

I Quarter 2022

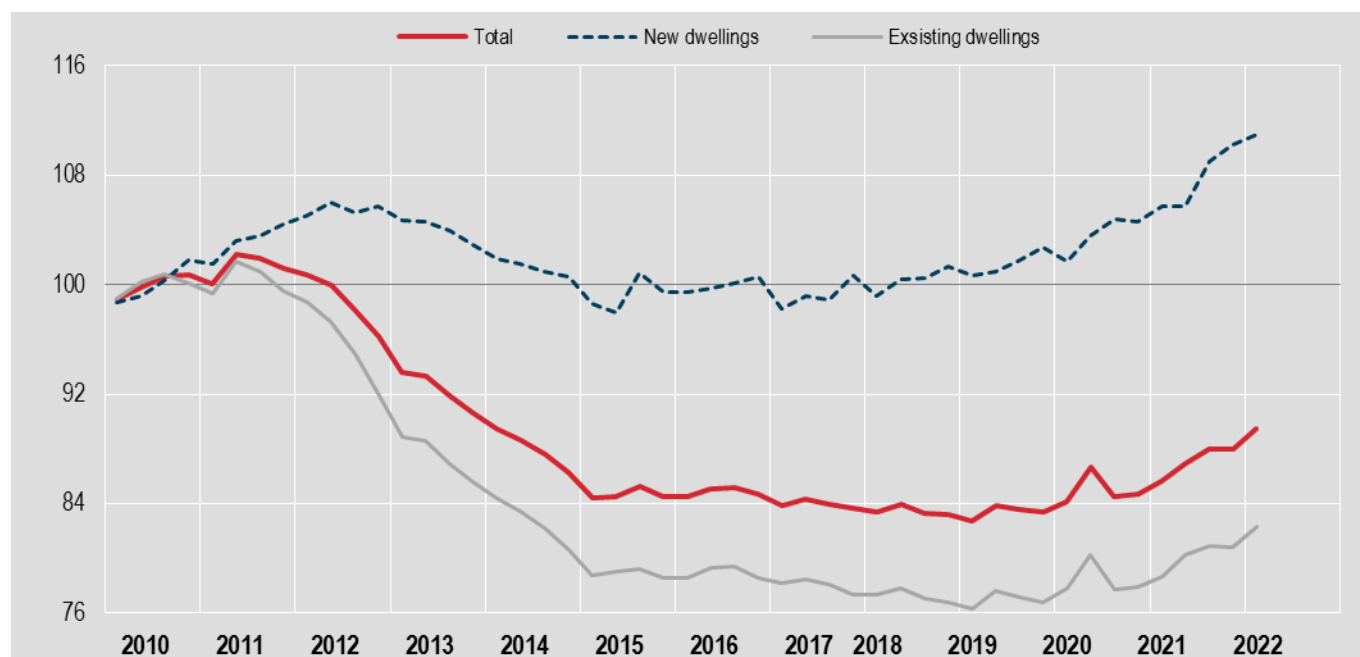
## HOUSE PRICES

Provisional data

- 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.
- According to preliminary estimates, in the first quarter of 2022 the HPI (see Italian IPAB) increased by 1.7% compared with the previous quarter and by 4.6% compared with the same quarter of the previous year (it was +4.0% in the fourth quarter of 2021).
- The increase on annual basis of HPI was due to both the prices of new dwellings, which grew by 5.0% (slightly slowing down from the previous quarter when it was +5.3%), and those of the existing dwellings that rose by 4.5% (a speed-up compared to +3.7% registered in the fourth quarter of 2021).
- The increase of HPI occurred in the context of a clear and persistent growth in sales volumes (it was +12.0% the annual rate of change registered for the residential sector in the first quarter of 2022 by the Observatory of Real Estate Market belonging to Tax Office, from +15.7% of the previous quarter).
- Also the increase on quarterly basis of the HPI was due to both the prices of new dwellings, that rose by 0.7%, and those of existing dwellings which increased by 1.9%.
- With the release of HPI for the first quarter of 2022, corresponding weights, as usual, are updated and disseminated. In particular, the weight of new dwellings amounts to 16.2% (it was about 35% in 2010) against 83.8% (it was about 65% in 2010) of the existing ones.

