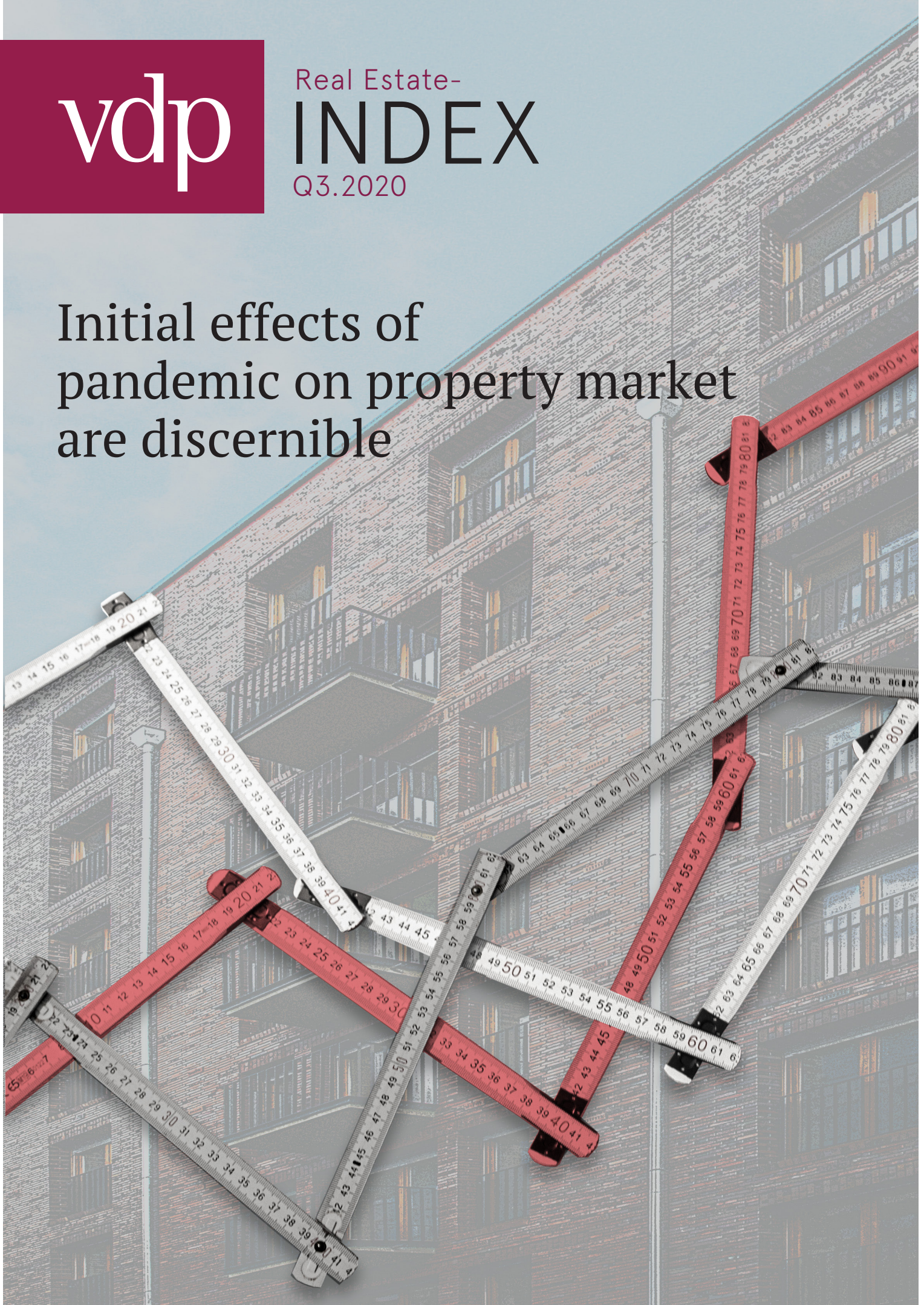


vdp

Real Estate-
INDEX

Q3.2020

Initial effects of
pandemic on property market
are discernible



Market as a whole

In the third quarter 2020, the vdp property price index increased by 6.1% year on year, representing a new high since measurements began in 2003. Residential properties were the main contributor to this increase; the corresponding sub-index rose by 7.1%. Residential properties appear to be particularly immune to the economic downturn caused by the pandemic –

