

Critical Review

Port geography at the crossroads with human geography: between flows and spaces



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ABSTRACT

Port research is not a new field of interest for human geographers, evidenced by numerous conceptual models and empirical cases of port evolution and development in the literature. However, several critical questions remain unanswered, notably the exact position of port geography as a subdiscipline within human geography in the past, present and future. Based on a pluralistic approach, the paper analyzes the changing waves and development of port geography as a sub-discipline of human geography, with a special focus on whether port geography has experienced a paradigm shift and, if so, when, why, and how. Also, through analyzing the major terrains of port geography research from the macro perspective, it brings a new lease of life to port geography in this rapidly changing world.

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1. Introduction

As the intersection points between land and water, ports have played important roles in the socio-economic development of cities, countries and regions throughout the history of human civilization (Hoyle and Pinder, 1992; Ng and Tam, 2012; Wang and Ducruet, 2013). In recent years, they have become even more significant thanks to the rapid development in transportation, communication technologies and international trade. Nowadays, ports, especially the major ones, have transformed to crucial components in facilitating transactions around the world (Ng and Liu, 2014). New demands, together with the rising influence of the neoliberal ideology in the construction of economic policies (see Harvey, 2005), have prompted port actors to reassess their operational and governance structures, while further integrating

themselves into global supply chains. Hence, the port community has become more complex (Martin and Thomas, 2001), in which it facilitates the interactions between stakeholders (both global and local), and add value to products and other economic activities which require port services (Nam and Song, 2011). With maritime transport moving at least 80% of internationally traded cargoes, ports are lively communities, embedded within particular geographical settings while sustaining the global economy.

Unsurprisingly, considerable research opportunities exist for human and transport geographers (Keeling, 2007). In fact, the interest in ports by human geography researchers is not new, as exemplified by the conceptual models and empirical cases on port evolution and development especially during the three decades since the Second World War (WWII), together with the publication of some influential books during the same period. More recently, some geographers have conducted critical review studies on port geography, including its research trends, the community's 'network' and its influence as a sub-discipline within human and transport geography (e.g., Ng, 2013; Ng and Ducruet, forthcoming). Despite such efforts, hitherto, critical questions remain unanswered. First, port research has attracted not only human geographers, but also those from other academic

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disciplines, such as business and management, economics and engineering. The question is thus, what was the focus of research for human geographers, and how is it distinct from work in other established scholarly disciplines? Second, how did the transformation of the global transport system affect the research direction, and study approaches, of human geographers when conducting research in port geography, especially in view of its own identity? Third, with the perceived changing research direction and focus in recent decades, how has port geography, as a sub-discipline within human geography, evolved and developed, and has a changing tide already taken place? Finally, what exactly is port geography in the past, present and future, and what is its position within human geography? The above queries have been partially addressed by some of the aforementioned studies, together with journal special issues touching upon port and transport geography, planning and regional development (e.g., Hall et al., 2006; Ng and Wilmsmeier, 2012; Ng et al., forthcoming). Nevertheless, the breadth of research on port geography still requires further collective inputs from researchers so as to address such queries comprehensively.

Recognizing such a salient need, the paper investigates port geography as a sub-discipline within human geography. It offers insight on the extent of port geography research, aiming to complement the fundamental objectives of the study of human geography (i.e., to study the Earth's surface, its people, communities and cultures, with an emphasis on the relations between and across space and place (Johnston, 2000)) and transport geography (i.e., to enhance understanding of the underlying economic, environmental and social processes that contribute towards continually changing transport patterns (Keeling, 2008)). If the study of an academic discipline is 'the study of a society within a society' where its life does not (and cannot) proceed independently in its own closed system (Johnston, 1997), then this paper is studying 'a society within a society within a society', and its evolution and research direction would certainly be affected by external forces (both academic and non-academic). In a nutshell, the research question is: how, why and to what extent does port geography evolve, and as a sub-discipline of human geography, what are its impacts on human geography in the past, present and the future? We attempt to re-invent port geography as a lively and dynamic sub-discipline, so that it can offer a distinctive contribution to advance the future practice of human geography.

When writing the paper, we have undertaken a pluralist approach which comprised unity in diversity; each section was prepared by different authors (while all the authors have read, and provided necessary feedback on, the other sections). Authors for different sections were carefully selected based on respective backgrounds and expertise within port geography research. Inevitably, this led to some diversified views between sections. However, given the wide range of topics and stakeholders (both academic and non-academic) with which the research community has (and continues to be) engaged, diversity in ontological, epistemological and political commitments within port geography research inevitably exists (and will persist). It would be inappropriate, if not naïve, to overlook this fact and try to adopt a unified, relativist view. We strongly believe that the pluralistic approach has greatly strengthened the merit and credibility of the paper. By re-inventing port geography and its research, we hope that our efforts will attract young and capable geographers to this extremely interesting sub-discipline.

The rest of the paper is structured as follows. An overview of port geography research will be found in Section 2. Sections 3–6 address four major (although by no means comprehensive) themes of port geography and port geography research, including hinterlands and the port's role in intermodal transportation and supply chains, the operation of ports, the port's location and port–city/territory relationship and port management, policy

and governance. Although by no means comprehensive, these themes are schematic expositions reflecting:

- The traditional heavyweight topics in port geography research (port–city/territory relationship).
- The emerging topics in recent decades (the port's role in intermodal transportation and supply chains; management, policy and governance).
- The role of port geography in spatial analysis (the operation of ports).

Finally, Section 7 re-visits the epistemology of port geography, including its major challenges and future prospects.

2. An overview of port geography research since 1950 (César Ducruet and Adolf K.Y. Ng)

This section analyzes the evolution of port geography research since 1950. The analysis in this section is an extension of Ng and Ducruet (forthcoming) about collaboration and citation patterns in port geography research. In addition, however, this section focuses more strongly on the contents of the same corpus. The major terrains of port geography are based on Ng's (2013) previous classifications (Table 1).¹ The period was divided into two main periods, with 1990 as the cutting point, chosen due to important changes taking place in port and maritime industries at the time.² Also, given the increasing ability of port geographers to convey their ideas to practitioners and specialists in other academic disciplines, it was recognized that papers on port geography were not published only in geography journals, and so we have categorized port geography papers during the aforementioned period into two branches, namely 'core port geography' (CPG) (port papers published in the 'core' geography journals) and 'extended port geography' (EPG) (papers which addressed topics closely related to port geography but not published in geography journals).³ The research themes of port geography papers published in geography and non-geography journals in 1950–2012 can be found in Table 2.

There was a substantial increase in port geography papers in the past two decades. During the early period (1950–1990), 309 such papers were published, compared to 419 in the contemporary period (1991–2012). However, in the latter period, a substantial shift occurred by which many papers were published outside core geography journals, while during the contemporary period the number of EPG papers even tripled since the early period (251) compared with CPG (168), which suffered more than 20% decrease (see Table 2).

Despite such structural changes, common trends can be identified between CPG and EPG papers. First, the highest numbers were published on port–city relationships (80 and 62), which meant 19.5% of all port geography papers. The joint growth of 'management, policy and governance' papers illustrated an increasing concern for actors, governance, and port operations. This became much more rapid and voluminous for EPG due to the increasing availability of specialized transport and maritime journals, although CPG papers falling under this category also experienced steady increases in recent decades.

A comparable trend can be found in 'port's place in shipping strategies and networks', albeit the takeoff occurs earlier for EPG. Finally, a parallel increase for 'port, intermodal transportation and supply chain' implies that CPG/port geographers manage to

¹ See Ng (2013) for a detailed explanation on how the themes in Table 1 (and later Table 2) have been identified.

