Maritime Economics & Logistics (2025) 27:1–24
https://doi.org/10.1057/s41278-025-00313-8

EDITORIAL

Seaports in a tense geopolitical environment: key agents or sitting ducks?

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Accepted: 10 February 2025 / Published online: 28 February 2025

1 Introduction

Seaports are crucial logistic and industrial ecosystems in global trade and transportation networks, enabling the movement of goods, people, and information across borders (Haralambides 2017). They ensure broader value creation by supporting and facilitating economic activity linked to maritime supply chains. Ports are increasingly developing into key hubs in energy transition, digital transformation, and the circular economy, while also striving for broader social and sustainability goals (Notteboom et al. 2022). All in all, it is not surprising that all over the world ports have been described as engines for growth and pillars of regional economic development (Haralambides 1997).

In a globalized ecosystem of liberal economics, seaports thrive when the international macro-environment avoids conflict, promotes trade, and supports the development of efficient and extensive global supply chains. Given the morphology of our planet, trade would have been impossible without ports, something that makes efficient seaports *a sine qua non* in trade facilitation. For example, the container box -the kindle wood of global logistics- and the associated maritime and inland transport systems, proved to be instrumental to the consecutive waves of globalization and the growth of

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international trade since the protectionism of the 1970s (see e.g., Bernhofen et al. 2016; Levinson 2016).

But it was not always like this. In the protectionist economy of those days (1970s), and the *infant industry protection* theories of UNCTAD's Raúl Prebish (Prebish 1949), inefficient ports were effective barriers to trade, purposely maintained inefficient by powerful local producers, pursuing import substitution policies. These were the days of the general cargo ship: small multideck vessels whose cargo operations would take weeks if not months in port for loading and unloading. Delays and uncertainty would propagate throughout the supply chain, impacting port labor, transport and warehousing costs, general price level, growth and development (Haralambides 2019).

In recent years, geopolitical tensions and disruptions are increasingly influencing the dynamics of global trade and shipping networks. Geopolitics refers to decisions motivated by the constraints of geography, making the relationship between geographic space and political action a central theme in the production of policy (Tuathail 1999). Geopolitics assumes a distinction between domestic and foreign boundaries, adopting a broader understanding of what is considered 'inside' and 'outside' (Walker 1993). It therefore comprises more than the study of conventional relations among countries, expanding instead towards boundary-producing political *faits accomplis* (Ashley 1987), based on a classification of swathes of territory and masses of people, and often achieved through 'gunboat diplomacy' (Cable 1994).

While classical geopolitics focused solely on the role of states and statesmen (Agnew 2003), contemporary geopolitics encompasses also a wide variety of geopolitical agents, such as corporations and NGOs, when studying the practices that allow for the control of territory, trade and the extraction of natural resources (Flint 2021). This editorial provides insights on ports amidst a changing global geopolitical scene. Ports are attracting increasing interest as geopolitical levers, given their typical functionalities in stimulating national and regional industrial development, securing trade and energy needs, and supporting naval capabilities (Merk 2017). This makes seaports important focal points in geopolitical considerations, potentially allowing them to act as geopolitical agents that can influence and shape geopolitical debates and actions.

The editorial focuses on how and to what extent growing geopolitical tensions impact seaports. To that effect, a distinction is made between a handful of geopolitical themes directly or indirectly affecting ports: (1) Geopolitics and Trade; (2) Geopolitical aspects linked to investment and ownership in ports; (3) Ports as nodes in geopolitically vulnerable corridors and networks; and (4) Ports as potential geopolitical and military targets (Fig. 1). The editorial concludes with thoughts on ports' future role in the current geopolitical scene. Can ports assume a (pro)active role as key geopolitical agents, or are they condemned to be 'sitting ducks', passively enduring the consequences of geopolitical change?

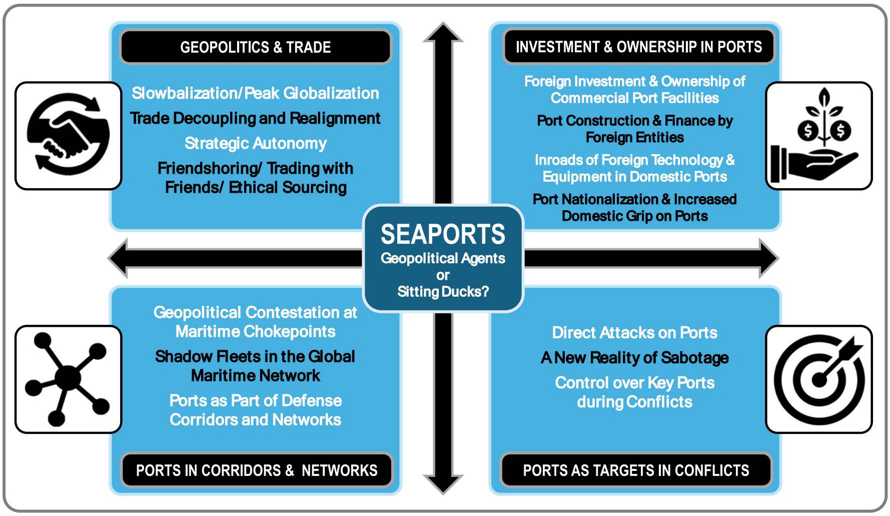

Fig. 1 A Classification of Geopolitical Developments and Dimensions Affecting Ports. *Source* the authors

2 Geopolitics and trade

2.1 Globalization revisited

In the 1950s, the concept of "World Peace through World Trade" became the foundation of post-war trade liberalization. The thinking was simple, marvelously propounded by Frédéric Bastiat one hundred years before (1850): “economic interdependence through trade and foreign investment makes war unprofitable” (Bastiat 1998). The same principle underlies President Xi Jinping’s grandiose concept of the Belt and Road Initiative (BRI): “the melding of cultures through economic interdependence expunges war and leads to a safer planet”.[1]

Before the early 1990s, globalization had gained momentum as Cold War ideologies were replaced by global economic interdependence and competition among nations (Porter 1990). This shift had led nations and economic blocks to focus on geoeconomic strategies aimed at developing and maintaining a strong position in the world economy, primarily through trade and finance. As a result, the importance of geopolitics and military prowess in shaping global trade networks was somewhat tempered. The emerging worldwide shipping networks brought changes to geoeconomic geography. For example, container shipping emerged as a crucial factor in transforming global supply chain practices, enabling multinational enterprises to implement global production and sourcing strategies. We have earlier described containerization and information and communication technologies as the two pillars of

[1] Both quotations, of Bastiat and Xi, are paraphrases of similar expressions of Bastiat and Xi, attempted here by the two editors of this editorial.

globalization (Haralambides et al. 1997): The significant advances in transport and communications technologies have increased the speed and efficiency of transportation and lowered the costs of communication. These developments have lowered the barriers of time and distance and give the impression of a "shrinking world" (Dicken 1992). Globalization was further fueled by the increasing interdependence between businesses, simultaneously supporting regional economic integration, as seen in the EU, NAFTA, ASEAN, Mercosur and more.

