EMPIRA

**DIVERSIFICATION POTENTIAL
OF RESIDENTIAL REAL ESTATE INVESTMENTS**

PROFITABILITY, STABILITY AND PORTFOLIO CONTRIBUTION
OF GERMAN RESIDENTIAL REAL ESTATE
IN THE EUROPEAN CONTEXT

RESEARCH REPORT
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Diversification potential of residential real estate investments

Profitability, stability and portfolio contribution of German residential real estate in the European context

For many years now private and institutional investors have focused on residential real estate. In this respect there is considerable interest in a stable and sustainable capital investment that can be planned easily. Real estate values have risen considerably in virtually every European country since the beginning of the new millennium. The underpinning of these values with real economic factors such as rents, incomes, economic strength and new construction costs varies greatly in a cross country comparison. This results in considerable diversification potential for investors, with the effect that they can optimize the yield and risk profile in line with their own requirements.

In this respect a relative assessment of the real estate values compared to the macroeconomic and market-related environments is important. On the basis of suitable reference parameters it is possible for investors, banks and analysts to draw conclusions on any other potential (and also catching-up potential) or on possible price bubbles. Thus it is possible to select locations with less risk and combine these in an optimum manner with locations that offer the opportunity for higher yields. To this end this study analyses the price development in 14 European countries and the contribution made by German residential real estate for portfolios with an international orientation.

Contents

1. Value development of German residential real estate in a European comparison

With real estate investments there is always considerable interest in a stable, sustainable capital investment with a regular cash flow which can be planned easily. Markets with continually increasing or at least stable long-term real estate values and revenues are attractive. In this regard international investors frequently focus on the German residential real estate market. In addition, in numerous segments of the apartment and housing market (in particular one-family dwellings close to urban areas, urban condominiums) there is considerable demand on the part of domestic owner-occupiers. The reasons for this are rising incomes and declining interest rates, whereby private buyers are increasingly also accepting higher purchase prices. The price level of German residential real estate has thus risen significantly – and above all in the much sought-after metropolitan areas, therefore.

In order to assess the value development of German residential real estate the values of these have to be compared with benchmarks. Here it seems obvious to utilise neighbouring European countries with similar political, geographic and socioeconomic structures. Furthermore, other international markets with less similarity and/or economic integration can assist with a relative assessment and point to investment alternatives.

For the following comparison 14 selected Eu-
ropean markets have been used. In addition to Germany these are Great Britain, France, Italy, Spain, Poland, the Netherlands, Belgium, Greece, Czech Republic, Portugal, Sweden, Hungary and Austria. Other locations, as a rule smaller European investment locations, were neglected for reasons of clarity. The development of real estate prices is portrayed using the respective Eurostat house price index (time series since 2000, for Hungary and Poland shorter).

The country-specific value developments for residential real estate display more or less large fluctuations. In this respect the development of the European markets is not at all uniform. Thus Sweden displays a virtually continuous rise in the house price index (exception 2018) up to the highest index level of 336.7 (basis year 2000 = 100). Similarly, stable growth is displayed by Austria (with only a slight decrease in 2004) and Belgium (two downturns in the time period). In contrast, two countries – Greece and Italy – have also displayed frequent price declines (in 9 and 7 years, respectively). In Germany the index developed in a very restrained manner at the beginning of the millennium. As recently as 2010 the index was virtually unchanged at the basis level from 2000. Since then the real estate values in Germany have increased considerably by approx. 50 %, however.
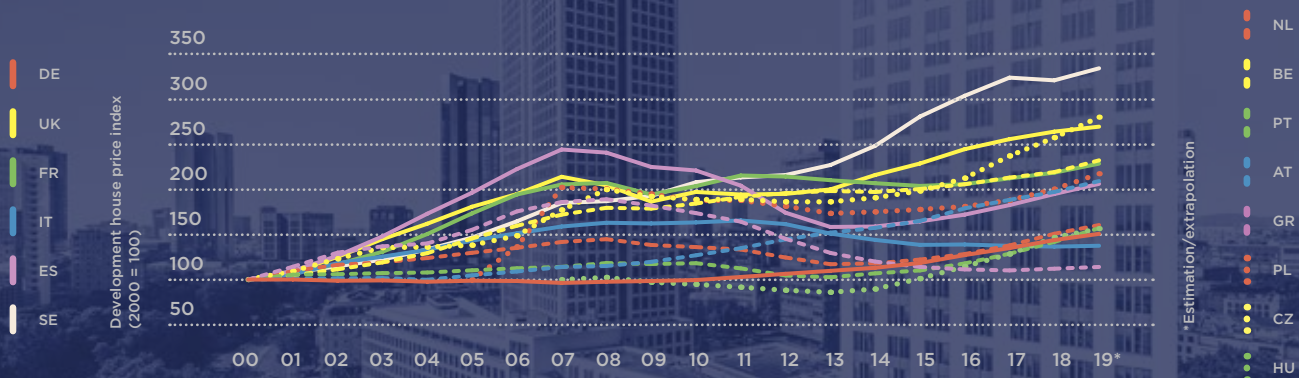

Fig. 1: Development of house price index (unadjusted, 2000 = 100); source: Eurostat; own calculation and illustration.

For the individual markets there are thus very different price increase rates and volatility ratios (standard deviation of the growth rates). Viewed over the past five years the annual growth rates average +5.0 % – with a bandwidth from -1.0 % (Greece) to +12.0 % (Hungary). Since 2000 the mean growth has amounted to 3.8 % p.a.. In this respect Sweden is the front-runner with +6.7 % p.a., whereas properties in Greece have increased in price by a mere 1.0 % each year.

In the overall comparison of the long-term value developments since 2000 Germany appears stable, yet with a below-average increase. In the short term (over 5 years) and in the medium term (over 10 years) the annual growth rates are higher than the mean for the 14 countries. The volatility ratios are in the lower segment of the bandwidth for all the countries across all the three time periods considered.

Another stable country in terms of value development is Austria (lowest volatility in two time periods). At the same time the value development is definitely attractive (highest in the ten-year time period). On the other hand, Sweden appears very volatile in the short term with a standard deviation of 4.6 percentage points, but is able to post in part very high growth rates across the whole period (since 2000 an average of 6.7 % p.a., only downturn in 2018 with -0.9 %). The weakest value development is displayed by Greece, which also has very high volatility. Since the beginning of the millennium the real estate values have increased by an average of 1.0 % p.a.. This is due above all to the long negative development since 2009, with a certain stabilisation of the values only noticeable in the past two years. An overview of the growth rates and volatility is to be seen in Fig. 2.

COUNTRY	DEVELOPMENT 5 YEARS		DEVELOPMENT 10 YEARS		DEVELOPMENT SINCE 2000	
	Growth p.a.	Volatility	Growth p.a.	Volatility	Growth p.a.	Volatility
DE	6.0 %	1.1 %-P.	4.4 %	1.8 %-P.	2.2 %	2.8 %-P.
UK	4.6 %	1.8 %-P.	3.8 %	2.9 %-P.	5.6 %	6.3 %-P.
FR	2.0 %	2.1 %-P.	1.7 %	2.8 %-P.	4.6 %	5.9 %-P.
IT	-0.9 %	1.6 %-P.	-1.6 %	2.5 %-P.	1.8 %	4.6 %-P.
ES	5.4 %	1.1 %-P.	-0.6 %	7.2 %-P.	4.3 %	9.1 %-P.
PL	4.5 %	2.7 %-P.	1.2 %	4.1 %-P.		
NL	6.4 %	2.0 %-P.	1.6 %	5.4 %-P.	2.7 %	4.7 %-P.
BE	3.4 %	1.4 %-P.	2.7 %	1.7 %-P.	4.6 %	3.4 %-P.
GR	-1.0 %	2.6 %-P.	-4.5 %	4.4 %-P.	1.0 %	7.8 %-P.
CZ	8.0 %	2.5 %-P.	4.0 %	4.6 %-P.	5.8 %	6.1 %-P.
PT	8.1 %	2.8 %-P.	3.2 %	6.0 %-P.	2.5 %	4.6 %-P.
SE	6.2 %	4.6 %-P.	5.8 %	4.0 %-P.	6.7 %	3.9 %-P.
HU	12.0 %	2.7 %-P.	5.2 %	7.3 %-P.		
AT	5.9 %	1.4 %-P.	5.8 %	1.3 %-P.	4.0 %	2.6 %-P.
Min.	**-1.0 %**	**1.1 %-P.**	**-4.5 %**	**1.3 %-P.**	**1.0 %**	**2.6 %-P.**
Mean	**5.0 %**	**2.2 %-P.**	**2.3 %**	**4.0 %-P.**	**3.8 %**	**5.2 %-P.**
Max.	**12.0 %**	**4.6 %-P.**	**5.8 %**	**7.3 %-P.**	**6.7 %**	**9.1 %-P.**

Fig. 2: Development of house price index (unadjusted, 2000 = 100); source: Eurostat; own calculation and illustration.

From the stance of a portfolio with investments throughout Europe, the value development has fluctuated considerably over the years. At the same time a wide spread (assumption: 14 markets in equal parts) leads to a clear stabilisation compared to the results for individual markets (Fig. 3). The reason for this is the wide bandwidth for value development (gap between maximum and minimum value in one year). In no year was this less than ten percentage points (lowest value: 10.2 percentage points in 2019). The most extreme value was reached in 2007 with just under 51 percentage points, attained in arithmetical terms as a result of the strong increase in Poland and the negative development in Germany. Whereas in recent years Hungary has usually been responsible for the upper value in the bandwidth, in the years prior to 2015 it was normally Sweden or Austria which attained the highest growth rates. In contrast, the minimum values were often seen in the countries seriously affected by the sovereign debt crisis – Spain, Italy and Greece. In 2008 and 2009 Great Britain brought up the rear. The German market has been relatively inconspicuous in this sense. Its value development has generally been close to or slightly higher than the average for the 14 European countries examined in this study.
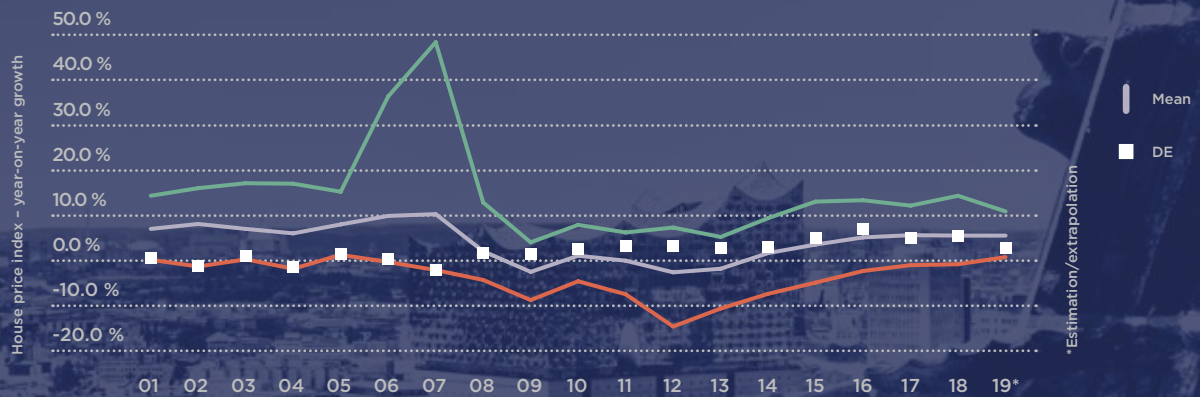

Fig. 3: Development of house price index (unadjusted), year-on-year growth, in each case minimum, maximum, mean, Germany; source: Eurostat; own calculation and illustration.

As the value developments for individual countries seemingly change over the course of time, it is not possible to identify any stable yield-risk profile for the investment strategy of investors, nor is it possible to make a sustainable recommendation in this respect. Even countries which have displayed strong growth over many years can later post a below-average development. Fundamentally, as a consequence of the highly heterogeneous markets, however, it is to be assumed that there is greater diversification potential through a combination of countries or of submarkets within a country (more on this in the third section).

Tactical considerations, in particular the question of over- and undervaluations, frequently play a role in the choice of markets. Corresponding statements result not only from the corresponding growth comparison of past results. Value developments do not arise independently. Rather they are dependent on various market parameters and up-stream factors. What is interesting, therefore, is a comparison with other ratios, e.g. the up-stream (socio) economic level. So as to explain value developments and to assess the levels attained, parameters such as rents, per capita incomes, economic strength and construction costs are utilised in the following study.