² See Ng and Ducruet (forthcoming) and Pallis et al. (2010) for detailed justification of this division.

³ For a detailed explanation of CPG and EPG, see Ng and Ducruet (forthcoming).

Table 1
The major themes of port geography research. Source: Adapted from Ng (2013).

Spatial unit	Functional perspective within the maritime industries	Focus of research	Issue
Foreland and maritime space (global)	Locational	Port system	Port hierarchy; port clustering; development of continental/national port ranges
	Operation	Port connectedness	Connections of ports with foreign markets
Hinterland (regional/national)	Impacts	Port choice, competition and cooperation	Port attractiveness; port competition and cooperation
		Port's place in shipping strategies and networks	Concentration and de-concentration; hub development; impacts of technological improvements on ports; relation between ships and ports; impacts of shipping lines and shipowner strategies on ports
	Locational	Catchment areas and supply chain linkages	Shrinking hinterland; evolution over time
The port (local)	Operation	Port, intermodal transportation and supply chain	The role of ports in the development of multimodal transportation and logistics; port's inland connection; relation between port and cargo sources/shippers
	Impacts	Inland/satellite terminal Port and regional development	Functions and operation of inland terminals, and their relations with ports
	Locational	History and location	Feasibility studies, impact assessments of port projects and intermodal facilities on regional and non-urban surroundings, including port development, climate change and environment issues, port and international trade; impacts of economic development on ports
Management, policy and governance	Operation	Evolution over time	Include geographical characteristics, cost–benefit analysis in port site selection; history of port international trade
	Impacts	Port operation	Composition of the port community; stages of port development; port morphology
	Port-city relation	Port and urban development, waterfront re-development, port–urban land use conflicts, port and transport labor issues	
Philosophy and epistemology			Politics, policies and the institutional system of port management and governance, including deregulation, devolution, privatization, public–private partnership; strategies of terminal operators; maritime organizations and port management and governance
			The definition, meaning and understanding of ports geography; the problem of taxonomy; analysis of port research trend; identity of port geographers, and their relation with other (non-)geography sub-disciplines

document specific issues within their own discipline. Together with a similar trend for 'port choice, competition and cooperation' and 'management, policy and governance' (although somewhat stagnated for CPG), this illustrates that the spatial effects of intermodal transportation in relation with ports continue to feature in major (human) geography journals. However, despite some delay in CPG's welcoming of (and developing) new, largely positivist methodologies and concepts (networks, hubs) – not dissimilar to the resistance to the wave of positivist research in human geography more widely since the late 1950s (Johnston, 1997) – the traditional preference for idiographic approaches was gradually complemented by more nomothetic-oriented studies, especially in the 1991–2012 period.

A main gap between CPG and EPG lies in 'history and location'. Port geographers of the early period had a strong historical culture and sensibility to long-term trends, whereas the EPG (except those from pure historical studies) and the CPG were more and more concerned with current developments. Another factor was that, during the early period, port geographers were more eager to develop spatial models that would be valid across space and time (the 'structuralist' approach and the development of 'spatial science', see Johnston, 1997), but such emphasis on idiographic methods was gradually replaced by approaches relying on well-established research methodologies, often rather sophisticated quantitative, modeling and computing techniques. This shift in methodological approach has best been most evident for the theme of 'evolution over time'. During the early period, this theme had the second largest volume of papers in CPG due to a high number of port geography books and monographs, which were much less common in EPG. All in all, the monographic approach has nearly

disappeared in recent years,⁴ as seen with the nearly 90% drop of such papers.⁵

The opposite trend can be noticed for 'catchment areas and supply chain linkages'. At a time when the concept of supply chains was still in its embryonic stage, CPG papers contained many studies of industrial linkages of ports in a context of booming industrial developments. The topic has attracted substantial attention, however, in recent years from EPG mainly due to its ability to develop new concepts (e.g., value chain, logistics chains, production networks, etc.) that have attracted interest among specific audiences. In parallel, physical flows in relation to places and territories have, in general, lost ground when compared to people and information flows – the exception being airline flows but they mostly carried passengers (like transport economics, tourism and urban studies) (see Hall and Hesse, 2012). A similar trend has occurred regarding 'port and regional development' for similar reasons: the economic impacts of ports on regional economic development, for instance, have been questioned deeply (see Baird, 1996), as more intermodal transport have expanded the geographic reach of port activities. More practical, industry-specialized studies have continued to investigate the 'remaining links' in other scholarly journals, where studies of particular projects have been welcomed. Finally, the 'port system' has offered a drastic difference because it was the

⁴ The embracement of positivism in mainstream research, which led to policy changes in many journals, also contributed to the reduction of monographic-style papers being accepted and published.

⁵ One should note that not all papers on 'evolution over time' were monographs. In fact, nearly all the EPG papers under this category could not be treated as port monographs. For further details, see Ng and Ducruet (forthcoming).

Table 2
The research themes of port geography papers published in geography and non-geography journals, 1950–2012. Source: Authors.

	Philosophy and epistemology	Port connectedness	Inland/satellite terminals	Port operation	Catchment areas and supply chain linkages	History and regional development	Port and intermodal transportation and supply chain	Port choice, Port's place and strategies	Management, policy and governance	Evolution and overtime relationships	Total (all categories)
Core port geography (CPG)	1950–1990	9	2	6	20	18	11	4	7	57	231
	1991–2012	2	6	3	3	9	23	13	15	6	168
Total	10	11	7	9	23	26	34	17	22	63	399
Extended port geography (EPG)	1950–1990	2	2	1	1	6	4	7	10	13	78
	1991–2012	2	11	18	13	7	18	33	37	15	251
Total	4	13	19	14	14	13	22	42	47	28	329
Total (CPG & EPG)	10	15	20	28	37	39	56	59	69	91	728

third largest topic in CPG and managed to sustain its importance up to the present, while for EPG it has remained a relatively minor topic. In some ways, the topic has been the 'legacy' of the early conceptual models (the ideal-typical sequence of port system development) which were continuously tested in (and confronted by) the real world. Given the increasing emphasis on sophisticated quantitative, modeling and computing research methodologies and structures (as mentioned earlier), it has remained a minor topic in both CPG and EPG, as illustrated by its rather marginal growth in the past two decades.

The above analysis has strongly hinted that port geography research has evolved from structuralism to methodological positivism, with more attention on how research outcomes could enhance (often short term) industrial practices and efficiency, rather than the indirect (but often more significant in the long term) dynamics between ports and their surroundings. In fact, the substantial increase in the study of the port's place in shipping, intermodal transport networks and management issues, which has coincided with the decline in the port–regional relationship and the port's evolution over time at an alarming rate, suggests that the positivist approach, and the applied nature, of research has gradually been taken for granted by considerable port geographers. One can observe that studies increasingly focused on technicalities and the development of the (industrial) 'best practices', while papers emphasizing diversity (e.g., Ng and Pallis, 2010) make cameo appearances only. Port geography seems to lean towards an increasingly 'closed system' stressing the port's internal structure and the links with its affiliated systems (transport, logistics and supply chains), while overlooking topics linking the port with the external environment (except the commercial functions) cutting across space and time – in contradiction to Shaw and Sidaway's (2010) argument that ports 'matter beyond being entities in and of themselves since they are so evidently at the heart of world trade'. Thus, port geography has gradually drifted away from actively participating in the philosophical discussions within human geography.