Globalization was promoted by the developed world not so much because it truly believed in its merits, but out of necessity: countries in the developed world had become 'mature' economies and 'affluent societies' (Galbraith 1958) with a car in every garage and a television set in every living room; how much more could consumers buy? Production in the developed world exceeded demand, so it had to be sold beyond its borders. And production had to be on a large scale in order to enjoy economies of scale and international competitiveness, following the successful example of post-war Japan. So, opening up foreign markets through free trade and globalization was the solution to sustaining massive production. And here was the capital error: the developed world was not producing "inside" to sell "outside," but produced "outside" through FDI and relied on reimporting these products. The effects of this on employment, tax revenues and the unraveling of the "welfare state" were all too obvious.

With the financial crisis of 2009, a trend of deglobalization or *slowbalization* (The Economist 2019) began to emerge and disdain for cheap consumerism, friendshoring, nearshoring, shorter supply chains, 3D printing, and general economic uncertainty started to become visible. The KOF Globalization Index (KOF 2024) shows that the trend of globalization peaked between the early 1990s and the 2008–2009 crisis and it leveled off since. The international political consensus that supported the universal economic benefits of globalization, which characterized much of the 20th and early 21st centuries, had begun to erode. A multipolar world emerged where nations compete for strong economic, political, and military positions. The emergence of China, as the leader of the global south, is now challenging the hegemony of the United States. Some other governments and political groups too have started to question the free trade model, seeking to rebalance or redefine its meaning and practical implementation. The role and function of trading blocs is also being scrutinized, as seen with Brexit and similar misgivings of more EU members. The structural developments that boosted trade in the past—falling transportation costs, trade liberalization, expanding global production chains and financial deepening—do not seem to support trade to the same extent as before. At present, we seem to be returning to the protectionist pre-WWII era, marked by high tariffs, conflict, trade wars, weakening trade ties, and great power competition; an era where defense spending becomes the means for explicit projection of power and global dominance.

After the 2008–2009 financial crisis, international trade continued to grow, albeit at a lower rate. World Trade Organization (WTO) data show an average 8% annual growth of international trade, from WWII up to the 2009 crisis. After this, trade halved to 4% on average. The 2009 crisis had altered consumer behavior dramatically -at least in the capitalist world- showcasing a contempt for consumerism and a turn to services and choices of personal betterment. As a result, the *GDP-Import*

Multiplier[2] also fell from around 2 to 1. Our predictions, however, are brighter than the scenario we have painted above: The economic development of India, Africa and the ‘global south’ in general will generate new cargo flows, as long as protectionism is exorcized and the world reverts to the time-honored principle of *comparative advantage* including a free, efficient and competitive shipping industry.

2.2 Trade decoupling and realignment

Economic power shifts among nations reshape trade networks, leading to new dependencies and rivalries. Geopolitical tensions between major economies can lead to *trade decoupling and realignment*. This means countries may reduce their dependence on rival nations, fostering or strengthening new trade alliances. For example, the war in Ukraine has resulted in an increasing disconnection between Russia and Western countries in both political and economic terms, coupled by a wide array of mostly ineffective sanctions (for an overview see Griffin et al. 2024). Starting in 2022, this situation has brought about abrupt changes in traffic volumes with Russia in many EU ports. Growing tensions between China and the USA are creating similar effects in the medium term, with Europe remaining indecisive about the merits of an equidistant stance between the two, in spite of the frequent friendly nods of China, the latter being visibly westernized exactly for this purpose.

In a possible return to protectionism, tools that governments have at their disposal, in addition to reciprocal tariffs, include quotas, import licensing, tighter customs procedures, sanctions, trade defense measures, and the favorable treatment of domestic business. Additional trade remedy actions consist of antidumping, countervailing, and safeguard measures (World Bank 2021). With the new US Administration and President Trump’s ‘America first’ policy, mostly pursued through import tariffs (or threats thereof), ports will soon start to feel the full impact of the situation. At the time of writing, a good example of this happening is the imposition of steep tariffs by the USA and EU on the imports of Chinese electric vehicles (EV), in order to address ‘unfair and unbalanced trade’ (The White House 2025), and ‘unfairly subsidized’ China-made electric vehicles (European Commission 2024). As a result, EV manufacturing is likely to shift even more to countries not liable to such tariffs like Thailand, Indonesia, Vietnam, Hungary, Turkey, Brazil. Together with this, global trade patterns and shipping networks are realigned. It is expected here that similar will be the results of the announced US tariffs on Canadian and Mexican exports, planned to take effect in early March 2025 after the initial implementation date was postponed for a month.

At this juncture, we would be amiss not to mention that for tariffs to be effective, demand for imports must be elastic; otherwise, inflation and high interest rates would ensue, hurting the imposer, and hindering growth and development in his own country. Moreover, tariffs overvalue the imposer’s currency, hurting its own exports which would be hurt anyway by the countervailing tariffs of the affected countries.

[2] A GDP multiplier of 2 means that a 1% increase in national GDP would on average lead to a 2% increase in the country’s containerized imports.

Tariffs thus become a boomerang. In addition, inflation and interest rate uncertainty lead to volatility in financial markets and supply chains, again impacting trade and shipping patterns.

Environmental policies can by themselves also result in trade decoupling, even though such policies might not have emerged out of geopolitical motives in the first place. A good example of this is the Carbon Border Adjustment Mechanism (CBAM) of the European Union (EU Regulation 2023/956). CBAM aims to prevent 'carbon leakage' by subjecting the import of certain groups of products from third countries to a carbon levy linked to the carbon price payable under the EU Emission Trading System (ETS) when the same goods are produced within the EU.

The forces toward trade decoupling and realignment are the strongest in critical sectors such as energy, rare earth materials and high-tech goods. Here are some examples from the *energy industry*.

Our first example draws from the Ukraine war and the sanctions on Russia imposed by the EU. The EU launched its REPowerEU program in May 2022 (European Commission 2022) to cope with the steep energy prices and the EU's energy security concerns, caused by this major geopolitical change in the energy landscape. The backbone of this program relies on three fields of action: saving energy, enhancing the production of clean energy in the EU, and diversifying energy supplies (particularly for natural gas).

