How efficient is shipping of major bulk cargoes (coal, iron ore, and grain) to Japan?

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1. Introduction

Bulk cargoes are the basic materials for industry and food ingredients for daily life. They are loaded directly into the holds of bulk carriers in unpackaged form for shipping. The efficiency of such shipping is an essential element in raising the international competitiveness of industry and ensuring stability in the national livelihood. However, because bulk cargo shipping is tramp shipping conducted for specified shippers, information on it is extremely limited. In this research, the author devised a method for determining shipping performance for major bulk cargoes (coal, iron ore, and grain). The author then analyzed the circumstances of such performance in order to contribute to the planning and proposal of measures to improve shipping efficiency.

2. Method for determining the shipping performance of major bulk cargoes

To begin, a list of bulk carriers that can ship the relevant items and worldwide loading ports was prepared. Then, using the worldwide record of port calls by bulk carriers, it was determined that a bulk carrier was loaded with the relevant bulk cargo whenever it visited a loading port.

From this, roughly 60 to 90% of all shipping could be determined from contrasting various forms of data.

3. Results of comparison of major countries in Northeast Asia

The bulk cargo shipping conditions in major countries of Northeast Asia (Japan, China, South Korea, and Taiwan) were compared. Table 1 presents average per-port discharge volumes that were obtained by dividing loaded volumes when all carriers are fully loaded by the number of discharge ports. Here, if carriers are larger and the number of discharge ports per shipment is smaller, then the average discharge volume grows larger and shipping becomes more efficient. As a result, in the case of coal and grain, Japan had a low average discharge volume because its carriers were small and it had many discharge ports. Particularly in the case of grain, there was a gap of at least roughly 20,000 tons in carrier capacity between Japan and the other major countries. In the case of iron ore, Japan had large carriers, but it also had a large number of discharge ports.

Table 1: Average per-port discharge volume (tons)

Country	Coal	Iron ore	Grain
Japan	*49,097*	*123,335*	*17,168*
China	*59,887*	*103,781*	*47,727*
South Korea	*68,330*	*166,941*	*44,672*
Taiwan	*69,603*	*131,698*	*38,140*

Table 2: Rates of insufficient berth depth for fully loaded carriers

Country	Coal	Iron ore	Grain
Japan	*39.3%*	*79.5%*	*36.2%*
China	-	*19.1%*	*85.4%*
South Korea	*16.8%*	*37.7%*	*58.6%*
Taiwan	*15.5%*	-	*57.0%*

Note: Because China is a coal exporting country and data could be obtained for only one iron ore port in Taiwan, analyses were not conducted for these items.

The possibility that discharge ports lack capacity is presumed based on the small size of carriers and large number of discharge ports. Here, a comparison of water depth required to handle fully loaded carriers at each port and the maximum berth depth of each port was conducted. Percentages of ports having insufficient berth depths that were obtained from the results are shown in Table 2. In the cases of coal and iron ore, Japan had large berth depth insufficiency rates compared to the other countries. Japan had a smaller insufficiency rate in the case of grain. However, because the carriers were small, this insufficient rate exceeds 80%—the same level as China—if carriers having the same size as China's had been used in shipping.

4. Conclusion

The author intends to continue his analyses in the hope that they will help raise the efficiency of shipping to Japan.

[References]

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