3. The hinterland and the port's role in intermodal transportation and supply chains (Jean-Paul Rodrigue and Jason Monios)

Port geography is in good part influenced by the hinterland, which represents the geographical distribution of the port's customer base, both for inbound and outbound flows. Globalized supply chains are characterized by the acute physical separation of production and consumption, with the result that goods are moved not simply between ports but to and from areas far inland. The decreasing cost of ocean shipping has to some degree cross-subsidized the cost of overland transport, allowing regions distant from ports or in countries not having their own ports to access global trade routes through intermodal links. Developments in the maritime sector influence the geography of hinterland transport through competition for overlapping hinterlands, attempts to improve efficiency of inland transport modes through large intermodal corridors and efforts to integrate supply chains by the setting of inland ports.

Hinterland access is a crucial component of port competition and achieved increasing importance with the development of intermodal transport. In addition to improving the speed and capacity of hinterland transport services, it enabled a greater contestability of hinterlands, most of which were captive to local ports. Intermodal transport developed in the US in the 1980s when rail corridors allowed shipping lines to reach central and eastern US destinations quicker by sailing from Asia to West Coast ports and utilizing double-stacked rail corridors than by using the

Panama Canal route to East Coast ports. In Europe, intermodal transport developed later, in the 1990s, and included the use of barges, compensating for the lack of double-stacked rail services. In other parts of the world, inland intermodal services are less comprehensive, but emerging.

Technical advances on both the maritime and inland sides spur ports to develop infrastructure both to retain their existing customers and attract new business. Increasing throughput at ports, especially large single drops from new generation container vessels, requires upgrades of access infrastructure such as rail lines (e.g. the *Betuweroute* in the Netherlands or the Alameda Corridor in the US). It can also mean a more direct proactive role of port actors by joint development of load centres in the hinterland, planning rail services in conjunction with intermodal terminal operators or partnerships between port terminal operators, port authorities and rail/barge operators.

Mergers and acquisitions as well as increasing vessel size have made the maritime leg increasingly cost-effective. By comparison, inland transport remains fragmented and expensive. It is challenging to reconcile the massification of the maritime side with the atomization on the inland side, as each container must find its way to its final destination. Ports and carriers therefore try to cut costs, but in order for port actors to engage with land transport, changes are required in the operational and institutional settings, which have spatial implications.

The spatial structure of port hinterlands can be classified in terms of nodes and corridors, with a particular focus on nodes joining links within a transport system or joining different systems, such as transport and logistics through multi-functional integrated transport and logistics centres. Classification of inland freight facilities and the activities in which they engage is challenging. Early analysis focused on their functions and locations (Hayuth, 1980; Slack, 1990), and it is only in recent years that the spatial and institutional characteristics of intermodal terminals and inland ports (sometimes called dry ports) began to be addressed. They can be used as instruments of port competition, yet their development and operational models exhibit divergent characteristics dependent on the roles of port actors (port authorities, terminal operators and shipping lines) and inland actors (e.g. public sector developers, inland logistics providers and rail operators) (Notteboom and Rodrigue, 2009; Rodrigue et al., 2010; Monios and Wilmsmeier, 2012a; Ng et al., 2013).

These nodes act as load centres for commercial, manufacturing and resource hinterlands, linked to ports by high-density corridors. Such corridors facilitate not just continuous hinterlands (i.e. the natural hinterland adjoining a port) but discontinuous hinterlands hundreds and even thousands of kilometers away. Taaffe et al. (1963) examined how inland connections underpin port competition through the evolution of high-priority corridors between the largest nodes. Later researchers focused on load centres (Hayuth, 1981), the decentralization of port activities (Barke, 1986) and the development of port regions (Van Klink and van den Berg, 1998). Modern ports are embedded in the territorial and economic characteristics of their immediate geographical region, while also acting as gateways to the trade of larger regions.

Notteboom and Rodrigue (2005) expanded Bird's (1963) *Anyport Model* (see Section 5) with a phase of regionalization, to address the rising importance of inland load centres to port development, particularly the integration of inland terminals within the transport network (see Fig. 1).

The port regionalization phase extends earlier spatial models of port development with a focus on institutional relationships governing the complexity of inland connections. Port actors are involved in increasingly complex relationships, both in industry (e.g. horizontal integration with competitors and vertical collaboration with transport and logistics providers) and the public sector

(e.g. customs and other regulation, national governments, local and regional authorities with economic development imperatives). Some port actors have altered their institutional structure (e.g. processes of corporatization or privatization) to allow them to pursue new activities such as take investments in their hinterland (Jacobs and Notteboom, 2011; Notteboom et al., 2013; Monios and Wilmsmeier, 2013).

Institutional analyses of the collective action problem of hinterland access have explored the strategies of the many actors interacting across different spaces and scales (de Langen and Chouly, 2004; van der Horst and de Langen, 2008). The transport geography of port hinterlands is very much an economic and political geography, through its analysis of the jurisdictions, decisions, strategies and incentives that influence spatial outcomes. Effective hinterland transport must reconcile the varying and at times conflicting strategies pursued by many different actors (carriers, terminal operators, shippers, transport providers, governments) whose interests sometimes align and sometimes diverge. Just as the 'institutional turn' in economic geography drew on theories such as industrial organization (transaction cost approaches to firm creation and vertical/horizontal integration), institutional analyses of the transport geography of port hinterlands can also provide value to the broader field.

4. The operation of ports (Jason Monios and Gordon Wilmsmeier)

The emergence of container port operations in the 1960s and 1970s was originally driven by Fordist principles, based on economies of scale, efficiency gains and the standardization of products and services. New developments in a post-Fordist economic environment changed the source of port competitiveness from economies of scale based on basic production factors (capital, land and labour), to economies of scope, based on advanced production (service) factors. Moreover, the nature of required services changed from standard services with long life cycles to large differentiated service requirements with short lifecycles. Finally, the forms of organization have changed from integrated structures based on standard procedures and processes, to flexible, decentralized structures (Sánchez and Wilmsmeier, 2010).

Section 2 revealed that port geography research has become distanced from traditional geographical approaches, moving towards a more practical industrial focus. The topic of port operations tends to fit within a more generalized paradigm of 'port studies'; as such, it tends to be addressed less by geographers than by economists and mathematicians. What, then, is the role of geographers in the study of port operations?

Recent studies have observed the competitive convergence of global operators horizontally and vertically, redefining competition space (Notteboom and Rodrigue, 2012). Despite such descriptive approaches, the cultural and social geography of port reform has been insufficiently addressed (see Section 6), suggesting a failure on the part of geographers to engage in deeper analysis of the geographical, economic, institutional and social implications of such changes. While a broad recognition exists of power shifts resulting from the globalization of industrial relations, analysis of the spatial-temporal development of power in the port industry has been lacking. Port geography research has not embraced critical, radical or relational geographies. Thus, questions relating to these new conceptions of space and networks created through the corporatization and convergence of the industry remain unanswered. Purely descriptive approaches ignore the evidence of a capitalist trend towards oligopoly and the inevitable accumulation crisis to follow that leads to value destruction in one place and recreation in another. The role of geographers, then, should be to pro-