Market as a whole:

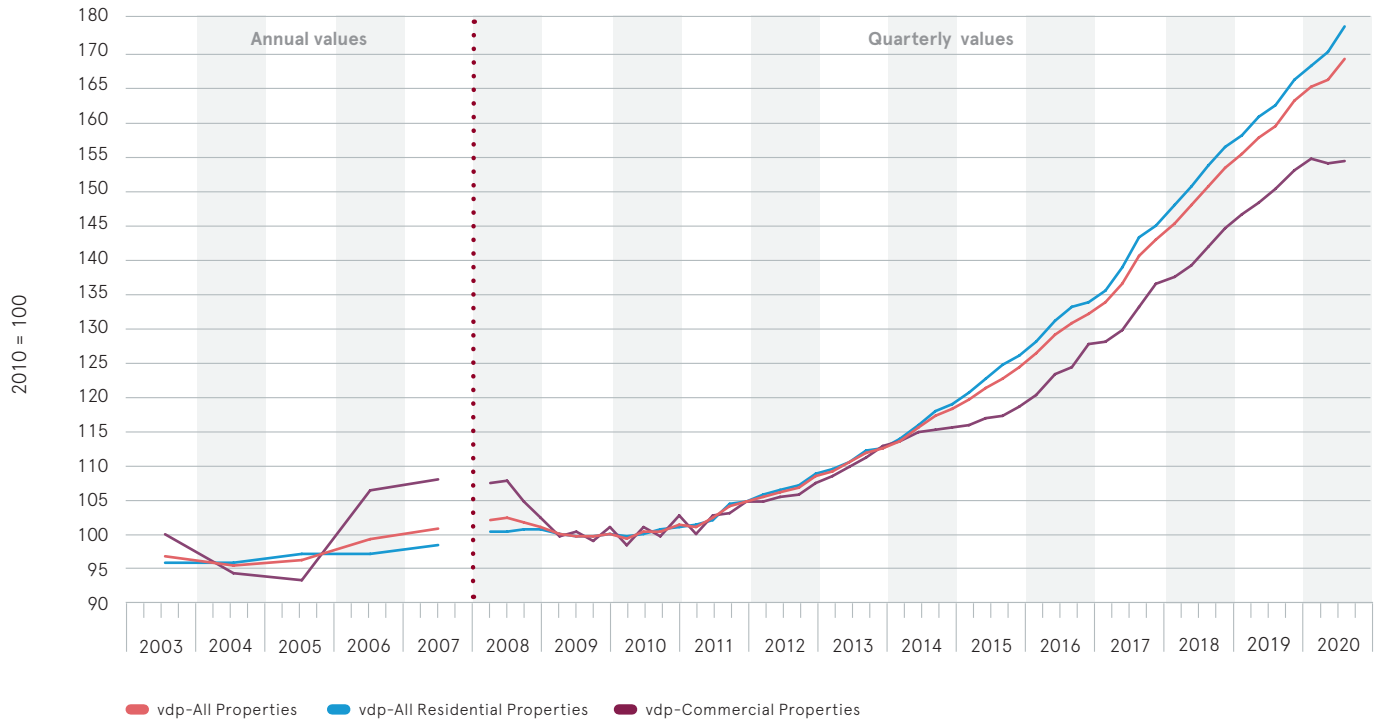
+6,1%

at least, they posted a 3.4% increase compared to the first quarter of 2020, when the nationwide ban on contacts went into effect. By contrast, the effects of the restrictions on public life can be seen more directly in the commercial property market, as one might expect. Although

prices for commercial properties also increased by +2.6% year on year, the trend has nevertheless been slightly negative (-0.3%) since the first quarter of 2020. However, the feared dramatic drop in prices has not yet materialised.

Following a sharp downturn in economic output in the second quarter, gross domestic product once again increased significantly (by 8.2%) in the third quarter. However it is not expected to rebound to the pre-crisis level until the end of 2021 – and the new “lockdown light” introduced in November has not yet been factored into this forecast. The course of the pandemic continues to be the greatest source of uncertainty.

