

Does Weather Explain the Cost and Quality Performance? An Analysis of UK Electricity Distribution Companies

EPRG Working Paper 0827

Cambridge Working Paper in Economics 0858

William Yu, Tooraj Jamasb, Michael Pollitt

In recent years a growing number of empirical studies have applied benchmarking techniques to measure the relative efficiency and productivity of firms. In the absence of competitive markets for electricity networks, some energy regulatory agencies have adopted these techniques as part of incentive-based regulation schemes to regulate the distribution utilities.

An important issue has been the extent to which such results are influenced by contextual factors that are beyond the control of the management and are not included in the benchmarking models. Among these are the weather factors and geographical conditions are frequently referred to as being among such factors. In this paper we aim to address the effect of these factors on the performance of distribution utilities.

However, inclusion of all potentially influential factors in benchmarking models is often not feasible. We use the Factor Analysis technique to reduce the number of the weather factors - i.e. gale, hail, temperatures, rainfall and thunder to a few composite factors. We then use the composite factors in two-stage Data Envelopment Analysis to examine the effect of these on the performance of distribution networks in the UK.

The findings of our analysis indicate that, contrary to that which might commonly be expected, the weather factors often do not have a significant economic and statistical effect on the overall performance of the utilities. The weather parameters in some of the more



Electricity Policy Research Group

comprehensive models, however, are significant in terms of economic efficiency. After excluding network length as an output in the model, the weather effect on performance becomes less significant. Hence, the network length in the model seems to be counteracting the effect of weather factors.

The results generally echo the findings of our previous studies examining the importance of extending the basic efficiency benchmarking model to include other inputs such as total expenditures, customer minutes lost per customer, and network energy losses in regulatory benchmarking.

Contact William Yu
Publication December 2008
Financial Support <ESRC Electricity Policy Research Group>