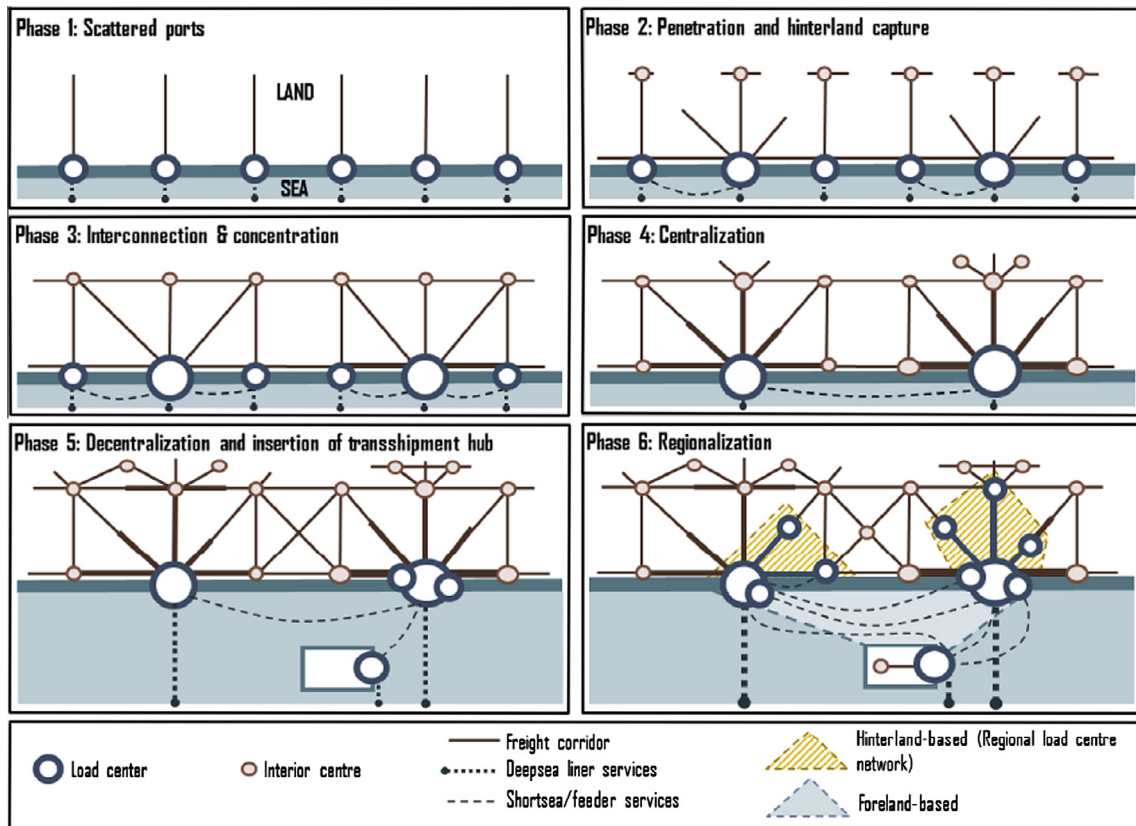


Fig. 1. The spatial development of a port system. Source: Adapted from Notteboom and Rodrigue (2005, 2010).

vide such a foundation, based on analysis of the influence of capital on the production of space.

A new narrative is beginning to take shape that charts the rise of 'critical' approaches to port geography, one that emphasizes the spatial politics of port development and the 'social/corporate' production of place. This shift toward the 'political' is significant, especially for 'a field that has traditionally been characterized by political innocence to say the least' (Vuolteenaho and Berg, 2009, p. 1). Indeed, many thematic areas in port geography remain under-theorized. It is, therefore, important to re-examine these issues, with attention to both the subtle and substantive shifts currently underway at the present historical juncture of economic crisis and geographical shift. The goal of this section is, therefore, to demarcate the new trans-disciplinary ideas for understanding and theorizing developments in the geography of port operations.

Following Black's (2001; p.1) observation that 'the only way to change one's relative location on the network is to change the geographic area covered by the network', the key to successful port operations becomes understanding how a node works and interacts with its environment and the relational space generated by the transport system. Ports serve as nodes in the wider supply chain context (Robinson, 2002), therefore determining the relative accessibility of these nodes (see Section 3) and their characteristics is fundamental. Taaffe and Gauthier's (1973) theory on the idealized process of transport development falls short of discussing how the institutional framework in which the actors relate creates beneficial conditions for port development and operations. Thus, they do not discuss how the performance of this type of node contributes to the development of its spatial reach and induces economic and social development. From the perspective of port operations, the question emerges as to how nodal accessibility is constructed, developed and evolves. Historically, ports were owned and operated by the public sector. Since the 1980s,

significant changes have occurred; corporatization, commercialization, internationalization, devolution and privatization of port operations are now global phenomena (see Section 6).

With devolution and privatization, the complementary and dominant level of integrated (or rather integrating) world capitalism, represented by global terminal operators, is creating a new 'smooth space' (Deleuze and Guattari, 1987, p. 492). The global smooth space of capitalism seizes every opportunity to extend the neoliberal globalization project, vertical integration with the liner shipping sector being just one of these 'opportunities'. The result is an inherent contradiction between a port's embeddedness in its local and regional hinterland and the expanding global 'corporatocracy' driving its operational strategy. Furthermore, the present conjunctions and connections of corporatocracy do not derive from the traditional countries of global hegemony (as evidenced in the transition of port dominance from Western to Eastern ports); therefore, this novel geography of port operations and ownership opens new fields of research. The current economic system tries to evade crisis through the spatial expansion of activity; the expansion of port operators is not specific to the sector but represents a general indicator of capitalist development (Sassen, 2002). New regions of economic activity and new relations of consumption and production are emerging, thus the shift of power is evolving as part of the geographical shift of trade.

Capitalism inherently implies uneven development; in the context of the geography of port operations, the issue is how the production of space creates imperialistic corporatocratic conditions. In line with Walker and Storper (1989, p. 36), it can be argued that the development and expansion of global port operators has the ultimate goal of production (port services) as profit generation rather than efficient resource allocation. Port operation creates 'a surplus of capital relative to opportunities to employ that capital' (Harvey, 1982, p. 192).

The spatial immobility of ports prohibits efforts to achieve agglomeration benefits by decreasing spatial distance, thus procedural/corporate closeness is being sought to overcome distance (Piore and Sabel, 1984). From this emerges the perspective of network efficiency, where the overall technical and cost efficiency of a corporate network of terminals and transport services is the level of required analysis. One might argue that the current and further expanding structure of the port operations industry adds a new dimension to what Harvey (1989) referred to as space–time compression, which is the overcoming of spatial boundaries or distance by economies of scope, thus facilitating the increased mobility of capital. In the case of port operations, the key performance indicators (KPIs) of financial performance results sought by external investors stand in fundamental opposition to the longevity of port infrastructure and superstructure. In the context of port corporatocracy, changing ownership structures in port operations, especially the entrance of private equity firms, raises the very real danger of ‘resource stripping’ rather than investment (Baird, 2013). The effect of non-sector ownership structures on a port system that facilitates around 90% of global trade is yet to be fully determined.

Current events in port operations thus underscore capitalist tendencies of uneven development, a fundamental outcome of capitalism as a means of production. Uneven development is a result of the inherent contradiction within capitalism, in which capital must be invested in a relatively stable manner in order to facilitate production but must also remain mobile in order to transfer to other sectors (Gregory et al., 2009). According to Harvey:

‘Capitalism perpetually strives...to create a social and physical landscape in its own image and requisite to its own needs at a particular point in time, only just as certainly to undermine, disrupt or even destroy that landscape at a later point in time.’ (Harvey, 1985; p. 150)

Port operations are, then, like other sectors, ‘both the product and the geographical premise of capitalist development’ (Smith, 1984; p. 155). Thus the expansion and geographical spread of global port operators might be argued to be symptoms of the efforts to stabilize the contradiction of territory fundamental to the deployment of capital.

