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vdp Property Price Index

Q4. 2019

Property prices continue to rise

Compared with the corresponding quarter the previous year:

Property market as a whole: **+6,3 %**

Housing: **+6,4 %**

Owner-occupied housing: + 6,6 %

Multi-family houses: +6,2 %

Housing top 7 markets: **+2,9 %**

Owner-occupied housing: +3,6 %

Multi-family houses: +2,7 %

Commercial: **+6,0 %**

Office properties: +8,9 %

Retail properties: -0,2 %



Property prices continue to rise

Market as a whole

The upward trend continues: property prices on the German market rose again in the fourth quarter of 2019. The vdp property price index climbed by 6.3 % year on year, reaching its highest level since measurements began in 2003.

The property market thus proved robust, despite low economic growth in 2019 due to continuing political uncertainties and faltering exports. A slide into recession was avoided thanks to the healthy domestic economy. In this respect, the still positive labour market outlook, accompanied by rising incomes and sustained household consumption, are the main elements tending to stabilise the economic situation. High demand for property is also being driven by historically low interest rates, as a consequence of which, property purchases remain attractive from the perspective of both private households and professional investors compared with other alternatives.

Housing market

Prices on the housing market increased by 6.4 % compared with the fourth quarter of 2018. Demand from domestic investors for residential property remains at a high level, against the background of low interest rates and higher expected returns compared with other asset classes. This was apparent in the market for multi-family houses, where prices rose by 6.2 %. Also, since demand for space in many cities continues to meet with a comparatively low supply, new lease rentals increased by 3.8 % in the same period. However, due to various legislative initiatives in cities with particularly high demand for housing, price momentum appears to be easing.

Prices for owner-occupied housing increased by 6.6 % year on year. Prices of single-family houses rose faster at 6.9 % than those of condominiums (+5.1 %). The favourable labour market situation combined with low lending rates continues to boost demand for residential property. Price momentum appears to be declining here too, given the high prices now observed in metropolitan regions dominated by multi-storey housing construction. Demand is increasingly shifting to the surrounding areas, with particular emphasis on single-family houses.

Top 7 housing market

In the top 7 housing markets, prices rose by 2.9 % compared with the same quarter of the previous year, thus reinforcing the trend already observed in recent quarters: price growth is continuing, but steadily weakening. Markets for residential accommodation in particular are increasingly moving sideways. This is also true of the dominant markets of Berlin and Munich, which account for over half of all rented residential units in the top 7 cities. Here, new lease rentals increased by only 2 % in Berlin and 2.2 % in Munich. Overall, new lease rentals rose by 2 % in the top 7 markets.

There is noticeable uncertainty in rental markets owing to the likely introduction of a rent cap in Berlin, even though no reduction in new lease rentals has been observed as yet. The index of cap rates for multi-family houses declined by 0.7 %, with prices of multi-family houses rising by 2.7 % overall.

This trend is less pronounced in markets for owner-occupied housing. Although growth is slowing down consid-

erably here too, it is still much higher than for rents. Prices of single-family houses rose by 4 % and condominium prices by 3.2 % compared with the prior period. The difference between price growth and rental growth already observed in recent quarters is thus becoming even more pronounced. Overall, the price of owner-occupied residential housing rose by 3.6 % compared with the same quarter of the previous year.