### CHART 1. HOUSE PRICE INDICES (HPI)

Q1 2010 – Q1 2022 (index, 2010=100) (a)



(a) The choice of 2010 as a base year is to be attributed only to graphic reasons. Data for Q1 2022 are provisional.

**TABLE 1. HOUSE PRICE INDICES HPI (NEW AND EXISTING DWELLINGS)**

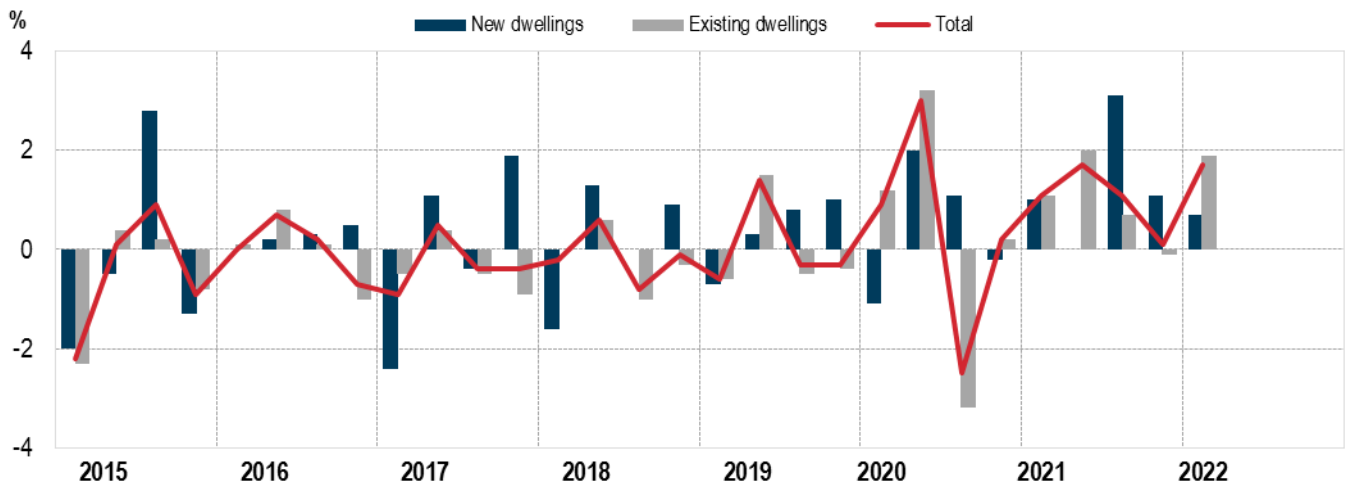
Q1 2022, indices, quarter on previous quarter and quarters on same quarters a year ago percentage changes (index, 2015=100)(a)

DWELLINGS TIPOLOGIES	Indices	Quarter on previous quarter	Quarters on same quarters a year ago
	Q1 2022	Q1 2022 Q4 2021	Q1 2022 Q1 2021
New dwellings	111.8	+0.7	+5.0
Existing dwellings	104.3	+1.9	+4.5
<b>Total</b>	<b>105.8</b>	<b>+1.7</b>	<b>+4.6</b>

(a) Data for Q1 2022 are provisional.

