



Quality report on residential property price indices on the basis of data provided by bulwiengesa AG¹

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¹ Price indices are calculated by the Bundesbank. In addition to price data supplied by bulwiengesa AG, data from the Federal Statistical Office and vdpResearch GmbH are used.

1. General information on the statistics

1.1 Reporting group

The reporting group comprises the prices of all dwellings sold in Germany as individual properties. These encompass apartments as well as detached and terraced single-family houses. By contrast, multiple-family dwellings sold as one unit are excluded. The price covers the building and the plot or the share of a building and plot, including VAT. Not included are the additional costs associated with buying and selling property (e.g. real estate transfer tax, fees for notaries and land registry entries as well as estate agents).

1.2 Statistical units

The statistics are based on the estimates supplied by bulwiengesa AG regarding prices of typical properties. Properties classed as typical are apartments with 65-95 square metres of living space, terraced (mid-terrace) houses with 100-120 square metres of living space and detached single-family houses with 150-200 square metres of living space. It is assumed that properties are attached to plots of corresponding size in average to good locations and come with fixtures and fittings that would generally be interpreted as providing comfortable living conditions.

In the case of apartments and terraced houses, a distinction is made between new builds and pre-owned properties. In the case of detached single-family houses, only price data from resales are available.

The average price level for each district and (district-free, i.e. independent) city is reported. Included in the calculations is the price per square metre, with the midway point of the living space range for each type of properties being used as the standard living space for that property type, i.e. 80 square metres for an apartment, 110 square metres for a terraced house and 175 square metres for a detached single-family house.

1.3 Geographical coverage

The basic data cover the territory of the Federal Republic of Germany in its entirety. Using the price data for the 401 administrative districts, it is possible to calculate the aggregates for Germany as a whole. Added to these are all of the sub-aggregates based on the administrative district breakdown. There are also data for 61 towns and cities belonging to a district, which, together with the data for 66 district-free towns and cities, are used to calculate indices for city groups.

1.4 Reporting period

The reporting period is the current calendar year.

1.5 Frequency

The statistics are collected at annual intervals. Price indices calculated on the basis of basic data providing comparable regional and property-specific coverage and using the same methodology are available from the 2003 reporting year onwards. Earlier time periods – going back as far as 1975 – are also covered by price indices based on price data provided by

bulwiengesa AG. However, these differ in terms of methodology (e.g. weighting) and regional coverage; see Section 6 for details.

1.6 Legal basis

The residential property price indices on the basis of price data provided by bulwiengesa AG are compiled by the Bundesbank as part of its mandate under the Bundesbank Act (*Gesetz über die Deutsche Bundesbank*) and the Financial Stability Act (*Finanzstabilitätsgesetz*). In addition, in accordance with Council Regulation (EU) No 1096/2010, the European System of Central Banks (ESCB) is tasked with lending the European Systemic Risk Board (ESRB) statistical support in the area of real estate price statistics, too.

1.7 Confidentiality

The basic data supplied by bulwiengesa AG are licensed and subject to confidentiality. The publication of aggregate price indices which do not allow any direct references to be made to the individual data is permitted.

1.8 Quality assurance

The data provided by bulwiengesa AG are checked for completeness. In addition, plausibility checks are carried out to ensure internal consistency and data accuracy. Abnormalities are discussed with the data supplier.

2. Contents and users

2.1 Published contents

It is standard procedure for price indices to be published for Germany, 127 towns and cities and its seven major cities.² Indices are available for all property types and broken down into apartments and houses (i.e. detached or terraced houses) for both Germany and the aforementioned city groups. In addition, results are published separately for new builds and pre-owned properties. The publication of special calculations (e.g. specific regional delineation) is also possible.

2.2 Purpose of the statistics

Residential property price indices are an integral part of reporting on the situation in the real estate markets, which is incorporated into macroeconomic analyses and forecasts as well as studies of financial stability.

Together with the official house price index (HPI) and indicators supplied by private sector providers (e.g. price indices for owner-occupied housing published by the Association of German Pfandbrief Banks (*Verband deutscher Pfandbriefbanken*)), residential property price indices based on price data provided by bulwiengesa AG form a broad-based information system on price movements in the German residential property market. The multi-indicator approach is expedient because all price indices currently published contain statistical

² These are Berlin, Hamburg, Munich, Cologne, Frankfurt am Main, Stuttgart and Düsseldorf.

uncertainties due to data gaps and methodological challenges, particularly in connection with the heterogeneity of the real estate markets; see also Section 7.

3. Methodology

The objective here is to measure the “pure” change in residential property prices over time. In order to extract the pure price component from the observable market values, they need to be adjusted for effects that are attributable to changes in the composition of properties sold in terms of size, location, age, fixtures and fittings, and other price-determining factors.

