affected by the geoeconomic turn.

5. Entering a New Period of Partnering? The Rise of Sino-European Collaborative Ties

We have argued that, beyond the realm of investment, an ecosystem of cooperative forms of cross-border corporate relations between Chinese and European companies exists, which has hitherto remained largely overlooked in the analyses of Sino-European corporate relations. JVs and SAs constitute two such modes of cross-border intercorporate relations that firms establish for the purpose of pooling resources for R&D activities, technology exchange, coproduction, the provision of marketing and sales services, and gaining access to foreign markets (cf. Y. Zhang et al., 2012, pp. 105–108). Moreover, such cooperative intercorporate relations often precede the establishment of more extensive investment relations, as we will discuss below. As Figure 5 indicates, establishing JVs and SAs with European partners has indeed been a considerable part of the globalization strategy of the Chinese Top 500 automotive and ICT firms in our sample (Table 1).

These forms of cooperative relations between Chinese companies and their European partners not only continue to be established after the geoeconomic turn but actually more than doubled in the period 2017–2023; a development similar to the surge in OFDI ties during this period. This increase in the formation of cooperative relations notably occurred prominently in the ICT sector which was already subject

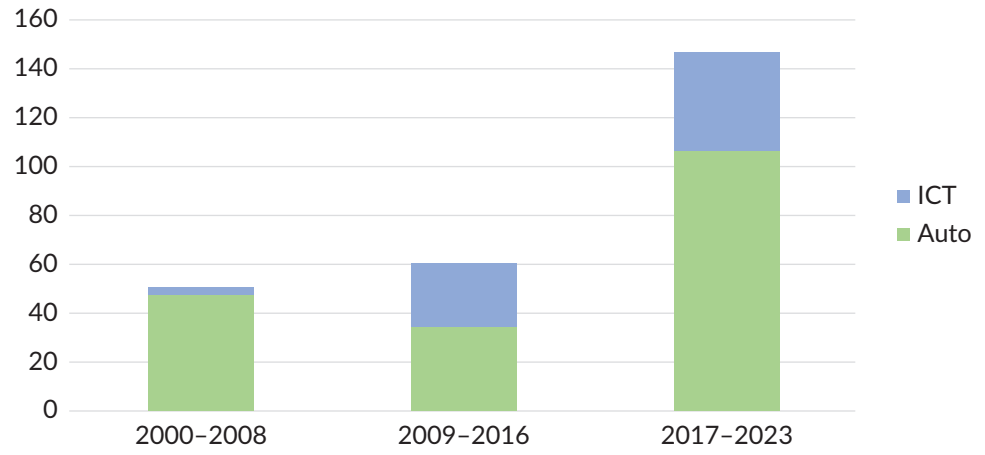

Figure 5. Sino-European JVs and SAs in ICT and automotive (full sample) before and after the geoeconomic turn. Source: Authors' calculations based on the SDC database (Thomson Reuters, 2023).

to heavy geopoliticization during that period (Calcara, 2023; Friis & Lysne, 2021; Starrs & Germann, 2021). Another sectoral variation we find is that Chinese ICT firms generally establish more collaborative ties with European firms than Chinese automotive firms do.

Assessing the variation depending on the degree of party-state permeation (Figure 6), we observe a substantial shift over time. While highly party-state permeated companies accounted for the majority of all JVs and SAs in the periods before the geoeconomic turn, they established significantly fewer of these links after the geoeconomic turn. In contrast, we see a substantive increase in the formation of JVs/SAs by low party-state permeated companies.

The intentions behind the establishment of such alliances can be manifold, as indicated by the literature on JVs and SAs (see Section 2). We therefore conducted an explorative qualitative analysis of the descriptions provided in the SDC database on each of these JVs and SAs. This explorative analysis indicates that many of these deals are R&D partnerships and agreements on the provision of products from Chinese companies

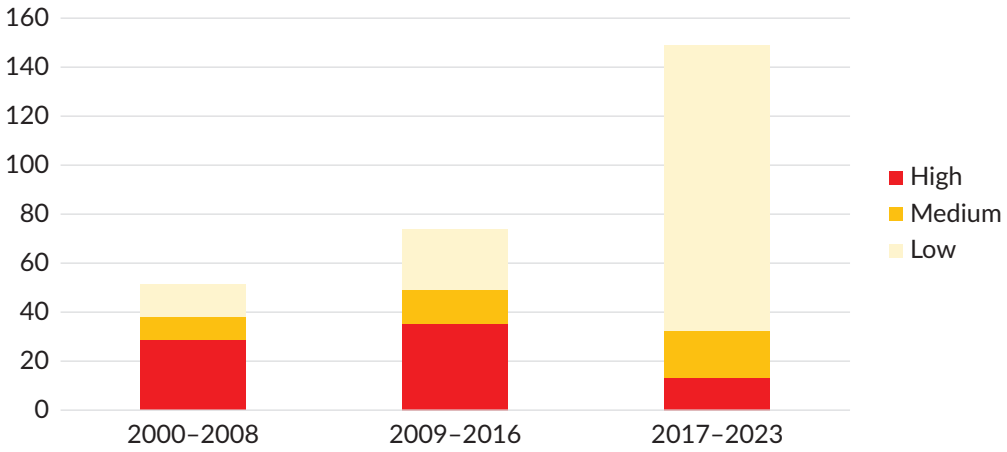

Figure 6. Sino-European JVs and SAs by party-state permeation (full sample) before and after the geoeconomic turn. Source: Authors' calculations based on the SDC database (Thomson Reuters, 2023).

to their European partners, which the latter utilize on both the European and Chinese markets. For example, many of these cooperative agreements with Alibaba or Huawei are about providing IT services to European car producers. The increase for low party-state permeated companies is thus a reflection of the wider ascent of private companies in the Chinese ICT and automotive sectors which have strengthened their competitive position in global markets (Hung, 2022).

We zoom in below to analyze the configuration of these ties and the corporate interfirm networks of our smaller sample (Table 2) to get a more granular assessment of: (a) their development over time, (b) their geographical spread, and (c) the variation across sectors and degree of party-state permeation. Figure 7 depicts a pattern in line with our full sample, illustrating the growing number of JVs and SAs over time, and a tripling of those ties in the period after the geoeconomic turn (2017–2023).

This figure also shows that the companies in our smaller sample that are most active in establishing these cooperative corporate relations are Huawei, Tencent, and Geely. Again, Huawei is a particularly interesting case in this regard since it seems that, despite the highly politicized and securitized debates about blocking Huawei from European 5G infrastructure networks (Calcara, 2023, pp. 446–447), it has managed to continue its globalization strategy out of the spotlight and has established a sprawling network of SAs in Europe during and after the geoeconomic turn (see also Figure 8). This includes many cross-sector alliances with, for example, Europe-based car manufacturers such as Volkswagen, Audi, and Volvo (owned by Geely), involving, e.g., collaboration in R&D and the provision of IT services. Also noteworthy is the close interrelation between collaborative ties and investments. For example, CATL and Mercedes-Benz initiated an SA in 2020 to supply Mercedes-Benz with CATL's battery cell modules, which served as a catalyst for CATL's subsequent decision to make a large-scale greenfield investment in Germany and Hungary (Section 4). Another notable example is the enduring collaboration between BAIC Motor and Daimler that

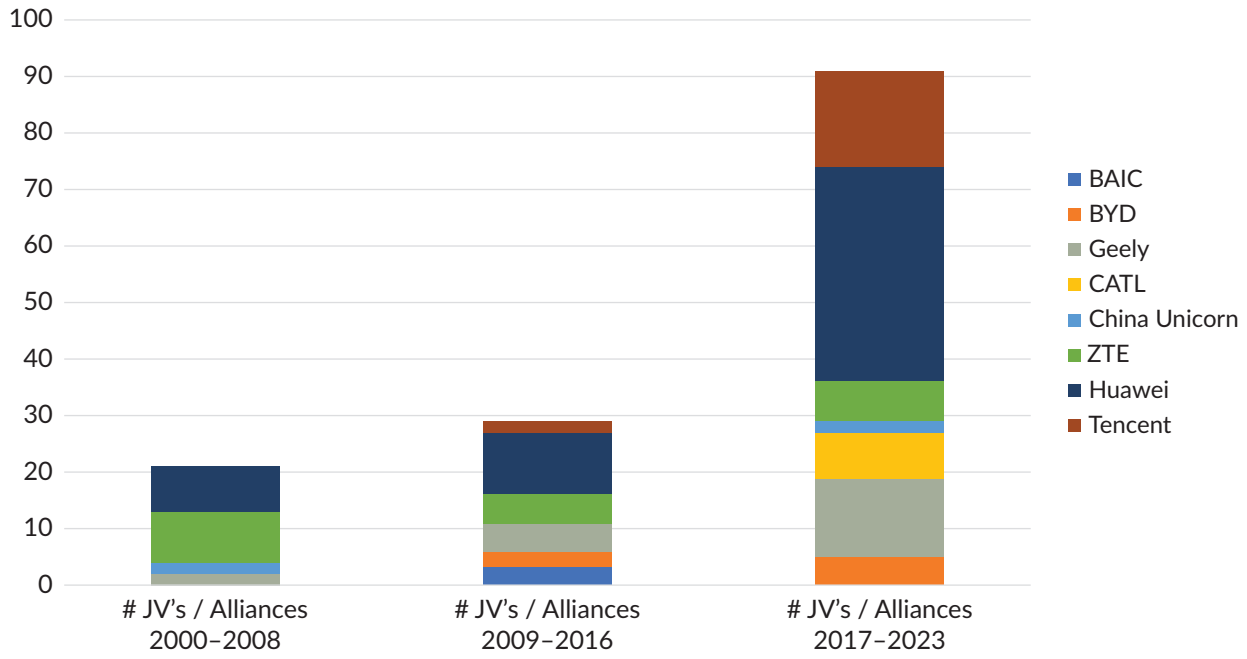

Figure 7. Sino-European JVs and SAs in the ICT and automotive sectors (small sample) before and after the geoeconomic turn. Source: Authors' calculations based on the SDC database (Thomson Reuters, 2023).

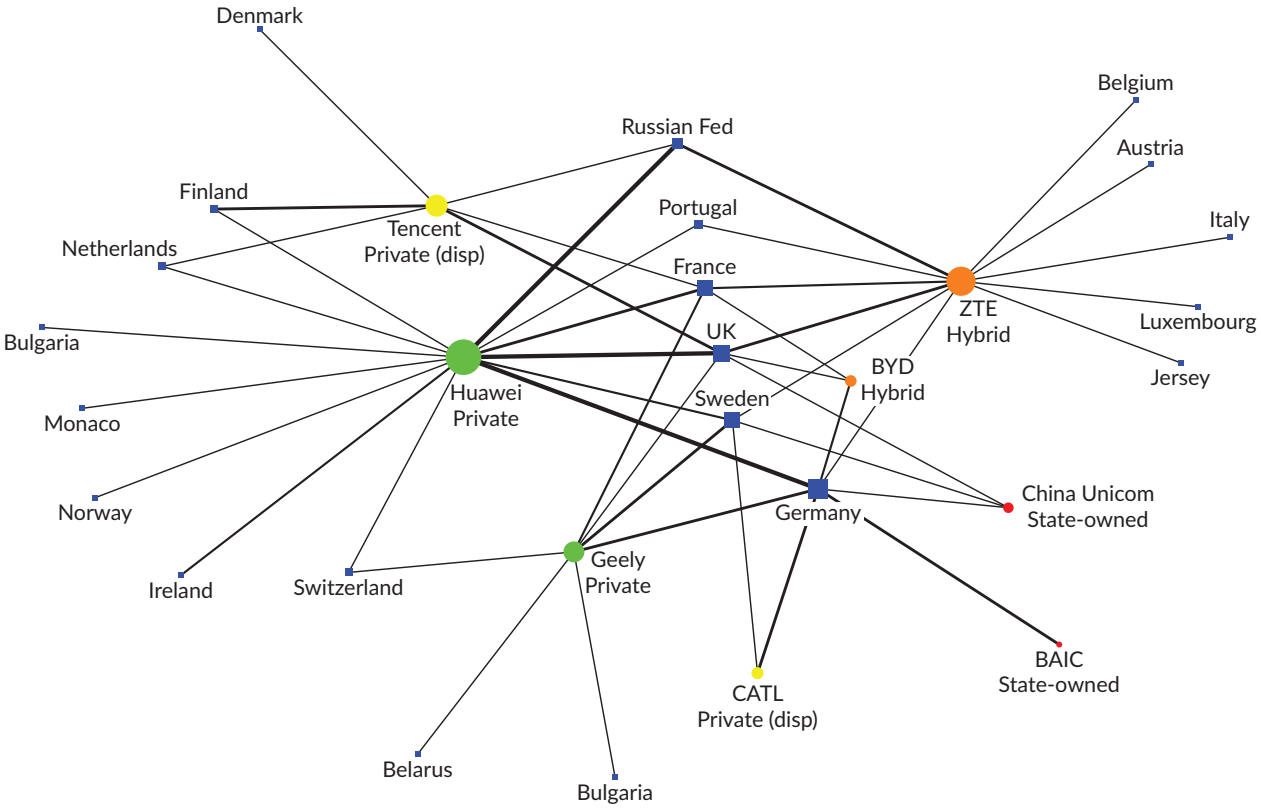

Figure 8. Geographical configuration of Sino-European JVs and SAs, 2000–2023. Notes: blue nodes = country of participant firms; green nodes = 100% private firms; yellow nodes = private firms with dispersed ownership; orange nodes = hybrid firms; red nodes = 100% state-owned firms; tie strength represents number of alliances with a firm in that country, and node size represents degree centrality (i.e., number of incoming ties). Source: Authors' calculations based on the SDC database (Thomson Reuters, 2023).

culminated in the establishment of a JV in the early 2000s known as Beijing Benz Automotive, producing Mercedes-Benz cars in China. This partnership set the stage for BAIC's acquisition of a 10% stake in Daimler in 2019, exemplifying the interconnectedness between the establishment of JVs/SAs and investments.

Mapping out the geographical networks for the eight Chinese firms in our small sample, Figure 8 shows that German firms are the most frequent partners for their JVs and SAs, closely followed by the UK, Sweden, and France. Besides Tencent, all the firms in our small sample partner with German firms. This two-mode network also illustrates that ICT firms have much more extensive geographical networks. Again, Huawei is the most widely and extensively connected. Chinese automotive firms only establish such relations with a few countries; in particular—and unsurprisingly—with Germany. Again, we find some variation based on the degree of party-state permeation, as the low and medium party-state permeated firms (green, yellow, and orange nodes) have much more extensive networks than the highly party-state permeated firms (red nodes) have.

6. Conclusion

This article has engaged with the ongoing international relations and international political economy debates about Europe's geoeconomic turn and contributed to these debates by analyzing its implications for the internationalization of Chinese firms into Europe. In contrast to prevailing studies and expectations, our data

reveal that the geoeconomic turn so far has not affected the aggregate number of OFDI ties by Top 500 Chinese ICT and automotive companies. Moreover, while it may have *altered* the investment activities of highly geopoliticized companies, it has—as the case of Huawei shows—not *halted* them.

Europe's geoeconomic turn, however, has had a differentiated impact on companies related to their degree of party-state permeation. We have shown that investments by highly party-state permeated Chinese companies have dropped markedly. By comparison, investments by companies with a low degree of party-state permeation—and, to a lesser extent, companies with a medium degree of party-state permeation—remain highly dynamic. Our results thus indicate that, while the "selective fortification" (Lavery, 2023) of European capitalism(s) coincided with a slowdown in the momentum of OFDIs by highly party-state permeated Chinese companies, investments by companies with a low party-state permeation (in many cases operating in high-tech fields such as ICT and electric vehicles) actually *increased* after the geoeconomic turn.

This article also reveals the existence of an extensive ecosystem of cooperative forms of cross-border corporate relations between Chinese and European companies that has so far been largely overlooked in the analyses of Sino-European corporate relations. As we show, Chinese ICT firms, and—to a lesser extent—automotive companies, engage intensively with Western companies by establishing collaborative ties (JVs and SAs) to pool resources for R&D activities, technology exchange, coproduction, the provision of marketing and sales services, or preparing their entry into foreign markets. Notably, this dynamic has also intensified in the wake of the geoeconomic turn. Here, however, it is again the companies with a low degree of party-state permeation that have entered into cooperation with Western companies after the geoeconomic turn, while the involvement of Chinese companies with a high degree of party-state permeation has declined sharply. Uncovering this extensive network of Sino-European collaborative ties, our findings point to the need to conduct further in-depth qualitative investigations into what these ties imply for Chinese corporate globalization. Moreover, it is interesting to note that, given the interrelatedness between the establishment of JVs and SAs and investment activities, the surge in these collaborative corporate ties could serve as a precursor to heightened investment endeavors in the future.

In general, our results stress the importance of including cooperative corporate relationships in the analysis of Chinese companies' internationalization strategies and the benefit of a more encompassing assessment of OFDI, including not only value but also the number of investment ties. We have suggested that JV/SA formation can be a strategy for avoiding regulatory prohibitive measures and screening; more research into the motives and drivers on the part of both Chinese and European partners for these modes of collaboration would be one fruitful research avenue. We found indications of JV/SA partnerships leading to more intensive and expansive investment relations, but whether this is indeed a robust pattern needs to be established more systematically. Moreover, the present study focused on two key sectors in the geoeconomic competition between Europe and China; future research would need to confirm whether the patterns we found in these sectors also apply to other sectors such as finance, infrastructure, and energy.

Another key takeaway from our study is that, despite the blurring boundaries between state-owned and private Chinese firms and the complex entanglement of state-capital relations in Chinese capitalism, geopolitical and geoeconomic dynamics do have a substantive differentiated effect on Chinese firms' internationalization strategies related to their degree of party-state permeation. Our study has not analyzed the mechanisms of this influence and the party-state business ties within firms (but see Köncke et al., 2022),

nor has it investigated how these are perceived by their corporate partners abroad, both of which would constitute fascinating follow-up studies. Our findings make clear that continued attention in both academic and policy assessments of Sino-European economic relations to the distinctive and complex nature of Chinese party-state capitalism is called for—while keeping Western-centric blinders in mind.

Finally, this study suggests that European governments' efforts to "de-risk" their economic relations with China and the call for "open strategic autonomy" vis-à-vis China have, so far, been accompanied by an intensification of Sino-European business relations with respect to both investment ties and collaborative ties of China's largest ICT and automotive companies, be it more "under the radar." This seems to indicate that firms and cross-border corporate relations are more resilient to the growing geopolitical and geoeconomic rivalry and the adjacent tightening of policies than the headlines might lead us to expect. For the wider Sino-European relations and the potential unfolding of de-globalization—or even decoupling—our findings indicate that this is certainly not a unilinear or one-dimensional development. De-globalization, or an unraveling of Sino-European relations, does not seem to be impending, at least not within the wider realm of corporate cross-border interactions, though it could happen selectively, in certain industry segments and specific cases (e.g., semiconductors, 5G). National security concerns and economic imperatives seem to interact in contradictory ways, and it appears to be a rocky road from political strategic decisions to corporate behavior.

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Conflict of Interests

The authors declare no conflict of interests.

Supplementary Material

Supplementary material for this article is available online in the format provided by the authors (unedited).

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ARTICLE

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A Chip War Made in Germany? US Techno-Dependencies, China Chokepoints, and the German Semiconductor Industry

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Abstract

As geo-economic and geopolitical rivalries intensify, the US is weaponizing its power in global semiconductor supply chains to restrict Chinese technological development. To win this chip war against China, the US must compel key foreign firms in Asia and Europe not to supply its adversary with the materials, tools, and know-how needed to make advanced semiconductors. But will these firms agree to follow the US chip embargo and avoid the lucrative Chinese market? This article examines Germany's "China chokepoint" firms, whose identity and behavior remain critically understudied. Drawing on novel data sets and annual company reports, we show that German firms across three case studies are highly "techno-dependent" on the US. Despite this techno-dependence, German firms have so far sought to circumnavigate US export controls. This constitutes a puzzle because Germany's semiconductor firms are no more involved in the Chinese market than are firms in Japan and South Korea—which have frequently signaled voluntary compliance or even withdrawn from China in anticipation of harsher US sanctions. To resolve this puzzle, we map out Germany's semiconductor network and demonstrate that it is tightly articulated with Germany's auto industry—which is in turn heavily exposed to Chinese markets. We propose that this secondary exposure, through firms' embeddedness in Germany's "national production regime," encourages them to resist the US chip embargo. In this way, we contribute empirical and conceptual insights to international political economy scholarship on firms as geo-economic actors, actively engaged in a protracted and contentious policy process with US authorities.

Keywords
China; geopolitics; Germany; international political economy; sanctions; semiconductors; supply-chain analysis; techno-dependency; weaponized interdependence; United States

1. Introduction

Our contribution to this thematic issue starts with the proposition that the decisive "geo-economic turn" away from the neoliberal project of free trade and free markets—though not from globalization as such—has come from the US. This turn is epitomized by the unprecedented measures the Trump and Biden administrations have taken to sabotage China's development of advanced semiconductors. Waging this "chip war" involves incising deep cuts into an interconnected web of highly specialized suppliers in a globe-spanning industry estimated to grow to US$1 trillion in revenue by 2030 (KPMG & GSA, 2024). Winning this chip war depends in large part on whether the US can compel not only its own but also foreign firms to stop selling chipmaking tools and related materials, components, and services to China—the world's largest consumer of semiconductors (Araya, 2024).

Most important to these efforts are so-called "China chokepoint" firms based in a handful of US-allied countries, which occupy critical nodes in advanced semiconductor production networks where China has little to no domestic capacities (Khan et al., 2021). To curb Chinese access to these technologies, the US has pressured allies to impose export controls on chokepoint firms under their national jurisdiction. In parallel, the US has also given its own restrictions extraterritorial force, which legally oblige compliance from users of US technology and thus weaponize these non-US firms directly. This mix of bilateral talks and unilateral sanctions worked in the case of the Netherlands and Japan, with both states and national semiconductor giants ASML and Tokyo Electron agreeing to follow US sanctions in law and in spirit (Starrs et al., 2024; Haeck & Moens, 2023). Talks with other US allies—such as South Korea, Taiwan, and Germany (Baazil et al., 2024; "Germany plays down report," 2023; Nienaber et al., 2023)—have not yet yielded formal deals, and one recent study finds that there are still "gaps in compliance between U.S. companies and those of allies" (Shivakumar et al., 2024, p. 1). Nevertheless, firms from countries without such agreements yet in place (such as South Korea and Taiwan) appear to be practicing strategies of "anticipatory compliance" by drawing down China investments and partnerships in favor of alternate locations (Lim, 2024; Nussey et al., 2024). This raises vexing questions about the nature, extent, and limits of US power, particularly in relation to the capacity of foreign transnational corporations (TNCs) to resist or evade US weaponization against China (e.g., Malkin & He, 2024; Moraes & Wigell, 2022; Shukla, 2022).

This article examines Germany as a counter-intuitive but high-stakes case study for addressing this research problem. That the US should seek to engage Germany in export control negotiations is understandable, given that Germany holds considerable influence within the EU and China is its most significant trading partner. Getting German firms to follow US export sanctions would therefore be a big win for US attempts to multilateralize its chip war. But the German case is also puzzling. To start, Germany is not generally known to have a world-leading semiconductor industry and it has very few well-known companies in the sector. It is also not well understood how exposed its chip firms are to Chinese markets. This has meant that Germany's involvement in the chip war has remained critically underexplored, and the identities of Germany's potential "China chokepoint" firms remain unclear. To our knowledge, there has been no attempt

to systematically identify these firms, nor to determine whether they are already adhering to existing US export controls, waiting to see whether the German government will yield to US pressure, or actively avoiding US sanctions.

Our article seeks to contribute to ongoing attempts to more thoroughly explain and theorize firm behavior in the new geo-economic era. To do so, we identify who the key German firms are that the US needs to enlist in its chip embargo, and we assess the specific leverage the US has over them. We then ask our central research question: To what extent do these firms choose to follow or evade US export controls, and what explains these outcomes in firm decision-making? This article sets out and develops our answer to this question in four steps.

The next section locates our work within the recent international political economy literature on TNCs as geo-economic actors. We argue that firm behavior needs to be examined in relation to "techno-dependency" on the US, weighed against their embeddedness in "national production regimes" (Koddenbrock & Mertens, 2022). Section 3 analyzes the German firms that matter to the US chip war on China. Building on industry and media reports, we show that there are just shy of a dozen German semiconductor firms that, alongside a handful of foreign firms, occupy different chokepoints across the length of the semiconductor supply chain—from design and materials to equipment and testing.

The remainder of Section 3 zooms in on an illustrative subset of these "China chokepoint" firms from across the chain—Siemens, Merck, and SÜSS MicroTec—on the basis not only of their strategic importance but also their specific attributes and varied visibility to US regulators. Drawing on Bloomberg Professional and S&P Capital IQ Pro datasets, we demonstrate that all three firms are techno-dependent on the US in terms of the facilities, subsidiaries, and affiliates they have located in the US, supply chains with suppliers or customers in the US, and the technologies that they use which are derived from US sources. We show that the three firms have nevertheless delayed compliance by either dragging their feet until directly ordered by US officials or by shifting their operations to minimize their potential legal liabilities. This is not, at least in two of our three cases, due to direct exposure to the Chinese sales market, which represents a modest proportion of overall revenues.

Instead, Section 4 maps the supply-chain linkages within and between Germany's semiconductor industry and other sectors of the German economy. We reveal how Germany's chipmakers are embedded in a "national production regime" (Koddenbrock & Mertens, 2022) which deeply integrates them with the German automotive industry. This integration is pivotal because the automotive sector maintains substantial investments in and commitments to the Chinese market, rendering it particularly susceptible to potential retaliatory actions. Consequently, firms will likely demur from any measures which might imperil Germany's auto sector. German chipmakers' "secondary exposure" to the Chinese market therefore renders them hostile to US chip sanctions.

We conclude that attention to *both* the embeddedness of TNCs within national production regimes *and* their techno-dependencies on the US is needed to move towards a fuller understanding of how they navigate the geo-economic turn. This turn, we insist, is not simply dictated by states any more than it is shaped solely by the commercial decisions of firms. Rather, it involves a complex and contentious policy process in which the US can target foreign firms directly, while these firms have some leeway to resist US "weaponization" in favor

of pursuing their own commercial interests, shaped in part by the broader national production regime to which they belong.

2. US Power and Corporate Agency in the Geo-Economic Turn

As the networks of globalization become arenas of great power contestation, a new body of international political economy scholarship has emerged that recognizes TNCs as actors navigating the geo-economic turn (Abels & Bieling, 2023; Malkin & He, 2024, p. 694; Moraes & Wigell, 2022; Rolf & Schindler, 2023). This literature eschews a realist-inspired and security-establishment-adjacent worldview in which companies are mere instruments through which state power is projected or received (Babić et al., 2022a, pp. 4–6). But it also dispels the liberal myth that TNCs are globally footloose and can simply evade national policies that do not suit their interests. Instead, these scholars are interested in the structural constraints and strategic choices faced by TNCs as states seek to redraw global supply chains in the name of national security. The principal question that animates this scholarship is how far and under what conditions companies are bound to follow or able to resist such "supply-chain statecraft" (Babić et al., 2022b, p. 191; Baines et al., 2024). Scholars have developed typologies of firm behavior linked to the profiles and profitability of firms, the political systems to which they are tied, or varieties of state-firm relations (Calcara, 2022; Geertz & Evers, 2020, pp. 124–127; Moraes & Wigell, 2022, pp. 44–45; Rolf & Schindler, 2023).

Our article contributes to this budding research agenda in three ways. First, we propose that the US chip war against China, as the pivot of the geo-economic turn, holds unique insights into the changing dynamics between states and firms. Concretely, the US wishes to dictate with whom foreign TNCs can and cannot do business—which directly impinges on their established business models, investment, and locational strategies. Therefore, the US chip war on China offers, as Malkin and He (2024, p. 677) aptly put it, "something approaching a natural experiment that tests the extent to which the US as a state actor can exercise its preferences."

Second and related, to fully understand corporate responses, we need to situate them in the context of US power. The ability of the US to weaponize foreign firms in its chip war against China has been attributed to the prominence of US companies, capital, and technology in global semiconductor production (Beaumier & Cartwright, 2024, pp. 14, 16; "Chains of control," 2023, p. 36; Farrell & Newman, 2023, pp. 200–201; Malkin & He, 2024, p. 687). But the principal focus of this literature has, understandably, rested on the ultimate target of US weaponization, i.e., the Chinese state and its firms. The secondary power dynamic between the chip sanctions of the US and the commercial decisions of allied firms has yet to be extensively explored. This requires that we operationalize, and measure in concrete cases, the specific extraterritorial leverage that the US has over third-country firms. To do so, we introduce the concept of "techno-dependency," by which we mean the significance of the US as a base of operations, site of strategic investments, and source of know-how and products for individual companies. Techno-dependency is what enables the US to craft regulations, including with extraterritorial legal force, to ensure compliant behavior.

However, as our third contribution spells out and our empirical findings underline, it would be wrong to see firm compliance as a fait accompli, even where techno-dependencies on the US are very high. Corporate decisions, we contend, are complexly determined and shaped in important ways by a firm's place within a specific "national production regime" (Koddenbrock & Mertens, 2022)—that is, the network of connections

to domestic customers and suppliers within and beyond a given sector. Understanding the likely outcomes of particular geo-economic conflicts, then, requires undertaking detailed mappings of these supply chains in both their domestic and global configurations. By empirically mapping these networks in the case of Germany's semiconductor industry, we are better positioned to analyze the strategies of key firms and the limitations of "weaponization" in the context of growing Sino–American competition.

3. The German Semiconductor Network and Its China Chokepoints

This article zooms in on the relationship between the US and German firms whose cooperation is needed to close loopholes in the US chip embargo against China. The US has two avenues to pursue compliance. First, the US can ask German regulators to mirror US export controls so that they apply to German firms. And indeed, media reports confirm that talks between the US and Germany have been ongoing since at least 2023 (Baazil et al., 2024; "Germany plays down report," 2023; Nienaber et al., 2023). Second, in addition to inter-state bargaining, the US can also proceed unilaterally and mobilize its export control regime so that it prohibits German firms that use US products or know-how from selling specified items to China and/or doing business with blacklisted Chinese firms.

Since Trump came into office, the US has placed dozens of Chinese tech firms on the Entity List. Under Biden, the US also added advanced chips and numerous tools and technologies to manufacture semiconductors and supercomputers to the Commerce Control List. Both lists are maintained by the Bureau of Industry and Security (BIS) with the Department of Commerce. The latter catalogs dual-use items that cannot be exported without a license if they are destined for specific countries, specific end uses, or specific end users that are considered to be of concern. The former specifies the foreign entities, including now over 600 Chinese companies, that may not be supplied with these items.

Crucially, the Foreign Direct Product Rule (FDPR) applies these export controls to certain items made anywhere in the world if they meet a specified threshold of US-origin content or use US-origin technologies or equipment. Thus, the BIS has effectively banned all worldwide shipments of leading-edge graphics processing units to China because they cannot be made without US software or equipment. It has also banned sales of foreign-made items made with US inputs to China if they can be used to produce supercomputers or if they are destined for certain Entity List firms, i.e., those with a so-called "footnote 4" designation (Rasser & Wolf, 2022). The FDPR has been extended to other countries of concern outside China (Dohmen & Feldgoise, 2023; Reinsch et al., 2023), along with expanded export licensing requirements, to keep them from re-selling certain items to China (Dohmen & Feldgoise, 2023). And, in a spectacular expansion of extraterritoriality, the BIS in October 2023 specified a type of lithography equipment to which the FDPR rule applies even if it does not contain any US inputs (Goujon & Kleinhans, 2023).

How far these regulations already legally oblige German suppliers, let alone induce compliance, depends on the specific firms in question. Germany is not generally known as a home to key players in the global semiconductor industry. While Infineon is often cited as a leading manufacturer of automotive and power semiconductors, it does not belong to the same class of cutting-edge chip firms as TSMC or Samsung. Smaller German companies—like Zeiss or Trumpf—have made the news. But they are usually discussed as suppliers to ASML (ASML, n.d.; Hofer, 2023; Höltschi, 2023; Rudzio, 2023) whose coveted extreme ultraviolet and deep ultraviolet lithography machines have already been hit by US and Dutch export

controls (Starrs et al., 2024). The future role of these and other suppliers in the US-led chip war is therefore unclear.

To fill in this picture, we build on a landmark study by the Center for Security and Emerging Technology (Khan et al., 2021) that systematically surveys the global semiconductor supply chain to identify areas where Chinese firms currently have little to no capacities. These segments of advanced semiconductor manufacturing constitute potential "China chokepoints," insofar as the dominant firms, usually from a handful of countries, can be convinced not to sell to China.

Figure 1 shows the 11 German "China chokepoint" firms listed in the Center for Security and Emerging Technology report. As we can see, they primarily cluster around semiconductor manufacturing equipment but are also present at other steps in the supply chain. Siemens, for instance, is one of four firms globally that own over 95% of chip design software. Siltronic ranks fourth in the world in the production of silicon "wafers," including advanced 300 mm diameter wafers from which virtually any chip below 45 nm is made (Khan et al., 2021, pp. 55, 57, 92). Furthermore, Zeiss is not only ASML's largest known supplier, accounting for over 25% of the company's costs (Bloomberg, 2024); it is also among the few firms worldwide that make the tools China relies on to inspect these wafers and the transparent plates ("photomasks") used to transfer circuit patterns onto them (Khan et al., 2021, p. 44).

Figure 1 also shows a concentration of German chokepoint firms in chipmaking tools. All but one of these firms make alternative lithography equipment that does not use ultraviolet light but ion-beam,

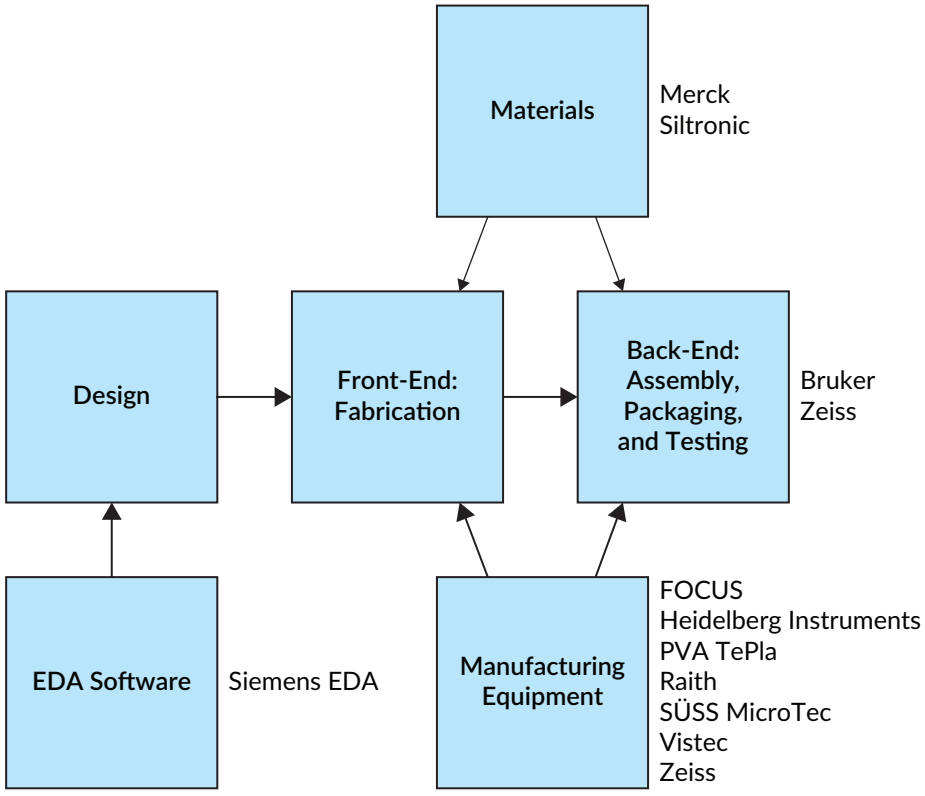

Figure 1. Germany's "China chokepoint" firms in the semiconductor supply chain. Source: Authors' work based on Khan et al. (2021) and Varas et al. (2021).

electron-beam, laser, or imprint technology to draw circuits onto chips (Khan et al., 2021, p. 34). This type of equipment presents a potential, though not yet fully developed, substitute for the sanctioned extreme ultraviolet and deep ultraviolet machines (e.g., Shivakumar, et al., 2024, p. 5). Vistec, for instance, has an over 90% global market share in electron-beam lithography for chipmaking (Khan et al., 2021, p. 30). Japan added this technology to its export control list in 2023, but at least one other German company (Raith) has so far continued to sell it to China (Wettach, 2024, p. 30). To sum up, though less critical than Dutch, Japanese, Taiwanese, and South Korean firms, German firms do matter for the US's ability to curtail China's access to critical supplies, hamper its production, and prevent technical workarounds and future innovations.

Unlike those in other US-aligned countries, Germany's chip firms have not been widely reported to be withdrawing from China. In fact, as we demonstrate below, they have pursued business strategies predicated on deepening their China dependencies and systematically worked to evade the spirit of US decoupling initiatives. As Table 1 indicates, this is not because German chip firms are more directly exposed to China than those in other countries. Germany and Japan each send about a quarter of their exports of semiconductor manufacturing equipment to China. That is more than the Netherlands, but significantly below the percentage of exports that Taiwan and South Korea send to China. Measured in US$ values, moreover, Germany ranks last. Japan exports nearly 10 times as much equipment to China as Germany, and even the Netherlands exports nearly three times as much.

To better understand the role and strategies of German firms in the US–China chip war, the remainder of this section examines three of these "China chokehold" firms—Merck, Siemens, and SÜSS MicroTec—selected for pragmatic and strategic reasons. First, all three companies are publicly listed and large enough for sufficient supply-chain and facilities data to be available on Bloomberg Professional and S&P Capital IQ Pro. Second, they occupy distinct yet critical roles across the semiconductor supply chain, which gives scope to our analysis. Merck is a world-leading producer of specialty gases and high-quality materials needed for semiconductor manufacturing. Siemens is an industrial conglomerate that has become one of four firms globally that own over 95% of chip design software. SÜSS MicroTec is a manufacturer of chipmaking tools developing the most promising alternative to US-sanctioned photolithography equipment. Third, the three firms offer helpful contrasts because they are of vastly different sizes. With a market capitalization of €142 billion, Siemens is an industrial giant more than twice as large as Merck (€65 billion), while SÜSS MicroTec, valued at €891 million, is a significantly smaller, self-styled "hidden champion" (SÜSS MicroTec, 2023a). Such variation allows us to explore whether size has an impact on firm responses. Lastly,

Table 1. Exports of semiconductor manufacturing equipment to China (2022).

	US$	China % of total exports
Germany	926,454,000	25.8
Netherlands	2,450,173,380	14.7
Japan	8,927,690,000	28.7
South Korea	1,601,329,000	51.3
Taiwan	2,192,458,200	34.4

Notes: Aggregated trade data for products classified under Harmonized System codes 381800, 848610, 848620, 848640, 903082, and 903141; we follow Beaumier and Cartwright's (2024, p. 6) aggregation for "semiconductor manufacturing equipment" but also add "machines and apparatus of a kind used solely or principally for the manufacture of semiconductor devices or of electronic integrated circuits." Source: Authors' calculations based on Observatory of Economic Complexity (2024).

the three companies have received different types of scrutiny by US authorities. Siemens has had numerous Chinese customers put on the US Entity List, and in one prominent case, was singled out and virtually directly ordered by US regulators to review its business ties (Heide & Murphy, 2023). Merck is rumored to be the subject of US–German trade talks (Nienaber et al., 2023). SÜSS MicroTec, finally, has seen export licenses delayed by German regulators, which suggests indirect pressure by the US (Finkenzeller, 2023). Thus, in so far as we find that all firms responded similarly in resisting US decoupling initiatives, the reasons for this common behavior need to be sought elsewhere.

3.1. Merck

The importance of Germany for the US tech embargo first became apparent in April 2023 when news broke that the German government was in talks to restrict the export of "chip chemicals" to China (Nienaber et al., 2023). The two companies potentially affected are BASF and Merck, the latter occupying a China chokepoint ("Germany plays down report," 2023; Nienaber et al., 2023). A science and technology company with a dedicated and newly expanded electronics division (Merck, 2021), Merck offers a range of materials and material solutions for the semiconductor industry. It is one of the world market leaders in the production of electronic gases (Khan et al., 2021, p. 56) and supplies chemicals for polishing wafers (Wettach, 2023). In addition, Merck builds supply systems for the chemicals and gases used in semiconductor manufacturing (Hofer, 2023). The company prides itself on the fact that "almost every chip in the world uses one of our products or services" (Merck, n.d.) and counts YMTC and SMIC among its customers, leading Chinese firms that are both on the US Entity List (Bloomberg, 2024). As a result, Merck has become engulfed in the tech war between China and the US, noting as early as 2020 that the conflict touches on every aspect of its business (Ziesemer & Steinmann, 2020).

When the possibility of Germany aligning its export controls with the US was first reported, one chemical industry expert objected that extending the German dual-use list to chip chemicals would make little sense because "the majority of the semiconductor chemical value chains of Merck and BASF did not involve Germany or Europe geographically" ("Germany plays down report," 2023). Contrary to this criticism, this is not because production has been fully localized in China. Rather, our analysis suggests that Merck's production network runs through the US. Some 29% of Merck's facilities are located there, compared to just 8% of its facilities in Germany (Bloomberg, 2024). Moreover, whereas just 12% of its long-term assets are based in Germany, 64% are based in the US (Bloomberg, 2024). The long-term assets Merck has in the US include two of its four facilities producing specialty gases (with the other two located in South Korea; Bloomberg, 2024) and several facilities of its high-tech materials business in North America. In 2019, Merck acquired two US-based firms: Versum Materials, which makes slurries used for flattening wafers (Wettach, 2023), and Intermolecular Inc., which provides technology platforms for high-tech materials research and development (Merck, 2019). Indeed, Merck has confirmed that its US subsidiaries and affiliates are already subject to US export controls (Wettach, 2023).

Given these significant techno-dependencies and the relatively modest contribution of the Chinese market to its total revenue (13% of its total revenue in 2023; Merck, 2024, p. 251), it is surprising that the company is going to great lengths to defend its China operations. To continue to sell to China, Merck has embraced "a strong local presence" and is investing in a new site for advanced semiconductor solutions in Zhangjiagang (Merck, 2024, pp. 60, 82). It also plans to reduce its reliance on raw materials from outside of China, especially

from the US (Yang & Nilsson, 2023). Increasing investment in and sourcing from China is the opposite of what the US wants. With Merck, then, we have our first case of a German "China chokepoint" firm that is circumventing rather than following the US chip embargo.

3.2. Siemens

The second and most prominent example is Siemens. It is the world's fifth-largest industrial conglomerate by market value and a leading supplier of manufacturing software including semiconductor production (Statista, 2024). With its acquisition of Mentor Graphics in 2017, it became one of only four companies worldwide that possess the software to design next-generation semiconductors (Hägler, 2023). This oligopoly position in EDA puts Siemens at the center of the US chip embargo, and its diversified product portfolio extends to other advanced technologies and military applications where the US seeks to curtail China's access, including aerospace, battery manufacturing, and biotechnology ("Chains of control," 2023, p. 36; Hayashi & McKinnon, 2023).

While Siemens has no less than 43% of its long-term assets in the US, it has been present in China since the late 19th century, where it generates 12% of its total revenue (Siemens, 2024, p. 14) and where 17% of its known customers are domiciled (Baines et al., 2024). What, if any, resources does the US possess to compel this industrial behemoth to follow its sanctions? And what, if any, evidence is there to suggest that Siemens has complied?

The most compelling source of US legal authority over Siemens is that Mentor Graphics, which the firm acquired as "Siemens EDA" in 2021, is domiciled in the US. This establishes a direct obligation for its US subsidiary to abide by US export controls, which the Commerce Department extended to EDA software in August 2022. Moreover, under the revised FDPR in October 2022, any foreign item made using EDA software or any foreign item made by a facility (or major component of a facility) linked to EDA software is subject to the same restrictions. Any company that uses, let alone owns and develops, Siemens' EDA software must comply with US export restrictions—no matter where in the world it is located.

It is therefore noteworthy that Siemens became engulfed in a scandal following media reports in 2022 that some of its non-EDA engineering software had been resold by Chinese distributors—Transemic and Zhongke Beijing Hope—to two universities with ties to the Chinese military (Cadell & Nakashima, 2022; Heide & Murphy, 2023). At least some of the software in question came from a subsidiary registered under a business address previously shared with Siemens EDA (Cadell & Nakashima, 2022; Standard & Poors, 2024). Siemens had also moved to acquire Arizona-based Zona Technology, which was reported to have sold its aerodynamics simulation software to a research institute involved in China's hypersonic missile program (Cadell & Nakashima, 2022).

Despite the revelations, Siemens took the position that the specific software had not been sanctioned either by the US or EU and that it had no knowledge of the military ties of its distributors (Heide & Murphy, 2023). However, a BIS official clarified that under its missile "catch-all" provisions, no US-made item whatsoever—not even a pencil—may be shipped to a missile end user and that companies cannot plead ignorance (Cadell & Nakashima, 2022). This turned the attempted Zona acquisition toxic. To date, the deal has not been completed.

Nevertheless, Siemens held on to its Chinese distributors until the US finally put them on the Entity List in June 2023 and made it clear that Transemic's ties to the military "included the development of hypersonic weapons" (Heide & Murphy, 2023; "Siemens kappt Verbindung," 2023). This episode demonstrates that the US has the power to compel even a non-US TNC with over a century of business links with China to abide by its sanctions. But it also shows that the company dragged its feet and had to be publicly called out and legally compelled to cease commercial dealings even when they aided China's military development—ostensibly the target of the US chip embargo. This, then, constitutes the second case of a German "China chokepoint" firm that has sought to resist the US chip war.

3.3. SÜSS MicroTec

Our last case is SÜSS MicroTec, which presents itself as the only provider of photomask cleaners "so far qualified for the 3nm technology node" (SÜSS MicroTec, 2024, p. 29) and thus, an indispensable supplier for ASML and its customers (Finkenzeller, 2023). SÜSS MicroTec also holds an 85% market share in mask aligners (Khan et al., 2021, p. 30), which Chinese companies do not make. Mask aligners are said to "lack strategic importance" (Khan et al., 2021, p. 34) because they are less precise than scanners and steppers as they physically attach the photomask to the wafer. And yet, in 2024, the *Asia Times* reported that SÜSS MicroTec's mask aligners had been used to make a new Chinese quantum chip (Pao, 2024). This may not technically violate the restrictions the US has taken so far to prevent Chinese advances in quantum computing (Klyman, 2023; Pao, 2024), but it certainly puts SÜSS MicroTec in the limelight.

