Drivers of Path Dependence and Change in Port Hinterlands: Towards Resilient and Decarbonized Supply Chains

Special issue information

This special issue is dedicated to hinterlands and intermodality, particularly in the context of post-crisis recovery and the ongoing transition of port authorities towards driving energy transition. The term 'hinterland', which is a German word meaning 'the land behind', was first introduced in English by the Scottish geographer G. Chisholm in 1908. Three decades later, Sargent set a simple definition of port-hinterlands i.e. 'the area which a port serves' which he revisited in 1938 by introducing a sub-division of hinterlands based on single (or group) commodity differentiations. Since then, the approaches deployed for analyzing port-hinterlands have significantly evolved, adhering to tectonic changes that heavily transformed port-hinterland networks such as containerization and the consequent rise and expansion of intermodal transport. Having now endured major global shocks (e.g. COVID-19, energy crisis, etc.) with still strongly felt implications, whilst being at the brick of disruptive developments (e.g. digitalization, decarbonization, automation, etc.), it is now more timely than ever before to revisit port-hinterland research. The pressing needs encompass new methods and approaches covering a broad range of dimensions of analysis, aimed at inducing further efficiencies, strengthening stakeholders' collaboration and coordination, improving governance, supporting policy and business strategy formation and decision-making, etc.

Main themes

Hinterlands and Disruptions in Maritime Supply Chains

The COVID-19 crisis has underscored the fragility of maritime supply chains and has highlighted the increasing power of shipping lines. Unlike the vertical integration strategies deployed in the 1990s and 2000s, the current strategies of these shipping lines appear to have intensified. This raises the question of whether there has been a paradigm shift or merely an escalation of existing trends. The interaction between port governance and hinterlands remains crucial, with the concept of port regionalization—introduced in the 2000s—continuing to provide valuable insights into the current organization of inland connections. Revisiting papers from the 1990s and early 2000s that analyzed the intermodal landscape in Europe can help assess the accuracy of their assumptions about future developments. Additionally, the relationship between network disruptions and hinterlands is critical, as illustrated by examples such as the ebb and flow of the North American land bridge and natural and human-induced disruptions affecting the Suez and Panama Canals. During the COVID-19 pandemic, the closure of several borders significantly impacted port choices, demonstrating how "hard borders" affect the logistics landscape. Compared to solely using road transport, intermodal solutions in port hinterland transport involve numerous actors and activities, increasing operational uncertainty and vulnerability to shocks. One way to reduce this vulnerability is by employing buffers, but this incurs costs that are critical to the competitiveness of alternatives to road transport (Wide et al., 2021).

The Challenge of Greening the Land Connections of Ports

The push towards a circular economy and energy sustainability has placed increasing responsibilities on port authorities, prompting them to engage in activities beyond their traditional roles. The challenge of greening land connections involves examining the relationship between hinterlands, the introduction of mega-vessels, and the growing need for economies of scale in port handling and strategic alliances. Although some major ports are well advanced in green hinterland strategies such

as Rotterdam and Los Angeles, other ports leading green port strategies are slower to adopt measures regarding hinterlands (Gonzalez-Aregall et al., 2018). Moreover, the uneven development of alternative modes of transport—such as inland waterways and rail—poses a challenge, with most hinterland transport still reliant on diesel-fueled trucks. The slow introduction of electric trucks, hindered by financial constraints faced by small truck firms and issues related to autonomy, further complicates the transition to greener transport options. Furthermore, the introduction of the Emissions Trading System (ETS) in Europe is expected to affect competition between ports (Lagouvardou and Psaraftis, 2022) and their land-side connectivity, with some European ports potentially experiencing a decline in connectivity and some regions potentially losing their competitive edge in the global context.

Port and Carriers Reorganization and Changes in the Hinterland Landscape

The evolving role of port authorities, with their increasing involvement in driving energy transition, challenges their traditional functions. The green transition represents a significant advancement in the evolving role of port authorities, building on their previous strategies aimed at expanding hinterlands, often acting as private operators. Port privatization further interacts with hinterland expansion, exemplified by Cosco's acquisition of the container port of Piraeus and its investment in a rail link to Hungary (Pallis and Vaggelas, 2022). Concurrently, sea carriers, buoyed by profits from recent high rates, have reinvested in vertical integration of inland logistics, transport, and handling activities on an unprecedented scale. The relationship between hinterlands and recent geopolitical struggles, such as the OBOR initiative, the Ukraine conflict, and Brexit, highlights the impact of geopolitics on the hinterland landscape (Serry, 2023). Additionally, the automation of maritime transport and handling activities, and their integration with hinterland transport, raises questions about the future resilience of transport systems. The involvement of new regions in containerization, such as Africa, further emphasizes the critical role of hinterland links for connectivity. For example, Ethiopia's reliance on Djibouti, with potential shifts to Somaliland and Eritrea (Guiziou, 2023), and South Sudan's corridor to Lamu, Kenya, illustrate the importance of hinterland connections in enhancing regional connectivity. Given that most hinterland studies focus on Europe, North America, and East Asia, case studies from regions such as Africa, Latin America, Southeast Asia, and Central Asia are particularly welcome.

This special issue also welcomes contributions to the following (non-exhaustive) list of topics:

- Port development evolution and implications for the hinterland
- Sea- and land-driven (network and/or corridor) developments in the hinterland
- Spatial and functional complexity of contemporary port-hinterlands
- Effects of horizontal and vertical integration strategies on port-hinterlands
- Intermodalism, decarbonation, and changes in port hinterlands
- Implications of port governance models for the hinterland
- Port-hinterland stakeholders' cooperation / coordination and tension areas
- Resiliency of port-hinterland networks / corridors on disruptions
- Port-hinterland connectivity as key factor in multi-layered port competition
- Status assessment of port-hinterlands in emerging trading regions (e.g. Africa)

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