Research in Transportation Business & Management xxx (xxxx) xxx–xxx

Contents lists available at ScienceDirect

Research in Transportation Business & Management

journal homepage: www.elsevier.com/locate/rtbm

Trucking regulation as a critical chain asset in port complexes

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ARTICLE INFO

Keywords:
Trucking
Port governance
Southern California
Vancouver

ABSTRACT

This paper argues that port trucking regulation is an increasingly important arena of supply chain governance in maritime ports. While all ports fulfill similar functions for the different categories of cargo, the ways in which ports are inserted into supply chains, as well as the ways in which supply chain segments are integrated through technology, management and regulation do differ from one port complex to another. To illustrate our proposition, we discuss and contrast recent developments in the Southern California and Vancouver ports with respect to the regulation, integration and governance of port container trucking. The successful accumulation of value within port-related supply chains is increasingly vulnerable to disruption and inefficiency in port trucking. On the west coast of North America, this is due to both labor related issues as well as issues of asset management. In response, governments, port authorities and operators have taken on a more active role in ensuring that the supply chain has adequate equipment and land to deal with significant congestion-related bottlenecks. These actions represent expanded areas of responsibility beyond traditional notions of port governance.

1. Introduction

This paper argues that port trucking regulation is an increasingly important arena of supply chain governance in maritime ports. In his classic application of Cox's (1997) supply chain power perspective to ports, Robinson (2002: 241) argued that ports should be viewed "as elements in value-driven chain systems, not simply as places with complex functions." The success of a port could no longer be evaluated through factors such as crane or gate efficiency alone, but also through the integration of diverse components. Subsequent scholarship nuanced this view by appreciating that while the functional components of ports are similar for different categories of cargo - and most especially for the standardized ocean shipping container and related handling equipment and systems - the ways in which ports are inserted into supply chains, as well as the ways in which supply chain segments are integrated through technology, management and regulation do differ from one port complex to another (Coe, Hess, Wai-Chung, Dicken, & Henderson, 2004; De Langen, 2003; Jacobs & Hall, 2007). For this reason, researchers seeking to understand spatial differences in port evolution and performance are paying renewed attention to institutional dynamics to understand how the supply chains that traverse ports are governed and regulated (Ng, Hall, & Pallis, 2013).

Drayage or short-haul trucking is a critical supply chain asset in container port complexes; yet it has proven challenging to integrate trucking into supply chains due to its market and organizational structure (Giuliano & O'Brien, 2007). Port trucking regulation has long been a point of operational and public policy concern in North American ports, with outcomes linked to the more general consequences of deregulation in the transportation industry (Bonacich & Wilson, 2008; Talley, 2004). But, there is also increasing concern about port-hinterland connections by truck in other parts of the world (De Borger & De Bruyne, 2011; Ubogu, Ariyo, & Mamman, 2011; Wang, 2014). The challenges of port trucking regulation are not identical in every location, and their (attempted) resolutions even less so; however, a theoretically informed analysis of the port trucking regulation dilemma, and the institutionally-conditioned responses to it, may have general use.

Hence, what we seek to do in this paper is reconceptualise the port trucking regulation dilemma as a public policy problem. Ports as public authorities are trying to achieve a complex balancing act when addressing trucking challenges, elements of which might include cargo growth, efficient use of terminal investments, a reduction in truck trips and mitigation of negative community and environmental impacts – *it is this complex, jurisdiction-crossing, balancing act that is the port trucking regulation dilemma.*

We emphasize that port authorities *might* wish to balance these trucking concerns because it is not always correct to assume that port authorities have a clearly defined and unambiguous objective function to be optimized. Instead, the port trucking regulation dilemma for port authorities needs to be understood in the context of the multiple objectives and pressures which confront port authorities as public

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https://doi.org/10.1016/j.rtbm.2018.04.002
Received 15 September 2017; Received in revised form 18 April 2018; Accepted 19 April 2018

regulatory bodies. We contend that in responding to these demands related to port trucking, port authority actions are influenced by three related dynamics:

- The insertion of ports into supply chains which are mediated by information communication technologies and which are increasingly shaped by a small number of oligopolistic actors in key operational segments, though not in port trucking;
- The geographic rescaling and regionalization of the port function related to economies of scale (especially in container shipping), and involving both the intensification of marine terminal activities, and a more extensive and fragmented dispersal of port activities across metropolitan space; and
- The organizational responses of port authorities, both as landlords with primary resource dependence on terminal operators, and with limited formal regulatory authority beyond the 'port area', but also with a requirement for public legitimacy and perceived responsibility for activities beyond the waterfront.

After discussing these theoretical outlines, we then trace recent developments in the Los Angeles-Long Beach and Vancouver port complexes with respect to the regulation, integration and governance of port trucking. The successful appropriation and accumulation of value within port-related supply chains on the west coast of North America is increasingly vulnerable to disruption and inefficiency in the port trucking leg. This is due to both labor related issues as well as issues of truck and chassis availability, scheduling and management. In response, Canadian governments have crafted regulations that reinforce the requirements for container trucking companies to obtain provincial licenses in order to operate at the Port of Vancouver, while regulating rates and restricting the number of trucks permitted to operate. In Southern California, the Ports have established environmental standards for trucks entering terminal gates and taken on the responsibility of helping to ensure that equipment and land are available for a supply chain dealing with significant congestion-related bottlenecks. The latter largely takes the form of "port as convener" but in each case the actions represent expanded areas of responsibility beyond traditional notions of port governance.