2. Explanation of value development on the basis of the economic and socioeconomic market environments

For the most part the value development of real estate is the result of macroeconomic and socioeconomic developments. In this respect investment-related factors such as the investment requirement, capital flows and the development of interest rates have more or less the same impact worldwide, across all markets therefore. They can only be used to a limited extent to explain specific regional and national developments or to differentiate between these.

In contrast, parameters such as rents, incomes, economic strength and construction costs can by all means be regarded as specific for the respective market in terms of their amount and development. Accordingly they can be compared with the development of the respective real estate markets. Theoretical relationships and statistical correlations serve to explain and forecast value developments, and to assess the associated risks. For example, rising residential rents lead to higher revenues. The residential rents, in turn, are driven by the incomes of the target group, and these by the general economic development. These up-stream factors should be taken into account in evaluation and decision-making systems. Their development – in terms of absolute size or relative to the value development – can reveal market potential and differentiate between the corresponding investment alternatives. A number of correlations are examined in the following.

Real estate values vs. rents

One obvious correlation is that between real estate values and the respective rents in a market. Even though the underlying index for the development of house prices here is a market-wide survey both for rented and owner-occupied properties, rents are nevertheless a generally accepted and universally valid parameter. In the case of rented apartments the impact of the development of rents on the real estate values results from the increase in individual revenues (possibly also with a time delay following a rental increase or a new lease) and the corresponding earning values (a fundamental parameter in evaluation methods alongside the discount rate). In the case of owner-occupied housing the effect is seen less directly, yet is nevertheless present. Owner-occupied properties also have the potential for use as rented property, whereby the earnings value can also be calculated using the respective estimated obtainable rents. In addition, rising rents for sitting tenants amplify the desire to purchase property, thus resulting in greater demand on the part of buyers, and in turn inducing price increases on the housing market.

Fundamentally, in the analysis of value developments the rent index for the same market is of interest, therefore. Corresponding indices at country level are provided by the OECD for all of the 14 European markets considered here.

In a country comparison it is noticeable that rents have seen significantly different developments (Fig. 4). This can be due to base effects, to very low initial rents, for instance. A corresponding constellation is to be assumed in Hungary, where the index has increased by 200 % since the beginning of the millennium and by 42 % in the past ten years. In the same periods there were increases in Germany of only 26 % and 14 %, respectively. Likewise it may be seen that the development of the European markets has by no means taken place in parallel. This is not only true of the growth rate itself, but in part there has also been country-specific dynamism in individual phases. Thus the rents in Greece have declined continually since 2011. In the Czech Republic and Poland, in contrast, clear catching-up effects were identified, which later translated into more average growth. In many countries the rents have increased continually since 2000. Only in four markets (France, Italy, Spain and Greece) have there been downturns in certain years, whereby Greece stands out in particular with its negative development

since 2011. In the selection of markets and the allocation of investments to specific target markets a frequent consideration is the index level and the underlying rent growth. Further- more, the stability of the market development is interesting. There is a relative degree of security for investments and their revenue planning in markets in which the growth rate for rents has not fluctuated greatly over the course of time. In Germany this increase has been an extremely constant ca. 1.3 % p. a. across several comparative periods (5 years, 10 years, since 2000). In contrast, France (and

likewise Italy) has displayed differing average increases of 0.3 %, 0.8 % and 1.6 % across the same periods, something which indicates slower growth.

Fluctuations over the course of time may be quantified using volatility ratios. Fundamen- tally, investors look for markets which pro- mise a specific yield with the lowest possible volatility. Low volatility of usually less than 1 % is offered not only by Germany, but also by the Netherlands, Belgium and Austria, for example. The table (Fig. 4) shows an overview of all three time periods in the study.

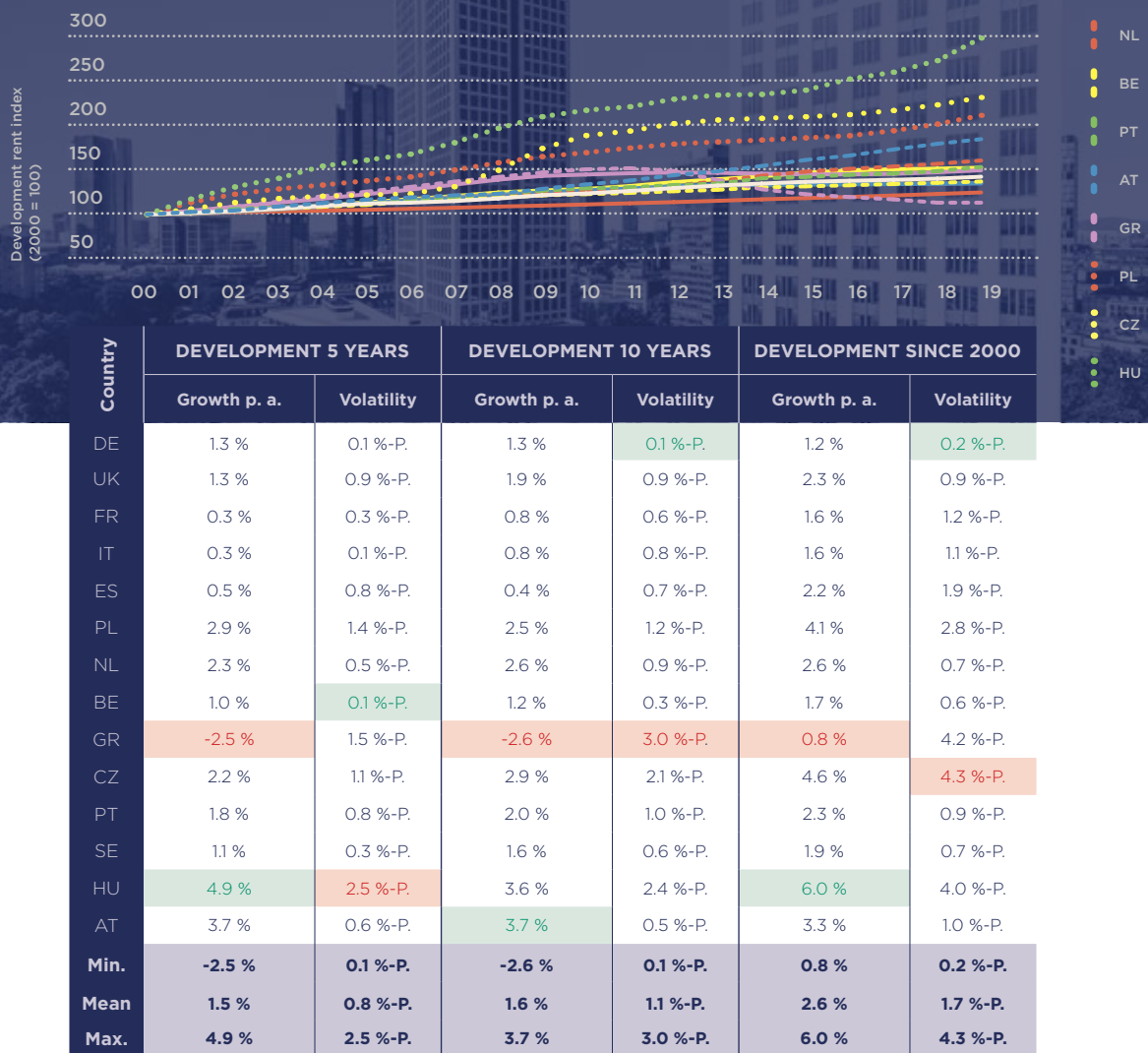| Country	DEVELOPMENT 5 YEARS		DEVELOPMENT 10 YEARS		DEVELOPMENT SINCE 2000	
	Growth p. a.	Volatility	Growth p. a.	Volatility	Growth p. a.	Volatility
DE	1.3 %	0.1 %-P.	1.3 %	0.1 %-P.	1.2 %	0.2 %-P.
UK	1.3 %	0.9 %-P.	1.9 %	0.9 %-P.	2.3 %	0.9 %-P.
FR	0.3 %	0.3 %-P.	0.8 %	0.6 %-P.	1.6 %	1.2 %-P.
IT	0.3 %	0.1 %-P.	0.8 %	0.8 %-P.	1.6 %	1.1 %-P.
ES	0.5 %	0.8 %-P.	0.4 %	0.7 %-P.	2.2 %	1.9 %-P.
PL	2.9 %	1.4 %-P.	2.5 %	1.2 %-P.	4.1 %	2.8 %-P.
NL	2.3 %	0.5 %-P.	2.6 %	0.9 %-P.	2.6 %	0.7 %-P.
BE	1.0 %	0.1 %-P.	1.2 %	0.3 %-P.	1.7 %	0.6 %-P.
GR	-2.5 %	1.5 %-P.	-2.6 %	3.0 %-P.	0.8 %	4.2 %-P.
CZ	2.2 %	1.1 %-P.	2.9 %	2.1 %-P.	4.6 %	4.3 %-P.
PT	1.8 %	0.8 %-P.	2.0 %	1.0 %-P.	2.3 %	0.9 %-P.
SE	1.1 %	0.3 %-P.	1.6 %	0.6 %-P.	1.9 %	0.7 %-P.
HU	4.9 %	2.5 %-P.	3.6 %	2.4 %-P.	6.0 %	4.0 %-P.
AT	3.7 %	0.6 %-P.	3.7 %	0.5 %-P.	3.3 %	1.0 %-P.
Min.	**-2.5 %**	**0.1 %-P.**	**-2.6 %**	**0.1 %-P.**	**0.8 %**	**0.2 %-P.**
Mean	**1.5 %**	**0.8 %-P.**	**1.6 %**	**1.1 %-P.**	**2.6 %**	**1.7 %-P.**
Max.	**4.9 %**	**2.5 %-P.**	**3.7 %**	**3.0 %-P.**	**6.0 %**	**4.3 %-P.**

Fig. 4: Development of rent index (seasonally adjusted, 2000 = 100); source: OECD; own calculation and illustration.

Low fluctuation for rents is seen above all in stable economies, therefore. Here rent developments are at about the same levels as those observed for general price inflation, and over the course of time they hardly display any larger deviations (typical for Germany, see Fig. 5). Other countries can deviate considerably from this uniform development, whereby on the whole there is a wide bandwidth for the group of 14 markets considered in Europe. With the observed extreme values (min., max.) it is the specific developments in Greece (crisis) and Hungary (strong nominal growth), for example, which catch the eye. Even if these extreme values may be explained by special effects and are not at all sustainable in terms of their size, they nonetheless play a role in the evaluation and the portfolio management. A strategy for risk minimisation can be the distribution of the investments across all markets. Thus the annual rent increase (mean of the evenly distributed portfolio) would be at approximately the same level seen in Germany (Fig. 5).
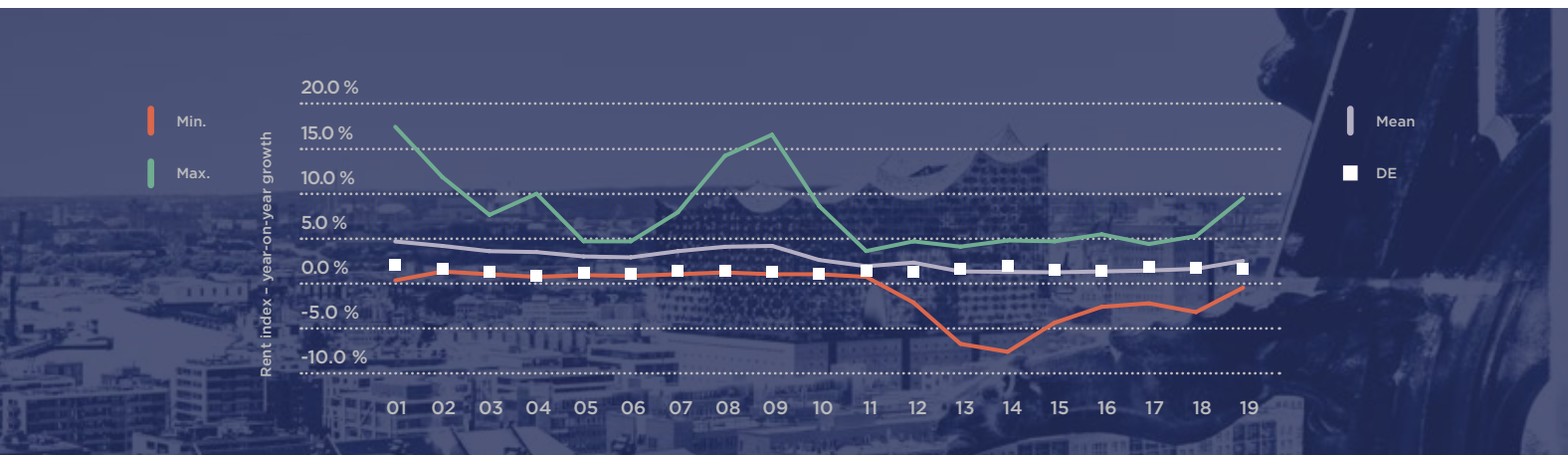

Fig. 5: Development of rents (seasonally adjusted), year-on-year growth, in each case minimum, maximum, mean, Germany; source: OECD; own calculation and illustration.

