The capital stock plays the role of quasi-fixed input in our variable cost model. It is represented by the number of vehicles owned by LPT companies weighted by the average fleet age. We calculated the indicator as follows: K_{ft} = (*number of vehicles in the rolling stock*)*(age_s / age_{ft}), where age_s is the average fleet age in the whole analyzed sample, while age_{ft} is the average fleet age of firm *f* at the observation *t*.

Prices of variable factors were computed getting information from the balance-sheet statistics. The labor price (P_L) was obtained by dividing total labor costs by the average annual number of service workers (drivers, maintenance workers and administrative staff). The average price of fuel (P_F) was obtained by dividing fuel costs by the annual number of liters consumed[12]. Expenses for materials and services represent a residual cost category. It has been divided by the annual seat-kilometers offered to obtain an average price for this input (P_{MS})[13]. Indeed, it is reasonable to assume that this kind of expense strictly depends on the actual exploitation of the network.

In addition to the standard variables of a proper cost function, we included in the model the average commercial speed of LPT vehicles (*SP*), already considered in some works on the industry (for instance, Windle, 1988; Levaggi, 1994; Wunsch, 1996; Gagnepain, 1998). The specificity of the territorial area where the service is provided makes it difficult to compare the cost performance of different firms. Indeed, the traffic conditions and the geographical characteristics are peculiar to each network. To some extent, the average commercial speed should reflect differences in these environmental factors. Incorporating the variable into the cost frontier, costs are expected to lower with increasing network speed.

We added to the model a time trend too, measured in years, so as to account for possible effects of Hicks neutral technological change. In fact, given the seven-year length of the panel the impact of scientific or organizational progress should not be negligible. Other things unchanged, costs are then expected to diminish over time.

A translog functional form is chosen for this analysis[14]. The stochastic frontier cost model [1]-[2] is then defined by equation [3]:

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12 For a few firms which utilize tramways, trolley-lines or railways and consume electricity, kilowatt-hours were transformed in equivalent-liters.

13 Seat-kilometers are the multiplication of traveled kilometers by the average load capacity of vehicles.

14 Given the regularity conditions ensuring duality, the estimation of a translog cost function does not impose any other a priori restriction on the characteristics of the below technology. In particular, the elasticity of substitution and the returns to scale can vary with both the output level and the combination of inputs. This fully satisfies the criterion of model generality.