

## **Nonlinear quantile regression-based modeling of hedonic house prices**

Many applications of statistical real estate appraisal methods involve the following challenges:

identifying the relevant characteristics of a property, estimating the shadow prices (marginal market valuation) of characteristics, and estimating the prices of bundles (of characteristics) not observed.

State-of-the-art hedonic housing price analysis comprises modeling price functions nonlinearly, accounting for complex spatial association structures (horizontal market segmentation), and allowing for varying functional relationships across the conditional price distribution (vertical market segmentation).

We discuss two general classes of nonlinear quantile regression models which meet these criteria but pursue different avenues to simultaneously address the challenges outlined above.

Due to the underlying assumptions, the inference obtained from both model classes differs analytically and -- more importantly -- leads to different economic interpretations.

The methods are illustrated by applying them to data generating processes with various degrees of functional and spatial complexity in a Monte Carlo study and to geo-referenced urban housing price data.