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## Original article

# Cooperation Performance Evaluation between Seaport and Dry Port; Case of Qingdao Port and Xi'an Port\*

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#### **Abstract**

Along with the drastic competition among ports, the strive for the vast economic hinterland and the supply of goods have become strategic problems for port operators. At the same time, port enterprises are paying more and more attention to the construction of dry ports. This article establishes the port cooperation performance evaluation index based on the balanced score card method and uses the grey relational degree method to evaluate the cooperation performance between seaports and dry ports. Finally using Qingdao port and Xi'an port as an example, and Zhengzhou port and Lanzhou port as benchmarks, the application of this evaluation method is introduced in detail. The conclusion reveals that cooperation between Qingdao port and Xi'an port has deficiencies in customer satisfaction, financial cooperation and non-market tools. Alongside this, the author proposes related issues about information management in the supply chain, competition position and the scope of hinterland. This article, combined with the related theory of supply chain and performance evaluation, puts forward a set of relatively complete cooperation performance evaluations between seaports and dry ports, which provide scientific theory support for better cooperation.

Keywords: Seaport, dry port, cooperation performance, balanced score card, grey relational degree.

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#### I. Introduction

Recently, China's economy has developed rapidly, as well as its regional ports. With ports continuously strengthening their own construction and their cargo capacity increasing year by year, the competition between bordering seaports increases at the same time. The strive for the vast economic hinterland and the supply of goods has become a strategic problem for port operators. In addition, it has become an inevitable requirement for regional development for the inland areas to establish a low-cost and high-efficient transportation and customs clearance way. With the compulsion of these two demands, combined with the active participation of railway and highway transportation departments, the development of dry ports in China are taking shape.

Dry port is also known as inland port or land port. This concept derives from the United States. In recent years, the construction of domestic and international dry ports has made rapid headway. Relevant research includes the development and operation mode of dry port, as well as the actual development situation, etc.

With regard to foreign research on the development mode of dry port, Jean (2000) focuses on the history of its development, Violeta (2009) pays attention to the environmental impact, and Wothnius (2010) attaches importance to the efficient shipping of goods. In China, Lv (2007) classifies the patterns of existing dry ports combined with their developments. He summarizes the characteristics and operations of each mode. Because of the strong practical and realistic significance of dry port construction and development, most foreign scholars have been concerned about applying the construction theory of dry port into practice in recent years. Andrius and Aidas (2007) have put forward some measures to improve the operation management of dry port, to encourage more people to participate in its construction and development. Wang (2008), Yang (2009) and Fan (2010) researched the construction, and development prospects some of the dry ports of China. They aim to guide the construction and development of dry port scientifically by doing theoretical research

From this research, we found that scholars pay more attention to the definition; roles, functions and operation modes of dry port, but research ventures based on on the cooperation between dry port and seaport by way of comparison are relatively few in number In the meanwhile, the development of dry port in China still has many problems. Therefore, this article will put forward a set of relatively complete cooperation performance evaluations between seaports and dry ports combined with the related theory of supply chain and performance evaluation.

#### II. Theoretical Basis

Dry port, just as its name implies, is a concept we can contrast with "water port". This term originated from western countries in the twentieth century and in 1991. the Council of Europe defined dry port as: a landlocked station which is connected to the seaport directly and

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