Commercial property market

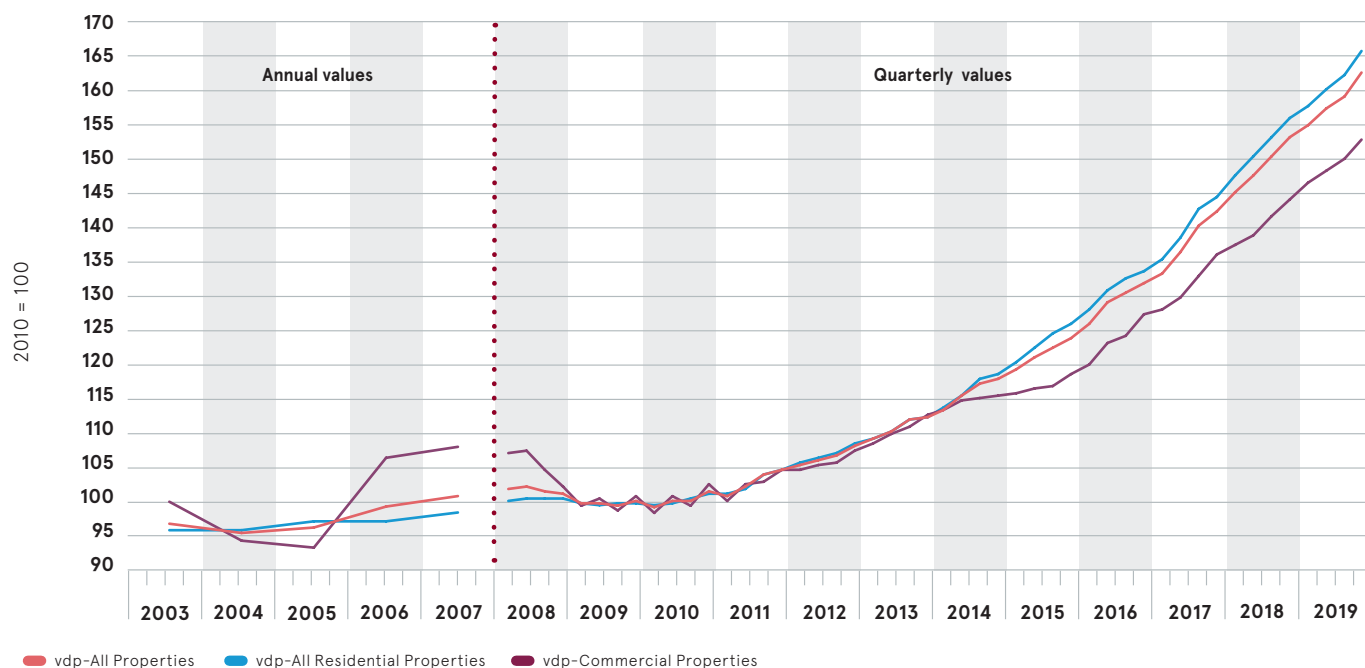
Commercial property prices rose by 6 % compared with the fourth quarter of 2018. However, opposing trends were observed in the respective sub-markets.

Prices on the office market recorded a further strong increase of 8.9 %. This is because, despite low economic growth, continuing high demand on the labour market is driving greater demand for office space. As supply has lagged well behind demand in recent years, vacancies in many office markets have been reduced to less than 3 %. This has led to a rise in new lease rentals: the corresponding index climbed by 6.2 % year on year. Investors continue to focus on office properties as an asset class, with the result that the cap rate index declined by 2.5 % over the same period.

By contrast, prices of retail properties decreased by 0.2 % year on year. This is due to relentless competition from e-commerce in the retail sector and the associated challenges in letting new retail space. As a result, new lease rentals declined by 0.9 %.