Property market as a whole: initial effects of pandemic on property market are discernible



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 %
2010	100.0	0.5	100.0	0.6	100.0	0.4
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

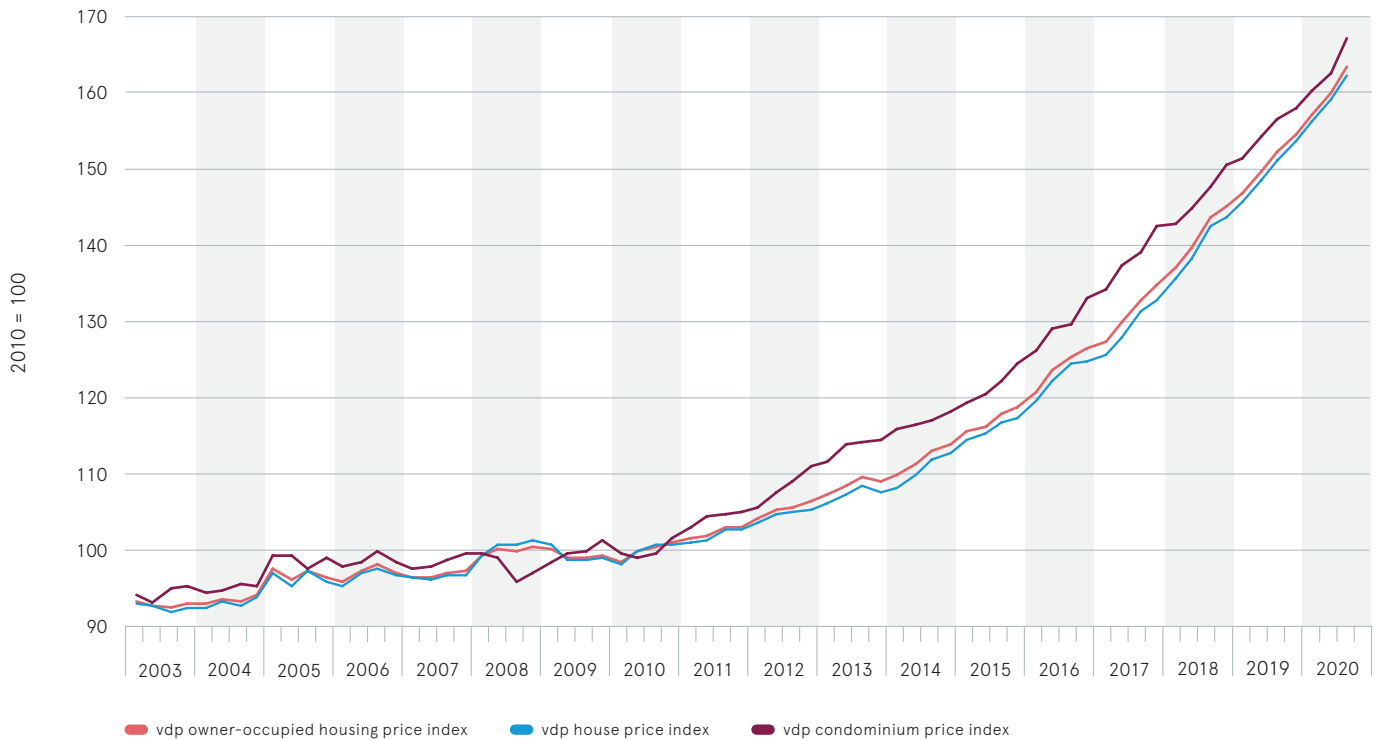
Quarter	All properties		All residential properties		All commercial properties	
	Index	y-o-y gegenüber Vorjahr	Index	y-o-y gegenüber Vorjahr	Index	y-o-y gegenüber Vorjahr
Q4 2018	153.5	7.6	156.4	8.0	144.5	6.0
Q1 2019	155.4	7.0	158.2	7.0	146.7	6.7
Q2 2019	157.7	6.7	160.7	6.6	148.4	6.8
Q3 2019	159.7	5.9	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

Housing market

Overall, residential property prices increased by 7.1% year on year. Prices for owner-occupied housing increased by 7.3% compared to the prior-year period and were 4% higher than at the end of the first quarter. The trend in single-family houses/duplexes and condominiums has been quite similar since the start of the pandemic (4% and 4.3%, respectively; 7.4% and 6.7%, respectively, year on year).