A clear correlation may be recognised in the comparison of the development of the values and rents for residential real estate. Thus downturns in rents brought about by economic or socioeconomic developments lead to a loss of value, as is clearly shown by the example of Greece across differing periods of time. In stable European markets such as Germany, Great Britain, Sweden and Austria the rents have risen continually, as have the corresponding values (depending on the market and length of the review, above- or below-average). Fluctuations are noticeable in particular in smaller markets. In Hungary, for instance, the value appreciation in the shorter period was much higher than the rent increase (75 % to 27 %).

Fundamentally, any sudden value development not underpinned by the rent development (or other indicators) can be an indication of a risk, for instance a speculative bubble. On the other hand, high rent increases which are not yet reflected in the real estate values (or value declines with generally constant rents) can point to certain market opportunities. Naturally this only applies if other factors (in particular valuation yields) do not interfere with this correlation between values and rents. On average the value developments on the markets are significantly higher than the rent developments, and especially with this overall effect of yield compression. This is true of all the three periods considered. Above all in the shortest period

considered there is a considerable difference in the dynamism of both parameters, which clearly favours the real estate values. Sweden is striking, where the house price index has increased by more than 220 % since 2000 – with absolute rent growth of merely 41 %. Only in the economies with a comparatively weak development in recent years – namely Italy, Spain and Greece – is the value development in some of the comparative periods

lower than the development of rents; this may be explained by various factors, in part with a parallel impact, such as earlier price levels, excess construction, a slump in demand and financing problems. An overview of the absolute growth rates and the difference between value and rent developments is to be seen in Fig. 6.

COUNTRY	DEVELOPMENT 5 YEARS			DEVELOPMENT 10 YEARS			DEVELOPMENT SINCE 2000		
	Values	Rents	Difference	Values	Rents	Difference	Values	Rents	Difference
DE	33.6 %	6.8 %	26.8 %-P.	53.7 %	13.9 %	39.8 %-P.	51.2 %	25.6 %	25.6 %-P.
UK	24.9 %	6.9 %	18.1 %-P.	44.8 %	20.4 %	24.5 %-P.	165.8 %	52.4 %	113.3 %-P.
FR	10.5 %	1.3 %	9.2 %-P.	17.7 %	8.6 %	9.1 %-P.	119.8 %	35.6 %	84.2 %-P.
IT	-4.5 %	1.3 %	-5.8 %-P.	-15.3 %	8.3 %	-23.6 %-P.	37.0 %	35.4 %	1.5 %-P.
ES	30.0 %	2.6 %	27.3 %-P.	-8.4 %	4.5 %	-12.9 %-P.	95.8 %	48.4 %	47.5 %-P.
PL	24.3 %	15.2 %	9.1 %-P.	11.6 %	28.3 %	-16.7 %-P.			
NL	36.3 %	12.1 %	24.2 %-P.	16.1 %	29.3 %	-13.2 %-P.	51.3 %	57.8 %	-6.4 %-P.
BE	17.9 %	5.2 %	12.7 %-P.	30.1 %	13.1 %	17.0 %-P.	120.4 %	36.5 %	84.0 %-P.
GR	-5.0 %	-11.9 %	6.9 %-P.	-37.6 %	-23.3 %	-14.3 %-P.	12.2 %	13.5 %	-1.3 %-P.
CZ	47.1 %	11.3 %	35.7 %-P.	46.0 %	33.1 %	12.9 %-P.	159.1 %	124.3 %	34.8 %-P.
PT	47.4 %	9.1 %	38.3 %-P.	34.3 %	21.3 %	13.0 %-P.	42.2 %	49.6 %	-7.4 %-P.
SE	34.8 %	5.8 %	29.0 %-P.	73.8 %	17.4 %	56.4 %-P.	223.2 %	41.1 %	182.1 %-P.
HU	75.7 %	27.0 %	48.7 %-P.	61.9 %	42.3 %	19.7 %-P.			
AT	33.2 %	19.7 %	13.5 %-P.	75.5 %	43.8 %	31.7 %-P.	98.2 %	80.4 %	17.9 %-P.
Min.	**-5.0 %**	**-11.9 %**	**-5.8 %-P.**	**-37.6 %**	**-23.3 %**	**-23.6 %-P.**	**12.2 %**	**13.5 %**	**-7.4 %-P.**
Mean	**29.0 %**	**8.0 %**	**21.0 %-P.**	**28.9 %**	**18.6 %**	**10.2 %-P.**	**98.0 %**	**50.0 %**	**48.0 %-P.**
Max.	**75.7 %**	**27.0 %**	**48.7 %-P.**	**75.5 %**	**43.8 %**	**56.4 %-P.**	**223.2 %**	**124.3 %**	**182.1 %-P.**

Fig. 6: Development of house price index (unadjusted) and rent index (seasonally adjusted), comparison across differing time periods; sources: Eurostat, OECD; own calculation and illustration.

Real estate values vs. incomes

A socioeconomic parameter which serves to explain price increases on the real estate market and which can fundamentally underpin these is the disposable per capita income of households. In this respect catching-up effects led to high growth rates in the eastern

European transformation economies Poland, Hungary and the Czech Republic. Poland and the Czech Republic are also the only countries in the study group to post unbroken income growth. Sweden and Germany have been able to post an increase of nearly 60 % since 2000. The development in Greece is striking. With strong growth in the first years

of the new millennium, in 2008 the index exceeded all the other countries considered. The subsequent economic slump also led to enormous declines in incomes (by nearly 40 index points through to 2013). Since then the disposable per capita incomes have again seen moderate growth.

The described developments have led to high volatility for incomes in Greece, while the fluctuations in Great Britain, Hungary and Spain also tend to be high. Germany has displayed the lowest volatility in both the short-term analysis as well as in the observation since 2000, and its growth rates are higher than the average of all 14 countries in all three periods. The growth leaders in the individual periods are Poland (over 10 years and since 2000) and the Czech Republic (over 5 years). In the short term Spain and Portugal have displayed a clear upward trend with average annual income growth of 2.8 and 2.6 %, respectively.
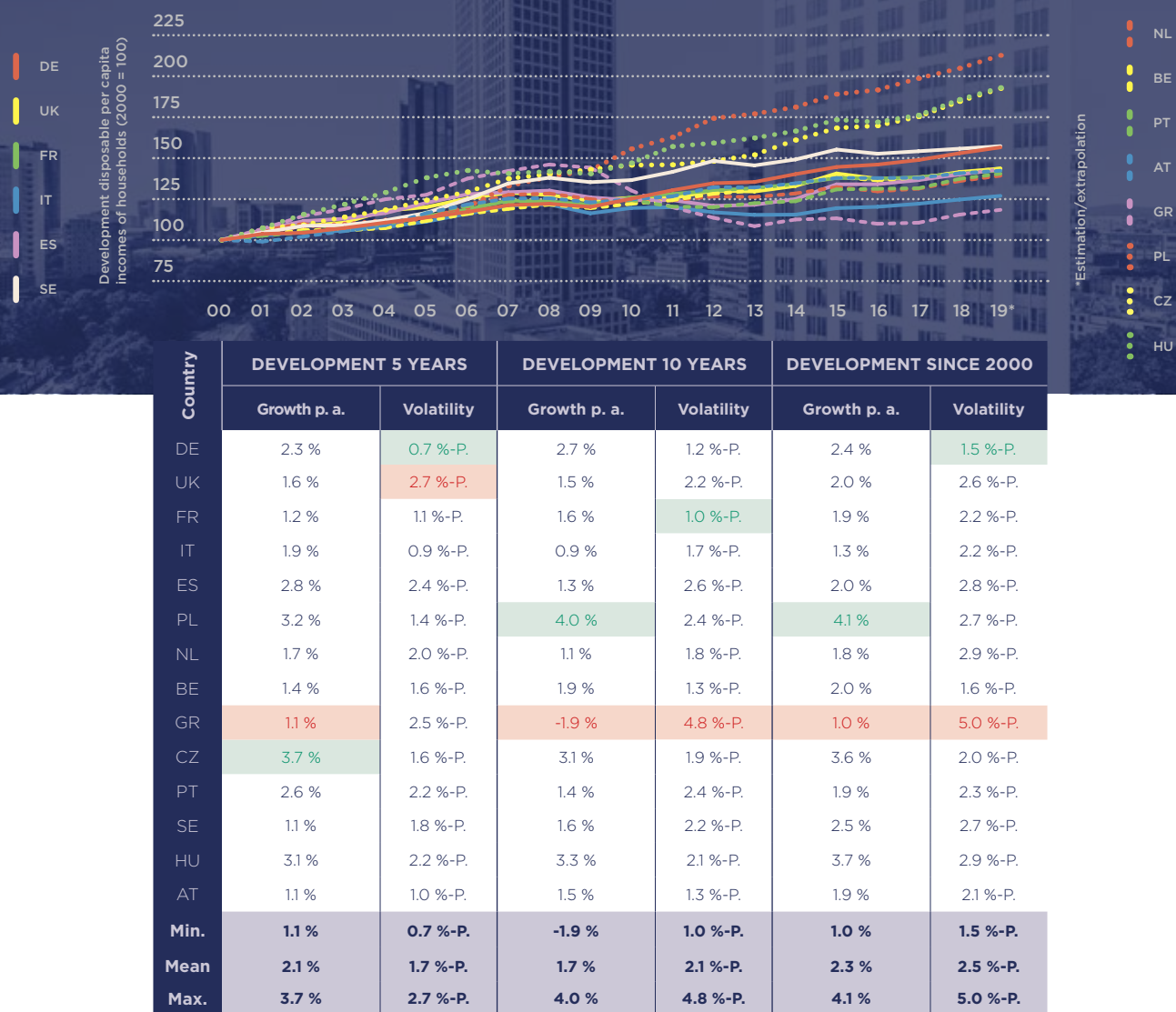
Country	DEVELOPMENT 5 YEARS		DEVELOPMENT 10 YEARS		DEVELOPMENT SINCE 2000	
	Growth p. a.	Volatility	Growth p. a.	Volatility	Growth p. a.	Volatility
DE	2.3 %	0.7 %-P.	2.7 %	1.2 %-P.	2.4 %	1.5 %-P.
UK	1.6 %	2.7 %-P.	1.5 %	2.2 %-P.	2.0 %	2.6 %-P.
FR	1.2 %	1.1 %-P.	1.6 %	1.0 %-P.	1.9 %	2.2 %-P.
IT	1.9 %	0.9 %-P.	0.9 %	1.7 %-P.	1.3 %	2.2 %-P.
ES	2.8 %	2.4 %-P.	1.3 %	2.6 %-P.	2.0 %	2.8 %-P.
PL	3.2 %	1.4 %-P.	4.0 %	2.4 %-P.	4.1 %	2.7 %-P.
NL	1.7 %	2.0 %-P.	1.1 %	1.8 %-P.	1.8 %	2.9 %-P.
BE	1.4 %	1.6 %-P.	1.9 %	1.3 %-P.	2.0 %	1.6 %-P.
GR	1.1 %	2.5 %-P.	-1.9 %	4.8 %-P.	1.0 %	5.0 %-P.
CZ	3.7 %	1.6 %-P.	3.1 %	1.9 %-P.	3.6 %	2.0 %-P.
PT	2.6 %	2.2 %-P.	1.4 %	2.4 %-P.	1.9 %	2.3 %-P.
SE	1.1 %	1.8 %-P.	1.6 %	2.2 %-P.	2.5 %	2.7 %-P.
HU	3.1 %	2.2 %-P.	3.3 %	2.1 %-P.	3.7 %	2.9 %-P.
AT	1.1 %	1.0 %-P.	1.5 %	1.3 %-P.	1.9 %	2.1 %-P.
Min.	1.1 %	0.7 %-P.	-1.9 %	1.0 %-P.	1.0 %	1.5 %-P.
Mean	2.1 %	1.7 %-P.	1.7 %	2.1 %-P.	2.3 %	2.5 %-P.
Max.	3.7 %	2.7 %-P.	4.0 %	4.8 %-P.	4.1 %	5.0 %-P.