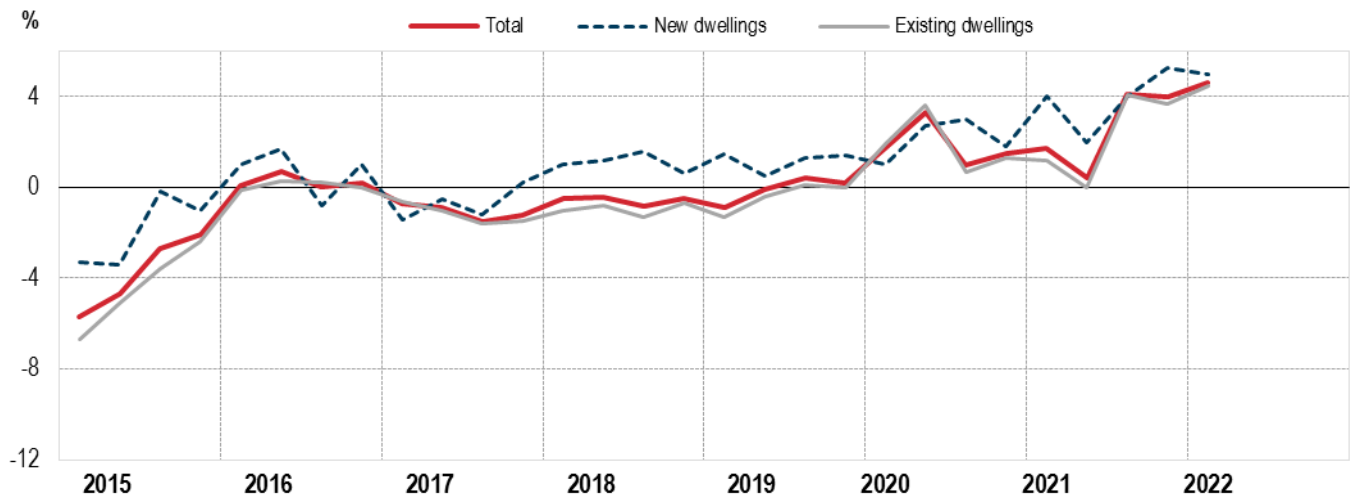
**CHART 2. HOUSE PRICE INDICES (HPI), QUARTER ON PREVIOUS QUARTER PERCENTAGE CHANGES**

Q1 2015 – Q1 2022, percentage values (index, 2015=100)



**CHART 3. HOUSE PRICE INDICES HPI, QUARTER ON SAME QUARTER A YEAR AGO PERCENTAGE CHANGES**

Q1 2015 – Q1 2022, percentage values (index, 2015=100)



**TABLE 2. HOUSE PRICE INDICES (HPI)**

Q1 2019 - Q1 2022, indices, quarter on previous quarter and on same quarter a year ago percentage changes (index, 2015=100) (a) (b)

PERIOD	TOTAL			NEW DWELLINGS			EXISTING DWELLINGS		
	Indices	Percentage changes		Indices	Percentage changes		Indices	Percentage changes	
		Quarter on previous quarter	Quarter on same quarter a year ago		Quarter on previous quarter	Quarter on same quarter a year ago		Quarter on previous quarter	Quarter on same quarter a year ago
<b>2019</b>									
Q1	97.7	-0.6	-0.9	101.4	-0.7	+1.5	96.8	-0.6	-1.3
Q2	99.1	+1.4	-0.1	101.7	+0.3	+0.5	98.3	+1.5	-0.4
Q3	98.8	-0.3	+0.4	102.5	+0.8	+1.3	97.8	-0.5	+0.1
Q4	98.5	-0.3	+0.2	103.5	+1.0	+1.4	97.4	-0.4	0.0
<b>2020</b>									
Q1	99.4	+0.9	+1.7	102.4	-1.1	+1.0	98.6	+1.2	+1.9
Q2	102.4	+3.0	+3.3	104.4	+2.0	+2.7	101.8	+3.2	+3.6
Q3	99.8	-2.5	+1.0	105.6	+1.1	+3.0	98.5	-3.2	+0.7
Q4	100.0	+0.2	+1.5	105.4	-0.2	+1.8	98.7	+0.2	+1.3
<b>2021</b>									
Q1	101.1	+1.1	+1.7	106.5	+1.0	+4.0	99.8	+1.1	+1.2
Q2	102.8	+1.7	+0.4	106.5	0.0	+2.0	101.8	+2.0	0.0
Q3	103.9	+1.1	+4.1	109.8	+3.1	+4.0	102.5	+0.7	+4.1
Q4	104.0	+0.1	+4.0	111.0	+1.1	+5.3	102.4	-0.1	+3.7
<b>2022</b>									
Q1	105.8	+1.7	+4.6	111.8	+0.7	+5.0	104.3	+1.9	+4.5

(a) Data for Q1 2022 are provisional.

(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".