The second example regards (green) hydrogen. The energy transition implies reducing reliance on fossil fuels by shifting to renewable energy sources such as wind, solar, hydrogen and others. Hydrogen is set to cover up to 12% of global energy use by 2050 (IRENA 2022). The transition to hydrogen triggers a shift to a new system with political, technical, environmental, and economic disruptions, with wide-ranging impacts on ports (see Notteboom and Haralambides 2023 for a detailed analysis). In particular, green hydrogen is likely to influence the geography of energy trade, further regionalizing energy relations, with the emergence of new centers of geopolitical influence built on the production and use of hydrogen. Countries such as Chile, Morocco, and Namibia are preparing themselves to become green hydrogen exporters while wind- and sun-rich fossil fuel exporters, such as Australia, Oman, Saudi Arabia, and the UAE, are increasingly considering green hydrogen production and exports to diversify their economies. Thus, the gradual adoption of green hydrogen in the new energy mix will result in trade realignments in the energy field. As part of the broader energy transition away from fossil fuels, this will bring major changes to the nature and geography of maritime energy flows handled in seaports.

2.3 Strategic autonomy

The push for selective trade decoupling and realignment is evident in the geopolitics of *strategic autonomy*. In general terms, strategic autonomy policies seek to enable a nation or region to make independent decisions and act autonomously in critical areas, thereby reducing excessive dependence on other countries. These policies reflect a desire to safeguard sovereignty, in an increasingly globalized and interdependent world, while minimizing vulnerability to external pressures. Key economic components of these policies include diversifying trading partners, reducing reliance on single suppliers or nations for critical goods (e.g., rare earth minerals, food, energy, or medical supplies), and enhancing production in strategically vital sectors, such as semiconductors, pharmaceuticals, renewable energy technologies, agriculture, and military equipment. Geopolitics and technological leadership play a crucial role in this endeavor.

The pursuit of strategic autonomy necessitates policies that, to the extent possible, balance partnerships with global powers while preserving the ability to act independently. This can be quite challenging, as exemplified by the European Union's strategic autonomy efforts (EPRS 2022), aiming to reduce dependency (e.g., on NATO) while maintaining cooperative ties with (most) non-EU nations. An earlier and more successful example of strategic autonomy was the Non-Aligned Movement (NAM) of (former) Yugoslavia, India, Egypt, Ghana and Indonesia. The organization was masterminded by Yugoslavia in 1961, which broke ties with the Soviet Union, wishing to keep an independent, equidistant, position between Russia and the USA, with its own system of '*workers' self-managed socialism*' (Willetts 1978).

When designing such policies, policymakers must consider that achieving full autonomy is extremely difficult (if not impossible) in a highly interconnected global economy characterized by strongly intertwined global supply chains. For example, a full economic decoupling from China is unthinkable and undesirable by any country, given China's dominance in many industrial manufacturing sectors (UNCTAD 2024a, b). Moreover, considerable financial resources and time are needed to develop strategic autonomy capabilities, while expressing intentions related to strategic autonomy may provoke retaliatory actions or trade responses from other nations, even those considered friendly.

Strategic autonomy has a significant *maritime dimension*. It encourages states to reduce their dependence on fleets owned or operated by rival nations, especially those that are geopolitically distant. To accomplish this, a government may adopt protectionist measures to further develop, strengthen and safeguard its own *national fleet*, or impose restrictions on domestic businesses regarding the use of certain foreign flags. A recent example of this is the decision of the US Department of Defense, in early January 2025, to add China's state shipping company China COSCO Shipping to a blacklist of companies allegedly supporting the Chinese military (Yep 2025). By prioritizing the development of their own merchant fleets, countries aim to ensure that critical goods can be transported under national 'oversight', during crises or geopolitical tensions. This approach also helps guarantee the transport of essential goods, such as energy resources and food, without excessive reliance on foreign-flagged vessels, thereby safeguarding energy and food security. However, developing and maintaining an *own* fleet comes at a cost, demanding substantial investments, skilled labor, and expertise. Haralambides (1986) has shown that whatever a country earns as freight revenue of its own fleet is annulled by losses in the trade account of its balance of payments.

Second, strategic autonomy is often focused on maintaining a domestic shipbuilding industry whose commercial activity is not driven by efficiency or cost, but by the need for shipyards to continue building naval vessels; again, this is the case in the USA. It is interesting to note that USAid and an ever-growing list of "strategic" cargoes, ranging from energy products to wheat, rice and soybeans, must be carried by a U.S.-flagged vessel. The latter must be financed and built in the U.S. and manned by American citizens whose high wage costs are subsidized to bring them in line with crews from other countries.

Governments may offer subsidies, tax incentives, or low-interest financing to encourage shipping companies to procure domestically built vessels and strengthen national fleets. China, for example, in an attempt to support and expand its massive shipbuilding industry, currently the largest in the world,[3] subsidizes the early retirement (scrapping) of its vessels (Yang et al 2019).

Finally, in a tense geopolitical environment, governments may specifically target shipbuilding facilities in rival countries that have military connections and are involved in the construction of *dual-use ships.* These are designed to serve commercial purposes during peacetime and fulfill military or emergency roles during crises (Coulter 2006).

2.4 Friendshoring and trading with friends

As a result of the above, decisions by multinational companies regarding production locations and sourcing strategies are increasingly influenced by geopolitical objectives and policies regarding strategic autonomy and security, and ethical and sustainability aspects. Policies that lead to trade decoupling and realignment can apparently cause sudden or gradual changes in firms' decisions on production and sourcing locations, also with regard to seaports. The evolving geopolitical landscape of nations and regions, as well as *global economic uncertainty* (Bloom 2009), makes 'distance' a stochastic variable (Haralambides et al. 2024) and prompts companies to mitigate risk by shortening supply chains and reducing dependence on certain countries. This is changing trade flows and shipping networks.

This may involve sourcing and producing locally (onshoring/reshoring), or closer to one's home markets (nearshoring). Additionally, companies may adopt concepts such as *trading with friends*, which means prioritizing trade with countries that share similar norms, values, or political systems. Another concept is *friendshoring*, referring to relocating economic activity to nations with aligned norms and values (see Fig. 2). The World Trade Organization (WTO) highlighted these trends for the first time in its World Trade Report for 2023 (released in September 2023), indicating the early signs of trade fragmentation, where countries are increasingly favoring trade with like-minded partners, where the concept of *trust* is prevailing, over those viewed as geopolitical risks. Also, UNCTAD (2023) suggested a gradual shift in bilateral trade preferences toward countries with similar geopolitical stances.

[3] see UNCTAD (2024b) for a detailed overview of the world shipping and shipbuilding industries.