Fig. 7: Development of disposable per capita incomes of households (in PPS, 2000 = 100); source: Eurostat; own calculation and illustration.

The development of incomes is also subject to a certain bandwidth, both between the countries as well as between the years (Fig. 8). The largest deviation between maximum and minimum is seen in 2010 with the strong income growth in Poland (+9.4 %) and with declining per capita incomes in Greece (-9.8 %). Germany has generally displayed an above-average performance since 2010. To be noted is a tendency towards a tightening of the bandwidth in recent years. In this regard the per capita income developments have displayed greater alignment and a decline in dynamism (low volatility, comparatively low maximum values). Residential real estate portfolios (also with differing market weightings) tend to gain in security on the basis of this fundamental support.

Fig. 8: Development of disposable per capita incomes of households (in PPS), year-on-year growth, in each case minimum, maximum, mean, Germany; source: Eurostat; own calculation and illustration.

In the comparison it is possible to discern a clear lead on the part of value development over income development across all periods. A fundamental explanation for the value developments solely on the basis of the growth rates for incomes may be seen above all in Germany (since 2000) and Poland (over 10 years), yet also statistically in Greece (long-term consideration since 2000). In the shorter observation across 5 and 10 years respectively the partially positive income developments in Greece, Italy and Spain are predominantly due to a loss of value on the real estate market, and are thus not necessarily to be viewed as a stability indicator.

Particularly large differences in the long-term development of both parameters are seen in Great Britain and above all Sweden (since 2000: value development +223 %, income development +59 %, difference 164 percentage points). In the short term the discrepancy is greatest by far in Hungary with a difference of nearly 60 percentage points between the value and income developments.

In contrast, a very well-balanced relationship between the development of real estate values and incomes is displayed by France, where the difference is merely 4.3 percentage points in the five-year period and is actually less than one percentage point over 10 years. Here the prices seem to be very well underpinned by the disposable incomes. Bigger differences are seen for the earlier years from 2000 onwards.

On the whole the real estate values have usually grown much more strongly than the per capita incomes, however. Consequently, the value increases may only in part be explained by higher incomes and underpinned in economic terms. The respective differences should be taken into account in the risk analysis and market selection. Other indicators are required to arrive at an explanation and make an assessment.

COUNTRY	DEVELOPMENT 5 YEARS			DEVELOPMENT 10 YEARS			DEVELOPMENT SINCE 2000		
	Values	Incomes	Difference	Values	Incomes	Difference	Values	Incomes	Difference
DE	33.6 %	11.8 %	21.7 %-P.	53.7 %	30.9 %	22.8 %-P.	51.2 %	58.0 %	-6.7 %-P.
UK	24.9 %	8.1 %	16.8 %-P.	44.8 %	16.1 %	28.7 %-P.	165.8 %	44.3 %	121.4 %-P.
FR	10.5 %	6.2 %	4.3 %-P.	17.7 %	17.3 %	0.4 %-P.	119.8 %	43.1 %	76.7 %-P.
IT	-4.5 %	9.9 %	-14.4 %-P.	-15.3 %	9.1 %	-24.4 %-P.	37.0 %	26.8 %	10.2 %-P.
ES	30.0 %	14.7 %	15.3 %-P.	-8.4 %	13.8 %	-22.1 %-P.	95.8 %	43.8 %	52.0 %-P.
PL	24.3 %	16.8 %	7.5 %-P.	11.6 %	47.5 %	-35.9 %-P.			
NL	36.3 %	8.5 %	27.8 %-P.	16.1 %	11.6 %	4.5 %-P.	51.3 %	39.7 %	11.6 %-P.
BE	17.9 %	7.3 %	10.6 %-P.	30.1 %	20.5 %	9.6 %-P.	120.4 %	44.4 %	76.1 %-P.
GR	-5.0 %	5.3 %	-10.3 %-P.	-37.6 %	-18.1 %	-19.5 %-P.	12.2 %	18.8 %	-6.6 %-P.
CZ	47.1 %	20.0 %	27.1 %-P.	46.0 %	35.4 %	10.6 %-P.	159.1 %	95.8 %	63.2 %-P.
PT	47.4 %	13.8 %	33.6 %-P.	34.3 %	14.6 %	19.7 %-P.	42.2 %	41.0 %	1.2 %-P.
SE	34.8 %	5.5 %	29.2 %-P.	73.8 %	16.5 %	57.2 %-P.	223.2 %	58.7 %	164.5 %-P.
HU	75.7 %	16.3 %	59.4 %-P.	61.9 %	38.3 %	23.6 %-P.			
AT	33.2 %	5.8 %	27.4 %-P.	75.5 %	15.9 %	59.6 %-P.	98.2 %	42.9 %	55.3 %-P.
Min.	**-5.0 %**	**5.3 %**	**-14.4 %-P.**	**-37.6 %**	**-18.1 %**	**-35.9 %-P.**	**12.2 %**	**18.8 %**	**-6.7 %-P.**
Mean	**29.0 %**	**10.7 %**	**18.3 %-P.**	**28.9 %**	**19.2 %**	**9.6 %-P.**	**98.0 %**	**46.5 %**	**51.6 %-P.**
Max.	**75.7 %**	**20.0 %**	**59.4 %-P.**	**75.5 %**	**47.5 %**	**59.6 %-P.**	**223.2 %**	**95.8 %**	**164.5 %-P.**

*Fig. 9: Development of house price index (unadjusted) and disposable per capita incomes of households (in PPS),
comparison across differing time periods; source: Eurostat; own calculation and illustration.*

Real estate values vs. economic strength

The general development of economic strength can allow for additional conclusions to be drawn on the stability of national markets. This is studied here on the basis of the per capita GDP. In part we see a similar picture here to that observed with incomes. The highest growth rates were posted in the eastern European countries namely the Czech Republic, Hungary and Poland, something which may be explained by comparatively low starting levels and economic catching-up processes. With an index value of 317 the Czech Republic is the clear leader at the end of the time period considered. After Hungary (294) and Poland (281), Austria comes quite a way behind (169). In Germany attained an index value of nearly 160. Thus the per capita GDP in the Federal Republic of Germany has grown by approx. 60 % since 2000. Alongside the dynamism, the level attained is noteworthy. The bandwidth here is again high. The value for the Czech Republic corresponds – at ca. EUR 20,6k – to only about half that of German per capita GDP.

Low growth is displayed by Great Britain. Since 2000 the growth rate has been a mere 19.3 %, something which is due above all to the weakness of the past five years coupled with the Brexit process. Sweden only posted weak figures for a short time (only +2.4 % per capita GDP over five years, with +45 % since 2000). Some developments are taking place almost in parallel, however. In 2009 economic strength decreased in general in the wake of the global financial crisis. For a number of strong countries (Germany, France, the Netherlands, Belgium and Austria) this was the only negative year, however. In Greece, in

contrast, economic output declined as many as eight years in succession (2009 to 2016). It is only in recent years that the situation here has stabilised somewhat. Since 2017 GDP has again seen growth, with figures of significantly more than 2 %.

With regard to the volatility of GDP development it is also possible to differentiate easily between a number of countries. Here too Great Britain has posted highly unfavourable

ratios. On the whole the past five years have been very successful in economic terms across all countries. The mean annual growth amounted to 3.2 % and was thus better than in the two other periods (2.5 % and 3.1 %; both incl. financial crisis). From an investor's stance Germany, France, the Netherlands and Austria would be particularly interesting on the basis of these ratios, as solid growth has been accompanied by comparatively low volatility.
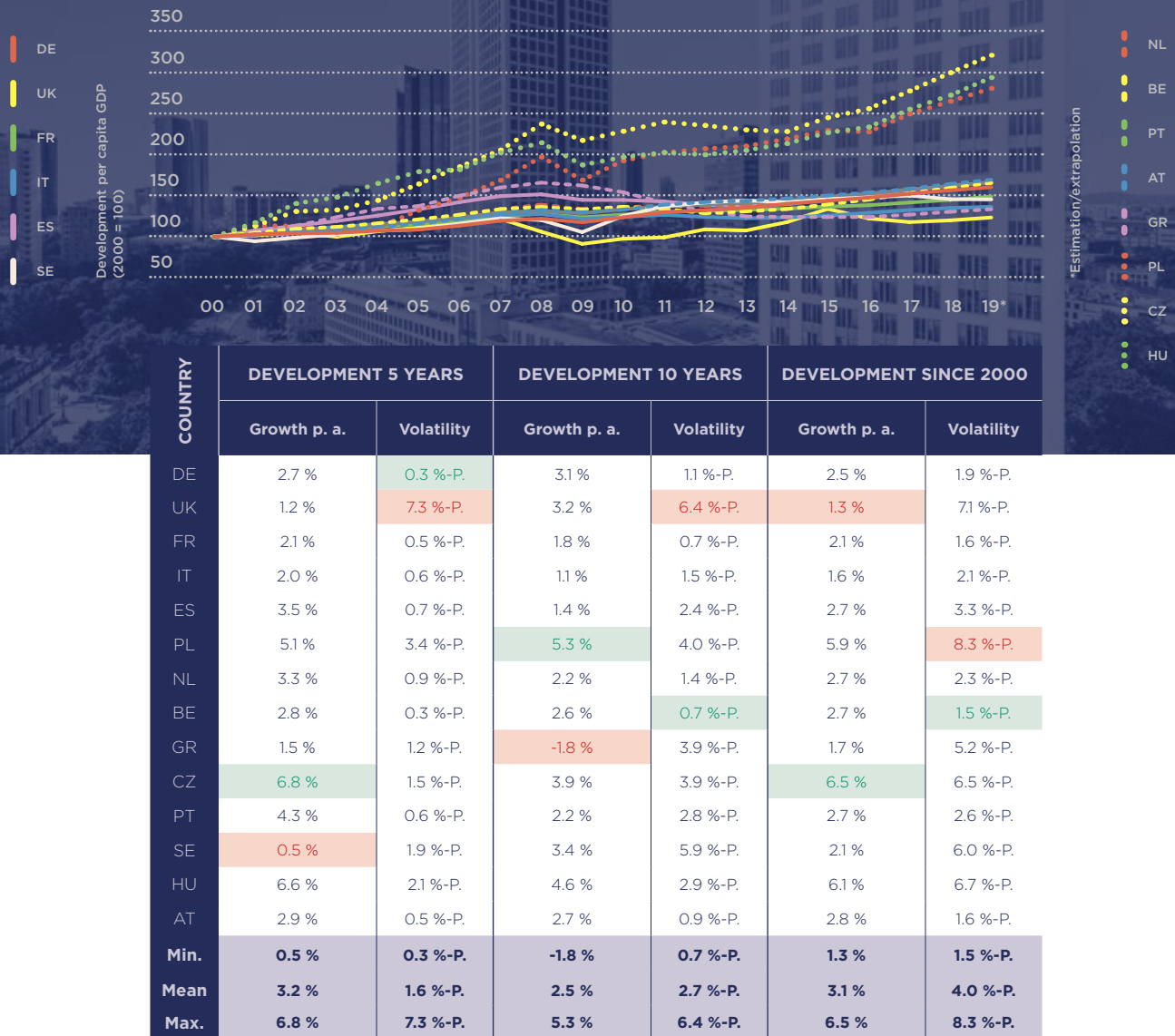