The price data provided by bulwiengesa AG concern typical properties whose characteristics remain unchanged over time. This means that the prices reported are not the ones directly observed on the market but rather expert assessments for normalised properties. From a methodological perspective, this is a case of quality adjustment based on expert judgement. This is a recognised method in price statistics which has an advantage over explicit methods (e.g. hedonic regression), particularly when the reporting sample is especially heterogeneous and there is limited data availability.³

The price indices are calculated using the Laspeyres formula. A weighting scheme that remains constant over several years is determined for the base period. Price indices may be calculated on either a transaction-weighted or a stock-weighted basis.⁴ Transaction weightings are regularly updated every five years; stock weighting, every ten years.

Transaction weighting

The basis of the data for transaction weighting is the data provided by vdpResearch GmbH on purchase transactions for apartments as well as single-family and two-family houses sold, broken down by administrative district and district-free town or city. This information is derived from evaluations of market reports by the relevant expert committees of property valuation (*Gutachterausschüsse*), with allowances made to adjust for the systematic under-recording of market activities. As from the 2015 reporting year, purchase transactions averaged over the 2015 to 2017 period are used for calculation; prior to 2015, the average of the years from 2010 to 2012.

Weighting is based specifically on the take-up of space, which is determined by multiplying the purchase transactions for each property type by their corresponding standard living space; see Section 1.2.

The weights for cities belonging to a district – essential for calculating price indices by city group – are, owing to a lack of original data, calculated taking into account stock data as a substitute under the assumption that the ratio of purchase transactions in districts to those in cities belonging to a district is the same as the ratio for existing real estate. An assumption of

³ See Eurostat, Handbook on Residential Property Price Indices (RPPIs), 2013 edition, Luxembourg: Publications Office of the European Union.

⁴ The price indices reported in the February issue of the Monthly Report are transaction-weighted.

proportionality is also made when determining the weights of detached and terraced single-family houses.

The weights for new builds and pre-owned properties can be determined using the corresponding weighting shares in the HPI. However, no regional breakdown is available. The HPI weighting shares are averaged over the 12-month period which is also applied as the reference period used to derive the weighting for aggregating the regional units.⁵

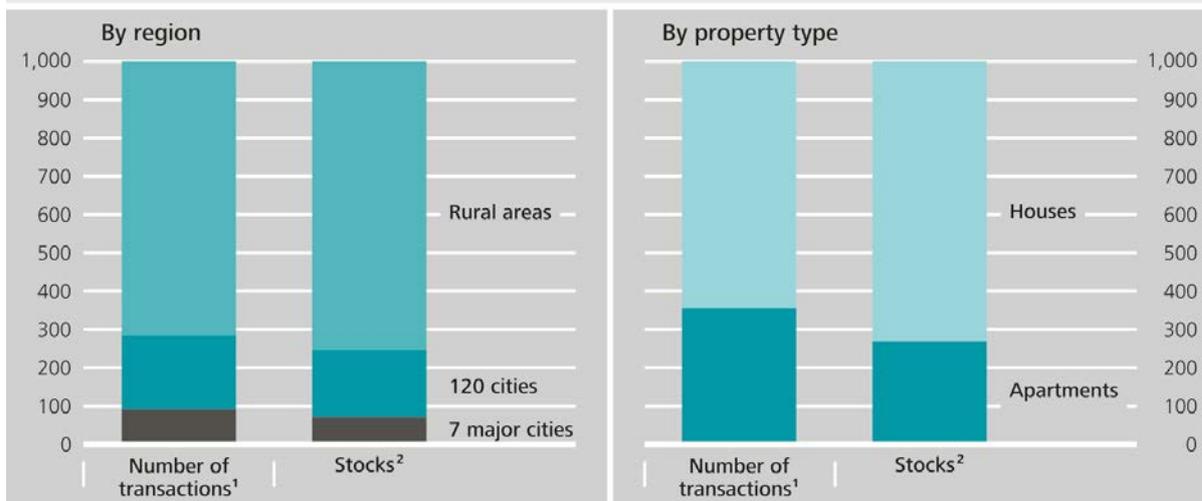
Stock weighting

Stock weighting is based on data from a complete census of existing buildings and housing conducted as part of the 2011 census, the deadline for which was 9 May 2011. Use is made of data on living space in apartments in residential buildings containing one apartment, broken down by construction type (detached house, semi-detached house and terraced house), and in apartments in residential buildings divided up according to the Act on Cooperative Apartments and Proprietary Leases (*Wohnungseigentumsgesetz*). The aforementioned transaction-based HPI weights are applied in the same manner for all regional units and property types to provide a breakdown into first-time occupancies and resales.

