

Changing Concentration Ratios and Geographical Patterns of Bulk Ports: The Case of the Korean West Coast



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Abstract

Contrary to liner shipping, common shipping network patterns are difficult to organize in tramp shipping as origin and destination ports are irregular and they may change based on shippers' demands. Unlike liner shipping whereas the choice of ports is strongly related to their geographical locations among other factors and a topic of much research in the contemporary literature, the geographical issues related to bulk ports are an interesting yet currently under-researched topic. For this reason, this study aims to analyze the concentration ratios of bulk ports to reveal geographical patterns, using the case of bulk ports along the west coast of Korea including, Incheon Port (ICP), Pyeongtaek-Dangjin Port (PDP), and Gunsan Port (GSP). To examine and shed more light to the above mentioned research issue, this paper adopts a series of methods, such as Hirshmann-Herfindahl Index (HHI), Location Quotients (LQ), and Shift Effects (SE). Results from the HHI analysis, indicated that de-concentration has been gradually rising because of a considerable overlapping of ports' functions. Meanwhile, the LQs' confirmed this result. Finally, the SE' results effectively showed that a substantial shifting of cargo had occurred among the ports.

Key Words : Bulk Port, Port Concentration, Shifting of Cargo, Geographical Pattern of Port

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I. Introduction

Containerization, the so-called transportation revolution, has created a huge impact upon maritime transportation.¹⁾ Due to containerization, global trade is not only becoming more intensive and frequent, the world economy is also growing. Since the 1950s, when containerization first came into use, hub and spoke (H&S) network systems have increasingly been used to facilitate liner shipping networks. Thus, there have been many studies related to port research on strategic location evaluations because the ports with superior locations often have diverse shipping networks.²⁾ While containerization has been expanding gradually, this revolution has also generated a new development, supply chain integration in port, which highlights the importance of value-added services through the vertical integration of port logistics activities.³⁾ As a result of port competition, there has been transportation paradigm shifts leading to the concentration and de-concentration of ports, and thus transport geographers and port researchers had begun to focus on the geographical aspects of ports by radically examining port evolution stages and the interactions between ports and peripheral areas.⁴⁾ Severe port competition would gradually result in deconcentration as it is expected that there would be cargo shifting between competing ports. In other words, the level of cargo concentration in a port might be reduced if it is more competitive than other ports in a region.

Apart from studies examining the role of container ports in transportation patterns, the topic of bulk cargoes and bulk ports has never been in relation to transport geography in the contemporary literature. Bulk cargoes are commodities that are traded in large quantities, such as grain, iron ore, and coal.⁵⁾ The research issues related to bulk cargoes can be dealt with using an econometric approach. Oliveira and Cariou (2011), for instance, attempted to approach through data envelopment analysis (DEA) using iron ore and coal ports.⁶⁾ Besides, because freight rates change frequently, the forecasting of dry bulk freight rates has been

1) Levinson(2006); Notteboom and Rodrigue(2008)

2) Song and Yeo (2004); Lirn et al.(2004); Ugboma et al.(2006); Yuen et al.(2010)

3) Robinson(2002); Wang and Cullinane(2006); Song and Panayides(2008); Panayides and Song(2008); Tongzon et al.(2009)

4) Taaffe et al.(1963); Slack(1990); Barke(1986); Hayuth(1981); Le and Ieda(2010); Li et al.(2012)

5) Stopford(1997)

6) Oliveira and Cariou(2011)

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