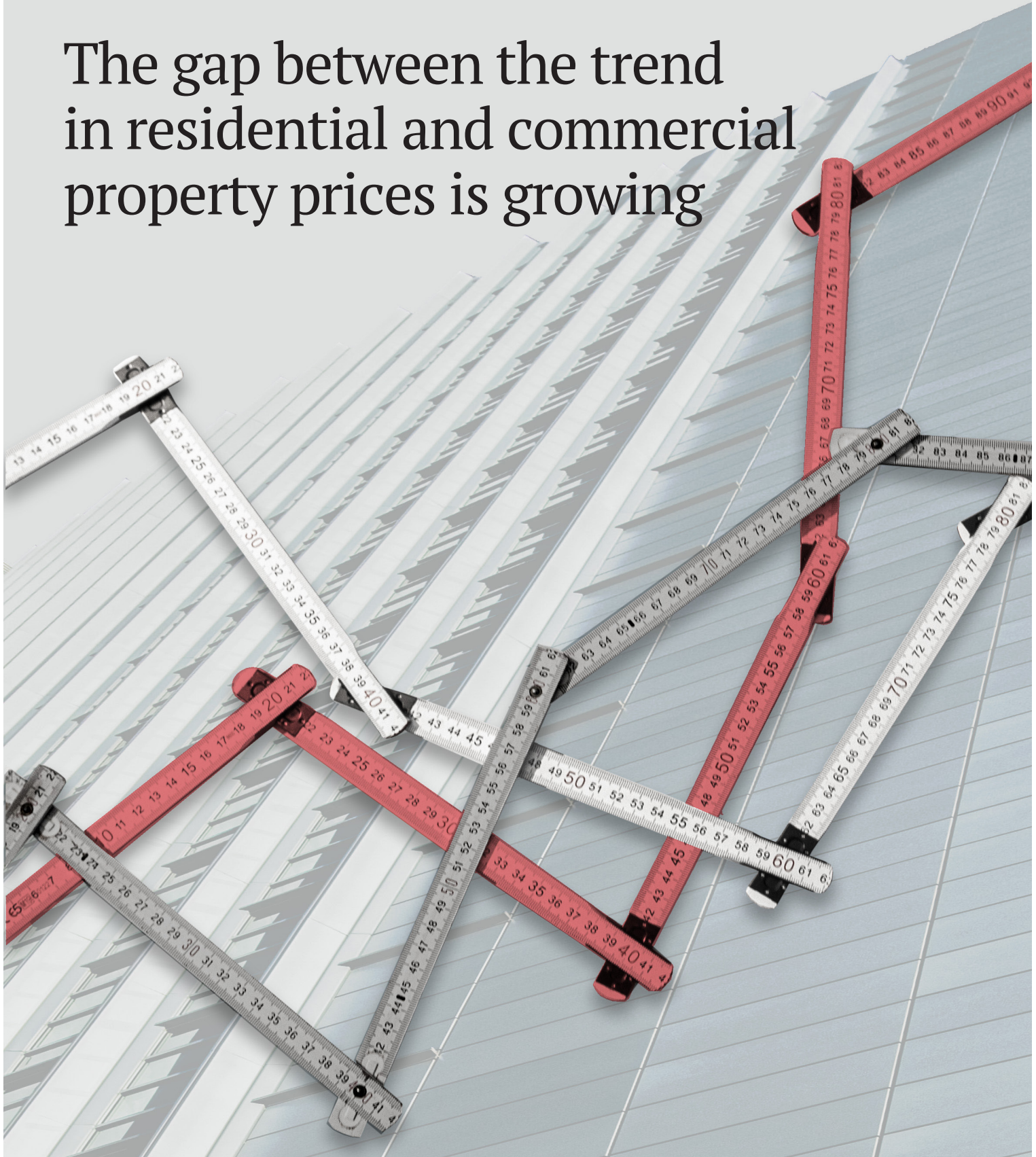




Real Estate-
INDEX
Q4.2020

The gap between the trend
in residential and commercial
property prices is growing



Market as a whole

Despite the COVID-19 pandemic, the vdp property price index, which is based on actual transaction data, reached another record high during the fourth quarter of 2020, increasing 6.0% year on year to 172.8 points. The new record high for the overall index conceals significant differences in trends in the underlying subindices for residential and commercial prop-

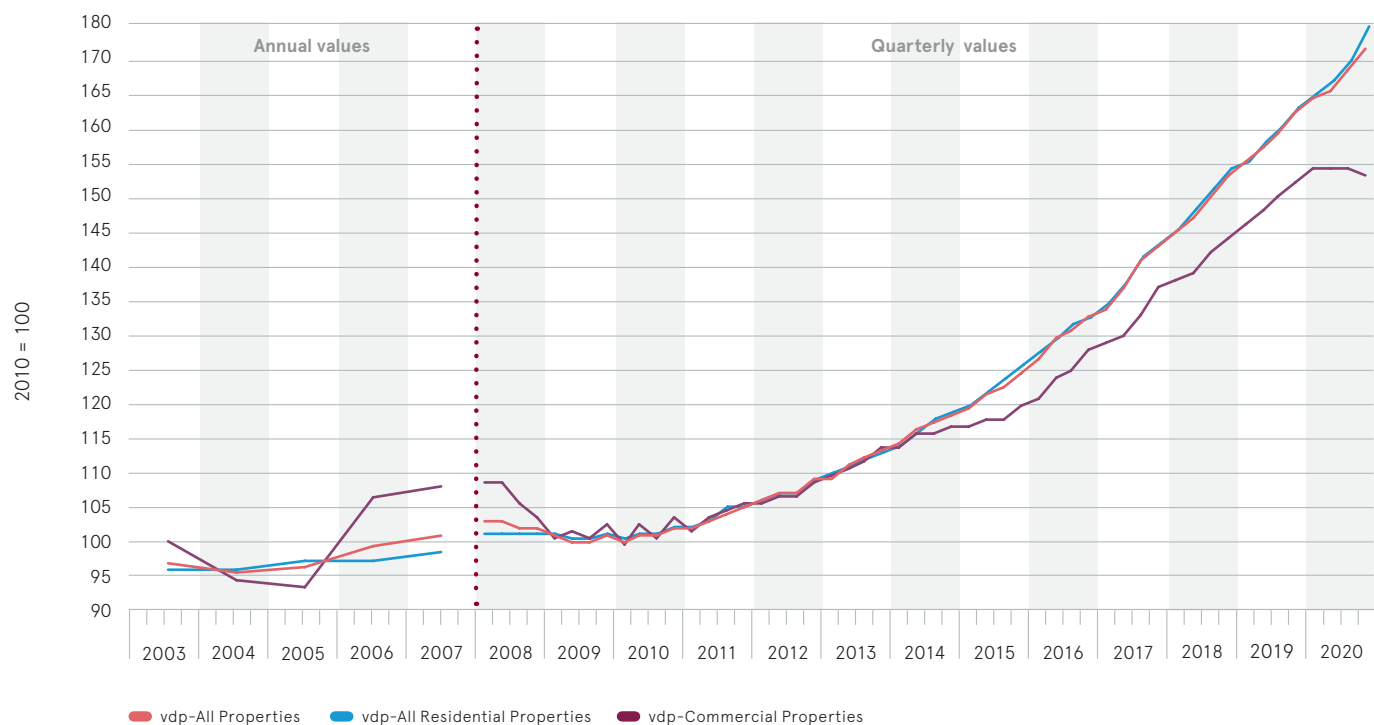
Market as a whole:

+6,0%

erties since the pandemic began: while prices for residential properties have increased by 7.5% year on year, prices for commercial properties during the same period were flat, increasing by only 0.6%.

Fears expressed at the start of the pandemic regarding a possible collapse in prices on the German property market have not yet materialized. However, it is increasingly obvious that the longer it takes to control the pandemic in a sustainable way by vaccinating broader swathes of the population, the more government efforts to control the outbreak are going to have negative consequences for commercial property markets, in particular.

The gap between the trend in residential and commercial property prices is growing



Index: 2010 = 100

Year	All properties		All residential properties		All commercial properties	
	Index	y-o-y change in %	Index	y-o-y change in %	Index	y-o-y change in %
2011	102.7	2.6	102.7	2.7	102.4	2.4
2012	106.4	3.7	106.7	3.8	105.5	3.0
2013	110.7	4.1	110.9	3.9	110.4	4.6
2014	115.9	4.7	116.4	5.0	114.6	3.8
2015	121.7	5.0	123.3	5.9	117.0	2.1
2016	129.5	6.4	131.4	6.5	123.7	5.8
2017	138.3	6.8	140.5	6.9	131.8	6.5
2018	149.4	8.0	152.2	8.3	140.7	6.8
2019	159.0	6.4	162.0	6.5	149.7	6.4
2020	168.4	5.9	173.0	6.8	154.3	3.1

Index: 2010 = 100

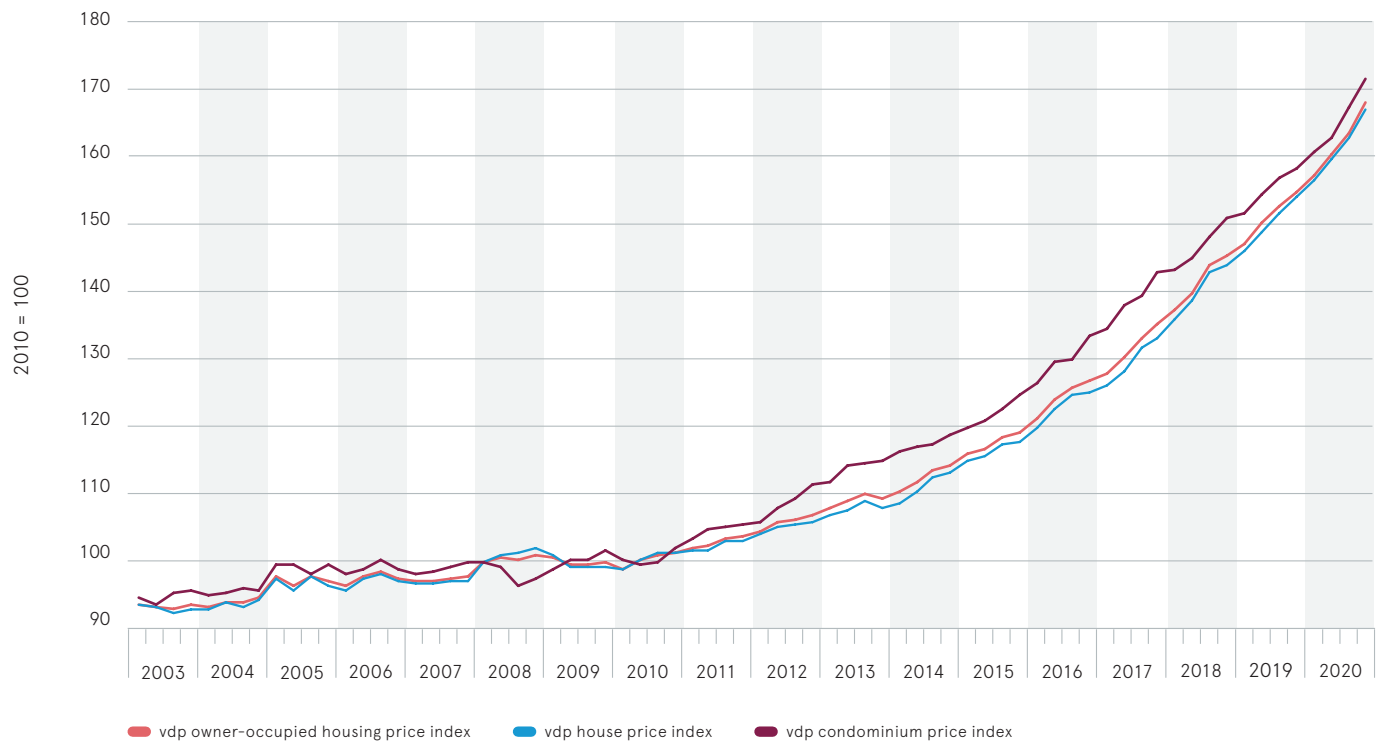
Quarter	All properties		All residential properties		All commercial properties	
	Index	y-o-y change in %	Index	y-o-y change in %	Index	y-o-y change in %
Q1 2019	155.4	7.0	158.2	7.0	146.7	6.7
Q2 2019	157.7	6.7	160.7	6.6	148.4	6.8
Q3 2019	159.7	5.9	162.6	5.8	150.4	5.9
Q4 2019	163.1	6.3	166.4	6.4	153.1	6.0
Q1 2020	165.1	6.3	168.5	6.5	154.7	5.4
Q2 2020	166.4	5.5	170.3	6.0	154.2	3.9
Q3 2020	169.3	6.1	174.2	7.1	154.3	2.6
Q4 2020	172.8	6.0	178.9	7.5	154.1	0.6

