

A DEA-LOGISTICS PERFORMANCE INDEX

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Logistics and transport increasingly play a pivotal role in international trade relations. The Logistics Performance Index (LPI) measures the on-the-ground efficiency of trade supply chains or logistics performance. The aim of this paper is to propose a data envelopment analysis (DEA) approach to compute a synthetic index of overall logistics performance (DEA-LPI) and benchmark the logistics performance of the countries with LPI. Dealing with the six dimensions of LPI, the proposed approach uses DEA as a tool for multiple criteria decision making (MCDM). Furthermore, the paper also analyses the potential differences observed when using different variables, namely income and geographical area. Our findings suggest that the logistics performance depends largely on income and geographical area. High income countries are in the group of best performers, which is highly dominated by the EU.

JEL classification codes: C5, F1, O52, R4

Key words: logistics performance, freight transport, data envelopment analysis, logistics performance index

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I. Introduction

International trade has recently been affected by globalization and increased competitiveness of lagged regions that in the past did not play such an important role in the world. This trend has had an extreme impact on logistics as one of the key elements facilitating the mobility of products, ensuring their safety and speed as well as providing cost reductions when international trade among countries is growing. De Souza et al. (2007) define logistics as part of the value chain that plans, implements and controls the efficient flow of goods, services and information from the source to the consumer. The importance of the key components of logistics –transport, inventory and warehousing– has been recognized in the last 20 years although these elements have been fundamental in the industrial and economic life of nations for countless years (Rushton et al. 2014).

In late 2013, after more than 10 years of negotiation, the World Trade Organization (WTO) approved the *Agreement on Trade Facilitation*, providing crucial guidance on trade policies. This Ministerial Declaration deals with three key issues: trade facilitation, agriculture, and commercial impetus to help developing countries mitigate existing differences. Specifically, it contains provisions to speed up and improve the efficiency of customs procedures and border management (Sanz 2014). However, as outlined by Arvis et al. (2014), it introduces only minimum common standards, and in no way guarantees success. Only if countries are truly prepared to implement the advances that commercial globalization requires, can they benefit from the advantages of improved logistics performance. Hence, a suitable quantitative instrument is clearly needed in order to measure and compare the role of logistics in different parts of the world.

The *Logistics Performance Index* (LPI) was established with a view to bridging this gap. Its main objective is to measure the efficiency of logistics supply chains based on survey feedback from export companies. The LPI was first published in 2007 and led to a global debate on the importance of logistics in world economic growth. At the same time it revealed the need to implement concrete policies to improve future performance. By comparing the results obtained by the LPI for the four years analysed, the enormous value of the trade facilitation policies (i.e. the international distribution of production) can be appreciated. This index and its components can help countries (governments and corporations) to get to know their business partners more closely and anticipate any possible adjustments that could harm their competitiveness.

LPI is sometimes compared to other indicators such as the *Doing Business* ranking. However they differ in a number of respects, and so are not interchangeable.

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