# House Prices: provisional data
## III Quarter 2016

The House Price Index (HPI) measures the evolution of market prices of all residential properties that are purchased by households (flats, detached houses, terraced houses, etc.), both new and existing, independently if bought for own-occupancy or as an investment.

In the third quarter of 2016:

- the House Price Index (see Italian IPAB) increased by 0.1% compared to the previous quarter and decreased by 0.9% in comparison to the same quarter of the previous year (slightly down from -0.8 registered in the second quarter of 2016);

- prices of new dwellings were stable compared to the previous quarter and decreased by 2.1% with respect to the third quarter of 2015 (1.0 percentage points lower than that of the previous quarter); prices of existing dwellings increased by 0.1% compared to the previous quarter and decreased by 0.6% with respect to the third quarter of the previous year (-0.7% the rate of change in the second quarter of 2016).

**TABLE 1. HOUSE PRICE INDICES HPI**
2013 Q3 – 2016 Q3, indices and percentage rate of changes (base year 2010=100) (a) (b)

| Period | Total | | | New dwellings | | | Existing dwellings | | |
|---|---|---|---|---|---|---|---|---|---|
| | Indices | Rate of change % | | Indices | Rate of change % | | Indices | Rate of change % | |
| | | On the previous period | On the same period of the previous year | | On the previous period | On the same period of the previous year | | On the previous period | On the same period of the previous year |
| 2013 | 92.3 | - | -5.7 | 102.4 | - | -2.4 | 88.0 | - | -7.2 |
| 2014 | 88.3 | - | -4.4 | 100.1 | - | -2.2 | 83.4 | - | -5.2 |
| 2015 | 86.0 | - | -2.6 | 98.6 | - | -1.5 | 80.9 | - | -3.0 |
| **2013** | | | | | | | | | |
| Q3 | 91.9 | -1.5 | -5.6 | 102.1 | -1.0 | -2.5 | 87.5 | -1.8 | -7.2 |
| Q4 | 90.2 | -1.8 | -5.4 | 100.9 | -1.2 | -3.6 | 85.7 | -2.1 | -6.0 |
| **2014** | | | | | | | | | |
| Q1 | 89.3 | -1.0 | -4.9 | 100.5 | -0.4 | -2.9 | 84.6 | -1.3 | -5.8 |
| Q2 | 88.7 | -0.7 | -4.9 | 100.1 | -0.4 | -2.9 | 83.9 | -0.8 | -5.8 |
| Q3 | 88.3 | -0.5 | -3.9 | 100.4 | 0.3 | -1.7 | 83.4 | -0.6 | -4.7 |
| Q4 | 86.9 | -1.6 | -3.7 | 99.5 | -0.9 | -1.4 | 81.8 | -1.9 | -4.6 |
| **2015** | | | | | | | | | |
| Q1 | 86.1 | -0.9 | -3.6 | 98.4 | -1.1 | -2.1 | 81.1 | -0.9 | -4.1 |
| Q2 | 86.1 | 0.0 | -2.9 | 98.5 | 0.1 | -1.6 | 81.1 | 0.0 | -3.3 |
| Q3 | 86.3 | 0.2 | -2.3 | 99.5 | 1.0 | -0.9 | 81.1 | 0.0 | -2.8 |
| Q4 | 85.4 | -1.0 | -1.7 | 98.1 | -1.4 | -1.4 | 80.3 | -1.0 | -1.8 |
| **2016** | | | | | | | | | |
| Q1 | 85.2 | -0.2 | -1.0 | 97.9 | -0.2 | -0.5 | 80.1 | -0.2 | -1.2 |
| Q2 | 85.4 | 0.2 | -0.8 | 97.4 | -0.5 | -1.1 | 80.5 | 0.5 | -0.7 |
| Q3 | 85.5 | 0.1 | -0.9 | 97.4 | 0.0 | -2.1 | 80.6 | 0.1 | -0.6 |

(a)   data for the third quarter of 2016 are provisional. Time series should be subjected to revision as soon as new information (provided by Tax Office) will be available.

(b)   Istat makes available HPI data, from the indices referred to 2010, on the data warehouse I.Stat, in the Theme "Prices", Subtheme "House price index".

**For more detailed information, please refer to the Italian version**
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# House Price Index
# Methodological note

The House Price Index (HPI, see Italian IPAB) measures the evolution of market prices of all residential properties that are purchased by households (flats, detached houses, terraced houses, etc.), both new and existing, independently if bought for own-occupancy or as an investment. HPI covers transactions of dwellings carried out within the household sector and transactions made by the household sector with other institutional sectors. HPI compilation is based on final market prices that are paid by households and the price of land is included.

HPI is released quarterly and it is composed by the following two sub-indices:

- price index for new dwellings

- price index for existing dwellings.

The new indicator production is part of the Owner-Occupied Housing (OOH) Project coordinated by Eurostat. Housing price indices for OOH should be developed in the framework of the Harmonized Index of Consumer Prices (HICP). More specifically, the OOH index follows the net acquisitions approach; as a consequence only dwellings that are acquired by households for own use and that are new to the household sector are included. In fact the aim of the HICP is to provide a measure of the inflation perceived as a monetary phenomenon restricted to market transactions made by the household sector with other institutional sectors. Unlike HPI, the OOH will not cover all dwellings transactions because transactions carried out within the household sector are out of scope. Finally the price of the land is excluded.