Property market as a whole

Upward trend continues

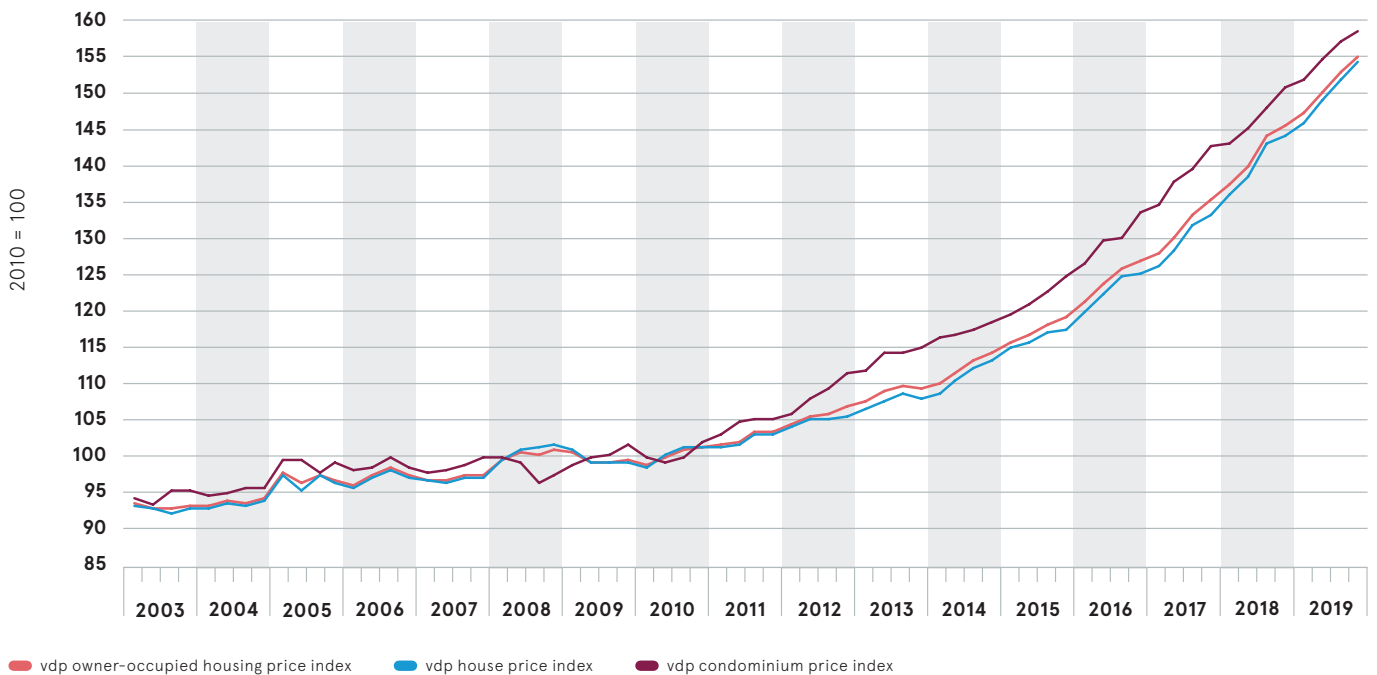


Year	All properties		All residential properties		All commercial properties	
	Index	y-o-y change in %	Index	y-o-y change in %	Index	y-o-y change in %
2009	99.5	-1.9	99.4	-0.8	99.7	-5.3
2010	100.0	0.5	100.0	0.6	100.0	0.4
2011	102.7	2.6	102.7	2.7	102.4	2.4
2012	106.4	3.7	106.7	3.8	105.5	3.0
2013	110.7	4.1	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 change in %	Index	y-o-y change in %	Index	y-o-y change in %
Q1 2018	145.3	8.8	147.8	9.2	137.5	7.4
Q2 2018	147.9	8.3	150.8	8.7	139.0	7.1
Q3 2018	150.8	7.3	153.7	7.4	142.0	6.8
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