Is thus the establishment and global reach of port operators an evidence of over-accumulation and part of the cycle leading to the process of creative destruction that revolutionizes economic structures (Schumpeter, 1975)? While Schumpeter misses the spatial implications, Harvey (1989) relates to the spatial dimension of over accumulation and refers here to the effect of spatial fixes,⁶ a Marxian notion of which ports may be considered exemplars (Monios and Wilmsmeier, 2012b).

5. Port–city/territory relationship (Wouter Jacobs and César Ducruet)

The local relationships between ports and cities have recently received renewed international attention from politicians and policymakers due to a series of case study reports commissioned by the Organization for Economic Co-Operation and Development (OECD) (see Merk, 2013). The studies primarily focus on the importance of ports for urban economic development, the performance of port–city economies and the way ports are managed within a particular local and national institutional context. In this section, we discuss the evolution of the geographical thoughts on the fraught and delicate relationships that exist between ports and cities (for similar overviews, see Hall and Jacobs, 2012; Beyers and Fowler, 2012; Hesse, 2013).

The earliest studies on ports in relation with cities have been fairly descriptive in nature (for example, see Gottmann, 1951). Probably one of the most influential and earliest models is the *Anyport* Model developed by Bird (1963, 1973) which deals with the morphological and functional development of port cities. It distinguishes three phases in the evolution of port cities: settlement, expansion and specialization. As mentioned in Section 3, Notteboom and Rodrigue (2005) later proposed to add a new phase of regionalisation, in which the externalities and functionalities of port and transport activity are rescaled to the wider urban regional level and with development taking place inland and along corridors. A model similar to the *Anyport* Model was developed by Hoyle (1989), in which six phases in the evolution of the port–city interface are discerned. What Hoyle adds to the *Anyport* Model is that the older waterfronts become places of decay, conflict and ultimately sites of urban redevelopment.

The aforementioned models have been widely endorsed among contemporary (transport) geographers and (urban) planners alike. However, they have neglected the external forces that shape port–city evolution and the position of port cities within wider urban systems. Somewhat overlooked by contemporary researchers is in this same context Bird’s (1973) work on the *Gateway* (also see Burghart, 1971). According to Burghart (1971), the *Gateway* can be considered as a node connecting the national ‘core area’ with a regional service area or as the link between two urban ‘matrices of interconnections’. Building upon these thoughts, Bird (1973) developed a three-stage evolutionary model of urban systems that links the concept of gateway in a Loschian way with the Central Place Theory (CPT) as developed by Walter Christaller (1933).

Nonetheless, the *Gateway* can be criticized for its treatment of space as abstract and not as a ‘real place’ in which actors are embedded within social relationships, communities of practice and institutional contexts: issues more prominent in geographical thought on the port–city during the 2000s (cf. Hall, 2003; Olivier and Slack, 2006; Jacobs, 2007; Hall and Jacobs, 2010). Thus, what these earlier models lack is a conceptualization of *agency* in shaping port–city evolutionary pathways. An exception is the work of James Vance (1970) and his mercantile model of settlement. Like Burghart and Bird, Vance departs from the CPT, and models how through diffusion port cities evolve in relation with imperial foreland and tributary hinterland. Yet, he also pays considerable attention to the role of the merchant or wholesaler, who acts as an information broker between centers of supply and demand and who has the entrepreneurial skills and incentives to invest, explore alternatives and orchestrate distant transactions.

During the 1990s, a group of economists centred on the Nobel Prize laureate Paul Krugman (in what is now known as the ‘New Economic Geography’) started to model the role of transport in explaining increasing returns to international trade. Notably, Fujita and Mori (1996) argued that many port cities have historically continued to prosper even after their original advantage and deep-water access to trade became unimportant. Although coming from different theoretical and methodological background than geographers, they concluded that their econometric model ‘fits well for the regions of the world which developed out of colonial expansion’ (p. 97). Port–city evolution was also the focus of more recent works on co-evolution, path-dependence, innovation diffusion, morphogenesis, and multi-level spatial interactions in a system of cities. Bretagnolle et al. (2009) particularly showed how certain (port) cities such as Venice, Lisbon, and London evolved in relation with other cities through wider trade and innovation cycles.

Two distinct, more empirical approaches have developed in parallel since the 1980s in order to elucidate the micro-level of these changing relationships, but often without explicit reference to previous models. Numerous case studies of waterfront redevelopment

⁶ It is important here to refer to the double meaning of ‘fix’ – in its original Harvey referred to the meaning of fix as mending or repairing.

ment, focusing on cultural identity, urbanism and architectural issues, on the one hand, and of port economic impacts, on the other, thus emerged as well as more theoretical discussions on the nature of the port–city interface (Hayuth, 1982; Norcliffe et al., 1996). Given the high variability of individual cases, comparative approaches were proposed. For example, Lee et al. (2008) showed how the evolutionary processes of Asian port cities follow a different dynamic than those in Europe and North America. Based on demographic and traffic data on 330 port cities worldwide for the period 1970–2005, it was found that port functions might not always decline in large cities due to infrastructure renewal near the urban cores (Ducruet and Lee, 2006). The urban and regional embedding of port and maritime activities was also analyzed by looking at the influence of urban and port characteristics on the location of advanced producer services specialized in the maritime and port sector (Jacobs et al., 2011), or at the mutual specialization of commodity flows and port regions (Ducruet et al., forthcoming). It was notably confirmed that while services and traffics have distinct location factors, certain places maintained a close association between port and urban functions, thereby questioning the footloose character of commodity chains and production networks. Analyzing the combination of port and airport activities in global city-regions also contributed to better understanding the macro-scale of port–city relationships (O'Connor, 2010; Ducruet et al., 2011).

Across the numerous port–city studies, more efforts are required to further test the validity and applicability of port–city evolutionary models throughout the world. This might help us to further elucidate how port and urban evolution have stimulated each other at various scales. To achieve these goals, more trans-disciplinary interactions with historical approaches and simulation modeling techniques should be envisaged, as in other areas of transport/urban geography.

6. Management, policy and governance (Brian Slack and Theo Notteboom)

Port governance and management has been one of the more important research topics over the last decades in port geography. In this section, we review the work of port geographers and their co-researchers from other disciplines. Much of the research is empirical, but here we seek to extract and consider some of the theoretical and conceptual implications of this work not only for port geography itself, but also for the broader discipline of human geography. To facilitate the review, the subject of governance is treated separately from management, even though there are evident linkages between them.

Prior to the 1980s, ports in most parts of the world were administered and operated by public authorities and financed by public funds. Because of the dominant governance model, ports were considered as largely homogeneous entities, as reflected in many of the models developed in geography, including the *Anyport* Model (see Section 5) and the model of transport system evolution developed by Taaffe et al. (1963). However, in the 1980s, this picture of governance began to change. The growing influence of the neoliberal ideology among policymakers coincided with a growing research interest in port governance models. The World Bank supported this trend and published the *Port Reform Toolkit* focusing on port governance reform. Port reform and devolution became a global process, giving rise to empirical research using broad samples, including for instance Baird's comparative study on the privatisation in the world's top 100 container ports (Baird, 2002).

