

Spatial Estimates of Housing Bubbles: Tokyo House Prices and Rents

Xiangyu Guo
National University of Singapore
xguo@u.nus.edu

Chihiro Shimizu
Nihon University

House sale and rental prices usually lie at the heart of the growing literature examining house price bubbles. In these studies, time series price-to-rent ratios are most commonly used. However, the characteristics of houses on sale and rental units are different and exhibit spatial variations. In this paper, we construct spatially varied estimates of house sale/rental prices, based on the locally weighted quantile approach and the decomposition technique of Machado and Mata (MM). The geographic quantile version of locally weighted regressions can place greater weight on observations closer to the target point, which produces unique quantile coefficients for each observation. This approach allows the distribution of predicted values to vary smoothly over space. Based on a spatial version of MM decomposition, the counterfactual prediction of rental prices for each observation of the sales sample can be estimated. Thus, this study constructs a price-to-rent ratio for each observation in the sale sample. The approach is applied to a large sample of condominium sale and rent data in Tokyo over 1986-2016, which covers the greatest bubble of the Japanese market. We find significant variation in appreciation rates of sale prices as well as rental prices. The sale prices rose more rapidly than did rents during the boom 1986-1990, and then declined more rapidly during the bust 1991-1996. The rents maintain a stable level from 1997-2016, while price changes a lot. The appreciation rates of sale and rental prices vary over space and time. The sale prices of high-priced houses rose less in 1986-1990 and declined more in 1991-1996 than low-priced houses. The regions with high price change over time. Before 2000, the north-east area of Tokyo has the highest price and price-to-rent ratio, while the south-west area has a higher price and price-to-rent ratio than the north-east area in 2001-2015.