COUNTRY	DEVELOPMENT 5 YEARS		DEVELOPMENT 10 YEARS		DEVELOPMENT SINCE 2000	
	Growth p. a.	Volatility	Growth p. a.	Volatility	Growth p. a.	Volatility
DE	2.7 %	0.3 %-P.	3.1 %	1.1 %-P.	2.5 %	1.9 %-P.
UK	1.2 %	7.3 %-P.	3.2 %	6.4 %-P.	1.3 %	7.1 %-P.
FR	2.1 %	0.5 %-P.	1.8 %	0.7 %-P.	2.1 %	1.6 %-P.
IT	2.0 %	0.6 %-P.	1.1 %	1.5 %-P.	1.6 %	2.1 %-P.
ES	3.5 %	0.7 %-P.	1.4 %	2.4 %-P.	2.7 %	3.3 %-P.
PL	5.1 %	3.4 %-P.	5.3 %	4.0 %-P.	5.9 %	8.3 %-P.
NL	3.3 %	0.9 %-P.	2.2 %	1.4 %-P.	2.7 %	2.3 %-P.
BE	2.8 %	0.3 %-P.	2.6 %	0.7 %-P.	2.7 %	1.5 %-P.
GR	1.5 %	1.2 %-P.	-1.8 %	3.9 %-P.	1.7 %	5.2 %-P.
CZ	6.8 %	1.5 %-P.	3.9 %	3.9 %-P.	6.5 %	6.5 %-P.
PT	4.3 %	0.6 %-P.	2.2 %	2.8 %-P.	2.7 %	2.6 %-P.
SE	0.5 %	1.9 %-P.	3.4 %	5.9 %-P.	2.1 %	6.0 %-P.
HU	6.6 %	2.1 %-P.	4.6 %	2.9 %-P.	6.1 %	6.7 %-P.
AT	2.9 %	0.5 %-P.	2.7 %	0.9 %-P.	2.8 %	1.6 %-P.
Min.	0.5 %	0.3 %-P.	-1.8 %	0.7 %-P.	1.3 %	1.5 %-P.
Mean	3.2 %	1.6 %-P.	2.5 %	2.7 %-P.	3.1 %	4.0 %-P.
Max.	6.8 %	7.3 %-P.	5.3 %	6.4 %-P.	6.5 %	8.3 %-P.

Fig. 10: Development of per capita GDP (in euros, 2000 = 100); source: Eurostat; own calculation and illustration.

The development of GDP shows strong fluctuation with the extreme values (maximum, minimum), yet also with the mean value (Fig. 11). Growth rates at the upper end of the bandwidth are generally posted by eastern European countries, something which speaks in favour of the opportunistic strategies encountered there. Greater stability would be disposable to investors in central European countries such as Germany, Austria, the Netherlands and Belgium. German economic strength initially saw below-average development, yet in the past ten years has been approximately the same as the average for all 14 economies. It would have been impossible to avoid the sharp economic slump in 2009 in any possible market choice or portfolio structure.
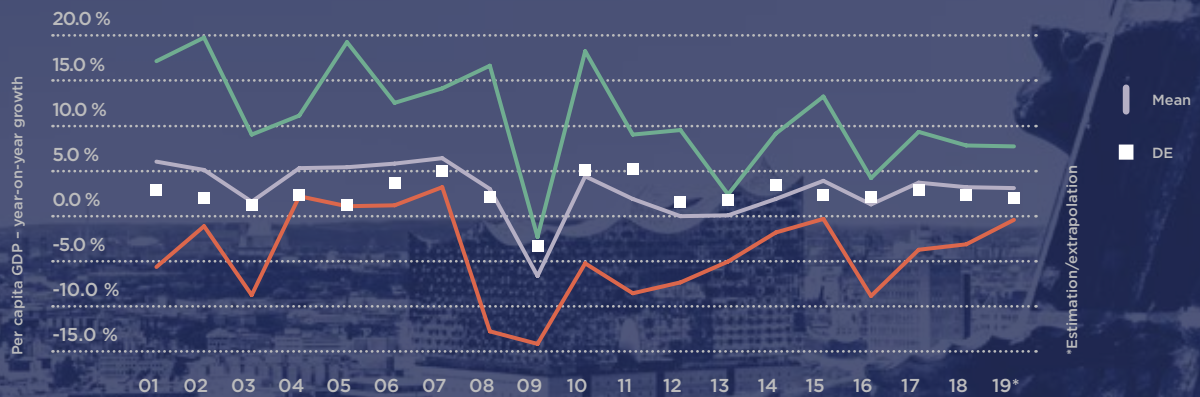
Fig. 11: Development of per capita GDP (in euros), year-on-year growth, in each case minimum, maximum, mean, Germany;
source: Eurostat; own calculation and illustration.

The development of the real estate values was, on average, considerably higher over 5 years than the economic growth; over 10 years, however, they were virtually evenly matched. Except from Italy and Greece, which posted values losses, in the past five years the real estate values in France and Poland saw a below-average development of 10.5 % and 24.3 % respectively. Hence, in the above named countries the development of per capita GDP was more dynamic than the growth of values.

Poland is striking above all, and was able to offer further potential for value development. In the ten-year consideration GDP rose by more than 50 percentage points more than the real estate values. This development is also confirmed by the improvement in incomes discussed earlier. The real estate values are likely to have been aided to a major extent by the economic environment. Sweden saw a contrary development. In the five-and ten-year periods there were high value losses, which contrasted with a highly restrained economic development. The price levels reached can scarcely be explained by the fundamental economic data.

In Germany the house price index also usually exceeds its economic benchmark, per capita GDP. The difference is lower, however, and in the long-term view since 2000 is actually slightly negative. The drifting apart of residential real estate values and economic growth is seen at most in the short term, not in the long-term comparison, however.

Country	DEVELOPMENT 5 YEARS			DEVELOPMENT 10 YEARS			DEVELOPMENT SINCE 2000		
	Values	Per capita GDP	Difference	Values	Per capita GDP	Difference	Values	Per capita GDP	Difference
DE	33.6 %	14.2 %	19.3 %-P.	53.7 %	35.9 %	17.8 %-P.	51.2 %	59.5 %	-8.3 %-P.
UK	24.9 %	4.7 %	20.2 %-P.	44.8 %	34.2 %	10.6 %-P.	165.8 %	19.3 %	146.5 %-P.
FR	10.5 %	10.8 %	-0.3 %-P.	17.7 %	20.1 %	-2.4 %-P.	119.8 %	44.1 %	75.7 %-P.
IT	-4.5 %	10.3 %	-14.9 %-P.	-15.3 %	11.6 %	-26.9 %-P.	37.0 %	34.0 %	2.9 %-P.
ES	30.0 %	18.9 %	11.1 %-P.	-8.4 %	14.6 %	-23.0 %-P.	95.8 %	61.1 %	34.7 %-P.
PL	24.3 %	28.1 %	-3.8 %-P.	11.6 %	66.1 %	-54.5 %-P.			
NL	36.3 %	17.5 %	18.8 %-P.	16.1 %	23.7 %	-7.7 %-P.	51.3 %	58.3 %	-6.9 %-P.
BE	17.9 %	14.8 %	3.1 %-P.	30.1 %	28.6 %	1.5 %-P.	120.4 %	60.9 %	59.5 %-P.
GR	-5.0 %	7.4 %	-12.4 %-P.	-37.6 %	-17.6 %	-20.0 %-P.	12.2 %	30.2 %	-18.0 %-P.
CZ	47.1 %	38.9 %	8.2 %-P.	46.0 %	45.8 %	0.2 %-P.	159.1 %	200.3 %	-41.2 %-P.
PT	47.4 %	23.5 %	24.0 %-P.	34.3 %	23.8 %	10.5 %-P.	42.2 %	58.9 %	-16.7 %-P.
SE	34.8 %	2.4 %	32.3 %-P.	73.8 %	37.1 %	36.7 %-P.	223.2 %	44.9 %	178.3 %-P.
HU	75.7 %	37.6 %	38.1 %-P.	61.9 %	56.8 %	5.1 %-P.			
AT	33.2 %	15.4 %	17.8 %-P.	75.5 %	30.3 %	45.3 %-P.	98.2 %	63.7 %	34.5 %-P.
Min.	-5.0 %	2.4 %	-14.9 %-P.	-37.6 %	-17.6 %	-54.5 %-P.	12.2 %	19.3 %	-41.2 %-P.
Mean	29.0 %	17.5 %	11.5 %-P.	28.9 %	29.3 %	-0.5 %-P.	98.0 %	61.3 %	36.8 %-P.
Max.	75.7 %	38.9 %	38.1 %-P.	75.5 %	66.1 %	45.3 %-P.	223.2 %	200.3 %	178.3 %-P.

Fig. 12: Development of house price index (unadjusted) and per capita GDP (in euros), comparison across differing time periods; source: Eurostat; own calculation and illustration.

Real estate values vs. construction costs

A further indicator for the assessment of real estate values on the basis of the production costs as well as the corresponding supply prices is the construction costs index. Here the production factors (labour costs, material costs) for the erection of new residential buildings are taken into account. Data from the construction industry (orders received, construction approvals) are commonly regarded as leading economic indicators. Accordingly, the construction costs are also a good indicator of the current economic situation and are an indirect pointer to demand on the real estate market. An increasing index value explains rising real estate values as a consequence of a growth in construction costs for new buildings. Portfolio properties are not excluded from the price development in the construction costs index as demand can shift to the portfolio segment with an increase in prices for new buildings and thus lead to corresponding price effects (arbitrage and valuation effects).

The countries observed have one thing in common here – the construction costs are significantly higher everywhere than they were in the starting year 2000. In this respect the index value has developed most strongly in Hungary, where it has increased by 140 %. Strong growth has also been observed in Great Britain. Here the index value has doubled since the beginning of the millennium. The lowest growth rates were posted in Greece (nearly 26 %) and Poland (32 %). In Germany the index value is ca. 44 % higher than in the year 2000. Moreover, Germany, alongside the Netherlands, Austria and Sweden, is the only country in which the index has risen

continually. Even the leader, Hungary, posted a downturn in one year (2010). Poland (7) and Greece (6) had the most periods with negative year-on-year growth.
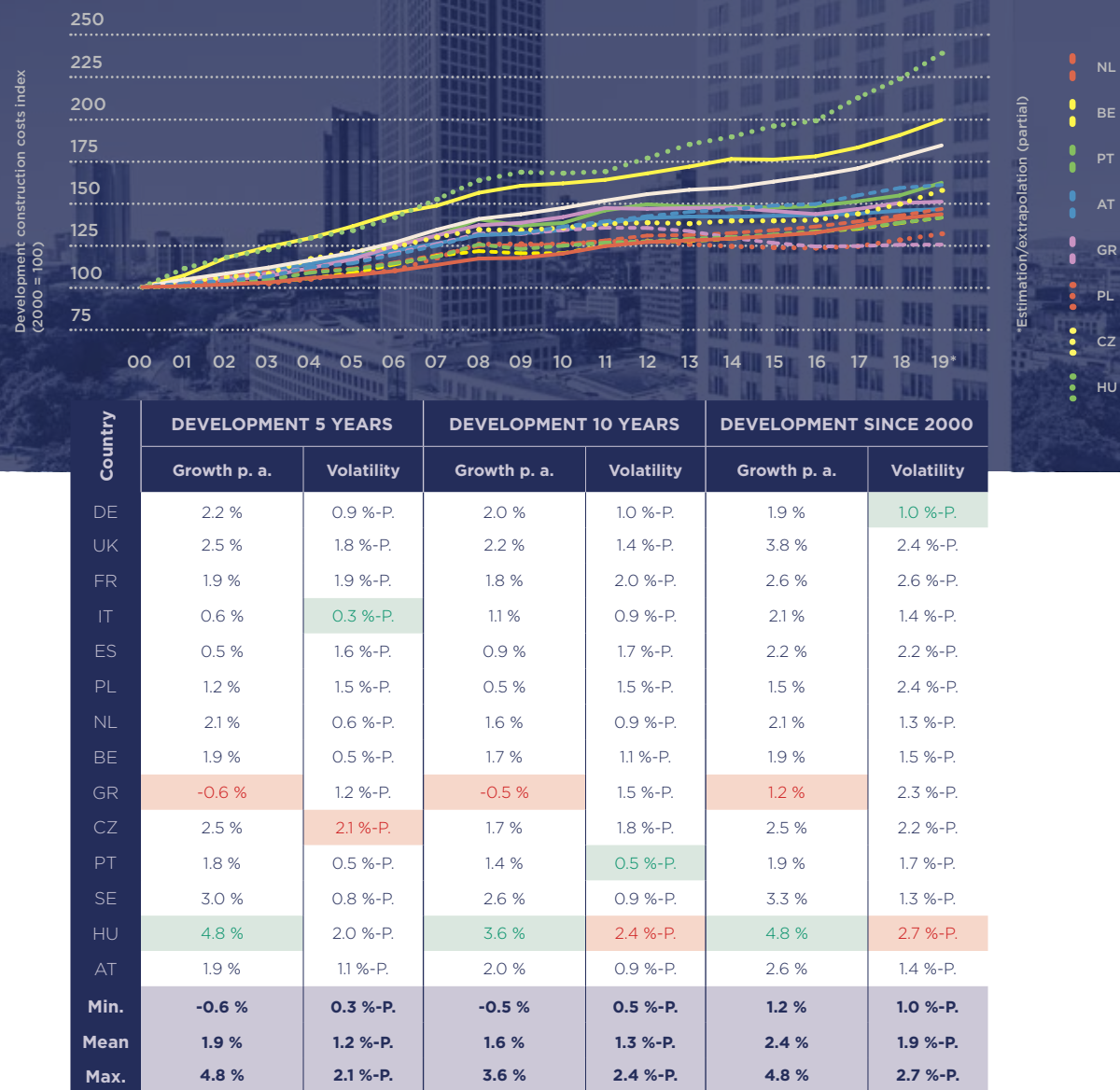