SÜSS MicroTec also matters because it is one of five companies worldwide—alongside EV Group (Austria), Canon (Japan), Obducat (Sweden), and Nanonex (US)—that is developing nanoimprint lithography. Nanoimprint lithography uses a similar template to photomasks to print patterns onto wafers at the nanoscale frontier and with throughput comparable to photolithography (Foster, 2023; Khan et al., 2021, p. 34; Yamamoto et al., 2022). It is, therefore, the most commercially viable rival to extreme ultraviolet machines and constitutes a workaround for China which cannot purchase EUV equipment from ASML due to US restrictions. EV Group currently dominates the nanoimprint lithography market, and Canon plans to sell equipment from 2025 capable of stamping circuit patterns of 2 nm (Mochizuki & Furukawa, 2023). SÜSS MicroTec's nanimprint machines can also be used to produce advanced semiconductors (SÜSS MicroTec, n.d.-a, p. 9). And while Canon's CEO already concedes that "I don't think we'll be able to sell" (Mochizuki & Furukawa, 2023) the technology to China (even though it is not on Japan's export control list), SÜSS MicroTec, by contrast, has made no such statement.

SÜSS MicroTec currently has manufacturing facilities in Garching and Sternenfels in Germany, in Eindhoven in the Netherlands, and in Hsinchu in Taiwan (SÜSS MicroTec, 2020, p. 80). In 2020, the company shut down its production site in Corona, California (SÜSS MicroTec, 2021, pp. 29). Its remaining US locations are sales centers (Standard & Poors, 2024). Overall, SÜSS MicroTec is the most embedded in Germany: 73% of its invested capital is in Germany, compared to just 15% in the US (SÜSS MicroTec, 2024, p. 151). Whereas 73% of its purchasing volume originates from suppliers in Europe, only 6% of its purchasing volume comes from suppliers in North America (SÜSS MicroTec, 2024, p. 73).

But even though it no longer has a manufacturing footprint in the US, SÜSS MicroTec continues to rely on US technology. In 2001, SÜSS MicroTec first established itself as a supplier of precision photomasks when

it acquired Image Technology Inc., based in Palo Alto (Pao, 2024). In 2010, it consolidated this position with the purchase of HamaTech APE, which specializes in photomask cleaning equipment (SÜSS MicroTec, n.d.-b). In 2012, SÜSS MicroTec added projection lithography to its portfolio by buying up Tamarack Scientific Co. (based in Corona, California; Holton, 2012). In 2019, it signed a five-year cooperation agreement with a US customer, allowing its lithography and bonder divisions (the latter used to join wafers) to use its partner's facilities and machines for research and development (SÜSS MicroTec, 2024, p. 164). This right-of-use, and reliance on US technology more broadly, expose SÜSS MicroTec to FDPR provisions that the US could use to strong-arm the firm.

German authorities, for one, started to more strictly screen the export of equipment including mask aligners to China. This led to significant delays in deliveries in 2023 even though, as SÜSS MicroTec complained, "the legal basis for shipments of SÜSS MicroTec equipment to China has not fundamentally changed in recent months" (SÜSS MicroTec, 2023b).

How, then, has SÜSS MicroTec responded? In 2020, it already moved the production of ultra-violet projection scanners from California to Taiwan, citing "the current market situation and low investment demand from potential customers" (SÜSS MicroTec, 2020, p. 4). More recently, SÜSS MicroTec decided to expand its facility in Taiwan to supply the Asia–Pacific region, which accounts for 66% of its total sales (SÜSS MicroTec, 2024, p. 44). According to the company, this investment is to respond to record demand for its products driven by the boom in artificial intelligence (SÜSS MicroTec, 2023c). But this move also has the added advantage of solving the German export licensing issue. Beyond these investment decisions, SÜSS MicroTec is also reconfiguring its supplier base. In its latest annual report, the company acknowledged that using US-based components puts it at risk of being cut off from its Chinese customers by US restrictions and states that it "tries to avoid this risk by qualifying alternative suppliers for the previous US suppliers" (SÜSS MicroTec, 2024, p. 106). The decision to expand operations in China's near abroad and substitute non-US suppliers for US suppliers points to SÜSS MicroTec's intent to respond to US pressures in ways that mitigate any potential loss of access to the lucrative Chinese market, which is said to account for a third of SÜSS MicroTec's sales (Finkenzeller, 2023). SÜSS MicroTec—like Merck and Siemens—is following the letter of US exterritorial law while, in some crucial respects, actively circumventing its spirit. How to explain this behavior in the face of US power is the subject of Section 4.

4. Secondary Exposure and National Production Regimes

The previous section has identified how three German companies relevant to the US chip embargo are equally techno-dependent on the US and yet trying to circumnavigate US efforts to restrict flows of technology to China. Merck (2024, p. 106) plans to localize production and source raw materials from *within* China, noting that "many relevant components of US origin were replaced by alternative suppliers." Despite media revelations that two of its Chinese distributors had supplied software to blacklisted Chinese firms, Siemens cut ties only after these distributors were themselves added to the Entity List, notwithstanding negative publicity and clear signaling from US regulators. For its part, SÜSS MicroTec is expanding production in Taiwan and switching to non-US suppliers to remain in the Chinese market after German authorities (possibly at the behest of the US) stalled the issuing of export licenses.

It is clear from these cases that corporate compliance cannot be extrapolated from techno-dependency. To be sure, our analysis of the three companies does indicate that the US can force their hands if regulators decide to expand the scope of the FDPR rule and prosecute violations or strike a multilateral agreement with the German government. In a clear indication of its willingness to do the former, the BIS in October 2023 reduced the percentage of US content required to trigger the FDPR to zero for some advanced lithography equipment. This unprecedented expansion of the extraterritoriality of US tech sanctions is so far confined to a small range of goods, targeting one of ASML's machines that is not (yet) on the Dutch export list (Goujon & Kleinhans, 2023). Still, one could easily foresee this rule being extended to nanoimprint lithography if it were to rival photolithography in precision and output. If SÜSS MicroTec or any other company were to really advance in these or other areas, the US seems prepared to intervene—multilaterally if possible, but unilaterally if need be.

Our point then is not to deny that the US possesses this go-it-alone power, but to insist that we cannot treat firms' anticipatory compliance as a prefigured outcome. To do so is to miss out on what our case study suggests is better understood as a politicized, negotiated, and protracted policy process. To understand the reservations and resistance of the three German firms, we need to take a closer look at how Germany's semiconductor industry ties into other sectors of the German economy—its "national production regime" (Koddenbrock & Mertens, 2022).

Figure 2 presents the position of the three companies within Germany's broader semiconductor production network. This network diagram shows both their first-tier customers and suppliers headquartered in Germany and those German-headquartered second-tier customers and suppliers that are connected to the three focal firms via other semiconductor and semiconductor equipment companies. This mapping of supply chain connections reveals that all three focal firms have Infineon as their customer, which is the hub of Germany's semiconductor production network. As the world's leading automotive chip company, Infineon is geared towards the Chinese car market, which is the largest in the world by output and sales, and, in 2024, became the largest by export (Kawakami et al., 2024). As of 2023, 32% of Infineon's revenue came from China, whereas the US and Germany each account for 12% of its revenue (Bloomberg, 2024).

The company is tightly articulated with the German automotive industry. Three of Infineon's top five highest spending customers for which we have data are major auto-suppliers (ZF Friedrichshafen, Robert Bosch, and Denso Corp; Bloomberg, 2024), and Infineon's automotive segment itself accounts for 51% of the company's overall revenue (Infineon, 2024, p. 2).

The fact that automotive companies—both lead firms such as Volkswagen and major auto suppliers such as Continental—feature so prominently in Germany's semiconductor network offers strong suggestions as to why Germany's chip firms have so far hesitated to align themselves with the US chip war. Germany's auto industry is deeply embedded in China and highly vulnerable to potential Chinese countermeasures (Baines et al., 2024). Most important here are China's recent anti-foreign sanction regulations that threaten to curtail the operations or even seize the assets of companies that support discriminating restrictions against China (Reich, 2021, pp. 32–33). To prevent this worst-case scenario, German companies are advised to show that their hand is being forced by US regulators (Industrie- und Handelskammer Region Stuttgart, n.d.). Given their close integration with the German automotive sector, German chip firms must take their secondary exposure to the Chinese market into account and are therefore unlikely to take actions that could trigger Chinese retaliation, despite techno-dependencies on the US.

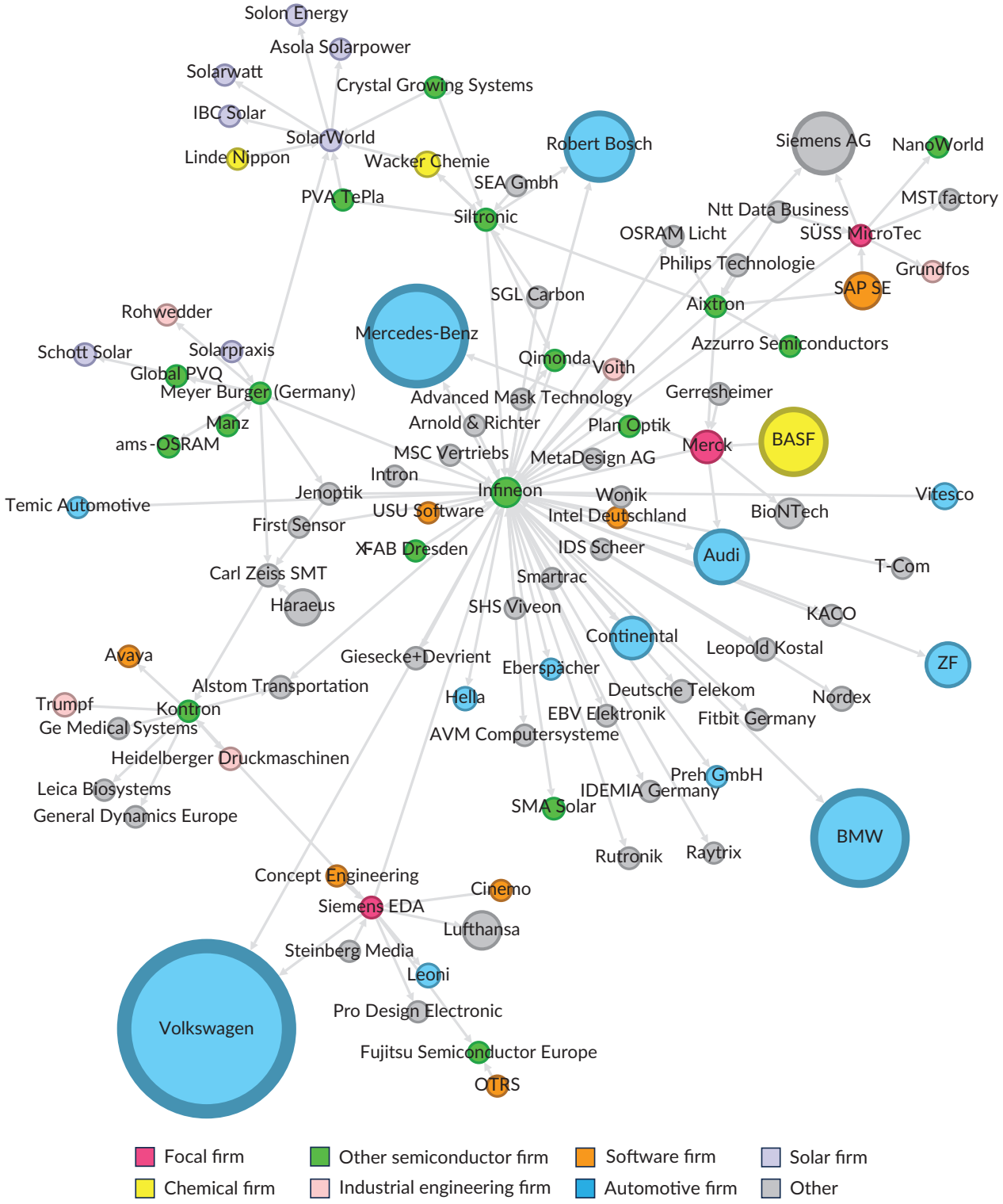

Figure 2. The German semiconductor network. Note: Node size is proportional to annual revenues for the latest available year. Source: Authors' work based on Bloomberg (2024), Standard & Poors (2024), and SÜSS MicroTec (2019).

5. Conclusion

As growing US–China tensions drive deeper fissures through the global economy, attention has shifted to how the US has increasingly sought to "weaponize interdependence" (Farrell & Newman, 2023). Our research into Germany's semiconductor industry has empirically demonstrated the centrality of the US as a base of operations, target of strategic investments, and source of know-how and products for foreign semiconductor firms. This gives US regulators significant extraterritorial reach and the ability to set the parameters within which these firms ultimately operate. But our case has also highlighted the complexities involved with US efforts to mobilize allied firms as weapons in a battle over future technologies. This adds new insights to an emerging research agenda on TNCs as geo-economic actors whose interests and behavior can converge or collide with governments' supply-chain statecraft (Babić et al., 2022b; Geertz & Evers, 2020; Moraes & Wigell, 2022; Rolf & Schindler, 2023).

This article has offered a deep dive into three "China chokepoint" firms that—though similarly techno-dependent on the US—have sought to circumvent the US chip embargo to continue to sell to China. That German chip firms would take extraordinary measures to try to evade the long arm of the US—even in cases when China is not a vital sales market—poses a puzzle. A potential solution, we argue, is provided by their extensive links (largely via Infineon) to the German automotive industry, which is in turn deeply embedded in China and most vulnerable to Chinese countermeasures. Given the significance of the auto sector to the broader German economy, its chipmakers are likely to be highly conscious of the potential implications and risks of any decoupling from sales in China. Our data highlights the stark limitations of both bilateral trade statistics and firm-level geographical revenue data for adjudicating dependency on particular country exports.

The US–China chip war is of course not *only* made in Germany, but non-compliance of certain nodal German firms could significantly complicate and delay US efforts to constrain China's technological ambitions. If the US were to extend its China sanctions to other sectors such as advanced battery manufacturing or biotechnology, more German companies would move into its crosshairs. Furthermore, if German firms were to shift the battlefield of production from Germany to Taiwan or other countries to keep trading with China, the US would be forced to act more aggressively towards them to enforce its export controls. The outcome of the geo-economic turn remains inconclusive, then. Empirically mapping out these dynamic production networks, state-firm relations, and firm strategies will be of ongoing importance in adjudicating the efficacy of US supply-chain statecraft in the coming years.

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Conflict of Interests

The authors declare no conflict of interests.

Data Availability

The data that support these findings are derived from sources in the public domain (The Observatory of Economic Complexity, http://oec.world/en) or available from Bloomberg Professional and S&P Capital Pro IQ, subject to commercial restrictions. The authors' calculations are available within the article and/or upon request for non-commercial academic purposes.

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The New EU Industrial Policy: Opening Up New Frontiers for Financial Capital

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Abstract

The EU has implemented a whole array of industrial policy programmes over the past decade to bolster the competitiveness of selected knowledge-intensive industries and to induce a digital and green transition. Responding to shifting competitive challenges in global capitalism, and the adoption of industrial strategies by other major economies, the new EU industrial policy seeks to onshore manufacturing capacity in sectors of geoeconomic importance, and simultaneously reduce dependencies on global value chains. Drawing on a historical materialist perspective, this article historizes and contextualises the financing strategies adopted within EU industrial policy. Faced with tight budgetary constraints, and deficit spending not being an option at the EU level, unlocking private investment takes centre stage, such as by tapping into capital markets or using member state aid or EU structural funds as a precursor, as well as by incentivising private investments through risk-absorbing financial instruments that rely on the EU budgetary resources. As will be shown, the EU has been experimenting with such risk-absorbing financial gimmicks for industrial policy purposes since the 1990s; yet, their usage has reached unprecedented levels with the heightened geoeconomic tensions since the 2008 and Covid-19 crises. The article demonstrates moreover that organised factions within financial and industrial capital have actively advocated for public safeguards, and that their deployment thus is not merely a functionalist response to shifting power dynamics or a desperate last resort in the absence of a supranational fiscal policy.

Keywords

capitalism; European Union; finance; financial capital; industrial policy; risk

1. Introduction

Alarmed by rising geoeconomic tensions and the adoption of vast industrial policy programmes around the world, the EU has launched a series of industrial policy initiatives over the past decade. Similar to Made in China 2025, Make in India, or Build and Buy America, EU programmes are reminiscent of a "Make Europe Great Again" strategy that aims at positioning the single market as a global hub for knowledge-intensive high-tech and digital industries (European Commission, 2023c). Confronted with the risk of sliding into a similar trade war with China as the US, the EU seeks to onshore a range of selected high-value-added industries and reduce dependencies on global supply chains, notably in industries where Chinese manufacturers have been catching up rapidly, such as in energy renewables, electric car batteries, or electronics (European Commission, 2014a, 2017b, 2023c). Furthermore, sponsoring such industries should put the EU on track for reaching the net-zero emission goals set for 2050, and counteract the increasing trade deficit with China. By deepening intra-EU economic ties, manufacturing products should be exported with the label "Made in Europe" (European Commission, 2020b).

The European Commission (hereafter the Commission) estimated that only for scaling up manufacturing capacities for net-zero technologies and products more than €700 billion of *additional* annual investments will be needed until 2030 (European Commission, 2023a). This raises the question of how the new EU industrial policy is being financed, and, by extension, who is accumulating the profits, and who is controlling the innovation process and for what purpose. Understanding the redistributive consequences of EU industrial policy and its financing is particularly pertinent when considering that the EU has a budget comparable to that of Denmark, and cannot run a deficit or take on debt, while not every EU member state has much fiscal leeway, especially in the context of the strict debt and deficit rules of the Economic and Monetary Union. This article shows that, in addition to non-reimbursable EU grants or state aid, a whole arsenal of risk-absorbing financial instruments has been developed to unlock private sector loans, private equity or quasi-equity investments, or what the European Commission (2023b) refers to as crowding in investors. These instruments often rely on the EU budget or the liquidity reserves of EU and national development banks as a revolving guarantee fund, and tend to be coupled with other forms of state aid, non-repayable EU grants from one or several of the 43 programmes of the EU structural funds, or funding retrieved on capital markets (European Commission, 2023a).

This article adopts a historical materialist perspective, which is particularly well equipped for historicizing the financing strategies in the evolution of EU industrial policy and locating the interplay between industries and the EU state apparatus against the backdrop of shifting geoeconomic rivalries. As will be shown, industrial capital has been firmly embedded in a dialogue with the EU state institutional body to discuss challenges and co-develop industrial policy responses, notably in the wake of the weak recovery from the 2008 financial crisis and the 2020 pandemic slump. At the same time, financial capital has also been closely involved and has managed to carve out a powerful position in deciding whether or not to invest and under what conditions. Organised labour and other societal interests, in turn, have been factored out.

The article contributes to the political economy literature on the revitalisation of EU-level industrial policy in several ways. Although much attention has been paid to how EU statecraft seeks to redefine geoeconomic power dynamics (Aiginger & Rodrik, 2020; Bulfone, 2023; Di Carlo & Schmitz, 2023; Lavery, 2023; McNamara, 2024; Schneider et al., 2023; Seidl & Schmitz, 2024), the intertwinement of public-private financing has often

sailed under the radar, leaving important questions about its redistributive effects untouched. Exceptions are scholars who have documented the growing importance of the European Investment Bank (EIB) Group, which operates a quasi-fiscal EU body that, in addition to loan provision, has been de-risking private investments for decades (Cooiman, 2021; Gabor, 2023; Griffith-Jones & Naqvi, 2021; Mertens & Thiemann, 2019). While Gabor (2023) and Cooiman (2021) speak of a de-risking state under financial capitalism, Mertens and Thiemann (2019) observe a "hidden investment state," emphasising the opaque nature in which the EIB Group subsidises the profits of private investors while socialising the risks. As will be shown here, the EIB Group continues to form a cornerstone in the financing of EU industrial policy; yet, EU industrial policy financing strategies expand beyond the development banks, which amplifies the intransparency further.

Political economists who focus on industrial policy have conceptualised the EU as a "catalytic state" that connects agents and scattered organisational and financial resources as if it were a neutral or "honest" broker that merely solves collective action problems (Di Carlo & Schmitz, 2023; Prontera & Quitzow, 2022). Or scholars actively advocate an "entrepreneurial state" that should take over the role of risk taker and market shaper, fill the financing gap, and lead investments and stimulate innovation (Aiginger & Rodrik, 2020; Mazzucato, 2018). The state–capitalism nexus in the (re-)production of power asymmetries, and the redistribution of wealth, is often not further discussed, theorised, or analysed (an exception is Van Apeldoorn & de Graaff, 2022). Industrial policy is also sometimes subsumed under "state capitalism," defined as states scaling up their roles as promoters, supervisors, and owners of capital, and using an "extremely wide array of practices, policy instruments and vehicles, institutional forms, relations and networks that involve the state to different degrees and at a variety of levels, time frames, and scales" (Alami & Dixon, 2020, p. 71; see also Babić, 2023; Schindler et al., 2022). This article, in contrast, perceives EU industrial policy as part of the "capitalist state" (see also Germann, 2023; Lavery, 2023; Schneider et al., 2023). What may seem merely semantic has important ontological implications: States, or incomplete state-like apparatuses like the EU, do not control investments or the production process through industrial policy, but rather selectively sustain particular capital accumulation patterns.

The article draws on a critical reading of EU policy documents and position papers of organised interests. Section 2 delineates the key ontological dimensions of a historical materialist take on the capitalist state and industrial policy. Sections 3 and 4 sketch in broad strokes the evolution of European Community-level industrial policy and its financing from the postwar era of European integration to the neoliberal state restructuring, where risk-absorbing gimmicks gradually have made their inroads. Section 5 zooms in on the heightened utilisation of such gimmicks over the past decade. The conclusions reflect on the agency and privileged role of financial capital, and the limits of debt-led accumulation patterns in the current geoeconomic conjuncture and the climate emergency.

2. A Historical Materialist Perspective on the Capitalist State and Industrial Policy

Historical materialism foregrounds the constant and constitutive role that states and state regulation play in the expansion and reproduction of global capitalism, and the multiple asymmetries in wealth and power arising from it within and across geographical spaces, and social classes. Rather than being neutral arbiters or honest brokers, states or state-like entities like the EU are perceived as asymmetrical institutional terrains that through regulation legitimise, codify, and formalise the capitalist social relations of (re-)production, and, in this process, reproduce their own institutional authority and political legitimacy, which renders states capitalist

themselves (Jessop, 1999; Van Apeldoorn, 2013). Those who control a society's productive resources enjoy a powerful position, and the outcomes of past struggles are inscribed in state institutional settings, which renders the state as a site and a centre of power to be structurally biased (Poulantzas, 1978, pp. 127, 132). Notwithstanding this, states are not mere conveyor belts for the interests of capital above labour but retain a relative autonomy, a certain "strategic selectivity" to promote or obstruct specific interests, coalitions, and action possibilities, and, by extension, they impinge on, or ease, specific logics of capital accumulation (Jessop, 1999, pp. 44–45). States can be strategically selective by virtue of their ability to provide general conditions for the continued accumulation of capital and the social antagonism revolving around capitalist competition. This competition pits not only capital against capital, capital against labour, and labour against labour, but also precipitates the agglomeration of unevenly distributed regionalities, or what Trotsky (1977) coined as "uneven and combined development" whereby advanced production and labour processes are concentrated in some areas, and less advanced ones are diffused in others. As capital usually flows where the rates of return are highest, or where a stable income stream can be generated, provided that the conditions for its reproduction are more favourable elsewhere, state regulation can seek to intervene in the redifferentiation of the conditions of production, and impact on the geographical asymmetries on which global capitalism is based. It is here where the geoeconomic nature of industrial policy is rooted.

Capital accumulates through the exploitation of labour and nature; yet, the broad categories of capital and labour are not seamless monolithic entities but internally fractionalised in multifaceted ways across various axes and stages in the capitalist cycle, with shifting hierarchies over time and space (Jessop, 1999; Poulantzas, 1978). For example, while national and transnational industrial capital is invested in the production of goods and services, financial capital, as a fictitious form of capital, thrives on extracting value from the realm of production, such as through the extension of debt, or other rent-generating income streams (Hudson, 2021). Although all surplus capital is temporarily fictitious prior to being valorised through a profitable reinvestment in the sphere of exchange or production, profits can continue to accrue through financial channels rather than trade or commodity production. Financial circuits of accumulation can come to prevail if the regulatory environment allows for it (Krippner, 2011, pp. 27–28).

Class fractions that emanate from different accumulation regimes can be confronted with varying competitive pressures and hold contrasting views on how the economic realm ought to be regulated, which renders unified class positions for a strategic direction of the agenda-setting, decision-making, and implementation of state regulation difficult to attain. Common identities and demands continuously need to be forged and (re-)negotiated. To win the consent of others, class fractions often have to articulate a strategic orientation beyond their immediate interest, which is why, in addition to a state's strategic selectivity, political influence and power cannot simply be assessed by tracing lobbying activities (Van Apeldoorn, 2013). Furthermore, industrial policy can cater to multiple interests simultaneously, especially as it tends to come in "packages of interactive measures and strategic coordination" (Andreoni & Chang, 2019, p. 146). Such packages can attenuate in-built class rivalries, such as by giving labour or other interests a say in the orientation and control of investments and innovation, or privilege industrial capital associated with either ascending or descending accumulation patterns without attempting to achieve consent from contesting groups in the form of (material) concessions. The focus can lie on stimulating or curbing the exposure to capitalist competition, and thereby subsume competition policy. Industrial policy can also take shape as investment policy, such as by enabling the spatial dispersion of reinvestment opportunities or by reaching out to financial capital and direct investments into a particular direction.

Following from this, historical materialism underscores the historically contingent and open-ended nature of political struggles that gives shape to the state–capitalism nexus. The historical contingency is also inscribed in the very nature of the EU as an incomplete, rescaled, multi-scalar, and multi-level state-like apparatus with a continuously evolving set of supranational and intergovernmental competences. As the next two sections demonstrate, industrial policy and its financing are testimony to this: Although industrial policy became a shared competence only in the 1990s, supranational industrial strategies and its financing have given shape to European integration at the outset.

3. Charting the Evolution of Community-Level Industrial Policy and Its Financing

Industrial policy was a key pillar of European integration, starting with the European Coal and Steel Community of 1952, which can be seen as an industrial policy *par excellence*. The European Coal and Steel Community ensured corporate access to coal and steel, two resources that were essential for energy-intensive and fossil fuel-based Fordist accumulation patterns of Western capitalism. In addition to price, quality, output controls, and working conditions, the European Coal and Steel Community also coordinated member state loans, subsidies, and grants for upgrading coal and steel industries and related infrastructures (European Community, 1966). And even though the Treaty of Rome establishing the European Economic Community in 1958 did not include industrial policy as a designated Community-level competence, it can be seen as a meta-level industrial policy: Through the reconfiguration of several markets into one giant common market, it sought to establish the conditions for economies of scale and scope production. Importantly, its preambles declared a high degree of competitiveness as an overarching community goal, which laid the foundations for integrating industrial policy objectives in various policy areas, like competition, transport, and trade policy, alongside sectoral policies like energy or the common agricultural policy (Pelkmans, 2006, p. 8).

Industrial policy during the postwar decades has been characterised as "inward-looking" (Bulfone, 2023). Indeed, there was a conviction that some industries, and to a lesser degree also workers, had to be cushioned from "external" shocks that came with the gradual exposure to the trade re-liberalisation at international level (Jessop & Sum, 2006, pp. 124–125). At the same time, industrial policy was imbued with strong geoeconomic rationales, responding to "outside" competitive pressures stemming from the dominance and technological superiority of US industries in the market for high-value goods (Servan-Schreiber, 1968). As Commission President Hallstein argued at the time, the purpose of "the transformation of the market relations in the European Community as a whole was to build a new giant big enough in a world of giant powers" (cited in Freyer, 2006, p. 282).

The need for an industrial policy was widely endorsed at national and supranational levels, albeit to different degrees (Warlouzet, 2014). While member states imposed concrete industrial programmes, the European Community exerted its statecraft through the imposition of protectionist tariffs, quotas, and non-tariff barriers to limit imports, and through the enforcement of supranational competition laws, a domain where the Commission was equipped with unmatched discretionary powers, without the European Parliament or the Council having a say (Wigger & Buch-Hansen, 2013). Based on Articles 85 to 94 (in the Lisbon Treaty, Articles 101 to 109), the Commission sought to create Eurochampions through facilitating all sorts of cross-border alliances, joint ventures, distribution and supplier agreements, as well as the cross-licensing of intellectual property, or franchising contracts, alongside an overall permissive stance towards cross-border

economic concentration (Hayward, 1995). The Commission left public monopolies in key utility sectors untouched, which translated to beneficial downstream effects for all sorts of industries, such as lower prices for energy, water, transportation, postal services, or telecommunications (Bovis, 2014, p. 32).

Supranational competition control was also pivotal for the financing of national industrial policies. The Commission generously permitted direct or indirect forms of state aid, such as subsidised loans and financial guarantees, financial support in the form of government grants for investments or R&D projects, tax reductions or guaranteed preferential public procurement contracts, and export assistance. Recipients were industries lagging behind US counterparts, such as computing and aerospace, and industries considered "too important to fail," such as agriculture, steel, coal, electricity, car, textiles, shipbuilding, infrastructure, or defence (Warlouzet, 2014, p. 228). Industrial policy and its financing through state aid enjoyed the vast political support of an inter-class alliance between organised industrial capital and labour. Against the backdrop of unseen GDP growth rates averaging 4 percent between 1950 and 1973, corporate profits tended to be reinvested to maximise productivity growth, as a result of which the stock of gross-fixed capital formation in European manufacturing industries doubled from 1960 to 1973 (Hobsbawm, 1994, p. 261). During the postwar boom, industrial capital yielded to the (wage) demands of the predominantly male labour force, while financial capital was largely subordinate to the interests of industrial capital and constrained to member states by the Bretton Woods capital controls.

When the Great Stagflation Crisis of the 1970s hit, member states stepped up their industrial policy measures. The Commission initially permitted the "ever-rising tide of restrictive agreements, concentrations and protectionist national subsidies" (Cini & McGowan, 1998, p. 27). To deal with overproduction, overinvestment, and overcapacity in steel, shipbuilding, chemicals, man-made fibres, and textile industries, the Commission also authorised "crisis cartels," which it justified on the basis of public interest, the restoration of full employment, and regional development and technological progress (European Communities, 1977). When the "new protectionism" failed to alleviate the economic downturn, industrial policy and state aid were increasingly criticized for rescuing lame ducks and sunset industries that have lived past their glory times, and for exacerbating what was referred to as the "Eurosclerosis" (Giersch, 1988). As outlined in the next section, industrial policy did not disappear with the neoliberal political project.

4. Industrial Policy and Its Financing During the Ascendancy of Neoliberalism

From the mid-1980s onwards, Community-level industrial policy came to embody the shift from Fordist to post-Fordist accumulation patterns where labour-intensive medium- and low-technology manufacturing was offshored to cheap labour areas, and service and financial industries began to prosper. Ascending fractions of transnationalizing industrial and financial capital, and fractions revolving around the service industries, advocated restoring economic growth through a dismantling of all sorts of market barriers, reducing corporate taxes, flexibilizing labour markets, suppressing wages, deregulating financial markets, and relaxing lending standards, alongside a monetarist focus on maintaining low inflation (Wigger & Buch-Hansen, 2013). State aid was still considered legitimate in some areas, such as the case of car manufacturers that faced competitive pressures from US, Japanese, and later also Korean producers; however, in others, it was compared to "woodworms eating away the carcass of the ship of integration" (Andriessen, 1982, p. 6). The Commission started to make inventories of "anti-competitive" state aid schemes and encroached on a naming and shaming campaign by publishing the size of state aid granted by each member state (Wilks,

2005, p. 124). With the imposition of new state aid conditionalities, the enforcement of competition laws became more stringent, and the Commission started to prosecute unauthorised state aid before the European Court of Justice (Wilks, 2005, p. 124). Community-level industrial policy focused instead on encouraging and monitoring industrial "restructuring" and "rationalisation" plans (European Communities, 1981). The budget deficit and public debt rules of the Economic and Monetary Union in the 1990s curtailed the financing of industrial policy further: From 1992 to 2011, overall EU state aid levels were reduced in half (Schito, 2021, p. 279).

At the same time, the Treaty on the Functioning of the European Union of 1992 declared industrial policy as a shared competence, which empowered the Commission to propose concrete industrial policy programmes (see TFEU, Article 173). Although the content and form of supranational intervention remained undefined, its scope was limited to horizontal measures only, such as securing framework conditions favourable to industrial competitiveness. Throughout the 1990s, and especially with the launch of the Lisbon Strategy and its successor strategy Europe 2020 from the 2000s onwards, EU industrial policy increasingly took shape as public-private partnerships that focused on stimulating innovation and R&D in high-tech manufacturing, infrastructure development, and technical education and training meant to raise the skills in the labour force (Avdikos & Chardas, 2016; European Commission, 2005). Geoeconomic rivalries once more gave the impetus for the redefined EU industrial strategy. To keep pace with competitors from the US, Japan, and South Korea in the ICT and related industries revolving around Silicon Valley in California or Route 128 in Boston, organised transnational industrial capital, such as in the formation of the European Round Table of Industrialists, pushed for EU support in bolstering knowledge- and technology-intensive high value-added production, such as labour-related measures in the form of benchmarking lifelong learning to transform the EU into a knowledge-driven economy and the flexibilisation of labour markets (Van Apeldoorn & Hager, 2010, pp. 218–210). With the ensuing deindustrialisation and the transnationalization of production, wage pressures increased and organised labour in manufacturing was weakened considerably (Bieler, 2005). And what was not paid out in wages found new outlets in the liberalised financial circulation sphere: The extension of debt and the trading of debt instruments led to an alternative and more profitable capital circuit alongside commodity production and trade, triggering a situation whereby investors channelled ever more surplus capital into financial markets where anticipated profits were higher (Schneider et al., 2023, p. 256).

With the proliferation of public-private partnerships, financial capital made its inroads into EU industrial policy. The EIB evolved as an active promoter of public-private co-financing for industrial policy purposes (Liebe & Howarth, 2019). Already in the late 1970s, it adopted instruments that partially covered investor losses in addition to facilitating grants and equity investments (Griffith-Jones & Naqvi, 2021, p. 96). The usage of such instruments increased with the advent of the European Investment Fund in 1994, which was itself the result of private-public co-financing, and with private financial institutions taking a seat in its governing board (Cooiman, 2021, p. 8). From the 2000s, the EIB and the European Investment Fund, which together form the EIB Group, became the single largest lender for public-private partnership projects, making use of "increasingly complex financial instruments and products" that created investment opportunities for a whole array of financial intermediaries and institutions beyond commercial banks, such as private equity funds, angel investors, and venture capitalists (European Court of Auditors, 2023, p. 6). These were all financial players that, compared to the US, had hitherto played a significantly smaller role in the EU (European Commission, 1998). The usage of such instruments proliferated beyond the EIB Group,

when EU structural funds were gradually opened up for financing risk-absorbing instruments to provide loans or equity to corporate recipients without the risks that were usually involved (Bovis, 2014, p. 94).

As the next section demonstrates, with the revitalisation of EU industrial policy after the 2008 and the Covid-19 crises, the deployment of such instruments increased further.

5. Risk Socialisation as a Financing Pillar for the "New" EU Industrial Policy

EU industrial policy gained prominence in the wake of the 2008 global financial crisis and remained a high priority during the Covid-19 crisis and the ongoing climate emergency. When the 2008 crisis transmuted into a sovereign debt crisis, economic growth lingered, intra-EU value chains and intra-EU trade decreased, and, in most EU economies, private investments in the formation of fixed capital, as an indicator for investments in the production economy, fell to its lowest level (European Central Bank, 2014). Emerging economies like China and India doubled their share of global GDP between 1990 and 2010, while the EU share declined from 25 to 15 percent during the same period (Lavery, 2023, p. 337). Geoeconomic tensions intensified when China and India adopted industrial programmes to transform their economies into high-tech manufacturing hubs in strategic value chains, alongside nearly a hundred other states that launched some form of industrial policy, accounting together for more than 90 percent of the global GDP (United Nations Conference on Trade and Development, 2018).

A coalition of national and transnational industrial capital demanded to put industrial competitiveness at the centre of EU policy-making, especially after Chinese foreign direct investment (FDI) had seized control of a few EU-based hi-tech companies (European Round Table of Industrialists, 2013, 2014; Federation of German Industries, 2014; Joint Declaration of Industry Representatives, 2017; Lavery, 2023). The Commission subsequently heralded a "European industrial renaissance" and promised measures that would increase the manufacturing share in the EU GDP to 20 percent by 2020, thereby closely echoing the European Round Table of Industrialists' similarly titled position paper (European Commission, 2014a; European Round Table of Industrialists, 2014). These measures initially sought to improve the price and cost-competitiveness of manufacturing through internal devaluation, especially as currency devaluations were not an option to induce export-led growth within the Economic and Monetary Union's "iron cage" (Ryner, 2015). A range of flanking policies were adopted that did not require public funding, such as the introduction of competitiveness proofing to eliminate existing EU legislation considered too costly for business and to screen new laws for their impact on industrial competitiveness. Similarly, by blending industrial policy initiatives into existing EU policy areas and funding structures, additional public spending was not necessary. For example, in 2014, Smart Specialisation, a programme aimed at catalysing the transition of manufacturing sectors to innovative Industry 4.0-type technologies like robotics, the internet of things, and artificial intelligence, was subsumed under EU Cohesion Policy and the Cohesion Fund (Di Cataldo et al., 2022). As part of the Renewed EU Industrial Policy Strategy in 2017 and following up from the 2013 European Steel Action Plan and the 2016 Defence Action Plan, the Commission announced the launch of action plans for almost every imaginable industry—most of which would not require public funding (European Commission, 2017b).

Political pressures for "a genuine European industrial policy strategy" intensified when, in 2019, the German and French ministries of economy and finance outlined a joint vision for the EU to become a "manufacturing powerhouse in 2030" (German Federal Ministry of Economic Affairs and Energy & French Ministry of

Economy and Finance, 2019). Coinciding with the European Green Deal of 2019 as the EU's new "growth strategy," EU industrial policy was reinvigorated in the name of digital and green transition, suggesting that the digitalisation of industries would serve as a key enabler for decarbonizing capitalism. Amongst others, the post-pandemic recovery programme NextGenerationEU of 2021, and the Chips Act and the Digital Single Market Act of 2022 were adopted, which alongside a wide range of greening initiatives sought to reduce dependencies on global semiconductor and microchips value chains, and move industries ahead of the global digital supremacy race respectively. The green growth strategy received new momentum with the 2023 Green Industrial Plan as a geoeconomic counterproject to the 2022 US Inflation Reduction Act, a $400 billion package of conditional subsidies, tax breaks, and loan guarantees to ease investments into US-based clean-tech industries. Responding to organised industrial capital fearing disastrous consequences for industrial ecosystems in the EU (European Round Table of Industrialists, 2022), Commission President von der Leyen (2023a) assured that the EU would do whatever it takes to support industries in winning the race for leading green technology value chains. As part of a "selective fortification strategy" for industries of key geoeconomic significance (Lavery, 2023), REPowerEU, the EU Net-Zero Industry Act and the Critical Raw Materials Act were adopted with the aim of reducing energy imports, enable corporate access to raw materials around the world, and ensure that 40 percent of the new green technologies will be homegrown by 2030 (European Commission, 2023c).

The green growth plans come with a variegated financing strategy that exceeds the reliance on existing EU funds. To begin with, the Directorate-General for Competition generously allowed for state aid for so-called game-changing industries, like batteries, microelectronics, hydrogen, and cloud computing within the Treaty-based possibility that allows for a public financing of Important Projects of Common European Interest. Unlike traditional state aid, Important Projects of Common European Interest can be fully financed with non-reimbursable grants, without imposing a limit. At the same time, "ordinary" state aid control has also been lifted until 2025 for all public investments into the same net-zero technologies as targeted by the US Inflation Reduction Act (European Commission, 2023d). The Directorate-General for Competition even allowed for exceeding US state aid levels, such as in the case of Germany seeking to attract a battery producer that had already secured state aid in the US (European Commission, 2024b). Eventually, however, state aid should only be a temporary measure and be phased out by the completion of the Capital Markets Union, which aims at facilitating corporate financing beyond bank loans (von der Leyen, 2023b).

In addition, tapping into capital markets has also become a financing strategy for EU industrial policy programmes, where the Commission, mandated by the Council, issued bonds on the basis of the collective triple-A rating of the EU-27 (European Commission, 2023c). So far, NextGenerationEU constitutes the biggest borrowing programme in EU history, but REPowerEU is also being financed through obtaining collective debt (European Commission, 2023c). In addition, EU industrial policy is increasingly being financed through the deployment of public guarantees and counter-guarantees that should seduce financial capital to invest, such as by covering an agreed amount or percentage in the case of a loan default, or unrealised profit in the case of equity or various forms of quasi-equity investments, a type of financing ranking between equity and debt (European Commission, 2020a, p. 6). In 2020, the Commission managed 36 different risk-absorbing instruments, of which 23 targeted beneficiaries within the EU (European Commission, 2020a).

Using the firepower of instruments that back up investor liabilities should minimise "budgetary outlays for the public sector": Whereas non-reimbursable grants can only be spent once, the EU budget is expected to

work like a revolving guarantee fund that can be reused multiple times to de-risk financial capital and unlock ever more private investment (European Commission, 2018). To facilitate the usage of such instruments, the Financial Regulation that governs the EU budget has been reformed to allow for a greater variety of risk-sharing modalities, and for blending them with other forms of public support, as well as for including a wider range of financial intermediaries (European Court of Auditors, 2023, pp. 27–29). In addition to EU and national development banks, international financial institutions like the World Bank, national promotional banks, as well as private commercial banks, sovereign wealth funds, private equity, angel investors, or venture capital institutions can also make use of EU budgetary safeguards (European Commission, 2017a). The reform also introduced a Common Provisioning Fund, a safety buffer that should cover contingent liabilities to avoid losses in the annual EU budget. In addition, the General Block Exemption Regulation No. 651/2014, which exempts financial instruments from the state aid notification requirement, has been adopted to encourage member states to make more use of such instruments instead of non-reimbursable grants (see Commission Regulation No. 651/2014 of 17 June, Article 21(13)). The Commission's rationale was that financial intermediaries were beneficiaries in their own right, despite the fact that they "must be managed commercially and their managers shall take investment decisions in a profit-oriented manner" (European Commission, 2014b).

These reforms paved the way for the adoption of a series of EU risk-bearing facilities, such as the European Fund for Strategic Investments for mobilising private funding for risky infrastructure and innovation projects, and the Programme for the Competitiveness of Enterprises and Small and Medium-sized Enterprises (COSME), which partially covered the risks of more than a thousand registered financial institutions when providing loans to SMEs (European Commission, 2018). According to the Commission, these risk-bearing facilities have contributed to mobilising more than €500 billion during 2015–2020 (European Commission, 2024a). When they expired in 2020, InvestEU was adopted for the 2021–2027 budgetary cycle with the aim of bringing all the instruments under one roof and facilitating the procedures. Drawing partly on the debt-financed budget of NextGenerationEU and the EU budget, InvestEU offers a guarantee of €26.2 billion, which, on the basis of a multiplier effect of 1:14, should mobilise at least €372 billion of private investment until 2027 (European Commission, 2024a). While 75 percent of InvestEU is reserved to back up financial instruments issued by the EIB Group, the remaining 25 percent are being used for backing up loans, equity, or quasi-equity investments by other financial players, such as private investors with a public service mission, private equity and other venture capital institutions, or other investment companies, which the Commission can sign up as implementing partners at any given time (European Commission, 2024a). Importantly, although InvestEU was entrusted with a "green" mandate, only 30 percent of the programmes need to target green transition investments (European Commission, 2024a).

Financial capital has been closely involved in designing the various safe harbour possibilities for investors. For example, the vast majority of more than 4,000 pages of feedback to the 2013 green paper *Long-Term Financing of the European Economy* stemmed from financial sector representatives (European Commission, 2014b). Respondents, like the European Financial Services Roundtable, argued that such public safeguards were urgently needed, especially as the liquidity requirements imposed in the wake of the 2008 crisis had led to unintended contraction in longer-term funding of the economy, forcing financial players to focus on "funding loans with shorter tenors" (European Financial Services Roundtable, 2013a, 2013b, pp. 3, 7–8). The Association for Financial Markets in Europe demanded a higher public risk coverage for a wider array of private investors and the lowering of thresholds and requirements for private investors, such as by reducing

the minimum requirement for private sector co-investment from 50 to 20 percent only (Association for Financial Markets in Europe, 2013). This Association, together with several other financial sector organisations, also reached out to organised industrial capital, like BusinessEurope, when demanding that a greater variety of financial market actors should be included in EU risk-absorbing instruments (Association for Financial Markets in Europe, 2017; see also BusinessEurope, 2016, pp. 6–7). And when InvestEU was drafted, financial capital suggested that the private sector should take the lead whenever investments were profit-making, and that the public sector should intervene whenever a project was making a loss (European Financial Services Roundtable, 2019). BlackRock, the world's largest asset manager, and one of the biggest shareholders of the top European banks, advised the Commission on "acceptable levels" of private sector risks (European Commission, 2013a). The Commission reiterated these demands and argued that the EU had to step in whenever private investor risks were too high, or the return on investments would take too long to be realised (European Commission, 2013b, 2017a).

The expansion of public risk-coverage instruments, often without any strings attached, also led to contention. Organised labour at the EU level criticised "an economy dependent on and driven by financial markets" and demanded the inclusion of conditionalities like pay raises and better working conditions (European Trade Union Confederation, 2023). Moreover, a report commissioned by the European Parliament pointed to the democratic shortcomings that came with the complex and nontransparent "galaxy of funds and instruments around the EU budget" (European Parliament, 2017). As the Parliament can only approve or reject the EU budget, it lacks the right to make amendments to annual commitments and payments made related to EU programmes or funds, and as risk-absorbing instruments are usually adopted by Council regulations, the Parliament is not consulted in the legislative process (European Court of Auditors, 2023, p. 32). The Parliament also lacks oversight rights and intervention possibilities for instruments deployed off-budget, such as in the case of collective borrowing through capital markets, or in the case that the Common Provisioning Fund, the safety buffer for covering contingent liabilities, would be exhausted and defaults affect the EU budget (European Court of Auditors, 2023, pp. 4, 33).