A large body of research has been undertaken in response to these changes. How port governance was implemented has occupied the largest number of researchers (Everett and Robinson,

2006; Ferrari and Musso, 2011; Sanchez and Wilmsmeier, 2006; Song and Lee, 2006). Because the reforms were carried out by national governments, most of this body of research has dealt with processes as individual countries applied them. The research has demonstrated clearly that the World Bank's model of port reform is simplistic, that while there has been a near-global reform of ports in which state control has been reduced, the results are different in each country. Such diversity demonstrates that as much as globalization and the neoliberal ideology are tending to homogenise space, institutional factors are giving rise to local diversity. This conclusion mirrors findings in economic geography, where the concepts of path dependency, embeddedness and convergence are used to explain how social, cultural and institutional factors produce spatial differences in economic activity (Amin, 1999). However, in port geography, very few researchers have made the links explicitly despite the plea from Olivier and Slack (2006). Exceptions include Ng and Pallis (2010), Notteboom (2009) and Jacobs and Notteboom (2011).

Since the 2000s, the attention has clearly shifted from descriptive studies on port reform processes towards analysis of the outcome of reform implementation and the role of port authorities under the new governance setting. There has been research looking into whether the port reforms have in fact led to efficiency gains (Cheon et al., 2010; Cullinane et al., 2005; Barros, 2003; Tongzon and Heng, 2005). The majority of studies do find some indications of efficiency gains, although the extent of the gains is variable; others find or predict the opposite (Coto-Millan et al., 2000; de Monie, 1996). It is somewhat surprising to see that port geographers have not considered the cultural and social implications of port reforms. Port labour issues have been reported in studies by international and regional organizations, such as the International Labour Organization (e.g. work on social dialogue in ports), the World Bank's *Port Reform Toolkit*, the European Commission (see Portuis, 2013) and the European Sea Ports Organization (see Notteboom, 2010) but socio-geographic studies on this theme have been largely absent.

In a similar fashion, the urban impacts of port reform have been largely absent from port governance research in port geography. A number of case studies in Brooks and Cullinane (2006) and Notteboom et al. (2009) make reference to the urban context in which port governance reform unfolds, but a systematic analysis of urban impacts is lacking. However, some researchers (Debrie et al., 2007, 2013; Debrie and Lavaud-Letilleul, 2010; Lacoste and Douet, 2013) have approached the French port reform as a territorial challenge rather than a purely commercial one, since devolution has devolved responsibility for all but the largest ports to regional and local governments. Ports now face new challenges in responding to local funding priorities and planning that may be more oriented to roads and demands for more recreational boat berths, condominiums, to name but a few.

In this regard, the privatization of ports has failed to achieve widespread acceptance outside the UK. Rather it is the 'landlord' model that is now found around the world. Here, private companies provide services under a range of forms of concession (Notteboom, 2006). These concessions are increasingly held by either terminal operators with global portfolios, or by container shipping lines.

This process has generated a great deal of interest by port geographers since 2000. Some has been directed at the expansion of the terminal operating companies, both regionally (Airriess, 2001; Notteboom, 2002), and globally (Slack and Frémont, 2005; Parola and Veenstra, 2008; Olivier et al., 2007; Notteboom and Rodrigue, 2012; Parola et al., 2013). The research has demonstrated the importance of institutional factors in shaping the expansion, but it has also shown that other elements are important. For example, Olivier (2005) has explored how financial institutions, such as pension funds and banks, have played a critical role in making pos-

sible the expansion by providing capital; [de Langen and Pallis \(2005\)](#) have identified entry barriers, such as the degree of liberalization of the labour market, as deterrents to many terminal operators; and [Airriess \(2001\)](#) has demonstrated that a factor in the early success of Hutchison Port Holdings in penetrating the China market was *guanxi* (relationship), or formal connections between Hong Kong Chinese and those in the mainland. This point matches the findings of [Yeung and Olds \(2000\)](#), whose research has determined the importance of overseas Chinese in Singapore and Hong Kong in business development in China.

Also, research has examined the differences between the dedicated terminals leased by the shipping lines and the multi-user terminals operated by the international terminal companies. [Haralambides et al. \(2002\)](#) found that multi-user terminals achieve higher throughputs, while [Turner \(2000\)](#) suggested that the reverse is true. More recently [Soppé et al. \(2009\)](#) have suggested that the distinction between the two sets of actors is less clear in reality, by demonstrating cooperation contractually and through equity ventures.

It is significant that this research widens the concept of port governance to recognise the importance of individual business enterprises and their individual policy decisions, and the context in which these actions take place. It changes port geography from being considerate only of the port as a structure to one where agency in many forms shapes actions and outcomes. Also, it impacts on how ports are perceived, since in any port there may be several different terminal operators holding concessions from the port authority. A number of researchers (for example, [Heaver, 1995](#); [Slack, 2007](#)) have suggested that the terminal is the most important focus of competition rather than the 'port'.

To conclude, the topic of governance has clearly enlarged the research field of port geography. It has, in general, precipitated a large body of research that is contributing to a greater understanding of ports. While the impetus for port reform has come from globalization and the neoliberal ideology, it has resulted in a very diverse set of governance structures around the world. Spatially, it has produced a re-scaling of the concept of the port, in which individual terminals, managed by firms with different business goals and practices, are impacting on port performance, hinterland penetration, and market coverage.

These results are to some degree parallel to the 'cultural shift' of economic geography, but, with some exceptions, the exchanges have been few. This is despite the relevance of some port geography research to the broader sub-discipline: the role of governance reform in enhancing local and regional distinctiveness; the terminal operating companies as leading actors in global port terminal management and the particular importance of Asian firms in this process; and, cooperation and competition between maritime firms by exploiting governance changes.

There are several lacunae, however. Theoretical and empirical insights from other related sectors, such as air transport, might help to deepen the fairly narrow focus of many port governance studies. Also, the impacts of port reform on labour and the communities that depend on the port have been largely ignored. Finally, nearly all the research has focussed on container terminals, and there has been little focus on how port reform has impacted on other aspects, e.g. bulk cargo, passenger activities, etc. This disparity reflects a general imbalance in port geography that, in our opinion, should be redressed.

7. The evolution of port geography and its future prospects (Adolf K.Y. Ng and Ka-chai Tam)

Port geography is multi-faceted, consisting of the study of the internal operations and management of ports, their relationships

and interactions, past and present, with surrounding urban and regional landscapes. It is clear that port geographers nowadays put more emphasis on the internal structure, or day-to-day operations. The traditional core of port geography focused on investigating the relationship between ports and their surrounding landscapes ([Johnston, 1997](#)) have diminished,⁷ especially as far as the port–region relationship is concerned. [Fig. 2](#) provides a simplistic (three disciplines) illustration of the evolutionary stages of port geography research in the past six decades, and in our opinion the appropriate direction in which it should evolve in the future.

Before the 1980s, port geography was largely a subdiscipline taken up by human geographers as a side occupation (e.g., James Bird, who introduced the *Anyport* Model (see [Section 5](#)), was a renowned human geographer of his time, notably in urban geography and philosophical issues; see [Bird, 1975, 1977, 1989](#)). The consequence was that publications on port geography during that time often shared two main characteristics:

1. Monographs which were largely descriptive in nature.
2. Much of the analysis of port development was based on theories and concepts originating from economic and urban geographies: a deductive, 'inside out' approach which was largely discipline-oriented (stage 1 in [Fig. 2](#)).