**TABLE 3. HOUSE PRICE INDICES (HPI)**

2010 – 2021, indices and year on previous year percentage changes (index, 2015=100)

PERIOD	TOTAL		NEW DWELLINGS		EXISTING DWELLINGS	
	Indices	Year on previous year percentage changes	Indices	Year on previous year percentage changes	Indices	Year on previous year percentage changes
2010	118.1	-	100.8	-	126.8	-
2011	119.7	+1.4	104.0	+3.2	127.3	+0.4
2012	116.7	-2.5	106.3	+2.3	121.4	-4.6
2013	109.1	-6.5	104.8	-1.4	110.9	-8.7
2014	104.0	-4.7	102.0	-2.6	104.7	-5.5
2015	100.0	-3.8	100.0	-2.0	100.0	-4.5
2016	100.3	+0.3	100.7	+0.7	100.1	+0.1
2017	99.2	-1.1	100.0	-0.7	98.9	-1.2
2018	98.6	-0.6	101.1	+1.1	98.0	-1.0
2019	98.5	-0.1	102.3	+1.2	97.6	-0.4
2020	100.4	+1.9	104.5	+2.1	99.4	+1.9
2021	103.0	+2.5	108.5	+3.8	101.6	+2.2

This press release, in addition to the preliminary estimates of house price indices for the first quarter of 2022, provides the final estimates for the fourth quarter of 2020. In fact, at the time of first dissemination, between 76 and 88 days after the end of the reference quarter, all the notarial deeds of sale are not yet available and the indices are therefore provisional.

#### TABLE 4. HOUSE PRICE INDICES (HPI), REVISIONS

Q4 2021, indices and percentage changes (index, 2015=100)

DWELLINGS TIPOLOGIES	FLASH ESTIMATES				FINAL DATA			
	Indices	Percentage changes			Indices	Percentage changes		
	Q4 2021	Q4 2021 Q3 2021	Q4 2021 Q4 2020	2021 2020	Q4 2021	Q4 2021 Q3 2021	Q4 2021 Q4 2020	2021 2020
New dwellings	111.0	+1.1	+5.3	+3.8	111.0	+1.1	+5.3	+3.8
Existing dwellings	102.5	0.0	+3.9	+2.3	102.4	-0.1	+3.7	+2.2
<b>Total</b>	<b>104.0</b>	<b>+0.1</b>	<b>+4.0</b>	<b>+2.5</b>	<b>104.0</b>	<b>+0.1</b>	<b>+4.0</b>	<b>+2.5</b>

**New dwellings:** newly built dwellings or existing renovated dwellings sold by construction companies.

**Existing dwellings:** existing dwellings sold by the household sector or other institutional sectors.

**Acquired inflation:** represents the average change of the index in the indicated year if the index itself is assumed to remain at the same level as the last quarterly data available for the remainder of the year.

**HPI (Italian IPAB):** House Price Index covering new dwellings and existing dwellings that are new to the household sector, independently if purchased for housing purposes (for own-occupancy) or as an investment.

**HICP (Italian IPCA):** harmonized index of consumer prices, calculated according to the EU regulations.

**Hedonic method:** a regression model that expresses the observed price of the asset, in the period  $t$ , depending on the characteristics of the asset itself and a random component. The use of hedonic methods represents a solution to the problem of adjustment of the change in the quality.

**OOH Index:** House Price Index covering dwellings that are new to the household sector and are purchased for housing purposes.

## Introduction and regulatory framework

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. The observation field also includes all the transactions from household to household or from another institutional sector to household. The compilation of HPI 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:

- ▶ the price index of new dwellings;
- ▶ the price index of existing dwellings.

The production of the house price indices is governed by the Regulation (EU) No 2016/792 of the European Parliament and of the Council of 11 May 2016 on the harmonized indices of consumer prices and on the house price index and by the Commission Implementing Regulation (EU) 2020/1148 of 31 July 2020. The first experiments are part of the Owner-Occupied Housing (OOH) project, promoted by the Statistical Office of the European Commission Union (Eurostat), and aimed at producing price indices of dwellings that are new to the household sector, purchased by households for own use (Owner- Occupied Housing Index-OOH). More specifically, the OOH index is constructed following the net acquisitions approach. OOH index concerns the transactions that modify the stock of dwellings owned by the household sector, in accordance with the main purpose of the harmonized indices of consumer prices (HICP) that is to provide a measure of the inflation, intended as a monetary phenomenon for the transactions performed by households with other sectors.

Therefore, the OOH index, unlike the House Price Index (HPI), does not concern all residential property purchases, as real estate sales from household to household are not included in the observation field. In addition, the land price is excluded. The HPI series are calculated and released having, as reference base year 2015=100, in line with the other countries of the European Union and in compliance with the Regulation (EU) No 2016/792. The production of the HPI is performed on the basis of the “Survey on Residential Housing Prices (OOH Project)”, which is part into the 2020-2022 National Statistical Programme – approved by decree of the President of the Republic of 9 March 2022 and published in the Official Journal - general series - nr. 122 of 26 May 2022.

