

# Answer to the referee report 2 to the paper

## Urban House Prices: A Tale of 48 Cities

March 24, 2015

1. First, country-specific nominal apartment prices might reflect differences in past inflation rates, which might also affect nominal GDP per capita. A conversion to real/relative prices is advisable. Using the nominal exchange rate for non-euro area countries and no conversion at all for euro area countries implicitly assumes that purchasing power parity holds (real exchange rate = 1). For residential property this is highly questionable! Therefore a real exchange rate should be used to make nominal apartment prices across countries comparable..

Our answer: This is a very important comment. We are going to use purchasing power parities in order to address this issue.

2. Second, the approximation of city-specific explanatory variables by region-specific data or extrapolated national data is unsatisfactory. After all, the point of the analysis is to use city-specific data. In some cases, the city-specific share of the national variable could be extrapolated for a more reliable proxy.

Our answer: We are aware of this problem. For some cities, where available, we are already using the city-level indicators, such as GDP. For other cities no such data are

available. However, we don't really see how to make more reliable interpolations at the city level. The solution of this problem would be a paramount task, which is worth a separate publication.

3. Third, a measure for the supply of apartments is omitted in the regression equations, potentially biasing the coefficients on the remaining variables. A given increase of GDP per capita might have differential effects on apartment prices depending on the existing stock of housing at the beginning of the period. Also, omitting the supply side in a cross-sectional regression of apartment prices might make the fitted values appear unduly high (the negative impact of housing supply on prices might be partly included in the residual), mistakenly producing signs of undervaluation of property.

Our answer: Indeed, the relation between the supply (housing stock) and demand (number of households) is an important factor determining the house prices. We will try to collect the corresponding data and use them in our regressions.

4. Fourth, the (lagged) homeownership rate and mortgage loans per capita might be endogenous to apartment prices. (Past) Homeownership might be high due to high expected apartment prices. More generally, homeownership rates should reflect a tenure choice, which should be driven by the relative costs of renting vs. owning, but not by the levels of rents or prices. The national amount of mortgage financing partly reflects apartment prices in the big cities. Mortgage supply measures such as the loan-to-value ratio or qualitative supply conditions might be preferable.

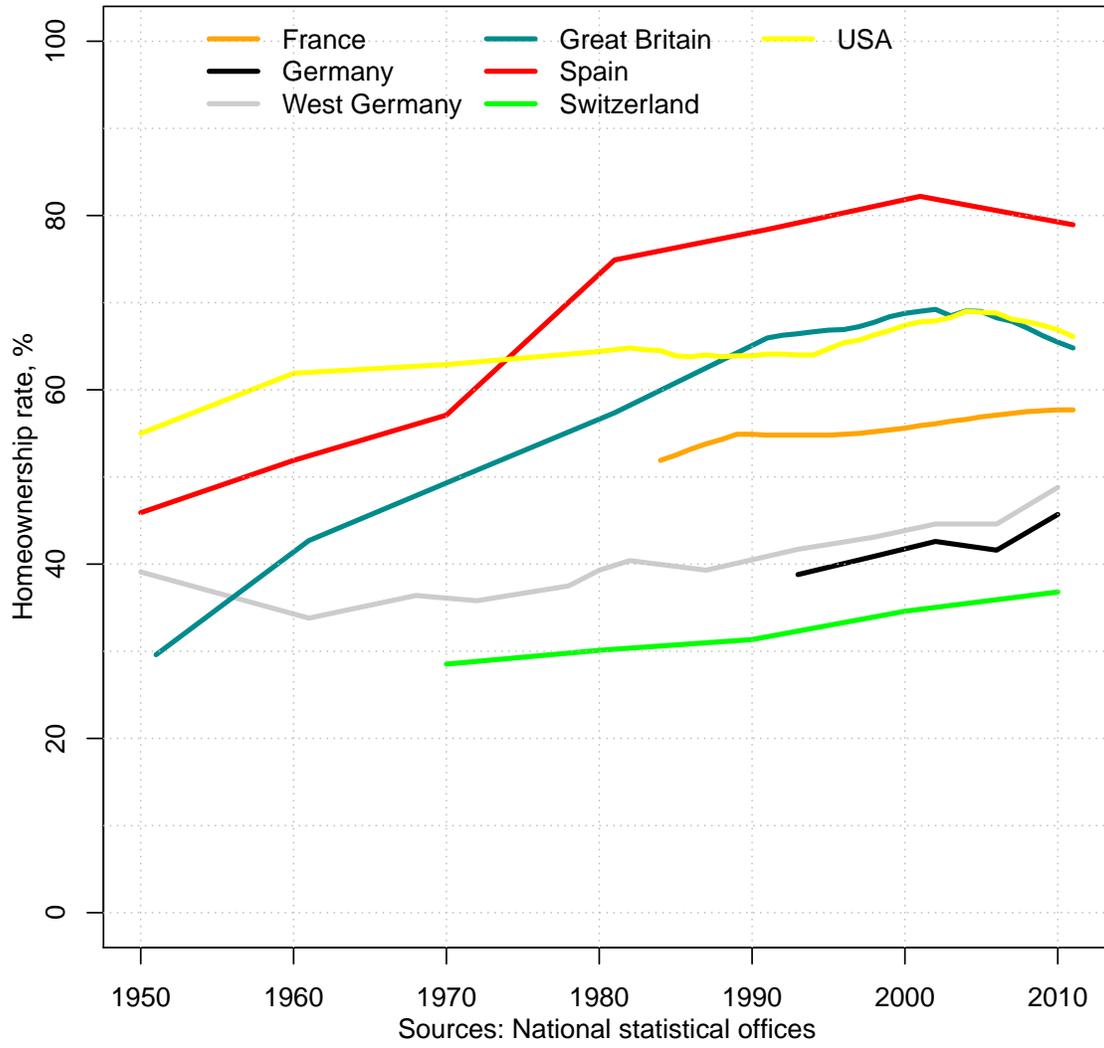
Our answer: The homeownership rate evolves very slowly, see Figure 1. The cyclical relative price fluctuations hardly affect it. More important is the institutional framework