6. Conclusions

Industrial policy as a response to shifting geoeconomic challenges has been a constant feature in European integration to counter competitive threats, but the financing strategies have diversified over time. Different forms of state aid, traditionally associated with industrial policy financing during the postwar reconstruction era and the crisis of the 1970s, have certainly undergone a revival now that the EU seeks to keep up with the vast industrial programmes of other major economies that seek to bolster domestic high- and clean-tech industries; however, state aid, whether reimbursable or not, is considered merely a temporary measure that comes with an expiry date. At the same time, collective debt financing outside the EU budget has made its entry as an industrial policy financing strategy, debt that is also partially being used to back up the increased usage of risk-mitigating financial instruments, alongside EU budgetary resources that operate as a revolving guarantee fund.

The usage of public money as a safeguard to incentivise private investment may sound politically appealing, notably as it seeks to channel financial capital away from the bloated financial circuit. It may also seem the only option available, given the size of the EU budget and the absence of a supranational fiscal policy; yet, both debt financing and the complex labyrinth of hybrid financing channels that rely on the EU budget

come with major redistributive consequences and impair the democratic position of the European Parliament. Rather than being an instance of "state capitalism" (Alami & Dixon, 2020; Schindler et al., 2022), EU industrial policy opens up new frontiers for capital accumulation. The EU does not invest but instead seeks to leverage investments by private financial capital; after all, the current risk-bearing facility is called InvestEU, and not EUInvest. Alongside ascending fractions of industrial capital in technology-intensive value chains, financial capital is not only a key beneficiary but also enjoys a powerful position: It can make a profit from the loans or equity investments without having to carry all the risks, while (organised) labour, and society at large, has no participatory role in the decision-making about the reinvestment of accrued profits. Importantly, within set parameters, it is financial capital that determines whether or not to invest in EU industrial policy programmes, and who can receive a loan or equity investment on the basis of EU guarantees. Financial capital also sets the investment conditions, notably the amount, the duration, interest rates, and fees. This has also major implications for how we tackle the climate emergency. By handing the reins to financial capital, it is financial capital that determines the pace of decarbonizing capitalism and achieving an emission-free energy transition. Importantly, the public sponsoring of loans implies that the green transition of industries is subsidised by debt. Debt serving as a lever for the green transition not only carries financial risks but debtors will eventually have to prioritise short-term economic growth over long-term ecological and social sustainability, which raises the question of how much more debt we can afford within our planetary boundaries.

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Conflict of Interests

The author declares no conflict of interests.

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A Regulatory-Developmental Turn Within EU Industrial Policy? The Case of the Battery IPCEIs

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Abstract

The European automotive industry is transitioning from combustion engines to electric vehicles but lags behind international competitors. This geoeconomic competition has contributed to the revival of industrial policy in the EU. However, EU competition policy restricts more vertical industrial policy approaches. In this context, the Important Projects of Common European Interest (IPCEIs) have emerged as a novel governance tool. This article examines this transformation in EU industrial policy by focusing on the Battery IPCEIs. The article includes an in-depth case study of the Battery IPCEIs, using secondary literature and 11 expert interviews. It concludes that IPCEIs represent a gradual regulatory-developmental turn within EU industrial policy by drawing on developmental state theory in a European context, critical EU integration literature, and global production networks research. In response to geoeconomic competition and the region's lack of productive capacities, the EU is indirectly facilitating the development of European battery innovation and production networks by issuing direct state aid at the national level. However, the EU's participation in the subsidy race and the global green-tech race via "green" industrial policy indicates only a partial shift in the relationship between states and markets.

Keywords

batteries; competition policy; developmental state; European Union; global production networks; industrial policy; IPCEIs; subsidies

1. Introduction

International economic dynamics can affect the design of industrial policy (Hannon et al., 2011, p. 3696). Since the late 1970s, EU policy has been aligned with a broader neoliberal policy paradigm shift. This neoliberal

era is associated with less interventionist modes of economic governance and seeks to ensure "undistorted" competition. The EU's neoliberal policy orientation has become even more pervasive since the Maastricht Treaty was ratified in 1992. This has limited the policy space for vertical industrial policy, including subsidies, and favored horizontal industrial policy (Pianta et al., 2020). However, Wade (2014) has identified a "return of industrial policy" which presents a challenge to this neoliberal paradigm and indicates that developmental state functions also exist in industrialized Western countries. In the case of the EU, there is indeed growing evidence of an increase in "state interventionism" (McNamara, 2023) and the presence of "state capitalist elements" (Alami & Dixon, 2023). Similarly, other authors identify industrial policy in the EU as having an increasingly supranational "market-directing" character (Seidl & Schmitz, 2023) and serving "developmental functions" (Di Carlo & Schmitz, 2023). However, this return of industrial policy could also be interpreted as a "weak" return of the state, as an approach that ultimately enables "corporate welfare" due to the lack of conditionality tied to industrial policy programs (such as state aid) and thus as a type of subordination to business interests (Bulfone et al., 2023, p. 253). Alternatively, current developments could be understood as a more "gradual shift" in EU economic governance that reflects a willingness to embrace new forms of state intervention, including in industrial policy (Gräf & Schmalz, 2023). These changes in industrial policy have even been interpreted as a type of "de-risking" measure implemented by (green) capitalist states within a continued neoliberal paradigm (Gabor, 2023).

Despite these varying interpretations, five key drivers have stimulated the return of industrial policy in the EU (Eder & Schneider, 2020), and have once again introduced debates about industrial policy to the political agenda. The first driver, the global financial crisis of 2007–2008, laid the groundwork for the EU to embrace more vertical industrial policy within an otherwise horizontally-oriented post-Maastricht industrial policy arena. A second driver is the shifting thematic focus of industrial policy. "Green industrial policy" (Rodrik, 2014) has emerged as a priority and focuses on industrial transformation towards a clean energy and low-emission industrial base. In the EU, this is most prominently exemplified by the European Green Deal and programs related to the energy transition such as the Net-Zero Industry Act (Gräf & Topuria, 2023). The third driver is the EU's intention to create a digital single market, which would require the digital transition of European industry through industrial policy. The fourth and most recent driver results from the risks related to global value chain dependencies, which became particularly apparent during the Covid-19 pandemic. While approximately 70% of international trade involves global value chains (OECD, 2023), this has remained a "neglected issue" in industrial policy so far (Chang & Andreoni, 2020). The final driver, increased geoeconomic competition, has resulted in a "geo-dirigiste turn" (Seidl & Schmitz, 2023) in industrial policy.

The European Industrial Strategy 2020, updated in 2021 in light of lessons learned during the Covid-19 pandemic, defined strategically important global value chains (European Commission [EC], 2021b, p. 12). One of these is the battery value chain; European firms are lagging behind significantly in battery innovation and production, a fact recognized as early as 2018: "The EU only had about 3% of the global production capacity of Lithium-ion (Li-ion) battery cells, while China had about 66% and South Korea together with Japan and other Asian countries about 20%" (EC, 2021a, p. 68). Since then, the EU has launched several industrial policy initiatives to enhance its position in battery innovation and production in an effort to establish competitive European battery production networks. These initiatives are intended to narrow the technological gap between Europe and major Asian competitors (EC, 2021a, p. 68). With this in mind, European public policies are intended to "target the whole value chain of strategic green sectors, including large-scale deployment and access to raw materials" (von der Leyen, 2022) in the context of the "global clean-tech race."

In this context, the Important Projects of Common European Interest (IPCEIs) have emerged as a novel governance instrument in the EU's updated industrial policy toolkit. IPCEIs are cross-country industrial policy projects where firms from multiple EU member states collaborate on the development, production, and "roll-out" of key strategic technologies and their value chains. These technologies are more advanced than current state-of-the-art technology and require significant research, development, and innovation in areas where European firms are currently lacking geoeconomic competitiveness (IPCEI Batteries, 2024). In addition to private funding, participating firms receive public funding in the form of state aid (subsidies/direct grants) from their respective member states in accordance with EU state aid regulations, namely the IPCEI funding scheme (EC, 2024). Hence, IPCEIs are industrial policy projects that are interconnected with competition policy. Among others, there are two IPCEIs on batteries targeting the battery value chain. The IPCEIs may even "serve as a blueprint" (Letta, 2024, p. 39) for further EU industrial policy aspirations (Letta, 2024, p. 11).

Taking the Battery IPCEIs as an example, this article analyzes the question: Is EU industrial policy transforming, and, if so, is industrial policy becoming more developmental as it actively shapes European battery innovation and production networks? Section 2 outlines the relevant theoretical tenants, which build on developmental state theory in a European context and critical EU integration literature. These approaches are further complemented by global production networks (GPN) research. Section 3 explains the methodological approach for the empirically grounded case study of the two Battery IPCEIs based on 11 expert interviews. Section 4 analyzes the Battery IPCEIs empirically. Section 4.1 contextualizes the EU's lack of lithium-ion battery innovation and production networks and explores how this deficit has contributed to a variety of key policies and programs targeting battery production, including the IPCEIs. Section 4.2 explains the vertical orientation of the IPCEIs as a specific state aid mechanism. Section 4.3 conducts an empirical investigation of the Battery IPCEIs and their developmental functions. Section 5 concludes that the Battery IPCEIs represent a geoeconomically driven albeit regulatory-developmental turn within EU industrial policy.

2. Theoretical Debates on the Return of Industrial Policy in the EU

To analyze the question of whether EU industrial policy is transforming, this section introduces three theoretical tenants: (a) developmental state theory in a European context, (b) critical EU integration literature, and (c) GPN research.

2.1. Developmental State Theory in a European Context

Developmental states target structural economic changes and infant industries by intervening in economic sectors and taking on "a leading role in governing the market…[through] market-steering [and] 'societal mission' roles well beyond neoliberal limits" (Wade, 2018, p. 518). While developmental states can take different forms, they are generally associated with late-industrializing countries that are in the process of catching up. Examples include some Latin American countries which are characterized by "new developmentalism" (Bresser-Pereira, 2019) and most famously the classic East Asian "developmental states" (Wade, 1990). Within these contexts, industrial policy emerged as a crucial governance tool (Meckling, 2018, p. 62).

Industrial policy can take developmental, entrepreneurial, or regulatory forms (Ebner, 2009, p. 383). In contrast to regulatory-oriented industrial policy (focused on market liberalism and rule-making) and entrepreneurial-oriented industrial policy (focused on state entrepreneurship and innovations), policymakers that apply industrial policy in a developmental tradition utilize more significant interventions designed to support the local assimilation of new technologies and pursue long-term goals for economic catching-up. These three outlined functions of industrial policy are often depicted as mutually exclusive, but they can also co-evolve and coexist within the same jurisdiction (Ebner, 2009, p. 381; Meckling, 2018, p. 61). For example, Andreoni and Roberts (2022, p. 1431) identify an "entrepreneurial-regulatory state" approach to governing large digital platforms and the development of industrial capabilities through industrial and competition policies.

Interestingly, a growing body of research also identifies increasingly "developmental" industrial policies in so-called developed and industrialized Western countries (Wade, 2018). For example, Block (2008) famously identified the US as a "hidden developmental state," referred to as a "developmental network state," even during the neoliberal era. The "developmental network state" strategically promotes technologies through targeted resourcing to overcome certain key hurdles, opens windows by providing funding and support for collaborations, acts as a broker to link scientists and engineers, and facilitates the establishment of technical standards that accelerate the commercialization of new technologies (Block, 2008, pp. 188–193). However, the "developmental network state" would not grant subsidies to firms that are already leading in international competition (Block, 2008, p. 172).

2.2. Critical EU Integration Literature

Economic governance in the EU has been neoliberally oriented since the Single European Act came into force in 1987. The resulting "new constitutionalism" (Gill, 1998) marked a shift from positive integration in the EU, where member states focused on spending and taxation, to fiscal consolidation, liberalization, and deregulation. Regulation became the primary form of state intervention at the EU level (Majone, 1997; Meckling, 2018, p. 61). This neoliberal governance was institutionally anchored by the Maastricht Treaty (concluded in 1992) and assumes that market processes, as opposed to state interventions, are better suited to determine which industries and firms are most efficient. Consequently, market actors are seen as the primary producers, while policymakers are expected to refrain from influencing production decisions through industry-specific financial support. One essential outcome of this approach to governance was the EU's adoption of mostly horizontal industrial policies (Pianta et al., 2020).

Horizontal industrial policies are designed to target economic structures broadly, offering support to all firms and industries equally. This approach includes tools such as R&D funding, general tax incentives, and the provision of infrastructure. In contrast, vertical industrial policies are directed at specific industries or firms selected by policymakers. Due to the varying levels of selectivity and diverse implementation methods employed by state entities, vertical industrial policy is associated with stronger state intervention in market processes (Weiss & Seric, 2021). Hence, the predominantly horizontal post-Maastricht institutional framework limits the scope for the EU to implement vertical industrial policy, and, more importantly, to serve developmental functions.

Nevertheless, the EU is increasingly applying developmentally-oriented policies as geoeconomic competition intensifies. In terms of infrastructure policy, a geoeconomic shift in focus towards controlling transnational value chains has led to more state-interventionist governance of projects like Gaia-X and the Hydrogen Strategy (Abels & Bieling, 2024). Similarly, the EC executes developmental functions within EU industrial policy. Comparable to the US, the EC promotes innovation through targeted resourcing by funding projects likely to achieve technical breakthroughs, for example through the European Investment Fund, and brokers the emergence and sustenance of cross-national and cross-sectoral networks, such as industrial alliances. A key difference from Block's (2008) conceptualization is the increased role of the EU in protecting firms from competition with non-EU firms, demonstrated by tools like the Foreign Subsidies Regulation. Moreover, the EC facilitates the adjustment of EU regulatory constraints to promote these networks within the post-Maastricht horizontal institutional framework (Di Carlo & Schmitz, 2023, p. 2069). Additionally, green technologies are emerging as central components of these gradually transforming developmentally-oriented industrial policies (Meckling, 2018). A key difference between classic developmental states and these emergent developmental functions in the EU is their decentralized and networked character (Di Carlo & Schmitz, 2023; Meckling, 2018, p. 62).

2.3. GPN Research

Nowadays, policymakers, including those in the EU, must not only govern markets and firms in a national context but also in transnational value chains (Abels & Bieling, 2024). In contrast to linear and chain-oriented research, these networks are best explained by GPN research. GPNs are comprised of organizationally fragmented and spatially dispersed economic activities yet are functionally interconnected via transnational networks (Bridge & Faigen, 2022, p. 2). These networks intersect horizontal, vertical, and transnational dimensions of production, trade, and distribution, covering both upstream and downstream processes (Coe & Yeung, 2015; Henderson et al., 2002). Typically, research in this field has focused on firms as key actors: "Through [a] process of strategic coupling, national firms have been gradually disembedded from state apparatuses and re-embedded in different global production networks that are governed by competitive inter-firm dynamics," a process "spanning different territories and regions" (Yeung, 2015, p. 70). However, there has been a renewed scholarly interest in the state–GPN nexus and the role this relationship plays in shaping production networks due to the revived involvement of states in governing GPNs, including through industrial policy (Horner, 2017). For example, state actors in a facilitator role assist firms in addressing challenges within GPNs, e.g., through subsidies (Horner, 2017, pp. 7–9). From a spatial perspective, these networks are governed through "vertical governance" which links different tiers of GPNs, while "horizontal governance" connects national political economies (Gereffi & Lee, 2016, pp. 28, 30). Overall, industrial policy serves as a governance tool that has the potential to influence the competitive position of firms and sectors within these production networks (Chang & Andreoni, 2020).

Overall, GPNs are a "contested field" (Levy, 2008) involving diverse actors with unique interests in specific developmental outcomes (Coe & Yeung, 2015). These interests pertain to high value-adding activities distributed across different parts of production networks, related to both innovation and production. However, this depends on varied and asymmetric power resources. Firms can exercise corporate power while states possess institutional power. For example, powerful lead firms have the ability to control and significantly shape GPN outcomes, whereas this power drastically diminishes towards the lower tiers of production and their suppliers. Moreover, GPN actors are embedded within specific institutional contexts

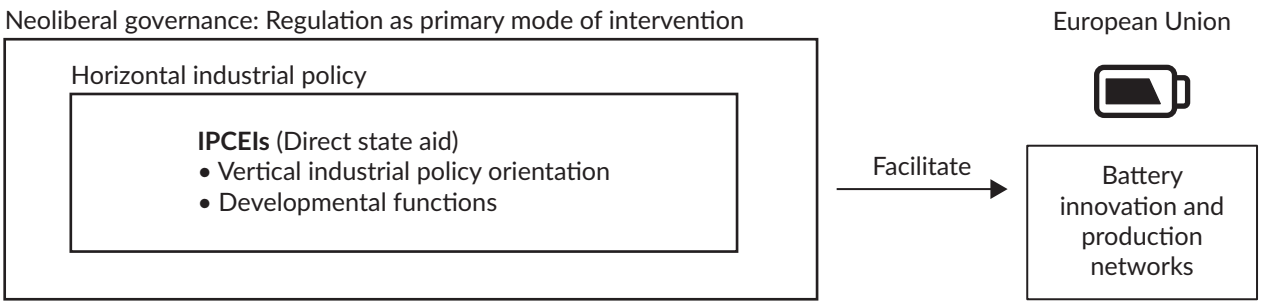

Figure 1. Developmental functions of the IPCEIs within EU's neoliberal governance.

that can be either limiting or supportive (Henderson et al., 2002). Figure 1 summarizes how the IPCEIs remain embedded within horizontal industrial policy and a broader neoliberal economic governance paradigm characterized primarily by regulatory modes of state intervention. Nevertheless, IPCEIs are a form of vertically-oriented industrial policy and reflect emerging developmental functions within this institutional setting. These contribute to the facilitation of European battery innovation and production networks.

3. Research Design

This exploratory study empirically analyzes the early stages of project execution (through the end of 2023) for the two Battery IPCEIs by employing qualitative research methods. It builds on a review of primary sources including relevant governmental documents from the EU and member states as well as press releases, and secondary literature, in particular scientific publications on EU industrial policy. This review primarily informs the analysis of the context of the EU's lack of battery innovation and production networks which has contributed to a variety of policies and programs that target this deficit, including the Battery IPCEIs. It further informs the analysis of the IPCEIs as a state aid funding scheme.

Several key conceptual terms guide the analysis: Since the Maastricht Treaty (1992), European economic governance has mostly facilitated *horizontal industrial policy* (general support intended to assist the entire economy and industry) and limited *vertical industrial policy* (selective support of specific industries or firms). However, as will be demonstrated, the IPCEIs have a more vertical industrial policy orientation, which is characteristic of developmental industrial policy traditions. The resulting regulatory-developmental turn in EU industrial policy is linked to the emergence of new developmental functions within the EU's primarily neoliberal and regulatory governance paradigm. These *developmental state functions* and policies (a) target structural economic change and economic catching-up to (b) support infant industries (c) beyond the limitations of neoliberal governance through (d) specific (financial) resources, including state aid, and (e) aim for the local assimilation of new technologies. In a European context, industrial policy is executed through (f) highly decentralized and networked structures. This is the case for both Battery IPCEIs which facilitate decentralized collaboration on the development of battery cells and systems between several firms across various member states. The IPCEIs include firms responsible for upstream processes (raw materials) and downstream processes (recycling) and link various lead firms and tiers of transnational battery production networks to capture high-value-adding activities. Hence the Battery IPCEIs can be understood as "an organizational platform through which actors in different regional and national economies compete and co-operate for a greater share of value creation, transformation, and capture through geographically dispersed economic activity" (Bridge & Faigen, 2022, p. 2).

Referring to these conceptual key terms, an in-depth single case study of the two Battery IPCEIs was conducted based on 11 semi-structured expert interviews. Experts were selected using "purposive sampling" (Campbell et al., 2020). These experts, which include representatives from firms and member states involved in the execution of the Battery IPCEIs, provided insights into the functioning of the projects. The resulting interview sample is detailed in Table X of the Supplementary Material. As a result of this selection strategy, the sample covers various national contexts, governance scales, firm sizes, and the four work streams to understand the decentralized and networked character of the Battery IPCEIs. Based on Kuckartz (2014), the interviews were transcribed and analyzed using qualitative content analysis. The coding and analysis focused on five areas: geopolitics, innovation, cooperation, funding, and conditionality. Data triangulation validates the results. All interview partners remain anonymous.

4. Analysis

This section empirically analyzes the geoeconomically-driven regulatory-developmental turn within EU industrial policy in three ways: firstly, by contextualizing the lack of lithium-ion battery innovation and production networks in the EU and the emergence of the Battery IPCEIs as one key governance instrument to support the development of these networks (Section 4.1); secondly, by explaining the vertical orientation of the IPCEIs as a specific state aid mechanism (Section 4.2); and thirdly, by conducting an empirical investigation of the Battery IPCEIs which demonstrate emerging developmental functions (Section 4.3).

4.1. Context: The Lack of Lithium-Ion Battery Innovation and Production Networks in the EU

A key trend in global automotive production networks is the shift from internal combustion engines to electric vehicles (EVs). Lithium-ion batteries, in particular, play a crucial role in this transition. While batteries are essential to various markets such as energy storage and e-bikes, the increasing relevance of EVs remains the primary driver of battery demand (Bridge & Faigen, 2022, p. 8). More importantly, batteries constitute up to 40% of the value added to an EV (Bundesministerium für Wirtschaft und Klimaschutz, 2022). This highlights the significance of batteries for the automotive industry. More importantly, this poses challenges to traditional lead firms in particular and their suppliers in the automotive GPNs. The reason therefore is that Asian firms, especially Chinese firms, have already established themselves as key players and are currently dominating emerging battery innovation and production networks within automotive GPNs. To illustrate this, in 2023, China held an 80% market share in global battery cell manufacturing (Racu & Poliscanova, 2024, p. 13). Consequently, current lead firms in the internal combustion engine-based automotive GPNs, particularly European lead firms (e.g., BMW, VW, etc.), have been lacking international competitiveness. Nevertheless, they aim to catch up by transitioning to electric mobility (Interview 4). This classifies the European battery industry as an infant industry (Interviews 6, 7, 11).

To address this lack of innovative and productive capabilities (Interviews 2, 5), the EU has initiated a variety of industrial policy instruments and programs to shape and facilitate an emerging battery industry. This is not only motivated by geoeconomic competition but is further driven by the EU's sustainability goals which aim to achieve climate neutrality and include a planned de facto ban on new internal combustion engines by 2035. The EC's 2018 Action Plan laid the groundwork for these initiatives and was informed by the revised Strategic Energy Technology Plan in 2015 and the 2017 EU Industrial Policy Strategy (European Court of Auditors, 2023, pp. 16–17). Some key policies and programs include CO^2 emission standards, new regulations on batteries and

waste batteries, the EU anti-subsidy investigations into and tariffs on EU imports of EVs from China, as well as the Battery IPCEIs (EC, 2023). These IPCEIs present a novel type of state aid mechanism that contributes to the regulatory-developmental turn occurring within EU industrial policy.

4.2. The Case of the IPCEIs

This section explains how the IPCEIs act as a novel industrial policy instrument as they enable more vertically-oriented industrial policy within the EU's horizontal institutional framework. Due to the EU's shared competence in competition policy, state aid is allocated at the member-state level, but only in accordance with EU state aid regulations. The predominantly horizontal approach taken to industrial policy since the Maastricht Treaty, within the broader neoliberal policy paradigm (see Section 2), restricts direct state aid. Direct state aid is considered a distortion that interferes with competition in the single market. Given this, such aid is only permissible if it is deemed compatible with competition policy and internal market rules (Pianta et al., 2020, p. 787). This reflects the contradictory interconnectedness of competition policy and more vertically-oriented industrial policy in a European context.

However, Article 107(3)(b) of the Treaty on the Functioning of the European Union allows for a specific type of state aid scheme in the form of direct aid to "promote the execution of an important project of common European interest or to remedy a serious disturbance in the economy of a Member State" (Treaty on the Functioning of the European Union, 2008, Article 107(3)(b)). This state aid scheme refers to the IPCEIs. The IPCEIs were already part of the Treaty of Rome but were only formalized in 2014 during the state aid modernization process. The 2014 EC Communication (COM/2014/C 188/02) established the guidelines for evaluating projects as being of common European interest. These IPCEIs must be strategically important to the EU, generate positive spill-over effects across member states, involve several member states, and focus on technologies beyond the state-of-the-art (Gräf & Topuria, 2023). The implementation of IPCEIs was only considered in the context of intensified geoeconomic competition in future technologies and strategic value chains.

These IPCEIs represent a legal and vertically-oriented "loophole" (Gräf & Schmalz, 2023) within the post-Maastricht horizontal competition policy for several reasons. First, IPCEIs target specific sectors deemed strategically important to the EU (EC, 2018). Currently, there are seven approved IPCEIs, including two in microelectronics, two in hydrogen, one in cloud and edge technology, and two in batteries. Two further IPCEIs are planned for solar energy and health (as of April 2024). A key criterion for selection as an IPCEI firm is that the firm is able to meet the high level of technological innovation required for participation (Interview 4). This shows that IPCEIs are unique in being sector-specific and technology-biased in contrast to, for example, the General Block Exemption Rules. Second, IPCEIs are not traditional R&D and innovation projects (Interview 5). Instead, they adopt a unique funding logic, allowing funding up to the "first industrial deployment" (after pilot stages and before mass production). This implies that the EC and member states can fund projects for an extended duration and further into the production process phase up to the market ramp-up phase (Interview 1). Third, IPCEIs reflect an expanded understanding of market failures. IPCEIs are intended to "remedy a serious disturbance in the economy of a member state" (Treaty on the Functioning of the European Union, 2008, Article 107(3)(b)), and hence to address "market failures" by facilitating the scale-up of high-risk future projects amid geoeconomic competition (Interview 10). According to neoclassical theory, government intervention is justified only in cases of market failures, where there is a

lack of investment in high-risk projects (Mazzucato, 2018, pp. 806–807). However, there is a broadened understanding of market failure in the context of a "geo-dirigiste turn" within EU industrial policy, as the EC is more willing to "adequately 'price in' geo-economic competition beyond traditional market failure concepts" (Seidl & Schmitz, 2023, p. 14). Building on this, IPCEIs address a lack of productive capabilities, such as in the battery sector, amidst geoeconomic competition (Interview 4).

Nevertheless, IPCEIs remain embedded in the EU's competition policy and maintain the horizontal character of EU industrial policy by ensuring that multiple countries and firms benefit from this type of funding within a single IPCEI project. The allocation of direct state aid to a specific IPCEI firm is contingent upon several more IPCEI firms receiving direct state aid within selected sectors and production networks. Additionally, the 2014 EC Communication was revised in 2021 to mandate participation from at least four member states to enhance compatibility with the EU single market. Moreover, the public funding received by IPCEI firms ultimately comes from national budgets, without a simultaneous increase in national or EU-level budgets (EC, 2024). Increased state budgets and spending are associated with stronger state intervention as seen, for example, during the Covid-19 pandemic (McNamara, 2023). While still adhering to regulatory modes of governance characteristic of the (still dominant) neoliberal paradigm (Di Carlo & Schmitz, 2023, p. 2063; Majone, 1997), the EU nevertheless makes indirect decisions about production and privileges certain firms and networks, such as battery production. Therefore, the Battery IPCEIs demonstrate a more vertical industrial policy orientation while maintaining horizontal industrial policy elements.

4.3. The Battery IPCEIs: Unpacking the Regulatory-Developmental Turn Within EU Industrial Policy

The Battery IPCEIs are reflective of a regulatory-developmental turn in EU industrial policy, and the abandonment of the previous paradigm of "undistorted" competition via market forces. This section analyzes how the Battery IPCEIs' rationales, governance structures, production network implications, funding, power dynamics, and conditionality contribute to key *developmental functions*. These functions target structural economic change and facilitate the catching-up process of the European industry by funding technological battery development and production via direct state aid to decentralized networks of firms. These functions operate beyond the limitations imposed by neoliberal governance in the EU (particularly in terms of vertical state support; see Section 3):

> If Europe had not been convinced in 2017 that it wanted [the battery] industry and that it wouldn't work under normal market conditions due to geopolitical competitors actively promoting these industries, rather than leaving them to market forces, then there would be no IPCEI. Certainly, the industry here in Europe would have faced many challenges. (Interview 6, translated by author)

Then in 2019, the first Battery IPCEI ("IPCEI on Batteries"/"Summer IPCEI"), comprised of 17 participants from seven member states, was adopted and extended through 2031. In 2021, the second "IPCEI European Battery Innovation (EuBatIn)" ("Autumn IPCEI"), comprised of 42 participants from 12 member states was adopted and extended through 2028 (see Tables 1 and 2). The issuance of the second Battery IPCEI reflects the demand for this type of state support (Interview 4).

Table 1. Overview of the Battery IPCEIs.

IPCEI on Batteries: Firms	Country	Automotive GPN actor	State aid (in €1,000)
Opel ACC	GER	Lead firm	436,812
BASF Schwarzheide	GER	Tier-1/-2	165,107
Automotive Cells Company	FRA	Tier-1	115,000
VARTA Micro Production	GER	Tier-1/-2	101,452
VARTA Microbattery	GER	Tier-1/-2	90,506
BMW	GER	Lead firm	60,092
SEEL	SE	R&D	53,066
BASF	GER	Tier-1/-2	14,899
Rhodia Operations	FRA	Tier-1/-2	7,030
Solvay Chemicals	BE	Tier-1/-2	5,734
BASF Battery Materials Finland	FIN	Tier-1/-2	5,605
Terrafame	FIN	Tier-1/-2	3,206
Keliber	FIN	Tier-1/-2	2,641
Umicore	GER	Tier-1	2,625
Fortum Waste Solutions	FIN	Tier-1	1,047
Elemental Strategic Metals	POL	Tier-1/-2	
Nanocyl	BEL	Tier-2	
Endurance	ITA	Tier-1	
ENEL X	ITA	Tier-1	
FAAM	ITA	Tier-1/-2	
Flash Battery	ITA	Tier-1	

Notes: Information about firms, member states, and share of public funding has been retrieved from the EC's State Aid Transparency Database; due to the two-step funding process, it is possible that some member states, e.g., Italy, have not yet paid the pre-approved funding; firms' position within the battery-based automotive GPN and their relationships to the automotive industry have been identified based on the IPCEI project descriptions, the firms' websites, and further research.

The key (technological) objective of the two Battery IPCEIs is to steer the development and production of "*next generation*" *lithium-ion batteries* among European firms, encompassing not only liquid electrolyte but also solid-state technologies. Each IPCEI is clustered into four work streams covering "raw materials" (work stream 1), "battery cells and modules" (work stream 2), "battery systems" (work stream 3), and "recycling and repurposing" (work stream 4). In addition to addressing the current lack of productive capabilities of battery cells, modules, and systems, IPCEIs shall further contribute to efficient mining and material technologies and exploit the unused potential of existing raw materials through recycling, e.g., second-life batteries. Hence, the Battery IPCEIs focus on developing battery production networks in the EU, including upstream and downstream processes relevant to battery production.

Overall, the IPCEIs are highly decentralized (see also Di Carlo & Schmitz, 2023, p. 2027) and are characterized by indirect dependencies among the participants (unlike, for example, a consortium). Participating IPCEI firms collaborate within, but also across, these work streams (Interview 1) in both intra- and inter-IPCEI networks. These collaborations, outlined in an internal and confidential document called the "Chapeau" document, are not limited to a certain national context, but can be transnational and are

Table 2. Overview of the EuBatIn.

EuBatIN I: Firms	Country	Automotive GPN actor	State aid (in €1,000)	EuBatIN I: Firms	Country	Automotive GPN actor
Northvolt Germany	GER	Tier-1	155,445	Alkeemia	ITA	Tier-2
Manz	GER	Tier-1	71,335	Arkema	FRA	Tier-1/-2
BMW	GER	Lead firm	67,993	Ferroglobe	SPA	Tier-2
Cellforce Group	GER	Tier-1	56,718	Hydrometal	BE	Tier-1/-2
Skeleton Technologies	GER	Tier-1	50,994	Italmatch Chemicals	ITA	Tier-2
SGL Carbon	GER	Tier-2	42,926	Tokai Cobex	FRA	Tier-2
ElringKlinger	GER	Tier-1	33,770	Green Energy Storage	ITA	Tier-1/-2
Northvolt	SE	Tier-1	21,470	Midac	ITA	Tier-1/-2
InoBat Auto	SK	Tier-1	19,192	Sunlight Group	GR	Tier-1
ENERGO – AQUA	SK	Tier-1/-2	15,207	Endurance	ITA	Tier-1
ZTS – Výskum a Vývoj	SK	Tier-1/-2	14,940	Enel X	ITA	Tier-1
Rosendahl Nextrom	AT	Tier-1/-2	10,620	FPT Industrial	ITA	Tier-1
VARTA Innovation	AT	Tier-1	9,197	Rimac Automobili	ITA	EV producer
Alumina Systems	GER	Tier-1/-2	8,700	Engitec	ITA	Tier-1
InoBat Energy	SK	Tier-1	8,495	Little Electric Car	SPA	EV producer
Voltlabor	AT	Tier-1	6,721	Syensqo	ITA	Tier-2
AVL List	AT	Tier-1	6,365			
Valmet Automotive	FIN	Tier-1	4,324			
Miba eMobility	AT	Tier-1	3,837			
Borealis	AT	Tier-1/-2	3,671			
Liofit	GER		2,840			
Fortum Waste Solutions	FIN	Tier-1	1,884			
Keliber Technology	FIN	Tier-1/-2	550			

Notes: Information about firms, member states, and share of public funding has been retrieved from the EC's State Aid Transparency Database; due to the two-step funding process, it is possible that some member states, e.g., Italy, have not yet paid the pre-approved funding; firms' position within the battery-based automotive GPN and their relationships to the automotive industry have been identified based on the IPCEI project descriptions, the firms' websites, and further research.

influenced by pre-existing commercial partnerships, geographical proximity, and national contexts. Nevertheless, new collaborations have emerged within the context of the IPCEIs (Interviews 1, 5, 6). These collaborations do not only encompass the technological development of batteries, including both up- and downstream processes, but also for example the handling of legislative regulations. For example, IPCEI participants have been cooperating on industry standards such as a common recommendation for the development of the new EU digital battery pass, which sets standards for battery production in the EU and on the composition requirements of battery cells for easier recycling (Interviews 1, 6). Additionally, IPCEI firms may engage in additional parallel cooperation and partnerships concerning technological developments that do not relate to the IPCEI projects directly (Interview 5).

European policymakers coordinate these Battery IPCEIs through vertical governance, linking the various transnational, *decentralized*, and *networked* tiers of participating firms across the emerging battery

production networks. The EC defined battery production as a technological priority and implemented this novel form of state aid that permits participating firms to utilize IPCEI state aid in compliance with EU competition policy (see Section 4.2). This process was further influenced by the German and French governments and by consultations with the private sector. At the (sub-)national levels, the EC maintains a lower degree of involvement. The operational and administrative coordination is overseen by the French and German governments. The French government coordinates the IPCEI on Batteries, and the German government coordinates the EuBatIn (Interviews 1, 2, 4). However, the German government has outsourced these tasks to an external German project management firm. This firm undertakes a variety of tasks ranging from idea development, the suggestion of participants, and the preparation of funding approvals to providing supplementary research and facilitating networking among IPCEI participants as well as with external networks and actors. In addition, the German government's plans to expand the second Battery IPCEI to include countries like Portugal and non-EU countries such as Switzerland and Norway faced opposition from the EC. Instead, the EC introduced the option of associated membership in November 2023. Current IPCEI members decide on admission based on the Chapeau document. An associated membership allows participation in networking events and the work streams of the Battery IPCEIs, but without receiving state aid through the IPCEIs (Interview 1). This private intermediation in the German case, coupled with conflicting interests between the EC and the German government regarding the expansion of the IPCEIs, reflects a more fragmented role of state activity in the return of industrial policy in the EU.

Nevertheless, the implementation of the Battery IPCEIs has been enabled by new geoeconomic competition for high-value-added activities in the battery-based automotive GPNs (see Section 4.1). IPCEI firms acknowledge that their main competitors are non-European firms, referring in particular to Chinese firms but also to Japanese, Korean, and US firms (Tesla), who in some instances receive foreign state subsidies (Interview 4). Furthermore, the Battery IPCEIs were driven by an interest in preventing the "Foxconnisation of the automotive industry" (Lüthje, 2022) in the EU (Interview 5). This would imply changing power dynamics as traditional automotive lead firms would have to rely on contract manufacturers and new players such as battery systems producers who capture large shares of the value added.

These conditions led to the implementation of the Battery IPCEIs as a novel type of *state aid* (see Section 4.2), granted when there is a need to catch up to international competition and a lack of innovation vis-à-vis the leading international competitors (Block, 2008, p. 172). This enabled a total share of €3.2 billion in state aid for the first IPCEI, supplemented by €5 billion in private investments, and €2.9 billion in state aid for the second IPCEI, supplemented by €8.8 billion in private investments (for a detailed allocation see Tables 1 and 2). Member states fund the IPCEI firms through their national and subnational budgetary funds. Overall, there is consensus among involved firms and policymakers that the IPCEIs are a helpful instrument and funding scheme, given the *limitations* on direct state aid in the EU in contrast to, for example, the Inflation Reduction Act (concluded in 2022) in the US (Interviews 1, 3, 5, 8, 9, 11).

While Chinese firms, in particular, are currently leading in battery production (see Section 4.1), European firms are nevertheless engaged in a fragile *catching-up process*. Importantly, IPCEI state aid is indeed leveling investments and battery production capacities. For example, Northvolt has announced the provision of 60 GWh of battery cell capacity in Germany, Automotive Cells Company (ACC) in France 40 GWh, and InoBat & Gotion (Slovakia) 20 GWh by 2030 (Racu & Poliscanova, 2024, pp. 14–15). In addition, the Battery IPCEIs support gigafactories, which reflects the global trend of gigafactories becoming central to state and

investment strategies within the global battery GPNs, as they function as key nodes in these networks (Bridge & Faigen, 2022, p. 8). For example, the German chemical firm BASF constructed a gigafactory for cathode materials in Lausitz, Germany, supplemented by upstream products from the BASF site in Harjavalta (Finland); the Swedish battery producer Northvolt is setting up a battery gigafactory in Heide (Germany); and the European joint venture ACC is establishing a gigafactory for battery cells and modules in Billy-Berclau (France) as well as a factory at the Opel site in Kaiserslautern (Germany) that are expected to create cluster effects. Yet, reports of delays and disruptions also exist (Interview 5).

However, if the analytical focus is shifted to power dynamics, it becomes clear that the Battery IPCEIs replicate existing asymmetric corporate power dynamics along several dimensions of the European combustion-engine-based automotive GPNs. The main beneficiaries of the Battery IPCEIs are primarily powerful GPN actors not only in terms of firm size (encompassing lead firms as well as Tier-1 or Tier-2 supplier firms and gigafactories) but also in terms of the position of firms in the combustion-engine-based automotive GPNs. In contrast, only a minority of IPCEI firms are considered small or medium-sized enterprises (see Tables 1 and 2). Moreover, the automotive industry, in particular in France, was quite influential in initiating the IPCEIs on Batteries, and are now among the key beneficiaries. The first "IPCEI on Batteries" was primarily driven by French automotive firms together with the French government (Interview 1). This shows that the automotive industry was not only influential in the design of the Battery IPCEIs but is also one of the main beneficiaries.

In addition, the return of industrial policy in the EU raises questions about the conditionality of funding distribution, such as subsidies (Bulfone et al., 2023). Strong conditionality is lacking for the IPCEI funding (Interview 11). The Battery IPCEIs, particularly the second IPCEI, claim to support social and environmental objectives (IPCEI Batteries, 2024), but these are secondary to technological and economic goals (Interviews 1, 5, 4). Social objectives are primarily focused on the creation of high-skilled jobs, which are, importantly, small in numbers. For example, only about 100 jobs are being created at an IPCEI lead firm in a deindustrialized region (Interview 6). There is even a "war for talent" among IPCEI firms (Interview 7). Environmental goals are assumed to be met through contributions to electric mobility, which is seen as synonymous with environmental sustainability (Interviews 1, 4). This reflects "green industrial policy" (Rodrik, 2014) approaches that are focused on modernizing rather than transforming existing industrial structures, such as new mobility concepts (Pichler et al., 2021).

A condition for funding is, however, the sharing of knowledge among IPCEI participants and with the wider public after project termination, excluding core business secrets (Interview 1). In addition, this requirement was one of the reasons why Tesla opted out of the first Battery IPCEI (Interview 6). Moreover, a so-called "claw-back" mechanism, regulated by the Chapeau document, ensures the repayment of extra profits to their member states after IPCEIs end (Interviews 1, 5). This is a significant financial condition to place on funding. Its effectiveness remains to be seen, with calls to ease this mechanism already being made (Interview 7): "A State Aid framework with common conditionality for disbursement is crucial. The effectiveness and acceptability of State Aid instruments depends crucially on the strategic use of public funds to achieve common public policy objectives" (Letta, 2024, p. 39).

5. Conclusion

Intensifying geoeconomic competition has contributed to debates about the return of industrial policy in the EU, raising questions about whether the character of EU industrial policy is transforming. This study contributes to these debates by analyzing the Battery IPCEIs as a novel governance instrument in the EU's industrial policy toolkit designed to facilitate European battery innovation and production networks.

Despite limitations imposed by EU competition policy, these IPCEIs allow for the distribution of direct state aid to a network of selected firms engaged in the advancement of next-generation lithium-ion batteries across member states, encompassing both upstream and downstream processes. The rationale for these projects is that the EU aims to support structural changes in the European automotive industry by catching up in battery innovation and production, particularly to the Asian firms currently leading in battery production. Notably, batteries account for up to 40% of the value added to an EV. The Battery IPCEIs thereby create opportunities for vertical industrial policy as well as emerging developmental functions within EU industrial policy, which traditionally favors horizontal approaches consistent with a neoliberal governance paradigm, with regulation as the primary mode of intervention.

Hence, this article concludes that EU industrial policy is experiencing a geoeconomically-driven regulatory-developmental turn, and is moving away from the primacy of undistorted competition. Indeed, the Battery IPCEIs have triggered investments in expanding battery innovation and production and are contributing to the process of European firms catching up to their Asian counterparts. Nevertheless, this progress remains fragile within a dynamic and emerging battery industry. Furthermore, from a critical perspective, the Battery IPCEIs tend to replicate asymmetric power dynamics and lack strong conditionality.

As this study examines the early stages of IPCEI project execution, future research should analyze the evolution of these projects and critically assess how emerging developmental functions evolve. It should also evaluate the impact of this state aid mechanism, given that the EU's institutional framework still imposes limitations on stronger public support and intervention, in contrast to, for example, the Inflation Reduction Act in the US.

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Conflict of Interests

The author declares no conflict of interests.

Supplementary Material

Supplementary material for this article is available online in the format provided by the author (unedited).

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Drivers and Limits of the Geoeconomic Turn in EU Infrastructure Policy

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Abstract

In recent years, the EU has increasingly applied state-interventionist practices to initiate and implement infrastructure policy projects. This stands in stark contrast to a phase of liberalization of infrastructure networks and services accompanying European integration and fiscal consolidation and infrastructure decay during the euro crisis. This article argues that the new state interventionism is strongly driven by the changing global constellation of a "new triad competition" where the EU is increasingly competing over infrastructures with the US and China. As a consequence, EU infrastructure policy undergoes a geoeconomic turn that aims to control transnational value chains and related political-economic spaces. Drawing on concepts of critical geography and international political economy, the article outlines the core features of this geoeconomic design logic of infrastructures and contrasts it with complementary or competing ones. The article substantiates these arguments by analyzing EU decision-making on two cases of high-tech infrastructure in the fields of communication and energy: the federated data infrastructure Gaia-X and the Hydrogen Strategy. Both cases provide evidence for the geoeconomic turn in EU infrastructure policy. Yet, the analysis also highlights that the turn is at times supported but also hampered by a capitalist logic that is reflected in the positioning of European and non-European businesses, as well as the EU's reliance on private action. Furthermore, it illustrates that an ecological and a social-integrative design logic to key infrastructures are largely subordinated. The conclusions reflect on the discrepancy between the EU's geoeconomic agenda and its less far-reaching implementation.

Keywords

European integration; European Union; Gaia-X; geoeconomics; global competition; hydrogen; infrastructure policy

1. Introduction

On the European level, infrastructure policy has moved to the forefront of the political debate. The EU nowadays sees the strategic development of infrastructure as a necessary response to contemporary challenges. From an ecological perspective, it views the active shaping of its energy and transportation networks as a prerequisite for reaching its goal of climate neutrality. From an economic perspective, state-directed impulses are meant to overcome a decade of what has largely been a stagnating and imbalanced European economy. Most central to this article are the EU's geoeconomic motives: its position in a "new triad competition" with the US and China forces the EU to engage in global competition over the strategic control and economic potential of infrastructures (Abels & Bieling, 2023a). This has resulted in a more strategic infrastructure policy that hitherto received considerably less academic attention than the EU's shifts in industrial policy (Lavery, 2023; McNamara, 2023) or trade and investment (Meunier & Nicolaidis, 2019; Schmitz & Seidl, 2023).

This article analyzes recent developments in EU infrastructure policy, asking how key infrastructure initiatives come about and which logics and political alliances drive them. It argues that the EU is engaging in a more state-interventionist infrastructure policy that aims to control transnational value chains and related spaces: land masses, oceans, airspace, and outer space, even cyberspace. Triggered by the changed global constellation, the geoeconomic turn in EU infrastructure policy represents a structural phenomenon that is increasingly shaping the European agenda. In practice, progressing from agenda-setting and planning to decision-making and implementation, other political interests and design logics influence the extent to which the geoeconomic turn takes shape. Most centrally, we find the geoeconomic logic to be in parts supported but also hampered by a capitalist logic that determines the positioning of European and non-European businesses contributing to initiatives, as well as the EU's persisting reliance on private actors. The article substantiates these arguments by analyzing EU decision-making on the federated data infrastructure Gaia-X and its Hydrogen Strategy.

