Uncovering the Determinants of Shippers' Willingness to Shift from Road to Rail Freight Transport

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Traditionally, shippers have preferred road transport to move their commodities from the point of production to the point of consumption. However, road transport's environmental and economic impact have become increasingly apparent, especially following the just-ended COVID pandemic. As such, a growing interest in inducing a modal shift in the freight movement from road to rail freight has increased exponentially. This shift can potentially influence the existing modal split, as rail transport offers lower carbon emissions, reduced road congestion, and lower transportation costs. Various factors influence the mode choice decisions of freight shippers, and modellers consider these factors within the perceived utility these shippers are assumed to maximise. However, this perceived utility varies for different shippers, even for the same commodity type, resulting in shippers choosing different modes for different freight trips. In this study, we look at revealed modal shift choice behaviours by estimating a discrete choice model to understand the key factors that induce modal choice. The estimated mode choice model applies a revealed preference data of import and export movement to and from one of the major Australian ports. The model estimation results show that shipments' weight, distance, rail mode accessibility and monetary value are highly relevant to modal shift choices. Specifically, the higher the monetary value of commodities such as agricultural and livestock products, the less likely shippers will use rail. Moreover, distance, weight, and mode availability play a crucial role in the mode choice behaviour of shippers. For example, longer distance increases the likelihood of using rail compared to road, and heavier commodities such as coal products are more likely to be shipped by rail than by road.