

A Portuguese perspective

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This research is aimed at examining the performance of metros in Europe, using for the purpose two methods, the application of performance indicators and the non-parametric technique of DEA. The work was divided, essentially, into three parts. In the first part, an extensive documentation review related to urban public transport was carried out in order to understand what were the relevant issues and who were the stakeholders involved. The benchmarking concept is presented along with a brief overview of the existing organisations in transport benchmarking. In the second part, related to metros organization in Portugal, it has been considered, among other things, the national legislation on public transport, the sector institutional structure, the system financing, the various public services providing models, the state involvement and the transport services contracting schemes (e.g. public-private partnerships, PPP). In the third part, a framework of performance indicators was proposed and 8 indicators of efficiency and effectiveness for the 39 European metros were analyzed in detail. Later, the DEA methodology was applied to build three models for 37 metros, with different inputs (extension of the network, staff, vehicles and other operating cost) and different outputs (vehicle-kilometres, passenger and passenger-kilometres). The input-minimisation version of DEA was used for all the models, and each one of them was tested with both constant and variable returns to scale. Both benchmarking methods have shown that London and Moscow metros are efficient. The metros of Lisbon and Oporto showed a poor performance and are placed below the European average.

Keywords: Metro, efficiency, Portugal, performance indicator, data envelopment analysis.