Prices of multi-family houses were 7% higher than in the third quarter of 2019. The continued high level of investor interest could be explained by the fact that the loss-of-rent risk is lower here compared to commercial properties, resulting in more stable earnings. Accordingly, the cap rate index dropped by 3.3% compared to the third quarter of 2019. Over the same period, rents under new contracts increased by 3.4%. However, various legislative measures relating to rent levels appear to be acting as a brake on price increases.

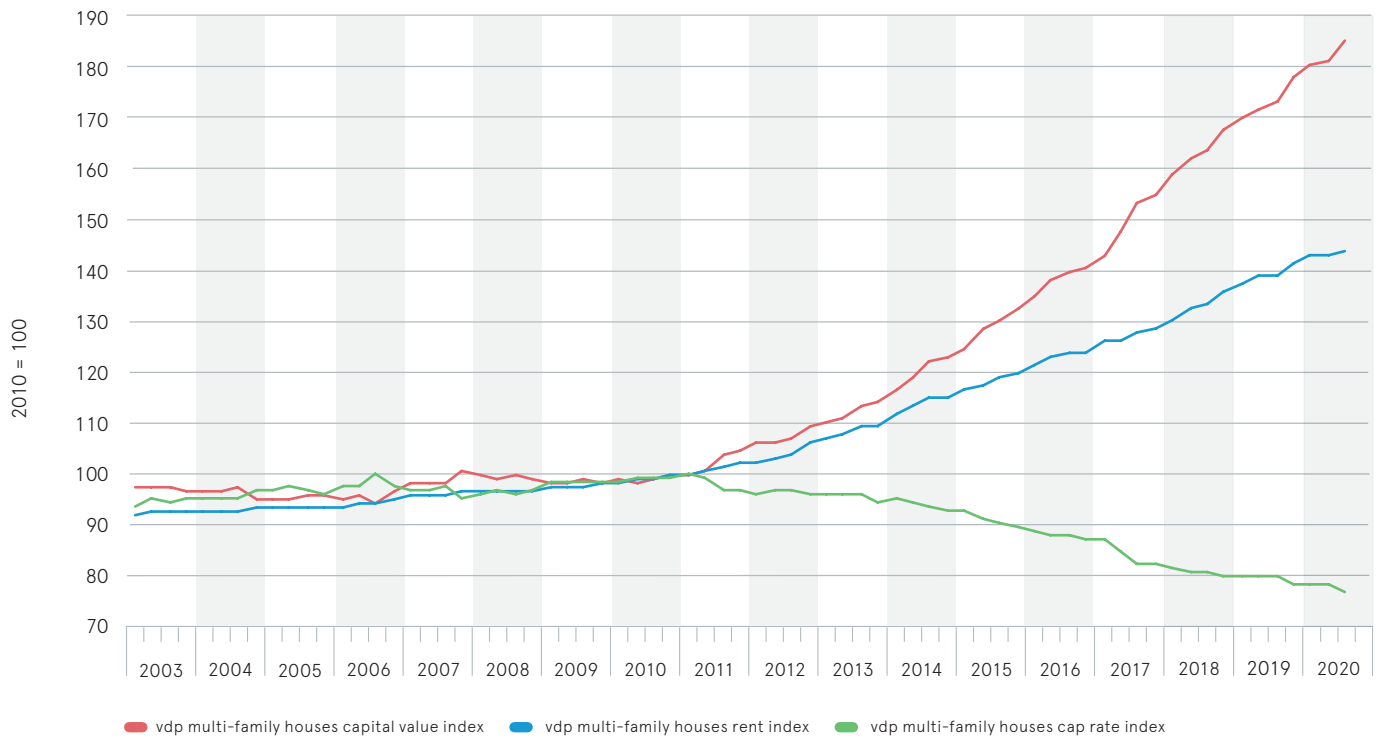
Owner-occupied housing: negative effects fail to materialise



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
2010	100.0	0.6	100.0	0.7	100.0	0.2
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

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 %
Q4 2018	145.3	7.7	143.9	8.2	150.6	5.6
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

Multi-family houses – top 7 markets: demand remains high



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 %r
2010	100.0	0.6	100.0	1.5	100.0	0.9
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

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 %
Q4 2018	167.8	8.4	136.6	6.0	81.4	-2.2
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

Top 7 housing market*

The scenario that was observed back in the second quarter continues to be visible in major metropolitan area property markets: while the number of transactions has decreased, the feared negative impact on prices nevertheless has not yet materialised. Residential prices have increased by 3.8% compared to the prior-year quarter. Prices in the top 7 markets also increased compared to the results of the first quarter of 2020 (+2.3%) – i.e., immediately before the Covid-19 pandemic began.