The guidelines provided by Eurostat were followed for the construction of the HPI in order to ensure the comparability of results between countries; recommendations are contained in a Technical Manual defining a conceptual framework and calculation methods which are common as well as consistent with the standards at the base of the HIPC calculation.

HPI indices are constructed using data from administrative sources; in particular data of the notarial deeds of sales held by the Agenzia delle Entrate (Tax Office) that has incorporated Agenzia del Territorio (Land Agency) from 1 December 2012 (art. 23c of Law Decree No 95/2012). In particular, the provision of the data occurs in the context of a Memorandum of Understanding between the Ministry of Economy and Finance, Fiscal Agencies and Istat, aimed at the management and development of the statistical information exchange system. Finally, the current procedure for the production of the indices could benefit and still benefits from the collaboration of the Central Directorate for Real Estate Market Observatory and Estimating Services (OMISE) of the former Land Agency.

## The Database

The notarial deeds of sales constitute the information source on which Istat bases the construction of the house price indices. The data of the deeds of sale have gained statistical importance for the purposes of calculation of the new indicators, thanks to the effects of important regulatory innovations that determine a greater consistency between the declared price and that effectively paid (art. 1, paragraph 497. Finance Law 2006; art. 1, paragraph 309, Finance Law 2007; art. 1, paragraphs 164 and 165, Finance Law 2008). In addition, notaries have to transmit online data on the real estate act using the Unified Online Form (MUI) within thirty days from the date of the act. This ensures the availability of a database promptly updated.

Starting from indices for the first quarter of 2018 Istat produces HPI using a new database more complete and timeliness than the previous coming from Tax Office. The availability of data for previous years allowed the revision of the entire time series (starting from the year 2010) and the production of HPI more detailed at territorial level.

The new data source is the “Database of property transaction”. Microdata starts from Tax register; information on subjects and characteristics of building coming from the Land Registry are provided by Tax Office. The company in charge of managing all the IT system of Tax Office arranges ad-hoc integration procedure. Also data coming from the real estate market observatory are provided.

The advantages of the administrative database lie in the possibility to identify the contractor, allowing the exact definition of the field of observation for both OOH and HPI, and the calculation of the HPI separately for new and existing dwellings.

The compilation of HPI is based on a subset of transactions involving Italian residential properties excluding those relating municipalities having a different cadastral system in particular: provinces of Trento and Bolzano; some municipalities of Veneto (2 municipalities), Lombardia (2 municipalities) and Friuli Venezia Giulia (44 municipalities).

Data used to estimate HPI concerns transactions involving residential properties and relating outbuildings (Land Registry categories from A1 to A11, excluding A10; categories C2, C6, C7 that is garage, parking spaces and basements). In accordance with OMI criteria, a new classification of outbuildings has been adopted

The availability of true prices registered into real estate acts excludes the possibility of evaluating the evolution of the prices established during the compromise (first binding contract); anyway, it remains an acceptable solution although it is known that time generally passes between the fixing of the property price and the signing of the contract. However, the price registered in the act fully satisfies the definitions of the HIPC, that require the price registration of the purchased property at the moment in which the buyer takes possession, specifically, at the moment in which the contract is signed.

From the territorial point of view, the coverage of the indices is nearly total and equal to 97,4% of the resident population in Italy on 1 January 2022.

## Index calculation methodology

The process followed for the construction of the new indicators is consistent with recommendations set out in the Eurostat technical manual. In particular, administrative data are subject to control procedures with the aim to identify missing data and outliers. The crucial phase of the HPI production process is represented by the quality adjustment that become necessary given the nature of the property for which the price is monitored. The dwelling, in fact, is a unique asset whose price may be observed only at the transaction moment; in addition, the heterogeneity of purchased dwellings is high and the geographic location contributes greatly to the formation of the market price. Problems of comparability of prices over time therefore arise and one of the fundamental prerequisites for the calculation of the consumer price indices (the necessity to follow the prices of properties with homogeneous characteristics) falls. The quality adjustments, therefore, allow the elimination of the qualitative variations of the property because the movement of “pure prices” can be measured.

