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Nonlinear Empirical Pricing in Electricity Markets using Fundamental Weather Factors

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## ACCEPTED MANUSCRIPT

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2	Factors
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10	Abstract
11	
12	A nonlinear factor model based on fundamental weather variables, in addition to market-
13	related variables, is proposed for modeling the price of electricity. The full conditional
14	distribution of electricity prices using quantile regressions is modeled and the effect of
15	weather factors on upside and downside risks in the electricity market is analyzed. Data from
16	the Nord Pool is used to fit the proposed model to a wide and highly integrated market, as
17	well as several individual national markets, and to search for possible asymmetries in both
18	individual and aggregated levels of the price dynamics. By doing so, important differences
19	across countries and quantiles in the price responses to weather variations are documented,
20	but mostly extensive evidence in favor of the quantile-factor model based on weather
21	variables is provided.
22	
23	Keywords: electricity; pricing; quantile regression; weather; risk.
24	
25	1. Introduction and Literature Review
26	Factor models are currently milestones for the analysis of electricity prices. Both practitioners
27	and academics rely heavily on such models to forecast and explain the dynamics of spot and
28	forward prices. The key point in factor-pricing models is the selection of explanatory factors
29	to be included in a potential empirical specification. When envisioning factors to include in

30 a pricing equation, the literature can be divided into two streams. On one hand, chosen factors

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