

## Box 3

**TOOLS FOR DETECTING A POSSIBLE MISALIGNMENT OF RESIDENTIAL PROPERTY PRICES FROM FUNDAMENTALS**

Euro area residential property prices have exhibited pronounced volatility over the last decade, not dissimilar to the dynamic in other advanced economies. A legacy of the substantial appreciation in house prices in most euro area countries over the decade leading up to 2005, as well as the strong expansion of economic activity related to housing, has been an accumulation of imbalances in this sector that continue to affect the economic and financial outlook.<sup>1</sup> This box reviews the recent evolution of some measures for detecting residential property price misalignments from fundamentals in selected euro area countries for which relatively long time series for house prices and the ancillary fundamental variables are available from national and international sources.

<sup>1</sup> For an overview of measures to track and quantify house price misalignments from fundamentals, see C. Himmelberg, C. Mayer and T. Sinai, "Assessing High House Prices: Bubbles, Fundamentals, and Misperceptions", *Journal of Economic Perspectives*, No 4, Vol. 19, 2005.

Two sets of valuation metrics are commonly used to assess housing values relative to fundamentals. First, house prices are often related to demand and supply determinants, most frequently captured by some notion of housing affordability, given the inelasticity of housing supply in the short run. In this vein, “affordability” indices and regression-based approaches have been applied in recent cross-country housing market assessments by, for example, the IMF and the OECD.<sup>2</sup> Second, house prices are often assessed using an asset pricing framework relating their evolution to that of the rental yield. Indeed, imputed rents can reflect the cost of owning a house for a period which in equilibrium should be equal to the returns from renting the house for the same period.<sup>3</sup> At the same time, observed rents can be a proxy for the flow of fundamental returns in a dividend discount framework.<sup>4</sup>

Following the approaches described above, four specific methods – two relating to housing demand forces and two relating to an asset pricing framework – were computed for a selected group of euro area countries for which long time series are available. These indicators are computed as follows:<sup>5</sup>

- Crude affordability in the euro area – measured in this case by the ratio of per capita GDP to the house price index – is computed relative to long-term trends (an implied equilibrium given the absence of reliable data on house price levels). While real disposable income may be a more appropriate variable in calculating affordability, real GDP is used instead given the longer time series for this variable.
- A measure of imbalances in housing valuation inferred from the residual of a simple error-correction framework with real house prices regressed on real GDP per capita, population and the real interest rate (with all variables in logs, apart from the interest rate).
- The evolution of the house price-to-rent ratio<sup>6</sup> is computed relative to its long-run average – a simplified static dividend discount model or asset pricing approach.<sup>7</sup>

2 See, for instance, D. Andrews, A. Caldera Sánchez and A. Johansson, “Housing Markets and Structural Policies in OECD Countries”, *OECD Economics Department Working Paper*, No 836, 2011; OECD, *Economic Outlook*, No 86, November 2009; and IMF, *World Economic Outlook*, April 2008. Country house price “gaps” are obtained on the basis of regression analysis on “fundamentals”, such as disposable income, population, interest rates, credit and equity prices.

3 See J.M. Poterba, “Tax Subsidies to Owner-Occupied Housing: an Asset-Market Approach”, *Quarterly Journal of Economics*, No 4, Vol. 99, 1984.

4 See J.Y. Campbell and R.J. Shiller, “The Dividend-price Ratio and Expectations of Future Dividends and Discount Factors”, *Review of Financial Studies*, Vol. 1, 1988.

5 While illustrative, these valuation measures – along with other measures of overvaluation in housing – are subject to several caveats, which can be grouped into three categories. First, data uncertainty is particularly high in measuring house prices given problems in coverage, quality control and representativeness. Second, the problem of structural breaks is particularly acute in housing, as the possibility of changing economic, financial or institutional factors (e.g. non-market distortions in the rental market, the role of tax policies, owner-occupancy rates, etc.) can also induce strong changes in historical or equilibrium relationships. Third, these methods do not control completely for the influence of other factors, such as housing supply elasticity or non-market forces, in driving housing market developments.

6 It should be stressed that the ratio can be distorted in some countries since the rent index may also include a share of controlled rents and old generation contracts. As a result, the valuation measure may overestimate the misalignment in some countries.

7 A dynamic variant of the dividend discount model applied to a panel of euro area countries indicates that, in addition to the evolution of the rental yield, stable low-frequency variation in expected returns may also have contributed to large and persistent swings in euro area house prices – see P. Hiebert and M. Sydow, “What drives returns to euro area housing? Evidence from a dynamic dividend discount model”, *Journal of Urban Economics*, forthcoming.

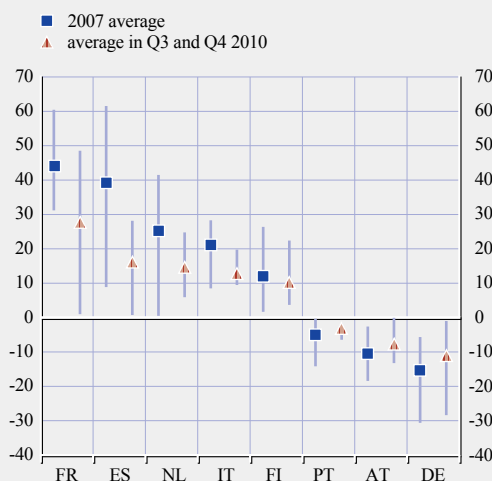
- The evolution of the house price-to-rent ratio computed relative to the real long-term interest rate, based on a model where the return on a housing investment (approximated by the rent-to-house price ratio) should be equal to the returns on alternative investment opportunities bearing the same risk.

Overall, there seems to be a significant reduction over time of the misalignment for the majority of the selected countries when assessing 2010 ranges against 2007 ranges (see chart). Nevertheless, a cross-check of the four above methods suggests some misalignment in housing valuation in 2010, albeit with significant heterogeneity across countries and approaches (see chart). In this vein, it would appear that fundamentals cannot fully explain house price levels in some cases. The reported ranges for 2010 refer to estimates based on the latest available two quarters. Some countries show an average overvaluation between around 10% and 30% (i.e. France, Spain, the Netherlands, Italy and Finland). It should however be noted that the minimum value for some countries (i.e. France and Spain) is around zero. Residential property prices seem to be undervalued in three countries (i.e. Austria, Germany and Portugal). The wide ranges between minimum and maximum values for some countries can be related to the high level of uncertainty surrounding current housing market developments.

All in all, these valuation measures suggest that the off-peak adjustment process has substantially reduced the average residential property price overvaluation in several countries. Nevertheless, overvaluation still seems to persist in some euro area countries, while others are showing signs of undervaluation. That said, it should be noted that – as the wide dispersion across the different valuation measures presented in this box illustrates – it is very difficult to assess property price misalignments and national specificities (including fiscal treatment and structural aspects of housing markets) have to be taken into account when assessing the house price levels in different countries.

### Residential property price valuation indicators for selected euro area countries

(percentages; deviation of prevailing house prices from indicators; maximum, minimum and mean across four different valuation indicators)



Sources: National statistical offices, NCBs, ECB, OECD and ECB calculations.  
Notes: Estimates are based on data until the fourth quarter of 2010. All estimation starts in 1985 except for Austria (1987) and Portugal (1988).