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Les défis de développement pour les villes et les régions dans une Europe en mutation

## Impact of Pricing System on Urban Public Transport Efficiency? Evidence from France

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### Référence à la session / reference to the session

B3 - Accessibilité, mobilité, transport et communication

### Résumé / Summary

#### 1. Objectives

In a time of increasing concern about global warming and other environmental problems, increased public transport usage is often promoted as part of the solution. In France, as well as in many other countries, public transport is heavily subsidized and controlled by public authorities. The purpose of these subsidies and control is to ensure the dominance of public transport in the citizens' mobility, and therefore ensure efficiency of this sector. Thus, evaluating the performance of public transport is of significant importance in our days. The organisation authorities of urban transport need to regularly improve their efficiency in the design and delivery services to further attract users in an increasingly competitive environment with financial constraints and polluting transport modes such as car. The aim of this paper is to assess the efficiency of public transport operators and to identify the determinants of their inefficiency. In particular, we focus on the impact of pricing strategy.

#### 2. Data & Methodology

We adopt a parametric approach using the Stochastic Frontier Analysis (SFA) model, developed by Battese and Coelli (1993, 1995), of production function for 200 public transport operators during 2000-2012. The great advantage of SFA is that it can measure not only the technical inefficiency, but also recognizes the fact that random shocks can affect production. For this reason, the great advantage of SFA is that the error term

is composed of two parts: one unilateral component that captures the effects of the relative inefficiency of the stochastic frontier, and a symmetric component that allows a random variation of the frontier between companies and includes the effects of measurement error, other statistical noise, and random error. Thus, the main attraction of the stochastic frontier approach is that it allows us to study the determinants of inefficiency including those related to pricing strategy.

### 3. Expected results

The major contribution in this paper is to identify the determinants of inefficiency. As opposed to other studies on the public transport operators' performance, this study attempts to explain inefficiency by variables under operators' control. In the literature, most research has shown that the market organization, contract conception, regulatory system degree and nature, and network characteristics are the inefficiency determinants (De Borger et al. 2002). In this study, in addition to these determinants, we also consider the pricing types (single pricing or by area), reduced pricing, free pricing as explanatory variables of public transport inefficiency. Factors relating to the pricing system play an important role on the efficiency of urban public transport. In particular, the reduced pricing has a positive and significant impact on all three types of performance, including commercial efficiency. This type of pricing allows to reconcile the objectives of social equity and economic efficiency.

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