HPI compilation follows methodological standards set out in the technical manual on Owner-occupied housing for HICP provided by Eurostat to ensure comparability of HPI indices across Member States. HPI indices are calculated using a chained Laspeyres formula. The chaining of the quarterly indices is carried out multiplying the indices (with six decimal figures) in the calculation basis (that is the fourth quarter of the previous year) of a given year by the indices (with six decimal figures too) of the fourth quarter of the previous year in the reference basis. The chaining is used for each HPI (the general one and those ones referred to existing and new dwellings), so that general HPI in the reference basis is not the results of the aggregation of the HPI, in reference basis, of both the components (existing and new dwellings): this is the reason why (in addition to the rounding to one decimal figure of all the indices in the reference basis), in some cases, the level of the index and the rate of change of general HPI is out of the range between the levels of the indices and the rates of changes of HPI of the two components.

The reference base year for all indices is 2010=100 and data, from the indices referred to 2010, are available on the data warehouse I.Stat, in the Theme "Prices", Subtheme "House price index".

HPI compilation for Italy is based on administrative data; in particular, prices of dwellings are gathered from notarial deeds of sales data provided by Tax Office. The development and the index production benefited and still benefits from experts' suggestions of the Observatory of Real Estate Market Office (belonging to Tax Office). HPI covers expenditure on purchases of dwellings carried out by households over the whole national

territory, excluding two provinces (Trento and Bolzano) that are regulated by a different cadastral system and that represent about 2.3% of Italian population.

Indices, measuring the market trend of dwellings prices, play a fundamental role orienting monetary and economic policies and for financial stability. In fact, HPI is one of the indicators in the Macroeconomic Imbalance Procedure (MIP) Scoreboard developed by European Commission together with the European Central Bank and Member States with the aim to prevent and correct macroeconomic imbalances within the European Union. On the other hand, housing price statistics belong to principal European Economic Indicators (PEEIs), a source of information for short-term economic analysis.

## Methodology for the calculation of indices

Calculation of Italian HPI is coherent with the recommendations of Eurostat technical manual.

First of all data are checked in order to detect possible outliers. Then the crucial step of HPI calculation is quality adjustment, which is necessary to make houses comparable during the time. As a matter of fact houses, that are sold and for which prices are observed quarterly, show different qualitative features and are located in different geographical areas and both (qualitative features and geographical location) affect the final prices paid by the households to purchase them. Therefore prices have to be "adjusted" taking into account the different qualitative features of the houses sold in each quarter, making them comparable, on a quality level, over time and allowing the detection of pure price changes (a milestone of the European approach to HICP that is also adopted for HPI).

For the quality adjustment a mix of data stratification and hedonic method of re-pricing has been adopted (this mix is classified by Eurostat as an A category, the best one, in the ranking of quality adjustment methods for house prices). Re-pricing method implies the use of a hedonic function to clean prices from the influence of qualitative features and geographical locations. Hedonic function is estimated for each year *y*, during the indices re-basement, through a regression model that uses the data of the previous year (*y-1*): estimated regression coefficients are kept constant for the whole reference year (*y*). AA model is estimated for each geographical area (North-west, North-east, Centre, South and Islands) and for new and existing houses separately (in order to guarantee a minimum amount of observations in each stratum, total strata are 240, whereof 192 are referred to the existing ones and 48 to the new ones). In the model, the main explicative variables are the following ones: a) natural logarithms of the surface, b) percentage of the surface of the house appurtenance, c) house typology, d) the floor; the dependent variable is the natural logarithms of the price per square metre. The general aggregate index is calculated as a weighted arithmetic average of stratum elementary indices where the weight of its stratum is proportional to its importance on the total expenditure of households to buy houses (weights are updated yearly and are estimated on the basis of the same data base used for processing price information).

## Indices rates of change calculation

Hereafter formulae for the calculation of quarterly, annual and annual average rates of change for HPI are described. The HICP formulae are applied to HPI.

The rate of change (QUR) of the index (*I*) of the quarter *q* with respect to the quarter *q-1* is calculated with the following formula[1]:

$$QUR(I_{q-1,y};I_{q,y}) = round\left\{\left(\frac{I_{q,y}}{I_{q-1,y}}100-100\right),1\right\}$$

The annual rate of change (AQR) of the index (*I*) of the quarter *q* with respect to the quarter *q* of the year *y-1* is calculated with the following formula:

$$AQR(I_{q,y-1};I_{q,y}) = round\left\{\left(\frac{I_{q,y}}{I_{q,y-1}}100-100\right),1\right\}$$

The annual average rate of change (AAR) of the index (*I*) of the year *y* with respect to the year *y-1* is calculated with the following formula:

$$AAR(I_{y-1};I_y) = round\left\{\left(\frac{\sum_{q=1}^{4}I_{q,y}}{\sum_{q=1}^{4}I_{q,y-1}}100-100\right),1\right\}$$

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[1] The extremes of the time interval in the formulae are expressed in chronological order, starting from the most remote one.

Analogous formulae are used to calculate the period (semester for example) average rate of change. As for HICP, annual and period average rates of change are calculated through the ratio of the sum of quarterly indices of the periods that are compared and rounding the results at the first decimal figure. This method, coherent with Eurostat standard, guarantees a better international comparability of the data disseminated.

## Weighting structure

In the Table 1 the weighting structure for new and existing dwellings is reported.

TABLE 1. WEIGHTS FOR NEW AND EXISTING DWELLINGS
Years 2010 - 2016, percentage values

| Typology | Weights* | | | | | | |
|---|---|---|---|---|---|---|---|
| | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 |
| New dwellings | 33.99 | 31.39 | 29.73 | 30.23 | 29.03 | 24.59 | 20.32 |
| Existing dwellings | 66.01 | 68.61 | 70.27 | 69.77 | 70.97 | 75.41 | 79.68 |
| **Total index** | **100.00** | **100.00** | **100.00** | **100.00** | **100.00** | **100.00** | **100.00** |

*The year is referred to indices; the weighting structure is based on notarial deeds of sales of the previous year.