

Abstract

Integration of renewable energy sources impacts electricity spot price and its variation. Remaining open question is, in which direction. Volatility fluctuations threaten security of electricity supply, influence trading strategies and create uncertainty in optimal installed capacity planning. In this thesis, drivers of price volatility in Czech and German day-ahead power market are analysed with an emphasis on penetration of renewable energy sources. To the best of our knowledge, this is the first study focused on this issue in Czech electricity market. We apply recently developed approach of quadratic variation theory with an adjustment for electricity prices. Realised volatility is divided into its continuous and jump component. The continuous part is modelled by three heterogeneous autoregressive models, differing in complexity and inclusion of market-specific fundamental variables. Amendments to each model for the particular market are proposed and the models are evaluated both in-sample and out-of-sample. Addition of exogenous variables – commodity prices, weather conditions and seasonal variables – to simpler heterogeneous autoregressive model is found to improve volatility forecast accuracy. The results suggest higher continuous volatility due to increased penetration of power from wind generators in German market. The effect of photovoltaic penetration on continuous volatility in both studied markets is not significantly different from zero.