Housing market

Residential property prices ended 2020 7.5% higher than in the fourth quarter of 2019. Owner-occupied housing prices rose 8.5% year on year. Since the introduction of social distancing in the first quarter of 2020, prices have increased by 6.8%. Single-family houses and duplexes followed almost identical trends, with increases of 6.8% and 6.9%, respectively (8.5% and 8.4% compared to the previous year). In spite of the tough economic environment and the associated uncertainty of households regarding jobs and disposable income, so far the pandemic has caused prices to increase. Demand for housing continues to be high, due to persistently low lending rates and the lack of investment alternatives.

Over the same period, prices for multi-family homes rose by 6.7%. These continue to be attractive to property investors, despite the high price levels reached in many large cities, because they have a lower risk of rent default compared with commercial properties. The cap rate decreased by 3.6% compared to the prior-year quarter. For rents under new contracts, the trend towards a slowdown in rent increases continued, with rents up by 2.8% compared to the fourth quarter of 2019.

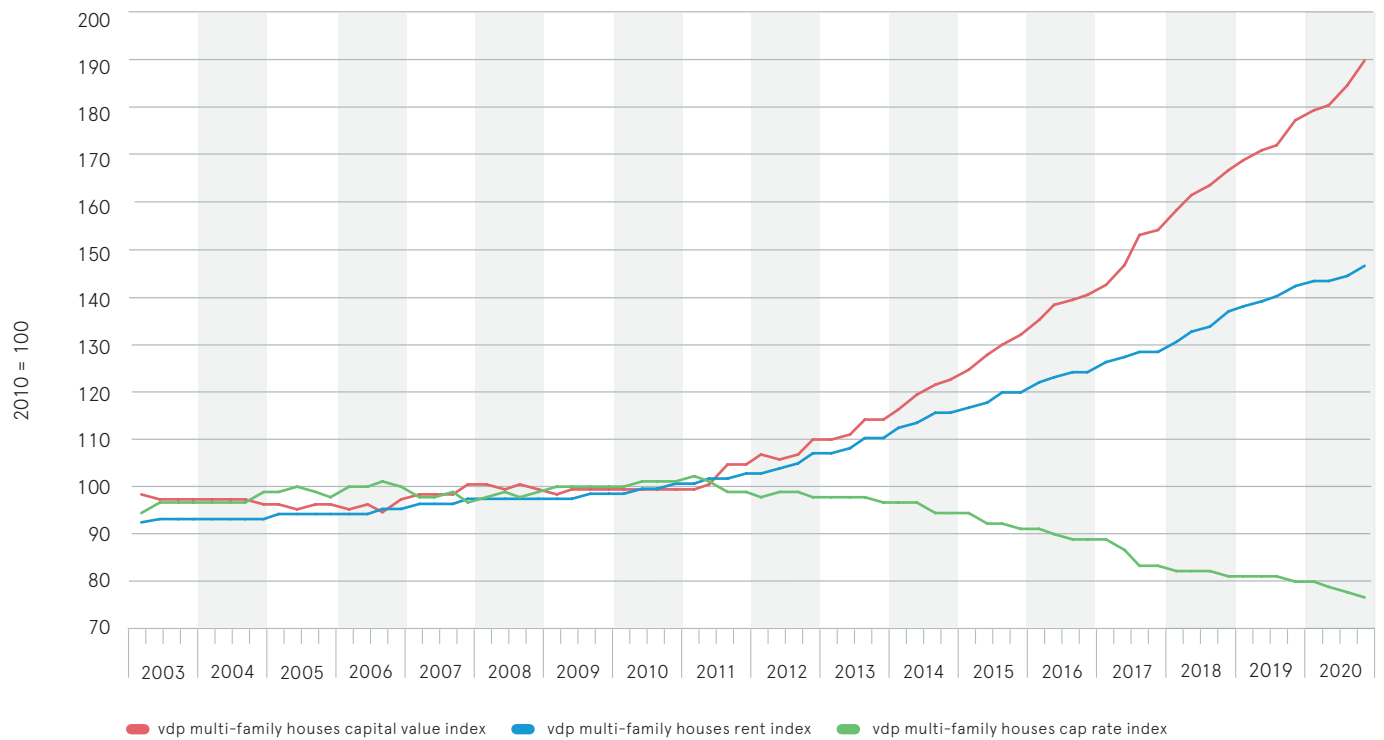
Demand for owner-occupied housing continues to be high



Year	Owner occupied housing		Single family houses		Condominiums	
	Index	y-o-y change in %	Index	y-o-y change in %	Index	y-o-y change in %
2011	102.4	2.4	101.9	1.9	104.3	4.3
2012	105.5	3.0	104.7	2.7	108.3	3.9
2013	108.7	3.1	107.5	2.6	113.6	4.9
2014	112.1	3.1	110.8	3.1	117.0	3.0
2015	117.2	4.6	116.0	4.7	121.7	4.0
2016	124.2	6.0	122.8	5.8	129.6	6.5
2017	131.4	5.8	129.6	5.5	138.5	6.8
2018	141.5	7.7	140.2	8.2	146.6	5.8
2019	151.0	6.8	150.0	7.0	155.2	5.9
2020	162.2	7.4	161.4	7.6	165.6	6.7

Quarter	Owner occupied housing		Single family houses		Condominiums	
	Index	y-o-y change in %	Index	y-o-y change in %	Index	y-o-y change in %
Q1 2019	146.9	7.2	145.8	7.4	151.5	6.0
Q2 2019	149.9	7.3	148.8	7.6	154.3	6.4
Q3 2019	152.5	6.0	151.4	6.0	156.9	6.1
Q4 2019	154.8	6.6	153.9	6.9	158.3	5.1
Q1 2020	157.2	7.0	156.4	7.3	160.5	6.0
Q2 2020	160.2	6.8	159.5	7.2	162.9	5.6
Q3 2020	163.6	7.3	162.6	7.4	167.4	6.7
Q4 2020	168.0	8.5	167.1	8.5	171.1	8.4