Owner-occupied residential housing

Demand remains high

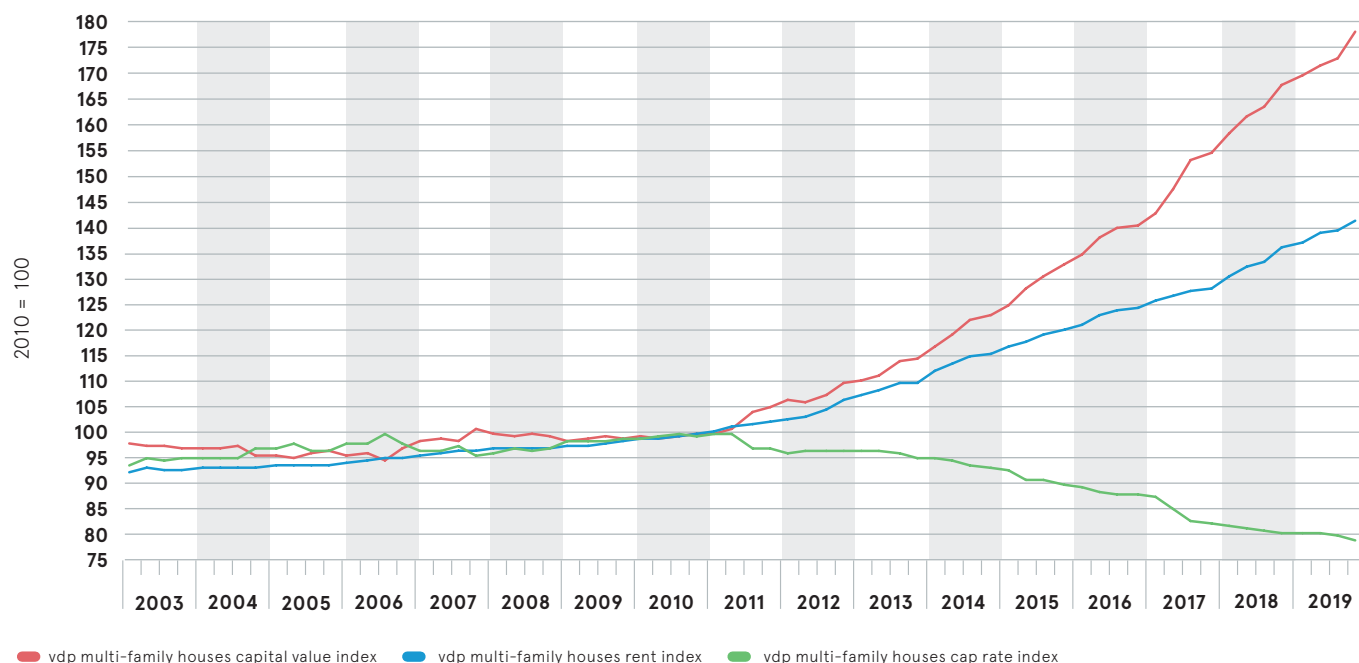


Year	Owner occupied housing		Single family houses		Condominiums	
	Index	y-o-y change in %	Index	y-o-y change in %	Index	y-o-y change in %
2009	99.4	-0.6	99.3	-1.3	99.8	2.0
2010	100.0	0.6	100.0	0.7	100.0	0.2
2011	102.4	2.4	101.9	1.9	104.3	4.3
2012	105.5	3.0	104.7	2.7	108.3	3.9
2013	108.7	3.1	107.5	2.6	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 %
Q1 2018	137.1	7.4	135.7	7.8	142.9	6.3
Q2 2018	139.7	7.5	138.4	8.1	145.0	5.3
Q3 2018	143.8	8.1	142.8	8.7	147.8	6.1
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