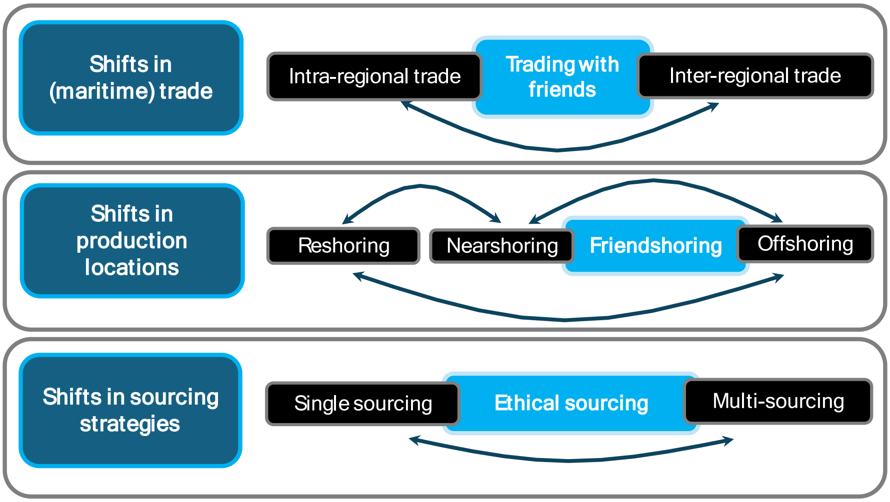

Fig. 2 Trading with friends, friendshoring and ethical sourcing in the broader context of *(maritime) trade and corporate strategies*. Reshoring = Bringing activities back to the country/region; Nearshoring = Moving activities to a neighboring country; Friendshoring = Moving activities to a country with similar norms and values and/or political system; Offshoring = Moving activities to countries in another continent. *Source* the authors

3 Investment and ownership in ports

3.1 Foreign investment & ownership of commercial port facilities

Trade decoupling and realignment processes, caused by geopolitical dynamics, can have serious ramifications for seaports, although, in most cases, ports are not the prime or first-in-line target of geoeconomic policies. However, geopolitical tensions can also result in policy decisions directly aimed at ports as prime targets. In particular, as geopolitical tensions rise, *ownership and investment in port areas come increasingly with geopolitical strings attached*, affecting a port authority's ability to welcome specific investors or operators to the port.

Most of the world's ports were publicly owned and operated until reforms were set in the 1990s (Brooks et al. 2017). Since then, the port industry has witnessed a wave of internationalization and corporatization, whereby governments typically retained ownership of the port real estate and introduced a landlord port management system (Farrell 2012). In the majority of ports, the private sector now undertakes commercial terminal activities through lease or concession agreements with the public sector, represented by the port authority. Exceptions to this port management system are found in countries such as the UK (fully privatized ports) and South Africa, where ports and terminals are controlled by the state-owned Transnet (Fraser and Notteboom 2015). The corporatization of ports worldwide has resulted in a retreat of local public or state-owned entities from terminal operations. Interestingly though, the entry of global players into the local terminal operator industry did not always imply an infusion of private capital. Instead, this meant that large foreign state-owned terminal operators were moving in. A great early example of this can be found in the way Hong Kong capital, led by Hutchinson Ports, developed two of the world's largest ports and marvels of technological prowess: the ports of Shenzhen and Guangzhou at the mouth of Pearl River Delta; China's southern industrial powerhouse (Li et al 2022). Other examples include global investments by DP World (part of Dubai World) and PSA (part of Temasek Holdings), or the large Chinese state-owned firms Cosco Shipping Ports and China Merchants Holding. The moves of these foreign operating groups can, rightfully or not, stir geopolitical controversy as exemplified by the take-over of P&O Ports by Dubai-based DP World, or the investment spree of COSCO and China Merchants around the world:

- **DP World in the US**: To support its growth path from a regional port operator to a global player, Dubai-based DP World took over the global portfolio of P&O Ports in 2006 (Parola et al. 2013). That portfolio included terminals in American ports such as New York, Baltimore, Miami, New Orleans, and Philadelphia. In the US, the deal raised concerns, given DP World's Middle Eastern origins, over the security situation of a post 9/11 background (Beisecker 2006; Simpson 2006). DP World received approval from all relevant regulatory authorities, including the Committee on Foreign Investment in the United States (CFIUS). However, the US Congress delayed the sale, while the US House Committee on Appropriations even voted to block the deal. In the end, DP World delegated the US terminal assets of P&O Ports to the American Insurance Group (AIG), and they were later incorporated into the portfolio of Ports America. International business policy did not prevent DP World from entering the US terminal market. Still, in the end, (geo)political controversy made DP World decide to abandon the acquired US terminals (Notteboom and Rodrigue 2023).
- **Chinese port operators**: State-owned firms like Cosco Shipping Ports and China Merchants play an important role in financing and developing port infrastructure as part of the Belt and Road Initiative (BRI) (Yang et al 2022). BRI (formerly OBOR) was launched in 2013 and is a centerpiece of China's foreign policy and domestic economic strategy (Haralambides and Merk 2020; Huang 2016). At the seaport level, Chinese companies have substantially contributed to key port expansion and rehabilitation projects across Asia (Sri Lanka, Pakistan, Southeast Asia), East Africa (Djibouti, Kenya, Tanzania, Mozambique, Sudan, Madagascar; see Yang et al. 2020), West Africa (Nigeria, Ghana, Côte d'Ivoire, Senegal, Guinea, Sierra Leone) and parts of Europe (e.g., Piraeus, Valencia, and Zeebrugge).

Piraeus in Greece is a unique and far-reaching case, given that COSCO acquired a majority shareholding in the port authority—initially of 51% in 2016, and later increased to 67%. In this way, COSCO went beyond the usual model of obtaining a concession as a mere terminal operator, and into the effective control of Greece's main port (Van der Putten 2014). This development took Europe aback, particularly the Port of Rotterdam and 'Brussels', and it heightened concerns about foreign ownership of critical infrastructure. As a result, the European Commission introduced its 2019 'critical infrastructure' framework for screening foreign direct investments to safeguard security and public order. Opposite to the binding nature of similar screening steps of the US Senate, however, the EU makes mere recommendations, leaving the decision to accept or not the FDI to the member state.

The investment spree of state-owned global terminal operators remains controversial to many who assume, often purposely wrongly, that investments are aligned with the geo-economic ambitions of the parent state-holding (Chen et al. 2019a, b). As geopolitical sensitivities have become much more pronounced in recent years, often refuting the principle of *comparative advantage*, foreign involvement in port investments is increasingly seen as a direct security risk, particularly in case commercial objectives in a port are combined with military and geopolitical motives (Merk 2017; Devermont et al. 2019; Office of the U.S. Trade Representative 2025). Therefore, commercial strategies pursued by terminal operators can become important national policy issues. This is exemplified by the 24.99% minority shareholding of COSCO Shipping Ports in HHLA's Container Terminal Tollerort (CTT) in Hamburg. When COSCO and HHLA announced the proposed deal in 2022 (initially involving a 35% shareholding), political controversy erupted in Germany, also with strong opposition from labor unions (such as Verdi). The Berlin government and the European Commission screened the proposed transaction, with the latter recommending against approval. In the end, Chancellor Olaf Scholz pushed the deal through in 2023 (Doppen et al. 2024). CTT was officially declared "critical infrastructure" in 2023, but this did not change the situation on the ground.