It proceeds as follows: the second section specifies the structurally changed historical context and indicators of the geoeconomic turn in EU infrastructure policy. The third section draws on critical geography and international political economy to outline a geoeconomic design logic that views infrastructure policy as both a means to secure control and access to essential networks as well as to expand economic production. It relates this logic to other competing and complementary design logics: a capitalist, an ecological, and a social-integrative one. The fourth section analyzes the logics and alliances driving the geoeconomic reorientation empirically. We take a look at two central initiatives in the field of communication and energy: Gaia-X and the Hydrogen Strategy. The conclusion reflects on the implications of the findings.

2. The New State-Interventionism in EU Infrastructure Policy

Following the global financial crisis and subsequent crises, the global and European political-economic landscape underwent significant changes. The dominance of neoliberal concepts seems to have waned, while protectionist and state-interventionist strategies are becoming more widespread (Babić et al., 2022; Roberts et al., 2019). The new state interventionism seeks to enhance control over transnational value chains that appear to be at risk: either because certain actors can weaponize them by restricting or

preventing flows (Farrell & Newman, 2019) or because accidents or crises might disrupt or permanently damage established networks of commercial cooperation.

For the last decades, the EU strongly relied on export activity and a largely market-liberal globalization strategy to maintain its international position. Yet, in response to a series of crises, the EU has geared its policy areas towards safeguarding and strengthening the resilience of value chains (Rosén & Meunier, 2023). Aside from security, energy, and trade policy, this particularly concerns infrastructure and industrial policy. Infrastructure policy primarily aims to improve connectivity, i.e., the circulation of resources, goods and services, money, knowledge, people, etc. It includes all efforts that seek to maintain, develop, and regulate infrastructures within and beyond a political space. In practice, infrastructure policy and industrial policy often go in the same direction (see Figure 1).

Cycles of infrastructure and industrial policy in the EU have been historically correlated. In the post-war era, national industrial and infrastructure policy activities were guided by Keynesian concepts of state interventionism (Bulfone, 2023). Governments selectively built and modernized infrastructures according to domestic industrial structures. It was only in the 1980s and 1990s that the EU developed a significant infrastructure policy. During the process of integrating the internal market, transnational capital advocated for the enhancement of cross-border infrastructures (Balanyá et al., 2000). At the core of this agenda was the Trans-European Networks (TEN) initiative, which sought to coordinate the expansion and interlocking of European transportation, energy, and communication infrastructures. Network-related infrastructures such as post, telecommunications, rail, gas, and electricity were liberalized, and sector-specific directives drove the organizational separation of infrastructure and service providers. The TEN strategy has successively been extended to neighboring regions, including Eastern Europe, the Caucasus, and the Mediterranean region. It continued in the 2000s but became increasingly securitized due to the rise of international terrorism and cybercrime. The concept of "critical infrastructures" gained prominence during that time, as the EU focused more strongly on monitoring and preventing new infrastructural risks (Council directive 2008/114/EC of 8 December 2008, 2008).

During the euro crisis, however, the EU intensified its market-liberal approach to infrastructure policy. Public-owned energy and transportation infrastructures in crisis countries were often sold below market value to consolidate national households. In addition, the EU's management of the euro crisis forced those

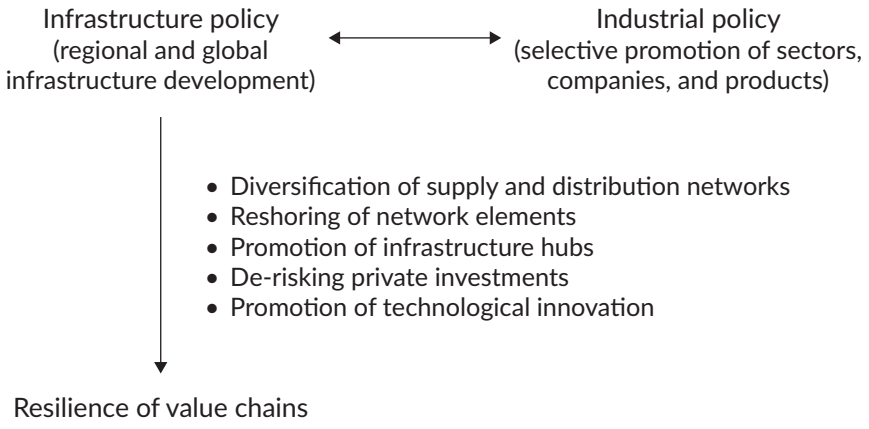

Figure 1. Intended effects of infrastructure policy.

member states most affected by the crisis to cut back on infrastructure-related investment. Figure 2 outlines the substantial economic divergences these decisions created within the EU regarding investments in communication, energy, and transport infrastructure development. Data for 2007 serves as an index value. Productive investment only includes assets that are materially produced, which subtracts land purchases and natural resources and excludes residential buildings. It highlights that budget cuts in the Southern periphery had strong negative effects on public investment in transportation and energy infrastructures, where private investment was insufficient to compensate for this. This undermined the productive capacity of those economies and contributed to economic divergences between member states.

In the aftermath of the financial and euro crises, internal and external factors contributed to an upgrading and reorientation of infrastructure policy. Internally, the member states were under pressure to promote re-industrialization and counteract the legitimacy crisis of the integration project. The "infrastructure push" (Ougaard, 2018) was an attempt to compensate for the infrastructure gap that resulted from market forces' failure to allocate available resources towards infrastructures under crisis and non-crisis conditions. Externally, the EU's position within an intensifying "triad competition" (Abels & Bieling, 2023b) with the US and China created pressure to modify the European approach to infrastructure development. The privatization of publicly owned infrastructures during the euro crisis opened the door to foreign ownership of essential European transport and energy networks. While the EU had hoped for some time to benefit substantially from China's global infrastructure initiatives and the modernization of routes between Asia and Europe, Beijing's central role in and control over these networks led to calls for increased economic sovereignty on behalf of the EU (Leonard et al., 2019). The US seemed to be several steps ahead. Under President Biden it implemented a transformative economic agenda that built on large-scale infrastructure-relevant programs such as the Infrastructure Investment and Jobs Act and the Inflation Reduction Act, subsidizing the development of US-based technologies and infrastructures.

This global constellation contributed to an increasingly geoeconomic orientation of central infrastructure initiatives. The European Economic Security Strategy warns of "risks [that] can occur along the entire value chain," concerning, among others, the "physical and cyber security of critical infrastructure" as well as the "weaponisation of economic dependencies" (European Commission, 2023a). Key documents such as the New Industrial Strategy (European Commission, 2020a) and the EU's Digital Strategy (European Commission, 2020b) seek to reduce dependencies regarding access to critical infrastructures and technologies,

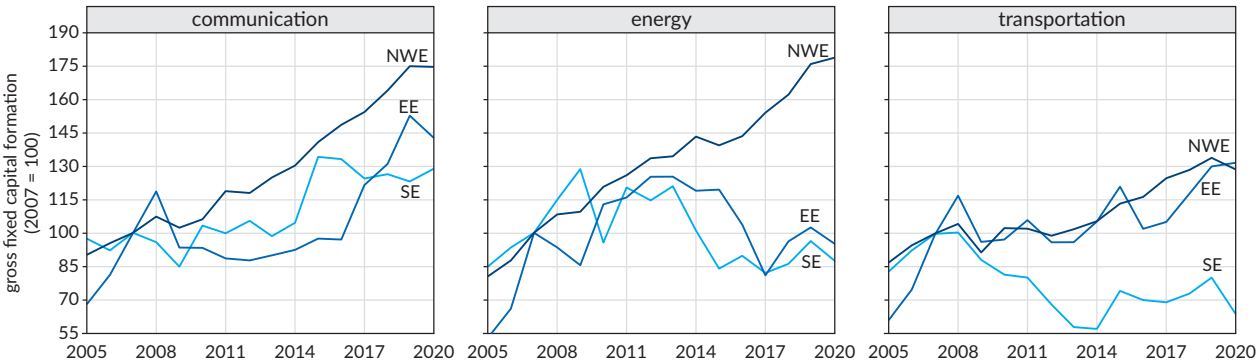

Figure 2. Productive investment in different sectors for European regions, 2005–2020. Notes: EE = Eastern Europe; NWE = Northern/Western Europe; and SE = Southern Europe. Source: Own calculations based on Eurostat.

particularly in the fields of energy and communication. The Important Projects of Common European Interests (IPCEI) exploit legal exemptions in the EU's state aid rules to promote business endeavors related to geoeconomically relevant technologies, such as battery development, cloud infrastructure, and hydrogen. In response to the Covid-19 pandemic, the Recovery and Resilience Facility (RRF)—an EU fund with a volume of about €750 billion—was designed to accelerate infrastructural transformation through public investment. Finally, with a more global outlook, the EU announced its Global Gateway initiative in 2021, which is supposed to make available up to €300 billion in financing for infrastructure projects in Africa, Latin America, and Asia until 2027 (Heldt, 2023).

3. Design Logics of Infrastructure Policy

Infrastructures are socio-technical networks that include material or digital facilities and their connections and enable the circulation of goods, services, people, energy, and data across space (Larkin, 2013). In principle, therefore, infrastructures also enable the organization and provision of public goods, including mobility, communication, education, and so forth. However, they are also associated with negative side effects, including their ecological and social impact as well as financial costs.

Infrastructures are the product of different forms of infrastructure policy where political influence is exerted at several points: in the planning, production, financing, and regulation of infrastructures. Overall, infrastructures are political, as they are subject to competing or complementary design logics, backed by different social interest groups and alliances. In the EU, in addition to the Commission and national governments, non-state actors such as think tanks, transnational corporations, and business associations are involved in the formation of infrastructure policy. Each of these actors is guided by a specific set of political objectives and ideas related to the design and operation of infrastructures. We schematically differentiate between four design logics that can, depending on the issue at hand, be mutually reinforcing or competing:

1. The *geoeconomic design logic* is the one central to this article. It corresponds to the changed global constellation and seeks to organize infrastructures in a way that enables the control of transnational value chains. Within the EU, the geoeconomic logic is primarily promoted by the European Commission and select national governments, in cooperation with think tanks operating at the intersection of European trade, competition, and foreign policy—e.g., the European Council on Foreign Relations or the Center for European Policy Studies—as well as some sectoral business associations, while umbrella associations are more hesitant.
   Geoeconomics is distinct from geopolitics. While in a narrow or instrumental understanding, it can refer to the utilization of economic tools, such as sanctions in geopolitical (sometimes even military) conflicts, geoeconomics in a more comprehensive form constitutes politics that strive to control transnational value chains for the purpose of expanding national production, safeguarding economic autonomy, and gaining a competitive edge over global rivals. Infrastructures play a crucial role in this. Networks generate patterns of dependency and allow actors in control of critical hubs to exploit this for territorial or social control (Farrell & Newman, 2019). This includes the instrumentalization of extant infrastructures, but also the strategic planning, financing, and regulation of new ones, for security aims and the control of spaces. The geoeconomic shaping and operation of infrastructural networks also serves to expand economic production, as infrastructures constitute the physical and digital linkages between economic spaces, determining the pathways and speed through which their exchange takes place. A geoeconomic

design logic thus views infrastructures not just as powerful tools of coercion or information-gathering, but also as prerequisites of consolidating transnational value chains and of economies' inclination to expand geographically (Abels & Bieling, 2023b). Accordingly, infrastructure policy is geared towards outperforming competitors in the race for key markets and technologies.

2. There is a *capitalist design logic* that displays some significant compatibilities with the geoeconomic one. These concern above all the productive facet of geoeconomics that corresponds with establishing specific "spatio-temporal fixes" (Harvey, 2003). Infrastructure policy aims to fix capitalist development by anchoring and embedding it materially and channeling financial resources into fields of investment that are crucial for improved economic connectivity. Yet, the capitalist logic is not confined to geoeconomics but focuses on two intrinsic aspects: macro-economically on stabilizing the economy and micro-economically on promoting productivity and enabling profits. Thus, at the EU level, this logic is commonly promoted by the European Commission (above all by the Directorate-Generals for the Single Market, Competition, Industry, and Trade), financial investors, and all kinds of lobby groups and business associations, including the European Industry Round Table and BusinessEurope. Infrastructure development presents investment opportunities where large volumes of capital are mobilized and channeled into projects with a long-term perspective. It is related to the prospect of future profits for companies utilizing infrastructures and those involved in establishing and financing them. This may imply tensions with the geoeconomic logic, as profit-seeking actors such as transnational corporations, financial investors, and associated political forces have incentives to prioritize and promote not those projects of the highest geostrategic value but those that generate the highest returns.
3. There is also an *ecological design logic* that aims to optimize the energy and climate balance of infrastructures and the connectivity generated by them. Against the backdrop of the climate crisis, this design logic has gained importance practically and discursively. It has been articulated primarily by environmental movement organizations as well as green parties and has been taken up and transposed into a modernization strategy by business actors, other political parties, and state apparatuses (Haas et al., 2022). As current debates on renewable energies, hydrogen, or the expansion of rail networks illustrate, issues relating to the generation and supply of energy and mobility are at the center of many infrastructure policy considerations. The ecological design logic is reflected in concepts for an innovative transition policy, entailing a comprehensive infrastructural reorganization embedded in the broader discourse on sustainable development.
4. A *social-integrative design logic* aims to improve democratic control, participation, and social cohesion (Foundational Economy Collective, 2018). It is frequently articulated by trade unions, including the European Trade Union Confederation, consumer associations, and social movements. This logic views infrastructures as prerequisites for the provision of essential public goods. It thus pushes for the development of social infrastructures in the fields of childcare, education, and housing, but also for the general availability, affordability, and accessibility of infrastructures in the fields of energy, communication, and transport. In addition, the logic is characterized by calls to compensate or ease the consequences of rapid structural change via the flanking of infrastructural programs with employment programs, vocational training, and further measures.

The outlined design logics and the alliances that promote them have been stimulated and shaped by recent crisis dynamics. There are some practical compatibilities between logics, yet they are frequently subject to minor or major conflicts of objectives. As the analysis in Section 4 demonstrates, all logics impact EU infrastructure policy to some degree, but some design logics articulate themselves hegemonically.

4. Analyzing EU Policy on High-Tech Infrastructures

4.1. Methods and Material

Seeking to understand what logics and alliances are driving the new state interventionism in EU infrastructure policy, this article takes a closer look at the development of two central high-tech infrastructure projects: the federated data infrastructure Gaia-X and the Hydrogen Strategy. We chose these two cases as they are representative of two major infrastructural fields: communication and energy. Hence, comparing the findings will help us identify larger dynamics of EU infrastructure policy instead of remaining limited to a certain field. In addition, both the processing of European data as well as the energy transition are central issues in which current debates over the control and autonomy of European value chains intersect. The two projects, Gaia-X and the Hydrogen Strategy should be viewed as elements of the new state-interventionist phase in EU infrastructure policy. As both are rather recent initiatives, they are still in the planning and early implementation phases: Gaia-X was announced in 2019 and the Hydrogen Strategy was agreed on in 2020.

The analysis seeks to identify and compare in a structured manner the geoeconomic context, the intervening logics and alliances, and the policy outcomes of both projects. It builds on data from official documents, position papers, and media reports to reconstruct the underlying constellations. Non-state actors, particularly business actors, are becoming part of the organizational structure of the infrastructure projects as they progress. Negotiation processes are also becoming more opaque and public records by the involved parties more scarce. We collect available documents and statements made by central state and business actors—companies and associations—involved in both cases and present the most significant in the following analysis.

Gaia-X is characterized as a communication infrastructure, whereas the Hydrogen Strategy concerns the field of energy. Due to their geostrategic, ecological, social, and economic relevance, the previously outlined design logics have a role to play. These design logics constitute an admixture of material interests and ideational preferences, which relevant state and non-state actors pursue and find their expression in their contribution (or resistance) to specific infrastructural initiatives. The self-positioning of actors is cross-checked with media reports and academic studies to approximate the relevant design logics and their proponents.

4.2. Gaia-X

4.2.1. Geoeconomic Context

Cloud services are central building blocks of a digitizing economy. They allow companies and consumers to access and use the storage and computing capacities of central providers according to their current demand and without having to set up designated data centers. The flexibility in utilizing these services—being able to assign high capacities to individual processes—has made them indispensable tools for digital applications such as the training of machine learning models as well as the processing of vast amounts of data generated by autonomous vehicles or smart cities. Cloud services rely on the setup of infrastructures in the form of data centers at strategic locations and their physical connection via ties, such as fiber optic cables.

Cloud providers benefit from economies of scale, as larger providers will get better deals on hardware and software and can optimize the costs of networks and personnel. Consequently, centralization effects in the cloud sector contributed to the concentration of traffic and data access. Several big players became increasingly influential. Subsidiaries of Amazon, Microsoft, and Google have a combined market share of around 65%, making cloud services a segment mostly controlled by US tech firms. In light of global competition, the US government has leveraged its position as a global cloud services hub. In March 2018, it passed the US Cloud Act, which grants US law enforcement access to electronic data held by domestic providers even if the data is stored on servers located outside the US.

For the EU, this has raised concerns about the dependency of European states and businesses on essential infrastructures provided by US firms, about data security, and conflicts with the EU General Data Protection Regulation (Autolitano & Pawlowska, 2021, p. 11). In 2019, initiatives for a more autonomous cloud sector in the EU resulted in a proposal by the German Ministry of the Economy (BMWi), closely coordinated with the French Ministry of Economy, to set up an EU-based infrastructure called Gaia-X. The initiative, which German Minister of Economy Peter Altmaier praised as a "moonshot" and a "gold standard for cloud services" (Koch et al., 2020), would be coordinated by a non-profit association seated in Brussels, while national Gaia-X hubs were to be set up in participating member states. As of now, the organization consists of 377 members. It operates via its board of directors, consisting of management staff from participating organizations. Board members have to be headquartered in Europe. It is currently headed by Catherine Jestin from Airbus. It also includes representatives from companies such as Deutsche Telekom and Orange as well as large European and national business associations. EU actors earmarked substantial funds for the project, with the Commission aiming to contribute €2 billion (Obendiek & Seidl, 2023, p. 1319). In 2023, they set up a designated IPCEI called Next Generation Cloud Infrastructures and Services (CIS), which is supposed to fund initial industrial use cases with a volume of €3.5 billion.

4.2.2. Intervening Logics and Alliances

In the early phases of the initiative, the form Gaia-X would eventually take was still subject to debate. The logics and alliances involved in the formation of political decisions on Gaia-X were pulling in different directions. A geoeconomic logic addressed both the EU's external dependencies and productive potentials. It viewed Gaia-X as a way to make Europe more autonomous in its access to and regulation of essential cloud infrastructure, while also highlighting the potential of securing a share of the cloud market and related value chains for European companies.

Thierry Bretton, former CEO of the French tech firm Atos and, since 2019, Commissioner for Internal Market in the von der Leyen Commission, has been criticizing non-European providers and demanded European data to be stored and processed in Europe (Manancourt, 2020). The BMWi took up his arguments, criticizing the lock-in effects that made it hard to migrate data away from US providers and warning that this dependency could negatively affect the EU's economy "in the event of political conflicts" (BMWi, 2019, p. 8). The geoeconomic argument was that an independent EU cloud infrastructure would decrease the foreign leverage over European companies and, by extension, states, and increase the EU's autonomy and capacity to act.

Such territorial arguments have also been reflected in statements from national business associations. The Federation of German Industries (BDI) and the French employer federation MEDEF have been strongly

supportive of the initiative from its inception, associating with it an acceleration of "sovereign digitisation" and "leadership in the digital economy" (BDI & MEDEF, 2020). VOICE, Germany's largest umbrella organization of IT-using companies, warned that "Europe cannot and must not assume that US or Chinese providers will pursue…the interests of our companies" and that US and Chinese data regulations would endanger data security and promote industrial espionage (VOICE, 2019). Bitkom, a large association of the German digital economy, which is represented on the board of directors at Gaia-X, has viewed the project and the calls for digital sovereignty as a "German and European response to US threat scenarios," while stressing the need to "revitalize the partnership with the US" (Bitkom, 2020). Ultimately, state actors and business organizations, mostly national ones, promoted a geoeconomic logic and expressed the expectation that Gaia-X could reduce external dependencies and make the EU more competitive technologically and economically.

The geoeconomic logic was in parts complemented, yet eventually overshadowed by a capitalist one that viewed Gaia-X in terms of productivity and profit-seeking, enabling business activity and new business models that would help Europe catch up in the digital economy. This logic has been part of BMWi's initial reasoning for Gaia-X as well: European companies, particularly SMEs, would remain skeptical about the costs of cloud usage and resulting dependencies, which means that "innovative ideas are less likely to be translated into new business models" (BMWi, 2019, p. 8). At a conference, Marco Alexander Breit, senior official of the BMWi responsible for Gaia-X, referred to Europe's lack of an innovation hub comparable to Silicon Valley, viewing Gaia-X as an opportunity to create such a hub digitally (Baur, 2023, p. 16).

Large European industry associations discussed Gaia-X in a similar tone. Digitaleurope, a major trade association of the digital technology industry, is represented on Gaia-X's board of directors. It largely refrains from addressing Gaia-X in terms of global rivalry, focusing more strongly on "jobs, innovation and economic growth" and calls for public de-risking of private investments in the cloud industry (Digitaleurope, 2021). What unites large tech-centered associations like Digitaleurope, Bitkom, or CISPE is that their membership is open to non-European companies. Digitaleurope and Bitkom both represent the interests of Amazon, Apple, Google, Microsoft, Intel, and Huawei as their members. The organizational structure of Gaia-X stipulates that only European-based companies are authorized to sit on the decision-making body, the board of directors. However, the fact that Digitaleurope, Bitkom, and CISPE are represented there has also brought US tech companies and other non-European organizations to the table. The European companies working on Gaia-X are often partnering with or in a dependent relationship with these firms, which has given non-European capital a strong leverage in working groups as well (Goujard & Cerulus, 2021). In effect, the geoeconomic orientation of the project has been toned down. Government actors were hardly able to counteract this. Gaia-X's organizational structure and the dominance of private actors in the initiative strongly reflect the desire of member states to make this "a project of the industry for the industry" (Obendiek & Seidl, 2023, p. 1321). Private companies—both European and foreign—made use of this hands-off approach by the member states to shift Gaia-X's design logic further towards the advancement of their profit interests and the stabilization of their business models via public funds.

A social-integrative logic has been essential to the project in the initial phase but has been less pronounced since. The safeguarding of European data and the free choice of cloud services for users have been stressed as central objectives of Gaia-X. All participating providers are expected to fulfill standards in line with European regulations on data protection. However, documents published by private contributors seldom

refer to the accessibility or affordability of services or their societal benefits. VOICE has criticized that Gaia-X as an organization almost exclusively features the supply side—cloud providers, associated industries, and their representatives—instead of user associations (VOICE, 2019).

The ecological design logic plays only a marginal role, even though cloud infrastructure has a substantial impact on the environment and the climate. Data centers emit a lot of waste heat and consume vast amounts of electricity. In the political debate, the ecological relevance of the project is mostly addressed in ways that frame renewable energy systems and the circular economy as potential beneficiaries of Gaia-X (BMWi, 2020).

4.2.3. Policy Outcome

As a consequence of the gradual amendment of a geoeconomic logic by a capitalist one, Gaia-X remains one of the EU's major state-initiated infrastructure projects, yet its form has changed over time. The initiative has argued that "once more, our continent is in danger of losing out in one of the core sectors for the economic development of the century," but that a European cloud hyperscaler would "engage in a futile attempt to compete for market share in mass business with the dominant platforms of the Americans and Chinese" (Gaia-X, 2022). What was originally discussed as an "AI-Airbus" has been transformed into an "ecosystem" connecting certified cloud providers. Gaia-X now envisages to rather standardizing cloud providers in Europe, binding them to European rules and standards, and preventing lock-in effects.

This reshaping of the initiative has gone hand in hand with a discursive and political shift towards attenuated geoeconomic ambitions to which several factors have contributed: internal conflicts between companies over organizational details; a retreat of state-interventionism after the initiation phase; and the influence of non-European actors from cloud provider giants, like Amazon Web Service to US-military associated firms like Palantir.

4.3. Hydrogen Strategy

4.3.1. Geoeconomic Context

Hydrogen is seen as an energy carrier with great potential. It has been the subject of research for some time and is at present mainly produced from gas or coal—so-called "grey" and "brown" hydrogen—or obtained as a by-product of industrial production. However, the high technological and material requirements, security risks, and considerable costs associated with producing, storing, transporting, distributing, and using hydrogen, have limited its use (Lebrouhi et al., 2022). This now appears to be changing due to new energy sources, especially renewables ("green" hydrogen), and more efficient electrolysis or hydrogen extraction, combined with carbon capture and storage ("blue" hydrogen). The change is contingent on the provision of a suitable infrastructure linking production and use to establish a functioning hydrogen market.

In recent years, this development has gained momentum, initially in the context of the European Green Deal (Haas et al., 2022). Hydrogen represents an option for mitigating the large fluctuations in renewable energies, especially solar and wind power, through storage. It also represents a way of replacing fossil fuels with alternative fuels in industries, such as steel and chemical, as well as in heavy freight transportation such as trucks and ships. The EU is working to expedite this transition. The Hydrogen Strategy (European

Commission, 2020c) has announced ambitious targets to be achieved by 2030: the European increase of electrolysis capacity from below one gigawatt to 40 gigawatts and the production of 10 million tons of clean hydrogen annually. The development of hydrogen infrastructure in addition to newly built pipelines and refueling stations, also includes the conversion of the existing gas infrastructure (pipelines, storage, liquefied natural gas terminals) and the establishment and connection of regional hydrogen clusters.

The geoeconomic dimension of the Hydrogen Strategy is significant. The EU is competing with the US, China, and Japan for global technological leadership across all elements of the hydrogen value chain (Van de Graaf et al., 2020, p. 4). This competition also involves the definition of specific standards for production, storage, and transport in international forums and organizations. Additionally, the EU aims to achieve its targets by importing green hydrogen. The REPowerEU plan proposes the import of 10 million tons per year starting from 2030 (European Commission, 2022). For this purpose, it suggests the establishment of three major hydrogen corridors through the Mediterranean, the North Sea area, and Ukraine (as soon as conditions permit). The Russian attack on Ukraine has further emphasized the geoeconomic orientation of EU energy policy (Siddi & Prandin, 2023). This is also reflected in the manifold activities through which the EU aims to achieve control over all components of the hydrogen value chain.

4.3.2. Intervening Logics and Alliances

The emerging hydrogen market is more heterogeneous, flexible, and decentralized than the international gas market. This is partly due to the complex nature of the hydrogen value chain, open to manifold forms of influencing. Consequently, companies from different business sectors, in cooperation with state agencies, try to expand the capitalist design logic in their interest (Van de Graaf et al., 2020, pp. 2–3): by pushing for the technical, financial, and regulatory promotion of a particular type of green, blue, or grey hydrogen or by facilitating infrastructure projects that allow the handling of specific forms of hydrogen—gaseous, compressed, or liquid. Companies compete for specific transition pathways to improve their respective profit expectations by locking in practices corresponding to their business model. This applies above all to hydrogen-affine operators of gas pipelines organized in the European Hydrogen Backbone (EHB) initiative and individual gas companies organized in Hydrogen Europe, highly effective EU lobbying organizations (Corporate Europe Observatory, 2023, p. 7). Companies from other fields of energy production, logistic firms, financial actors such as banks and investors, as well as research centers and think tanks also make a case for hydrogen. They are organized in the European Clean Hydrogen Alliance (ECHA), set up in 2020 to actively support and implement the EU's Hydrogen Strategy. The close cooperation within ECHA changes the form of governance of the project as it allows the EHB, Hydrogen Europe, and financial investors to lobby European decision-making from within.

The capitalist design logic largely corresponds with a geoeconomic design logic that focuses on controlling the different components of the hydrogen value chain. This control is both inward and outward-oriented. The inward orientation relates to the attempt to secure energy supply through a more comprehensive infrastructure: new hydrogen pipelines, upgraded gas pipelines, more storage, additional fueling stations, etc. Time and again, Hydrogen Europe (2024, p. 6.) has proposed a series of measures that would make a strong and resilient pan-European hydrogen infrastructure operational. In line with this, the EU has promoted a couple of projects, using wind power from the North Sea and Baltic Sea area and solar power from Spain and Portugal for a trans-European hydrogen grid. This is complemented by an outward orientation that aims at

both technological leadership in the field of hydrogen and clean hydrogen imports from neighboring regions, above all from African countries, such as Morocco, Algeria, and Mauretania (Weko et al., 2023). The geoeconomic design logic is promoted by supranational state agencies, such as the Commission and the EIB, member states, as well as the aforementioned lobbying organizations. The latter strongly welcomed and supported REPowerEU (EHB, 2022). Hydrogen Europe, in cooperation with other European energy and key material suppliers, calls with urgency for an "EU Clean Industrial Deal," meaning "a real and tangible Industrial Policy covering the full supply chain…to ensure Europe does not drop out of the world's clean technology race" (Hydrogen Europe, 2023, p. 1). Furthermore, business actors make use of international fora like the African-Europe Green Energy Initiative or bilateral diplomacy to prepare outside investments in hydrolysis capacities, pipelines, and shipping routes.

A social-integrative design logic can only be identified to the extent that additional investments also create employment opportunities and thus implicitly activate the consent of employees and trade unions. Compared to this, the ecological design logic plays a much stronger role. The aim of decarbonizing the European and global economy is mentioned in all documents and strategy papers and state and business actors play the climate card frequently. At the same time, the ecological design logic is also articulated by associations and networks of the environmental movement who have become increasingly critical of the so-called "hydrogen hype" (Corporate Europe Observatory, 2023, p. 3). They emphasize the limits and problems of a modernization approach that regards hydrogen as a technology that serves to rescue fossil energies and corresponding modes of production and living (Haas et al., 2022, pp. 255–256). Also, they fear that the EU's foreign hydrogen infrastructure investments will generate new forms of "green land grabbing" and ecological harm, for example in water-scarce regions (Claar, 2022).

4.3.3. Policy Outcome

Critical voices are not absent in discussions about the hydrogen strategy. They are few, however, compared to the powerful actors organized in the ECHA that cooperate very closely with the Commission and EU member states. As a result of this cooperation, decarbonization efforts are increasingly reframed and subsumed to the criteria of profitable investment and geoeconomic control. The reorganization and securitization of energy provision after the Russian attack on Ukraine also impacts the EU's Hydrogen Strategy. The aim to achieve control of the whole hydrogen value chain is tangible in the strategy paper and related documents, such as Global Gateway (European Commission, 2021) or the Critical Raw Material Act (European Commission, 2023b). Practically, control should be achieved by a gradual but planned extension of the hydrogen infrastructure. Financial resources for investments are mobilized by the RRF or as part of IPCEIs—a second wave of 35 individual projects in 2023 is explicitly dedicated to hydrogen infrastructure.

EHB outlines how, from its members' perspective, the gradual improvement and extension of the hydrogen infrastructure should continue until 2030 to reach the goals of REPowerEU (EHB, 2023). Their report focuses on EU-internal infrastructure but includes some links to neighboring regions. EU bodies, national agencies, and private actors like energy companies and transmission operators have been trying to build external links for some time now, negotiating international standards for hydrogen production, transport, and use to facilitate investments and hammering out specific projects (Weko et al., 2023). The EU hopes that Global Gateway will expedite such initiatives, as additional financial resources should stabilize the profitability expectations of private investors; and, eventually, contribute to geoeconomic control.

5. Conclusion

The findings of our analyses support the overall argument that European infrastructure policy has, in recent times, been increasingly driven by the changed global constellation and that it takes a more state-interventionist form to reach European objectives. Both Gaia-X and the Hydrogen Strategy are representations of this trend. In their planning stage, they reflect a geoeconomic logic that seeks to reduce external dependencies and guarantee control over and access to transnational value chains. However, as the project reaches an implementation phase, in both cases a capitalist logic that prioritizes the realization of profits on the part of European businesses complements (hydrogen infrastructure) or even overshadows (cloud infrastructure) the geoeconomic one. In both cases, a social-integrative and an ecological design logic are largely sidelined and become subordinated. This is particularly remarkable in the case of the hydrogen strategy where there is an immediate effect of infrastructure policy on the carbon footprint.

The findings do not imply that the geoeconomic logic behind the projects vanishes or that it served only as a discursive device. As is apparent in the new state interventionism of recent years, the EU infrastructure policy has indeed changed in light of global pressures, and both Gaia-X and the Hydrogen Strategy are an expression of this. In the two cases, the geoeconomic and capitalist logics display substantial complementarities, which drove the project forward. Yet, particularly in the case of Gaia-X, the capitalist logic has become more dominant and limits the transformative potential. While France and Germany, the initiators, showed strong interest in an autonomous European cloud infrastructure, this ambition has proven at odds with the private character of financing, operation, and organization of the project.

The extent of geoeconomic control the EU strives for seems to decrease in the case of Gaia-X, while it remains prominent in the hydrogen strategy. Whereas in the case of the latter, it is primarily European lobbying organizations that influence the formation of infrastructure political decisions, with Gaia-X non-European businesses, first and foremost US-American oligopolistic tech firms, got a substantial say in the process due to the hands-off approach of European member states. This confirms the assumption that European infrastructure initiatives which could become globally competitive provoke external interference by competitors such as the US, who exploit internal divergences and reluctance to hinder the process, leveraging their business ties with European companies (Abels & Bieling, 2023a). It also highlights that the EU runs the risk of infrastructure policy failure as geoeconomic and geopolitical objectives are often insufficiently aligned with the interests of business elites (Hameiri & Jones, 2023).

The EU's infrastructure policy is currently in flux. We are witnessing the beginnings of a more state-interventionist era where initiatives and the allocation of resources are increasingly the product of political planning instead of being left to market mechanisms. Yet, at times, the EU's intergovernmental structure as well as its non-aligned business fractions act as a brake on the emerging geoeconomic turn. The EU frequently relies on private investment in light of tight public budgets and on business impulses to realize infrastructure projects. This reliance poses strict limits to the geoeconomic orientation of infrastructure policy as well as the EU's overall ability to compete globally.

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ARTICLE

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US Critical Mineral Policies and Alliance Strategies in an Age of Geopolitical Rivalry

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Abstract

We examine the geoeconomic strategies of the US regarding critical minerals through the lens of geopolitical rivalry with China. Chinese companies, mostly state-owned enterprises, play a prominent role in the extraction and processing of minerals critical to the energy transition. Drawing on the balance of power theory, we argue that the US, the incumbent hegemon, can employ both domestic policies and alliance-building strategies to counterbalance China's dominance in critical mineral sectors. Empirically, we first assess the nature of US domestic policies with respect to promoting domestic critical mineral production and restricting foreign investment in the extractive sectors through investment screening measures, and then assess the degree to which the US has relied on Five Eyes alliance partners to achieve common strategic goals. We find evidence that the US uses a multifaceted geoeconomic approach involving domestic policies and alliance strategies to counterbalance China's dominant position in critical mineral supply chains.

Keywords

China–US rivalry; critical minerals; Five Eyes; geoeconomics; state-owned enterprises

1. Introduction

US–China rivalry has escalated in recent years (Allison, 2017; Kim, 2018), extending its scope to include climate-related technologies and critical minerals (Kalantzakos, 2020; Shen, 2022). China dominates in both sectors, with other countries highly dependent on China for critical minerals (Castillo & Purdy, 2022). As critical minerals are essential inputs for the global energy transition and an integral part of the global fight

against climate change (International Energy Agency, 2021), dominance by a single state over critical mineral supply chains suggests the importance of de-risking strategies by countries seeking to reduce resource dependence on China. De-risking here refers to reducing the risks of overdependence on a single country in critical industries while maintaining basic trade and investment activities with that country (Capri, 2023). It is distinct from decoupling, which entails completely cutting off economic connections with a rival country. We focus on de-risking because countries like the US are currently adopting such strategies in critical sectors with regard to China (Sullivan, 2023). While most discussion focuses on de-risking in advanced technologies, such as the US CHIPS and Science Act and efforts to rally allies to restrict exports of semiconductor tools to China (Donnelly, 2023; Malkin & He, 2023), scant attention has been paid to critical minerals (Kalantzakos, 2020; Zhou et al., 2023). De-risking from China in this context poses unique challenges due to the geographic concentration of critical minerals in specific countries, which may not be US allies, and the high economic and environmental costs associated with their extraction and processing, making diversification away from China challenging (Castillo & Purdy, 2022).

In this article, we address the underexplored questions of what de-risking strategies the US has adopted concerning critical minerals. Specifically, we investigate the US' critical mineral strategies and policies from the perspective of its hegemonic rivalry with China, focusing on its efforts to de-risk and counterbalance China's dominance in critical minerals.

Our work builds on classic realist theories focused on the balance of power (Gilpin, 1981; Walt, 1985; Waltz, 1979), along with their recent applications to understand economic policies in a geopolitical context (Donnelly, 2023; Malkin & He, 2023; Roberts et al., 2019). We argue that when an incumbent hegemon such as the US perceives a threat to its position, it tends to take balancing actions, including domestic and external strategies, to maintain or enhance its relative power. In the context of critical minerals, the US perceives significant risks arising from dependence on China for these resources and the potential for China to weaponize its dominance in this sector. Accordingly, we suggest that the US may adopt geoeconomic strategies—using economic instruments for geopolitical gains (Blackwill & Harris, 2016)—to counter China's growing dominance in the critical mineral sector. Domestic balancing strategies include policies to boost domestic production and strengthen foreign investment screening measures (ISMs). External balancing strategies are based on diffusing these strategies through alliances (Roberts et al., 2019). We summarize these arguments in a theoretical framework (Table 1), categorizing US strategies into four types aimed at enhancing the strategic position of the US and its allies relative to China.

We use this theoretical framework to empirically address the following question:

> Does the US use domestic policies and international alliances to de-risk and counterbalance China's dominance in the critical mineral sector, and, if so, what specific strategies does it employ?

To understand the US' external balancing strategy, we consider critical mineral strategies of its allies in the Five Eyes (FVEY) intelligence alliance, including Australia, Canada, New Zealand, and the UK. We focus on this alliance for three reasons. First, these countries are part of a common intelligence network, share similar economic and political institutions, and have common roots in Anglo-Saxon common law, all of which facilitates policy collaboration and policy convergence (Hemmings & Varnish, 2021; Holzinger & Knill, 2005). Second, these countries either possess potentially abundant critical mineral resources or serve as hosts for

global resource companies, thereby increasing their appeal as potential alliance partners for the US to build an alternative critical mineral supply chain. Third, the FVEY countries have been identified by observers as a coordinated group forming a "protectionist huddle" designed to limit foreign interference and investment within their borders and support secure supplies of critical minerals (Kissin, 2023).

Analyzing documents pertaining to critical minerals in all FVEY countries, we find that the US has used domestic policies and alliance-building strategies to both promote the critical mineral sector in the US and allied countries and weaken China's access to resources and capabilities in critical mineral sectors. Domestically, the US has implemented industrial policies to support domestic critical mineral development. Additionally, it has linked the extractive sector to national security concerns in its domestic ISMs and trade policies, thus weakening China's access to critical minerals in the US. Internationally, the US has established collaborative partnerships to promote trade and investment with Australia and Canada in critical mineral supply chains. Our results suggest that a US ally's shared concerns over dependence on China's critical mineral supplies, coupled with the strategic importance of critical mineral businesses for the country's competitive advantage, increase incentives to align with US policies in critical mineral sectors. Specifically, Australia, Canada, and the UK have expressed concerns regarding reliance on China's dominance in critical minerals and have strengthened or adopted ISMs to enhance regulatory scrutiny over foreign investments, particularly those involving foreign state-owned enterprises (SOEs), in critical minerals in their respective countries, showing convergence in ISMs with those of the US. In the case of New Zealand, despite potentially hosting a variety of critical minerals (GNS, 2024), current mining operations in the country remain relatively small, and it has yet to adopt stringent ISMs or form a partnership with the US on critical minerals.

Our study contributes to geoeconomics research by studying geoeconomic policies (as opposed to military strategies) in the context of internal and external balancing. Building on current scholarship on geoeconomics (Babić et al., 2022; Malkin & He, 2023; Weinhardt et al., 2022), we examine how states rely on economic policies both domestically and internationally to balance a rising rival power. In particular, we enhance understanding of the conditions leading to convergence in geoeconomic policies among the hegemon and its allies. Furthermore, our study advances the current discussion on de-risking (Farrell & Newman, 2023) by expanding its focus beyond advanced technologies and employing a balance of power perspective to unpack internal and external de-risking strategies. We find that the de-risking strategies in critical minerals entail industrial, trade, and investment policies, highlighting the various roles of economic policies in geopolitical competition within an understudied strategic sector.

In the following section, we present our theoretical framework, using the balance of power theory to understand the US–China rivalry. Next, we study the existing power relations in the critical mineral sector, focusing on the perceived threat posed by China's control of the supply chains of specific critical minerals. We then outline how the US can use both domestic and international strategies to strengthen its position in the critical mineral sector. Finally, we present our analysis and findings, followed by our conclusion.

2. Theoretical Framework: Balance of Power in the US–China Rivalry

The liberal world order that emerged during the first phases of globalization is being challenged by shifting geopolitical and geoeconomic developments manifested in the US–China rivalry. This rivalry intensifies as China increases its economic and military power and is amplified by fundamental differences in economic,

political, and value systems (Allison, 2017; de Graaff et al., 2020). We see a rise in interventionist economic policies from advanced industrialized states, led by the US, aimed at counterbalancing the expansion of state capitalism championed by China (Alami et al., 2022; Babić et al., 2020), which includes attempts to redefine global supply chains and create new trading partnerships (Kolben & Rioux, 2023; Linsi, 2022; Malkin & He, 2023).

We use the balance of power theory to examine these issues in the context of critical minerals and hegemonic rivalry. The theory suggests that a hegemonic power, when it perceives a threat to its position, will seek to restore balance through domestic policies and external alliances (Gilpin, 1981; Walt, 1985; Waltz, 1979). Internal balancing relies on domestic policies to improve a country's position against rivals, while external balancing entails collaboration with allies and partners through coordinated policies (Roberts et al., 2019; Schweller, 2016).

As China's power over a specific economic sector, such as critical minerals, expands and the US becomes increasingly dependent on China in this sector, the perceived threat to the US also increases. This vulnerability is captured in the theory of weaponized interdependence, which suggests that countries can leverage their market power and bilateral dependencies to extract benefits from power imbalances when they exert dominant control over specific nodes (Farrell & Newman, 2019). Farrell and Newman (2019) illustrate how US centrality in financial nodes and networks allows it to weaponize its financial dominance, but the idea can be extended to other sectors such as oil (Detomasi, 2022), and other countries such as China that can use their centrality in different sectors to weaponize parts of the network where they dominate, such as by restricting US access to critical mineral resources.

Thus, we anticipate that an incumbent power will take balancing measures against its rival to address the perceived threats and mitigate the associated risks (Walt, 1985). Moreover, balancing strategies are increasingly geoeconomic in nature, relying on economic policies to support national interests against competing states (Ikenberry & Nexon, 2019; Malkin & He, 2023; Weinhardt et al., 2022). Domestic policies, such as curbs on imports/exports, imposition of tariffs, and adoption of ISMs, are geoeconomic tools that can be designed to restrict a country's economic relations with a rival state in selected industries (Roberts et al., 2019). Governments can supplement these measures with industrial policies promoting selected industrial sectors. Industrial policies have been used as a response to disruptive technological changes and, in the Western economies, to the rise of China (Aiginger & Rodrik, 2020). Roberts et al. (2019) note that countries adopting these policies use national security rhetoric to justify growing interventionism in the economy. External policies focus on alliance-building to reshape economic relationships both between oneself and one's allies and between allies and the rival state (Roberts et al., 2019). In several cases, the US has used external balancing by urging its alliances to ban Huawei from its 5G technology (Roberts et al., 2019), while also employing geopolitically motivated friend-shoring, linking supply chains among allied nations (Vivoda, 2023).

Below, we apply the balance of power theory to explore how the hegemonic power, the US, responds to the dominance of Chinese firms, largely SOEs, in critical mineral supply chains by employing internal and external balancing strategies to pursue geoeconomic objectives.

3. Existing Power Relations in the Critical Mineral Sector: Dependence on China and National Security Considerations of the US

Critical minerals, deemed "strategic resources," are concentrated in specific geographical regions and prone to resource competition driven by geopolitical and strategic objectives as states seek resource security and economic security (Le Billon, 2004; Shiquan & Deyi, 2023). As the world embarks on the next industrial revolution and a clean energy transition, critical minerals such as lithium, cobalt, and nickel that are essential in the production of rechargeable batteries for electric vehicles and for renewable energy generation will increasingly be in demand (Castillo & Purdy, 2022). Securing critical mineral supply chains is thus considered a "non-traditional national security" challenge, given their importance in supporting industrial systems necessary for addressing climate change (Shiquan & Deyi, 2023). In this case, a concentrated control of critical minerals in a single country considered a rival to the US is seen as a national security threat. Despite the need for global collaboration in alleviating the global climate crisis, the rise of national security rhetoric restricts collaboration in strategic sectors like critical minerals.

China is a dominant player in critical minerals. China dominates global supply chains for several critical minerals, especially in the processing stage (Castillo & Purdy, 2022). Based on 2019 data, China produced around 60% of the world's lithium, over 60% of graphite, and processed over 90% of rare earth elements and around 50% to 70% of lithium and cobalt (International Energy Agency, 2023). Furthermore, China increasingly acts as a "one-stop shop" to finance, produce, and refine critical minerals, especially in developing countries, through its Belt and Road Initiative (Kalantzakos, 2020). This consolidation strengthens China's ability to set global prices, restrict access to resources, and use minerals as political leverage. Of particular concern is the potential for weaponization, as evidenced by China's past actions, such as restricting exports of rare earth elements during a dispute with Japan in 2010 and threatening to limit critical mineral supplies to the US during the 2019 trade war (Bordoff & O'Sullivan, 2023). China's decision in 2023 to tighten export restrictions on gallium and germanium (Ministry of Commerce of the People's Republic of China, 2023) further reinforced the fears about China's ability to control critical mineral supply chains ("China's curb on metal exports," 2023).