Multi-family houses

Rental price growth flattening off at a high level

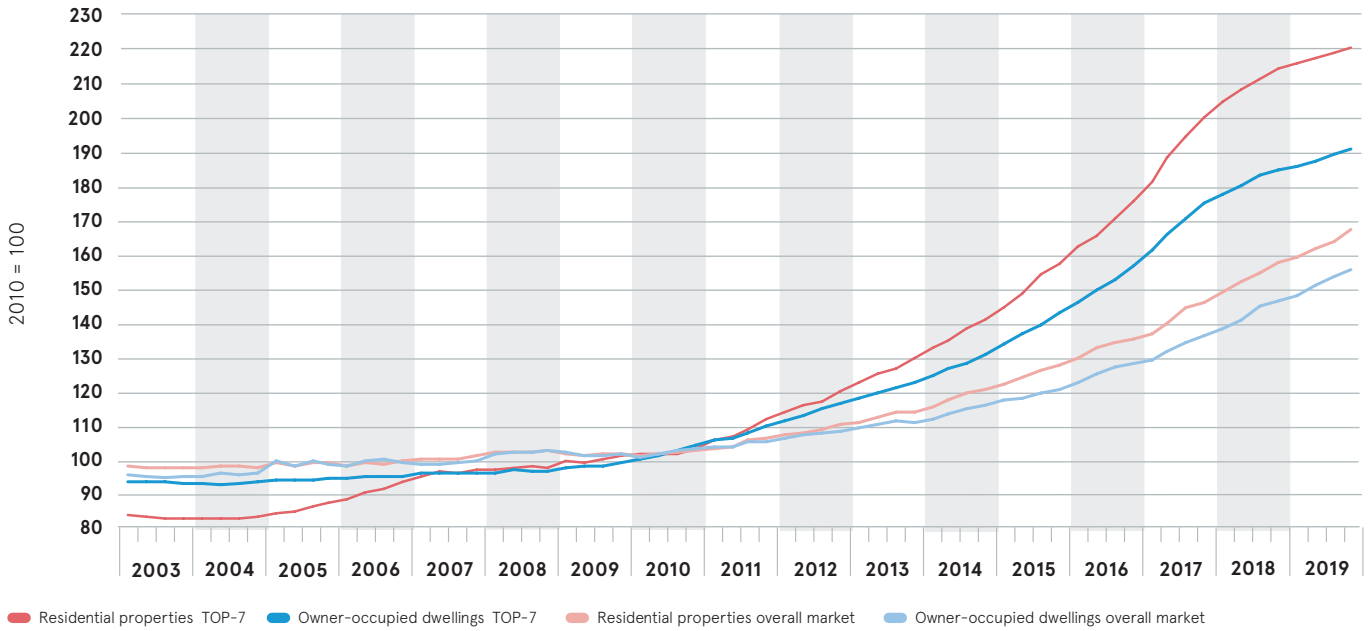


Year	Capital value		Residential rents		Cap rate	
	Index	y-o-y change in %	Index	y-o-y change in %	Index	y-o-y change in %
2009	99.5	-0.9	98.5	0.8	99.1	1.7
2010	100.0	0.6	100.0	1.5	100.0	0.9
2011	103.0	3.0	102.1	2.1	99.1	-0.9
2012	107.9	4.8	104.8	2.7	97.1	-1.9
2013	113.1	4.8	109.3	4.2	96.6	-0.5
2014	120.8	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 %
Q1 2018	158.9	10.9	130.9	3.5	82.4	-6.6
Q2 2018	162.1	9.7	133.1	4.6	82.1	-4.7
Q3 2018	163.8	6.8	133.8	4.4	81.7	-2.3
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	5.2	141.8	3.8	79.6	-2.2