(the way the tenancy and homeownership are treated in terms of taxation or subsidies, rent controls, transaction costs of purchasing housing, etc.). These regulations are arguably the major driving force behind the HOR changes. Loan-to-value ratios (LTV), similar measures or some composite index of them could be useful indicators in our analysis. However, it is virtually impossible to find consistent LTVs for all cities in our cross section. For example, Drudi et al. (2009), Table 2, p. 27 report “typical LTVs” just for the 15 Euro area member states in 2009. We could not find more recent figures even for those countries. The ECB Bank Lending Survey (<https://www.ecb.europa.eu/stats/money/surveys/lend/html/index.en.html>), which is conducted on a monthly basis, does not contain LTV data for all Euro area countries. Moreover, the actual LTVs may strongly deviate from the typical LTVs, especially during house price booms. This would cause an endogeneity problem even if the data were available.

5. Fifth, to get a feeling for the effects of the missing quality adjustment and of working with asking prices it is suggested to compare the price data with quality-adjusted transaction prices from other sources at least for some countries, possibly using the Eurostat data mentioned on p. 3.

Our answer: Figure 2 compares the price levels reported by the official sources (Eurostat, Rosstat, and Statistical Office of the Republic of Serbia) for 2003-2006 (red) and 2007-2009 (blue) to the prices we constructed using the Internet ads. For the first period, there are 31 observations that belong to both databases, while for 2007-2009 there are 25 observations. The correlation in the former case is very high (0.86), while in the latter case it is somewhat smaller (0.62) but significant. The correlation with the more recent