Investors continue to focus on multi-family housing



Index: 2010 = 100

Year	Capital value		Residential rents		Cap rate	
	Index	y-o-y change in %	Index	y-o-y change in %	Index	y-o-y change in %
2011	103.0	3.0	102.1	2.1	99.1	-0.9
2012	107.9	4.8	104.8	2.7	97.1	-1.9
2013	113.1	4.8	109.3	4.2	96.6	-0.5
2014	120.8	6.8	114.5	4.8	94.8	-1.9
2015	129.5	7.3	118.9	3.9	91.8	-3.2
2016	138.7	7.1	123.7	4.0	89.1	-2.9
2017	149.7	7.9	127.7	3.2	85.3	-4.3
2018	163.2	9.0	133.6	4.6	81.9	-4.0
2019	173.2	6.2	139.6	4.5	80.6	-1.6
2020	184.0	6.2	144.3	3.3	78.4	-2.7

Index: 2010 = 100

Quarter	Capital value		Residential rents		Cap rate	
	Index	y-o-y change in %	Index	y-o-y change in %	Index	y-o-y change in %
Q1 2019	169.8	6.9	137.7	5.2	81.1	-1.6
Q2 2019	171.9	6.0	139.2	4.6	81.0	-1.3
Q3 2019	173.1	5.6	139.7	4.4	80.7	-1.2
Q4 2019	178.2	6.2	141.8	3.8	79.6	-2.2
Q1 2020	180.1	6.1	143.2	3.9	79.5	-2.0
Q2 2020	180.8	5.2	143.5	3.1	79.4	-2.0
Q3 2020	185.1	7.0	144.5	3.4	78.1	-3.3
Q4 2020	190.1	6.7	145.9	2.8	76.7	-3.6

Top 7 housing market*

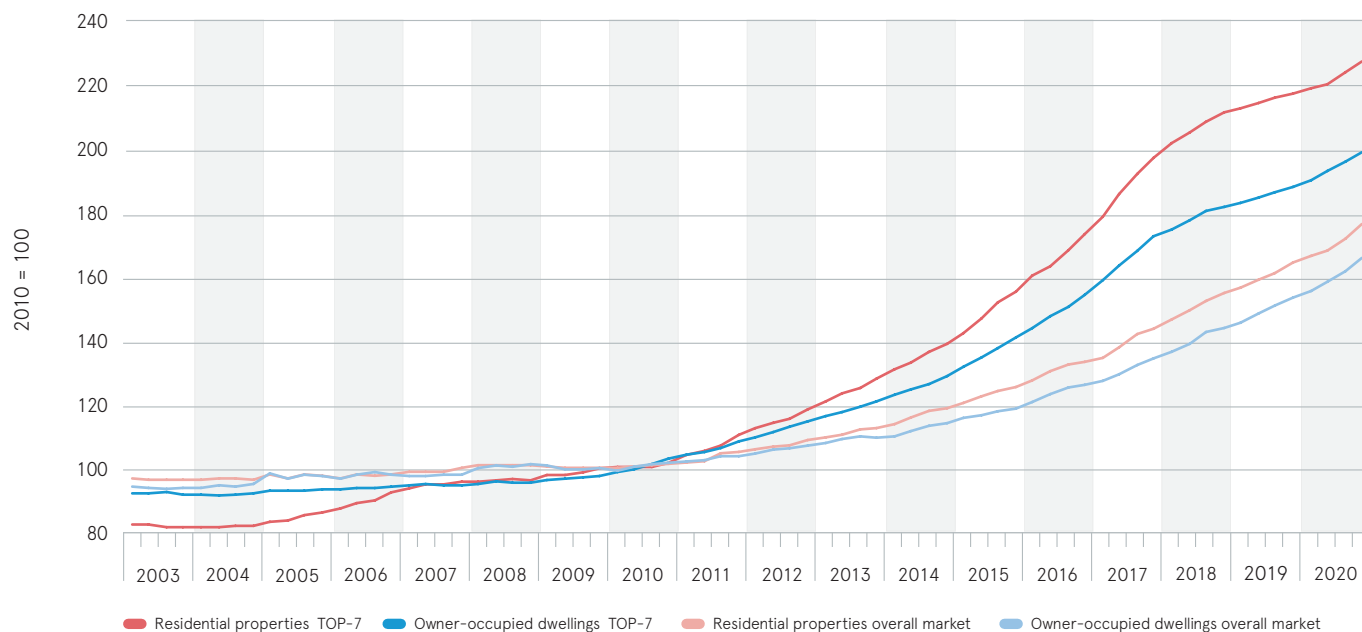
Compared to the prior-year quarter, prices in the **top 7 markets increased by 4.7%**. A look back at 2020 shows that the segment housing market was particularly resilient in the face of the potential impact of the pandemic. There were no obvious signs of price drops or equivalent.

While rates of increase are no longer at the levels seen two or three years ago, nevertheless **owner-occupied housing** continued to enjoy stable growth, with prices **rising by 5.7%** year on year. The sharpest price increases were reported in Hamburg, where prices for single-family homes and condominiums rose by 6.6% and 8.6%, respectively. The lowest price increase was measured in Frankfurt am Main, where prices for owner-occupied housing increased by 4.1% compared to the prior-year quarter.

The market for **multi-family homes in the top 7 cities** continues to be in the focus of investors and is characterized by stable price growth. Declining cap rates continue to be measured, with the corresponding index **falling by 2.7%** year on year. Rent increases in metropolitan areas finally appear to be reaching their limits. This is attributable partly to the sharp increases in rents seen in recent years but, of course, also to the political tools now being employed in many places. The result is that, compared to the previous year, **rents** in the top 7 cities have **increased by only 1.7%**. Compared to the prior-year quarter, rent increases in Berlin came to a complete standstill. Only in Hamburg did we see a relatively strong increase in prices of 4.1%.