Country	DEVELOPMENT 5 YEARS		DEVELOPMENT 10 YEARS		DEVELOPMENT SINCE 2000	
	Growth p. a.	Volatility	Growth p. a.	Volatility	Growth p. a.	Volatility
DE	2.2 %	0.9 %-P.	2.0 %	1.0 %-P.	1.9 %	1.0 %-P.
UK	2.5 %	1.8 %-P.	2.2 %	1.4 %-P.	3.8 %	2.4 %-P.
FR	1.9 %	1.9 %-P.	1.8 %	2.0 %-P.	2.6 %	2.6 %-P.
IT	0.6 %	0.3 %-P.	1.1 %	0.9 %-P.	2.1 %	1.4 %-P.
ES	0.5 %	1.6 %-P.	0.9 %	1.7 %-P.	2.2 %	2.2 %-P.
PL	1.2 %	1.5 %-P.	0.5 %	1.5 %-P.	1.5 %	2.4 %-P.
NL	2.1 %	0.6 %-P.	1.6 %	0.9 %-P.	2.1 %	1.3 %-P.
BE	1.9 %	0.5 %-P.	1.7 %	1.1 %-P.	1.9 %	1.5 %-P.
GR	-0.6 %	1.2 %-P.	-0.5 %	1.5 %-P.	1.2 %	2.3 %-P.
CZ	2.5 %	2.1 %-P.	1.7 %	1.8 %-P.	2.5 %	2.2 %-P.
PT	1.8 %	0.5 %-P.	1.4 %	0.5 %-P.	1.9 %	1.7 %-P.
SE	3.0 %	0.8 %-P.	2.6 %	0.9 %-P.	3.3 %	1.3 %-P.
HU	4.8 %	2.0 %-P.	3.6 %	2.4 %-P.	4.8 %	2.7 %-P.
AT	1.9 %	1.1 %-P.	2.0 %	0.9 %-P.	2.6 %	1.4 %-P.
Min.	**-0.6 %**	**0.3 %-P.**	**-0.5 %**	**0.5 %-P.**	**1.2 %**	**1.0 %-P.**
Mean	**1.9 %**	**1.2 %-P.**	**1.6 %**	**1.3 %-P.**	**2.4 %**	**1.9 %-P.**
Max.	**4.8 %**	**2.1 %-P.**	**3.6 %**	**2.4 %-P.**	**4.8 %**	**2.7 %-P.**

Fig. 13: Development of cost index of the construction industry (unadjusted, in national currency, 2000 = 100); source: Eurostat; own calculation and illustration.

The bandwidth for construction costs development (range between annual maximum and minimum values) is somewhat tighter than with the indicators previously observed, and with the exception of the first two years of the time series is predominantly between four and six percentage points (Fig. 14). The data series generally show little fluctuation; in particular the period from 2011 to 2016 was very uniform. The construction costs index in

Germany has consistently increased in terms of its rate of change and since the economic downturn in 2009 has virtually always been higher than the mean of all 14 countries. In the past three years an increase in production prices in new housing construction has again been observed across all countries. The maximum figures in the time series since then have again been in the range of significantly more than 5 % (in Hungary in each case). And the minimum rates of change are also once again positive (Greece in each case). On the whole it is scarcely possible to establish a typical country profile. At the upper end of the scale (incl. France, Hungary, Austria, Great Britain) as well as at the lower end (incl. Poland, Portugal, Spain, Greece, Netherlands) the development has led to a frequent change of markets. On average the increase in construction costs has been less than 2 % p.a. and can therefore only account in part for the value gains.
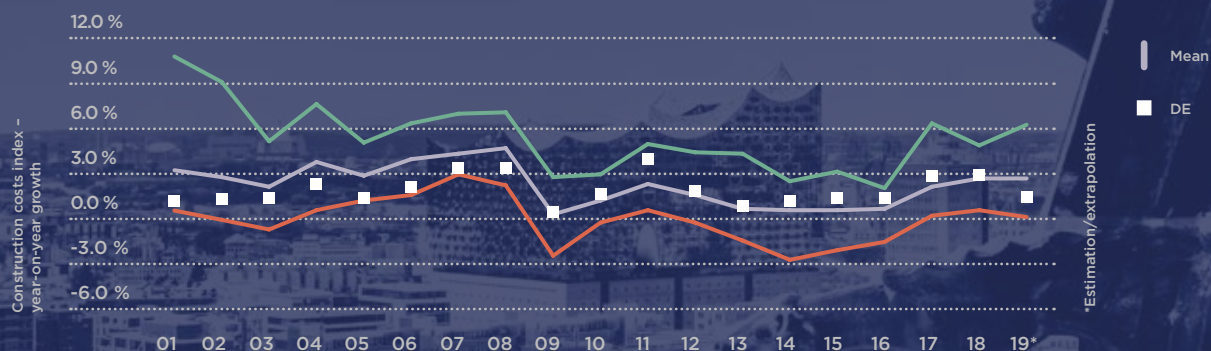
Fig. 14: Development of cost index of the construction industry (unadjusted, in national currency), year-on-year growth, in each case minimum, maximum, mean, Germany; source: Eurostat; own calculation and illustration.

By comparing construction costs and real estate values it is possible in part to seek a reason for the price increases.

The rates of change for construction costs in the three analysed periods are minimal for Greece, and in part there are even declines. This is also the case with the real estate values there. In all other countries the rates of change across the various time periods are consistently positive. In Italy (over five and ten years) and Spain (over ten years) rising construction costs are accompanied by value losses on the residential real estate markets, however. Over five and ten years France experienced a virtually balanced development of real estate values and construction costs. The situation is similar for the ten-year period in the Netherlands and for Portugal in the analysis period since 2000, where the difference between the value and construction costs development is merely 0.4 percentage points. In the short-term consideration Hungary displays not only the highest value development by far but also the biggest increase in construction costs (over 10 percentage points more than in second-placed Sweden). The difference between both figures amounted to nearly 50 percentage points, however.

Over the five- and ten-year periods the differences between the value and construction costs development in Germany are also very large, whereas the difference in the long-term consideration since 2000 is somewhat moderate at 7.4 percentage points.

Country	DEVELOPMENT 5 YEARS			DEVELOPMENT 10 YEARS			DEVELOPMENT SINCE 2000		
	Values	Construction costs	Difference	Values	Construction costs	Difference	Values	Construction costs	Difference
DE	33.6 %	11.3 %	22.2 %-P.	53.7 %	22.4 %	31.3 %-P.	51.2 %	43.8 %	7.4 %-P.
UK	24.9 %	13.2 %	11.7 %-P.	44.8 %	24.5 %	20.3 %-P.	165.8 %	100.5 %	65.3 %-P.
FR	10.5 %	9.5 %	1.0 %-P.	17.7 %	18.9 %	-1.2 %-P.	119.8 %	62.8 %	57.0 %-P.
IT	-4.5 %	3.2 %	-7.8 %-P.	-15.3 %	11.0 %	-26.3 %-P.	37.0 %	46.9 %	-9.9 %-P.
ES	30.0 %	2.4 %	27.6 %-P.	-8.4 %	9.2 %	-17.6 %-P.	95.8 %	51.4 %	44.5 %-P.
PL	24.3 %	6.1 %	18.2 %-P.	11.6 %	4.8 %	6.7 %-P.			
NL	36.3 %	10.9 %	25.4 %-P.	16.1 %	17.4 %	-1.3 %-P.	51.3 %	47.0 %	4.4 %-P.
BE	17.9 %	9.8 %	8.1 %-P.	30.1 %	17.9 %	12.2 %-P.	120.4 %	41.8 %	78.6 %-P.
GR	-5.0 %	-3.1 %	-1.9 %-P.	-37.6 %	-4.8 %	-32.8 %-P.	12.2 %	25.6 %	-13.4 %-P.
CZ	47.1 %	13.1 %	34.0 %-P.	46.0 %	17.9 %	28.1 %-P.	159.1 %	58.2 %	100.9 %-P.
PT	47.4 %	9.1 %	38.3 %-P.	34.3 %	15.4 %	18.9 %-P.	42.2 %	41.8 %	0.4 %-P.
SE	34.8 %	15.9 %	18.9 %-P.	73.8 %	28.8 %	44.9 %-P.	223.2 %	85.2 %	138.0 %-P.
HU	75.7 %	26.4 %	49.3 %-P.	61.9 %	42.3 %	19.6 %-P.			
AT	33.2 %	9.9 %	23.3 %-P.	75.5 %	22.1 %	53.4 %-P.	98.2 %	61.4 %	36.8 %-P.
Min.	**-5.0 %**	**-3.1 %**	**-7.8 %-P.**	**-37.6 %**	**-4.8 %**	**-32.8 %-P.**	**12.2 %**	**25.6 %**	**-13.4 %-P.**
Mean	**29.0 %**	**9.8 %**	**19.2 %-P.**	**28.9 %**	**17.7 %**	**11.2 %-P.**	**98.0 %**	**55.5 %**	**42.5 %-P.**
Max.	**75.7 %**	**26.4 %**	**49.3 %-P.**	**75.5 %**	**42.3 %**	**53.4 %-P.**	**223.2 %**	**100.5 %**	**138.0 %-P.**

Fig. 15: Development of house price index (unadjusted) and cost index of the construction industry (unadjusted, in national currency), comparison across differing time periods; source: Eurostat; own calculation and illustration.

