Abstract

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MODELING PORT SelectION IN LINER SHIPPING MARKET, WITH APPLICATION TO EAST WEST TRADE ROUTES

Shipping lines are the most relevant decision makers influencing port choice as they route cargoes through the ports they serve. Therefore, ports have to constantly monitor and understand the needs of port users in order to devise the quickest way to respond to. In this context, port Selection decision is a process that requires consideration of many important and relevant criteria. The East West trade routes market has experienced significant growth in container traffic and a remarkable expansion and restructuring. The creation of competitive environment among ports, particularly among homogenous ports providing similar services, has rendered the port Selection in the East West trade routes a complicated decision making task. In addition, the changes in supply chains and shipping lines will, of course, have influences on how shipping lines Select proper port of call. This research investigates how to Select a port considering the different criteria which contribute to the Selection process, compare among the alternative ports based on these criteria, and eventually come up with the best choice which meets the basic requirements of efficient ship operation and customer satisfaction. Furthermore, it aims to investigate the merits of using Multi Criteria Decision Making in the field of port Selection in the East West trade routes from a shipping liner perspective. Six major criteria were found to be very important and decisive in port Selection from the perspective of liner shipping companies. These are: port finance port location cargo volume port infrastructure port efficiency and performance and application of new technology. Moreover, eight major ports in the East West trade routes with a throughput higher than a million TEUs were considered. These are: Shanghai, Singapore, Jebel Ali (Dubai), Port Said, Algeciras, Hamburg, Antwerp and New York. Recent dynamics in the East West trade routes container port market was examined and analysed for the period from 2001 to 2016 in terms of market concentration and deconcentration tendencies. Market concentration was measured and analysed by using the Concentration Ratio and Herfindahl-Hirschman Index, while market conduct was investigated using the Shift Share Analysis technique. Furthermore, a proposed Analytic Hierarchy Process was used to Select a port along the East West trade routes. A questionnaire was designed to suit the proposed process, which contributed to reducing the number of pairwise comparisons requested from each participant, thus relaxing one of the main difficulties of applying this process. Out of 50 experts contacted, 39 experts could complete the questionnaire successfully, representing a reasonable response rate of 78%. The analysis of the East West container port market highlighted the ability of a port to compete in such a dynamic market not only depending on the availability of ports infrastructure, superstructure, location and throughput, but also affected by the optimum utilisation of such facilities in terms of port logistics efficiency. The results of the Analytic Hierarchy Process show that, in descending order of importance, cargo volume ranks the highest, followed by port infrastructure, port efficiency and performance, application of new technology, port finance and port location. The data analysis also revealed that Shanghai ranks the first, followed by Singapore, Jebel Ali, Antwerp, Hamburg, New York, Algeciras and Port Said. The main contributions of this research are the analysis of the recent dynamics in the East West trade routes container port market and the treatment proposed to overcome possible inconsistencies associated with the Analytic Hierarchy Process and, at the same time, to significantly reduce the number of judgements requested from each participant. The current results communicate to port managers and terminal operators the need to systematically monitor and follow up the criteria affecting shipping companies port choice and to respond to changes that take place in the containerisation market through flexible management plans, in order to increase even maintain their market share and profit. On the other hand, this research may be perceived as a starting point for further studies in the field of port Selection by applying the proposed procedure to other trade route markets, and to use higher number of criteria and ports. Future research could also consider other Multi Criteria Decision Making models, crisp fuzzy.