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Insurance against weather risk: Use of heating degree-days from non-local stations for weather derivatives

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Summary

¶Weather derivatives enable policy-holders to safeguard themselves against extreme weather conditions. The effectiveness and the efficiency of the risk transfer is determined by the spatial risk basis, which is the stochastic dependency of the local weather outcome being insured and the outcome of the weather underlying the insurance instrument. The lower this risk basis the higher the effectiveness and the efficiency of the risk transfer. To study the spatial risk basis component in relation to the design and evaluation of a weather derivative contract to insure for heating degree-days (HDD), the historical temperature records were analyzed for five sites across the Netherlands.

Sensitivity and specificity of the insurance instrument were used to quantify the potential spatial risk basis. Setting indemnification beyond a half standard deviation above the mean meant that between 60% and 76% of the indemnable HDD were classified correctly, while 82% to 99% of the non-indemnable HDD were classified correctly. These results indicate that the spatial risk basis is a major concern and that successful weather derivatives require the utilization of carefully selected weather data obtained from meteorological stations in close proximity to the area being insured.

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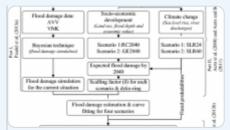
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