Often, such opposition to FDI isn't but concealed protectionism with the blessings of trade unions which are in this way also protecting the employment of their members. A notable recent example (2024) was the strong opposition of the International Longshoremen's Association (ILA) of the USA[4] against automation and foreign ownership, citing threats to job security and potential national security risks. In summary, any foreign state-linked investment and ownership in port terminals can raise, justifiably or not, several geopolitical concerns prompting action.

First, there might be concerns about the market power of these foreign entities, particularly when there is a *high risk of alignment of these firms with foreign geopolitical interests*. Investments by foreign terminal operators can be controversial since their hold onto strategic port facilities may imply a loss of sovereignty, going against long-term national interests.

Second, some geopolitical agents might voice their concern that foreign terminal operators might *extract sensitive trade data, or might acquire access to key technologies and information flows*. Opponents of specific foreign investments or ownership in ports might argue that, when shared with foreign government agencies, such data can be used to design (hostile) trade policies or used in the battle for technological superiority. To counter any reasonably plausible arguments and to protect data sovereignty, governments are increasingly implementing policies to ensure national or regional control over data, data confidentiality, and data transfer.

Third, geopolitical agents might want to reduce the risks of a *drain of economic surplus toward powerful foreign state-linked players.* Local and national

[4] ILA represents dockworkers along the U.S. East- and Gulf Coasts.

policymakers might want to ensure that the local community is getting its fair share of the economic surplus enjoyed by the foreign terminal operator as a result of its often exclusive entitlement to operate the terminal. Experience in the drafting of concession agreements has addressed many of such qualms although, as always, the devil is in the detail and attention is required. This is especially true of concessions in developing countries where, often, considerable *information asymmetry* exists between the global terminal operator and the local port authority awarding the concession.

The agreements on dock work in US ports serve as an example. In late 2024, US President-elect Donald Trump took a stand in favor of the International Longshoreman's Association (ILA) in its contract dispute with the United States Maritime Alliance (USMX), the latter covering the U.S. East- and Gulf-Coast ports[5] with many of its members being foreign companies. Trump's support for ILA was strongly fed by the notion that dock workers should be eligible for a fair share of the economic surplus enjoyed by these state-owned and private foreign entities: "*Foreign companies have made a fortune in the U.S. by giving them access to our markets.* […] *They've got record profits, and I'd rather these foreign companies spend it on the great men and women on our docks than machinery* […]" (post on Truth Social, 13 Dec 2024). Surprisingly, it remains unclear whether this discourse was supported by hard evidence and advice provided by relevant US government departments. In early 2025, ILA and USMX reached a six-year East- and Gulf-Coast port agreement.

Fourth, some geopolitical agents may voice concerns to the effect that foreign state-linked entities might use their entry into ports as a stepping stone to increase their *control and influence in the hinterland* through infrastructure investments (such as rail), and the implementation of a vertical integration strategy of the port operating company to include land transportation or distribution activities. While such concerns are yet to be supported by empirical evidence, particularly smaller ports could worry that such a geopolitically backed strategy reduces free choice for port users and lowers competition levels in a port's hinterland connectivity.

Given the above, governments might impose restrictions on who can invest and operate terminals, and related hinterland infrastructure and services, and stipulate strict institutional and operational conditions foreign state-linked entities should adhere to. In this context, *FDI screening mechanisms* are gaining momentum. Countries often require stringent reviews of foreign investments in critical infrastructure, like that of the U.S. Committee on Foreign Investment (CFIUS) process. In Europe, Regulation (EU) 2019/452 established a framework for EU cooperation on incoming foreign direct investment (FDI) based on standards for investment screening and the establishment of a network for information sharing across the EU. The regulation should better equip the EU to identify, assess and mitigate potential risks certain FDIs—particularly those in critical infrastructure and advanced technology sectors—pose to the security or public order of the EU or its Member States.

In the past years, most EU member states have amended existing national investment screening mechanisms, or have developed new ones, while the EU is revising

[5] USMX is an alliance of container carriers, direct employers, and port associations.

its 2019 FDI Screening Regulation (European Commission 2023). In the case of the 2019 regulation, it appeared that the European 'north' was in favor of stricter screening while the capital hungry 'south' was much more lenient and accommodating. Such differences in approach, often well justified, make an EU-wide policy on screening mechanisms rather challenging in the case of terminal FDI (and not only). Doppen et al. (2024) demonstrate that the investment screening mechanisms in EU member states have elicited quite different responses from the side of port authorities across the EU. FDI screening frameworks and their applicability in ports might differ between nations, and only a few practical experiences have been gained on how to deploy FDI screening mechanisms in a meaningful way in the context of terminal concessions or terminal acquisition processes.

3.2 Port construction and finance by foreign entities

Next to providing port services via state-owned or state-linked terminal operators, foreign states can also exert geopolitical influence on ports in other ways (Merk 2017; Yang et al. 2022). First, they can directly or indirectly provide financial support for port construction using national state-owned banks or other strategic investment vehicles, or by granting subsidies or technical assistance. Such financial or technical support, although in principle welcome, often comes with certain conditions. Deals are typically negotiated and closed bilaterally at government level. It has occasionally been argued that deals might involve pressure to ensure geopolitical alignment of the receiving country. In other words, port finance, it has been claimed, can be used as a tool of economic diplomacy, fostering dependencies that can translate into political influence. Recriminations of this sort have often been directed towards China, including 'debt trap' accusations. However, no investigation to date, even in highly debated cases such as investments in the Sri Lankan Hambantota port, or the Mombasa-Nairobi railway in Kenya, has shown 'sinister' motivations.

Second, state-owned construction companies might be mobilized for port construction, maintenance, and operations. For example, Yang et al. (2020) analyze how Chinese state-owned companies such as China Merchants Holdings International (CMHI), China State Construction (CSC), China Harbour (CHEC) and China Road and Bridge (CRBC) are involved in port investments, construction and operations in African ports using a multitude of business modes ranging from EPC (Engineering Procurement Construction), EPC + F + I (EPC + Finance + Invest) and BOT (Build, Operate, Transfer) to other Public Private Partnership arrangements.

