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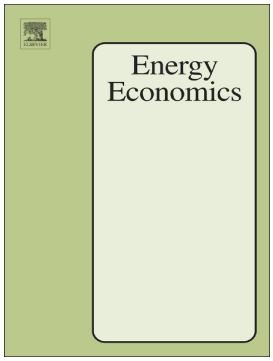

Comparison between Bayesian and information-theoretic model averaging: Fossil fuels prices example

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Comparison between Bayesian and information-theoretic model averaging: Fossil fuels prices example

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Abstract

The aim of this research was to find important predictors of the prices for the three selected fossil fuels, i.e., crude oil, natural gas and thermal coal. The period since 2004 was analyzed, basing on the monthly data. The methodology was based on various data-rich models, which had been motivated by uncertainty about the predictors. In particular, the applied methodology was based on comparing various model combination schemes. Bayesian techniques like DMA (Dynamic Model Averaging), DMS (Dynamic Model Selection) and Median Probability Model (MED) were confronted with the frequentist approach to model averaging. Generally, model averaging was found as an interesting alternative to benchmark forecasts like naïve or ARIMA. Moreover, it was found that the fundamental factors seem to play more important roles as price predictors for natural gas and coal than for crude oil. Crude oil seems to be linked with numerous other factors in more complex relationships. From the practical (forecast accuracy, role of predictors) point of view DMA and AIC-weighted averaging lead to similar results. Interestingly, it was found that MED can produce more accurate forecast than the highest probability model. Finally, implementation of the Internet search data might improve the forecast quality.

Keywords
coal spot price; crude oil spot price; energy commodities; forecast averaging; forecast combination; Google Trends; natural gas spot price; WTI

JEL
C32, C53, C58, G17, Q31, Q47

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