*Berlin, Cologne, Dusseldorf, Frankfurt am Main, Hamburg, Munich, Stuttgart

Owner-occupied housing in top 7 markets: demand continues to be high



For all the individual figures of the
TOP 7
cities, go to
www.vdpresearch.de

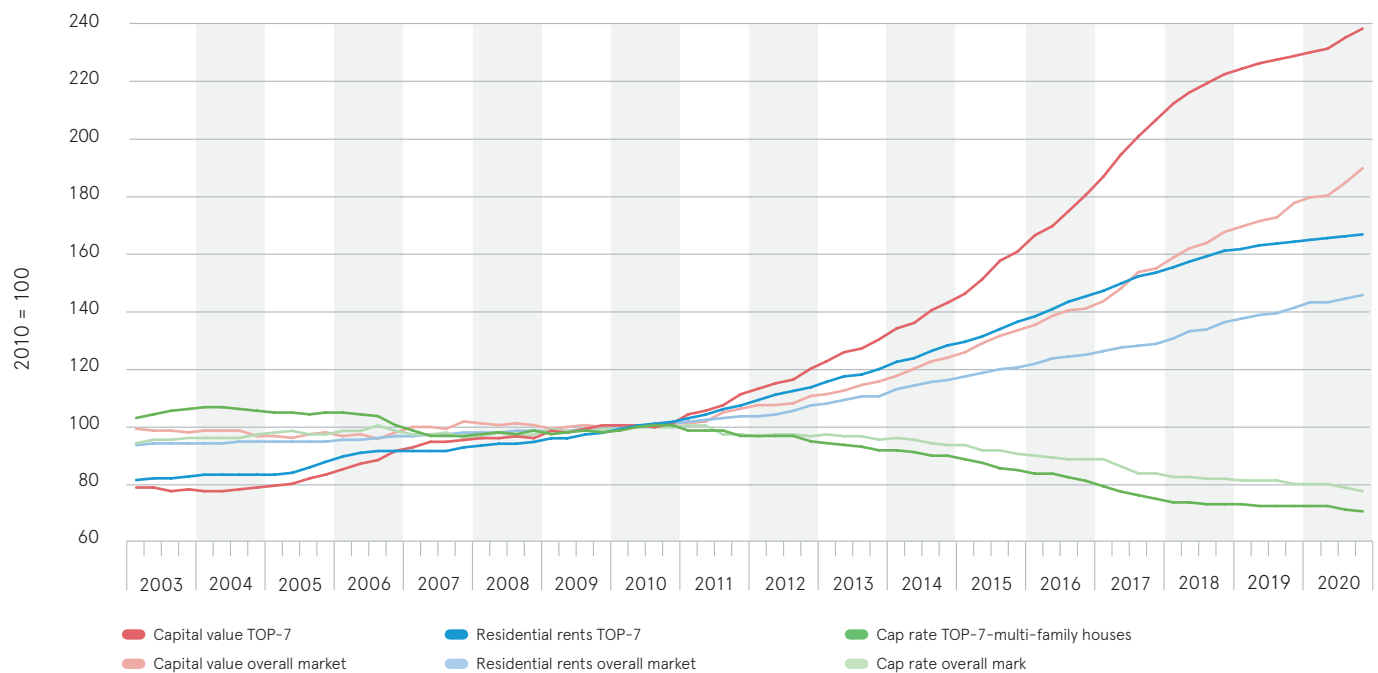
Index: 2010 = 100

Year	Residential properties TOP 7		Owner occupied housing TOP 7	
	Index	y-o-y change in %	Index	y-o-y change in %
2011	106.3	6.3	105.4	5.4
2012	114.9	8.1	112.0	6.3
2013	124.4	8.3	118.4	5.8
2014	135.3	8.7	125.9	6.3
2015	150.0	10.9	136.7	8.6
2016	167.6	11.7	150.0	9.7
2017	190.5	13.7	167.3	11.5
2018	209.3	9.9	180.7	8.0
2019	218.0	4.2	187.8	3.9
2020	225.7	3.5	197.0	4.9

Index: 2010 = 100

Quarter	Residential properties TOP 7		Owner occupied housing TOP 7	
	Index	y-o-y change in %	Index	y-o-y change in %
Q1 2019	215.6	5.6	185.0	4.7
Q2 2019	217.4	4.6	186.9	4.1
Q3 2019	218.8	3.6	188.8	3.4
Q4 2019	220.2	2.9	190.6	3.6
Q1 2020	221.9	2.9	192.6	4.1
Q2 2020	223.4	2.8	195.4	4.6
Q3 2020	227.1	3.8	198.6	5.2
Q4.2020	230.5	4.7	201.4	5.7

Multi-family houses in top 7 markets: stronger price increases than in Q3



Index: 2010 = 100

Capital value			Office rents			Cap rate	
Year	Index	y-o-y change in %	Index	y-o-y change in %	Index	y-o-y change in %	
2011	106.6	6.6	104.9	4.9	98.4	-1.6	
2012	115.8	8.6	111.4	6.2	96.2	-2.2	
2013	126.2	9.0	117.6	5.6	93.2	-3.1	
2014	130.8	9.4	125.0	6.2	90.5	-2.9	
2015	153.8	11.4	132.8	6.3	86.4	-4.6	
2016	172.6	12.3	142.0	6.9	82.3	-4.8	
2017	197.1	14.2	150.7	6.1	76.5	-7.1	
2018	217.6	10.4	158.4	5.1	72.8	-4.8	
2019	226.8	4.2	163.4	3.1	72.1	-1.0	
2020	234.1	3.2	166.3	1.8	71.0	-1.4	

Index: 2010 = 100

Capital value TOP 7			Residential rents TOP 7			Cap rate TOP-7	
Quarter	Index	y-o-y change in %	Index	y-o-y change in %	Index	y-o-y change in %	
Q1 2019	224.5	5.8	162.3	4.3	72.3	-1.4	
Q2 2019	226.3	4.7	163.2	3.6	72.1	-1.1	
Q3 2019	227.6	3.7	163.8	2.7	72.0	-0.9	
Q4 2019	228.8	2.7	164.4	2.0	71.9	-0.7	
Q1 2020	230.5	2.6	165.4	1.9	71.8	-0.7	
Q2 2020	231.6	2.3	165.9	1.6	71.6	-0.7	
Q3 2020	235.4	3.5	166.7	1.8	70.8	-1.6	
Q4 2020	239.0	4.5	167.1	1.7	69.9	-2.7	

