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Barriers to coastal shipping development: An Indian perspective

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ABSTRACT

Coastal shipping has been widely recognised as a sustainable and efficient alternative to road transport. However, the barriers encountered in the industry have not been systematically studied in any region. From an Indian perspective, this study aims to prioritise barriers to coastal shipping development for effective policy interventions. It identifies important barriers through a *Delphi* study and then quantifies their cause-and-effect relationships by the decision making-trial and evaluation laboratory analysis (*DEMATEL*) technique. It is interesting that the main barriers, those have most impact on coastal shipping development, are not necessarily the ones most widely recognised. The study also uncovers the hidden cause-and-effect relationships between several barriers. Four main barriers are identified: (1) Indian maritime legislation (especially cabotage rules); (2) issues in the infrastructure and procedures at port and port-centric areas; (3) underdevelopment of small ports; (4) lack of a collaborative culture among the various service providers involved in the logistics supply chain. This study finally recommends relaxing cabotage rules to stimulate the inflow of foreign capital to grow coastal shipping, improving the current port system through joint efforts of the ports, Indian customs and government, and fostering supply chain collaboration.

1. Introduction

Coastal shipping is the transport of goods along the coast over relatively short distances, as opposed to intercontinental cross-ocean deep sea shipping. In recent years, coastal shipping has been increasingly recognised as a sustainable and efficient alternative to road transport (Saldanha and Gray, 2002; Reis et al., 2014). It is more environmentally friendly as it produces far less greenhouse gas emissions and noise pollution. For medium- to long-distance freight transport, it offers substantial cost savings. Furthermore, it can reduce traffic congestion and can lower casualties due to accidents, which are common in road transport (Medda and Trujillo, 2010).

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The term *coastal shipping* is often used interchangeably with *short sea shipping* in the literature and practice (Musso and Marchese, 2002; Brooks and Frost, 2004; Grosso et al., 2010). There is no worldwide consensus on their respective definitions, so it is difficult to clearly differentiate them (Perakis and Denisis, 2008; Suárez-Alemán et al., 2014). We perceive two subtle differences between prevalent use of these two terms. One difference is that coastal shipping implicitly excludes freight movement at inland waterways, while short sea shipping has evolved to include the use of inland waterways. For example, the United States (US) Maritime Administration (MARAD) defines short sea shipping as an alternative form of shipping that uses both inland and coastal waterways to move freight from major domestic ports to its destination (MARAD, 2005; Yonge and Henesey, 2005). In Europe, a substantial amount of freight is moved along the Rhine river and is regarded as short sea shipments. The other difference is that, strictly speaking, coastal shipping refers to a single mode of waterborne transport, but short sea shipment is a door-to-door intermodal movement in which transshipment at the road/sea interface is the strategic element (Beškovnik, 2006). Therefore, coastal shipping does not include intermodal/multimodal components as short sea shipping does. Given these two differences, it is safe to argue that the term *short sea shipping* covers more than just *coastal shipping*. Nevertheless, it is mainly the coastal shipping journey that generates environmental and economic benefits in a door-to-door short sea shipment. This is especially true in regions where there are few or no inland waterways for commercial navigation.

To exploit the potential of coastal shipping, several economies have initiated some major programmes (Gouvernal et al., 2010). Since 1992, the European Union (EU) has been actively funding short sea shipping projects to support the development of a more sustainable and efficient intermodal freight system. In 2001, the EU launched the Marco Polo programme to develop "Motorways of the Sea (MoS)". This large-scale programme aims at shifting freight from road to sea to relieve pressure on road transport by 20 billion tonne-kilometres (km). In fact, short sea shipping has become the backbone of the EU's transport policy (Perakis and Denisis, 2008; Douet and Cappuccilli, 2011). Similarly, the US government has launched a project called Marine Highways to efficiently use its 29,000 nautical miles of navigable waterways. MARAD leads the way in promoting short sea shipping and its vision is to reduce freight congestion on road and on rail transportation networks by increasing intermodal capacity through the underutilised waterways. Many other countries, including Australia (Bendall and Brooks, 2011), China (Hong, 2007), Japan and South Korea (Medda and Trujillo, 2010) have also showed great interest in coastal shipping development.

This study is motivated by a significant problem observed in the industry: despite a promising future, coastal shipping has encountered many barriers to its development. In the European Union, MoS projects have achieved limited success in spite of strong political backing and favourable policies (Paixão Casaca and Marlow, 2002, 2005; Baindur and Viegas, 2011). In North America, relevant studies point out major challenges and barriers (Brooks and Frost, 2004; Perakis and Denisis, 2008). These studies sporadically offer valuable insights into the obstacles to a modal shift to coastal shipping; however, none of them systematically prioritise the barriers or analyse their relative impacts so as to inform effective policy intervention. In addition, the contexts of these studies were developed Western economies, which are quite different from the contexts of many developing countries that have observed much stronger growth in the port sector. Apparently, there is a significant gap in the literature as extant research remains far from scientifically analysing barriers to coastal shipping development, especially in the context of a developing country.

This research aims to narrow the literature gap by conducting a systematic barrier study of coastal shipping development. It addresses the following three research questions from the perspective of India, a major developing country that has both great need and ambition to grow its coastal shipping industry.

(1) What are the prominent barriers hindering the development of coastal shipping?
(2) How do these barriers interact with each other and how can they be prioritised for identifying root causes?
(3) What policies would be effective for overcoming the barriers?

This research answers the first question by a *Delphi* study to establish a list of important barriers based on inputs from experienced practitioners in the Indian shipping industry. It tackles the second question by employing a scientific prioritisation technique, decision making-trial and evaluation laboratory analysis (*DEMATEL*), to systematically analyse the complicated relationships between barriers. Based on the findings from the analysis, it discusses policy implications to answer the third question.

This research makes important original contributions. To the best of our knowledge, this research is the very first barrier study on coastal shipping or short sea shipping development. Besides identifying the major barriers and understanding their causal relationships, the research significantly contributes in eliciting discussions on policy implications. It timely meets the need of providing scientific inputs to facilitate effective policy formulation to support coastal shipping development. The insights offered are not only applicable to India, but also shed light on many other economies that face similar obstacles to growing their coastal shipping.

The rest of this paper is organised as follows. Section 2 is a review of relevant literature. Section 3 describes the methods used. Section 4 explains data collection. Section 5 presents the results and sensitivity analysis. Section 6 discusses policy implications. Section 7 concludes the research and suggests areas for further investigation.