3.3 Inroads of foreign technology and equipment in domestic ports

Government agencies may want to scrutinize foreign port technology and equipment, to be deployed in their ports in relation to foreign geopolitical strategy. If acquisitions are not procured with due attention to the availability of spare parts and maintenance services, relying on foreign-built systems might create a dependency, where the host country becomes vulnerable to supply chain disruptions or system malfunctions. In extreme albeit highly unlikely cases, such technology and equipment might be considered as posing national security risks, especially when they involve critical infrastructure and sensitive data. In the event of conflict or geopolitical tension, foreign control or influence over port infrastructure could be leveraged to disrupt trade, delay critical shipments, or even restrict access. Foreign software and hardware systems for operations like cargo tracking, surveillance, and communications could potentially include backdoors that allow unauthorized access or surveillance, or that deliberately increase the vulnerability to successful cyberattacks by a foreign state or non-state agents. This said, and in all honesty, one should also mention that the use of 'national security' arguments such as these, aiming to bypass the legislature through executive orders, is not as common in Europe as in other parts of the world.

An illustration of the heightened tension in this area is the recent controversy in the US related to terminal equipment in US ports supplied by the Chinese company ZMPC, the world's market leader in the manufacturing of container ship-to-shore (STS) cranes. A political report by Green et al. (2024) concluded that the national maritime industry is dangerously reliant on equipment and technology that has been produced, manufactured, assembled, or installed in China, including STS cranes, container handling equipment, and various other critical maritime infrastructure components. The report also claims the discovery of unauthorized and non-requested cellular modems installed on STS cranes produced in China, and intended for collecting usage data on certain equipment.

To eliminate such risks, a state might block the purchase and use of foreign port machinery and technology which could develop the capability to collect and transfer sensitive data on shipments, trade routes, and even military logistics. If foreign adversaries gain access to such data, as the argument goes, they could use it for economic or military advantage. Even if no actual data transfers could be demonstrated, the mere presence of data transfer capability of such equipment can be sufficient to trigger a strong defensive reaction by national government agencies and politicians. By imposing tariffs, governments could also encourage domestic development of port technology to reduce dependence on foreign systems.

In the contemporary geopolitical context, terminal operators are thus challenged to demonstrate that they deploy state-of-the-art port equipment and technology that, from a geopolitical perspective, does not pose a backdoor security vulnerability and does not undermine the integrity of national port operations. The failure to do so might result in the forced decommissioning of suspicious equipment. Furthermore, the government might instruct port operators active in national ports to purchase terminal equipment and technology from trusted suppliers located in non-adversarial countries. Government agencies might also resort to a complete import ban on products and technology manufactured by suspicious and unwanted foreign vendors.

3.4 Port nationalization and increased domestic grip on ports

A country that hosts important ports can mobilize relational power over other countries. A non-cooperative strategy for reducing foreign geopolitical influence in domestic ports is *nationalization* which can be voluntary or through seizure. In early

2025, worried about US strategic interests,[6] President Trump threatened Panama to take back the Canal. The intimidation worked well: Panama stepped out of China's Belt and Road Initiative while at the same time it is examining legal avenues of canceling the port concession to Hutchison Ports. However, nationalization can be considered very controversial in most instances as it implies a drastic reversal of the longer-term port devolution trend (Brooks and Cullinane 2006; Brooks et al. 2017) as observed in most countries around the world.

A more common approach is to ensure that port activities are reserved as much as possible for domestic companies or foreign companies coming from geopolitically close allies. For example, German ports for a long time remained largely focused on incumbent domestic terminal operators, thereby leaving little room for foreign operators to enter the national port system. The arrival of COSCO as a minority shareholder of Container Terminal Tollerort in Hamburg (see earlier discussion) thus presented a clear deviation from this path. The reflex to keep assets and operations in ports in national or 'friendly' hands is even more evident when highly strategic sectors are involved, such as energy and associated infrastructure (terminals, storage facilities, and pipelines.

Ports are often perceived and formally labeled as *critical infrastructures*. If major geopolitical risks force ports to engage in activities of (national) strategic interest, they have the opportunity to use their political embeddedness to access public capital, or private capital guaranteed by the state. From a pure microeconomic investment and port development perspective, this can potentially lead to the misallocation of scarce resources, something not uncommon anyway in port infrastructure development. For example, in times of a major geopolitical disruption or an eminent global security threat, a government might have strategic reasons to protect an operator from defaulting, e.g., by maintaining operations at an underutilized port, judged however to be of critical importance from a national economy or military perspective. As we mentioned above, the principal reason for keeping open US shipyards through commercial shipbuilding is their readiness to build naval vessels. Thus, governments might use geopolitical or national defense arguments to initiate arbitrary changes in the commercial port environment. This adds to the uncertainty port authorities and operators are confronted with, particularly if no policy frameworks are available to support possible geopolitically inspired changes imposed by the government on the commercial port setting.

Governments might also initiate geopolitically inspired actions in foreign ports. For example, they might instruct domestic companies to halt investments and operations in certain foreign ports when the geopolitical situation supports this.

[6] Interestingly, a 1999 U.S. State Department assessment found that Hutchison's presence posed no threat,

4 Ports in vulnerable corridors and networks

4.1 Geopolitical contestation at maritime chokepoints

Maritime and overland corridors are relatively narrow geographical areas, attracting trade flows due to shorter distances, superior infrastructure, and/or trade agreements between lateral states. As we argued earlier, however (Haralambides 2024; Notteboom et al 2024), the concentration of shipping and trade in limited areas gives rise to heightened risks and threats, and related disruptions.

Maritime corridors have become the main arteries of world trade. Strategic points along maritime corridors such as the Panama Canal, Suez Canal, the Straits of Malacca and the Straits of Gibraltar function as important turntables in the global shipping network. Maritime corridors and networks are complemented by land-based networks. In past decades, post-Panamax mega-ship developments, port development and the dynamics in logistics networks have created the right conditions for the large-scale development of long-distance inland corridors such as the rail land-bridges in North America, or the rail corridors between China, Central Asia and Europe, part of China's Belt and Road Initiative (BRI). At the same time, new maritime routes emerged as exemplified by the Northern Sea Route (NSR), backed by Russia and China (Fig. 3).

