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Measuring Energy Security

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Abstract Continuity of energy supplies is a central aspect of concerns about energy security. Although the continuity of supplies can be influenced by a large number of risks, most models only analyse a small subset of risk sources and often neglect interdependencies between them. In this paper we introduce a probabilistic time-series model that quantifies the impact of inter-dependent natural, technical and human risk sources on energy supply continuity. Based on a case study of Italian gas and electricity markets we conclude that typical simplifications in time-series models and alternative approaches lead to a bias, which justifies the usage of detailed time-series models of interdependent risks such as the framework suggested in this paper, even though more detailed versions of this and other frameworks may quickly become very resource intensive.

Keywords Energy Security, Security of Supply, Reliability, Monte-Carlo Simulation, Measurement

JEL Classification

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