3. Potential contribution of the German residential real estate market in international portfolios

Market assessment on the basis of growth comparisons

The indicators calculated before are suited to a fundamental differentiation between markets which tend to be stable and those which are more dynamic or volatile. Fig. 16 contrasts the development of the house price index (in average growth rates per annum) with the volatility of these rates of change. Taken into account in the short- and long-term consideration are all 14 countries.
Differentiated statements on the volatility are possible above all for the longer period, which is based on more data points. Here the annual growth rates for the house price index in Hungary and Spain fluctuate by more than seven percentage points and in Portugal by six percentage points. In particular Austria, Germany and Belgium are more stable with a standard deviation of less than two percentage points in each case. In the group of markets with less risk Austria and Germany also appear to be investment targets with stronger growth. Similarly high value gains to that made by Austria are only attained by the much more volatile Sweden. Greece stands out in a particularly negative sense, with comparatively high volatility accompanied by a negative value development. Also critical is Spain, which has

the second-highest standard deviation and a negative value development over 10 years. In the short-term consideration the volatility criterion is no longer particularly meaningful due to there being few data points and re-

sults that are very similar. On the other hand, the growth rates vary greatly. The bandwidth of the annual rates of change amounts to 13 percentage points – from 12 % in Hungary to -1 % in Greece.
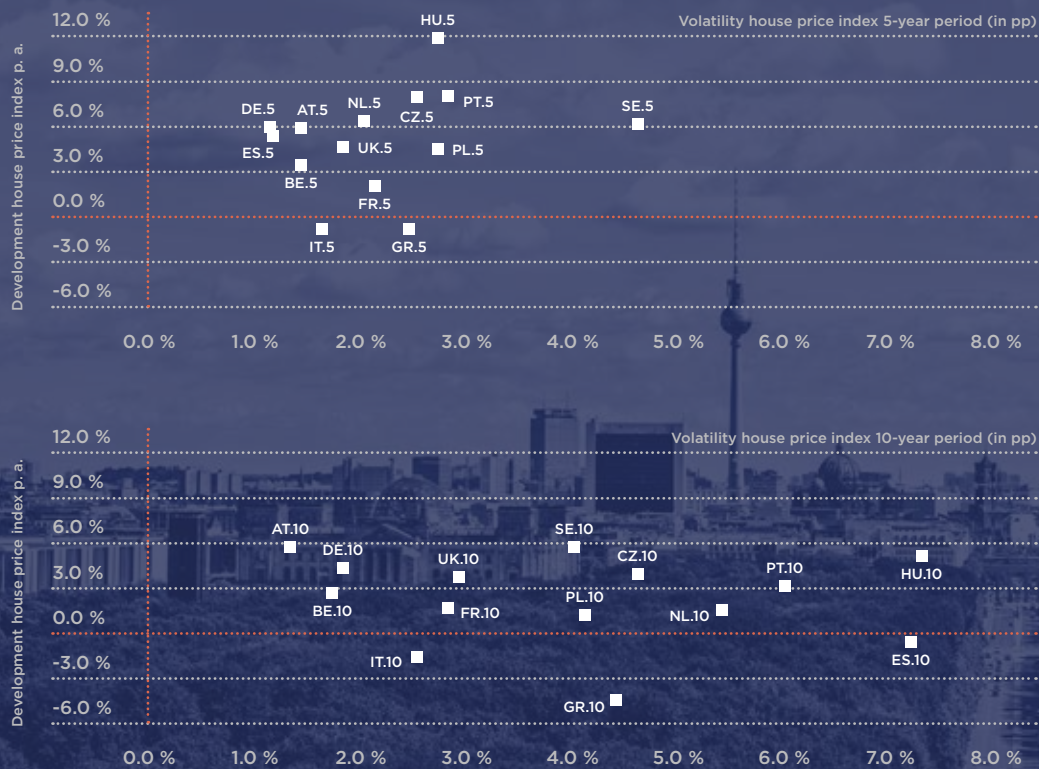

Fig. 16: Development (average p.a.) and volatility of the house price index (unadjusted), 5- and 10-year period;
source: Eurostat; own calculation and illustration.

In additional illustrations the development of the house price index (y-axis) is to be contrasted with the upstream indicators (x-axis in each case) in the five- and ten-year periods (Fig. 17). The different positions within a matrix allow for a classification of the markets on the basis of value changes and the development of the reference values. The upper-right quadrant (both values positive) as well as lower-left quadrant (both values negative) are intuitively the most easily comprehensible. Alongside this, the average annual rates of

change and the position of a point relative to additional lines (e.g. diagonals, minimum and maximum level) also allow for differentiated assessments.

In the matrix "Values vs. rents, 10 years" Hungary and Austria in particular stand out positively. Austria attains the highest mean growth with values and rents. Hungary takes second place in the development of the rent index after Austria, and with the house price index it occupies a very good third position.

Development p.a. 5 years
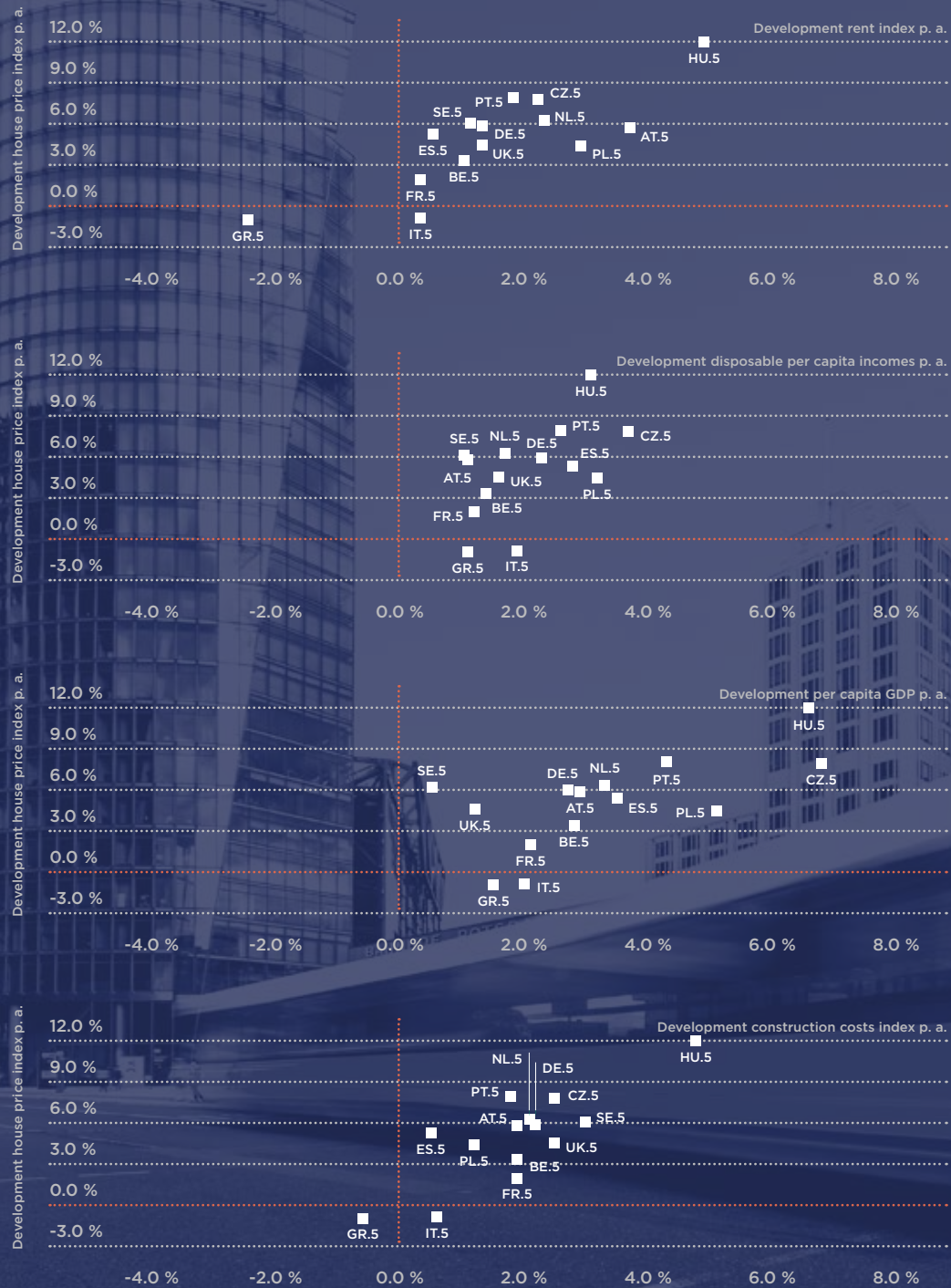
Fig. 17: House price index (unadjusted) in comparison to various indicators, 5-year period (average p.a.);
sources: Eurostat, OECD; own calculation and illustration.
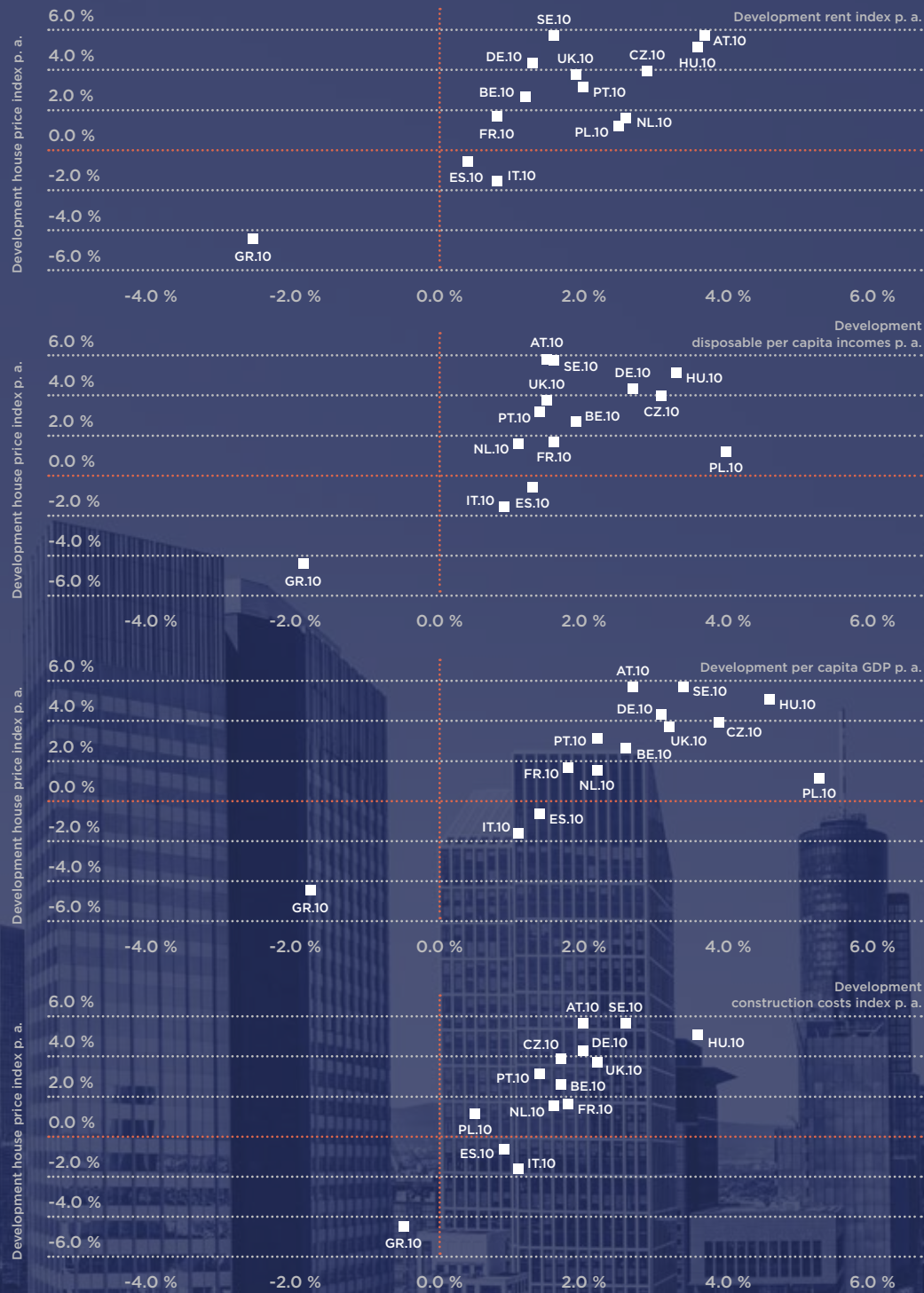
Development p.a. 10 years

*Fig. 18: House price index (unadjusted) in comparison to various indicators, 10-year period (average p.a.);
sources: Eurostat, OECD; own calculation and illustration.*

In the short-term view, in contrast, Hungary is the leader with both developments, while Austria still displays the second-highest rent growth. Italy (5 and 10 years) and Spain (10 years) display value declines, but at least an increase in the rent index. Greece is in the lower-left segment and thus has negative growth rates in each case. In the overall consideration (without these special cases) the countries display strong growth to a large extent. In the considerations over the course of time Germany is in the (upper) mid-table of the ranking in each case, whereby there is significantly stronger growth in real estate values compared to rents.

The rankings change in the other comparisons. The extreme values with value development are confirmed by differing indicators, however. Greece remains in the lower-left quadrants over ten years in all matrices (rents, disposable income, GDP/capita, construction costs). Here it may be seen that several economic and market indicators are linked to one another and accordingly are to be evaluated in parallel.

Although Spain and Italy are able to post economic growth, the ratios are lower than those for the other countries (per capita GDP) or are in the lower range of the ranking (disposable income, construction costs). Viewed on the whole and possibly driven by other factors and a pessimistic market sentiment the real estate values are declining or stagnating.