Commercial property market

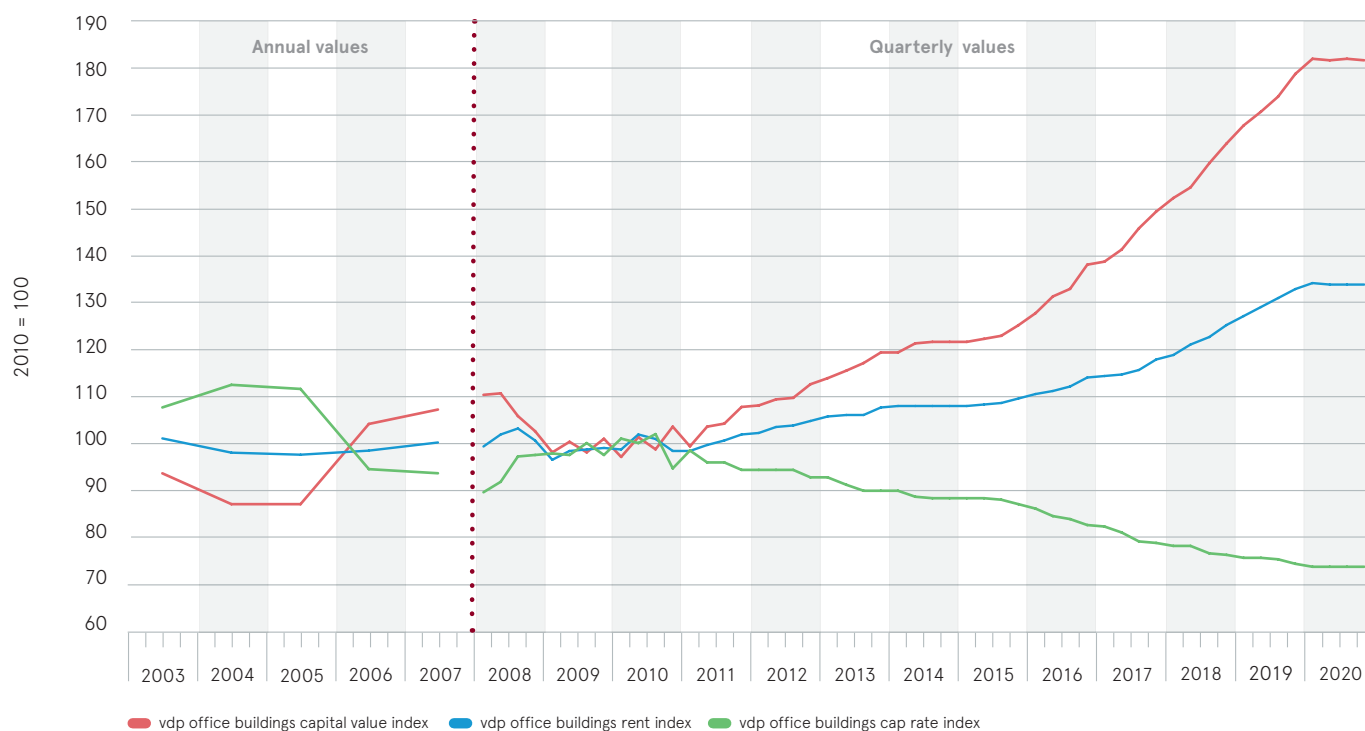
The commercial property market has been hit harder by the COVID-19 pandemic because the lockdown measures have directly affected the way office and retail properties can be used.

Prices for **office properties increased by only 1.7%** due to the dramatic decrease in demand for space caused by the pandemic compared to 2019. The reason for this is seen in particular in the uncertainty of companies about their economic future, accompanied by an increased emphasis on working from home supported by politics. In the current situation, new leases tend to be postponed. However, given the low vacancy rates at the beginning of the pandemic, this has not resulted in greater pressure on **rents under new contracts**, which again **increased slightly (+0.7%)** year on year.

There was a significant decrease in investment activity in the market for office properties, which nevertheless is still quite high compared to the recent past. However, demand was concentrated mainly in the top markets and in properties with a solid tenant mix. Consequently, the **cap rate dropped 1.0%** year on year. The future performance of the office property market will depend mainly on how long the pandemic lasts and the debate it has triggered about future requirements for office space.

The measures instituted have had an even greater impact on **retail properties**, where prices **were down by 2%** compared to the fourth quarter of 2019. Recently, however, the price decline has slowed noticeably. With the exception of shops selling essential items, brick-and-mortar retail shops had to shut down completely during the first and second lockdowns. That benefited online retail, further accelerating the structural shift in retailing. Lower demand for space led to a **1.4% decline in rents under new contracts** compared to the prior-year quarter. The **cap rate increased by 0.6%** over the same period.