Owner-occupied housing – top 7 markets*

Price growth easing



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

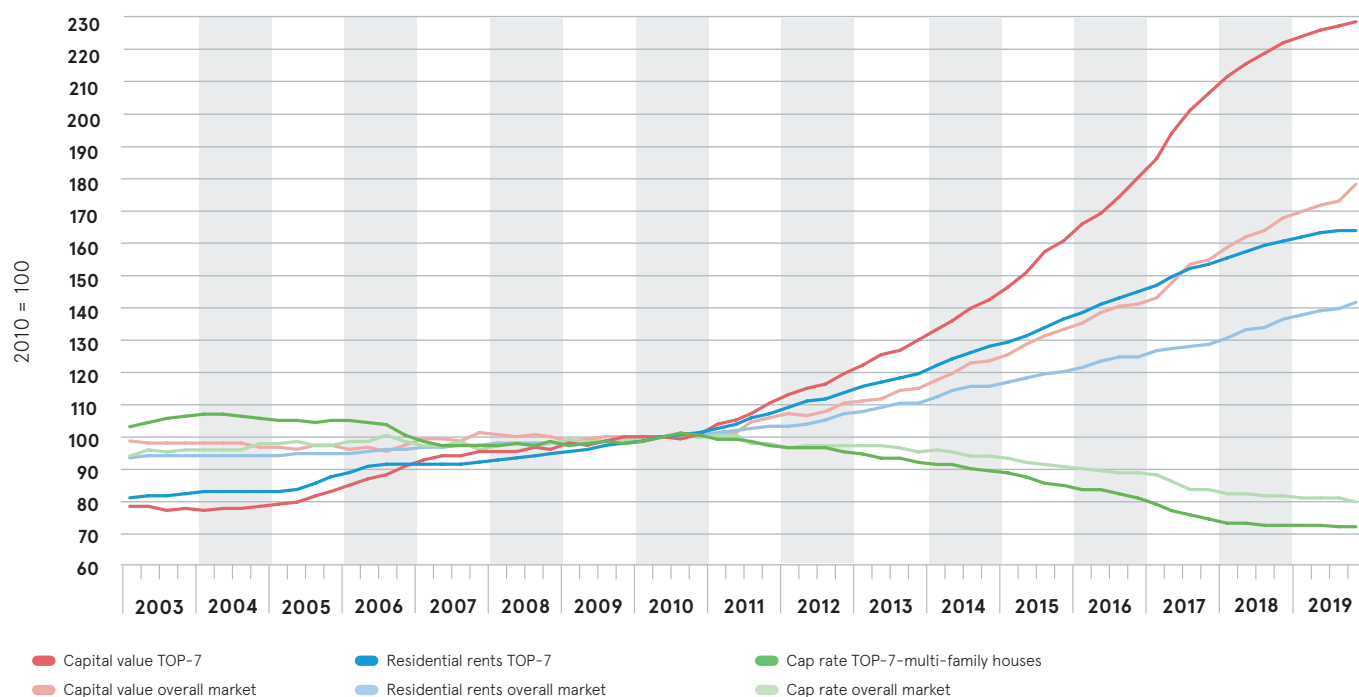
Year	Residential properties TOP-7		Owner occupied housing TOP-7	
	Index	y-o-y change in %	Index	y-o-y change in %
2009	97.9	2.5	96.1	1.6
2010	100.0	2.2	100.0	4.1
2011	106.3	6.3	105.4	5.4
2012	114.9	8.1	112	6.3
2013	124.4	8.3	118.4	5.8
2014	135.3	8.7	125.9	6.3
2015	150.0	10.9	136.7	8.6
2016	167.6	11.7	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 %
Q1 2018	204.3	13.1	176.8	10.4
Q2 2018	207.8	10.7	179.5	9.0
Q3 2018	211.2	8.8	182.5	7.5
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