China's ability to weaponize critical mineral supplies is bolstered by the predominant presence of SOEs among major players in the country's critical mineral sector. The SOEs play a key role in both supplying the global critical mineral market and making substantial investments in critical mineral sectors in various countries, including both advanced and developing economies. Notably, in 2019, nine Chinese companies ranked among the top 40 global mining companies by market capitalization, with eight of them being SOEs (PwC, 2020). Chinese SOEs are active participants in the mining sector, accounting for around 76% of China's total investment in mining worldwide from 2005 to 2023 (Figure 1). Furthermore, more than 75% of Chinese acquisitions in the energy and metal sectors of developed countries from 2013 to 2021 were made by SOEs. In addition to SOEs, the Chinese state may exert influence over private firms through financial incentives or data sharing when firms are seen as strategically important, even in the absence of formal state ownership (Milhaupt & Zheng, 2015; Shapiro & Globerman, 2012). These firms are commonly referred to as state-influenced enterprises. The extent of their presence in the extractive sectors is difficult to determine, but their existence suggests an even stronger influence of the Chinese government in the sector.

China's high degree of control over supply chains of certain critical minerals has been perceived as a threat to US national security. Such concerns are highlighted by the Biden administration in its *100-Day Review*

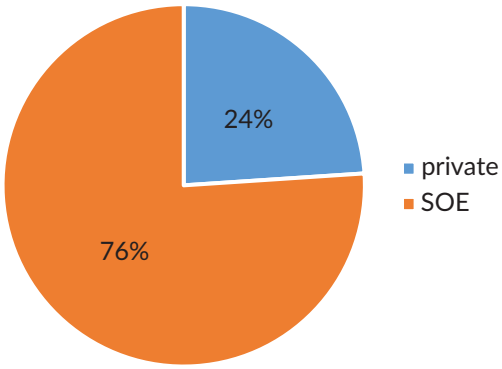

Figure 1. Chinese mining investment abroad private firms vs. SOEs, 2005–2023. Source: American Enterprise Institute (2024).

report, which emphasizes the concentration of critical mineral supplies and processing in a single nation and the dependence on potential adversaries, such as China, as primary risk factors (The White House, 2021a, 2022a). Studies suggest that the US relies on China for over 50% of its critical mineral imports (National Mining Association, 2023). Considering the expanding capabilities of China in critical minerals and the US' dependency on China in these sectors, the US may seek to prevent being vulnerable to weaponized networks by adopting counterbalancing and de-risking measures, as further discussed below.

4. Applying the Balance of Power Framework to US Policymaking in Critical Minerals

We examine the internal and external geoeconomic balancing strategies of the US to increase its relative power in critical minerals. We develop a two-by-two matrix to characterize these strategies (Table 1). Internal balancing strategies are focused on domestic policies, while external balancing relies on alliance-building to support common strategic objectives. The US can pursue internal balancing through policies designed to strengthen the domestic production of critical minerals or weaken China's capabilities

Table 1. A balance of power perspective to understand the US' critical mineral strategies in an age of geopolitical rivalry.

	Strengthen the US' and alliance partners' capabilities	Weaken the rival country's (China's) capabilities
Internal balancing: Domestic strategies	Policies in the US to support the development of domestic critical mineral sectors.	Restrictive FDI policies that limit Chinese firms' investments in critical mineral industries in the US.
External balancing: Alliance-building	Alliance-building to promote trade and FDI in critical minerals between the US and allied countries.	Promote the adoption of restrictive FDI policies by alliance partners to limit Chinese firms' critical mineral investments in allied countries, similar to those in the US, and coordinate policies with alliance partners on critical minerals.

by restricting its access to critical minerals in the US. The US can also engage in external balancing by either building alliance infrastructure to promote trade and foreign direct investment (FDI) with alliance partners or nudging alliance partners to adopt restrictive policies akin to those in the US, thus weakening China's access to critical minerals in the US allies.

As noted earlier, we assess the US' external balancing strategy by analyzing its collaboration with its FVEY alliance partners. These countries not only share an intelligence infrastructure and common institutions but are also either rich in critical minerals or host some of the world's largest mining companies. These characteristics not only enhance their appeal as important partners for the US in building alternative supply chains but also suggest that they may share US concerns over China's dominance in critical mineral supply chains and be interested in developing competitive mineral sectors themselves. These shared interests may drive them to work with the US to counterbalance China's dominance in this sector. Based on critical mineral production for 2021, Canada, Australia, and the US ranked as the major critical mineral producers among the FVEY countries (Figure 2), with Australia accounting for 48% of global lithium production and Canada for 31% of global potash production (Figure 3). Despite Chinese investment in Australia declining since 2013 and in Canada since 2019, these two countries remain among the top five destinations for Chinese SOE acquisitions in the mining sectors from 2013 to 2023 (American Enterprise Institute, 2024),

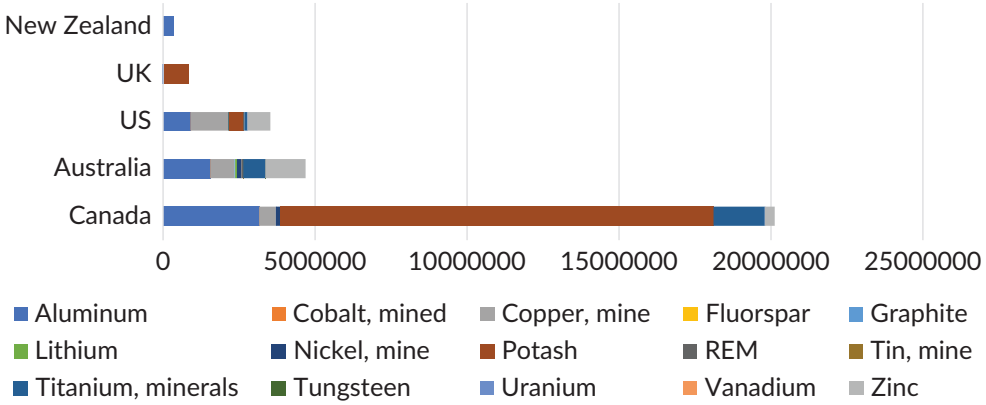

Figure 2. Critical mineral production, 2021. Source: Minerals UK (2024).

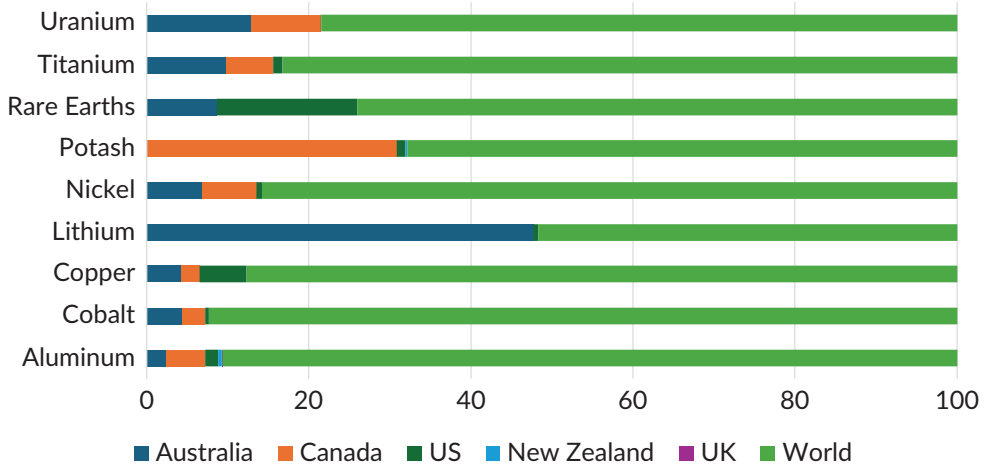

Figure 3. Share of critical mineral production (selected minerals) compared to global production, 2020. Source: Canada Energy Regulator (2023).

suggesting that Australia and Canada may be concerned about national security implications of these acquisitions. The UK, though not itself a resource-based economy, lists some of the largest mining companies in the world (BHP, Rio Tinto, and Glencore) on the London Stock Exchange. Although New Zealand has the potential to develop its critical minerals resources, it will not be discussed in detail in our analysis as it is currently in the process of developing its critical mineral list (New Zealand Government, 2024) and has not yet adopted policy measures to influence investment in the critical minerals sector.

5. Analysis and Findings

Our data includes four sets of relevant critical mineral policies and strategies adopted by the FVEY countries. First, we use the International Energy Agency's Critical Minerals Policy Tracker to identify 31 critical mineral policies, which are identified as "strategic plans" under the agency's policy classifications. Second, we gather relevant trade and investment policies, along with the state's industrial policies on critical minerals, from the New Industrial Policy Observatory dataset (Global Trade Alert, 2024). Third, we gather critical mineral agreements released by the FVEY countries (Table 2). Lastly, we collect ISMs released by the FVEY countries with particular attention to critical mineral passages.

For our analysis, we begin by closely reviewing US documents to understand their declared intent and determine whether their main goal was indeed to de-risk and counterbalance China's dominance, while also identifying specific internal and external balancing strategies adopted by the US in critical minerals. To achieve this, we review passages that contain keywords such as geopolitical concerns, national security, China, SOEs, anti-competitiveness, market intervention, and variations thereof. We use the same approach to review documents from the FVEY allies of the US, identifying their goals and actions, particularly in agreements with the US. We also compare the policies of FVEY countries and their evolution over time to identify any policy alignment in specific domains (such as ISMs). Below, we present evidence for each of the four US strategies classified in Table 1.

5.1. Internal Balancing: Domestic Strategies in the US to Strengthen Domestic Critical Mineral Industry

Under this strategy, the US adopts policies to strengthen the domestic critical mineral sector and reduce its dependence on China. Increasingly concerned about its import reliance on China, the US has updated its Strategic and Critical Mineral Stockpiling Act (The White House, 2021b), developed a set of subsidies to support domestic climate-related industries, including critical minerals, such as the Inflation Reduction Act (The White House, 2022b, 2022c), and is considering other options, such as the Buy American Act, to support the critical minerals industry (The White House, 2022d; US Department of Energy, 2021). The Strategic and Critical Minerals Stockpile Act of 1979 and its updates over time have been important in defining the US approach to critical minerals supply chain security (Bardi et al., 2016; Jordan et al., 1979; Shiquan & Deyi, 2023).

Based on data from the New Industrial Policy Observatory dataset, the US has adopted 43 trade-distorting policies relevant to the critical mineral sector (Global Trade Alert, 2024). Comparing these US trade-distorting policies on critical minerals, including tariffs, tax breaks, financial support, and public procurement policies, with those of other countries indicates that the US alone accounts for over a quarter (27%) of all such measures adopted globally from 2020 to 2023 (Figure 4). The Inflation Reduction Act, for example, can be considered

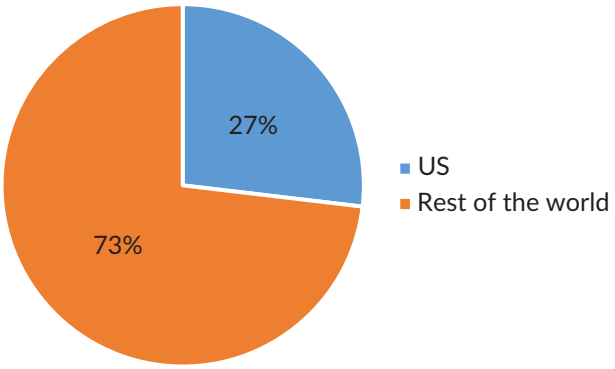

Figure 4. Critical mineral trade distortive measures, January 2020–November 2023. Source: Global Trade Alert (2024).

one of the US' trade-distorting strategies to safeguard its critical mineral supply chain. The US tends to adopt more restrictive trade policies in critical minerals than other countries, with three times as many restrictive policies as the second-largest adopter, India. Additionally, New Industrial Policy Observatory data shows that the US cites national security and geopolitical concerns as primary reasons for its tariff policies on critical minerals. The evidence illustrates the hegemon's desire to attain self-sufficiency given limited domestic critical mineral resources and high dependence on China.

5.2. Internal Balancing: Restrictive Policies to Weaken China's Access to Critical Minerals in the US

Countries may weaken a rival's capabilities by adopting restrictive investment policies to prevent the rival from benefiting from critical mineral exploration and capability development in their territories. These policies, known as ISMs, are designed to preempt investments deemed harmful to national security (Bauerle Danzman & Meunier, 2021) and can impede a rival's access to critical mineral resources and capabilities within their borders. The US adopts a two-pronged approach by designating critical minerals as strategic assets and identifying SOEs and China as entities of special concern, thus subjecting Chinese investments in critical minerals in the US to rigorous investment reviews. Specifically, since the adoption of the Foreign Investment and National Security Act in 2007, the US has closely scrutinized FDI by SOEs and, with the adoption of the Foreign Investment Risk Review Modernization Act in 2018, the US has heightened regulatory oversight over investment from China in strategic sectors (Government of USA, 2007, 2018). As of 2022, under Biden's Executive Order 14083, the scope of the Committee on Foreign Investment in the United States (CFIUS) reviews expanded to include critical minerals (Government of USA, 2022). These restrictive ISMs adopted by the hegemonic power indicate not only a desire to protect domestic sectors but also to restrict a rival country's capacities by limiting its access to critical minerals projects in the US.

5.3. External Balancing: Alliance-Building to Strengthen Critical Mineral Industry in the US and Allied Countries

The US seeks to partner with allies to secure safe access to critical minerals or use alliance networks to mobilize financial resources through trade and investment for the development of domestic critical minerals. US Executive Order 14017 outlines the importance of collaborating with allied and partner countries to secure critical minerals (Executive Office of the President of the US, 2021). To execute this order, the

Department of Energy seeks to partner with the US allies in developing critical mineral supply chains (US Department of Energy, 2021). Notably, the US envisions establishing closer trade and investment linkages with Australia and Canada to diversify its dependence on Chinese-sourced critical minerals (Government of USA, 2021).

The success of the alliance-building strategy of the US, however, depends on whether alliance partners share similar concerns and are willing to work with the US to develop such minilateral alliances. In the case of critical minerals, Australia, Canada, and the UK emphasize their desire to reduce dependence on China as it may undermine their economic and national security (Australian Government, 2022b, 2023; Government of Canada, 2022c; Government of UK, 2022; Government of USA, 2021). Australia and Canada also brand themselves as trusted and reliable suppliers, seeking to partner with allied or "like-minded" partners to develop their domestic resources by inviting allies to invest or sign trade deals (Australian Government, 2022b; Government of Canada, 2022c).

We find evidence in Table 2 that the US has established close collaborations with Australia and Canada to enhance the security of the critical mineral supply chain by promoting two-way trade and investment. Through these agreements, the US is championing collaboration with allies to uphold trade laws to "address adverse impacts of market-distorting foreign trade conduct" (Government of USA, 2021). By promoting two-way investment and trade, the allies seek to develop a critical mineral supply chain outside of countries that may use market distortion, such as export controls, therefore safeguarding the US' access to minerals essential for its economy.

We also find evidence in Table 2 that the US supports bilateral and multilateral collaboration on standard setting, including ESG standards, based on international agreements with its allies. The US, as a hegemon, has historically used trade policies to shield its domestic industries and support other countries to maintain its global dominance (Hopewell, 2021; Kim, 2018). However, these trade frameworks have the potential to differentiate private firms from SOEs, as some SOEs are perceived to have subpar ESG practices. Recognizing the importance of standard-setting, the US Department of Energy has taken a "leadership role in supporting establishing industrial standards" on critical minerals in "coordination with international allies" (US Department of Energy, 2021). Relatedly, the Canadian critical mineral strategy envisions "regulatory harmonization" with the partner countries (Government of Canada, 2022c). Similarly, Australia's critical mineral strategy emphasizes the importance of ensuring consistency in regulations and standards (Australian Government, 2022b). By creating a parallel supply chain infrastructure united by common standards, the US and its allies may be able to counterbalance the dominant position held by Chinese SOEs in the critical mineral sector.

While the US and the UK have not formalized a partnership to bolster critical mineral supplies, the UK acknowledges that "[c]oncentrated control of resources creates a risk of economic statecraft" (Government of UK, 2022) and that China may "weaponize" supply chains, reflecting on the 2010 incident when China reduced the export quota on rare earth elements causing prices to increase rapidly, to extract political leverage over them (Government of UK, 2022; UK House of Commons, 2023). In alignment with the US, the UK has established collaborations with Australia and Canada to seek investment opportunities in those countries and diversify their dependence on Chinese-sourced critical minerals (Government of UK, 2022). Thus, the US and the UK share common objectives of reducing reliance on China and mutual interests in

working with alliance partners to strengthen their own or allies' critical resource capabilities.

Table 2. Agreements between the US and its FVEY partners related to critical minerals. Source: International Energy Agency (2024).

Year initiated	US partner	Document name	Focus	Agreement type
2022	Australia	Australia–United States Net-Zero Technology Acceleration Partnership	Supply chain cooperation in critical minerals; diversify sources of critical minerals with a focus on production, processing, and manufacturing capacity.	Partnership promoting trade, investment, and commercial linkages on net-zero technology acceleration.
2023	Australia	Australia–United States Climate, Critical Minerals and Clean Energy Transformation Compact	Establish the Australia–United States Taskforce on Critical Minerals; diversify supply chains; secure, stable, sustainable, responsive, and responsible global access to critical minerals; "development of a shared energy industrial base" for critical minerals; information-sharing; identify risks and market distortions; collaboration on critical minerals through Quad.	Framework to enhance bilateral cooperation on climate and clean energy, including cooperation on investment and standard setting.
2020	Canada	Canada–US Joint Action Plan on Critical Minerals Collaboration	Improving critical mineral supply security by increasing two-way investment, information sharing, joint initiatives, and collaboration in multilateral fora.	Collaboration; Joint Action Plan focusing on investment and initiatives at the bilateral and multilateral levels.

5.4. External Balancing: Alliance-Building to Weaken China's Capabilities in Critical Minerals

External balancing to weaken a rival's power in critical mineral supply chains involves coordinated actions among alliance partners to weaken a rival country's capability to access the critical mineral sector. The Foreign Investment Risk Review Modernization Act of 2018 mandates the CFIUS to establish a formal process for sharing information with allies regarding specific technologies and disseminating best practices. This Act also urges the US president to engage in international outreach to allies to promote processes like CFIUS (Government of USA, 2018). Thus, since 2018, the US has intensified efforts to encourage its allies to adopt ISMs similar to those in the US and provided incentives, such as CFIUS review exceptions for certain investments from these allies (Li et al., 2024). In the areas of critical technologies, infrastructure, and data,

research demonstrates a substantial degree of policy convergence between the US and its FVEY allies, as these allies have either introduced or strengthened their national security reviews on FDI in these sectors in their countries since 2020. In 2022 and 2023, the US granted the FVEY partners exception status under CFIUS, underscoring the alignment of their ISMs with those of the US (Li et al., 2024).

Critical minerals policies have become an area where national security concerns over inbound FDI in the US and its allied countries are increasingly converging, and coordination in monitoring FDI patterns is increasing. The US continues to encourage allies to update their ISMs following the US model, including in the areas of critical supply chains (Government of USA, 2022). Australia's Treasurer noted willingness to collaborate with "key international partners" when monitoring FDI patterns in critical minerals (Watkins & Nowotny-Walsh, 2022). We also find that Canada and Australia adopted stringent ISMs on FDI in critical minerals, similar to those of the US. Canada has not only classified critical minerals as sensitive industries vital to national security but also restricted SOE investment in this sector. Since the release of Canada's 2022 guidance on SOE investment in critical minerals, SOEs are allowed to invest in Canadian critical minerals only on an "exceptional basis," which acts as a strong signal discouraging foreign SOE investment in Canada's critical minerals (Government of Canada, 2022a, 2022b). Furthermore, the Canadian guidance also applies to private firms influenced by the government from unfriendly countries, suggesting heightened regulatory scrutiny over FDI from both SOEs and state-influenced enterprises in Canadian critical minerals (Government of Canada, 2022b).

Australia also places limits on investment by foreign SOEs by requiring all SOEs to notify the government about making their investment as of 2019 (Australian Government, 2019), and, in 2022, has explicitly noted that any FDI in critical minerals is a reviewable national security action (Australian Government, 2022a). Australia's Treasurer noted that Australia will be "more assertive" when assessing FDI in critical minerals and determining if it is in the national interest of Australia to proceed with the investment (Watkins & Nowotny-Walsh, 2022).

The UK has not placed formal restrictions specific to foreign SOE investments or FDI in critical minerals. However, the UK passed the National Security and Investment Act in 2022, and, in 2023, it issued guidance on notifying the government about FDI in 17 sensitive areas. This includes advanced materials encompassing critical minerals (Government of UK, 2024). Moreover, the UK notes that China's use of state intervention and subsidies to expand domestic production and acquire assets abroad with the help of SOEs is jeopardizing the supply security of critical minerals (Government of UK, 2023). Thus, the National Security and Investment Act can increase regulatory scrutiny over FDI in critical minerals, particularly by Chinese SOEs.

6. Conclusion

Our study uses the balance of power theory to understand different geoeconomic policies that the US employs to de-risk and counterbalance a rising rival state (China) in the context of critical minerals. Specifically, we examine the US' development of domestic policies and external alliances to improve domestic and allied capabilities or weaken the rival's capabilities in critical minerals. By analyzing critical mineral strategies and FDI policies, we find that, domestically, the US has implemented industry policies to boost domestic critical mineral production and restrictive FDI policies that increase regulatory scrutiny over foreign investments in critical minerals, particularly by Chinese SOEs. Externally, the US has established

partnerships with Australia and Canada for critical mineral security and diversification. This highlights how geopolitical competition drives the US to collaborate with like-minded partners to reconfigure supply chains.

Our study also reveals that Canada, Australia, and the UK share US concerns on critical mineral dependence on China and have ISMs that could be used to review investments by Chinese enterprises, especially by SOEs, in critical mineral sectors. Notably, Canada has taken a stringent approach by explicitly restricting FDI by SOEs and requesting three Chinese SOEs to divest from critical mineral projects. These results suggest that a country's concerns regarding dependence on China's critical mineral companies and its aspirations to develop a competitive critical mineral industry can affect its security and strategic considerations, which, in turn, facilitates policy convergence with the US.

Our analysis contributes to the discussion of de-risking in supply chains and alliance-building in the increasingly realism-laden world order driven by the US–China rivalry. Our study focuses on the role of the FVEY alliance partners when examining the US' external balancing strategies in countering China's dominance in critical minerals. Future research could expand upon this by exploring the involvement of other US allies, such as the EU and Japan, to examine the extent of partnerships and whether these countries adopt similar ISMs as those in the US. Future studies should also examine if New Zealand follows the lead of the US in securitizing the critical mineral sector. Additionally, while ISMs in our study are about regulating inbound FDI, future studies could explore additional policy tools that the US might utilize, such as regulatory measures enabling the US to regulate firm behavior overseas through extraterritorial control. Evidence suggests that the US has disciplined non-US companies investing abroad (Crippa, 2021), as seen in the intervention in China's proposed acquisition of Axitron in Germany ("China criticizes U.S.," 2016). Future research could explore the feasibility of using extraterritoriality to regulate international investment activities of non-US firms, particularly those headquartered or operating in the US.

Furthermore, it is worth investigating the effectiveness of the US' domestic and international strategies in diversifying the control of production and processing away from China. There is potential to develop and process new resources in FVEY countries, especially in Canada and Australia, for certain minerals such as cobalt and lithium. As of 2022, Canada accounted for 4% of global cobalt production, and Australia accounted for 47% of the global lithium extraction and 9% of rare earth elements (International Energy Agency, 2023). From 2023 to 2030, Australia is projected to account for 11% of global planned refining projects for lithium, and Canada and Australia together are expected to represent 57% of planned refining projects for cobalt (International Energy Agency, 2023).

These possibilities are promoted under the current critical mineral strategies, but it is too early to gauge their success. Building an alternative supply chain is particularly challenging, given that mining is a cyclical industry highly sensitive to price fluctuations related to demand and supply (Kiladze, 2024). Moreover, the extraction and production of certain critical minerals (e.g., cobalt, nickel) are primarily in developing economies in Africa, Latin America, and Southeast Asia (e.g., the Democratic Republic of Congo, Chile, and Indonesia; International Energy Agency, 2023), many of which seek to preserve their ability to balance the influence of external powers to maintain some degree of policy discretion. In these countries, Chinese firms may have advantages in investing, given their extensive knowledge and experience in conducting business in developing countries, as well as the potential government support through the Belt and Road Initiative (Kalantzakos, 2020). Future research should consider these complexities when measuring the impact of

critical mineral strategies and ISMs on the effectiveness of developing an alternative FVEY-led supply chain for critical minerals.

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Conflict of Interests

The authors declare no conflict of interests.

Data Availability

Data of the American Enterprise Institute is available here: https://www.aei.org/china-global-investment-tracker

Data of the Global Trade Alert is available here: https://www.globaltradealert.org/data_extraction

Data of the International Energy Agency regarding the Critical Minerals Policy Tracker is available here: https://www.iea.org/policies/?country%5b0%5d=United%20States&type%5b0%5d=International%20collaboration&type%5b1%5d=Minerals%20security%20mechanism&topic%5b0%5d=Critical%20Minerals

Data regarding the critical minerals production can be checked at the World Mineral Statistics Data: https://www2.bgs.ac.uk/mineralsuk/statistics/wms.cfc?method=searchWMS

Data regarding the critical mineral production shares by countries is available on the Canada Energy Regulator website: https://www.cer-rec.gc.ca/en/data-analysis/energy-markets/market-snapshots/2023/market-snapshot-critical-minerals-key-global-energy-transition.html

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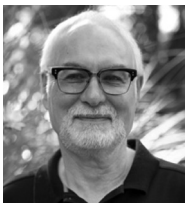

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ARTICLE

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The EU De-Risking of Energy Dependencies: Towards a New Clean Energy Geopolitical Order?

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Abstract

The mounting geopolitical tensions and rivalries between the world's major economies transform the goals and instruments of domestic and external policies. Industrial strategies of leading global powers call for technological decoupling, strategic autonomy, and the de-risking of dependencies in critical value chains. Economic interdependencies become a liability and de-globalisation tendencies come to the fore. The energy sector is not exempted from these trends, leading even to the weaponisation of energy in some cases. In that vein, this article explores the character and directions of EU international energy engagement through the geoeconomic lens. Taking inspiration from literature on energy security and the geopolitics of energy transition, the article theorises the concept of de-risking in energy to investigate how the EU is positioning itself as a power while ensuring security and competitiveness. Looking at three illustrative examples of the energy transition—supply of natural gas, access to energy-critical minerals, and international hydrogen markets—the article shows that EU de-risking means not only diversifying suppliers but, most notably, constructing new economic, sustainable, and potentially long-lasting international relations. As a result, despite the deep geopoliticisation of energy and the new global "disorder," the EU's de-risking has the potential to reshape international relations by forging new partnerships or reconfiguring existing ones, thus establishing a new economic order driven by clean energy while offering new economic opportunities to create local value chains and decarbonise economies in third countries.

Keywords

clean energy transition; dependence; de-risking; EU energy policy; geoeconomics; geopolitics; international cooperation

1. Introduction

At the turn of the 2020s, the global economic order disintegrated and became unwieldy (Babić et al., 2022). China's growing assertiveness has been challenging the US and EU global technological and industrial leaderships (Herranz-Surrallés et al., 2024; Lavery & Schmid, 2021; Roberts et al., 2019), and the Covid crisis exposed the vulnerabilities of highly intertwined global supply chains (Eckert, 2021; Goldthau & Hughes, 2020). In parallel, the climate emergency has worsened, with 2023 becoming the hottest year on record. Most recently, Russia's aggression on Ukraine obliged the Western countries to cut off trade and financial relations with Russia to a bare minimum by imposing several packages of sanctions. As a result of this global polycrisis (Lawrence et al., 2024), political attention has been shifting to the securitisation of economic policies and weaponisation of strategic trade and investment networks (Farrell & Newman, 2019) while advocating for relative rather than absolute gains and propelling deglobalisation forces (Kornprobst & Paul, 2021). In this new geoeconomic order (Roberts et al., 2019), economic interdependencies once believed to bring peace and stability are perceived as vulnerabilities and elicit the leading global powers to call for technological decoupling, strategic autonomy, and scaling-down of dependencies in critical value chains.

Confronted with these strategic shifts, the von der Leyen "geopolitical Commission" (Haroche, 2024 von der Leyen, 2019) launched the European Green Deal as Europe's new growth strategy towards climate neutrality by 2050, followed by several specific measures to boost EU competitiveness in innovative clean technologies and in setting global industrial standards. In parallel, the EU embraced an increasingly geoeconomic stance by adapting its goals and policies (Herranz-Surrallés et al., 2024) through a mix of offensive and defensive instruments that blend trade and investment with security concerns such as the Foreign Direct Investment Screening mechanism (Bauerle-Danzmann & Meunier, 2024; Weinhardt et al., 2022). The adoption of the "open strategic autonomy" model for its trade and investment policies (European Commission, 2021) encapsulates a political paradox whereby the EU attempts to strike a balance between remaining open while becoming assertive to strengthen its resilience and reduce its strategic dependencies (Juncos & Vanhoonacker, 2024; Lavery et al., 2022). This balancing act obliges the EU to manage its interdependencies and economic relations to achieve more independence and de-risk its relations.

In 2022, the EU leaders agreed to take further steps to build European sovereignty, reduce dependencies, and design a new growth and investment model (European Council, 2022), calling for a de-risking of economic relations by strengthening the EU's competitiveness, developing new defensive measures, and seeking alignment with other international partners (von der Leyen, 2023). These policy developments raise the question of what this de-risking means for EU external engagement. Does the EU response indeed entail scaling down its engagement and turning inwards to reduce dependencies? Or is EU external engagement transforming into new forms of partnerships and collaboration patterns?

This article answers these questions by looking at de-risking in the EU energy sector, which is characterised by a decades-long dependency on imports of fossil fuels. Moreover, the advancing clean energy transition brings new energy vulnerabilities to the fore by exposing the EU's acute reliance on imported critical minerals, indispensable for the energy transition, and highlighting an aggressively growing competitive pressure in green energy technologies. Recent literature has concluded that the energy transition will considerably alter relations between states. However, it has not yet explored the impact of these vulnerabilities and the de-risking approaches in energy for the character and direction of EU external energy

engagement. This article attempts to address this gap in two steps. Firstly, the article conceptualises the de-risking strategy and identifies that it consists of internal and external components. In the second step, the article explores what de-risking means for the character of the EU's external engagement. This will be done by looking at three energy dimensions of imperative relevance in the geopolitics of energy transition: ensuring supplies of natural gas, seeking access to energy-critical minerals, and developing global hydrogen markets.

The article shows that, despite deep geopoliticisation in energy, in the sense of decoupling from Russia and preventing new dependencies in green energy technologies and critical raw minerals (Herranz-Surrallés et al., 2024), the EU is not turning fully inwards, simply because it can't, as the EU lacks the necessary resources for its clean energy transition. While the EU decouples decisively from Russian energy and aims at curtailing its exposure to Chinese energy-critical minerals, it lays at the same time the grounds for new international energy partnerships, with new countries and on new terms that altogether create opportunities for long-lasting engagement and a new energy order. The re-assessment of EU external energy engagement through the geopolitical lens outlines the potential for the emergence of a new economic order driven by the paradigm of security, the urgent need to decarbonise the global economy, and the complementarity of external geoeconomic preferences.

These conclusions offer a fresh visualisation of the leverage that clean energy transition policies may have on international relations between the EU and other countries, which is equally important for scholars as well as for policymakers. Firstly, the results contribute to the understanding of de-risking as a concept that has the potential to constructively shape the new economic order. Secondly, the article emphasises that the EU is not operating in a political vacuum, and relations with third countries remain imperative for energy security and energy transition. As the world continues on an unwieldy, belligerent path, fresh knowledge about and understanding of strategies on how to rebalance external relations seem vital and timely.

The remainder of the article is structured as follows. Section 2 reviews the literature on EU external energy engagement and links it to the literature on the ongoing clean energy transition and geopolitics. Section 3 develops a conceptualisation of de-risking and presents the analytical approach. Section 4 constitutes the empirical core of the article, and the last section concludes, summarising the findings and discussing the wider implications.

2. A Geoeconomic Turn and the Geopolitics of Energy

For decades, the EU energy sector has been particularly affected by geopolitical shifts due to the scarcity of endogenous energy resources, notably oil and gas, and a heavy reliance on one dominant supplier. The academic community has been widely occupied with EU energy dependency and its susceptibility to manipulation and weaponisation, notably by Russia (LaBelle, 2023; Siddi, 2018; Wigell & Vihma, 2016). While, domestically, the policy focus was on reinforcing the interconnectivity and resilience of its internal energy market, externally, the EU was seeking to achieve its security goals predominantly through the promotion of its market-liberal rules and institutions, striking a balance between its inherently liberal identity and greater assertiveness (Goldthau & Sitter, 2015; Herranz-Surrallés, 2016). Even after the Crimea annexation in 2014, the EU was trying to handle Russia's dominant position as a gas supplier by using the rules of its internal energy market (Batzella, 2022; de Jong & Van de Graaf, 2021; Goldthau & Sitter, 2020).

Nevertheless, with the growing geopoliticisation of economic and trade relations, the EU's external energy engagement also grew progressively more strategic and geopolitical (Bocse, 2019; Prontera, 2020; Siddi & Kustova, 2021; Siddi & Prandin, 2023), culminating in a shift to deep geopoliticisation in the wake of the Russian aggression on Ukraine (Jerzyniak & Herranz-Surrallés, 2024).

In parallel, the ongoing clean energy transition started reshaping international energy relations and the roles of different countries (Global Commission on the Geopolitics of Energy Transformation, 2019), but the respective research comes with unclear and even contradictory results on the exact implications. On the one hand, the clean energy transition may attenuate the geopolitics of physical resources and their transportation routes because of the omnipresence of renewable energy, contrary to geographically concentrated fossil fuels, thus improving the geopolitical standing of energy importers (Giuli & Oberthür, 2023; Overland et al., 2022; Scholten et al., 2020). For example, some developing countries with abundant energy-critical minerals and/or geographical conditions for the production of renewable hydrogen could join the global energy markets if they were able to develop the necessary infrastructure supported by a favourable economic and political environment (Eicke & De Blasio, 2022); in the case of hydrogen, they could even capture 70% of the global export revenues in 2050 (Shirizadeh et al., 2023).

On the other hand, international energy trade might not disappear but instead create new interdependencies related to the control of clean technologies (Scholten et al., 2020), hydrogen trade (Van de Graaf et al., 2020), and access to energy-critical minerals (Apergi et al., 2023; Vezzoni, 2023). Moreover, scholars also observe that new and planned hydrogen and critical minerals projects between the so-called developed Global North and the developing Global South pave the way for green extractivism (Goldthau & Youngs, 2023; Hickel et al., 2022), as they drain the Global South of its resources and profits without contributing to local economies and without paying attention to human rights (Kalt et al., 2023; Lindner, 2023).

Certainly, the EU will not be spared from the geopolitical tectonics of the clean energy transition. Despite decades-long measures to build the EU internal market, the EU imported 90% of its natural gas, of which more than 45% came from Russia when the country started waging its war against Ukraine in 2022 (European Commission, 2022). The situation with energy-critical minerals seems even more dismal as the EU almost entirely relies on their imports with more than 90% of these imports coming from only one country, China (European Commission, 2023b). This is because more than 75% of the global production of lithium, cobalt, and rare earth elements is produced by only three countries, while their processing is even more concentrated, with China accounting for 35% of processing operations for nickel, 50–70% for lithium and cobalt, and nearly 90% for rare earth elements (International Energy Agency, 2023). In the "Net Zero Emissions by 2050 Scenario" of the International Energy Agency, the demand for critical minerals will further grow three and a half times by 2030. For some minerals, like lithium, the global demand is expected to grow by more than 40 times between 2020 and 2030. Regarding hydrogen, the global market is in fact in its nascency with the EU common rules for hydrogen agreed only at the end of 2023 (Council of the EU, 2023b). Nevertheless, the EU has admitted that for the creation of a viable hydrogen economy, imports will be necessary. While the European Hydrogen Strategy has set out the objective to produce 10 million tonnes of renewable hydrogen domestically, the REPowerEU plan (European Commission, 2022) complemented this goal by another 10 million tonnes to be imported by 2030. Production of clean hydrogen is still negligible, but estimates show that, globally, clean hydrogen would meet up to 12% of final energy consumption by 2050 (International Renewable Energy Agency, 2022). While the existing literature has

grasped the various possible trends in the geopolitics of energy transition, it has not yet linked them with the implications for the EU's external energy engagement in the context of the de-risking of energy dependencies and the European Green Deal and its complementary Green Deal Industrial Plan. Some emerging research explores new partnerships, described as friend-shoring, between countries that attempt to jointly overcome their dependencies (Vivoda & Matthews, 2023), like in the case of the US-led Minerals Security Partnership, or that even try to maintain cooperative relations with their competitors, as in the case between the EU and China (Kalantzakos et al., 2023). Similarly, some initial evidence shows new forms of international and multilateral collaborations, which attempt to support structural change in shared value chains in energy transition through regulatory, technology, trade, and policy collaboration (Aisbett et al., 2023). Nevertheless, the shift to assertive, or even aggressive, international competition in energy requires a balancing of dependencies in an ever more sophisticated manner. This article will close this gap and explore these implications for the character and directions of the EU's international engagement in energy.

3. Conceptualising De-Risking

There is no academic definition or metric of the concept of de-risking. In the political discourse, the European Commission, in its European Economic Security Strategy, refers to an "ability to make ourselves more resilient and reduce the risks arising from economic linkages that in past decades we viewed as benign," pointing to actions "diversifying economic ties to reduce harmful dependencies and increasing local production" (European Commission & High Representative, 2023).

The academic debates related to de-risking can be best found in the world of finance, taking inspiration from an adage whereby one should not put all of their eggs in one basket. This idea was excellently theorised by the economist and Nobel Prize laureate Henry Markowitz in his 1952 seminal paper "Portfolio Selection" (Markowitz, 1952). Accordingly, to avoid the risks of over-dependence, the dominance of one or only a few ventures in an investment portfolio should be diluted through diversification by adding more assets with uncorrelated exposure to risks. In finance, such assets would represent, for example, different investment classes (stocks, bonds, commodities, etc.), different industrial sectors, or different countries. As a result, a potential loss of a dominant asset would be reduced and compensated by potential gains of other assets. It should be noted that, despite its popularity in modern finance, the theory addresses only idiosyncratic risks (i.e., associated with individual assets) and fails to mitigate the aggregate or systemic risk that can potentially affect an entire sector at once (Lukomnik & Hawley, 2021).

Following this logic, de-risking in energy would mean managing dependence to avoid overreliance on one or very few dominant energy sources (suppliers) by increasing the number of alternative, uncorrelated energy sources. Managing such dependence can be achieved by internal (domestic) and external measures (Högselius, 2018). Internal measures reduce reliance on dominant foreign sources by developing domestic energy production and/or simply by saving energy. External measures reduce this reliance by adding new or increasing the share of other existing foreign sources. On the one hand, such "balancing dependence" (Choer Moraes & Wigell, 2022) means adopting state policies that seek to reduce economic dependencies on foreign actors, whether public or private, by promoting economic autonomy. On the other hand, it means forging new partnerships or strengthening existing relations with minor partners, and possibly complementing them with alliances with other dependent countries to strengthen its own negotiating position and discriminate against non-members (Meunier & Nicolaidis, 2019). This conceptualisation

excludes the most radical measures, such as the use of armed forces in exporting countries, which do not comply with the EU identity as a peace project. Managing de-risking through internal and external measures also corresponds with finding a balance between becoming autonomous and remaining open. Linking the energy portfolio approach to the trade and investment debates, de-risking through internal measures would support the claims of de-globalisation (Kornprobst & Paul, 2021) and the EU's quest for "strategic autonomy" (Lavery et al., 2022; Schmitz & Seidl, 2023), while de-risking through external measures would mean reaching out to international partners, thus being "open."

Nevertheless, the capability of internal measures is often limited due to the scarcity of domestic relevant resources. Consequently, the risk assessment of external measures must be reckoned more profoundly. Such risks can be analysed from various perspectives: economic, engineering, geopolitical, environmental, or geological. Because there is no single quantitative indicator, the measurement of energy risks is a highly complex and context-dependent task, spanning several interrelated technical, economic, and political dimensions (Siksnelyte-Butkiene et al., 2024). To add to this complexity, different risks can be present at different stages of the energy supply chain: firstly, risks related to the availability of energy resources to satisfy demand; secondly, risks related to the import of energy and the reliability of suppliers and supply routes; thirdly, risks related to the reliability and resilience of domestic markets and infrastructure; and, finally, risks related to economic vulnerability to price movements, and the cost of supply interruptions (Månsson et al., 2014). In this context, while domestic markets and infrastructure resources play a key role in de-risking internally, risks related to import routes and the reliability of suppliers stand out in the external dimension. In sum, the analytical framework of this article will assess the EU's de-risking efforts through three elements: the actual geographical diversification of energy routes and sources, the alignment of the partners with the EU values (a "quality" of the partner), and the potential scope of the partnership.

Imports are exposed to disruptions if they pass through strategic passageways (e.g., maritime routes) that could become chokepoints due to geopolitical factors or accidents. Therefore, geographical diversification of new suppliers has the potential to reduce risks of energy transportation and is considered the first crucial indicator in the de-risking assessment. The reliability of energy partners is more complex and relates to a couple of elements. To produce energy resources, countries need to possess the capacity to develop the necessary infrastructure. Such capacity depends largely on a wider political, administrative, and economic context in a supplier country (Eicke & De Blasio, 2022). In addition, politically unstable countries might deliberately cut off supplies or even weaponise energy resources as was done repeatedly in recent times by Russia. This leads us to the identification of two other de-risking indicators: the quality of the partnerships and their attractiveness for the third countries.

In fact, the EU's strategy for external energy engagement (European Commission & High Representative, 2022) stresses the need to "conclude partnerships with reliable partner countries to ensure open and undistorted trade and investment relations" and that "new standards and governance arrangements will be required to build more reliable and mutually beneficial partnerships through a rules-based approach." This closely reflects the EU's identity and objectives specified in the primary EU law whereby EU international actions must be driven by EU values and principles, as specified in Article 21 of the Treaty on the European Union (European Union, 2010). The alignment can be well measured by adherence of the relevant countries to democratic and transparency systems as assessed by the *Economist*'s Democracy Index (Economist Intelligence Unit, 2024), based on the assumption that there is a negative correlation between the

functioning of the government on the one hand and the likelihood to disrupt energy trade or even weaponise energy on the other. High scores on the Democracy Index also assume a higher capacity to develop the necessary infrastructure in third countries, hence ensuring higher reliability of the partnerships. Summing up, de-risking entails not only managing dependence by replacing one source with another but also dealing with the diversity and quality of energy sources (Chalvatzis & Ioannidis, 2017). Finally, effective de-risking hinges upon the implementation of the partnerships that also depend on the motivation of the partners to exploit the actual complementarities of preferences between the partners and the EU (Jerzyniak & Herranz-Surrallés, 2024). There are some indications that while the urgent need for clean energy is recognised in third countries, they might not perceive the urgency to export energy resources to the EU (Brauner et al., 2023).

Table 1 summarises the conceptual framework. In the first step, it demonstrates the two dimensions of de-risking: domestic and external. Analytically, in the first step, the article unpacks de-risking by mapping the presence of internal measures such as policy actions to increase EU-internal production of energy, domestic sourcing of relevant critical minerals, and energy-saving measures. In the next step, which constitutes the core of the analytical novelty, the article looks at external actions to increase the share of new or existing minor suppliers. In this regard, three areas stand out: the geographical diversity of the energy import portfolio (to avoid the occurrence of correlated potential political and security risks); the potential quality of the new energy portfolio; and, lastly, the character of the partnership, i.e., whether the partnerships have the potential to go beyond mere access to energy and focus on cooperation along the entire value chains. Noteworthy, due to the early stage of all these measures, is that the article's analytical emphasis is placed on strategies rather than the actual results of these strategies.

As regards the empirical data, this article analyses the EU's de-risking strategies based on two groups of documents. The first group includes the relevant Commission's communications and conclusions of the

Table 1. De-risking strategies in energy.

	Domestic (autonomy) dimension	External (open) dimension
Objectives of the de-risking strategy	Reducing the share of the dominant supplier by domestic substitution, i.e., domestic production of energy and relevant energy resources;	Reducing the share of the dominant supplier by external substitution, i.e., seeking new sources and/or increasing the share of existing minor suppliers;
	Reducing the share of the dominant supplier thanks to energy-saving.	Complemented by forging new alliances with other dependent countries to strengthen its own negotiating position and discriminate against non-members.
Indicators	Strategies and policies to increase the share of EU-internal production of energy or relevant energy resources;	Is the EU energy portfolio becoming geographically diversified and spreading more globally?
	Strategies and policies to save energy, including recycling.	Alignment of a partner: Is EU international action aligned with EU values?
		Cooperation: limited to imports of raw resources? Integrating the partners in the value chain? Partnership based on complementarities?

European Council adopted between 2020 and 2023, thus after the launch of the European Green Deal strategy. These documents look at what exactly the EU has done to reduce the share of a dominant supplier, notably whether there are clear strategies developed and targets set. This step will help primarily investigate the domestic dimension of de-risking. Secondly, and specifically for the external component of de-risking, the article analyses political agreements signed by the European Commission and European leaders. The core of the analysis is non-binding, bilateral (with one exception) memoranda of understanding (MoUs) on energy, signed on behalf of the EU. These MoUs represent a political intention to cooperate on one or more of the three geopolitical dimensions. At this point, a word of caution is appropriate: Although such documents may carry a significant political weight, they are different from legally binding trade agreements, and they fall under the policy-making and coordinating functions of the Council. Nevertheless, they send the often-necessary signals for business, financial, and non-governmental stakeholders. This group of documents also includes other MoUs with a significant energy section and political joint statements signed by the European Commission. In addition, the article takes into account Green Alliances and Green Partnerships, concluded under the European Green Deal, with energy being a constituent pillar of these instruments. Lastly, and for the sake of completeness of the EU external activity, a few agreements under the framework of Team Europe are included, whenever they deal specifically with energy. These analytical steps aim to identify whether the energy portfolio has become geographically diversified and spread more globally, compared to the initial situation. Further, the quality of the partnerships is explored, i.e., whether the new cooperation agreements are concluded with partners that share the EU values. Lastly, the analysis looks at what the scope of the partnership is, i.e., whether the cooperation is limited to imports of relevant resources or it also aims at building more lasting, mutually beneficial linkages. In the investigated period, the article identifies a total of 39 relevant political documents as summarised in Table 2.