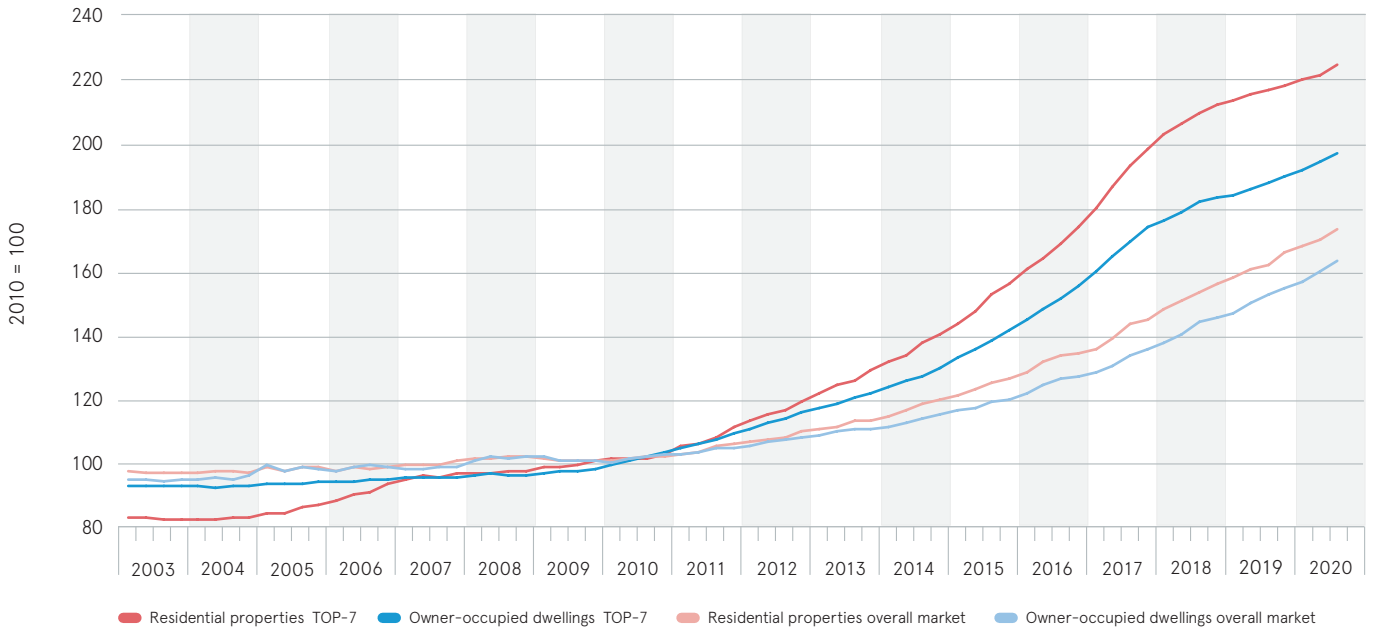
For owner-occupied housing in particular, it is clear that excess demand has grown even larger during the pandemic. In the top 7 cities, prices for single-family houses increased by 4.5% year on year, while condominium prices rose even further (by 5.8%). This is the strongest surge in growth in two years. With the exception of Munich, the larger price increases within the owner-occupied housing category are for condominiums.

In the top 7 cities, there is also a high level of demand in the market for multi-family houses, where prices increased by 3.5% year on year. A moderate increase in rents under new contracts was partially offset by significant decreases in the cap rate index, which was down 1.6% compared to the prior-year quarter. From a regional standpoint, the biggest declines were seen in Hamburg and Berlin (-1.8% year on year in each case).

Compared to the prior-year quarter, the index for rents under new contracts in the top 7 cities increased by 1.8%, with the largest price increases recorded once again in Hamburg (3.3%). In contrast, price increases were significantly lower in Germany's biggest rental market, Berlin (0.7%), apparently affected by brakes on rent increases and by rent caps.

