

Box 3

Statistical valuation metrics for residential property markets

Misaligned asset prices are among the key root causes of financial instability. This pertains particularly to residential property assets upon which the bulk of bank lending is secured. However, measures of the degree of house price misalignments from fundamentals are surrounded by a high degree of uncertainty. This reflects the challenge of adequately capturing the complex interaction of housing, rental and mortgage markets, as well as data constraints and measurement issues. In a cross-country setting, the challenge of identifying misalignments is made all the more difficult by the substantial heterogeneity in structural market characteristics across countries. Commonly used metrics are two statistical-based indicators, the house price-to-rent and house price-to-income indicators. This box assesses the usefulness of these statistical indicators when applied across euro area countries.

House price valuation metrics can provide useful information and a means of benchmarking developments against historical norms. In a cross-country setting, they can also provide a comparative framework for assessing imbalances in housing markets. From the policy perspective, such metrics entail a consistent benchmark to indicate whether further in-depth analysis is warranted at the country level at which point fuller cognisance can be taken of country specificities. Commonly used cross-country housing valuation metrics for this purpose can be broken down into two broad strands.

The first strand comprises statistical indicators and is the main focus of this box. This includes an indicator that relates house prices to rents based on an arbitrage assumption. Accordingly, if house prices rise beyond what is justified by fundamentals then households will postpone purchasing a house and rent instead, thereby producing downward pressure on house prices. The validity of this assumption rests on households having a viable alternative in the rental market. The extent to which this holds differs across euro area countries and largely depends on the scale and composition of national rental and owner-occupied markets. While on average rental markets only account for about 30% of the overall euro area housing sector, this differs considerably across

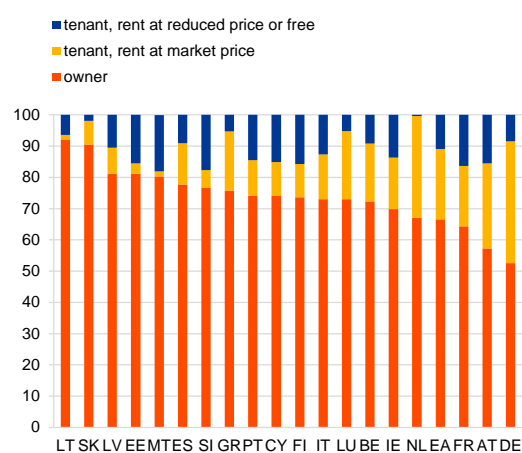
countries (see Chart A). Further complicating this, rents may not always be set at market rates given considerable regulation of the sector. Last but not least, the house price-to-rent indicator typically assumes a constant long-term average, but there may be important structural breaks arising from policy changes. For these reasons, the house price-to-rent indicator, although commonly used as a benchmark for house price valuation, may not be a reliable metric for assessing valuations in some euro area countries.

Chart A

Rental markets are relatively small in several euro area countries

Tenure status in euro area countries

(2013; percentages)



Sources: European Commission SILC Survey and ECB calculations.

Another statistical indicator relates house prices to income. Similar to the house price-to-rent ratio, such indicators are generally related to their long-term average. If the ratio lies above its long-term average, prospective buyers may find purchasing a home, and servicing the associated debt, more difficult, which should reduce demand and lead to downward pressures on house prices. Given a strong prevalence of mortgage financing, such indicators are often transformed into “affordability” measures, which are adjusted to reflect the prevailing average interest rate on bank loans for house purchase.

The affordability ratio can be adjusted for interest rate developments in a number of ways. An interest rate variable, derived from a standard annuity formula, can be incorporated directly into the affordability ratio⁵. Alternatively,

house prices can be regressed on income and mortgage interest rates and the residuals can be taken as the valuation estimates. To allow for the non-linear effect of interest rates on housing demand, the regression equation could be supplemented by a quadratic polynomial on interest rates. By way of illustration, house prices in the euro area as a whole appear moderately undervalued in 2014 when interest rates are taken on board (either by an annuity-based or a regression-based approach) rather than broadly in line with fundamentals as suggested by the basic house price-to-income indicator (see Chart B).

A separate strand relates house prices to a broader set of fundamental driving factors through multivariate regression analysis. While relating house prices to rents and incomes offers intuitive appeal and ease of construction, such measures might fail to capture important fundamental factors, notably those relating to the supply side of the housing market. In addition, given the symbiosis between housing and mortgage markets, developments in mortgage credit to households should be jointly modelled with house prices. That said, the fundamental factors themselves may be fragile. This is especially relevant in the case of mortgage credit⁶, as an assessment of

⁵ The ratio is constructed as follows: $r/(1-(1+r)^{-T}) * (\text{house price index}) / (\text{income index})$ where T is the mortgage term and r is the nominal mortgage interest rate. Typically, a mortgage term of 20 years and a fixed mortgage interest rate are assumed. The interest rate-adjusted affordability indicator is then calculated as the deviation in percentage terms of the ratio from its long-term average.

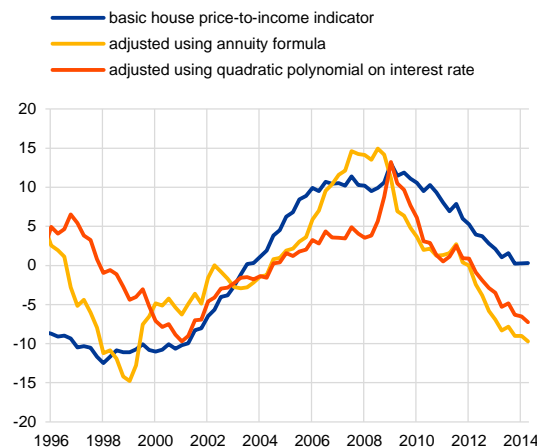
⁶ Muellbauer, J., “When is a housing market overheated enough to threaten stability?”, *Discussion Paper Series*, No 623, Department of Economics, University of Oxford, 2012.

Chart B

Residential property price valuations vary significantly across different house price-to-income metrics

House price-to-income ratios

(Q1 1996 – Q2 2014; percentage deviations)



Sources: Eurostat and ECB calculations.

Notes: Disposable income per household is used as the proxy for income rather than GDP per capita used in the existing framework. The interest rate is the average mortgage interest rate.

misalignments in house prices can only be meaningfully arrived at if allowances are also made for misalignments in mortgage credit. Further issues include the impact of structural breaks arising from, for instance, substantial changes to mortgage interest tax deductibility.

The three strands of metrics evaluated in this box form the basis of valuation assessments, both for the euro area and at the country level. The house price-to-rent and house price-to-income indicators offer simplicity, transparency and ease of computation, but given the numerous caveats attached to these indicators they may give an unduly distorted picture of the state-of-play regarding house prices in some countries. Thus, it may be preferable to place greater reliance on model-based approaches that take into account a wider set of fundamental factors. Work is under way to devise an analytical toolkit to address these issues, with the aim of rolling out further valuation metrics later this year.