⁵ As the HPI is calculated on the basis of European guidelines as a chain index, the weighting shares for new builds and pre-owned properties change annually. For a precise description of how the weights are derived, see J. Dechent, Preisindizes für Wohnimmobilien, *Wirtschaft und Statistik*, November 2011, pp. 1126-1134.

Real estate transactions and stocks in Germany

Weights in ‰



1 Average for the years 2015 to 2017. Source: vdpResearch GmbH. **2** Space available according to 2011 Census. Deutsche Bundesbank

4. Accuracy and reliability

4.1 Accuracy of the bulwiengesa AG price data

The price data provided by bulwiengesa AG are gathered from in-depth market monitoring, which forms a key basis for the data provider's appraisal activities and other services. Primary and secondary sources feed into its market monitoring.

The core primary source is an annual survey among bulwiengesa AG's contacts about the prices of typical properties in the 127 towns and cities. A group of experts (e.g. real estate agents, real estate experts at banks, project developers, investors), which is kept as fixed as possible, use a standardised questionnaire to submit their assessments; these are sent out and evaluated in autumn of each reporting year. To gain a comprehensive picture of the market situation, prices are requested for the upper, middle and lower segments. In addition, the number of local contact persons generally increases in step with the size and heterogeneity of the sub-markets. The questionnaires are evaluated by experts from bulwiengesa AG, who have a good understanding of their assigned regional markets and who run quality control and a plausibility check on the data. Centrally managing the evaluations also ensures the regional comparability of the data.

Secondary sources include evaluations made by expert committees of property valuation, pertinent publications by market participants, and analyses of the real estate market (e.g. price comparisons, appraisals). List prices (e.g. from the online real estate platform Immoscout24) serve as a guide, with corrections for systematic deviations between list prices and transaction prices.

The price data for residential real estate in the 312 administrative districts are based on a smaller stock of information. Compared with the 127 towns and cities, there are fewer local contact persons, and information is not procured regularly and systematically by way of

questionnaires. Greater weight is given to the analysis performed by bulwiengesa AG experts, who draw on surveys among contact persons as well as secondary sources.

bulwiengesa AG's own appraisal activities serve as an additional data source, by means of which information provided by those commissioning the appraisals is obtained as additional information about the real estate market.

4.2 Accuracy of the weighting

The data used to derive the stock weighting are taken from the 2011 census of buildings and apartments, which was a complete survey carried out by the Federal Statistical Office. The data can therefore be considered high quality.⁶ The stock weighting can be deemed accurate.

The main data source for the transaction weighting is the information provided by vdpResearch GmbH on purchase transactions for apartments as well as single-family and two-family houses sold. This information is gathered by vdpResearch GmbH from surveys which are conducted by expert committees of property valuation and are known to have gaps. These gaps are filled by vdpResearch GmbH using statistical extrapolation procedures. Furthermore, in the absence of sufficiently disaggregated data on purchase transactions, some use is made of stock ratios, and there is assumed to be proportionality between transactions and stocks of existing real estate. Overall, the derivation of the transaction weighting is associated with uncertainties. The transaction weighting is thus less accurate than the stock weighting.

4.3 Revisions

The price indices are subject to revisions stemming from changed price data from bulwiengesa AG (current revisions) and necessitated by rebasing, updated weighting or methodological changes in the index calculation (general revisions).

Current revisions

The concept of expert-based price estimation inherently entails that price data may change over time, because experts typically gain a better view of the market situation as time progresses. On the one hand, this can mean that individual price reports initially classified as outliers are later incorporated into the assessment of the underlying tendency. On the other hand, it may turn out that specific price signals were rashly interpreted as part of a broad dynamic.

Changes in bulwiengesa AG's basic data result in revisions of the price indices. New calculation bases for reporting periods already covered by statistics are usually announced in conjunction with the publication of data for a new reporting year. Current revisions are predominantly restricted to the period up to three years after publication of the first figure.

Given that comparable real-time data are available only from the 2014 reporting year onwards, revision measures have to be interpreted with caution. In the evaluation period, the first releases of the residential property price index in Germany were adjusted by, on average, ¾%

⁶ See Federal Statistical Office, Gebäude- und Wohnungszählung 2011, Qualitätsbericht, Wiesbaden, 2016.

on the year. There tended to be additional upward adjustments in the second and third year. This is also the magnitude of the revisions of the price indices for the important city groups (127 towns and cities and seven major cities).

General revisions

General revisions of the price indices occur at multi-year intervals. A distinction needs to be made between scheduled weighting recalculations and methodological adjustments. As regards the updates to weightings conducted at five-year and ten-year intervals, the index levels are revised back to the relevant base year. Where changes in the methodology are concerned, often the entire time series are affected.