Among the approaches that may be adopted, the joint use of the stratification and the hedonic method of *re-pricing* is considered the most appropriate (the method is classified as category A by Eurostat)<sup>1</sup>.

The *re-pricing* method entails the use of a hedonic function to clean the prices from the influence of the qualitative characteristics that may cause differences not due to real inflation. This hedonic function is estimated, normally, every year, at the time of re-basing, with a regression model that uses the previous year data; the estimated regression coefficients are maintained constant for the entire reference year<sup>2</sup>.

In detail, a model is estimated for 15 geographic areas and separately for the two housing categories (new and existent)<sup>3</sup>.

Among the characteristics of the dwellings used as explanatory variables, in addition to the location variables (including OMI zone), there are:

- the natural logarithm of the surface;
- the amount of outbuildings surface relative to the dwelling;
- dwelling type;
- floor level.

With reference to the size of properties, according to new criteria adopted by OMI, the surface data have been treated to take into account inconsistencies and anomalies.

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<sup>1</sup> Category A methods are those “which are considered to deliver the most reliable results, in terms of precision and bias” (Commission Regulation No 1334/2007 of 14 November 2007).

<sup>2</sup> For indices of the year 2022, regression coefficients estimated in 2021 were used.

<sup>3</sup> In more details: Piemonte, Val d’Aosta and Liguria; Veneto and Friuli Venezia Giulia; Umbria and Marche; Abruzzo and Molise; Puglia, Basilicata and Calabria; Sicilia and Sardegna; Lombardia; Emilia Romagna; Toscana; Lazio; Campania; Roma, Milano, Torino and Palermo. Previously a regression model is estimated for each of the 4 geographical areas (North-West, North-East, Center, South and Islands) and for existing and new dwellings separately.

The dependent variable is the natural logarithmic of the price per square meter.

The criteria adopted for the stratification differs between new and existing dwellings and guarantees a minimum number of observations per stratum. In total, the identified stratum are 104, of which 29 refer to new dwellings and 75 to existing dwellings.

The total index is obtained as a weighted average of stratum elementary indices; the used weighting coefficients reflect the weight, in terms of cost, of each stratum on the total weight. The weighing system is updated annually. The same database is used for the calculation of weights and of elementary price indices.

The formula for the calculation of the elementary price indices, for each stratum, adjusted for quality changes, using the *re-pricing* method is as follows<sup>4</sup>:

$$(1) \quad I_s^q = \frac{I_s^{non\ aggiustato}}{I_s^{EQI}} = \frac{\sqrt[n_q]{\prod_{i_s=1}^{n_q} P_{i_s}^q}}{\sqrt[n_0]{\prod_{i_s=1}^{n_0} P_{i_s}^0}} \bigg/ \frac{\exp(\sum_{j=1}^k \bar{X}_{j,s}^q \cdot \hat{\beta}^{ref})}{\exp(\sum_{j=1}^k \bar{X}_{j,s}^0 \cdot \hat{\beta}^{ref})}$$

Where the quality unadjusted price index ( $I_s^{non\ aggiustato}$ ), calculated as the ratio between geometric averages of observed prices, is corrected with the explicit index of quality change ( $I_s^{EQI}$ ) estimated using the results of the hedonic regression. In the previous formula:

- 0 is the base period (fourth quarter of the prior year);
- q is the reference quarter;
- s is the stratum;
- n<sub>q</sub> is the number of dwellings observed in quarter q;
- n<sub>0</sub> is the number of dwellings observed in quarter 0;
- $P_{i_s}^0$  is the price of the dwelling i belonging to the stratum s in the base period;
- $P_{i_s}^q$  is the price of the dwelling i belonging to the stratum s in the reference period;
- $\bar{X}_{j,s}^0$  is the average of the k characteristics in the stratum s of the base period;
- $\bar{X}_{j,s}^q$  is the average of the k characteristics in the stratum s of the reference period;
- $\hat{\beta}^{ref}$  is the vector of the coefficients of the hedonic regression.