Vessels navigate through maritime lanes and interoceanic passages according to the *international law of the sea* and various treaties that ensure free passage. Transit fees are occasionally charged by government agencies, such as the Panama Canal Authority, the Suez Canal Authority, and the various Russian controlling stations along the NSR. However, geopolitical tensions can make nations 'nervous' when it comes to using these critical routes. Seaports located in strategic chokepoints, such as the Strait of Hormuz, the South China Sea, the Red Sea/Suez Canal area, and the ports at the entrances of the Panama Canal, are especially susceptible to such tensions. Countries may seek to secure control over essential maritime trade routes, to minimize risks posed by external actors. As a

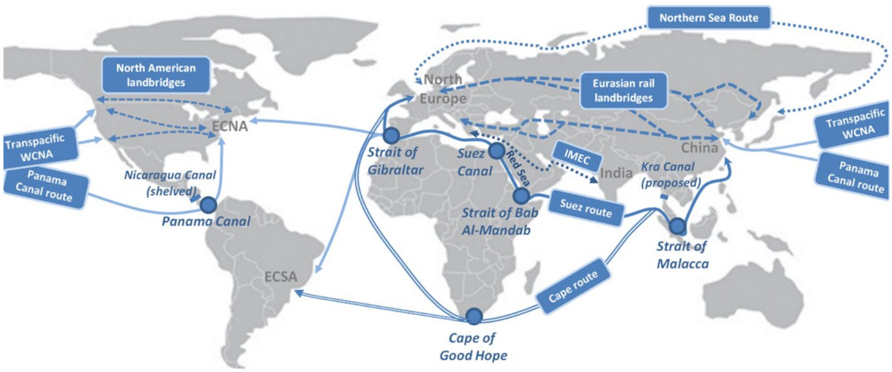

Fig. 3 Routing alternatives on the Asia-North Europe trade and Asia-Americas trade. *Source* Notteboom et al. (2024)

result, concerns are growing about the safety and costs associated with vessels passing through these maritime chokepoints.

The Red Sea crisis (see Notteboom et al. 2024 for a detailed analysis) shows that it is no longer unthinkable that a key maritime artery in the global shipping network gets severely disrupted and even cut off despite international treaties guaranteeing free passage. Geopolitical factors play an important role here. AIS data on ship movements shows that the Red Sea passage remained open for the maritime interests of certain geopolitically allied countries and companies that were willing to pay the Houthi militia for safe passage. Adversarial nations and vessel operators incurred substantial additional supply chain costs by having to sail around the Cape of Good Hope to avoid being attacked by the Houthi.

In the current geopolitical climate, states are motivated to preserve or control critical maritime infrastructure or, at the very least, ensure access to it. Recent examples include controversial statements by US President Donald Trump in early 2025 about reasserting US control over the Panama Canal, China's claims over islands in the South China Sea, and the Nicaragua Canal (Chen et al. 2019b) and Kra Canal (Sulong 2012) projects, as leverage to secure access to routes such as the Panama Canal and the Straits of Malacca, respectively. Geopolitical conflict affecting a specific route or passage makes the affected governments and supply chain actors search for alternative routes.

In recent years, competition among global powers has erupted anew, aiming to control strategically located ports with commercial and military capabilities (we refer to the discussion on state-backed terminal operators mentioned above). Control over ports strategically located vis-à-vis international shipping lanes enables countries to influence international trade routes, project power, and exert political leverage.

4.2 Shadow fleets in the global maritime network

Geopolitical conflicts often trigger the development of *shadow fleets* (also called dark fleets or gray fleets) such as those in the aftermath of the imposition of sanctions on Russian energy exports. These vessels use flags of convenience and intricate non-western ownership and management structures. Transshipment of cargo at sea is not uncommon, nor are their efforts to conceal the origin of their cargo and the vessel's position using a wide array of deceptive or even illegal techniques such as falsifying the vessel's position or switching off the AIS (EPRS 2024).

In a multipolar world of increasing geopolitical tensions and autocratic leadership, the concept of shadow fleets may become a more permanent reality (Adland 2025). This scenario would allow for greater transfer of vessel ownership, and the emergence of an alternative fleet controlled by companies and nations that align with specific geopolitical interests and ideologies, next to the pursuit of profit. However, shadow fleets may pose significant environmental, safety, and security risks, particularly for ports, especially since many of these vessels are aging, poorly maintained, and might not comply with international safety and environmental standards.

4.3 Ports as parts of defense corridors and networks

Growing security issues are leading to renewed attention and investments in defense. The role of seaports in this context is also receiving increased attention. Many ports are assigned a more pronounced military role and become indispensable to national defense. Their infrastructure, location, and operational capacity can make them a cornerstone of a nation's defense strategy, as well as attractive bases for the projection of foreign naval power, especially in times of conflict or geopolitical tension. Ports located near *critical trade routes* can serve as hubs of naval and other operations, aimed at securing international shipping lanes against threats like piracy and terrorism.

Many commercial ports have become dual use in nature by housing a naval base next to their commercial activities. They can be found at critical military locations near maritime chokepoints (e.g., Djibouti near the Red Sea and the Gulf of Aden; Gwadar, at the entrance of the Pakistan-China corridor; Souda Bay in Greece) or at domestic ports (e.g., San Diego and Norfolk as homeports for the US naval fleet at the US West Coast and US East Coast respectively). Stationing advanced warships at a port in a geopolitically tense region can send a message of military readiness. Ports can act as *command hubs* for the coordination and monitoring of defense operations, and house *electronic warfare capabilities* to intercept and jam enemy communications. Ports equipped with dry docks and maintenance facilities can play a role in constructing, repairing, and overhauling military and dual-use vessels.

In today's geopolitical context, port terminals might be asked to adopt a *logistical role in facilitating (large scale) military operations and exercises*. For example, in response to the Russian threat, the European Union committed to reinforce the military transport infrastructure needed to move troops and materiel. Some EU ports will play a key role in the creation of *defense corridors* primarily linking deep-water North Sea ports to Europe's eastern borders.

5 Ports as targets in geopolitical conflicts

5.1 Direct attacks on ports

Ports are strategic nodes in trade networks and global supply chains, while also having significant value for military/naval capacity deployment. Ports can become focal points or even outright targets in geopolitical contestation or conflict. The growing role of ports in defense logistics increases the risk of possible actions targeting port infrastructure and superstructure through direct attacks via air, water, or land. In the most extreme case, ports may be targeted in military, paramilitary, or terrorist operations due to their strategic importance. Attacks can include airstrikes, missile attacks, cyberattacks, or sabotage. Ports in key regions are particularly vulnerable to military blockades. Even if not directly targeted, ports can be affected by nearby conflicts. Cyberattacks in particular pose a significant threat to seaports worldwide, aiming to cause severe disruption and, among other objectives, extract ransomware payments. Efforts to digitalize ports make such attacks easier to carry out (Senarak 2024).

Heightened risks of direct attacks can trigger the *weaponization of ports* through the installation of coastal defense batteries, anti-aircraft systems, and other fortifications in port areas. In some cases, mines, underwater chains, drones, or other defensive measures can be deployed in harbor approaches to deter hostile ships. Some strategic ports are equipped with systems to detect and counteract submarine and missile threats. To enhance cybersecurity, ports might be included in robust national cybersecurity infrastructures.

5.2 A new reality of sabotage

Today's geopolitical and global security landscape has introduced new forms of potential *sabotage* affecting ports.