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

Owner-occupied housing – top 7 markets: strong growth surge

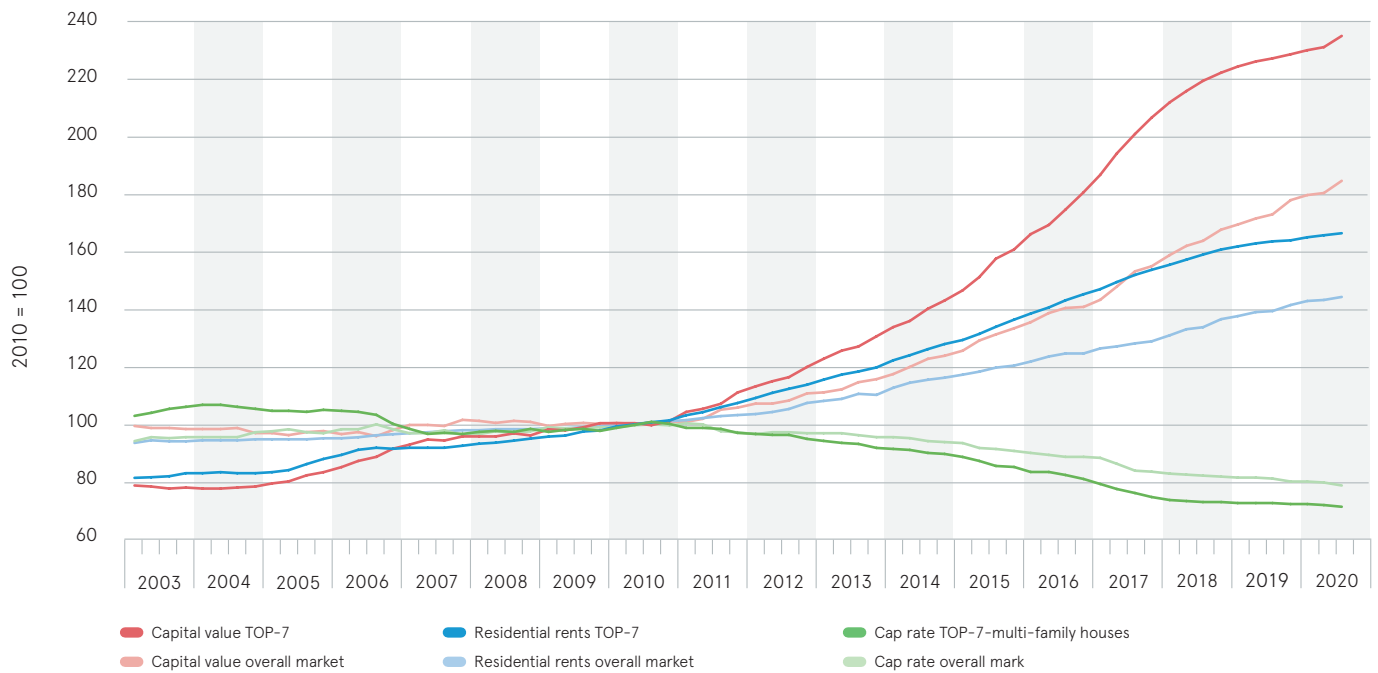


For all the individual figures of the **TOP 7** cities, go to www.vdpresearch.de

Year	Residential properties TOP 7		Owner occupied housing TOP 7	
	Index	y-o-y change in %	Index	y-o-y change in %
2010	100.0	2.2	100.0	4.1
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

Quarter	Residential properties TOP 7		Owner occupied housing TOP 7	
	Index	y-o-y change in %	Index	y-o-y change in %
Q4 2018	214.0	7.2	184.1	5.5
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

Multi-family houses – top 7 markets: demand remains high



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 %
2010	100.0	1.6	100.0	3.7	100.0	2.0
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

Quarter	Capital value TOP 7		Residential rents TOP 7		Cap rate TOP-7	
	Index	y-o-y change in %	Index	y-o-y change in %	Index	y-o-y change in %
Q4 2018	222.7	7.6	161.2	4.7	72.4	-2.7
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

Commercial property market

Commercial properties were more directly affected by restrictions related to the pandemic. Although **prices rose 2.6%** compared with the same quarter of the previous year, the trend has been slightly negative at **-0.3% since the start of the pandemic**. However, the sharp decrease in prices that has been feared from time to time still has not materialised.

