

DISSERTATION - Abstract in English

Three Essays on Electricity Markets

Author: PhDr. Petra Luňáčková

Academic Year: 2017/2018

This thesis consists of three papers that share the main theme - energy. The articles introduce characteristics and behavior of electricity focusing on its unique properties. The dissertation aims at the Czech electricity market and analyzes also highly discussed solar power plants.

The first article studies long term memory properties of electricity spot prices through the detrended fluctuation analysis, as electricity prices are dominated by cycles. We conclude that Czech electricity prices are strongly mean reverting yet non-stationary.

The second part of the dissertation investigates possible asymmetry in the gas - oil prices adjustment. Oil prices determine the price of electricity during the times of peak demand, as the reaction of power plants fueled by oil is quick but marginal costs are high. We chose the gasoline - crude oil relationship known as "rockets and feathers" effect and offer two new tests to analyze such type of relationship as we believe that error correction model is not the most suitable tool. Analyzing international dataset we do not find statistically significant asymmetry.

The third study assesses the impact of renewable energy sources, solar plants in particular, on the electricity spot prices, its goal is to verify the merit order effect on Czech market data. We describe history and consequences of photovoltaic power plants boom in the Czech Republic. With the use of the instrumental variables method we show that merit order effect differs for various renewable sources. Czech solar plants cause no merit order effect which is in contradiction to the preferential treatment they enjoy. The merit order effect of other renewables is present, however, if compared to subsidies, it is not of substantial magnitude.