As time passed, port geography in recent decades became 'professionalized' (and more 'business-oriented'), picked up by dedicated researchers who sometimes confidently claimed the study of ports (and/or transport), rather than geography, as their primary research interest - an act of self-affirmation (stage 2 in [Fig. 2](#)). Together with the increasing popularity of research collaboration with other disciplines, the influence of economic development during the post-WWII years and the neoliberal ideology on academic research, which contributed to the increasing emphasis on 'applied' research providing immediate, short-term, easily applicable solutions so as to enhance industrial practice since the 1980s ([Johnston, 1997](#)), had diluted the geographic image of the sub-discipline.

Given that the study of industrial activities, including ports, often overlapped between different disciplines ([Heaver, 2006](#)), such an 'outside in' approach added complexity for port geography researchers in understanding the nature of the discipline to which they were affiliated (human geography). Research in port geography was less rooted in the theoretical and conceptual discussions within human geography, and more from a process of searching for what exactly they could contribute to the mother discipline. Thus, the connection between 'the port' and 'human geography' became more ambiguous. The increased collaboration between port geography researchers and those from other disciplines, which contributed to the shifting of the research focus of port geography to somewhat more (internal) operational and management (and sometimes more vocational) aspects, accelerated this process.

It was often perceived that any new knowledge would likely occupy a backseat role if it failed to offer substantial heuristic knowledge so as to cause paradigm shifts in the existing theoretical discussions and research of established scholarly disciplines, as reflected by their impacts on such disciplines (e.g., citations from the major publications of the discipline(s) concerned). Moreover, one should not forget that most traditional, established disciplines (and their research communities), including human geography,

⁷ This did not mean that research on the dynamics and relationships between ports and their landscapes did not exist in recent decades. Rather, the nature of such research evolved from the 'classical' topics (like ports and cities and regions) to the more operational aspects (for instance, the roles of ports in global logistics and supply chains).

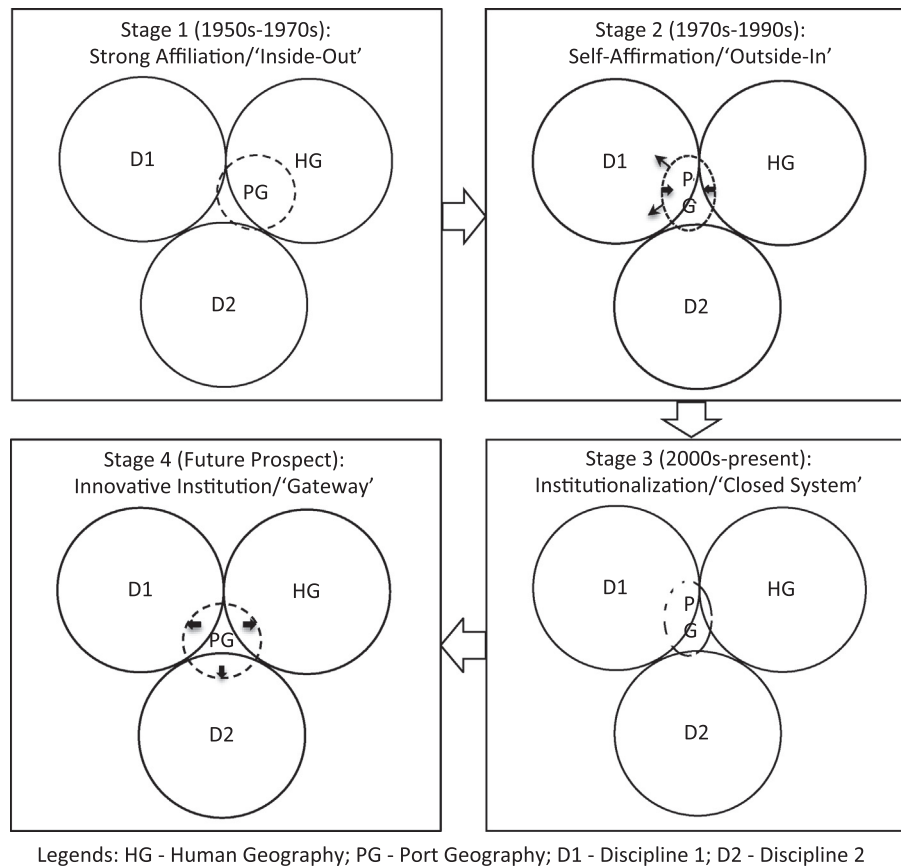


Fig. 2. Different evolutionary stages of port geography and its future prospects.

were highly institutionalized.⁸ In those disciplines, the expectation was for community members to socialize into existing paradigmatic cultures or models, including the ways of thinking about and solving any research problems (Johnston, 1997) so as to sustain the institution (Taylor, 1985). This put object-based researchers, including port geographers, into uneasy positions, as the emphasis on the object (the port) diluted (or made less explicit) the theoretical contributions of their works to the mother discipline. As mentioned in Section 5, a major deficiency of port geography research was the shortage of efforts bridging theory and practice. This was especially true when collaborations with other disciplines were involved, or when the research focused more on the ‘applied’ nature. As researchers, port geographers thus sometimes struggled to affiliate themselves firmly within particular disciplines and communities.

When this happened, occasional queries by the mainstream community regarding the academic value of their work started to be raised, with the knowledge generated by port geographers being questioned. In many cases, the perception of port geography research was conflated with hard positivism⁹ which portrayed the social world in terms of unproblematic, universal laws, accompanied by the philosophical discourse that knowledge would be cognitively

meaningful only if it was based on empirical experiences and observations.¹⁰ Based on the port geography paper list compiled by Ng and Ducruet (forthcoming), most of the papers involved large-scale datasets (usually accompanied with statistical and highly quantitative models) and/or in-depth case studies, while the research process was largely based on inductive reasoning which strived to supply empirical evidences to support and generalize the truth of their conclusions. The increasing emphasis of the sub-discipline on spatial processes and transportation systems, and the retreat from the study of port–regional relationship (see Section 2) and social–cultural impacts (like the impacts of institutions and culture on port management, and labour issues, see Section 6) did not help eliminating such prejudice. This was perhaps not surprising, as the nature of ports ensured that empirical information was mostly available from the industrial sector. Moreover, as mentioned in Section 2, the rise of neoliberal ideology encouraged researchers to work on topics which directly addressed industrial needs. In many cases, such topics were piecemeal; highly specific to the day-to-day operational needs; and more importantly, rarely based on mainstream geographical theories and concepts.

Inevitably, port geographers suffered marginalization from mainstream theoretical discussions, and the presence of the rest of the human geographers holding dismissive or even repressive attitudes to hard positivism throughout the late 20th century (Johnston, 1997; Wyly, 2009; Shaw and Sidaway, 2010) hardly did any favours. In fact, transport geography in general suffered

⁸ Crane (1972) described such institutionalized societies as the ‘invisible colleges’. See Kwan (2004) for further explanation on this.

⁹ We admitted that it was difficult to choose the appropriate term, as positivism was a highly diversified concept, ranging from the Vienna Circle in the early 20th century to more recent ideological thoughts calling for cohesion and trust between human geographers employing different approaches (e.g., see Kwan, 2004). Here we decided to use ‘hard positivism’ – similar to what Wyly (2009) had described as ‘hard-core positivism’. Some examples of ‘hard positivist’ port geography papers included Baird (2006), Tavasszy et al. (2011) and Ubogu et al. (2011).

