the 1 percent level of significance[57]. Given the small estimate for the parameter $\delta_{R\tau}$ relative to its standard error underlined above, the third null hypothesis in Table 2 concerns the absence of significant effects on the cost inefficiency due to the interaction between time and regulation, ($R_{ft} \times \tau_{ft}$). As expected, H_0: $\delta_{R\tau} = 0$, i.e., the hypothesis that the marginal variation of the inefficiency term whit respect to time, $\partial u_{ft}/\partial \tau_{ft}$, does not depend on the reimbursement rule faced by the company (or, alternatively, the differential impact of fixed-price schemes, $\partial u_{ft}/\partial R_{ft}$, is substantially the same across years), is accepted[58]. Re-estimating the model without $\delta_{R\tau}$, the estimates of the other parameters, β and δ, were little different from those obtained for the more general model, but the coefficients associated with the interaction of P_{MS} with *Y*, *K* and P_L, the interaction between *Y* and *SP*, and the quadratic terms for *Y* and *SP* persisted to be small and less than their estimated standard errors. Indeed, the LR statistic reported in Table 2 for testing the joint hypothesis H_0: $\delta_{R\tau} = \beta_{MSy} = \beta_{MSk} = \beta_{yy} = \beta_{LMS} = \beta_{ySP} = \beta_{SPSP} = 0$ is not significant[59] and so we consider that the preferred stochastic frontier model has the seven parameters, $\delta_{R\tau}$, β_{MSy}, β_{MSk}, β_{yy}, β_{LMS}, β_{ySP} and β_{SPSP}, constrained to be equal to zero.

The ML estimates for the parameters of the restricted model are presented in the third column of Tables 1a and 1b. It can be seen that all the β and δ coefficients for this model are larger than their estimated standard errors and most of them are statistically significant at the 1 percent level[60]. Table 2 reports the LR statistics for testing the null hypotheses of absence of inefficiency effects (sixth row) and of absence of stochastic effects (seventh row). Both values are not significant[61]. Similarly, the null hypotheses that the u_{ft}*s* are altogether unrelated to the *z*-variables (eighth row), that they are not a linear function of the subsidization mechanisms, the network commercial speed, the year of observation and the interaction between regulation and speed (ninth row), and that they do not include an intercept parameter (tenth row), are all also rejected at the

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[57] In this case the LR test statistic, 57.478, exceeds the 1% critical value for the mixed χ^2-distribution with 4 degrees of freedom, 12.483.

[58] The value of the χ^2-statistic reported in Table 2, 0.147, is less than the 1%, 5% and 10% critical values for the χ^2-distribution with 1 degree of freedom, which are 6.634, 3.841 and 2.705, respectively.

[59] The value of the χ^2-statistic, 11.885, is less than the upper 10 % point for the χ^2-distribution with 7 degrees of freedom, 12.017. Thus the null hypothesis is accepted at the 1, 5 and 10 percent levels of significance.

[60] The null hypothesis of zero value is rejected at the 1% level of significance (by asymptotic t-tests) only for the coefficient associated with the quasi-fixed input, β_k, which is statistically significant at the 10% level, and for the parameters β_{Ly}, β_{Lk}, β_{LSP} and β_{MSMS} in the frontier cost function, and the parameters δ_0, δ_R and δ_{RSP} in the cost inefficiency model, which are all statistically significant at the 5% level.

[61] In the first case, the LR test statistic, 67.849, exceeds the 1% critical value for the mixed χ^2-distribution with 6 degrees of freedom, 16.074, while in the second case, the LR test statistic, 58.665, exceeds the 1% critical value for the mixed χ^2-distribution with 4 degrees of freedom, 12.483.