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Measuring efficiency in the Brazilian electricity distribution segment

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To avoid the perverse incentive of distribution companies to shift operating costs to capital costs, European regulators have adopted total costs in efficiency models. However, in Brazil, operating costs are the subject of incentive regulation, while capital costs remain partially regulated by the cost of service scheme. Most efficiency studies on energy distribution companies in Brazil are restricted to analyzing operating costs. This study aims to fill this gap by adopting an integrated total costs benchmarking approach for these companies. For this purpose, we developed four models with non-decreasing returns to scale and input-orientation and tested them with a dataset of 60 Brazilian distribution companies from the period 2008–2012 using data envelopment analysis and stochastic frontier analysis. The sample data are segregated into two periods: from 2008 to 2010 to calculate the efficient frontier, and from 2011 to 2012 to validate the models. The results indicated that energy distribution company's average 0.70 to 0.84 efficient, indicating a room for improvement. In economic terms, the total costs estimated averaged 7% lower than those practiced, which represents a reduction of approximately R\$ 40 million per year. The Brazilian regulator needs to pay special attention to these inefficient distribution companies. This efficiency study concludes that, in theory, there is potential for cost savings in the energy distribution segment in Brazil. However, it is necessary to find a balance between the incentive to save total costs and, at the same time, ensure that desirable long-term investments are undertaken.

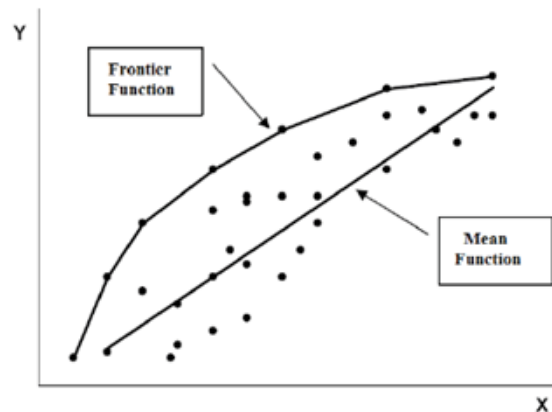


Fig. 1: Functions.

Recent Publications

1. Xavier S, Lima J M, Lima L M and Lopes A L M (2015) How efficient are the Brazilian electricity distribution companies? Journal of Control, Automation and Electrical Systems 01–16.

Biography

S S Xavier has her expertise in electricity distribution companies benchmarking, especially with Data Envelopment Analysis models. Besides, she has her experience in Economic Regulation.

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