

Inefficiency persistence and heterogeneity in Colombian electricity distribution utilities

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Jorge E. Galán and Michael G. Pollitt

Abstract The electricity reform in Colombia has exhibited gains in terms of reliability but its effects on firms efficiency and service quality have not been clear. Previous studies evaluating the performance of distribution companies after the reform have not found evidence of improvements, although large differences in efficiency have been found among firms. This suggests high inefficiency persistence and heterogeneity in the Colombian distribution sector. In this paper, we propose an extension of dynamic stochastic frontier models that accounts for unobserved heterogeneity in the inefficiency persistence and in the technology. The model incorporates total expenses, service quality and energy losses in an efficiency analysis of Colombian distributors over fifteen years after the reform. We identify the presence of high inefficiency persistence in the sector, and important differences between firms. In particular, rural companies and firms with small customers present low persistence and evidence the largest gains in efficiency during the period. However, increases in efficiency are only manifested during the last five years when the main improvements in service quality and energy losses are presented. Overall, inefficiency persistence, customer density and consumption density are found to be important criteria to be considered for regulatory purposes.

Keywords Bayesian inference, electricity distribution, dynamic effects, heterogeneity, stochastic frontier models

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Contact jegalan@est-econ.uc3m.es
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