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Price-rent Ratios and Expected Capital Gains: A Hedonic Spatio-temporal Approach

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The relationship between sales prices and rents of residential real-estate properties has been one of the most popular measures for monitoring the housing market. Special attention attracted high price-rent ratios since it potentially signals an overvaluation, or bubble, in sales prices. The implied consequence is that the affordability of decent housing decreases in proportion to a decline in the ratio (Lee and Park, 2018). Governments employ various policies to cool off booms in sales prices and, especially, in rents during periods with high price-rent ratios.

In this article, we outline and adopt a hedonic Spatio-temporal modelling approach which uses sales prices and rents in a joint model based on semi-parametric smoothing splines. We study the determination of the price-rent ratio for apartments in 21 major German cities over the period 2014Q2-2018Q1. In a second step, we apply the user-cost equilibrium condition to investigate the cross-section of expected capital gains. In addition, we construct quality-adjusted property price and rental indices at the city-level based on non-prespecified and thus very flexible functional forms in the model. This provides deep insights into the dynamics of the German housing market and has important implications for the housing policy of local authorities and strategies of real-estate companies and other market participants.

Our results show that there is a wide degree of heterogeneity across cities and time. We find price-rent ratios between 15.0 and 33.2, and expected real capital gain between 5.9% to 9.7% in 2018Q1. The increase in the sales price was between 13.5% and 60.5% over the sample period, while the increase in the rents was more moderate between 10.7% and 48.7%.