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

Multi-family houses – top 7 markets*

Lowest rental growth for ten years



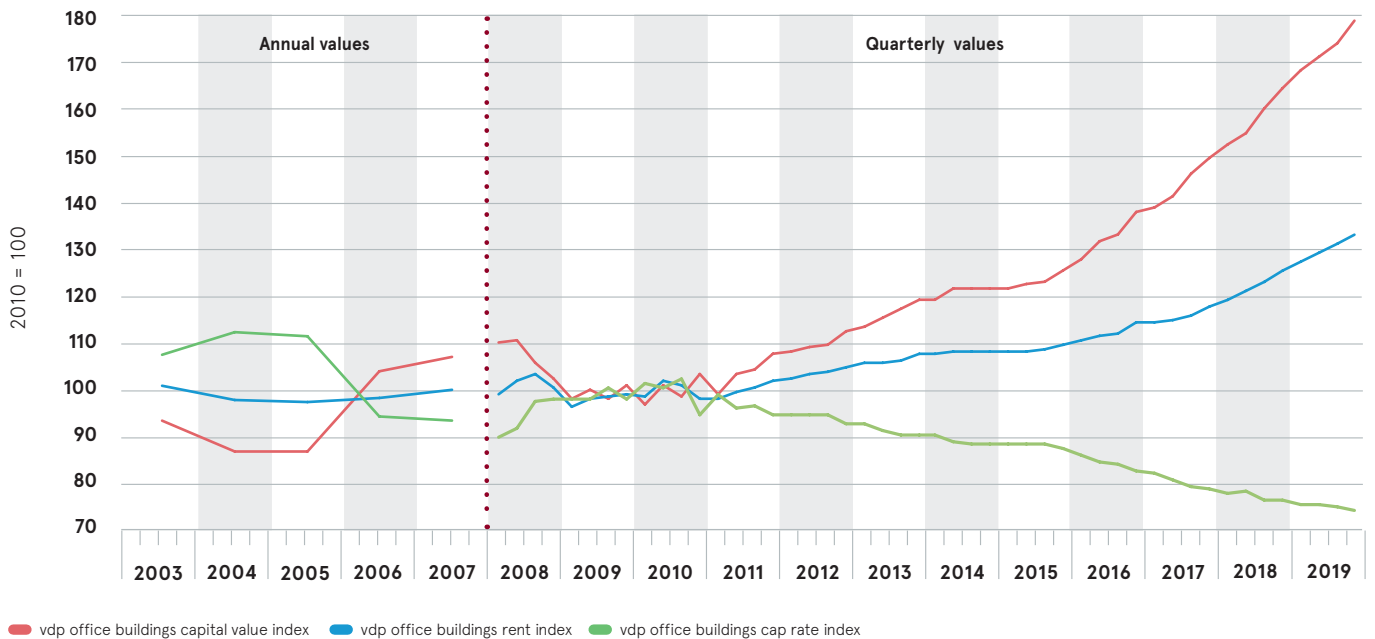
Year	Capital value TOP-7		Residential rents TOP-7		Cap rate TOP-7	
	Index	y-o-y change in %	Index	y-o-y change in %	Index	y-o-y change in %
2010	100.0	1.6	100.0	3.7	100.0	2
2011	106.6	6.6	104.9	4.9	98.4	-1.6
2012	115.8	8.6	111.4	6.2	96.2	-2.2
2013	126.2	9.0	117.6	5.6	93.2	-3.1
2014	130.8	9.4	125.0	6.2	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 %
Q1 2018	212.3	13.7	155.6	5.8	73.3	-7.0
Q2 2018	216.0	11.2	157.5	5.2	72.9	-5.3
Q3 2018	219.5	9.1	159.5	4.8	72.6	-3.9
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