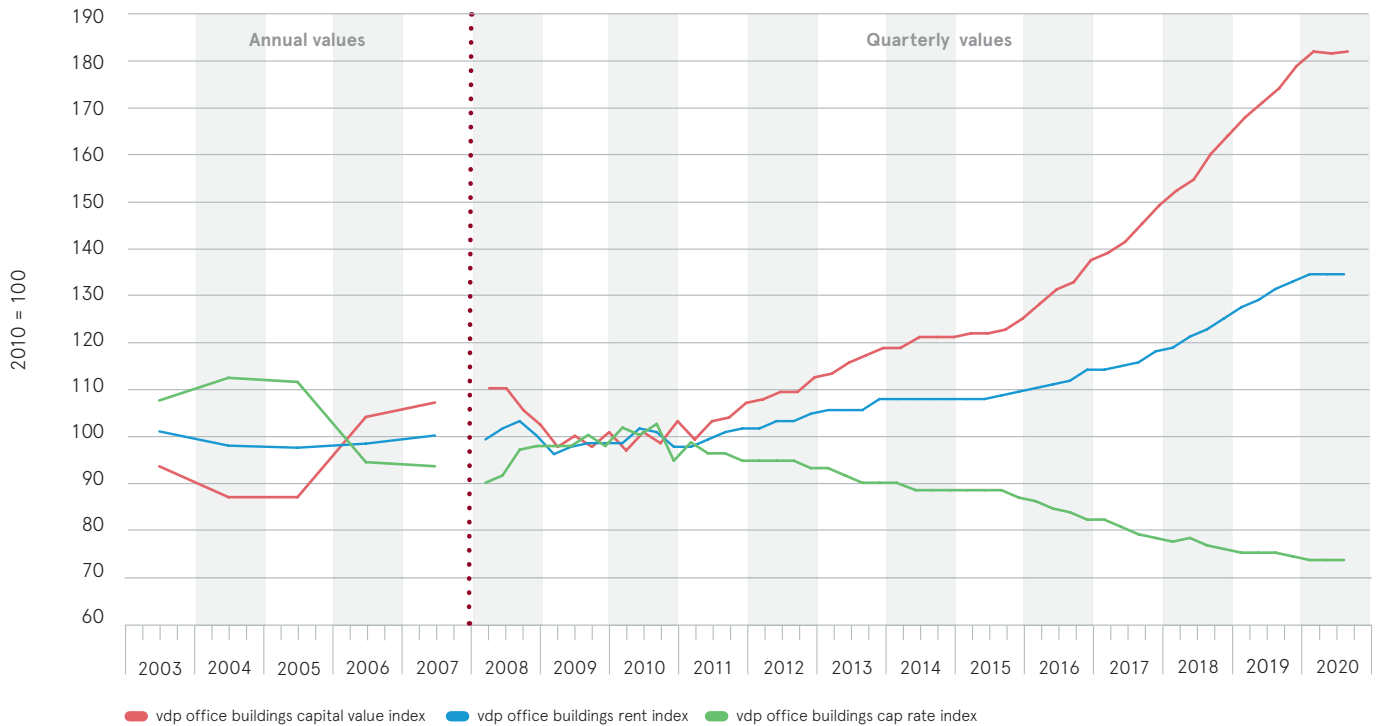
The mixed trend in the sub-markets is noteworthy: while prices for **office buildings** were still **4.7% higher** year on year, prices for **retail properties decreased by 2.2%** over the same period of time.

As expected, user demand for office space has weakened significantly since the pandemic began, reflecting companies' uncertainty about how the pandemic will progress. The cautious, wait-and-see attitude of many users has caused rents for **office space** to decline slightly (**by -0.2%**) since the **start of the pandemic**, but **rents** are still **2.3% higher** year on year.

In the investment market, confidence in office properties appears to be unshaken, despite lower transaction volumes; this may be due partly to the fact that so far, the pandemic has been relatively mild in Germany. The **cap rate index dropped 2.3%** year on year – but has been virtually unchanged since the pandemic began (**-0.1%**).

