

**“Green, safe and efficient shipping” in co-operation with the WCTR (world conference on transport research), SIG (special interest group) A2 (Maritime transport and ports)**

The issue carries revised and substantially extended versions of selected papers presented at the 2018 WCTR SIGA2 2018 conference held at the Department of Transport and Regional Economics, at the University of Antwerp, on 3-4 May 2018. The conference title was “The port and maritime sector: key developments and challenges”. The papers can be grouped into three broad topic areas: environmental, efficiency and safety aspects of shipping.

Quite some research has been done on the effects of internalising the external costs on the maritime part of the transport chain or on the hinterland part of that chain. The unanswered question is how the internalisation of the external costs over the total logistics chain affects the cost structure of the total chain. The question is extremely relevant to policymakers when devising such policy, as well as to port authorities, shippers and shipping companies, to determine a strategy on how to deal with an internalisation policy. Vierth *et al.* make an attempt at quantifying the impact for Sweden of varying road transport charges on the level of kilometres and greenhouse gas emissions. They apply a simulation model based on optimisation of logistics costs. This is done for different scenarios.

However, internalising external costs is just one part of the story. Other measures apply, like regulation, infrastructure development and innovation. Christodoulou *et al.* report on the establishment of a comprehensive global database of measures, policy instruments and incentives that target the reduction of shipping air emissions. Developing this database also entails classifying the various initiatives on the basis of specific features that they share.

Freese *et al.* identify and quantify cost effects of maritime environmental legislation; relate these with company characteristics like company size, average vessel age or area of operations; and investigate the impact of regulatory compliance. The paper highlights mechanisms applicable to environmental policy-making in other transport sectors and helps in building a transport policy that takes into account also the interconnectedness of different transport modes.

In addition, the efficiency of maritime supply chains has been investigated quite often. However, the link with actual processes has hardly ever been made. Each seaport has a set of terminals which in their turn have an own set of characteristics, such as allowable draught, navigation channel to enter the port, locks (if available) and number of container cranes. Port dues, tug boat cost, pilotage cost, etc. can differ between the different terminals in the same port. With respect to efficiency, Saragiotis reviews the application of business process management in the port sector. Its objective is to understand whether underlying principles are applied in the port sector, the role of the procedural factor in port performance evaluation and whether electronic data interchange systems have been used for process management purposes.

Equally, it is interesting to consider port efficiency. International comparisons have been extensively made in the past. However, at regional level, especially with an intra-Asia focus, very little research was found. Yang *et al.* investigate the efficiency changes of 23 major Asian container ports for the period from 2000 to 2007. In addition, to assess the general



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trend, the paper also attempts to decompose the overall efficiency change into technological efficiency change, technical efficiency change, and scale efficiency change to help port authorities to devise operational strategies. This study provides valuable suggestions to improve efficiency for container ports along the “Maritime Silk Road”.

Also for some particular segments in shipping, very little past research is available. That is the case, for instance, for the yacht segment, as dealt with by Wang *et al.* This paper is one of the preliminary studies to consider problems arising in yacht management in a quantitative manner. The proposed model has three main merits. First, it enables the government to better manage yachts and mooring areas. Second, with more yacht owners assigned with ideal mooring areas, the model helps reduce the travelling time of the yacht owners to yacht mooring areas. Third, by reducing the travelling time of the yacht owners, the model contributes to lessening the traffic burden in cities.

Finally, safety is an important aspect in international logistics chains. Safety, or lack of it, featuring accidents, has impacts on both staff and inhabitants living in the neighbourhoods of ports (people) and on the environment (planet). Equally, this is an under researched area for maritime supply chains. Despite tough economic circumstances, with declining freight rates, ship-owners still order larger container vessels. These ships’ dimensions go beyond past expectations. Van Zwijnsvoorde and Vantorre found that during (critical) ship passages, which only occur a few times during the stay at the berth, large singular motion peaks could pose potential safety issues. Based on considerations regarding the container handling process and deck layout, maximum motion limits are derived. The paper presents a simulation case study.

The beneficiaries of this issue include, but are not limited to, academic researchers in the areas of maritime studies, shipping companies, port authorities, terminal operators and policymakers. They can use the findings established in this paper for devising improved environmental, efficiency and safety strategies and policies.

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