Table 2. Overview of the analysed agreements.

Country	Year of signature	Type of document*	Specific energy area agreement**	General energy agreement, including specific energy area**	General political agreement, including specific energy area**	Alignment of the partner (Democracy Index)***
Algeria	2022	JS		NG, H2		authoritarian
Algeria	2023	JS		NG, H2		
Argentina	2023	MoU	CM			flawed
Argentina	2023	MoU		H2		
Australia	2022	JS		H2, CM		full
Australia		MoU a	CM			
Azerbaijan	2022	MoU	NG			authoritarian
Brazil	2023	JS			H2, CM	flawed
Canada	2021	MoU	CM			full
Canada	2023	GA		H2, CM		
Chile	2023	JS	H2			flawed
Chile	2023		CM			
Democratic Republic of Congo	2023		CM			authoritarian

Table 2. (Cont.) Overview of the analysed agreements.

Country	Year of signature	Type of document*	Specific energy area agreement**			General energy agreement, including specific energy area**	General political agreement, including specific energy area**	Alignment of the partner (Democracy Index)***
Egypt	2022	JS				H2		authoritarian
Egypt	2022	JS		H2				
Egypt	2022	MoU		H2				
Greenland	2023		CM					full
Israel/Egypt	2022	MoU			NG			full/authoritarian
Japan	2021	GA				H2		full
Japan	2022	MoC		H2				
Kazakhstan	2022	MoU	CM	H2				authoritarian
Kenya	2023	JS		H2				hybrid
Korea	2023	GP				H2		full
Mauritania	2023	JS		H2				hybrid
Morocco	2022	GP				H2		hybrid
Namibia	2022	MoU	CM	H2				flawed
Norway	2022	JS		H2	NG			full
Norway	2022	JS			NG			
Norway	2023	GA				H2, CM		
Norway	2024	MoU	CM					
Rwanda	2024	MoU	CM					authoritarian
Tunisia	2023	MoU					H2	hybrid
Ukraine	2021	MoU	CM					Hybrid
Ukraine	2023	MoU		H2				
Uruguay	2023	MoU		H2				full
United States	2022	JS				NG		flawed
Uzbekistan	2024	MoU	CM					authoritarian
Zambia	2023	MoU	CM					hybrid

Notes: * type of document: Memorandum of Understanding, including announced (MoU, MoU a), Memorandum of Cooperation (MoC), Joint Statement on energy (JS), Green Alliance (GA), Green Partnership (GP); ** specific energy area: critical minerals (CM), hydrogen (H2), natural gas/liquefied natural gas (NG); *** the *Economist*'s Democracy Index: full democracy (full), flawed democracy (flawed), hybrid regime (hybrid), authoritarian regime (authoritarian).

The framework is applied to the three most geopolitical dimensions of energy transition as identified in the literature review: securing natural gas supplies, ensuring access to energy-critical raw minerals, and creating new hydrogen markets. The article does not look at cross-sectoral risks. For example, while the de-risking of the gas sector is also possible by replacing it to some extent with renewable hydrogen, the three dimensions of the energy sector are analysed separately. The overall analysis benefits from first-hand and participatory, though unstructured, observation of the policy process. Such a method allowed quicker identification of the relevant documents and provided important input to grasp the political nuances and insider understanding of the analysed agreements.

4. Exploring EU De-Risking in Energy

4.1. Domestic De-Risking Measures and Their Limitations

In all three geopolitical energy dimensions, the EU adopted strategies and policies to de-risk domestically. Regarding natural gas, it has been only with the Russian aggression on Ukraine that the EU decided to end its dependence on energy from Russia, well before 2030 (European Commission, 2022). Two of the three pillars of the REPowerEU plan emphasised domestic actions: firstly, through "a massive speed-up and scale-up in renewable energy" (Jerzyniak & Herranz-Surrallés, 2024) in all sectors, accompanied by a binding target at EU level to reach at least 42.5% of renewables by 2030, with an aspiration for 45% of renewables in overall energy consumption; and, secondly, through substantial savings by setting a legal target for at least 15% reduction of gas consumption, accompanied by a legally-binding EU target to reduce the final energy consumption by 11.7% by 2030. Both targets were accompanied by additional measures to improve the framework conditions.

The high dependence on imported energy-critical minerals was first addressed in 2008 with the adoption of the Raw Materials Initiative and followed by regular publication of a list of critical raw materials and other supportive actions. Nevertheless, it has only been in the last few years—when clean energy gathered speed—that access to critical minerals became one of the most urgent priorities for the EU. The 2020 Critical Raw Materials Action Plan (European Commission, 2020b) proposed 10 non-legislative actions. However, they were deemed insufficient to mitigate the risks for supply chains, and, in 2023, the Commission put forward, for the first time, a legislative proposal for regulation establishing a framework for ensuring a secure and sustainable supply of critical raw materials (European Commission, 2023b). The proposal aimed to strengthen the EU's capacities throughout the value chain and set four quantitative goals by 2030 to annually source 10% of the strategic raw materials through domestic mining and extraction, 40% through domestic processing, and 15% through recycling—with this goal raised to 25%, as agreed upon by the Council and the European Parliament (Council of the EU, 2023a)—and lastly, no single third country should supply more than 65% of the EU's consumption of each strategic raw material. Additionally, the proposal improves the overall framework conditions for the achievement of the goals, establishes a European Critical Raw Materials Board, and institutionalises international strategic partnerships.

The EU's domestic approach to a secure and diversified hydrogen economy relies on three pillars. Firstly, the EU attempts to trigger its own production to install 6 GW of electrolysers' capacity in 2024 and 40 GW in 2030 (European Commission, 2020a). To that end, a comprehensive legislative hydrogen and gas market decarbonisation package has been adopted (Council of the EU, 2023b). Secondly, dedicated financial mechanisms have been created, most notably the European Hydrogen Bank (European Commission, 2023a), with a first auction amounting to EUR 800 million from EU emissions revenues channelled through the EU Innovation Fund launched in November 2023 (European Commission, 2023c). Thirdly, the EU launched several industrial initiatives, most notably the European Clean Hydrogen Alliance and the Clean Hydrogen Partnership, to encourage industrial innovation and production of the necessary equipment. Table 3 provides a compact overview of the domestic and external de-risking measures in the three geopolitical energy dimensions.

Table 3. Overview of domestic and external de-risking measures.

	Domestic (autonomy) dimension	External (open) dimension
Natural gas	REPowerEU: replacing Russian natural gas with domestic renewables (dedicated targets and legislative framework) and setting targets for energy savings through legislative measures and saving campaigns.	Five political agreements to increase the share of existing and new suppliers; Half of the partners are authoritarian regimes, only one partner is a full democracy; Cooperation focuses also on the reduction of methane emissions and renewables.
Critical energy minerals	Critical Raw Materials Act (2023) setting 2030 goals for domestic mining/extraction, domestic processing, and recycling, as well as capping the share of supplies from one single country.	Geographically well-diversified portfolio: 12 new partnerships with countries from all continents; Mixed alignment of partners: from full democracies to authoritarian regimes; Cooperation focuses on the entire value chain: business cooperation, research and innovation, regulation, skills and capacity building, and funding.
Hydrogen	Goals for domestic installation of electrolysers, dedicated legislative solutions to enhance domestic production, new financial instruments, and support measures for domestic industry.	Geographically well-diversified portfolio: 21 partnerships with countries from all continents (except Australia), though not all with potentially exporting countries; Mixed alignment of partners: from full democracies to authoritarian regimes; Cooperation focuses on the entire value chain: supply of hydrogen, global standards, and development of domestic production and consumption capacities (domestic decarbonisation), business cooperation, research and innovation, regulation, skills, and capacity building and funding.

4.2. External De-Risking Measures: New Partnerships and Cooperation Patterns

Despite all the internal measures to de-risk EU energy, it has been evident that the EU will not be able to satisfy its demand for natural gas, critical minerals, and hydrogen through domestic measures only, which necessitates some form of external engagement. In the analysed period of 2021–2023, the EU launched a wide energy-related diplomatic outreach to reduce dependency and extend the diversity of energy sources, resulting in political agreements with 26 countries (Table 2).

To reduce the share of Russian energy in its natural gas portfolio, the EU reached five political agreements. Firstly, a presidential Task Force on Energy Security has been launched between the EU and the US (2022), followed by further presidential and ministerial statements. Shortly after, the EU signed two MoUs: a trilateral one with Israel and Egypt to boost new gas deliveries and another one with Azerbaijan (2022) to increase the delivery of gas to Europe to at least 20 bcm annually by 2027. In addition, three joint statements have

been issued: firstly, with Norway, at the ministerial level, to ensure additional short-term and long-term gas supplies (2022), complemented by a presidential joint statement to jointly develop tools to stabilise energy markets and limit the impact of market manipulation and price volatility (2022); and lastly, with Algeria, at the ministerial level, to further energy cooperation including natural gas (2022).

Regarding critical minerals, the EU has concluded 12 partnerships: with Canada and Ukraine (2021), with Kazakhstan and Namibia (2022), with Argentina, Chile, the Democratic Republic of Congo, Zambia, and Greenland (2023), and with Rwanda, Norway, and Uzbekistan (until April 2024). In addition, an agreement with Australia has been announced.

In the area of hydrogen, the EU has concluded six MoUs that specifically target cooperation on hydrogen with Egypt, Kazakhstan, Namibia, Japan (2022), Ukraine, and Uruguay (2023). Hydrogen cooperation has been also explicitly mentioned in two Green Partnerships with Morocco (2022) and Korea (2023), in three Green Alliances concluded with Norway (2022), Japan (2023), and Canada (2023), in a MoU on strategic and global partnership with Tunisia (2023) and a MoU on energy cooperation with Argentina (2023), and in a Joint Statement of the Energy Dialogue with Algeria (2023). In addition, the EU launched initiatives under the Global Gateway–Team Europe framework (EU, EU member states, and their implementing agencies and public development banks). A Fund for Renewable Hydrogen was launched with Chile initially offering EUR 225 million (2023) and another agreement was reached with Brazil to invest EUR 2 billion in the production of renewable hydrogen (2023). Moreover, a Team Europe initiative for large-scale development of green hydrogen was launched by the Commission with Mauritania (2023) and a Green Hydrogen Strategy and Roadmap was developed with Kenya (2023).

In all three areas, the EU energy portfolios have become geographically more diversified. As regards natural gas, the partnerships were mostly expressions of further energy cooperation with existing suppliers—Azerbaijan, Norway, Algeria, and the US, with the latter one, however, becoming the largest liquefied natural gas supplier to the EU. The trilateral partnership with Egypt and Israel is the only truly new addition towards de-risking, which nonetheless still needs to materialise. In contrast, partnerships for critical raw materials have been concluded (and announced) with countries from all continents, pointing to a diverse geographical distribution of the EU energy-critical minerals portfolio. The geographic distribution of partnerships for hydrogen is also wide and covers all continents (except Australia), offering potential for a well-diversified portfolio of future hydrogen supply sources.

As regards the alignment of the partnerships from a political perspective, the picture is quite diverse. Among the 26 investigated countries, as measured by the *Economist*'s Democracy Index, only eight countries are full democracies, five are flawed democracies, six have hybrid regimes, and seven have authoritarian regimes. What is more, some of the full democracies, such as Japan, cannot be considered a viable option to increase the diversity of the hydrogen portfolio but rather only help contribute to market creation. Moreover, three of the critical sources of additional gas—Algeria, Azerbaijan, and Egypt—are classified as authoritarian regimes. Also, some of the partners for cooperation on critical minerals belong to the group of authoritarian regimes (Kazakhstan, Democratic Republic of Congo, Rwanda, and Uzbekistan). This poses a question of to what extent such partnerships are reliable alternatives and help de-risk energy dependencies. At the same time, however, the fact that the EU is reaching out not only to democratic, like-minded constituencies, but also to ones that are not aligned with the EU's values, demonstrates the attempts to exploit the benefits of

complementary preferences with a wide range of states and involve them in global value chains irrespective of their political systems.

What appears as the most novel component of all partnerships is that they go well beyond the supply of energy resources, demonstrating that de-risking adds a new political layer to EU external energy engagement. Natural gas agreements show a strong climate-related component as they explicitly address the reduction of methane emissions in the value chain of natural gas and underline the need to strengthen the decarbonisation of the entire energy sector with investments in renewables. Similarly, agreements on critical minerals go well beyond the mere import of material basis, distinguishing between five clusters of activities: business cooperation and joint projects along the entire critical raw materials value chains; research and innovation cooperation; regulatory approximation, notably in the area of environmental, social, and governance standards; promotion of skills and capacity building in the partner countries; and lastly, mobilisation of funding whenever applicable. Further, the hydrogen partnerships initially follow broadly two goals: to diversify supplies of hydrogen to the EU by designing stable and secure supply chains based on international rules and standards, as well as to support the production of renewable hydrogen in developing countries by enhancing their industrial basis and helping them decarbonise. To that end, the EU provides support financially or through the technical cooperation development of new hydrogen facilities, enables the exchange of relevant technologies, promotes policy frameworks and regulatory aspects of domestic hydrogen economies, and also supports capacity building, training, and skills. With the developed countries, most notably Japan and Canada, the EU aims to create global hydrogen markets focusing on sustainable production, trade, transport, storage, distribution, and use of renewable and low-carbon hydrogen and promote common standards and certification, which is the evidence for joint efforts to overcome dependencies.

5. Conclusions

This article analysed the EU's external energy engagement amidst the mounting geopolitical tensions and rivalries between the world's major economies. It attempted to explore how the EU positions itself internationally given its energy dependence while striking a balance between necessary assertiveness and the need to import energy and energy-related resources. To that end, the article conceptualised a political notion of de-risking and applied it to three vital energy dimensions: natural gas, energy-critical minerals, and hydrogen.

The main result of this article shows that the de-risking of EU energy relations means managing dependence, diversifying suppliers, and constructing new economic partnerships. Hence, while de-risking may sound like another EU buzzword meaning nothing else than diversification at first sight, it is much more than simply diluting the share of dominant assets (as in the case of China) or replacing them with any other assets (as needed following the phase-out of Russian energy). De-risking is about constructing new, diversified, and potentially long-lasting energy portfolios along the entire value chain. It is about building new economic relations.

De-risking through domestic measures can improve energy security only to a limited extent due to the EU's scarcity of relevant energy resources. The EU is, and will remain, dependent on imports of natural gas, critical energy minerals, and hydrogen. Therefore, the second important conclusion is that despite the new global disorder (Lavery & Schmid, 2021), the EU is not looking inward but reaching out to build alliances with new

countries across the globe or strengthen existing international partnerships. De-risking, as applied by the EU, demonstrates thus a strong constructive component that has the potential to reshape international relations to the benefit of all participating parties. Paradoxically, it is the EU's energy dependence that can lay the ground for a new wave of "green cooperation," a new trade and investment order driven by the clean energy transition.

Three elements stand out in this potentially new clean energy geopolitical order. Firstly, the article identifies the redrawing of international relations by breaking up with traditional partners (Russia) and rebalancing relations with others (China) to the benefit of forging alliances with countries that have never played any significant role in global energy value chains (e.g., Chile, Namibia, or Zambia). Secondly, the EU de-risking strategies are designed to enhance economic growth and social development, especially in developing countries. If the desired aims are to be achieved in terms of building industrial capacity, promoting skills, and environmental and safety standards in the third countries, de-risking has the potential to debunk the claims of green extractivism. Thirdly, the de-risking agreements are built on the intention to create new, rules-based global trade networks by involving developed and developing countries. Such networks could create trust, enhance common technical and economic standards, and generate mutual benefits if implemented properly. Lastly, EU de-risking may create new economic and political bridges, or at least a springboard for dialogues with countries that are not necessarily considered like-minded in terms of their adherence to political values and human rights. This is of relevance, as many of the new agreements are concluded with authoritarian regimes or countries that are not fully aligned with EU values. Nevertheless, none of such countries can be seen as a main supplier of energy and energy sources as was the case of Russia in fossil fuels or the case of China's dominant role in processing and supplying energy-critical minerals.

This research leaves room for a follow-up. The analysed agreements, although concluded with several countries in a well-diversified way, currently express desirability and intentionality only, rather than deliver tangible results. Hence, a question mark hangs over whether the political intentions, even if based on seemingly complementary preferences, will materialise. It is not the first time that the EU hoped to establish value-driven partnerships through economic and trade cooperation. Therefore, this article proposes two steps for further research. Firstly, a follow-up analysis would be recommended to analyse the extent to which political desirability turns into actual deliverables. Such ex-post analysis would allow identifying whether there are specific factors, either on the side of the EU and the partner countries, or specific framework conditions, that determine the effectiveness of the political agreements. As a further refinement of such analysis, additional research would be needed to explore differences between the various partnerships, as countries differ in their institutional paths and economic and political nuances. Approaches that work in one country might seem ineffective in another. Moreover, the analysis of multilateral initiatives which were not explored in this article, such as those that try to integrate consumer and producer countries (e.g., the Minerals Security Partnership or the EU Critical Raw Materials Club), could provide valuable research results concerning the effectiveness of bilateral and multilateral cooperation patterns. In this regard, more and continuous research on political and economic international cooperation in the clean energy geopolitical order will be of immense value, equally for scholars, policymakers, and practitioners.

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Conflict of Interests

In this article, editorial decisions were undertaken by Milan Babić (Roskilde University), Nana de Graaff (Vrije Universiteit Amsterdam), and Lukas Linsi (Rijksuniversiteit Groningen). The author is an official of the European Union, yet the research for this article was developed independently from that role. The opinions expressed in this article are those of the author only and should not be considered as representative of the European Commission's official position.

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ARTICLE

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Industrial Alliances for the Energy Transition: Harnessing Business Power in the Era of Geoeconomics

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Abstract

In a context of rising geoeconomic competition, the EU is embracing stronger industrial interventionism to address societal challenges and reduce external dependencies in strategic sectors. Developing this type of strategic industrial policy requires close government–firm relations. This article investigates whether and how the EU succeeds in articulating public–private collaboration in the pursuit of strategic goals by examining the role of the recently launched EU Industrial Alliances in clean energy technologies. We build on a "governed interdependence" (GI) approach to assess whether the Alliances resemble the embedded public–private networks that are common in states deploying strategic industrial policy. Our findings, obtained through desk research, surveys, and qualitative interviews, offer a mixed picture. On the one hand, in line with GI, the Industrial Alliances provide a novel, institutionalised venue for public–private collaboration, led by geostrategic objectives and contributing to reducing information gaps and fostering policy coordination. On the other hand, Industrial Alliances adhere less well to a GI system in their composition and structure, and in their loose articulation of risk-socialisation mechanisms.

Keywords

business power; clean energy technology; geoeconomics; industrial alliances; industrial policy

1. Introduction

Since 2017, the EU has launched 11 Industrial Alliances, a new collaboration format between public and private actors designed to achieve strategic objectives in critical technologies and value chains, such as electric batteries, cloud systems, and semiconductor technologies. Industrial Alliances are part of the EU's

attempt to articulate a more robust industrial policy in response to the challenge of the digital and energy transitions and growing geopolitical confrontation. When industrial policy has strong geopolitical drivers, it can be more specifically referred to as strategic industrial policy and a form of domestically-oriented *economic statecraft*, namely "government initiatives designed to reach for or push the high-tech frontier in order to fend off, outflank, or move in step with clearly defined rival powers" (Weiss & Thurbon, 2021, p. 474). States' ability to deploy this "new economic statecraft" presupposes close government–firm relations (Aggarwal & Reddie, 2021, p. 2). The launch of the Industrial Alliances thus indicates the EU's ambition to develop this form of domestic economic statecraft, complementing the gamut of new external economic policy tools that seek to enhance the bloc's economic security (cf. Garcia-Duran et al., 2023; Heldt, 2023; Rosén & Meunier, 2023).

However, scholarly analyses investigating these recent trends are divided in assessing whether the EU has the capacity and instruments to deploy industrial policy, let alone economic statecraft. On the one hand, the EU has embraced a "geodirigiste" industrial policy in strategic technological sectors (Seidl & Schmitz, 2023; see also Di Carlo & Schmitz, 2023; Terzi et al., 2023) as part of a broader geoeconomic turn of the Single Market (Babic et al., 2022; Bauerle Danzman & Meunier, 2024; Herranz-Surrallés et al., 2024). On the other hand, some studies emphasise that the EU does not have the fiscal capacity or levers of governance and control that states have at their disposal (McNamara, 2023). More generally, the EU's composite nature often complicates its ability to deploy geoeconomic policies (Christiansen, 2020; Gehrke, 2020; Weinhardt et al., 2022). Moreover, the shift towards a more interventionist industrial policy further represents a departure from the EU's traditionally market-centric economic approach and the technocratic legitimacy basis of the EU as a polity, leading to new cleavages and coalitional politics (McNamara, 2023; Seidl & Schmitz, 2023).

Given that geoeconomic measures might disrupt the free play of market forces, one of the potential new sources of friction is between government and business actors (Choer Moraes & Wigell, 2020, 2022). The risk of misalignment is particularly high in the EU, given the so-called "geoeconomic paradox" (Olsen, 2020, p. 43), underlining how decades of market liberalisation have strengthened European private companies, complicating the EU's ability to deploy economic instruments for geopolitical purposes. Despite calls for a less state-centric approach when studying geoeconomic trends (cf. Babic et al., 2022, pp. 4–5; Moisio, 2019, p. 4), the emerging literature on EU strategic industrial policy has so far neglected public–private relations, as studies focus either on mapping and explaining the preferences and strategies of public actors (Di Carlo & Schmitz, 2023; McNamara, 2023; Seidl & Schmitz, 2023; Terzi et al., 2023) or on the reaction of private companies to the geoeconomic turn (Choer Moraes & Wigell, 2020; Eckert, 2024; Vlasiuk Nibe, 2023), rather than the interface between the two.

To start addressing this gap, this article assesses the extent to which and how EU Industrial Alliances succeed in articulating public–private collaboration in pursuing strategic goals and what challenges emerge in that process. Specifically, it focuses on Industrial Alliances in the clean tech sector: the European Battery Alliance (EBA), launched in 2017; the European Raw Materials Alliance (ERMA) and the European Clean Hydrogen Alliance (ECH2A), both established in 2020; and the European Solar Photovoltaic Industry Alliance (ESIA), in place since 2022. This sector is analytically relevant since it is the single most important driver of the EU's industrial policy activities. Three of the six strategic areas identified in the New Industrial Strategy for Europe are energy-related (European Commission, 2020): batteries, raw materials, and hydrogen. Moreover, the urgency and strategic character of the energy transition turned up a notch with Russia's full-scale war

on Ukraine since February 2022, leading the EU to adopt the REPowerEU Plan to decouple from Russia as an energy supplier and speed up the deployment of clean energy sources (European Commission, 2022a). Accordingly, the Green Deal Industrial Plan acknowledges that "net-zero energy technologies are at the centre of strong geostrategic interests and the core of the global technological race" (European Commission, 2023).

Analytically, the article builds on the approach of "governed interdependence" (GI), introduced by Weiss (1995), to understand the articulation of government–firm relations in states seeking to deploy strategic trade and industrial policy in technological sectors. While this approach was initially developed to study public–private collaboration in East Asian economies, GI has regained attention in the context of the growing linkage between industrial and security policies in Western economies, most notably to examine government–firm relations in the US (Weiss, 2014; Weiss & Thurbon, 2021). The rising global competition for clean energy technologies has also motivated further refinement of the GI framework applied to China (Fu, 2023) and other leading Asian green-tech powers (Kang & Jo, 2021; Kim, 2019). Therefore, we argue that GI still provides a useful benchmark for assessing whether and how the EU is on the path to deploying strategic industrial policy, particularly in the domain of clean energy technologies. The analysis triangulates data from desk research, surveys, qualitative interviews, and participant observation. Our findings suggest that EU Industrial Alliances only partially adhere to the idea of embedded state–industry networks in GI systems. The analysis thus contributes to identifying the EU's shortcomings and challenges in developing instruments of domestic-oriented economic statecraft.

The remainder of this article is organised into three sections. Section 2 further discusses recent literature on industrial policy in a hardening geoeconomic context and develops the analytical benchmarks to assess and cross-compare the role of the EU Industrial Alliances. Section 3 presents our findings on the emerging features and functions of the Alliances considered. The final section concludes by discussing the main novelties and challenges of Industrial Alliances as an instrument to govern public–private relations in a geoeconomic context.

2. Assessing Public–Private Collaboration in EU Industrial Policy

To address the EU industrial policy "trilemma," namely "to combine decarbonisation with economic growth and jobs and world competitiveness, while also reinforcing resilience and sovereignty/autonomy/security of supply," a close and purposeful interaction between public and private actors is required (Tagliapietra & Veuglers, 2023, p. 19). The GI approach is relevant in that regard, as its original goal was to identify the forms of public–private collaboration that underpin an effective strategic industrial policy (Weiss, 1995, p. 605). The underlying assumption was that developing economic statecraft in technological sectors requires maintaining "embedded state–industry networks" (Weiss, 1995, p. 595), whereby the state's bureaucracy can gather information and coordinate agreements with private actors. In recent elaborations of the concept, GI is used to describe "a relationship between the state and private actors that involves considerable negotiation, collaboration and partnering, one that is pursued for mutual benefit but is ultimately governed by public objectives" (Weiss & Thurbon, 2021, p. 476). What makes GI stand out in the landscape of international political economy is its explicit aim to transcend the divide between statist and market approaches to technological innovation (Weiss, 2014, p. 18). Its focus is rather on the ability of government actors to elicit consensus and cooperation from the private sector.

Within the EU, these strategic state–industry collaborative arrangements have recently taken the form of Industrial Alliances. Di Carlo and Schmitz (2023, p. 8) conceptualise them as a "brokering" element of

industrial policy, a form of network governance that envisages "states connecting scientists working in universities, government laboratories or business settings to stimulate innovation." To examine the Alliances' contribution to articulate closer public–private collaboration in the pursuit of strategic goals, we develop an analytical framework that explores the extent to which the Alliances resemble the properties and functions of embedded state–industry networks of a GI system and identifies the tensions emerging in that process. The next subsections spell out these analytical dimensions (see Table 1 for a summary) and the methodological choices driving the data collection and analysis.

2.1. Properties of Embedded State–Industry Networks

The first element to examine is the *size and diversity* of membership. Creating broad networks of firms is particularly relevant when industrial policy aims to achieve technological leadership. Developing advanced technologies requires going beyond large firms in established industries and demands "a more inclusive and much less centralised approach" (Weiss & Thurbon, 2021, p. 478). Accordingly, EU Industrial Alliances are meant to be inclusive and cover different value chain segments in the respective sector. However, inclusiveness might also be a challenge when articulating close state–industry collaboration. One important factor outlined by Weiss (1995) is that a robust GI is more likely where nationals own the private sector, the assumption being that domestic firms are more committed to a well-functioning industrial ecosystem than foreign companies. Given that economic statecraft aims to promote the technological leadership of the "domestic" industry vis-à-vis strategic competitors, we would expect Industrial Alliances to be formed mainly by EU-based business actors. However, the idea of "open strategic autonomy," adopted as the new EU trade policy doctrine (European Commission, 2020), and the realities of some global value chains point in the direction of greater geographical spread, including non-EU actors (e.g., Schneider, 2023; Vlasiuk Nibe, 2023). Moreover, partnering with like-minded countries is a building block of Europe's economic security strategy (Rosén & Meunier, 2023; Timmers, 2022). Examining the Alliances' composition and membership criteria can thus provide valuable information about how the EU balances these seemingly contradictory requirements between inclusivity and exclusivity and, therefore, autonomy and openness.

The second element is the degree of *goal consensus*. A fundamental characteristic of GI is that the relationship between the state and private actors is "pursued for mutual benefit but is ultimately governed by public objectives" (Weiss & Thurbon, 2021, p. 476). In other words, GI necessitates squaring commercial and geostrategic goals, which may not always be aligned. For instance, Weiss (2014) extensively documented the frequent reluctance of US' high-tech firms to collaborate in government security-oriented programmes seeking technological primacy. Within the EU, studies focusing on Germany's recent shift towards strategic industrial policy have also identified major divisions within the German business community on whether to support the government's agenda (Germann, 2023; Schneider, 2023). Therefore, the alignment of industry actors with EU geoeconomic policies is not a given, and responses can range from lobbying in favour of such measures to active resistance (cf. Choer Moraes & Wigell, 2022; Eckert, 2024). The capacity of Industrial Alliances to reconcile geostrategic and commercial goals is thus relevant for articulating a fruitful relation of GI.

The third element is the level of *centralisation*. As an institutional form, GI is "neither simply bottom-up nor solely top-down" (Weiss, 2014, p. 18). Rather, it envisions a balance between an autonomous and dynamic industrial ecosystem and centralised mechanisms to ensure that the private sector contributes to the set strategic targets. EU Industrial Alliances are designed to foster bottom-up and horizontal interactions, with

private actors assuming a leading role in the management of the network. However, from a GI perspective, if the Alliances are to comply with the geopolitical drivers of industrial policy, they also require a prominent steering role from the European Commission. In the original framework, the presence of a committed, capable, and expert bureaucracy was actually one of the main factors explaining the successful articulation of GI (Weiss, 1995, pp. 596–597). It is, therefore, crucial to comprehend how the Alliances balance bottom-up and top-down dynamics and the extent to which expertise and bureaucratic capacity influence the steering ability of the European Commission.

2.2. Functions of Embedded State–Industry Networks

At the most basic level, state–industry networks contribute to *reducing information gaps*. For GI to produce the desired effects, state bureaucracy needs adequate mechanisms to gain knowledge of industrial conditions (Weiss, 1995, p. 596). The purpose of institutionalised state–industry links is to maintain close channels for gathering and sharing information, thus increasing the chances of a better policy design and implementation (Weiss, 1995, p. 601). In further elaborations of the approach, Weiss emphasised that the ability of the state to "extract and exchange vital information with producers" is key to the development of GI, understood as a form of infrastructural power, echoing Michael Mann's influential conceptualisation of the ways in which the state exercises power through linkages and negotiation rather than coercion (Mann, 1993, as cited in Weiss, 2006, p. 168). The Alliances' contribution to reducing information gaps, thereby increasing the Commission's chances to exert infrastructural power, can be exploratively assessed by the frequency and type of formal events, as well as working meetings and other internal communication channels. A possible tension when establishing routinised information flows is how the Alliances juggle between engaging all the members and facilitating close and agile exchanges. Therefore, we analyse how the Alliances articulate information flows, whether they are truly bidirectional, and whether they prioritise encompassing information or target a restricted group of members for a more substantive exchange of views.

A second function of state–industry networks is *policy coordination*, contributing to a joint articulation of strategic industrial policy. However, a condition for fruitful GI is that policymaking structures remain insulated from special interests (Weiss, 1995, p. 598). Some of the recent literature engaging with GI has examined this tension between connectedness and insulation in government–business relations, arguing that business actors in critical technological sectors have, over time, gained more power and autonomy vis-à-vis states (Kang & Jo, 2021; Kelton et al., 2022). This debate is also relevant for the analysis of the Industrial Alliances. On the one hand, the Alliances may become instrumental in generating policy solutions. These can be assessed by examining whether they produce joint statements or practical initiatives affecting policy debates and sectorial priorities. On the other hand, the more substantial the role of the Alliances in that regard, the more they may raise normative-political concerns regarding the transparency and insulation of policymakers from business interests. While the Commission explicitly indicates that the Alliances do not play a role in policymaking (European Commission, n.d.), some NGOs have criticised them as a new form of "corporate capture" (Friends of the Earth Europe, 2021). The contention is that the Alliances might "unduly influence political processes and direct public spending" (Friends of the Earth Europe, 2021, p. 2), thereby impinging upon the EU's democratic legitimacy and eroding the epistemic basis of EU policies, as policymakers might rely more on business actors than on independent experts. Whether this tension between interconnectedness and insulation is a concern that affects how the Alliances work is also relevant for investigating the articulation of GI in the EU.

Table 1. Analytical dimensions and empirical indicators for the study of GI in the Industrial Alliances.

Analytical dimensions		GI	Indicators
Alliances properties	Size and diversity	Inclusive industry networks, but exclusive of third-country firms	Membership structure (share of business actors, share of non-EU members) Stringency of the admissions procedure (who can join the Alliances and based on what elements)
	Goal consensus	Blending of geostrategic and commercial goals	Ambition of EU targets and type of instruments (market incentivising or restricting) Structure of the market and global value chains (how limiting the situation of the technological value chain is for a full geoeconomic display)
	Centralisation	Balancing bottom-up dynamics with top-down direction from expert bureaucracy	Governance structure of the Alliances (who manages the Alliances, how varied and inclusive the managing board is) Relation between Commission and coordinating bodies (what steering roles does the European Commission assume, why these roles are performed by the European Commission or other bodies)
Alliances functions	Reducing information gaps	Institutionalised and substantive information flows	Format and frequency of meetings (high-level or working-level meetings, restricted or broad participation) Internal communication channels (presence of newsletters, recurrence of and participation in steering committee meetings)
	Policy coordination	Joint articulation of industrial policy, yet maintaining insulation from special interests	Publications (joint statements, strategic plans) Perceptions regarding the insulation of decision-makers from specific business interests (descriptions of and accusations targeting the lack of transparency in the Alliances' procedures)
	Risk socialisation	Proactive techno-governance measures	Alliances' contribution to promoting public and private investment (engagement with public and private investors, existence of project pipelines) Link between the Alliances and risk-socialising measures (e.g., unlocking state aid measures, EU financing programmes, public–private innovation partnerships)

Last but not least, in a GI system, state–industry networks serve the purpose of *socialising the risk* of technological innovation, including by coordinating investment in strategic industrial sectors. Government and businesses share the responsibility for raising capital, developing new products and technologies, finding new markets, and training a skilled workforce (Weiss, 1995, p. 594). While all advanced states intervene in some way or another in techno-industrial governance, they can do so to different degrees, ranging from mere R&D expenditure to more active involvement, for example, by assuring demand for technological innovations, taking equity in innovation firms, or co-developing industry standards to outflank foreign competitors (Weiss, 2014). A system of GI implies the adoption of instruments on the proactive end of the continuum. For example, the US has long used all these forms of public–private collaboration, in what Weiss characterises as the "National Security State" (Weiss, 2014). Similarly, though motivated more by

geoeconomic than geopolitical concerns, East Asian economies have also intensified public–private collaboration in critical technologies. For example, studying South Korea and Taiwan, Kim (2019) identifies *hybridised industrial ecosystems* as a new "institutional mutation" of GI, characterised by a "genuine fusion of public and private features" (Kim, 2019, p. 160). Besides this high level of public–private integration, their success lies in linking up all segments of the production and innovation value chain rather than focusing on the different components. Besides external pressures, the degree of state involvement and choice of instruments is also determined by domestic factors, such as state–society relations (Weiss & Thurbon, 2021). For example, in the US, the dominant anti-statist ethos is said to have led to unconventional forms of state intervention (Weiss, 2014). A tension between ingrained state–society relations and proactive industrial governance could emerge in the EU, given its traditional market-liberal orientation and centrality of competition policy in ensuring a level playing field in the internal market. It is thus relevant to examine where the Industrial Alliances sit in the continuum between passive and proactive forms of risk-sharing collaboration.

2.3. Methodological Considerations

Our selection of four energy-related Industrial Alliances (EBA, ERMA, ECH2A, and ESIA) launched between 2017 and 2022 aims at ensuring some level of comparability yet capturing differences related to the industry characteristics or the stages of development. Our empirical analysis relies on publicly available information from the Alliances' website, EU and European Institute of Innovation and Technology (EIT) documents, and news articles retrieved via web research (around 50 documents) from January 2017, when the first Industrial Alliance was launched, and April 2024. The public data was used to construct our databases on the membership of the Alliances, their basic organisational structure, and activities performed. Moreover, nine semistructured interviews (Rubin & Rubin, 2012) were conducted between April and December 2023. Interviewees included five industry actors from EIT InnoEnergy, Hydrogen Europe, Eurobat, and the European Association for Electromobility, as well as four European Commission policy officers involved in managing the Alliances considered (see Table 2 for an overview).

A survey gathered additional insights from 13 private European companies in the critical raw materials, batteries, solar, and hydrogen sector and business associations representing the clean energy industry involved in one or more of the Alliances examined. Conducted between February and May 2023, the survey investigated private perceptions of the linkages between the energy transition and geopolitics and the relationship with national and supranational institutions in the energy transition. The survey was created and managed via Qualtrics. Thirteen questions investigated the participants' perceptions of the linkages between geopolitics, the race for clean energy technologies, and economic collaboration across firms and national and supranational institutions. Survey participation requests were sent to 33 individuals, of which 20 were employed in business organisations and 13 in relevant firms. In total, 13 people completed the survey, with a response rate of 39%. The responses were completely anonymised, and links are non-traceable.

This article combines endogenous and exogenous analysis. Specifically, we are interested in how the actors involved perceive the Alliances and echo any of the tensions discussed above while complementing such views with our own assessment of how they come close to or differ from the GI benchmark. Semistructured interviews are thus used as the main research method to address the scarce availability of online data. While interviews allow insiders' perspectives to emerge and outline the Alliances' purpose, the triangulation with

Table 2. Overview of interviews.

Interview	Date	Affiliation
1-BA	8 May 2023	Business association
2-BA	9 May 2023	Business association
3-BA	10 May 2023	Business association
4-COM	5 December 2023	European Commission
5-COM	13 December 2023	European Commission
6-COM	14 December 2023	European Commission
7-COM	19 December 2023	European Commission
8-EIT	22 December 2023	EIT
9-EIT	22 December 2023	EIT

data obtained via desk research allows the reconstruction of the (in)consistencies between insiders' views and public information. At the same time, the survey's findings were used to shape our views about public–private collaboration in the energy transition.

3. The EU Green Industrial Alliances at Work

3.1. Properties: Balancing Inclusiveness, Effectiveness, and Control

Dissecting data on the membership of the examined Alliances raises two important observations. The first is their remarkable *size*, ranging from less than 150 members of the ESIA to around 1,000 members of the ERMA and EBA and more than 1,700 members of the ECH2A. The second observation is the Alliances' variation in terms of the type of actors and their geographical spread (see Figure 1). While members do not have to be strictly EU-based, the Alliance's inclusivity ends where applicants cannot demonstrate their intention to contribute to strengthening the EU's industrial ecosystem. Moreover, while individual companies and business associations account for about two-thirds of the Alliances' membership, the remaining includes a wide variety of stakeholders, including research organisations, NGOs, trade unions, financial institutions, and regional or national public authorities.

EU-based actors compose most of the examined Alliances' members (see Figure 2). This is particularly true for the ESIA, which represents a sector increasingly overtaken outside the EU. However, across the Alliances, there is a consistent presence of actors from states of the European Economic Area (EEA) and the European Free Trade Area (EFTA), but most importantly, of overseas actors. Most members outside the EU and the EEA/EFTA are OECD countries, particularly the US, Australia, Canada, and South Korea, but not exclusively. In the ERMA, the high proportion of non-EU actors includes a sizeable African component, especially in the first segments of the value chain, focusing on primary raw materials. More surprising is the inclusion of companies from China (e.g., CNGR Advanced Materials Co., Svolt Energy Technology, and Botree Cycling in the EBA), given the country's portrayal as a strategic competitor.

When asked about the rationale behind the Alliances' membership, respondents indicated that the purpose of Industrial Alliances is to "grow as much as possible" and "bring all kinds of different interests together" as long as applicants "fulfil the membership criteria" (Interview 6-COM). Membership is granted if the

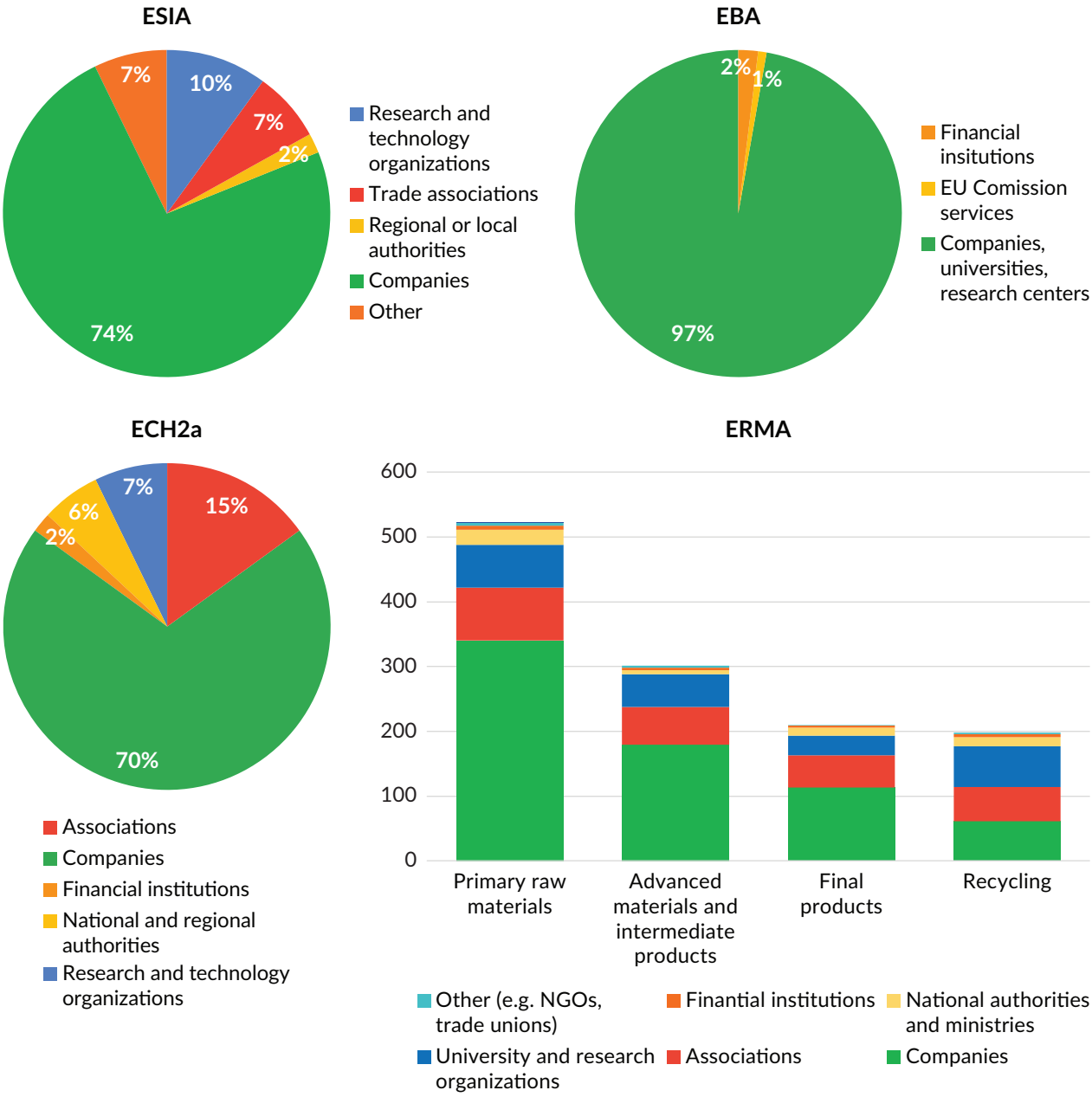

Figure 1. Membership of ESIA, EBA, ERMA, and ECH2A (by type of actors).

applicants demonstrate their intention or capacity to produce the relevant materials or technologies in the EU and create European value chains (Interviews 2-BA, 3-BA, and 6-COM). Such criteria result in "excluding some requests when the company has no such plans…or when the company is a non-EU company which is mainly interested in selling products in Europe" (Interview 8-EIT). The balance between inclusivity and exclusivity also depends on sectorial features. For the battery sector, for example, the relevant industry's position towards the geostrategic value of technological supply chains is "hard to define…because there are European companies, which are based in Europe, which see a protectionist policy as an advantageous one, while others do not" (Interview 3-BA). This is because batteries need materials that, in most cases, are not available in Europe; therefore, expecting the European battery industry to be self-sufficient and exclusive of competing actors "is a question that…from a certain point of view, is not possible" (Interview 3-BA). The case

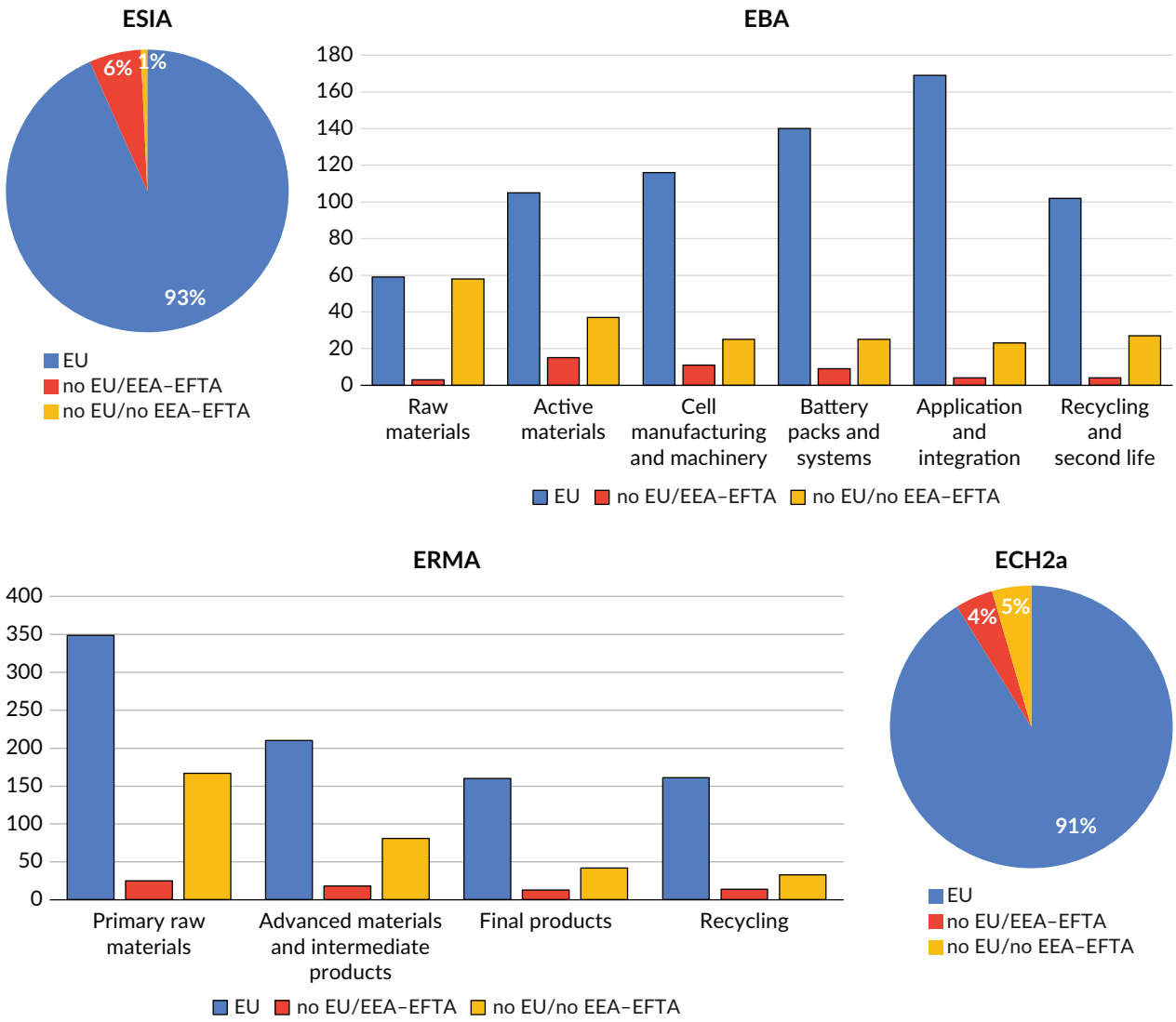

Figure 2. Membership of ESIA, EBA, ERMA, and ECH2A (by geographical origin).

of the solar industry, which has mostly been lost to China (Interview 7-COM), is starkly different and advocates for a more geostrategic approach to adapt to the "new geopolitical energy focused on Net-Zero" (SolarPower Europe, 2023). In sum, the Alliances are generally more inclusive than what would be expected in a GI system. They promote the development and growth of EU-based industrial ecosystems without excluding partnerships that could eventually benefit the European industry, even though this may result in the presence of companies from strategically competing countries.

