On structural inelasticity of modal substitution in freight transport

At the European level there is an increasing focus on how freight transport can be moved from trucks on roads to more environmentally friendly modes such as rail and ship. A large proportion of the transport services between OD pairs, however, cannot be substituted since there is only one alternative available. The paper investigates the magnitude of this "structural inelasticity" of modal substitution in freight transport due to a sparser layout of rail and ship-based freight networks compared to road. In the analysis we use a recent Scandinavian freight demand model covering more than 800 zones. We find that the structural inelasticity is very significant – in particular for transportation over less than 500 km. Moreover, the inelasticity varies greatly with commodity groups and between OD pairs, and it depends strongly on the port and rail infrastructure. The results suggest that pure charging instruments (road pricing for trucks) in many regions will have limited mode substitution impacts. However, if combined with structural changes in terms of improved infrastructure for rail and ship, impacts may be greater.

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