HPI is calculated using the Laspeyres-type annually chained index; the chaining occurs by multiplying the quarterly indices based on calculation (fixed to the fourth quarter of the previous year) of a given year, rounded to six decimal places, for the fourth quarter indices of the previous year expressed in the reference base, also to six decimal places. The HPIs (general index and new and existing dwellings indices) in the reference base derive from the chaining of the corresponding series of indices based on calculation; by consequence, the general reference based HPI is not the result of the aggregation of the reference based price indices of the existing and new dwellings. For this reason, and since the reference indices are rounded to one decimal place, in some cases the index level and the percentage variation of the general HPI may be outside of the range defined by the level of the indices and by the percentage variations of the HPI of the two components.

## Weighting structure

<sup>4</sup> The formula makes reference to the index based on calculation that is then linked relative to 2015, which is the year used as reference base.



Every year, at the moment of the release of the first quarter indices, the weights for new and existing dwellings, used for HPI calculation, are updated on the basis of the sold and purchased dwellings. In particular, the data used is that of the notarial deeds for the year prior to the index reference year.

Table 1 shows the structure of the weights separately for the new and existing dwellings.

**TABLE 1. WEIGHTS FOR NEW AND EXISTING DWELLINGS**

Years 2010-2022, percentage values

DWELLINGS TIPOLOGIES	WEIGHTS*													
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	
New dwellings	34.84	31.61	29.63	30.15	29.02	24.68	20.95	20.23	18.70	16.56	16.74	16.75	16.15	
Existing dwellings	65.16	68.39	70.37	69.85	70.98	75.32	79.05	79.77	81.30	83.44	83.26	83.25	83.85	
<b>Total index</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>	

\* The year is the index reference year; the structure of the weights is based on data of the notarial deeds of the prior year

### Publication: timeliness and databases

The HPI dissemination by Istat occurs on a quarterly basis and in two successive time slots according to different data issue methods: preliminary estimate and definitive estimate. The release of the provisional indices occurs between 78 and 89 days after the end of the reference quarter, while the issue of the definitive data occurs when preliminary estimates of the following quarter are disseminated. The house price indices of the reference quarter are provisional and subject to revision since the entire database is not available at the moment of their first release.

The indices, both provisional and definitive, are released on a quarterly basis through the “Housing price” press release, available on the Istat website at <https://www.istat.it/en/information-and-services/journalists/release-calendar>. The release calendar is defined on the basis of the deadlines provided by the Regulations and in accordance with the publication standards (SDDS plus - Special Data Dissemination Standard plus) defined by the International Monetary Fund. The calendar is made available in December each year for the following year on the Istat website.

Revised indices are released next quarterly press release; HPI indices are also available on the Istat data warehouse (<http://dati.istat.it>) under the theme “Prices”, sub-theme “Housing prices”. The short-term and trend percentage variations, the average annual indices, the average annual variations and the annually calculated weights are released together with the quarterly indices.

Summary data and comments on the trend of housing prices are also contained in some editorial products published annually by Istat, such as the Statistical Yearbook and the publication Noi Italia.

In compliance with the [European Regulation No 792/2016](#), the data of the survey on housing prices are transmitted to Eurostat within 85 days from the end of the reference quarter. The main indicators, stored in the Eurostat database, are accessible at <http://ec.europa.eu/eurostat/data/database> (Theme “Economy and finance”, “Prices” and subject “Housing price statistics”).

The indices that measure the variation over time of housing prices have a widely recognized role for economic and monetary policies purposes and for the evaluation of financial stability. In fact, HPI is one of the indicators provided by the “Macroeconomic Imbalance Procedure” (MIP) Scoreboard (the control system developed at European level by the EU Commission together with the European Central Bank and the Member States, for the purposes of prevention and correction of macroeconomic imbalances). Moreover HPI is one of the *Principal European Economic Indicators* (PEEIs), a set of short-term indicators for the analysis and monitoring of the European short-term.

Quarterly HPI by geographical area (North-West, North-East, Central, South/Islands) and by three major cities (Milan, Rome and Turin) are released twice a year with the dissemination of the “Housing price” press release referred to the second and to the fourth quarter of each year. Time series starting from 2010 are available on the data warehouse I.Stat (<http://dati.istat.it>).

For technical and methodological information

**Federico Polidoro**

Phone: +39 06 4673 2307

[federico.polidoro@istat.it](mailto:federico.polidoro@istat.it)

**Orietta Patacchia**

[orietta.patacchia@istat.it](mailto:orietta.patacchia@istat.it)