

Dynamic Efficiency and Incentive Regulation: An Application to Electricity Distribution Networks

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Abstract Efficiency and productivity analysis is a central concept in incentive-based regulation of network utilities. However, the efficiency measures obtained from benchmarking predominantly reflect short term performance and hence, provide only a snapshot of the firm's path towards its long run equilibrium. On the other hand, the factors affecting the short run behaviour of firms may not be adjusted instantaneously when firms undertake investment. In these instances, short run inefficiency caused by investments will be transmitted to subsequent periods. This effect, which arises from costs associated with the adjustment of capital stock or production capacity, is problematic under incentive regulation with ex-post regulatory treatment of capital expenditure. This is because it adversely affects the firms' short term efficiency and, consequently, regulated revenue. This paper analyses the dynamic behaviour of inefficiency for a balanced panel of 128 Norwegian electricity distribution companies from 2004 to 2010. We show that, in a given period, inefficiency is a combination of period-specific effects (shocks) plus a carry-over component from previous periods due to adjustment costs. Also, we estimate these two components of inefficiency along with the rate of inefficiency transmission between periods.

Keyword Dynamic efficiency, innovation, investment incentives, benchmarking, electricity

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