



# Institutions and Performance of Regulated Firms: Evidence from Electric Utilities in the Indian States

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It is widely recognised that institutions have an impact on the economic development of countries. However, there is a significant gap in knowledge and empirical evidence of the effect of institutions on specific sectors in regions of a country. India presents a particularly interesting case to explore this connection due to the differences in the quality of institutions and economic development across its states. The absence of transparency and unproductive institutions in India often manifest itself in the form of corruption that leads to economic inefficiency.

Since the 1990s, India has adopted reform steps to improve the efficiency of its electricity sector. A fundamental reform step has been the unbundling of the sector into generation, transmission, distribution and retailing. The enactment of the “Electricity Act, 2003” (which has been amended several times) was expected to address the lack of transparency and poor institutional endowment. The electricity sector policies in the country have had other aims such as improving electrification, reducing network energy losses, and managing the cross subsidies all of which have produced inefficiencies in the sector.

In this paper we examine the effects of state-level institutional endowment and economic factors on the performance of network utilities in India. Electricity distribution networks are very suitable for studying efficiency effects of institutions as these networks are generally modular systems and are rather similar in their basic design and technology. We estimate a set of Stochastic Frontier Analysis (SFA) models that allow us to analyse the cost efficiency of 52 electricity distribution utilities in 24 Indian states of India for the period from 2006-07 to 2011-12.



We find an average cost efficiency of 69.3% for the firms and a declining efficiency over the period analysed. The results also indicate that energy losses increase network costs as they imply a more intensive use of the networks, which involves further maintenance and operation activities. However, it is also observed that energy losses increase firms' efficiency, which is translated into lower costs. These inefficiencies may arise from reductions in capital costs and investment that make the capital appear to be more efficiently used. The combined effect shows a negative average marginal cost for energy losses, which indicates that some companies (especially the smaller networks) may have incentives to increase than to reduce their energy losses.

Our findings confirm that quality of institutions, as well as other contextual factors such as the Human Development Index and the level of economic development affect the firms' efficiency. This suggests that energy regulators need to consider these factors when evaluating utilities' performance through benchmarking while the institutional framework constrains their ability to improve efficiency. This should also be taken into account when setting financial rewards or penalties, as economic incentives alone may not be sufficient for nudging efficiency improvements in regulated firms. In addition, we simulate the cost savings per state derived from utilities' performance improvements linked with institutional enhancement. The results reinforce the idea of the need to strengthen the institutions, for example through the reform of regulatory agencies. Measures to improve the quality of institutions and, in particular, the state regulatory agencies represent worthwhile investments with long-term rewards.

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