Office and administrative buildings: pandemic is having an impact



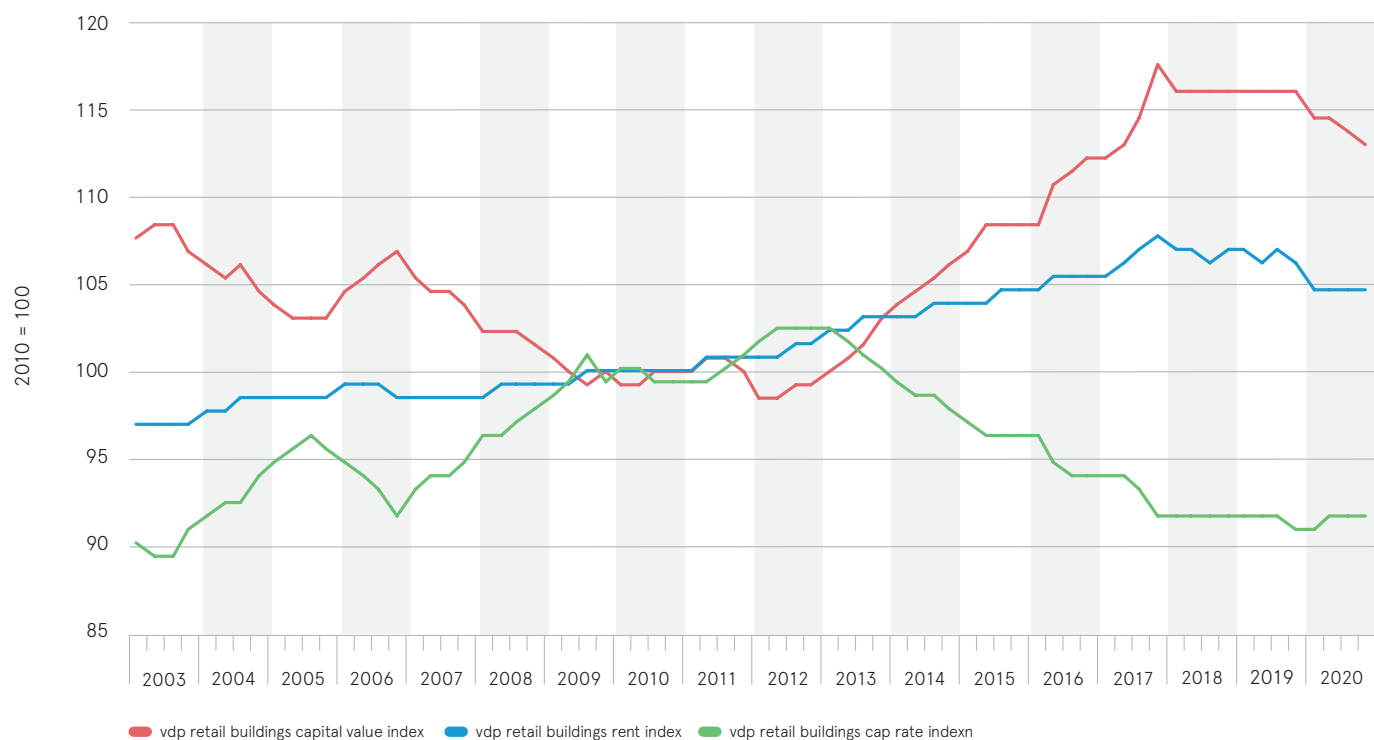
Index: 2010 = 100

Year	Capital value		Office rents		Cap rate	
	Index	y-o-y change in %	Index	y-o-y change in %	Index	y-o-y change in %rr
2011	103.6	3.6	100.2	0.2	96.7	-3.3
2012	109.9	6.0	103.6	3.4	94.3	-2.5
2013	116.4	5.9	106.4	2.7	91.5	-3.0
2014	120.9	3.9	108.0	1.5	89.3	-2.3
2015	122.9	1.7	108.7	0.6	88.4	-1.1
2016	132.4	7.7	112.1	3.2	84.7	-4.2
2017	143.6	8.4	115.7	3.2	80.6	-4.9
2018	157.4	9.6	122.1	5.5	77.6	-3.7
2019	172.5	9.6	130.2	6.7	75.5	-2.7
2020	181.5	5.2	134.2	3.1	74.0	-2.1

Index: 2010 = 100

Quarter	Capital value		Office rents		Cap rate	
	Index	y-o-y change in %	Index	y-o-y change in %	Index	y-o-y change in %
Q1 2019	167.6	10.2	127.4	7.0	76.0	-2.9
Q2 2019	170.5	10.5	129.2	6.7	75.8	-3.4
Q3 2019	173.5	8.8	131.2	6.8	75.6	-1.8
Q4 2019	178.3	8.9	133.1	6.2	74.6	-2.5
Q1 2020	181.7	8.4	134.4	5.5	74.0	-2.7
Q2 2020	181.2	6.3	134.2	3.9	74.1	-2.3
Q3 2020	181.7	4.7	134.2	2.3	73.9	-2.3
Q4 2020	184.4	1.7	134.0	0.7	73.9	-1.0

Further decreases in prices for retail properties



	Capital value		Office rents		Cap rate	
	Index	y-o-y change in %	Index	Veränderung in % change in %	Index	y-o-y change in %
2011	100.6	0.6	100.5	0.5	100.0	0.0
2012	99.0	-1.5	101.2	0.7	102.2	2.3
2013	101.3	2.3	102.8	1.6	101.4	-0.8
2014	105.2	3.8	103.7	0.9	98.6	-2.8
2015	108.0	2.7	104.3	0.5	96.6	-2.1
2016	110.6	2.5	105.0	0.7	94.9	-1.7
2017	113.9	2.9	106.4	1.3	93.4	-1.6
2018	115.8	1.7	106.7	0.3	92.1	-1.3
2019	115.5	-0.2	106.3	-0.3	92.1	-0.1
2020	113.6	-1.7	104.5	-1.8	92.0	-0.1

	Capital value		Office rents		Cap rate	
	Index	y-o-y change in %	Index	y-o-y change in %	Index	y-o-y change in %
Q1 2019	115.5	-0.2	106.6	-0.2	92.3	0.0
Q2 2019	115.4	-0.6	106.4	-0.4	92.2	0.2
Q3 2019	115.7	0.1	106.6	0.3	92.1	0.2
Q4 2019	115.3	-0.2	105.7	-0.9	91.7	-0.7
Q1 2020	114.2	-1.1	104.7	-1.8	91.7	-0.7
Q2 2020	113.9	-1.3	104.5	-1.8	91.8	-0.5
Q3.2020	113.2	-2.2	104.4	-2.1	92.2	0.1
Q4 2020	113.1	-2.0	104.3	-1.4	92.2	0.6

Methodology

Data basis

German financial institutions participating in the transaction database provide transaction details from their real estate financing business for input into the database. The database has been maintained since 2004 and provides statistically evaluable information on actual real estate transactions. Data are captured by the participating institutions in the form of appraisals of market and mortgage lending values that are prepared in the course of their mortgage lending activities. Property valuations are determined within each financial institution by certified property valuers or specially trained bank personnel. In addition to purchase price and date of purchase, the appraisal includes information about the property's macro and micro location, its age, layout and other price-influencing variables. In the case of certain types of property, information is also collected with regard to rental agreements and the date they were concluded. Information used to derive market and mortgage lending values is ascertained partly from submitted documentation and partly by valuers working in accordance with codified procedures. Table 1 provides an overview of the variables most frequently applied in the specification of individual indices for various market segments.