These sectorial differences are also important for the degree of *goal consensus* in the Alliances in terms of blending geostrategic and commercial objectives. As stated by one of the Commission's officials, "differences among different Alliances depend on the different features of each market" (Interview 7-COM). In the context of the ESIA, "there is geopolitical momentum as the industry has been taken over almost completely outside the EU, especially in China" (Interview 7-COM). The Alliance "was launched with the goal to have 30 gigawatts of manufacturing capacity," but Chinese dominance along most of the supply chain and the reinvigorated discourses on energy resilience following Russia's invasion of Ukraine have further

stressed the energy security dimension (Interview 6-COM). Such a situation also explains why the European Commissioner responsible for the Internal Market, Thierry Breton, personally hosted a ministerial meeting on the European solar photovoltaic industry under the umbrella of the ESIA to stress the importance of sustaining and re-growing an EU-based solar manufacturing industry (Directorate-General for Energy, 2023).

While the day-to-day work of the Alliances focuses more on the commercial-technical goals, such as creating investment pipelines or standardisation, the "pursuit of public objectives, the energy transition in this case, and the need to reinforce relevant industrial ecosystems in front of third countries' competition remains a priority" (Interview 7-COM). The purpose of the Alliances is "to look at the full value chain" (Interview 8-EIT); in the case of hydrogen, "the aim of the Alliance was to bring hydrogen from lab to market," so the Alliance "has the goal to support the large-scale deployment of clean hydrogen in order to decarbonise the industry…but also…the mobility sectors when it comes to trucks or shipping" (Interview 5-COM). For this purpose, the Alliances "bring together not only the private sector but also the public sector" so that "everybody has a different role" towards the same objective (Interview 5-COM). The Alliances thus adhere to the notion of GI by calibrating geostrategic and technical-commercial narratives according to the state of each industrial ecosystem; by so doing, they remain fora where discussion and conciliation are favoured to prevent internal conflict and defections.

The level of *centralisation* also partly depends on the relevant industrial features. However, the expertise of the leading organisations and the Commission's resources are determining factors for the degree of control assumed by the EU bureaucracy in the Alliances. The Commission "plays a significant role in all of them, although to different degrees" (Interview 7-COM). For instance, the EBA and ESIA are managed by EIT InnoEnergy, a company founded by 27 shareholders and supported by the EIT, an independent EU innovation body created under the framework of Horizon Europe (EIT, 2021). EIT InnoEnergy is one of the EIT Knowledge and Innovation Communities, which consist of partnerships dedicated to addressing specific global challenges, such as climate change. As one of their representatives described it, EIT InnoEnergy is "an investor in start-ups and scale-ups…in the energy transition field of work" (Interview 8-EIT). Born in 2009, it received "a mandate from the European Commission to start the first Industrial Alliance…a concept that [they] almost created together with Vice President Šefčovič at the time" (Interview 8-EIT). Similarly, EIT RawMaterials is the organisation that the Commission entrusted to manage ERMA's stakeholders' consultation process across the entire value chain and channel investments. Conversely, the European Commission takes care of ECH2A's operational work. The entrustment of the EBA and ERMA to the respective EIT innovation communities followed its capacity to act as an incubator and attract investment in the respective sectors.

While considerations of expertise drive the decision to entrust the management of the Alliances to EIT, resource efficiency is also important (Interviews 4-COM and 6-COM). As argued by one of the interviewees, "EIT has a lot of expertise and, at this point, they are very experienced with the Alliances" (Interview 6-COM); it works in close contact with companies and possesses market intelligence, saving the Commission's resources (Interviews 4-COM, 5-COM, and 6-COM). However, efficiency comes at the cost of limited oversight and information-gathering capacity by the Commission. Some interviewees acknowledged a trade-off in having less insight and voice into the day-to-day management of the Alliances (Interviews 4-COM and 5-COM). This also explains the higher centralisation of the ECH2A. Given the size of the hydrogen ecosystem and the multitude of parties involved, internal management of the Alliance was

preferred, as it is "an advantage when you want to have action or quick information"; moreover, "[the Commission] can have access to different roundtables, different co-chairs, and the steering committee. It's easier. And then [the Commission] know[s that it] can also monitor a little bit more" (Interview 5-COM). Overall, in terms of GI, the tendency to entrust the management of the Alliances to an autonomous industry actor (though supported by EU funding) does not fully align with the idea of a strong bureaucracy with in-house expertise.

3.2. Alliance Functions: Towards the Co-Production of Policies?

Reducing information gaps is a crucial activity of Industrial Alliances. Of the four examined Alliances, the ECH2A has the most encompassing information channels. It has a steering committee, which includes the Commission and the facilitating organisation of each of the six roundtables that define the Alliance's workstreams. Each roundtable can include up to 50 members, and the Commission ensures some balance in terms of geographical spread and type of actors, for example, ensuring a good representation of SMEs (about 20%) and at least two NGOs per roundtable. The steering committee meets around six times a year to exchange updates from the Commission on policy streams and the roundtables' work. Moreover, the ECH2A organises two Hydrogen Forums a year, featuring speeches from high-level political figures and thematic discussions, allowing all the Alliance's members to participate. Finally, every one to two months, the ECH2A circulates a newsletter across the membership to synthesise significant updates from events or calls from the European Commission which are relevant to the hydrogen ecosystem, to update all members about the work inside the roundtables, and to share cases of successful clean hydrogen projects (Interview 5-COM).

Comparatively, the EBA focuses on ad hoc and restricted meetings, which include only a segment of the membership or happen bilaterally (Interview 8-EIT). EIT InnoEnergy formed "a core group of CEOs that were a bit of a [sounding] board for the Commission on a number of topics, especially post-Covid reaction to the US Inflation Reduction Act and the energy crisis" (Interview 8-EIT). The EBA also runs targeted meetings to keep the European Commission informed, especially at the high level, for example, in ministerial meetings, where "the Battery Alliance was reporting to the ministers in terms of the status of the value chain, what is needed in that state" (Interview 8-EIT). In between, the information flows in ESIA mostly occur within the steering committee, which includes the Commission, EIT InnoEnergy, and two industrial associations, namely SolarPower Europe and the European Solar Manufacturing Council. These meetings are occasions to discuss the work inside the Alliance's four working groups led by key industry players, including Carbon, Enel Greenpower, Engie, IBC, Meyer Burger Technology AG, and Wacker Chemie AG. The ESIA also runs an annual forum, which has only convened once so far. In turn, the ERMA does not have a steering committee, but it hosts an annual EIT Materials Summit and is involved in organising the Raw Materials Week. In sum, in line with the idea of embedded state–industry networks in GI, the Alliances have built an institutionalised framework for the circulation of information in a bidirectional way. The channels of information appear to be more encompassing in the Alliances where the Commission plays a major role, particularly in the ECH2A, suggesting a correlation between widespread information-gathering strategies, oversight capacity, and the need to build in-house expertise.

In terms of *policy coordination*, the Alliances aspire to work "towards a shared goal and to discuss concrete actions…in a structured and efficient way [to] deliver on the goal" (Interview 9-EIT). Therefore, the Alliances are driven by specific EU-level targets. For example, the ESIA aims to reach a series of concrete actions to

re-industrialise the European solar photovoltaic industry and achieve the Green Deal targets to develop an industry to supply an annual capacity of 30 GW by 2025, adding €60 billion of new GDP every year in Europe and creating more than 400,000 new jobs (ESIA, 2023). In the context of the ECH2A, the European Commission and 20 CEOs signed a Joint Declaration in May 2022, whereby the signatories committed to a tenfold increase of their electrolyser manufacturing capacity by 2025, enabling an annual production of 10 million tons of renewable hydrogen by 2030 in the EU as set out in the REPowerEU Communication (European Commission, 2022b).

Moreover, the Alliances actively contribute to producing strategic action plans in close collaboration with the European Commission. In 2017, the EBA contributed to shaping the Communication on the mobility strategy for Europe. In the words of an interviewee, "the goals were set together with the Commission in 2017, and the action plan was devised between 2017 and 2018 and resulted in the Commission's official paper" (Interview 8-EIT). In 2018, the EBA also contributed to developing the Strategic Action Plan on Batteries (European Commission, 2019), setting out a comprehensive framework of regulatory and non-regulatory actions to support the battery value chain in Europe. The ERMA produced a call for action on rare-earth magnets and motors and another on energy storage and conversion materials, identifying the relevant bottlenecks and ways to improve such segments at the European level (Interview 4-COM).

In this sense, the Alliances influence policymaking, raising the question of whether EU bureaucracy is adequately insulated from special business interests. However, when asked about whether the Alliances could be seen as a privileged channel for business to affect the Commission's work, one interviewee stated, "I would not say that they have in the Alliance the ideal place to have these very bold lobbying activities because they do not need, especially the big players…the Alliances to do that" (Interview 5-COM). On the contrary, the Commission perceives the Alliances as a way to gather intelligence, identify the major policy gaps, set priorities, and increase the likelihood that the industry will invest and contribute to European ecosystems (Interview 7-COM). The Alliances' output (analyses, reports, and position papers on specific issues) often concentrates on highly technical aspects. Other topics can be politically more sensitive, such as the work of the ECH2A on permitting, standardisation, or the potential impact of the US Inflation Reduction Act. While so far, there has been limited political or public contestation regarding the role of Industrial Alliances, these have occasionally been put under the spotlight by transparency NGOs and some political groups in the European Parliament (cf. Taylor, 2021). In sum, the Alliances have assumed the function of providing some light forms of policy coordination, with relatively limited concerns regarding the ability of the European Commission to remain insulated from special business interests.

Finally, on *risk socialisation*, the Alliances remain on the passive end of the techno-governance spectrum envisaged by GI. While facilitating investment constitutes a core function of the Alliances, their contribution is limited to matching activities rather than direct involvement in innovation, e.g., through subsidies or public–private partnerships. The EU has developed risk-sharing instruments, most notably in the form of guarantees. As a successor of the European Fund for Strategic Investment introduced by the Juncker Commission, the EU currently counts on the InvestEU programme (2021–2027), powered with €26 billion in guarantees, to increase the risk-bearing capacity of the European Investment Bank (EIB) and national promotional banks to mobilise private investment in areas such as the green transition. The most proactive mechanisms concern hydrogen, where the Commission is involved in de-risking production and imports of green hydrogen through auctions supported by specific financial instruments. Regarding subsidies for clean

energy technologies, the EU does not provide direct support. However, it has relaxed its state aid rules to allow member states to subsidise battery and hydrogen technologies (€6.1 and €17.5 billion, respectively). To qualify as Important Projects of Common European Interest, projects "should be particularly important in size or scope or imply a very considerable level of technological or financial risk, or both" (European Commission, 2021, p. 14). Risk-sharing is thus at the core of the Important Projects of Common European Interest. Nevertheless, more ambitious EU-level risk-sharing mechanisms, such as the European Sovereignty Fund proposed by Commission President Von der Leyen to promote strategic technologies "made in Europe" in response to the nearly $400 billion in clean-tech subsidies of the US Inflation Reduction Act, did not get the support of the EU member states (Simon, 2024).

In this framework, the Alliances endeavour to help companies access finance by facilitating the matching between projects and investors, organising investor days and ministerial meetings involving private investors and the EIB (Interview 7-COM). Some of the project proposals of the ESIA were presented during the solar photovoltaic ministerial meeting in December 2023, during which the EIB was one of the attendees (Interview 6-COM). Other examples include the ECH2A's Green Hydrogen Investment Day, organised in November 2023 in collaboration with EIT InnoEnergy's European Green Hydrogen Acceleration Centre, where many projects could be pitched to various investors. The year before, the same Alliance launched two calls for projects with the EIB (Interview 5-COM). The ERMA also runs a Clean Technology Materials Task Force to mobilise and coordinate funding. One example of successful unlocking of private investment is the EBA Strategic Battery Materials Fund, launched in January 2024 by EIT InnoEnergy and Demeter (a major European private equity and venture capital firm), consisting of €500 million to boost domestic capacities for strategic battery materials and increase raw materials supplies from EU Raw Material Partnership countries, such as Canada, Namibia, and Argentina.

The Alliances also develop "project pipelines," which are overviews of project proposals in the respective sectors that the managing organisations collect and assess according to criteria such as project maturity. The Alliances are particularly intended to grow investments in their respective sectors. Most successfully, the EBA generated investments for about 160 projects since 2016, when "there was no industry" (Interview 8-EIT). However, as the same interviewee noted, "[Europe] is still under a lot of pressure and challenge within this industry to deliver on the commercialisation of those projects. It takes time to be competitive." The number of project proposals ranges from 840 project proposals in ECH2A to 150 for ERMA and 20 projects for ESIA. Including projects in the pipeline, however, does not guarantee their realisation. They can be seen as windows onto the potential of an emerging industry. Overall, the Alliances play a role in bringing the markets' attention to public support schemes, though in a rather passive form, by delegating to EIT, InnoEnergy, and RawMaterials the task of bringing in private capital and encouraging the formation of new industrial ecosystems without exacerbating dependencies on state support.

4. Conclusion

GI, understood as a specific form of institutionalised state–industry collaboration guided by public goals, "has become central to the effective execution of economic statecraft" (Weiss & Thurbon, 2021, p. 7). As the EU tries to boost its industrial policy in response to geopolitical and geoeconomic pressures, this article examined whether government–firm relations at the EU level, organised in the new format of Industrial Alliances, also take some of the qualities described in a GI system. The recently launched EU Industrial

Alliances were examined as important institutional innovations in that regard, as their explicit aim is to support EU strategic autonomy by increasing the capacity to innovate and domestically produce critical technologies, goods, and materials. However, our analysis has revealed a more mixed picture.

On the one hand, in line with GI, Industrial Alliances provide an institutionalised venue for public–private collaboration led by geostrategic objectives that contribute to reducing information gaps and fostering policy coordination. All examined Alliances provide structured channels of communication that allow the European Commission to better understand the industry's conditions and align its strategies with industrial priorities. By purposefully covering all the segments of the value chains in their respective technologies, the Alliances also echo the GI-inspired notion of hybridised industrial ecosystems. On the other hand, Industrial Alliances adhere less well to a GI system in their composition and structure, and their loose articulation of risk-socialisation mechanisms. In terms of membership, the Alliances are generally more open to third-country firms than expected by GI. Besides a normative commitment to openness, this inclusiveness reflects the high level of EU dependency on global technological value chains. The structure and management of the Alliances also reveal a shortage of resources and in-house expertise on the European Commission side to fulfil the steering functions that GI assigns to state bureaucracies.

However, the dimension where the EU practice differs most from GI is the degree of risk-socialisation mechanisms. The EU has comparatively limited instruments to elicit cooperation from the private sector. Hydrogen is the sector where the EU is most proactive, with the largest amount of state aid projects, specific financial instruments, and risk-sharing schemes embedded in the European Hydrogen Bank, and a clear goal to develop standards that give EU electrolyser producers an edge over competitors. However, while the EU has set strategic goals, such as the domestic manufacturing of 40% of clean technologies by 2030, it does not directly engage in public–private innovation partnerships, which is a key defining trait of the forms of GI that have developed in the US and East Asian economies. It has few mechanisms to link national subsidies to EU-level performance targets.

The EU's multilevel character and ingrained state–society relations contribute to explaining the shortcomings and challenges of the EU acting as effectively as other global players in an increasingly confrontational world. For decades, as it is characterised as a regulatory state (Majone, 1994), the EU has traditionally avoided linking the Single Market with geopolitical and security considerations. Quite the contrary, in domains such as energy policy, the EU rather concentrated on dismantling strong government–firm relations at the national level to unlock the economic potential of the Single Market. Therefore, the shift from market-creating to market-directing industrial policy (Seidl & Schmitz, 2023), while broadly accepted discursively, remains difficult to implement in practice. Given that the most powerful tools of strategic industrial policy reside at the national level (e.g., state aid), the EU's attempts to emulate the state capitalist tools of the US or China might ironically imply a weakening of the EU's ability to integrate and control member states (Fu, 2024, p. 789). Therefore, the risk of fragmentation and accentuation of regional inequalities within the EU due to the recent wave of industrial policy is a mounting source of concern (Di Carlo & Schmitz, 2023, pp. 24–25; Wigger, 2023).

The EU's difficulty in building up economic statecraft via industrial policy, supported by a robust GI, contrasts with the EU's relative success in articulating and leveraging its external tools of economic statecraft via trade and investment policy (cf. Bauerle Danzman & Meunier, 2024). Unpacking the causes and consequences of

this gap between EU domestic and outward-oriented economic statecraft constitutes an important avenue for further research on the interaction between geoeconomics and European integration. The way in which the EU develops and combines these two dimensions of statecraft is likely to have a profound impact on state–market–society relations, the balance between national and European authority, and the EU's ability to navigate global energy and digital transformations.

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Conflict of Interests

One of the authors was a Blue Book Trainee at the European Commission DG Internal Market, Industry, Entrepreneurship and SMEs (DG GROW) at the time of writing this article. While that role has facilitated the identification of key individuals responsible for the internal management of Industrial Alliances, the research for this article was developed independently from it and interviewees were fully informed about the research purposes of the interview. The opinions expressed in this article are those of the authors only and should not be considered as representative of the European Commission's official position.

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ARTICLE

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Latin American Involvement in the 21st Century Geoeconomic Turn: A Qualitative Comparative Analysis

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Abstract

In the past decade, profound political and economic transformations have reshaped the landscape of globalization and challenged the conventional notions of the liberal international order. The traditional boundaries between the economy and security realms have become blurred, giving place to a geoeconomic turn illustrated by the high utilization of economic statecraft in international politics. While much scholarly attention has been devoted to understanding the geoeconomic strategies of global powers like the US and China, the agency and roles of emerging and developing countries, notably those in Latin America, have often been overlooked. This article addresses this gap by examining how Latin American nations engage in 21st-century geoeconomic dynamics. Using qualitative comparative analysis across 18 case studies, the study assesses the conditions and key characteristics of geoeconomic actions involving Latin American countries since 2017. The article presents a typology that sheds light on the mechanisms at play within economic statecraft in the region through six different situations: (a) local geopolitical-driven economic statecraft, (b) Latin American value-driven economic statecraft, (c) extra-regional sanctions, (d) economic inducement strategy, (e) coercive strategy for strategic assets and technologies, and (f) precautionary defensive economic statecraft. The contribution is twofold: On the one hand, the article casts light on the different facets Latin American countries have in the geo-economic trends; on the other hand, the analysis and classification of these situations help understand the links between economic and strategic policies.

Keywords

economic policy; economic statecraft; geoeconomic turn; geoeconomics; Latin America; strategic policies

1. Introduction

Over the past decade, political and economic transformations have triggered a geoeconomic shift in international relations. Governments now leverage their economic power to pursue political, strategic, or security aims. This has blurred the boundaries between the economic and security realms, changing the international economic scenario and leading to the configuration of a "geoeconomic turn" (Babić et al., 2022; Bauerle Danzman & Meunier, 2024). Within this context, most of the specific literature has focused on understanding the dynamics of geoeconomic strategies between the US and China. Conversely, emerging and developing countries' roles, particularly Latin American ones, have remained overlooked.

This article addresses this gap in international relations literature by focusing on the dynamics of the 21st-century geoeconomic turn in Latin America. The analysis aims to address how Latin American countries have managed their strategies in geoeconomic times. Applying qualitative comparative analysis (QCA), the research examines the conditions and goals that trigger geoeconomic actions and the characteristics of the tools involved across 18 case studies. Further, it compares the configurations shown when Latin American countries are the initiating actors or the targets in a geoeconomic dynamic. The findings help to develop a typology of six different situations: (a) local geopolitical-driven economic statecraft, (b) Latin American value-driven economic statecraft, (c) extra-regional sanctions, (d) economic inducement strategy, (e) coercive strategy for strategic assets and technologies, and (f) precautionary defensive economic statecraft.

Section 2 delves into a thorough literature review, examining theoretical frameworks and empirical insights that have contributed to understanding geoeconomics and Latin American countries' role in the geo-economic turn. Section 3 presents the case selection and the conditions applied in the QCA. Section 4 discusses the characteristics of Latin American countries' involvement in the geo-economic trends and presents a nuanced typology based on the case studies. Finally, the concluding remarks synthesize the key findings and contributions.

2. Literature Review

The study of geoeconomics has gained prominence as the competition between the US and China settled as the central dynamic in global international relations since 2017 when the US government acknowledged China's growth as a challenge to American power and interests and introduced economic security as a pillar in the US National Security Strategy. The reasoning is twofold. On the one hand, there is a growing sense of competition instead of cooperation between major powers, which makes strategic policies more salient (Baracuhy, 2019). On the other hand, due to the extent of global interdependence, economic power is assumed to be a suitable tool for strategic goals—in some cases, even more than military ones (Farrell & Newman, 2019; Wigell et al., 2018).

Geoeconomics is a contested concept (Scholvin & Wigell, 2018). It can be defined as "an extension of the sphere of geopolitics applied to international economic relations" (Coelho Jaeger & Pereira Brites, 2020, p. 22). It has been applied as a systemic level approach that can characterize the growing tensions in great powers competition (Aggarwal & Kenney, 2023) and as a term that indicates how a state exercises power using economic tools (Bauerle Danzman & Meunier, 2024; Blackwill & Harris, 2016). From this perspective, the economic factors, including the position in economic networks, are framed as power resources in

interstate competition. It can be considered a special type of economic statecraft (Baldwin, 2020) that pursues particular aims: Instead of mere economic goals, these actions use economic tools for geopolitical purposes (Bauerle Danzman & Meunier, 2024). Motives can be mixed, but what distinguishes this type of behavior in the international arena is that it applies economic tools to pursue goals beyond their immediate economic effects, mostly linked with interstate rivalry (Scholvin & Wigell, 2018).

Among others, geoeconomics, as a type of economic statecraft, can be applied with aims such as shaping the strategic environment (Vihma, 2018) and influencing the behavior of other countries by deterring or compelling them to take certain actions (Baldwin, 2020; Mastanduno, 2003). In addition, it can be used as a punishment or signaling mechanism (Zhang, 2019) to satisfy domestic and international opinion or even as a bargaining tool (Miyagawa, 2023). For Choer Moraes and Wigell (2022), geoeconomics implies "trying to enforce dependencies on others" or "reducing such dependencies so as not to become a pawn in geoeconomic power politics" (p. 35). Under geoeconomics, "states use economic interdependence offensively to further their foreign policy goals" or "may defend themselves against the use of weaponized interdependence by other states" (Weinhardt et al., 2022, p. 108).

Geoeconomics and economic statecraft can encompass a wide range of instruments. Trade, finance, investment, and control of strategic assets and technologies are "weaponized" to exercise power. Governments, unilaterally or in coordination with others through regional integration processes, resort to coercive economic measures that restrict economic flows between the target and the sender, applying export restrictions, tariff increases, withdrawal of most-favored-nation treatment, freezing assets, capital control, aid suspension, and similar actions with geopolitical or strategical goals (Blackwill & Harris, 2016; Borchert, 2022). Other geoeconomic instruments include industrial policy for market dominance in choke points or supply chain diversification (Aggarwal & Reddie, 2021; Bauerle Danzman & Meunier, 2024).

Authorities can also pursue their geoeconomic goals by offering "carrots" that foster economic exchanges with particular counterparts. These economic engagement measures can be channeled through official international assistance, humanitarian aid, development finance, access to currency, trade preferences, preferential tariffs, and subsidies. For instance, free trade agreements (FTAs) have been framed as tools that can "shape the web of interdependencies…to improve one's own economic power…or to reduce the influence and power of global rivals" (Adriaensen & Postnikov, 2022, p. 7).

Existing literature distinguishes between short-term inducements, which focus on achieving a specific and relatively immediate change in policy, and long-term inducements, also termed "catalytic," which are designed to transform the target state's interests and preferences (Blanchard & Ripsman, 2013; Donovan et al., 2023). This might indicate a linkage between the type of tool implemented in geoeconomic dynamics and the goals pursued by the initiating actor.

It takes two to tango, and the same applies to geoeconomic dynamics. Geoeconomic dynamics are based on (asymmetrical) economic interdependence and economic networks. Thus, the relationship between the sender or initiating states and the target or targets is pivotal. Previous studies have almost exclusively focused on geoeconomics as a behavior belonging to big powers (Kim, 2020; Vihma, 2018), such as China and the US, emphasizing their role as senders. The characteristics of the sender–target relation, including political regime or ideological distance, have been taken into account in the study of the conditions under which these tools

are incorporated into foreign policy strategies (C. Lai, 2022) and in their effectiveness (Blanchard & Ripsman, 2013) as well.

Geoeconomics, however, is not a big-powers-only game. It has been acknowledged as a phenomenon with global effects (Borchert, 2022). A closer look at the literature reveals some relevant works that have analyzed the role of emerging and regional powers in these geoeconomics dynamics (Armijo & Katada, 2014; Breslin & Nesadurai, 2023; Narlikar, 2021). This literature suggests that middle powers are not merely recipients of big power actions but also that they could have the capacity to wield their tools for non-economic purposes. Breslin and Nesadurai (2023) acknowledge that the ability to generate global effects with economic statecraft actions is limited to only a few countries. However, in agreement with Blackwill and Harris (2016) and Wigell et al. (2018), they point out that geoeconomics can also be applied to a more restricted geographical scope. Narlikar (2021), for instance, proposes five strategies available for Global South countries in geoeconomic dynamics, from taking advantage of the opportunities that arise in economic networks as the big powers clash to capturing choke points, hedging, forming coalitions to external balancing, and developing certain narratives. Furthermore, findings of a special issue on the Pacific Region geo-economic dynamics show that countries in this region have developed their geoeconomic strategies and that reducing security externalities and enhancing economic and comprehensive security have been the aims of the last decade's economic statecraft efforts in that area (Breslin & Nesadurai, 2023b).

In Latin American studies, this type of framework has been more unusual. Geoeconomic and economic statecraft analysis in Latin America has focused mainly on the role of external actors. This literature has suggested that Latin America has predominantly played a passive role in geo-economic trends, often as a contested territory. For example, Gardini's (2021) work frames the dynamics of extra-regional powers' presence in Latin America, where the US and China are the key players. Several studies have focused on the role of the US in the region throughout history (Berg & Brands, 2022; Santa-Cruz, 2020). In addition, China's recent economic statecraft in Latin America has attracted much attention in regional and global studies (Jenkins, 2022; Urdinez et al., 2016).

In fact, the literature regarding the antecedents and capabilities of Latin American countries to wield economic statecraft is rather limited. Among the few studies that propose a proactive role of the region in the geo-economic trends, Brazil has gained interest, mainly due to its economic power as the supposed regional leader (Schenoni & Leiva, 2021; Scholvin & Malamud, 2020). Venezuela's Petrocaribe initiative has also caught some attention, and it has been studied as one salient example of Latin American geoeconomics at the beginning of the 21st century (Márquez Restrepo, 2018). Additionally, other geoeconomic dynamics in the region have been explored through the lens of post-hegemonic regionalism, encompassing regional integrations, cooperation, and financial statecraft (Riggirozzi & Tussie, 2012; Tussie & Nemiña, 2021). More recently, Fortin et al.'s (2021) research on "non-active alignment" has triggered a fascinating discussion on Latin American countries' strategies in the face of hegemonic competition. While geoeconomics is not the primary focus of that work, it briefly touches upon dynamics in which Latin American countries have acted as senders or targets.

To the best of current knowledge, no studies have revised and discussed the engagement of various Latin American countries in the recent decade's geoeconomic turn as a regional phenomenon. This article seeks to address and contribute to filling that gap by evaluating and comparing the conditions and key characteristics

of geoeconomic actions involving Latin American countries. The analysis examines the instances, circumstances, and methodologies through which Latin American nations have utilized their economic resources and networks in geoeconomic dynamics and the cases where other international actors have targeted them. This type of study has the potential to contribute to interregional comparative analysis in geoeconomic studies, which is needed to test the singularities of geoeconomic dynamics in emerging and developing countries.

3. Data and Methods

This article applies crispy QCA. Based on Boolean algebra, this method is appropriate for dealing with small-*N* and medium-*N* phenomena that present "multiple conjunctural causation" (Berg-Schlosser et al., 2009). This is the case for the geoeconomic situation in Latin America. In a nutshell, this method allows for comparing and contrasting the different configurations that produce an outcome. Among others, QCA is a good technique for describing complex phenomena synthetically and systematically and building typologies (Rosati & Chazarreta, 2017). The analysis was run using Cronqvist (2019), based on Rihoux and De Meur (2009).

The QCA aims to establish a classification of the diverse situations and characteristics within the geoeconomic dynamics deployed in Latin America. By identifying common elements across various scenarios, the study pursues the construction of a typology that encapsulates the observed phenomenon and contributes to a nuanced understanding of geoeconomic dynamics in the region. This method is appropriate for evaluating the geoeconomic dynamics' characteristics throughout the region without limiting the study to a few typical cases, as it happens with single case studies or small-*N* comparisons. By applying QCA, this article enhances its external validity and, at the same time, can still account for the complexities and equifinality of geoeconomic dynamics. The identification of the different configurations that this method brings to light is a unique contribution to building a typology that relates several triggering conditions, characteristics, and roles in geoeconomic dynamics.

The sample reunites different geoeconomic actions involving Latin American countries. As mentioned above, this article considers geoeconomic actions to be situations where authorities weaponize economic flux to change international actors' behavior or preferences. In particular, the analysis focused on situations where the pursued goal is non-economic and geographically or strategically founded. Therefore, the article took geoeconomics as a delimited type of economic statecraft.

The research traced situations in which there was an explicit decision by authorities to apply economic inducements (or the promise of them) or economic coercions (or the threat of them) that modified trade, market access, foreign direct investment, foreign official aid, credits, or loans, with political or strategic aims. These may include coercing or persuading an international actor to change a specific policy aligned with the sender's strategic goals, deterring other actors from resorting to coercive economic diplomacy against them or shaping the strategic environment in the international system by economic tools. Situations where geopolitical tools were used for economic ends were not considered in the sample, as they did not fit the abovementioned definition.

The analysis focused on the initial action in geoeconomic dynamics, evaluating the conditions and characteristics of the measures applied. However, the research tool employed could not capture the entire

action–reaction dynamics between the sender and target after the first move. Additionally, the QCA did not assess the effectiveness of the geoeconomic measures. Therefore, it is important to consider that being the target does not necessarily imply a lack of agency in the geoeconomic turn. Rather, this label helps to understand that the country or region presents certain conditions that make it vulnerable to geoeconomic dynamics. Conversely, when a country or region is identified as the sender, in this analysis, this serves as a sufficient indication of proactive behavior and clear agency in geoeconomics.

Through analyzing official documents, web scraping of news articles, observation of datasets, and review of specific academic literature, this article constructed a sample of 18 case studies involving Latin American countries in geo-economic dynamics since 2017. It is worth noting that previous literature focuses on single case studies or small-*N* comparisons. This study is the first in the specific literature to trace and document a medium-sized set of cases of geoeconomic dynamics involving Latin American countries from 2017 onwards due to the absence of a prior database from which to draw a sample.

Therefore, the sampling exercise was intentionally theory-based and data-driven. Mello (2021, p. 22) notes that "most QCA studies base their case selection on given populations, scope conditions, or purposeful selection." In this case, the selected cases introduced variety in each analysis condition, including having different roles as senders or targets and applying distinct types of tools of economic statecraft. When similar cases were encountered, such as Taiwan's economic diplomacy towards Paraguay and Central America, the case that best aligned with the analysis period and had more available academic literature was prioritized in the sample. For each of the selected cases, the scope of the action was traced and tested to ensure it aligned with the study's definition, considering that the primary tool was economic and that the stated goal from the initiating actor included some political or geostrategic aim.

Complex economic instruments like FTAs, explicitly stating political or geostrategic aims by the signing members, were considered in the sample. The sample included both individual cases and regions when these have the capability to weaponize the economic fluxes, such as the case of the EU or MERCOSUR. When dealing with geoeconomic strategies that involved the whole region as the target (e.g., the Belt and Road Initiative), the focus was placed on its development in one country as illustrative of the intended dynamic.

These sampling strategies allowed for the inclusion of a variety of situations that, through the QCA, could help bring about a classification or typology of the instances, circumstances, and methodologies through which Latin American nations are involved in geoeconomics dynamics. Table 1 summarizes the selected cases.

For the QCA, the evaluation initially focused on how geoeconomic situations varied according to the power dynamics triggering the action. As a salient characteristic of the geoeconomic turn in the last decade, attention was given to how cases responded to the hegemonic power competition. Geoeconomics is heavily driven by the hegemonic dispute and the contest of power at the systemic level (Baracuhy, 2019; Vihma, 2018). However, some literature has also pointed to using economic statecraft in the closer region as an arena for power disputes (Wigell et al., 2018). Therefore, a codification was built for "power competition as a challenge," examining whether the observed actions stemmed from hegemonic power competition—with their specific sensitive topics—or from a regional or bilateral power dispute. Data collection for this triggering condition involved qualitative content analysis of official documents and governmental press releases related to the intended measure under study.

Table 1. Geoeconomic situations involving Latin American countries (2012–2023): Selected cases.

Case ID	Year	Sender	Target	Brief description
MCS_VENEZUELA	2017	MERCOSUR	Venezuela	MERCOSUR decided to suspend Venezuela from the bloc for a rupture of the democratic order, using the Democratic Clause regime.
PAN_VENEZUELA	2017	Panama	Venezuela	Panama's government pledged to the US Department of the Treasury sanctions against Venezuela due to democratic principle violations.
CH_BRI–PAN	2017	China	Panama	After recognizing the People's Republic of China (and ending diplomatic recognition of Taiwan), Panama became the first country in Latin America to join the Belt and Road Initiative.
CH_ARG–LOAN	2017	China	Argentina	China and Argentina established a Preferential Buyer Credit Loan Agreement on the Jujuy Photovoltaic Power Plant Project, which entails purchasing goods and technologies from China and implementing Chinese standards (Article 2.5), enhancing China's strategic position in global competition.
USA_MEX–USMCA	2018	US	Mexico	Article 32.10 of the United States–Mexico–Canada Agreement (USMCA) restricts the party's ability to enter a FTA with a non-market country (China).
ARG_LEBANON	2019	Argentina	Lebanon	Argentina designated Hezbollah as a terrorist organization. It ordered a freeze on the financial assets of the group.
EU_HR–NICARAGUA	2019	EU	Nicaragua	The EU introduced restrictive measures (freezing assets) against targeted persons and entities to address Nicaragua's human rights violations and undermining of democracy and the rule of law.
TAIWAN_PAR–FDI	2019	Taiwan	Paraguay	Taiwan signed a US$150 million deal with Paraguay regarding humanitarian and social aid, education, housing, and infrastructure. These agreements are part of Taiwan's economic diplomacy towards its allies.
USA_5G–BRAZIL	2020	US	Brazil	Brazil received diplomatic warnings from the US on Huawei's participation in 5G networks. At the same time, the US invited Brazil to be part of the Clean Network initiative and offered credit operations for other companies.
BR_WTO	2021	Brazil	Unspecified	The government passed Law 14353, which provides for the suspension of concessions or obligations in the event of non-compliance with multilateral obligations by a member of the World Trade Organization (WTO).

Table 1. (Cont.) Geoeconomic situations involving Latin American countries (2012–2023): Selected cases.

Case ID	Year	Sender	Target	Brief description
ARG_MALVINAS	2021	Argentina	UK	Argentina implemented administrative restrictions on oil companies from the UK operating in the Malvinas Basin in violation of Laws 26659 and 26915, which prohibit the exploration or exploitation of hydrocarbons on the Argentine continental shelf without authorization from the Argentine government.
USA_CHILE	2021	US	Chile	Chile's government was forced to cancel the Chinese-German consortium Aisino–Mühlbauer tender to issue passports and identity cards to continue with a visa waiver program to the US.
EU–FTACHILE	2022	EU	Chile	Several non-trade issues, such as food security, energy and raw materials, and sustainable development, were included in the modernization of their FTA, following the EU's trade policy strategy *Trade Policy Review: An Open, Sustainable and Assertive Trade Policy*.
USA_HR–NICARAGUA	2022	US	Nicaragua	The US government applied restrictions on international financial institutions relating to Nicaragua and implemented targeted sanctions as part of the Nicaragua Human Rights and Anticorruption Act of 2018.
ECUADOR_CH–FTA	2022	Ecuador	China	Lasso's government negotiated an FTA with China, aiming for several geoeconomic strategic goals: positioning Ecuador as an economic hub in South America, increasing its competitiveness towards other regional countries, and gaining leverage for debt negotiation with China.
PARAG_ARG	2023	Paraguay	Argentina	Paraguay decided to restrict Argentina's power supply from Itaipú as a coercive measure against Argentina's decision to apply tolls over the Paraná–Paraguay waterway.
USA_CHIPSAct–PAN	2023	US	Panama	The US entered a cooperation agreement with Panama under the International Technology Security and Innovation Fund, established by the CHIPS Act. The objective is to develop "resilient, secure, and sustainable global semiconductor value chains" (U.S. Embassy in Panama, 2023, p. 1) between the two economies.
EU–ECUADOR–GGI	2023	EU	Ecuador	Under the EU-LAC Global Gateway Investment Agenda, Ecuador has benefited from two initiatives, Drinking Water and Sewerage Programmes in Ecuador and A Green Deal for Ecuador, which entail financing agreements and technical cooperation while promoting European values.

Secondly, an analysis was conducted to determine whether values and identity affected Latin American engagement in geoeconomics. According to Blackwill and Harris (2016), situations that threaten identity-related ideals can be perceived as salient enough to expect the use of economic statecraft. Therefore, the study evaluated whether geoeconomics was connected to values identified with the international liberal order (ILO). Public discourses, official documents, and press releases were traced to identify if they mentioned values and principles that encompass liberal democratic polity and economy, free movements of goods and capital, the rule of law, and human rights, as those typically related with the liberal order (Lake et al., 2021). The article assesses whether these values were triggering conditions for Latin American geoeconomics or if other priorities, such as sustainable development or autonomy, drove the observed actions.

Thirdly, an evaluation was conducted to assess how economic vulnerability affected the dynamics of geoeconomics. Economic interdependence is considered a precondition to geoeconomics (Farrell & Newman, 2019). In general, country A would only employ economic statecraft against country B if the latter is economically vulnerable. How to operationalize and measure economic interdependence has been a contested issue in academic literature (Gartzke & Li, 2003; J. Lai & Anuar, 2021). In this article, economic vulnerability was assessed by combining the market concentration of the target country and the leverage of the trade relations with the sender on the national economy. Initially, the Herfindahl–Hirschman index (HHI) was examined. Subsequently, for each pair of actors involved in the selected cases, trade dependence was evaluated as the effect of bilateral trade on the target's GDP: $(Exp_{ab} + Imp_{ab}) / GDP_{b}$. Following Alvarez et al. (2017), the economic vulnerability of a target was considered to take place when HHI was greater than 0.18 and trade dependence surpassed 5%.

Moreover, the goals pursued in each selected case were assessed considering whether the geoeconomic situation under analysis aimed a specific policy change in the target, usually in a tit-for-tat dynamic, or if its goal is to alter the other actor preferences in a medium-long term scenario. As discussed above, these different goals imply different dynamics in how geoeconomics is displayed. In the first scenario, governments resort to direct actions, clearly targeted, with short-term effects. Usually, this is a reaction to something that happened or the target actor did that is perceived as a threat to strategic interests. In contrast, goals such as gaining economic leverage in other countries or reducing their vulnerabilities to third-party coercion are the expected behavior under the latter options.

Therefore, the tool that instrumentalized the economic statecraft was traced. The study looked at the measures implemented to exert power, analyzing whether they restricted or limited the economic flows or created more interdependence and expanded the economic linkages between the actors involved. The official and legal documents of the sender country on the measure under study were examined for this purpose. In CoerciveES, 1 stands for the *use of coercive economic statecraft (sticks)* and 0 for the *resort to positive economic statecraft (carrots)*.

Lastly, the role that Latin American countries adopted in the launch of these geoeconomic situations was evaluated, either as *senders* (1) or *targets* (0). As discussed above, this is a sort of "smoking gun test": Being the sender sufficiently proves a proactive behavior in geoeconomics, but being a target does not necessarily imply a passive attitude or being merely a rule-taker. Latin American countries were the senders on seven occasions, while on 11 occasions, they were the target. In three instances, intra-regional geoeconomic dynamics involved dual roles as sender and targets. Those cases were coded as "senders." This variable served as the outcome in the QCA. Table 2 summarizes the conditions, codes, and values applied in the QCA.

Table 2. Conditions, codes, and values.

Condition	Code	Value
Power competition as a challenge	Trigger_PC	1: Governments respond to hegemonic power competition
		0: Governments respond to regional/local power competition
ILO values involved in triggering situation	Trigger_ILO	1: Defiant situation involves violation of ILO values such as democracy and human rights
		0: Defiant situation does not involve violation of ILO values
Economic vulnerability	Econ_Vulner	1: Target's exports or imports are highly concentrated on a few products, with HHI greater than 0.18 and trade between target and sender surpassing 5% of target GDP
		0: Target's exports or imports are not concentrated on a few products, with HHI below 0.18 and trade between target and sender being below 5% of target GDP
Defined policy change	Policy_Change	1: Economic statecraft pursues a specific policy change in target
		0: Economic statecraft aims to alter the target's preferences in the medium-long term
Coercive Economic Statecraft	CoerciveES	1: Economic statecraft is channeled through sanctions or threats
		0: Economic statecraft is channeled through positive economic engagement or promises
Latin American country as initiating actor	LA_Sender	1: A Latin American country is the initiating actor in the geoeconomic dynamic
		0: A Latin American country is the target of the geoeconomic dynamic

4. Mapping the Landscape of Latin American Involvement in the Geoeconomic Turn: A Typology

Although not the central arena of hegemonic dispute, Latin American countries have not remained strangers to the geoeconomic turn. The data covering the second decade of the 21st century shows—as expected—that the region is still a disputed territory by external powers. At the same time, our data introduces a novel narrative showing that Latin American countries have also developed some geoeconomic action against other countries in the region and some extra-regional powers.

The analysis of the different initiatives reveals seven configurations of geoeconomic dynamics involving Latin American countries (Table 3) out of 64 logical possibilities. The Boolean minimization, which stands with the parsimony principle in QCA, allows us to synthesize the results in six types of observed situations: (a) local geopolitical-driven economic statecraft, (b) Latin American value-driven economic statecraft, (c) extra-regional sanctions, (d) economic inducement strategy, (e) coercive strategy for strategic assets and technologies, and (f) precautionary defensive economic statecraft. The first three relate to traditional ways in which geoeconomics and economic statecraft have been used during the 20th century. Conversely, the last three are connected explicitly to 21st-century geoeconomic dynamics.

Table 3. Tabl

Case ID	Trigger_PC	Trigger_ILO	Econ_Vulner	Policy_Change	CoercivePES	LA_Sender (Outcome)	Typology
PARAG_ARG, ARG_MALVINAS	0	0	0	1	1	1	Type 1: Local geopolitical-driven economic statecraft
MCS_VENEZUELA, ARG_LEBANON, PAN_VENEZUELA	0	1	0	1	1	1	Type 2: Latin American value-driven economic statecraft
USA_HR–NICARAGUA, EU_HR–NICARAGUA	0	1	1	1	1	0	Type 3: Extra-regional sanctions
USA_MEX–USMCA, CH_BRI–PAN, EU–ECUADOR–GGI, CH_ARG–LOAN, TAIWAN_PAR–FDI, ECUADOR_CH–FTA	1	0	0	0	0	C	Type 4: Economic inducement strategy
USA_CHIPSAct–PAN, EU–FTACHILE	1	0	1	0	0	0	
USA_5G–BRAZIL, USA_CHILE	1	0	1	1	1	0	Type 5: Coercive strategy for strategic assets and technologies
BR_WTO	1	1	0	0	1	1	Type 6: Precautionary defensive economic statecraft

The first type of geoeconomic dynamic revealed in the analysis is local geopolitical-driven economic statecraft. Under this dynamic, Latin American countries have resorted to coercive strategies to exert pressure on third actors' policies that are perceived to be against strategic geopolitical territorial interests. This goal is closer to the traditional use of economic statecraft and is not specifically linked to the last decade's geoeconomic turn, as it does not involve power competition.