Figure 1: Evolution of homeownership rate in selected countries, 1950-2011



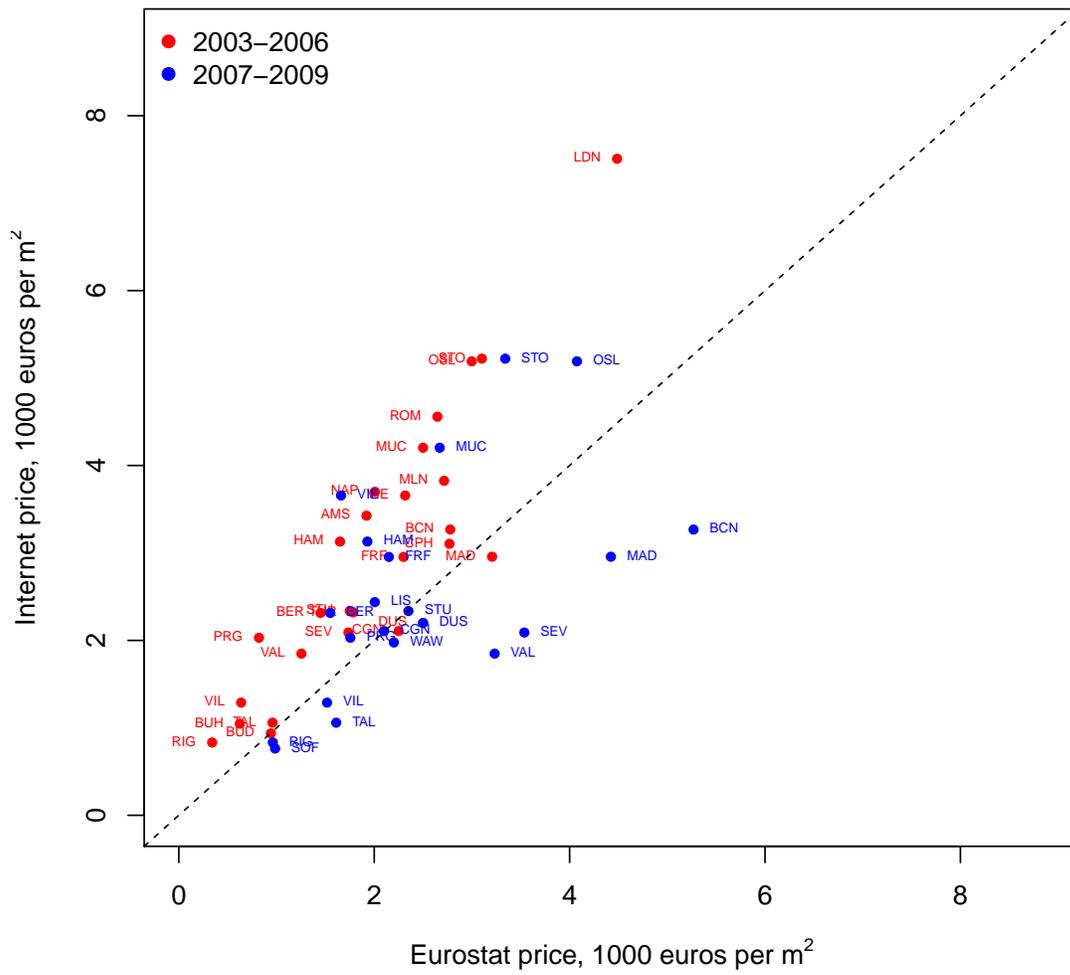
prices is lower, possibly because 2007-2009 was a period of a speculative bubble in many European housing markets. Only towards the end of that period the prices started to decline. This can clearly be seen in Figure 2: the 2012 Internet prices are higher than most of the 2003-2006 prices, but lower than most of the 2007-2009 prices. In 2010-2012, the prices in countries, where the speculative bubbles burst —especially, in Ireland and Spain, have undergone a strong downward correction, returning to the pre-bubble levels. All in all, we can conclude that my price estimates are relatively close to those produced by the official statistics.).

6. Strictly speaking, the conclusions about over- and undervaluations refer to sellers' asking prices. The link to actual prices requires an assumption about the wedge between asking and transaction prices, which could vary across countries and which might be related to the explanatory factors.

Our answer: Indeed, what we use here are offer (asking) prices and not the final transaction prices. There are several studies comparing both prices: e.g., Faller et al. (2009) and Henger and Voigtländer (2014) for Germany. The findings of these studies indicate that on average the offer prices are 6-8% above the real transaction prices. Significantly smaller gaps are found for urban locations. The differences may also systematically change across the phases of business cycle. That said, we still have to make use of the offer prices as proxies for the transaction prices, which are simply not available for all the cities in question.

7. Ideally, to construct the fundamental value, only cities which do not display over- nor undervaluation of property should be included in the reference sample. This requires an

Figure 2: Eurostat prices vs. Internet-based prices measured in January – May 2012



a priori judgment which should be complemented by a variety of sensitivity checks (i.e. systematically varying the reference sample).

Our answer: Indeed, by its very nature the OLS tends to minimize the deviations from the conditional mean. This implies that it tends to somewhat underestimate the extent of over- and undervaluations. On the other hand, an *ad hoc* assignment of the cities as under- or overvalued ones contradicts the very essence of our exercise, whose objective is to classify the cities based on the empirical data and not on some *a priori* assumptions.

## References

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