The residential property price indices based on bulwiengesa AG price data were first published using the currently valid calculation standards and weighting schemes in February 2015. The time series provided go back to 2004. The transaction weighting was updated on schedule when the 2019 reporting year was published, with the index levels being updated up until 2015. In August 2018, there was a methodological adjustment which took into account the fact that the data supplied by bulwiengesa AG on prices of terraced houses in 312 administrative districts are not to be included in the index calculation owing to quality issues. The revisions affected all of the time series, but were quantitatively small. For example, the adjustments to the annual rates of change for residential property prices in Germany as a whole were at a close interval of -0.3 to +0.2 percentage point.

The price indices provided prior to the general revision in February 2015 were based on other definitions and calculation concepts owing to considerable gaps in the data concerning not just the price data but also, in particular, the information base for the weighting. Reporting periods prior to 2004 can only be covered by the price indices calculated in this way. For more information, see the comments in Section 6.

5. Currency and timeliness of data

The price indices for the two city groups (127 towns and cities, seven major cities) along with the first results for the current reporting year are published at the same time as the February issue of the Bundesbank's Monthly Report in the following year. In the past five years, these have been published between 12 and 20 February. Given the publication lag of t+40 to t+50 days, the price indices based on bulwiengesa AG data for these city groups are among the earliest available information on price developments in the residential property market in the respective preceding year.⁷ The target publication date has so far always been achieved.

The price indices for Germany as well as for the sub-aggregates, which are based on an administrative district breakdown, are normally published one to two months later. In the past five years, the publication date has ranged from 30 March to 12 April.

⁷ vdpResearch GmbH publishes its price indices virtually simultaneously. The HPI is currently published around one month later (t+85 days).

6. Comparisons over time

The price series, which begin in the 2004 reporting year, are classed as homogeneous in terms of the basic data and methodology. Against these criteria, price indices have been comparable over time since 2004. Part of the index concept is to use the most up-to-date weights possible, to ensure representativeness. Due to their design, the scheduled adjustments to the weighting mean that the annual rates of change in the respective base years are not exclusively founded on pure price changes. However, the weighting adjustment effect is likely to be generally very small. To wit, according to current data, the annual rate of change in the residential property price index in Germany for 2015 is 6.7%. Prior to the update of the weighting – with the basic data being otherwise identical – it stood at 6.9%.

In addition, there are price series that were compiled using the definitions and calculation concepts valid up until the general revision in February 2015. Price indices of this kind are shown for two city aggregates (125 towns and cities, seven major cities) and various property types. They use population weighting. The price series begin in the 1995 reporting year and end in 2003. If required, price indices consistent with these and running up to the current end are made available.

Long series based on bulwiengesa AG price data run until 1975. There is limited comparability of the price indices in the period from 1975 to 1994. This is mainly due to changes in the composition of the city aggregates (1975-89: 50 West German towns and cities including Berlin-West; 1990-94: 100 western German towns and cities including Berlin-West) as well as ambiguity surrounding the configuration of typical properties.

7. Comparisons with other statistics

The residential property price indices based on bulwiengesa AG price data are among the price indicators for the German residential property market that the Bundesbank uses for analytical purposes as part of its multi-indicator approach. The price indices differ from the HPI and the price indices of private providers with respect to a host of statistical criteria, particularly periodicity, currency, price collection concept, index calculation, and regional as well as property-specific disaggregation.

One noted advantage of the price indices based on bulwiengesa AG data is that price movements can be shown for a large number of defined regions and by property type. Additionally, the time series using data from this source extend further back than any other price indicator. This means that it is essentially possible to compare prices over longer periods – no further back than 1975 – albeit accepting some dips in accuracy owing to heterogeneous basic data and methodology-based changes. One disadvantage is that only annual price data are available.

The bulwiengesa AG price data are based on expert assessments for typical properties. By contrast, alternative price indices, such as the HPI or the results of vdpResearch GmbH, are based on prices actually paid in real estate sales. Transaction prices are generally considered the best data source for price statistics. However, quality adjustment is a challenge given the heterogeneity of the properties being bought and sold. If, for example, the explicit quality

adjustment is associated with major statistical uncertainties where limited data are available, it may be advantageous to employ price estimation for typical properties based on quality adjustment using expert judgement.

8. Publications

In addition to the regular publication of the initial results of the price indices for the two city groups (127 towns and cities and seven major cities) in the February issue of the Bundesbank's Monthly Report, the aggregated time series are also available on the Bundesbank's website as part of the system of indicators for the German residential property market and in the time series database.

Further information on the residential property price indices based on bulwiengesa AG data can be found in the following publications, to name a few:

Deutsche Bundesbank, Price indicators for the housing market, Monthly Report, September 2003, pp. 45-58.

Leifer, Hans-Albert (2004) Preisindikatoren für Wohnimmobilien in Deutschland, Allgemeines Statistisches Archiv 88, pp. 435-450.