

Temperature stochastic modeling and weather derivatives pricing: empirical study with Moroccan data

Mohammed MRAOUA *
Financial engineer, actuary
OCP Group, Casablanca

Driss BARI †
Meteorologist engineer (IMCL 1)
Maroc Météo, Casablanca

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Abstract

The main objective of this paper is to present a technique for pricing weather derivatives with payout depending on temperature. We start by using the Principle Component Analysis method to fill missing temperature data. Consequently, the cold and the warm periods were determined on the basis of a “clean” data by using a statistical approach. After that, we use historical data over a sufficient period to apply a stochastic process that describes the evolution of the temperature. A numerical example of a swap contract pricing is presented, using an approximation formula as well as Monte Carlo simulations.

Keywords: Weather derivatives, temperature stochastic model, Monte Carlo simulation.

JEL Classification: G13, C15.

*Corresponding author: Quartier Wahda, Rue 196, N° 4778, Kénitra 37001, Morocco ;
Phone: (+212) 67 15 19 67/(+212) 74 25 84 72 ; Email: mraoua@altern.org.

†B. P. 631, C. P. 14000, Kénitra, Morocco ; Phone: (+212) 60 07 80 79 ; Fax:
(+212) 22 90 86 35 ; Email: barid_ma@yahoo.fr.