

Investigating effective competition in the Swedish freight market in the presence of network effects, using the case of road transport

Conclusion

The result of this study indicates that the Swedish road transport market is less effective when transport network effects are present, based on the definition of effective competition.

Transport network effects essentially account for interactions with other parts of the transport system. Thus, the more integrated the transport networks in a transport system, the more competitive advantages the transport mode operating in that system can gain over other modes.

Introduction

One of the main tasks of the EU and Sweden has been promoting effective competition between different modes of freight transport, to achieve modal shift from road transport to other energy-efficient modes of transport, such as rail and maritime transport.

Building on the discussion of effective competition in the economic literature and network effects, this study investigated effective competition in the Swedish road freight transport sector as an example in relation to the network effect.

Literature view

A market can be **effectively competitive**, if no clearly indicated and cost-effective policy change can improve upon the prevailing economic performance in the market.

Nodes and links are components of a transport network. A **network effect** arises when more network components are connected. Network effect also explains a situation where individual's demand is dependent on the demands of others.

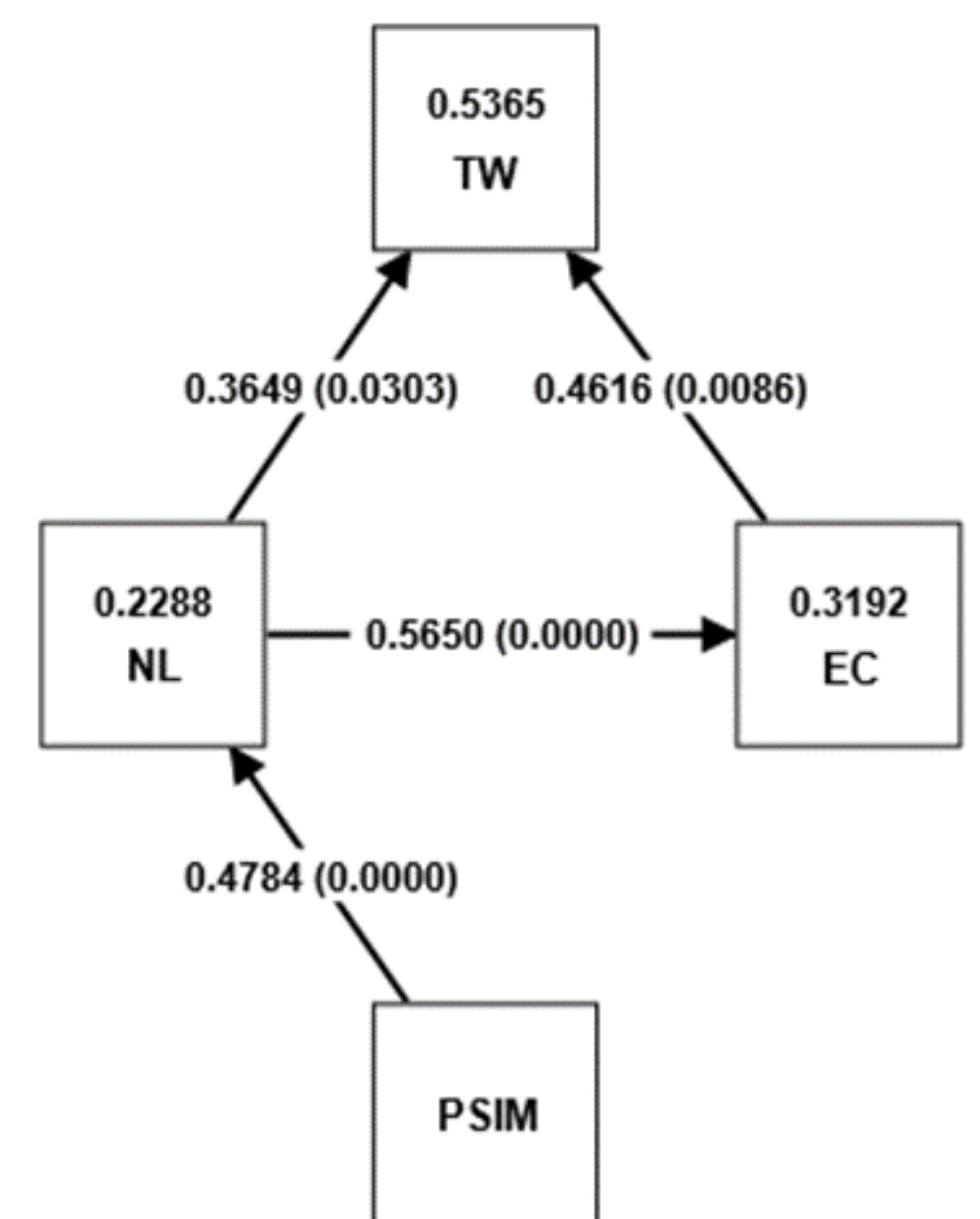
Here, the transport network effect is associated with **the size and the density of the network** and the overall characteristics of the network's design and operation.

Methodology

Panel data collected from 1990 to 2021:

- Domestic road transport work performed by Swedish registered trucks, measured in million tkm.
- Road network length, in km.
- Energy use of Swedish registered trucks, in GWh.
- Public spending on road investment and maintenance, in million SEK.

Partial Least Squares-based structural equation modeling (PLS-SEM) was used based on Wandel's transport system model as SEM enables testing multivariate and multi-layered causal relationships among dependent and independent variables.



Structural equation model (R^2 values in rectangles and path coefficients' p -values in brackets (produced using SmartPLS 4))

Note: TW—transport work, NL—network length, EC—energy use, PSIM—public spending on investment and maintenance.

Policy indications

From the modal shift perspective, various freight transport policies in the EU and Sweden should pay attention to network effects. And those policies should not only be designed to support relevant infrastructure development but also aimed at integrating different transport networks in a given transport system.