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Parametric density recalibration of a fundamental market model to forecast electricity prices

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Abstract-

This paper proposes a new approach to hybrid forecasting methodology, characterized as the statistical recalibration of forecasts from fundamental market price formation models. Such hybrid methods based upon fundamentals are particularly appropriate to medium term forecasting and in this paper the application is to month-ahead, hourly prediction of electricity wholesale prices in Spain. The recalibration methodology is innovative in seeking to perform the recalibration into parametrically defined density functions. The density estimation method selects from a wide diversity of general four-parameter distributions to fit hourly spot prices, in which the first four moments are dynamically estimated as latent functions of the outputs from the fundamental model and several other plausible exogenous drivers. The proposed approach demonstrated its effectiveness against benchmark methods across the full range of percentiles of the price distribution and performed particularly well in the tails.

Index Terms- electricity; prices; forecasting; fundamentals; hybrid; densities

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