In military terms, sabotage can be defined as 'a mission (conducted via individual act or as part of a campaign) to secretly disarm, obstruct, or destroy enemy war materiel or infrastructure for military advantage[7]'. However, it has become clear that recent sabotage actions affecting ports might not necessarily be conducted by official military forces or secret services of adversarial states. In a setting of hybrid conflict, non-state actors such as terrorist organizations, militia, unmarked mercenaries, civilian cyber criminals, or even crew on board merchant vessels could be mobilized to serve the geopolitical interests of a hostile nation. This enables the latter nation to deny any responsibility for sabotage, while still causing harm and damage. Recent cases of damage brought to sea cables in the Baltic and North Sea by merchant vessels demonstrate that it is often difficult to prove a genuine link between the suspected government or state and the actors involved in the deeds of sabotage. The same issue could occur when a foreign-based non-state organization launches a massive cyberattack on critical infrastructure and entities based in a rival nation.

In the current geopolitical setting, critical civil infrastructures can become key targets of sabotage actions. Undersea data and power cables, energy pipelines, and commercial port infrastructure and superstructure have made it to the list of highly vulnerable sabotage targets. Foreign-supplied equipment in ports, such as cranes, surveillance cameras, or automated systems, could be sabotaged or remotely disabled during a geopolitical conflict. We are aware that concerns such as these abound internationally. However, they should not lead to 'blind' spending on security, for risks yet to appear, to the enjoyment of security companies, public or private.

[7] Etymologically the word 'sabotage' derives from the French 'sabot': the wooden clogs (klompen in Low Countries where they are still popular) workers wore on the sweat floor during the industrial revolution, which they threw onto the machines to cause disruption and stoppage. To 'throw a spanner in the works' is the modern expression for this.

5.3 Control over key ports during conflicts

In conflict situations, rival powers may seek *control over key ports*, turning them into contested assets. Ports may be nationalized or seized by a hostile government during conflicts, causing political and economic fallouts. Ownership of port assets may become contentious during conflicts, leading to protracted legal battles. Ownership claims may also affect interoceanic canals. A notable example of this at the time of writing is the expressed threat of the current US administration to repossess the Panama Canal (cf. also above). From a trade perspective, ports in politically isolated countries or conflict zones may be sanctioned or excluded from global trade agreements, reducing their relevance often overnight. Moreover, geopolitical conflicts can disrupt seaport operations. For example, the ongoing tensions between Russia and Ukraine have led to significant disruptions in Black Sea and Sea of Azov ports, hindering grain exports and exacerbating global food insecurity. Similarly, territorial disputes in the South China Sea have raised concerns about the security of shipping lanes and the accessibility of regional ports. Ships and cargo passing through or docked at ports in conflict areas risk damage, seizure, or theft.

6 Conclusions: geopolitical agents or sitting ducks?

Seaports face significant vulnerabilities in today's geopolitical climate due to their critical role in global trade and their susceptibility to physical, cyber, and economic threats. This editorial demonstrated that the current geopolitical context for ports is multifaceted and highly complex. Given this complexity, one might ask whether ports can assume a (pro)active role as key geopolitical agents, or whether they are condemned to be 'sitting ducks', passively suffering the consequences of geopolitical change. The answer to this question urges us to reflect on the ramifications of the geopolitical issues discussed above.

The geo-economic and geopolitical landscape has a major impact on seaports, which have limited control over these external factors. Geopolitical objectives and policies also have a significant impact on the strategies and operational decisions of port users. Seaports should not merely endure these developments but adapt to them. Shifting trade patterns driven by processes such as friendshoring, trading with friends and strategic autonomy ambitions present new opportunities for ports. These trends can help ports attract business and further develop into industrial-logistics turntables. Geopolitical shocks and disruptions often lead to greater fluctuations in cargo volumes and affect the geographical distribution of incoming and outgoing cargo flows. To effectively manage these challenges, it is essential to develop a high degree of commercial resilience and operational agility, enabling ports to respond swiftly to disruptions within their value chains. The volatility of the geopolitical climate complicates the ability to predict future developments, underscoring the need for a stronger focus on risk and resilience management, scenario-based approaches for long-term port planning, and flexible strategies in port operations.

Seaports have a crucial role to play in enhancing the strategic autonomy of a country or region. As vital components of industrial and logistics ecosystems and energy hubs, ports are well-positioned to provide the land, infrastructure, and resources necessary for processing critical and strategic materials. They also facilitate the production, storage, stockpiling, and transportation of both fossil and alternative energy sources, as well as the development of circular economies focused on recycling and upcycling materials. Additionally, national or allied foreign seaports can serve as key locations for building national or regional shipbuilding capabilities and can act as home ports for the national fleet.

We have demonstrated that ownership and foreign investment in port areas increasingly come with geopolitical strings attached, impacting a port authority's ability to welcome specific investors or operators to the port. While investment screening mechanisms are on the rise, their content and applicability in ports can vary significantly from country to country. As governments increasingly scrutinize foreign port technology and equipment deployed in national ports in the context of geopolitical strategy, terminal operators are challenged to demonstrate that their port equipment and technology do not pose backdoor security vulnerability or undermine the integrity of national port operations.

Port authorities are not in principle involved in the geopolitical positions and strategies of their respective governments. However, this does not mean that port managing bodies should remain passive. Port authorities might have good reason to oppose or challenge geopolitical actions if such (arbitrary) actions seriously undermine their ability for effective value creation and service delivery for their customer base, or if they involve an unfounded and undocumented act of favoritism. Governments, port authorities, and the wider port and logistics community should engage in dialogue on how to assess and mitigate possible negative impacts that a justified government-led geopolitical action/measure could have on the commercial environment in the port. Frequent unannounced and uncoordinated geopolitical activism by a national government creates an unfavorable investment climate in ports.

Ports are key nodes in maritime corridors and networks that are becoming increasingly vulnerable. They are being drawn into geopolitical contests focused on crucial maritime chokepoints and shipping lanes, whether they like it or not. Many commercial ports are effectively transitioning to a dual-use profile by hosting naval bases, acting as hubs for naval operations aimed at securing international shipping lanes or playing a logistical role in facilitating large-scale military operations and exercises.

Ports play a critical role in trade and defense, but their vulnerability to attack makes them significant candidates for geopolitical disruptions and direct attacks. However, they are not as much sitting ducks as high-value assets and agents in a precarious geopolitical environment. To mitigate risks, it is essential to implement proactive measures such as diversifying trade routes, enhancing port security, building port resilience, and fostering international and stakeholder cooperation. As geopolitical agents, ports should ensure they are equipped with the capabilities to participate in debates about the balance of power, shape economic dependencies, and act as pivotal assets in protecting a nation's strategic and economic interests on the global stage.

Data availability Not applicable.

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