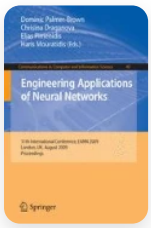
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Modeling and Forecasting CAT and HDD Indices for Weather Derivative Pricing

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Achilleas Zapranis & Antonis Alexandridis

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Abstract

In this paper, we use wavelet neural networks in order to model a mean-reverting Ornstein-Uhlenbeck temperature process, with seasonality in the level and volatility. We forecast up to two months ahead out of sample daily temperatures and we simulate the corresponding Cumulative Average Temperature and Heating Degree Day indices. The proposed model is validated in 8 European and 5 USA cities all traded in Chicago Mercantile Exchange. Our results suggest that the proposed method outperforms alternative pricing methods proposed in prior studies in most cases. Our findings suggest that wavelet networks can model the temperature process very well and consequently they constitute a very accurate

and efficient tool for weather derivatives pricing. Finally, we provide the pricing equations for temperature futures on Heating Degree Day index.

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Author information

Authors and Affiliations

Department of Accounting and Finance, University of Macedonia of Economics and Social Studies, 156 Egnatia St., P.O. 54006, Thessaloniki, Greece

Achilleas Zapranis & Antonis Alexandridis

Editor information

Editors and Affiliations

Faculty of Computing, London Metropolitan University, 166-220 Holloway Road, N7 8DB, London, UK

Dominic Palmer-Brown

School of Computing, IT and Engineering, University of East London, Docklands Campus, 4-6 University Way, E16 2RD, London, UK

Chrisina Draganova & Haris Mouratidis &

School of Computing, IT and Engineering, University of East London, London, UK

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