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

Office and administration buildings

Prices continue to rise at a high rate

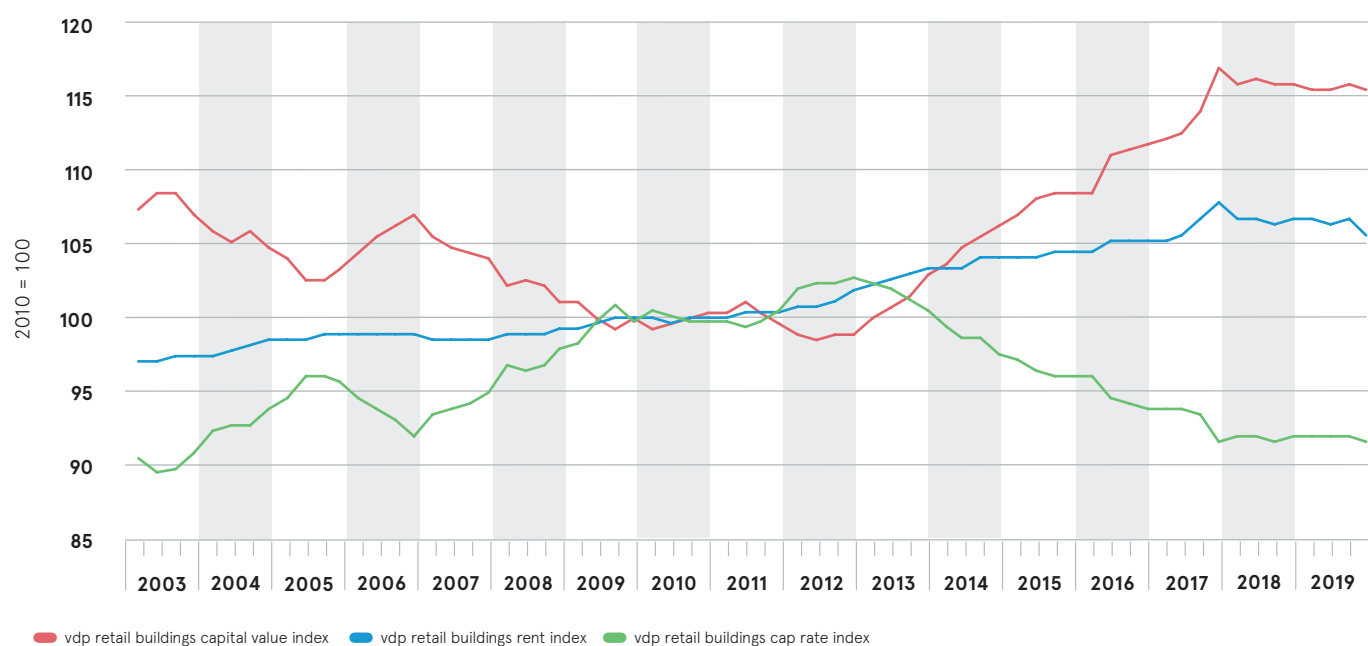


Year	Capital value		Residential rents		Cap rate	
	Index	y-o-y change in %	Index	y-o-y change in %	Index	y-o-y change in %
2009	99.3	-7.3	98.1	-3.1	98.8	4.5
2010	100.0	0.7	100.0	1.9	100.0	1.2
2011	103.6	3.6	100.2	0.2	96.7	-3.3
2012	109.9	6.0	103.6	3.4	94.3	-2.5
2013	116.4	5.9	106.4	2.7	91.5	-3.0
2014	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		Residential rents		Cap rate	
	Index	y-o-y change in %	Index	y-o-y change in %	Index	y-o-y change in %
Q1 2018	152.1	9.7	119.1	4.1	78.3	-5.1
Q2 2018	154.2	9.2	121.1	5.6	78.5	-3.3
Q3 2018	159.5	9.6	122.8	6.1	77	-3.1
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

Retails

Prices depressed by falling demand



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 %
2009	100.1	-2.0	99.9	0.7	99.7	2.7
2010	100.0	-0.1	100.0	0.1	100	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		Residential rents		Cap rate	
	Index	y-o-y change in %	Index	y-o-y change in %	Index	y-o-y change in %
Q1 2018	115.8	3.4	106.8	1.4	92.3	-1.9
Q2 2018	116.1	3.1	106.8	1.0	92	-2.1
Q3 2018	115.6	1.4	106.3	-0.4	91.9	-1.8
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

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.

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

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

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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Editor:

Verband deutscher Pfandbriefbanken e.V. (vdp)
Georgenstrasse 21, 10117 Berlin
www.pfandbrief.de

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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:

vdpResearch GmbH
Georgenstrasse 22, 10117 Berlin
www.vdpresearch.de

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.

Contacts:



Dr. Franz Eilers

Head of Real Estate Research
Tel.: +49 (0)30 206229-16
eilers@vdpresearch.de



Andreas Kunert

Indices Project Manager
Tel.: +49 (0)30 206229-17
kunert@vdpresearch.de