Table 1: Variables from the vdp's transaction database

Variable	Scaling	Characteristics
Makrolage	Nominal	Landkreis oder kreisfreie Stadt in Deutschland
Micro location	Ordinal	Very good – good – average – moderate – poor – catastrophic
Living /usable space	Metric	Living or usable space m ²
Plot size	Metric	Plot size of property in m ²
Year built	Metric	Year property built
Layout	Ordinal	Very good – good – average – moderate – poor – catastrophic
Condition	Ordinal	Very good – good – average – moderate – poor – catastrophic
Saleability	Ordinal	Very good – good – average – moderate – poor – catastrophic
Sub-property type	Nominal	Division of market segment into sub-segments
Purchase price	Metric	Purchase price of property in Euros
Rent	Metric	Contractual rent of property in Euros per m ²

Substantive definitions of individual variables are coordinated with financial institutions via the contractual relationship between them and the vdp. In addition, property valuation in Germany is subject to strict regulations, which ensure that the valuation processes of individual institutions are harmonised to the greatest extent possible, especially as a result of the Verordnung über die Grundsätze für die Ermittlung der Verkehrswerte von Grundstücken (Regulation on the Principles for Determining the Market Value of Property – abbreviated to ImmoWertV) and the Beleihungswertermittlungsverordnung (Regulation on the Determination of the Mortgage Lending Value – abbreviated to BelWertV). Because the purchase prices and significant price-influencing characteristics of individual properties are determined in a uniform manner and because they are input into a uniform database structure, it is possible to analyse the data with the help of complex statistical procedures.

Calculation

As a result of the distinct heterogeneity of real estate properties and in order to be able to measure pure price changes, it is necessary to take account of the varying quality of the properties concerned when measuring prices. Various procedures exist which take explicit account of the differences in the quality of individual properties in order to be able to measure pure price changes.

All vdp real estate indices are calculated by making use of so-called hedonic models. The hedonic model is based on the idea that heterogeneous commodities can be described by reference to their characteristics. In other words, a commodity can be represented as the sum of its characteristics. With regard to real estate, this means that this set of attributes might include, for example, details of physical characteristics such as plot size, living area, year built and details as to the property's location. Each of these named attributes has a specific influence on the price of the property, but there is no market for the attributes themselves; they cannot be sold separately and therefore cannot be viewed in isolation. It is possible, nonetheless, implicitly to determine the proportion of the overall price of the property which each individual attribute makes up by examining real estate supply and demand. Multivariate regression models are used for this purpose, helping to provide a statistical estimate of the marginal contribution of each attribute. It is assumed that the model incorporates all relevant attributes and that deviations occur simply by coincidence and are not indicative of any systematic structures.

Weighting

The overall index is the weighted arithmetical average of the various price indices for residential and commercial real estate. The weightings used correspond to the share of monetary turnover in the German real estate market constituted respectively by residential and commercial real estate. Based on details provided by valuer committees (Gutachterausschüsse), these averaged 75.6 % and 24.4 %, respectively, between 2007 and 2012.

The weights used correspond with the percentage share of households in Germany living in their own home. For the year 2011 this share stood at 50.7 %. Accordingly, 49.3 % lived in a rented dwelling. The weights were derived on the basis of the building and housing census conducted by the Federal Statistical Office in 2011. The price index for owner-occupied housing is calculated as a weighted arithmetic mean of the percentage of households living in their own single-family house or condominium. In 2011 these shares amounted to 79.7 % for single-family houses and 20.3 % for condominiums.

For the commercial property price index, the weightings attributable to the office property capital value index and the retail property capital value index correspond to the proportion of loans in the accounts of Pfandbrief Banks that were granted to these two categories. The figures for office property and retail property amount to 60 % and 40 %, respectively.

Top 7 residential properties

The top 7 residential property indices are calculated analogously to the calculation for the vdp's nationwide property price indices. The indices are estimated separately for each of the cities on the basis of the transaction database. Then, the seven individual indices of the relevant market segment are aggregated according to the respective shares to form a top 7 index. For more information, please visit the website of vdpResearch.

Base year

Starting from this edition, the base year for the indices is 2010.

Publication

All vdp real estate price indices are published on a quarterly basis. Each year's first quarter index figures are published on 10 May of the same year (six weeks after the end of the quarter under review). Other publication dates are as follows:

- 10 August, 2nd quarter
- 10 November, 3rd quarter
- 10 February of the following year, 4th quarter (including figures for the year as a whole)

The index figures are released at 8:30 a.m. on the respective publication dates. Where the publication date falls on a Saturday, Sunday or public holiday, the index figures are published on the next working day at 8:30 a.m.

The accompanying press releases are published in German and English on the websites of the Verband deutscher Pfandbriefbanken e.V. (vdp) www.pfandbrief.de and vdpResearch GmbH www.vdpresearch.de.

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The member institutions of the **Association of German Pfandbrief Banks** (Verband deutscher Pfandbriefbanken, vdp) have been the market leaders in commercial real estate finance in Germany and hold sizeable market shares in residential real estate finance as well. As the representative of its member banks, the vdp performs this function vis-à-vis all executive bodies of politics on both the national and the European stage and a wider public.

The vdp's know-how is tailored towards the specific interests of the Pfandbrief issuers, namely, the Pfandbrief business and the underlying business fields property finance, public-sector lending, ship and aircraft finance. The vdp assists its member banks also in regulatory matters and represents them vis-à-vis national regulatory authorities. By means of group governance, member institutions exchange information and experiences in vdp committees, which are then summarized and developed into market standards. The vdp also assists its member banks in the efficient structuring of their specialized loan or issuance businesses.

Scientific editing:

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vdpResearch GmbH, a subsidiary of the Association of German Pfandbrief Banks (vdp), works intensively on compiling, analyzing and forecasting property prices in the context of real estate finance. Its remit includes measuring and forecasting trends in rents and prices in the residential and commercial property sectors at the regional and national level.

To measure the movements of rents and prices, vdpResearch makes use of a unique transaction database that is also used to provide property-related comparative prices, comparative rents and other valuation parameters. These parameters are central to specially developed software solutions for valuing standard and individual properties and are fully compliant with regulations governing market and property valuation.

Today, the products and services of vdpResearch are a key component for many credit institutions in the evaluation and assessment of property and market price risks. The nationwide property price indices that vdpResearch prepares for the Association of German Pfandbrief Banks are geared to an interested public and offer an overview of general price trends in Germany's real estate markets.

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