¹⁰ Here the use of ‘positivism’ is not just about the research methodologies being used, but also the epistemological approach in the creation of ‘genuine knowledge’. For further details, see Friedman (1999).

such marginalization as it was, arguably unfairly, perceived to be closely associated with hard positivism and spatial science, often viewed as insufficient groundings for human geography (see Shaw and Sidaway, 2010). For instance, there was a significant citation imbalance between port geography papers and other (non-transport) papers published in geography journals, in which the former borrowed the latter's works and ideas much more heavily than the other way round. Simultaneously, in recent decades, one could witness a significant decrease of port geography papers featuring in prominent, mainstream (human) geography journals (which published considerable port geography papers before), with *Annals of the Association of American Geographers*, *Economic Geography*, *Geography* and *Tijdschrift voor Economische en Sociale Geografie* being notable examples.¹¹ Ironically, the efforts by port geographers in marketing port geography as 'applied geography' seemed limited at best, as exemplified by only two port papers featuring in *Applied Geography* since the journal's inauguration in 1981 (Ng and Ducruet, forthcoming). The feedback from the Editor of *Progress in Human Geography* (PiHG) to Ng and Ducruet's paper when they submitted the manuscript to PiHG perfectly summarized the marginalization of port geography:

'...Papers in [PiHG] engage with the substantive changes and contributions occurring in sub-fields of geographical research...[also,] our papers assume that there is an audience for the topic in question...[in this case,] how many researchers internationally are doing high quality research into ports that can speak to the larger debates in [for example] contemporary economic geography? [Finally,] our papers also report on the research of human geographers, without at all ignoring research outside the discipline. In your case, are you satisfied enough [that] interesting and influential research [is] currently being done by professional human geographers on ports...To my knowledge, few people in Anglophone human geography work on ports...since the majority of our readers are Anglophone or based in Anglophone Geography departments you'll want to ask: how can you speak to them with a paper like this if most don't do research into ports?' (quoted from an e-mail communication between the Editor of PiHG and the corresponding author, dated 25 September 2012)

Being marginalized from the established institution, this 'society within a society within a society' was forced to look for external, more receptive alternatives. The query by Ng (2013) on the dilution of the geographic image of port geography, especially since the 1990s, can now be well understood.

In this case, the receptivity with regard to research approach was especially significant. In the past decades, collaboration between port geography and (other non-transport) human geography researchers was less frequent compared to disciplines which generally embraced 'hard positivism' more readily than human geography, notably economics, business and management science (Ng and Ducruet, forthcoming). On the contrary, collaboration with the more 'hybrid' or 'critical' disciplines, like history, was more the exception than the rule. Indeed, ports have been magnets for attention from historians in recent years. While there was a trend that port geographers abandoned the once strong historical sensibility to long-term trends in the contemporary period (see Section 2), the port has enthusiastically been studied as a core subject in maritime and transport histories. There has been a paradigm shift inside the historical field that public and socio-economic histories gradually replaced traditional political and military histories as

the centers of research concerns (Ricoeur, 1980). Without the strong background of the geographers' theoretical frameworks, historians have emphasized documented written materials, the causal and chronological relationships among different events, the influences and contributions of individuals and organizations, and the human and social aspects of the port. Hundreds of articles have been published in history journals on port-related topics, such as the port's role in national and international trade systems, the transport and production network systems that developed around ports, and the institutions such as maritime laws and policies which favored the establishment and development of ports in the last five centuries after the global trade system emerged. The historians of some countries and regions have even established research centers and journals dedicated to the study of 'maritime history' whose major subject was the port. Despite their strong complementarity and potential for collaboration, few works by port geographers seem to have been used by historians in their growing literature (and vice versa). Little wonder that port geography has paid inadequate attention to the human components of ports, such as passenger terminals and dock workers (see Section 6), especially in recent years.

This demonstrates that even port geographers themselves have been very selective in choosing collaborators. The impacts of the neoliberal ideology on universities advocated this direction of collaboration, in view of the significance of benchmarks and the quantification of performance in deciding their academic careers, such as the quantity (not necessarily quality though) of publications and securing research grants from academic and non-academic sources. The recent research trends of port geography (see Section 2) have consolidated the perception that disciplines embracing hard positivism would serve as the right partners for collaboration. The development in the past decade has even suggested that such a view had institutionalized, and established a stable (but not very geographic) research paradigm which has hardly contributed to theoretical innovations in human geography (stage 3 in Fig. 2). Since the 1970s, few scholars have even bothered to question this institutionalized view, as exemplified by the virtual disappearance of any investigations into the philosophy and epistemology of port geography (Table 2). The sub-discipline has since dragged itself even further from the mother discipline, making fewer efforts to re-build the connection. Sadly, any sporadic interactions between port geography and (other non-transport) human geography in recent years were despairing attempts to bring long-separated couples back together. The feeling of unfamiliarity, uneasiness and even resistance to each other was hardly surprising.¹²

This is unfortunate, as the port is one of the most ideal platforms in realizing Wyly's (2009) proposed 'strategic positivism', and conciliating the social-cultural and spatial-analytical split in human geography (Kwan, 2004). Despite such uneasy relationship between port and human geographies nowadays, we should not forget that ports possess many unique characteristics to serve this role, which include (but not limited to) the following:

1. They are locally embedded within a particular region, and will always be affected by the local socio-cultural environment; but simultaneously they are the major outlet for external connections, and so will always be affected by global spatial development.

¹² The weakness of ties between disciplines and certain sub-disciplines was not specific to geography, but also other social sciences involved in transportation. For instance, the links between transport economists and other mainstream economists were rather weak, as demonstrated by the often highly different approach they dealt with transport cost (see, for instance, Rietveld and Vickerman, 2003). Such a lack of dialog was partly due to a high entry cost in port issues for scholars outside the field, where technical concepts were abundant, but quantitative information was rather rare. This could inhibit some potential readers of the works done by port geographers.

¹¹ Of course, the introduction of transport geography-dedicated journals since the 1990s, notably *Journal of Transport Geography*, also played notable roles in diverting considerable works done by port geographers away from mainstream geography journals.

2. They are the intersection and interaction points between people, cargo flows and markets.
3. They are the arenas which attract substantial research interests from many disciplines, which facilitate intra- and interdisciplinary collaborations; such characteristics cannot be taken for granted in every sub-discipline of human geography.

Hence, there are perhaps no better places for human geographers with diversified philosophies and methodological approaches to come together, building consensus and developing mutual trust for the betterment of the discipline. Of course, to cope with possible competing interpretations of geographic phenomena concerning ports and, more likely, to facilitate dialogue among researchers from different disciplines regarding port issues of common interests, the regeneration of port geography's 'geographic' roots is the key for it to achieve its rightful role and potential in human geography, and in academia more generally, in the future. Port geographers need to 'deinstitutionalize' and re-open the view of a port as a closed system (see Section 2). More research on the dynamics between ports and their surrounding regions, including environmental, cultural and social aspects, should be strongly encouraged and appreciated. Physically, ports serve as the 'gateways' for passenger and cargo movements, and facilitate communications and interactions between different regions. The study of port geography should continue to perform this 'gateway' function and evolve into an innovative institution, providing acid tests for theoretical and methodological innovations, bridging gaps within human geography and with other disciplines (stage 4 in Fig. 2). Such an ideal should be supported by appropriate editorial policies in journals dedicated to transport geography, notably *Journal of Transport Geography*, so as to ensure that all the accepted papers on ports are genuinely contributing to this 'gateway' function. By doing so, research works by port geographers will not only sustain, but also conciliate existing theoretical dilemmas within human geography, and will help it to construct new theoretical infrastructure, now and in the future.

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