Our broadly comparative, case study approach is appropriate because of the uncertain boundaries and emergent nature of the topic we are studying (Yin, 2014). We are not yet ready to claim that these ports on the west coast of North America provide 'critical' case studies of the phenomenon of port trucking regulation, in the sense intended by Flyvbjerg (2006); namely, that these cases may potentially disprove some formal hypothesis. For instance, if one believed that port authorities will only become involved in port trucking regulation if they are substantively accountable to local polities in wealthy democratic societies, then these west coast ports may provide such "critical" cases. Instead, we present Los Angeles-Long Beach and Vancouver as 'exemplary' cases, that is, as "cases that highlight more general characteristics of the societies in question" (Flyvberg, 2006: 14).

A scan of recent research on trucking in other port complexes suggests that we are observing something that is generally experienced in ports around the world. In their survey of truck-drivers serving Lagos and Port Harcourt, the two Nigerian ports which account for 75% of the nation's cargo, Ubogu et al. (2011) identified a series of operating constraints affecting long haul trucking. These are related to driver behavior, accidents, disruptions in the supply chain, outright robbery and also repeated quasi-legal checkpoints, and other operational costs. A key point about these findings is that the relatively high total costs of delivery are not driven by factors in the port foreland (such as small volume shipments) or terminals (on-dock inefficiencies), but rather in a series of trucking-related costs in the port hinterland. Road transport accounts for 70% of cargo movement, and hence the authors call for rail investment to reduce overall costs and prompt port shippers to focus on trucking for short-haul moves.

Wang (2014) and Yu (2008) have respectively written about the high dependence on truck deliveries in Chinese ports. In part this is related to the spatial structure of the economies of coastal Chinese regions with manufacturing plants clustered close to ports, but it is also related to relatively poor performance of the railway system. For example, Yang (2016) reports that in Dalian, the Chinese port best served by rail infrastructure, only 9000 of 349,000 containers handled by rail are international – which implies that just about every import-export container is drayed within the city-region. Nor (2011) has written about the way in which restrictions on inter-city truck movements conditioned the transformation of Hong Kong's marine economy in relation to surrounding port areas. Trucking in Chinese ports was deregulated as part of a wider privatization process, especially after 2000. While market entry has been encouraged, independent operators and small firms with fewer than 10 trucks are still required to associate with larger operators, with the goal of more integrated decision-making.

At the very least, these examples suggest that port trucking regulation needs to be placed firmly on the ports research agenda.

2. Three forces shaping the port trucking regulation dilemma

In this section, we review relevant literature to develop three stylized facts about the forces which are both creating port trucking regulation dilemmas, as well as conditioning the responses of key actors.

2.1. Supply chain integration and change

The first key idea is that as supply chains become more integrated and more efficient in some segments, they place demands on other segments, especially in port complexes, to support movement in new ways. Ports seek to insert themselves into supply chains which are mediated by information communication technologies, and which are increasingly shaped by a small number of oligopolistic actors in key operational segments, though not in port trucking. More vertically integrated supply chains and greater opportunities for supply chain visibility through ICT have heightened expectations around time-related performance metrics. This affects all modes, but especially trucking which offers ubiquitous and customizable delivery options not provided by other modes. And what happens on the terminal in terms of productivity and space utilization, affects what happens off the terminal in terms of queuing and congestion, and vice versa (see Le-Griffin & O'Brien, 2013).

The container shipping industry continues to face generalized cost pressures that can be traced to factors such as over-supply of ships and increasing market power of dominant shippers. At the same time, because of the increasingly complex supply chain dynamics, the costs of disruption may also be increasing. Paradoxically thus, port trucking may be viewed both as a site for cost containment, and as a critical asset in both causing and solving disruptions of various types.

The idea of a 'critical asset', first developed in supply chain studies (Cox, 1997), has gained currency amongst port scholars (Robinson, 2002). Control of a critical asset determines which actors are able to extract value from the supply chain. Hence control of critical port assets strongly influences the desirability of a port to shippers and carriers alike. Port trucking is typically not regarded as a critical asset in the sense that it is not in short supply, with low barriers to entry and low levels of capitalization. However, when ports are viewed as deeply connected to integrated systems of highway capacity, control points (e.g. terminal gates), supporting equipment (e.g. chassis) and drivers (e.g. which may be organized in various ways), it is not the case that the port trucking function will always be available on demand. Furthermore, realistic alternatives to port trucking – such as on-dock rail and systems of inland terminals – are often not easily or flexibly provided.

Recent theoretical literature and practical experience suggest that industrial organization and technological changes are underscoring the supply chain importance of the trucking function, and attendant