The decrease in prices observed since 2018 in the **market for retail properties** was intensified in the wake of the pandemic as the transformation process in the retail sector was accelerated. Compared to the previous year, **retail rents fell by 2.1%**, while the **cap rate index** remained almost **unchanged (0.1%)**.

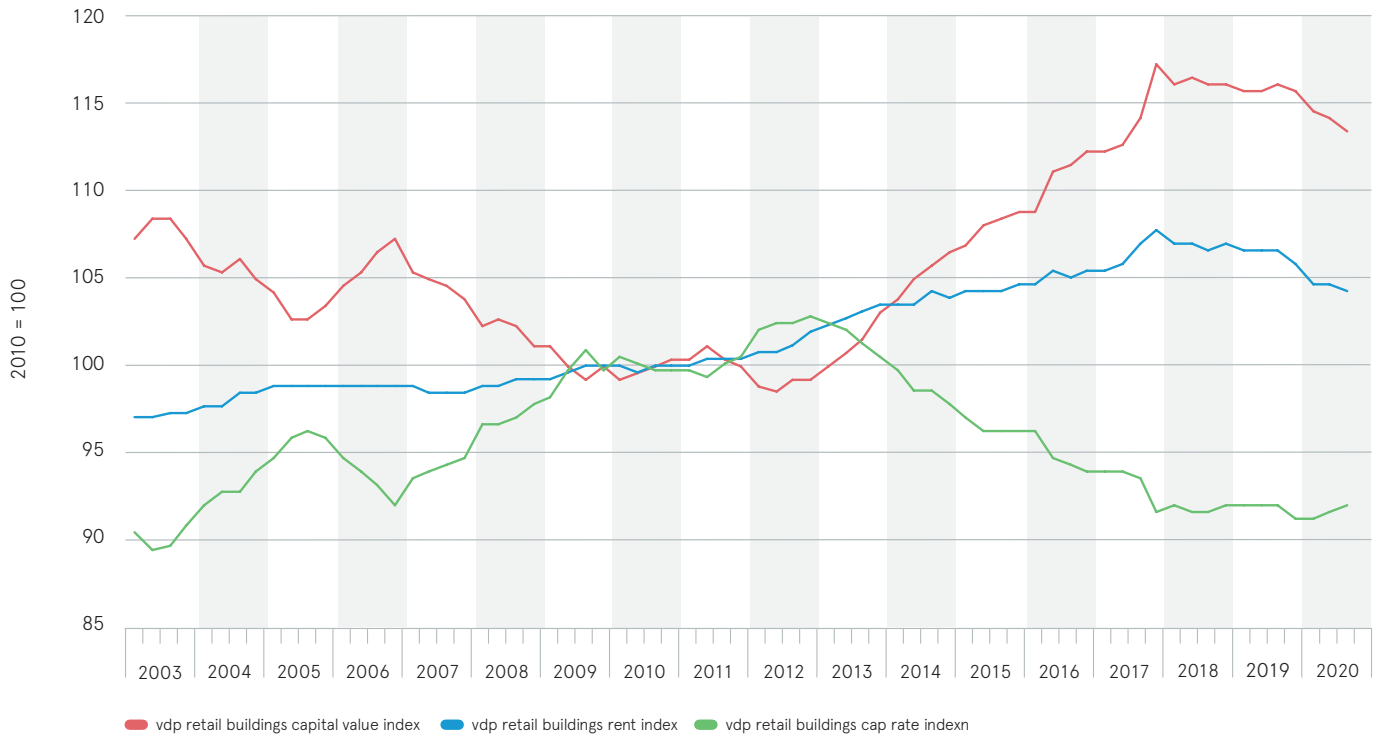
Office properties: decrease in demand since pandemic began



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 %r
2010	100.0	0.7	100.0	1.9	100.0	1.2
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

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 %
Q4 2018	163.7	9.7	125.4	6.4	76.6	-3.0
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

Retail buildings: pandemic is reinforcing structural change



Year	Capital value		Office rents		Cap rate	
	Index	y-o-y change in %	Index	Veränderung in % change in %	Index	y-o-y change in %
2010	100.0	-0.1	100.0	0.1	100.0	0.3
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

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 %
Q4 2018	115.6	-1.2	106.7	-0.8	92.3	0.4
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

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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