

FUZZY MCDM APPROACH FOR SELECTING STRATEGIC PARTNER: AN EMPIRICAL STUDY OF A CONTAINER SHIPPING COMPANY IN TAIWAN

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ABSTRACT. The main purposes of this paper are to develop a fuzzy MCDM algorithm and to survey an empirical study to select a suitable strategic partner for a container shipping company in Taiwan. At first, some concepts and methods of the fuzzy set theory are applied to develop the proposed fuzzy MCDM algorithm. For matching this evaluation process, a hierarchical structure is constructed with seven criteria, thirty-two sub-criteria and three alternatives for evaluating partner selection. Then, the aggregating evaluation ratings for all alternatives can be obtained by the proposed algorithm. By combining the methods of ranking fuzzy numbers with maximizing and minimizing sets and total risk attitude index, the suitable partner can eventually be determined. In addition, the risk-bearing attitude of the committee trends towards optimism, which is based upon the procedure of data input stage. Based on the proposed fuzzy MCDM algorithm and the empirical study, company C is finally selected as the most suitable partner for the WZ company to link with as a shipping alliance. Furthermore, this paper with its methodologies developed can be employed as a practical tool for business application.

Keywords: Selection of strategic partner, Container shipping, Fuzzy MCDM

1. Introduction. In the era of general cargo shipping before late 1960s, the shipping community generally includes shipping line, shipping agent, master stevedore, lighter operator, freight forwarder, wharfinger, road haulier, rail operator, and port authority [11]. Their affiliation and interaction mainly occurred at berth or terminal in the ports. Hence, the port authority represented the main body during the general cargo shipping era.

However, after the 1980s, the era of container shipping, the container shipping line plays the most key role among the shipping community mainly including terminal operator, feeder operator, freight forwarder, road/rail operator, and community network provider [11]. The roles of the container shipping lines and terminal operators are increasingly important now a day due to the larger size of container ship resulting from the economy of scale, which requires for speeding up the loading/discharging and cutting down the stay time in port [8,15]. Therefore, the effectiveness, efficiency, and rapid operation of the containers became the key factors on operating an efficient container terminal operator for container shipping line.

The overall comprehensive logistics and integrated transport service are employed to meet the shippers' requirements in the port-shipping chain. To satisfy the needs of shippers, all logistics and transport activities are integrated by the container shipping line, which represents the main part in the container shipping era. As a result, some incentives