In the sample, Argentina has applied administrative restrictions over companies that do not recognize Argentina's sovereignty rights over the Malvinas Basin in the context of the longstanding conflict over the Malvinas/Falklands Islands with the UK (Ministry of Foreign Affairs, International Trade and Worship of Argentina, 2021). As the literature shows, this has been a variable policy—sometimes coercive and other cooperative—and has also affected fishing licenses on other occasions (Míguez, 2022). More recently, Paraguay has tried to weaponize power supply to Argentina from Itaipú powers station as a coercive measure against Argentina's decision to apply tolls over the Paraná-Paraguay waterway ("Conflicto en la hidrovía," 2023).

The cases involve strategic geopolitical disputes, making a solid case for one of the possible reasons a Latin American country could resort to weaponizing its strategic assets. In this reasoning, it is notable that economic vulnerability, derived from market concentration, does not emerge as a necessary condition. On both occasions, Latin American countries resort to their control of strategic natural resources—energy exports and access to the exploration and exploitation of hydrocarbons—to exert power.

A different type of involvement in geoeconomic dynamics is the Latin American value-driven economic statecraft, under which governments resort to economic sanctions and coercive measures to punish human rights violations and protect liberal freedoms and democratic rights. The trigger is closely tied to the values of the international liberal order and, consequently, to the Western identity of countries in the region, who behave both as targets and senders. The tools involved include financial restrictions, freezing assets, and suspending concessions and rights, even though the targets are not economically vulnerable to these actions from the senders. It is possible to assume that these actions use geoeconomics mainly as a signaling strategy. The Democratic Clause, incorporated in the MERCOSUR regional process and other Latin American mechanisms, has been put in force twice (Henriques Ferreira & Alves Cunha Paiva, 2022). This mechanism suggests a deeply rooted predisposition in Latin American governments to resort to collective mechanisms and economic cooperation to protect certain values. The imposition of sanctions by Panama on Venezuela is a less studied case that draws attention to its unique rationale: it not only aims to penalize Venezuela's actions but also aligns with the US package of financial restrictions (Government of Venezuela, 2018). Finally, a case was identified in which a Latin American country, Argentina, implemented targeted financial restrictions on an extra-regional actor, Hezbollah, identified as a terrorist organization (Unidad de Información Financiera de la República Argentina, 2019).

In turn, Type 3 introduces extra-regional sanctions, referring to the weaponization of trade, investment, and foreign aid implemented by big powers pursuing a certain policy change from a government in the region on liberal values-related issues. In particular, the US has sustained a surveillance attitude against the violations of human rights and democratic values in the region during the last decade, being a frequent sender under this type of geoeconomic dynamics (Kirilakha et al., 2021). The EU has applied unilateral sanctions against countries in the region, although with less frequency.

As mentioned above, geoeconomics dynamic Types 4, 5, and 6 are directly related to the geoeconomic turn and its particularities, as all of them relate to the global power competition. We found that the economic inducement strategy is the most common dynamic in the sample. Under this logic, Latin American countries are mostly "on the menu" in a territory where big powers compete for leverage. According to the data, during the last decade, the US, China, Taiwan, and the EU have deployed geoeconomic strategies to create a strategic environment for their interest in Latin America in the face of global power competition. FTAs that include non-trade issues obligations, conditional loans, or merely economic aid have been weaponized as strategic means to gain regional influence and preference. These measures have gained prominence, especially since 2017, in correlation with the rise in hegemonic competition.

On some occasions, the tools displayed by the big powers, such as the CHIPS Act and the USMCA, explicitly mention the competition between the US and China (U.S. Embassy in Panama, 2023). The "anti-non-market-economy" included in the USMCA is a typical example of how a big power, such as the US, can leverage its economic power and, through the design of the agreement, condition Mexico's (and Canada's) relationship with China as theorized by Adriaensen and Postnikov (2022). Taiwan's financial aid and investment have a very similar dynamic: They are given under the condition that the counterpart/target keeps diplomatic relations with the Republic of China and not with Beijing (Maggiorelli, 2019). Other situations, such as the Belt and Road Initiative, are subtler regarding the conditionality implied (Jenkins, 2022). Chinese loans to Argentina show how conditioned credits can be implemented to enhance China's strategic position in global competition by promoting the adoption of Beijing's standards and technology. In the case of the EU, the rationale behind

the different economic engagement efforts is traceable through their strategic policy papers. For example, the EU's Global Gateway Initiative explicitly acknowledges that this is a geoeconomic action intended to promote "European values of good governance, transparency, and sustainability" (European Commission, 2022, p. 1).

Latin American countries have seldom involved themselves as senders or initiating actors in this type of geoeconomic dynamic. Ecuador's case study is one of the few exemptions in the sample. Ecuador's president, Guillermo Lasso, announced his intention to pursue an FTA with China as part of his electoral campaign, differentiating himself from former president, Correa, who had previously rejected this idea (Herrera-Vinelli, 2021). In 2022, negotiations were launched with mixed goals: debt renegotiation but also balancing Ecuador's relationship with the US, positioning Ecuador as a hub in South America while also increasing its competitiveness towards other countries in the region (Chile, Peru, and Costa Rica) that had already signed an FTA with Beijing (Alden & Mendez, 2023).

Meanwhile, coercive geoeconomic strategies related to hegemonic competition have been rare in Latin America. Only two cases were found in which these strategies were used against countries in the region in the context of hegemonic competition. This study's fourth type of geoeconomics is "coercive strategy for strategic assets and technologies." In both cases, these were actions sent by the US aimed to achieve a specific policy change by Latin American governments concerning the acquisition of strategic Chinese technology. On both occasions, previous economic interdependence with the US also existed and both targets had some degree of economic vulnerability since either imports or exports were concentrated. The US combined diplomatic threats with strongly conditioned access to economic inducement tools such as visa waivers or loans. The sender threatened to exclude the target from certain benefits unless the target revised its policy.

Brazil granting Huawei access to the 5G network was a worrisome scenario for Trump's government. In 2020, the US government launched Clean Networks, a global strategy to persuade allied countries to ban Huawei from 5G tender. Brazil received an official mission that warned about the risks perceived by the US and, at the same time, was extended an invitation to be part of the Clean Network initiative, conditioned to banning Huawei (Krach, 2020). In addition, companies in Brazil were offered credit operations for 5G networks (Della Coletta & Wiziach, 2020). The coercion was rather subtle, and direct economic inducement prevailed.

In the case of Chile, the government was forced to cancel the Chinese-German consortium Aisino–Mühlbauer tender to issue passports and identity cards to continue with a visa waiver program to the US (Fundación Andrés Bello, 2021). As in the Brazilian case, coercive diplomatic threats were reinforced by inducements. In this case, the visa waiver granted Chilean travelers access to the US.

Finally, this research yields only one case where a Latin American country, Brazil, displayed a geoeconomic strategy in the face of transforming the global order. This is the sixth type, "precautionary defensive economic statecraft." In 2021, Brazil passed a law (number 14353) that provides for the suspension of concession or obligations in the event of non-compliance with its multilateral obligations by a member of the WTO in the context of the blockade of the WTO Appellate Body. This measure has no specific target and aims to deter or prevent other countries from "appealing into the void" trade disputes with Brazil. The text is very similar to the EU's 2019 and 2020 *Enforcement Regulation* revisions, directed to empower the EU's capabilities to protect its interests when a trade dispute is blocked (European Commission, 2021).

Despite this antecedent, the study did not find other equivalent measures in the region. However, it has identified two potential additional instances of the precautionary defensive economic statecraft dynamics, which have not been included in the analysis due to being in very preliminary stages. In 2022, the Brazilian vice president proposed creating a "food security OPEC-like organization" ("El vicepresidente de Brasil propuso," 2022). In 2023, Bolivia's president called for a joint Latin American lithium policy (Ramos, 2023) to gain leverage in worldwide geoeconomics. While none have succeeded in constructing a collective mechanism to weaponize food or lithium, these instances serve as relevant antecedents for potential future examples of this type of involvement in geoeconomics.

5. Conclusion

Latin American countries engage in different dynamics of the evolving 21st-century geoeconomic turn. The research has shown that these experiences are not isolated situations but that the whole region participates either as initiating actors or targets. Furthermore, this research has illuminated that each role entails a distinct set of conditions and characteristics in the geostrategic utilization of economic statecraft.

Three different dynamics refer to locally oriented and value-driven geoeconomic actions. Coercive tools were implemented in these situations to achieve a specific policy change. In these dynamics, Latin American countries served as both senders and targets. Local geopolitical disputes, the defense of human rights, and democratic values were the main triggering factors. Regarding the enabling conditions in these cases, the study noticed some interesting outcomes regarding how Latin American countries exploited economic interdependencies. When performing as senders of geoeconomics dynamics driven by values or local geopolitical disputes, the economic vulnerability of the target does not appear to be a necessary condition for the action. However, when Latin American countries face extra-regional sanctions, economic vulnerability becomes present in the observed dynamics. Further research on the involvement of developing and emerging powers from the Global South as senders in geoeconomic dynamics is needed to assess the specific conditions and external validity that this initial finding on the Latin American experience suggests.

The analysis has also delved into three particular 21st-century geoeconomic dynamics in which Latin America was involved. According to the data, countries in the region often found themselves as targets in extra-regional power disputes. When the US, the EU, and China sought leverage through economic means in these dynamics, they primarily resorted to positive economic statecraft. Therefore, Latin American countries can expect positive economic statecraft to occur as global power contestation rises. Conversely, coercive tools were employed when a policy change was the desired outcome. This dynamic tended to focus on specific strategic assets.

While infrequent, Latin American countries have occasionally engaged in power disputes within the international order transformations, as seen in cases like Brazil and Ecuador. In these situations, governments tried to modify or weaponize their economic interdependence as a means of power for strategic means. Similar to the first three geoeconomic dynamics, the research did not identify explicit economic vulnerability among the counterparts involved in these cases. While the concerns about China's rise and the consequences of hegemonic competition observed in these situations are similar to the ones presented in previous studies on emerging and developing countries (Breslin & Nesadurai, 2023), the lower involvement in derisking strategies found in Latin America differentiates this region from others such as Asia

Pacific. It remains uncertain whether this is a structural characteristic or a temporary behavior. The article identified potential additional emerging cases of precautionary defensive strategies in which Latin American countries strive to become proactive participants in the 21st-century geoeconomic turn by weaponizing food security or lithium. Future research can further illuminate the enabling conditions for the success of such endeavors and compare them with other regions' experiences.

The article's contributions are both theoretical and empirically significant. The analysis has unveiled a greater significance of political and ideological motivations in utilizing geoeconomic tools, contrasting with the anticipated emphasis on economic vulnerability as a determining condition. Moreover, the analysis has contributed to distinguishing how the type of goal pursued can relate to the tool implemented, casting light on the choice of coercive measures or economic inducements. Finally, the article has contributed to updating and complementing the empirical knowledge on Latin American countries' use of geoeconomic power, their potential upcoming geoeconomic strategies, and the threats and risks faced in the global dynamics.

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Conflict of Interests

The author declares no conflict of interests.

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ARTICLE

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The Geoeconomic Turn in EU Trade and Investment Policy: Implications for Developing Countries

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Abstract

The so-called geoeconomic turn in global trade policy-making has changed the context in which the European Union positions itself as a trade actor. However, there is little scholarly attention paid to how the geoeconomic turn affects the EU's relations with developing countries. This article analyses the potential implications of new EU autonomous trade and investment instruments for developing countries, and how the EU has taken these consequences into account when designing them. We rely on a combination of desk research of official documents, trade data, and secondary literature complemented with expert interviews. We find that a trade-off between geoeconomic and development objectives is more pertinent in sustainability-related than in competitiveness- and security-oriented instruments. In these sustainability instruments, differential treatment of developing countries rarely features in the design—despite some proposals having been made. The geoeconomic turn has thus made it more difficult to align the different objectives in the EU's trade and investment policies, and development concerns are sometimes relegated to the background.

Keywords

development; differential treatment; European Union; geoeconomics; investment; trade

1. Introduction

Over the past years, we have witnessed a significant shift in the European Union's trade discourse and policies. This shift is the consequence of a confluence of inter-related trends and events including the China shock and the discontent of losers of globalization, the Covid-19 pandemic and concerns about the fragility

of globalized value chains, and the Russian invasion of Ukraine and the weaponization of interdependencies. Scholars have captured these trends and events under the concept of a "geoeconomic turn" (cf. Adriaensen & Postnikov, 2022; Roberts et al., 2019). While the term remains fuzzy, it is commonly used to indicate that states increasingly intend to use economic instruments to pursue foreign policy objectives or to protect domestic policies against unwarranted interference by third countries. While states still value economic interdependence, they have become more proactive in managing its externalities and security risks.

The context of a geoeconomic turn led the European Commission in early 2021 to present a review of its trade strategy under the banner of "open strategic autonomy," which aims to reconcile the goals of efficiency, sustainability, and security (European Commission, 2021). This strategic review has been accompanied by the introduction of a significant set of new autonomous trade and investment policy instruments that aim to (a) increase reciprocity in the EU's trade relations, (b) avoid or remedy negative sustainability effects of trade and investment flows, and (c) protect the EU's security interests against exploitation of interdependencies by hostile governments. These changes in the EU's trade and investment policies are in line with President of the Commission von der Leyen's 2019 call for a "geopolitical commission," while scholars see "Europe's geoeconomic revolution" unfolding (Matthijs & Meunier, 2023).

While existing literature on the geoeconomic turn initially focused on US–China relations (Farrell & Newman, 2019), scholarship on the EU's role in a geoeconomic context is on the rise (Meunier & Nicolaïdis, 2019; Weinhardt et al., 2022). A key concern in these studies has been the trade-off between the EU's defence of the principle of economic openness on the one hand, and the desire to increase its autonomy and sovereignty in economic policy-making to minimize perceived security risks on the other (Gehrke, 2022; Herranz-Surrallés et al., 2024). What has received scant attention so far, however, are the implications of the ongoing geoeconomic turn for the EU's objectives of eradicating poverty and integrating developing countries into the world economy. Considering effects on developing countries, also known as "policy coherence for development," is a Treaty obligation of the EU under Article 208(1) of the Treaty on the Functioning of the European Union. Yet, scholars of development policy have pointed out that the EU has in recent years become more likely to (re-)integrate, and perhaps subordinate, development goals into the wider foreign policy system (Bergmann et al., 2019; Hackenesch et al., 2021).

Examining whether this trend also holds for the EU's new autonomous trade and investment instruments allows us to re-evaluate the EU's role as a global actor. Against the backdrop of rising tensions between China and the US, the EU seeks to position itself as a more "strategically autonomous" actor amongst major powers (Gehrke, 2022). Yet, doing so also depends on relations with Global South countries as it seeks to diversify its supply chains to "friendly" partner nations. Whether or not its geoeconomic turn takes the interests of developing countries into account thus matters not only from the perspective of "decentering" EU external relations (Onar & Nicolaïdis, 2013) but also for what Ikenberry (2024, p. 123) describes as the competition between the three worlds of the West, East and South. According to his view, Europe (as part of the West) is increasingly competing with the East, and in particular China, for "support and cooperation of the global South."

Empirically, this article critically reviews the implications of the recent geoeconomic shift in EU trade and investment instruments for developing countries. We focus on a set of recently initiated autonomous instruments, which we introduce below. We examine their likely impact on developing countries, and whether the EU has considered development goals in the design of these instruments to limit potential

negative impact. Our analysis is based on desk research of official documents, trade data, and secondary literature complemented with and corroborated through six expert interviews: (a) interview with two officials from the Directorate-General (DG) for International Partnerships of the EC dated 5 December 2023; (b) interview with two officials from the DG for Trade on 13 December 2023; (c) interview with one official from the DG for Trade on 14 December 2023; (d) interview with one official from the DG for Trade on 22 December 2023; (e) interview with one official from the DG for Trade on 19 January 2024; and (f) interview with one counsellor of the EU Mission to the World Trade Organization in Geneva (European External Action Service) dated 24 January 2024.

We find that while not all of the EU's recent geoeconomic instruments are likely to have significant negative implications for developing countries, such trade-offs are particularly pertinent in sustainability-related instruments. Perhaps surprisingly, differential treatment of developing countries rarely features in the design of these instruments. These findings allow us to re-assess the recent geoeconomic turn in EU trade and investment policies by shedding new light on implications for developing countries. In doing so, we complement existing scholarly debates on the capabilities of the EU as a geoeconomic actor (Meunier & Nicolaïdis, 2019; Olsen, 2022; Weinhardt et al., 2022). Our findings indicate that the geoeconomic turn has made it more difficult to align the different objectives in the EU's trade and investment policies and that the EU has become more willing to relegate development concerns to the background.

2. The Geoeconomic Turn and the EU's Response

While scholarship on the strategic use of economic policies, so-called economic statecraft, has existed for decades (Luttwak, 1990), attention to geoeconomics has increased significantly in the past years. Roberts et al. (2019) prominently speak of an emerging geoeconomic order. While scholars disagree on how to precisely define geoeconomics, most adhere to the understanding that it entails the use of economic policies to pursue foreign policy goals or to protect one's domestic policies against foreign interference (Blackwill & Harris, 2016, p. 8; Olsen, 2022). The role of the US as a geoeconomic actor, in particular vis-à-vis China, has received the most attention (Blackwill & Harris, 2016; Farrell & Newman, 2019; Roberts et al., 2019). Recently, scholars have also turned their attention to the EU as a geoeconomic actor, including in energy, trade relations, and the field of investment (Babić et al., 2022). They note an increasing willingness to use economic policies for strategic purposes, as evidenced by the unprecedented turn towards unilateral trade instruments (De Ville et al., 2023; Gehrke, 2022). Given these new instruments, scholars have become interested in analysing the EU's capabilities as a geoeconomic actor (Meunier & Nicolaïdis, 2019; Weinhardt et al., 2022).

Others are more interested in unpacking changes and continuities at the paradigmatic level that underpin the EU's recent trade and investment instruments. Most scholars acknowledge the increasing prominence of security and other foreign policy goals in economic policy initiatives (Weinhardt et al., 2022), but also acknowledge the continuity of liberal market policies (Jacobs et al., 2023) and point out that struggles between neo-mercantilists and neo-liberals have a long tradition within the EU (Lavery et al., 2022). In the realm of trade, the EU's proclaimed goal to pursue "open strategic autonomy" captures these competing poles, given the tensions between economic openness and the more defensive and neo-mercantilist stance that strategic autonomy entails. Similarly, in energy, scholars note that the EU is shifting from a liberal to a strategic approach, which gives rise to tensions and inconsistencies (Siddi & Kustova, 2021). Some critically dissect how the EU justifies its geopolitical turn in trade policy discursively by contrasting it with presumably "bad" geopolitical

trade actors and its own previous "naïve" normative trade discourse (Couvreur et al., 2022). Others unpack the role of think tanks in contributing to the geoeconomic turn by facilitating an "ideas shift" (Schmitz & Seidl, 2023; Veselinovič, 2022).

What has received scant attention, however, is the impact of the EU's (partial) geoeconomic turn on its relations with developing countries. While some policy-oriented studies highlight that individual new trade and investment instruments of the EU are likely to have negative implications for developing countries (African Climate Foundation & The London School of Economics and Political Science, 2023; Komba et al., 2023), there is so far no comparative assessment that looks comprehensively at the EU's new unilateral trade toolbox. Most academic studies concentrate on the carbon border adjustment mechanism and the deforestation regulation and highlight potential negative implications for developing countries (Magacho et al., 2024; Partzsch et al., 2023).

3. Conceptualising the EU's Geoeconomic Turn in Economic Policies: Implications for Developing Countries

This section develops a conceptual framework that allows for the comparative assessment of the implications for developing countries of the EU's new trade and investment instruments. We propose two main steps for the comparative analysis: (a) an assessment of the potential impact of the instrument on developing countries and (b) an analysis of the extent to which the design of a given instrument takes development concerns into account. For this step, we make use of the concept of "differential treatment" of developing countries.

To facilitate the comparative assessment of the set of new EU geoeconomic instruments, we categorize them into three groups (cf. De Ville et al., 2023; Erixon et al., 2022; Gehrke, 2022): (a) competitiveness-related instruments that seek to address market distortions and establish a "level playing field" for EU businesses; (b) security-related instruments that allow for the use of economic instruments to further security goals; and (c) sustainability-related instruments that want to mitigate negative environmental externalities related to trade and investment. This leads us to select eight recently introduced geoeconomic instruments (see Table 1) that aim to improve EU competitiveness and security and to protect its sustainability measures from being undermined by competition from or policies in third countries. Our selection does not include other potential measures that are at the time of writing (April 2024) at an early stage in the legislative process, like the proposal for an instrument to monitor EU outbound investment. We also do not include the revised Trade Enforcement Regulation, which allows the EU to adopt countermeasures when the other party in a dispute appeals a ruling into the void or fails to cooperate on the adjudication of the dispute. While the revised Trade Enforcement Regulation is also a response to geopoliticisation, in contrast to our selection it does not regulate trade substantially but only sets the procedures under which the EU can respond to third countries' policies.

Note that we assume that not only security- but also competitiveness- and sustainability-related instruments have a geoeconomic dimension to them (cf. Gehrke, 2022; Goldthau, 2021; Matthijs & Meunier, 2023, p. 175). Competitiveness-related instruments follow a geoeconomic logic because they tend to be based on a perception of economic exchanges as zero-sum rather than positive-sum games in relation to rivals. Similarly, sustainability instruments have a geoeconomic dimension as states fear that being greener than competitors will hurt their relative economic strength. Moreover, states increasingly perceive the

Table 1. Three categories of new EU trade and investment instruments.

Competitiveness-related	Security-related	Sustainability-related
International procurement instrument	Investment screening regulation	Carbon border adjustment mechanism
Foreign subsidies regulation	Anti-coercion instrument	Deforestation regulation
		Corporate sustainability due diligence directive
		Forced labour regulation

sustainable transition as a green technology race that may leave some states overdependent on third countries for critical technologies or materials. Yet, motives behind sustainability-related instruments are likely to be mixed. In the case of EU attempts to undermine "carbon leakage," for instance (see Section 4.3.1), the EU aims both to halt climate change and prevent deindustrialization, given that EU-based firms could in the absence of these instruments consider relocating to countries with less stringent climate policies. While there may be an overlap between the three types of instruments, we nonetheless find this distinction helpful for analytical purposes (De Ville et al., 2023, p. 25).

In the first step of our analysis, we assess the "potential impact" of these instruments on developing countries. To identify who counts as a developing country—a highly contested category in global politics (Farias, 2022; Schöfer & Weinhardt, 2022)—we use the World Bank classifications of "low-income" and "lower-middle-income country" as a proxy. Conversely, "upper-middle" or "high-income" economies count as developed countries. We conceptualize potential impact as the extent to which a country's exports or investments are exposed to the new EU instruments. This exposure is a function of (a) the importance of the EU as an export or investment destination for a developing country, (b) the overlap between the sectoral scope of the EU instrument and the export structure of a country, and (c) the relationship between the practices regulated by the EU instrument and the domestic practices or policies in a developing country. Where possible, we use quantitative data to analyse the exposure of developing countries to the EU's new unilateral instruments. However, relevant quantitative evidence is not always available. We currently lack detailed data on the participation of different countries in EU procurement markets, on the countries of origin of inward investment into the EU, or on the amount of subsidies provided to exporting firms by developing countries. Consequently, for some instruments our analysis of potential impact is based on a more qualitative assessment of available knowledge about developing countries' trade and investment flows and domestic policies.

Second, these instruments may also vary in the extent to which the EU has considered development concerns when designing them. Here, we consider the extent to which the instruments allow for the *differential treatment of* developing countries to address development concerns in light of the respective instrument's goals. This principle of differential treatment is prevalent in many global regimes (see Dingwerth et al., 2024) and is particularly central to the global environmental (common but differentiated responsibilities [CBDR]; cf. Farias & Roger, 2023) and trade regimes (special and differential treatment [SDT], cf. Ukpe & Khorana, 2021). In the context of the EU's new instruments, we expect that differential treatment can either be highly formalized, e.g., in the form of legal provisions, or take on a more informal nature (Dingwerth et al., 2024). Concerning the latter, thresholds that limit the application of the instruments could de facto exclude developing countries, or discretion given to the EC may allow it to spare

Table 2. Formal and informal options to include the differential treatment of developing countries in new instruments.

Formalised differential treatment	Legally codified explicit differential treatment provisions (e.g., exemptions from regime obligations, or direct access to financial assistance)
Informal differential treatment	Legally codified thresholds that limit the application of a given instrument and may de facto facilitate the exclusion of developing countries
	Instrument grants discretion to the EC to apply it selectively, with the possibility to exclude developing countries

developing countries in pursuit of policy coherence for development (see Table 2). Thresholds remain informal, however, as long as they do not explicitly target countries classified as "developing" or are not based on indicators that measure a country's level of development. For this research step, we rely on the analysis of legal texts of the instruments at stake, and how they evolved.

Taken together, this conceptualization allows us to comparatively assess the implications of the EU's new trade and investment instruments for developing countries. High-impact instruments that lack formal and informal differential treatment provisions are most likely to have a negative impact; conversely, high-impact cases that include differential treatment can—depending on the specific design—potentially facilitate coherence for development and mitigate trade-offs.

4. EU Trade and Investment Instruments: Implications for Developing Countries

The following section presents the empirical analysis of the new trade and investment instruments of the EU. We start with discussing instruments that have a potentially limited impact, before turning to those with a potentially high impact on developing countries.

4.1. Instruments With Potentially Limited Impact: De Facto Differential Treatment

4.1.1. Foreign Subsidies Regulation

The foreign subsidies regulation (FSR) aims to counter unfair advantages enjoyed by subsidized third-country firms when acquiring a company or winning a public contract in the EU. If the EC finds that a foreign distortive subsidy exists and the overall impact on the EU market is negative, it can prohibit a merger or acquisition (M&A) or award of a public contract, or can ask for redressive measures and commitments, like divestment of certain assets. While larger lower middle-income countries like India are regularly targeted by EU anti-subsidy measures against *imports*, we expect this new instrument in the domains of M&A and public procurement to affect developing countries only to a limited extent. According to the United Nations Conference on Trade and Development data, developing countries are responsible for 30.8% of global foreign direct investment (FDI) outflows (United Nations Conference on Trade and Development, 2023, p. 6). But, following the classification of the United Nations Statistical Office, this includes China, which assumes a major share of this volume. Least developed countries only take up less than 0.1% of global FDI outflows. While we lack data on the countries of origin of companies or consortia winning public procurement bids in the EU, it is reasonable to assume that these will source only to a limited extent from developing countries (interview 3; see Section 4.2.1). The first couple of investigations done by the EC under the FSR—against Chinese firms participating in public tenders

for delivering trains, solar parks, and wind turbines to EU member states—show that this instrument will mostly be used against subsidized firms from large countries in sectors that the EU considers strategic for security or sustainability reasons.

The FSR does not contain an explicit exemption of developing countries. However, several thresholds relating to the value of the transaction and the volume of subsidies involved for the activation of the investigation apply, further limiting the probability that (small) developing countries will be affected. Even if a developing country's firm would be found to have profited from a distortive foreign subsidy, the EC has discretion in deciding which redressive measures to apply to M&As and public procurement bids, which leaves room for the preferential treatment of developing countries (European Union, 2022a, articles 25, 26, 30 and 31; interview 5).

4.1.2. Anti-Coercion Instrument

The anti-coercion instrument (ACI) aims to avoid or remedy economic coercion—when countries (threaten to) use trade or investment restrictions to unduly influence policy decisions in the EU—by third countries applied to the EU or member states. When the EC finds that a third country is applying economic blackmail to the EU, it can in cooperation with member states decide on a response measure, like the suspension of tariff concessions or the exclusion of the right to participate in public procurement tenders.

The ACI does not include the formal exemption of developing countries but can be expected to be applied only exceptionally to developing countries. The ACI's aim is to deter or remedy coercion by geoeconomic rivals of the EU, which are rarely developing countries. Moreover, to be able to apply *economic* coercion to the EU, a third country needs to hold economic leverage over the EU. This is less likely for developing countries than for developed or emerging economies. The ACI allows for discretion both at the stage of determining economic coercion and when deciding on appropriate countermeasures (European Union, 2023a, articles 3, 7 and 9 of the regulation). Lastly, in an ideal-case scenario, these countermeasures will never have to be applied, given the ACI's primary aim is to *deter* economic coercion (Interview 3).

4.1.3. FDI Screening Regulation

The FDI screening regulation—in force since October 2020—establishes a mechanism for information-sharing and cooperation between the EC and member states on incoming investments that may threaten security or public order in the EU. It enables the EC or member states to issue opinions on threats of inward investments and sets certain requirements for national investment screening mechanisms. Member states keep the autonomy to decide on inward investments and are so far not obliged to do investment screening.

The FDI screening regulation does not foresee any exemptions or specific treatment for firms from developing countries in inward investment screening. But as (small) developing countries are only a limited source of incoming investment into the EU (see Section 4.1.1) and they are rarely considered geoeconomic rivals, the impact of this instrument on them is presumably limited. Here, discretion in applying the instrument lies with the member states.

4.2. Instrument With Moderate Impact and Formal Exemption of Least Developed Countries

4.2.1. International Procurement Instrument

The international procurement instrument (IPI) allows the EU to restrict access to its procurement markets for companies based in countries that do not reciprocate the EU's liberalization of public procurement. Public procurement is an increasingly important sector, accounting for 15–20% of global GDP. The EU holds the view that it has liberalized its procurement market to third-country bidders significantly more than most other countries have opened their procurement markets to EU companies. The IPI aims to level this playing field.

The impact of the IPI on developing countries varies depending on the economic size of developing countries. There are three modes of public procurement: (a) a company based abroad wins a bid in the EU; (b) a subsidiary of a foreign company based in the EU wins a bid; and (c) a foreign company participates indirectly in a bid by providing intermediate goods and services to a firm winning the bid (Cernat & Kutlina-Dimitrova, 2016, p. 2). For most developing countries, with few large companies, only the last category is likely to be potentially affected by the instrument. Conversely, larger developing countries are more likely in a position to access the European procurement market through their own firms or subsidiaries in Europe. They could therefore be negatively affected by the IPI in several ways. Judging from official EU documents and press coverage, the IPI seems to target primarily high-income or upper-middle-income countries such as China or the US. Yet, as EC officials themselves acknowledge, it is difficult to assess which countries will be affected by the IPI and to what extent (interview 2). This is because existing databases on public procurement only cover the first mode of procurement, which is least important in economic terms. No database exists on the second or third modes, which are the most important ones (Cernat & Kutlina-Dimitrova, 2016, p. 2).

In terms of design, the IPI is unique among the instruments studied in this article in that it holds formal differential treatment provisions in place that explicitly exclude the group of least developed countries from the scope of the instrument. Article 4 of the regulation states that "the Commission shall not initiate an investigation in respect of least developed countries…unless there is evidence of circumvention of any IPI measure" (European Union, 2022b). Such an explicit exemption is the strongest way to ensure that new unilateral instruments take development concerns into account, and this is only done in the IPI. This exemption is "easy" to make for the EU in the sense that it is unlikely to affect the first and second modes of international procurement. Yet, for selected products such as cotton, the exemption could matter for least developed countries (interview 3). For a relatively simple textile product, e.g., used for work clothing in the public sector, the cotton that the firm within the EU relies upon could be sourced from a least developed country. The value of cotton imported into the EU could be up to 50% of the good if there is very little processing (interview 3). While least developed countries thus potentially benefit from this exemption, the IPI's design does not foresee differential treatment of economically more advanced developing countries.

4.3. Instruments With Potentially High Impact: No Differential Treatment of Developing Countries

4.3.1. Carbon Border Adjustment Mechanism

The EU's carbon border adjustment mechanism (CBAM) aims to preserve the integrity of the EU's climate policies by preventing "carbon leakage," that is when EU-based companies move production to third countries

with less stringent (and costly) climate policies or when EU production gets displaced by imports from these countries. Through CBAM, a price must be paid—through the purchase of emission permits—for the emitted CO_2 embedded in imports equivalent to the price paid for CO_2 emitted when producing in the EU under the EU's emissions trading scheme. CBAM will initially apply to imports of upstream energy-intensive sectors exposed to the risk of carbon leakage: cement, iron and steel, aluminium, fertilisers, electricity, and hydrogen. CBAM will gradually be phased in over the period 2026–2034 in parallel to the phasing out of free emission allowances for the covered sectors.

In terms of absolute impact (value of exports falling under CBAM), the most affected countries are—except for India—upper-middle income or high-income countries: Russia, China, Turkey, Korea, and the US. Yet, what matters from the perspective of third countries is the *share* of countries' exports that is potentially affected by the EU's CBAM. Put this way, the country that is most exposed to CBAM is from the group of least developed countries: Mozambique. Around one-fifth of Mozambique's total exports consist of exports of aluminium to the EU. When we calculate the exposure of all countries according to their World Bank classification, we see that low and lower-middle income countries are relatively more exposed to CBAM than upper-middle and high-income countries (see Figure 1). It is important to note that the final impact depends not only on exposure but on other dynamic variables like carbon intensity of production, demand and supply elasticity of covered products, trade diversion, the question if CBAM will incentivize other countries to adopt similar measures, etc. (see also Magacho et al., 2024). World Bank staff (Maliszewska et al., 2023), who in their "relative CBAM exposure index" integrate the carbon intensity of exports in the calculations, arrive at very similar findings to the ones presented here. EU officials confirmed that they have received disapproval from some developing countries on CBAM (interviews 3, 4). Opposition, however, is not uniform, as other developing countries have already moved towards practical discussions about implementation (e.g., question on traceability and integration with existing schemes; interview 4).

CBAM does not include an exemption of developing countries, although this was a point of debate in the EU's legislative process. This was seen as inopportune given the aim of the mechanism of avoiding carbon leakage, as a ton of CO^2 leaked to a developing country is as bad for the global climate as a ton leaked to a developed economy. As additional justification, an EU official argued that there were legal concerns that a "least developed country exemption" would not be possible under World Trade Organization rules (interview 2). Moreover, EU officials were sceptical that this exemption would have made sense even in terms of development objectives: It could create the wrong incentives and lead to "carbon sinks," as firms with high levels of CO_2 emissions may relocate to least developed countries. This would, in turn, be

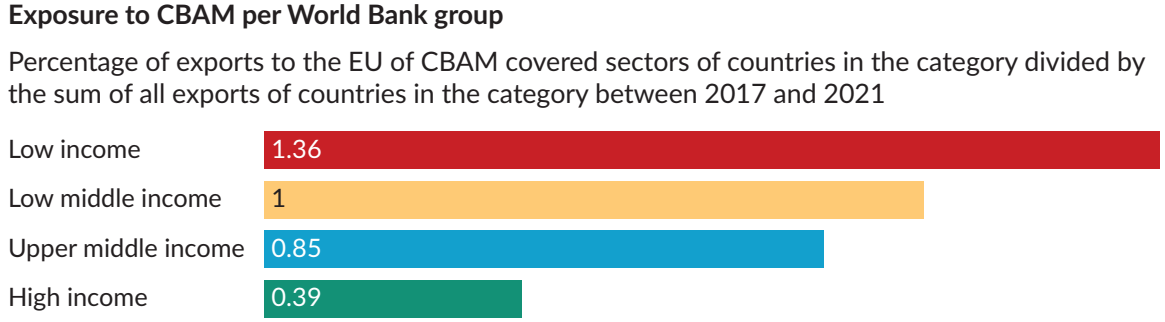

Figure 1. Exposure to CBAM per World Bank group. Source: Authors' own calculations based on WITS data.

detrimental to the long-term transformation of least developed economies towards a green economy (interviews 3, 4). Lastly, EU officials argue that CBAM applies at the company level and that it is mostly large multinational firms that are affected. These firms, however, are considered to have the means to comply with CBAM. For instance, South Africa—a country opposed to CBAM—exports steel to the EU. Yet, as an EU official argued, its largest exporter, the firm ArcelorMittal, already has the technology for green steel production (interview 4). To compensate developing countries for the potential economic losses because of the instrument, the European Parliament had proposed in its position on CBAM to "finance least developed countries' efforts towards the decarbonisation of their manufacturing industries with an annual amount corresponding at least to the level of revenues generated by the sale of CBAM certificates" (European Parliament, 2022, recital 55 and article 24a). This has not been included in the final regulation as this was seen as impossible under the EU's budget rules (interview 6). The relevant recital now only commits the EU to "continue to provide financial support through the EU budget" (European Union, 2023b, recital 73).

4.3.2. Deforestation Regulation

The deforestation regulation aims to avoid that EU consumption of certain goods contributes to deforestation and forest degradation worldwide. This should in turn help reduce greenhouse gas emissions and global biodiversity loss. The regulation bans imports (as well as EU-based production) of products sourcing from land that has been subject to deforestation or forest degradation after 31 December 2020. The regulation applies to the commodities cattle, cocoa, coffee, oil palm, soya, and wood, as well as relevant products that contain, have been fed with, or have been made using these commodities. The prohibition is enforced by obliging operators to follow due diligence procedures, thereby ensuring that only commodities and products for which the risk that they contributed to deforestation is negligible can be placed in the EU market. A key feature of the regulation is the country benchmarking system, through which the EC will assess the risk that countries produce relevant commodities and products that are not deforestation-free, resulting in three possible levels of risk: low, standard, or high. Obligations on operators are more stringent when they import commodities or products from countries with a higher risk assessment.

The regulation does not contain any exemption for developing countries. The regulation may affect developing countries disproportionally in two ways: A significant number of developing countries—and within them in particular smallholder businesses (cf. Zhunusova et al., 2022)—are specialized in the covered products and have a higher probability of being qualified as "high risk" countries for deforestation (at the time of writing, this country classification is still being drawn up by the EC). For several least developed countries and developing countries, exports to the EU of commodities covered by the regulation represent a very significant share of their total exports. An extreme example is São Tomé and Príncipe, a lower-middle income country, whose exports consist mostly of cocoa, the bulk of which goes to the EU. Other least-developed countries and developing countries like Ivory Coast, East Timor, Honduras, Cameroon, Sierra Leone, Ethiopia, Uganda, Burundi, and Ghana are significantly exposed to the deforestation regulation. When we again calculate the exposure according to World Bank income categories, we see that lower-middle and low-income countries are relatively more exposed to the deforestation regulation than upper-middle and high-income countries (see Figure 2). It is thus no surprise that, similar to CBAM, the deforestation regulation has created a lot of friction with developing countries (interview 3). An EU official acknowledged that the regulation could be more detrimental for developing countries compared to CBAM because (a) it affects smallholders rather than large multinational companies, (b) there is a very short

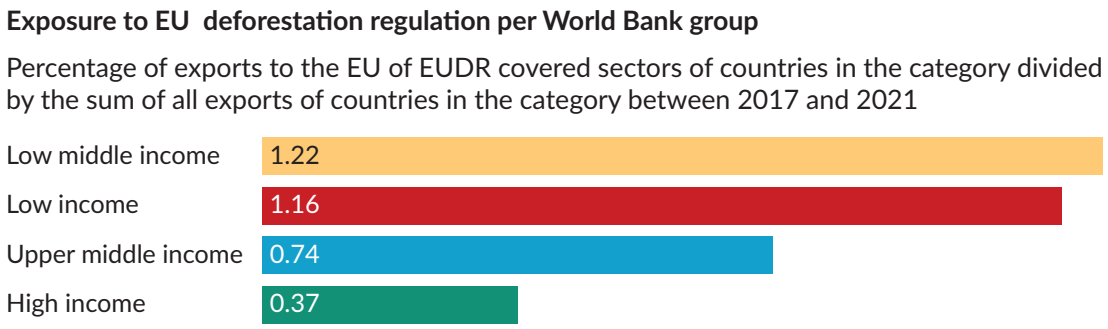

Figure 2. Exposure to deforestation regulation per World Bank category. Note: EUDR stands for the EU deforestation regulation. Source: Authors' own calculations based on WITS data.

transition period (2 years) compared to CBAM, and (c) it relies on a benchmarking system that could impose a classification of "high risk" on developing countries from the outside (interview 4).

4.3.3. Corporate Sustainability Due Diligence

The corporate sustainability due diligence directive (CS3D) aims to stimulate sustainable and responsible behaviour by companies with a large presence in the EU market throughout their supply chains. Companies will be required to monitor and, where necessary, prevent, end, or mitigate the negative impacts of their activities on human rights and the environment. This obligation applies to relatively large companies. The original proposal by the EC has been amended throughout the legislative process, and its scope has been reduced within the Council of the EU after difficult negotiations. The new version of the text, which at the time of writing still must be approved by the Council and the European Parliament, will only apply to a small number of very large companies with at least 1,000 employees and a turnover of 450 million euros. Moreover, while the original proposal lowered the threshold further in sectors with a "high risk" of human rights and environmental violations, this has now been eliminated.

The directive does not include any exemption of developing countries. To the extent that human rights and environmental violations are more frequent in lower-income countries, the CS3D may de facto have a higher impact on developing countries. Scrapping the "high risk" provision lowers the probability that developing countries will be disproportionately affected by the directive, as they are more specialized in the sectors that were considered of high risk in the original proposal. Still, while many civil society organisations welcome the CS3D, some experts are concerned about the potential negative impact that the directive may have on developing countries and smallholders in particular (e.g., Ellena, 2023).

4.3.4. Forced Labour Regulation

In March 2024, a year and a half after the proposal by the EC, the EU institutions reached a provisional agreement on a regulation to ban products made with forced labour on the EU market, applying to domestic products, exports and imports alike. The number of people in forced labour is estimated by the International Labour Organisation to be 27.6 million. The EC, which is responsible for implementing the ban on forced labour taking place outside the territory of the EU, would apply the ban through a risk-based enforcement approach, identifying in a database specific economic sectors in specific geographic areas for which there is reliable and verifiable evidence that there exists forced labour imposed by state authorities. These data will

be used to inform the decision to open an investigation into the existence of forced labour. If forced labour is found, the EU can ban these products from entering the EU market until the violation is eliminated.

The regulation does not include any exemption or special treatment of developing countries. It also does not include de minimis thresholds, nor exemptions for small firms, as the aim of the regulation is to ban *all* goods produced with forced labour from the EU market. Because of the risk-based enforcement approach, it is plausible that the instrument will de facto have a relatively strong impact on developing countries. According to the International Labour Organisation et al. (2022, p. 17), state-imposed forced labour is much more prevalent in low-income countries (2.1 per 1,000 inhabitants) than in lower-middle (0.1), upper-middle (0.7) and high-income countries (0.1).

The results of our comparative analysis are summarized in Table 3. Instruments with a potentially high impact and no differential treatment are likely to have the most significant negative implications for developing countries.

5. Conclusion

The EU's trade discourse and policies have recently shifted significantly. We have seen the creation of new trade and investment instruments that seek to re-position the EU in a context of geoeconomic competition, coupled with an accelerated climate crisis. This article has examined the implications for development. We find that the potential impact varies as a function of both the overlap between the instruments' scope and developing countries' economic and political practices and policies, as well as the extent to which design features allow for the differential treatment of developing countries to offset, or alleviate, negative implications.

As a result, the differential potential impact varies between the three categories of new instruments. Competitiveness and security instruments tend to have potentially limited impact on developing countries.

Table 3. Mapping of instruments: Implications for developing countries.

	No flexibility for developing countries (no differential treatment)	Possible flexibility for developing countries (informal differential treatment)	Explicit flexibility for developing countries (formal differential treatment)
Limited impact		FSR FDI screening regulation ACI	
Medium impact		IPI (developing countries other than least developed countries)	IPI (least developed countries)
High impact	CBAM Deforestation regulation CS3D Forced labour regulation		

They rarely include differential treatment, but this is not too problematic, as developing countries present only a limited threat (or attractive export market) to EU firms or national security. Instead, these instruments target primarily high-income or upper-middle-income countries such as the US, Japan, Canada, Brazil, and China. One notable exception is the lower middle-income country India, which as the fifth largest economy in the world may also be exposed to the EU's new unilateral security and, especially, competitiveness instruments such as the IPI. Sustainability instruments are likely to have the most significant negative impact on developing countries. These instruments tend to target specific high-risk products and/or countries and developing countries will often come into these instruments' focus. Giving developing countries no preferential treatment, or even implicitly treating them less preferentially through risk assessments, is seen as necessary to make the EU's sustainability policies effective. There seems to be a hope amongst EU policy-makers that the fears about negative impacts on developing countries will be overblown and that the market will help these countries adapt, and perhaps even benefit from the EU's new policies. Yet, developing countries often disagree with this positive take (Guillot & Kijeweski, 2023).

Our findings complement existing debates that tend to focus on the capabilities of the EU as a geoeconomic actor (Meunier & Nicolaïdis, 2019; Olsen, 2022; Weinhardt et al., 2022). We find, first, that coherence for development seems to be relegated to the background. This echoes research on financial assistance that finds that development concerns have increasingly become integrated into wider foreign policy goals (Bergmann et al., 2019). Yet, this may undermine the EU's attractiveness as a partner for Global South countries, also in light of increasing competition with countries from the "East" (Ikenberry, 2024). Second, our findings indicate that the geoeconomic turn has made it more difficult to align the EU's different foreign policy objectives. Under the previous (neo-liberal) paradigm, claiming to pursue a coherent trade policy was easier. Trade liberalization could be presented as a silver bullet that would bring global prosperity, peace, and sustainability all at once. The new geoeconomic paradigm recognizes that trade and investment liberalization come with significant (risks of) negative development, ecological, and security externalities. In this more complicated exercise of reconciling different objectives under the shifted paradigm, new trade-offs between different goals may thus arise. This confronts the EU with difficult questions. Is the EU sacrificing development on the altar of sustainability and geopolitics in its new trade and investment policy instruments? How to ensure that mitigating climate change or biodiversity loss does not result in burden-shifting on developing countries? If compensation is not integrated into the design of the agreements themselves, does the EU pursue this sufficiently through other means, such as the EU–Africa Green Energy initiative, the Global Gateway, or bilateral initiatives and funding instruments?

Our analysis has some limitations. First, we discuss, based on their design, the potential impact of new instruments that the EU only begins to apply at the time of writing, or that are even still to be formally adopted by the EU institutions. In the coming years, future research will be able to analyse more directly the *actual* effect of these instruments on developing countries. Second, our analysis suffers from a lack of precise data on some of the instruments. The implementation of these instruments will produce new detailed data, which can be tapped in future research. Finally, our analysis also did not consider how developing countries themselves perceive and react (economically and politically) to these new instruments. This provides a fascinating avenue for future research, which will also shed interesting light on the question of how effective the EU's geoeconomics turn will eventually turn out to be, and how this will affect its future (bilateral) relations with developing countries.

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Conflict of Interests

The authors declare no conflict of interests.

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