When it comes to the (socio) economic figures, the eastern European markets stand out positively with positions relatively far to the right in the matrices. Only the bandwidth for construction costs development is somewhat tighter, something which may be related to in-ternational interdependencies with materials and also labour costs. Germany is generally in the (upper) mid-table area of the ranking for the examined variables.

In particular in the short-term view we see that positionings are not invariable. Although, for example, the negative impression for Italy and Greece is confirmed in the long-term comparison, Spain has seen a considerable improvement for all the key ratios since overcoming the major crisis in the more recent past and is now positioned higher in the matrix (value development) or at least further to the right (development of reference figures).

Market assessment on the basis of rankings

Using the various individual ratios it is possible by picking, evaluating and, where appropriate, weighting to create rankings as a summary. A corresponding implementation is provided by Fig. 19.

The analysed parameters are evaluated using a points system, which conducts a classification using the annual average growth rates. In this respect the bandwidth of points ranges from -2 to +2. Negative growth rates up to the threshold of zero growth (0 %) are given -2 points. Only marginal growth of between 0 and 1 % p.a. is given -1 point. Growth in the area of target inflation (ca. 1 % to 2 %) is weighted as neutral, and thus receives 0 points. Accordingly, higher growth rates receive +1 or +2 points. In the table these are displayed with the signs [-- - o + ++]. The results are then portrayed on the basis of this assessment scheme.

Result 5 years

Country	VALUE DVLPMT.		VALUE FLUCTUATION		FUNDAMENTAL DATA					
	5 y p.a.	Rnk	Volatility	Rnk	Rents	Incomes	Per capita GDP	Construction costs	Total	Rnk
DE	6.0 %	(6.)	1.1 %-P.	(1.)	o	+	+	+	3	(5.)
UK	4.6 %	(9.)	1.8 %-P.	(6.)	o	o	o	+	1	(8.)
FR	2.0 %	(12.)	2.1 %-P.	(8.)	-	o	+	o	0	(11.)
IT	-0.9 %	(13.)	1.6 %-P.	(5.)	-	o	o	-	-2	(13.)
ES	5.4 %	(8.)	1.1 %-P.	(2.)	-	+	++	-	1	(8.)
PL	4.5 %	(10.)	2.7 %-P.	(12.)	+	++	++	o	5	(3.)
NL	6.4 %	(4.)	2.0 %-P.	(7.)	+	o	++	+	4	(4.)
BE	3.4 %	(11.)	1.4 %-P.	(4.)	o	o	+	o	1	(8.)
GR	-1.0 %	(14.)	2.6 %-P.	(10.)	--	o	o	--	-4	(14.)
CZ	8.0 %	(3.)	2.5 %-P.	(9.)	+	++	++	+	6	(2.)
PT	8.1 %	(2.)	2.8 %-P.	(13.)	o	+	++	o	3	(5.)
SE	6.2 %	(5.)	4.6 %-P.	(14.)	o	o	-	+	0	(11.)
HU	12.0 %	(1.)	2.7 %-P.	(11.)	++	++	++	++	8	(1.)
AT	5.9 %	(7.)	1.4 %-P.	(3.)	++	o	+	o	3	(5.)

Result 10 years

Country	VALUE DVLPMT.		VALUE FLUCTUATION		FUNDAMENTAL DATA					
	10 y p.a.	Rnk	Volatility	Rnk	Rents	Incomes	Per capita GDP	Construction costs	Total	Rnk
DE	4.4 %	(4.)	1.8 %-P.	(3.)	o	+	++	+	4	(3.)
UK	3.8 %	(6.)	2.9 %-P.	(6.)	o	o	++	+	3	(6.)
FR	1.7 %	(9.)	2.8 %-P.	(5.)	-	o	o	o	-1	(11.)
IT	-1.6 %	(13.)	2.5 %-P.	(4.)	-	-	o	o	-2	(12.)
ES	-0.6 %	(12.)	7.2 %-P.	(13.)	-	o	o	-	-2	(12.)
PL	1.2 %	(11.)	4.1 %-P.	(8.)	+	++	++	-	4	(3.)
NL	1.6 %	(10.)	5.4 %-P.	(11.)	+	o	+	o	2	(8.)
BE	2.7 %	(8.)	1.7 %-P.	(2.)	o	o	+	o	1	(9.)
GR	-4.5 %	(14.)	4.4 %-P.	(9.)	--	--	--	--	-8	(14.)
CZ	4.0 %	(5.)	4.6 %-P.	(10.)	+	++	++	o	5	(2.)
PT	3.2 %	(7.)	6.0 %-P.	(12.)	o	o	+	o	1	(9.)
SE	5.8 %	(2.)	4.0 %-P.	(7.)	o	o	++	+	3	(6.)
HU	5.2 %	(3.)	7.3 %-P.	(14.)	++	++	++	++	8	(1.)
AT	5.8 %	(1.)	1.3 %-P.	(1.)	++	o	+	+	4	(3.)

Fig. 19: Evaluation value development, value fluctuation and fundamental data over 5 and 10 years – ranking of the studied countries; sources: Eurostat, OECD; own calculation and illustration.

The image shows a stylized letter "E" in white on a dark blue square background.

Inasmuch it is possible to differentiate between the markets by growth (value development), volatility (stability) and support (fundamental data).

In the ten-year observation Austria heads the rankings for value development (highest p.a.) and volatility (lowest over period). Hungary takes third place for the real estate values after Sweden, yet is to be found at the lower end of the ranking for volatility due to the strong fluctuation in growth rates. Germany has favourable investment data, taking fourth place in the value development ranking after Austria and third place in the volatility ranking. This assessment of the German market is supported by the evaluation of the fundamental data. Here Germany shares third place with Poland and Austria thanks to positive figures for incomes (+1), per capita GDP (+2) and construction costs (+1). Merely Hungary (two plus points for all four parameters) and the Czech Republic (+5) are higher in the ranking. Less surprisingly, Greece is in last place and has, in complete contrast to the front-runner Hungary, negative annual growth with all the ratios, ultimately resulting in eight minus points. Spain and Italy share 12th place. And even France (11th place) puts in a poor performance with one minus point (downward development of the rent index, neutral valuation with the other ratios). On the basis of this analysis the market in Great Britain also proves to be sustainable, with the value development, volatility and assessment of the four parameters on the whole meaning that it occupies a strong mid-table position (6th place in each case) in the country comparison. In the shortest period studied the leading group is more or less confirmed. In the development of the real estate values and the fundamental parameters Hungary once again leads the way. In this time period Germany drops off somewhat in terms of purchase values and variables in a comparison with the ten-year period, yet is still able to occupy a mid-table position with 6th place (value development) and 5th place (fundamental data, shared with Austria and Portugal). In addition, over the past five years the German market has proved itself to be the most stable of all

the 14 countries with volatility of merely 1.1 percentage points.

The sample valuation methods and the resulting rankings can be expanded with the aid of additional ratios, more complex classifications and weightings, differentiated model tests and a corresponding implementation to create an automated screening system. Rankings provide pointers to a favourable or more negative market selection. Nevertheless, the portfolio strategy will not be based solely on the leader in a ranking, but will as a rule take into account several markets so as to attain a wide spread. To this end additional valuation models serve to illustrate the diversification potential.

Market assessment on the basis of the contribution to portfolio optimisation

Irrespective of the explicit preference towards individual markets on the part of investors, investments are not exclusively (to 100 %) made in the particular market which heads a specific ranking. The practical and also academic reason for this is provided by the principle of risk spread. As may be seen with the evaluation of the volatility ratio, all markets – even relatively strong ones – are subject to certain fluctuations. In this respect the value-related annual results of a property or fund would also fluctuate. With a focus on a single market it would at best be possible to select markets with less risk (less fluctuation), something which is often accompanied by a considerable decrease in the yield. For the markets under consideration and a long-term view from 2000 to the present this would be true, for example, of Belgium, Austria and Germany. This is undoubtedly the explanation for the particular interest of investors in Germany – the larger and more liquid market of this group of three countries.

So as to attain the uniform development of a portfolio and a reduction in assumed or unforeseeable risks the classical portfolio strategy is based on risk spread. If we remain at country level for the time being, the risk spread could be implemented by distributing the assets evenly across all markets, for exam-

ple. With 20 potential markets 5 % of the total investment volume would be invested in each market, therefore. Such an approach is rarely efficient. On the one hand, the individual sums to be invested are quite low, which creates unfavourable cost structures for the market development and the regional management, for instance. On the other hand, the benefits of a very wide spread can also be low if individual markets are relatively similar.

An arithmetical solution to this market selection and optimisation problem was provided by the Markowitz portfolio theory. The corresponding model is based on market-related yields, volatilities and correlations, and tests possible portfolio structures with regard to the optimum yield-risk ratio. In a certain bandwidth from risk minimum through to yield maximum various portfolios are conceivable which each generate the optimum yield for the assumed risk. This "efficiency curve" may also be portrayed for the value developments considered here. Purely under the aspect of value development and its volatility (while ignoring other earnings components, in particular the cash flow) we then see the optima portrayed in Fig. 20.
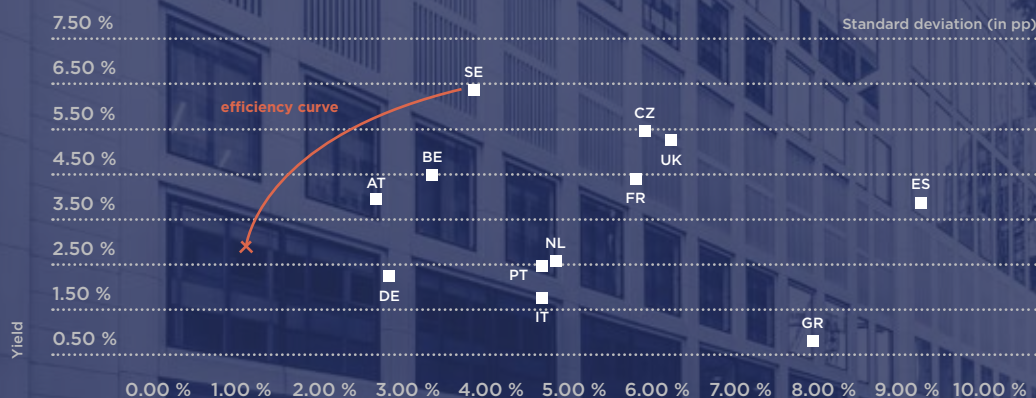
Abb. 20: Development (growth p.a.) of the house price index (yield) and volatility since 2000 and illustration of the efficiency curve (due to lack of data without Poland and Hungary); source: Eurostat; own calculation and illustration.

An extreme example is formed by a portfolio which invests entirely in Sweden and thus generates the highest conceivable value yield of all the individual markets and market combinations. Nevertheless, this is accompanied by a risk (value fluctuation) which is greater than that for the other possible markets.

Many investors will prefer markets with lower risk. To this end there is a spectrum of yield-optimised portfolios with the respective preferred (higher or lower) risk along the efficiency curve. A minimum of risk is found at the left end of the efficiency curve with a certain market combination, which does not exclusively contain one of the individual mar-

kets. The arithmetically attainable minimum value for the fluctuation range is still considerably lower than the volatility ratio of the most stable market, Austria.

The portfolio with the lowest possible risk contains the German market to a large extent, with a share of 43 %, in addition to Italy, Austria and Sweden with lower proportions. At the same time, this means that in purely arithmetical terms these four markets would already suffice for risk minimisation and the other eight markets would initially not be required in this respect. Nevertheless, fundamental portfolio strategy considerations still take into consideration other markets, for

instance if these are suitable substitutes for the above-mentioned markets, if they display a particular potential or are required because of specific investment ratios. Additional parameters such as minimum or maximum shares can offset the efficiency curve and thus the risk minimum and yield maximum to a greater or lesser extent, with the optimisation model remaining usable even in a modified form. Along the efficiency curve between risk minimum and yield maximum there are other optimum portfolio combinations. If one accepts a somewhat greater (mean, not maximum) risk,

then value increases of ca. 5 % are conceivable. The portfolio structures here are different. The share in Germany is discarded; instead the contribution of Austria and Sweden increases. The markets in Belgium and the Czech Republic are also used in the investment strategy. An overview of optimum portfolio structures and their yield-risk ratio along the efficiency curve is shown in Fig. 21. These result in numerous efficient market combinations depending on the investment profile of the respective fund.
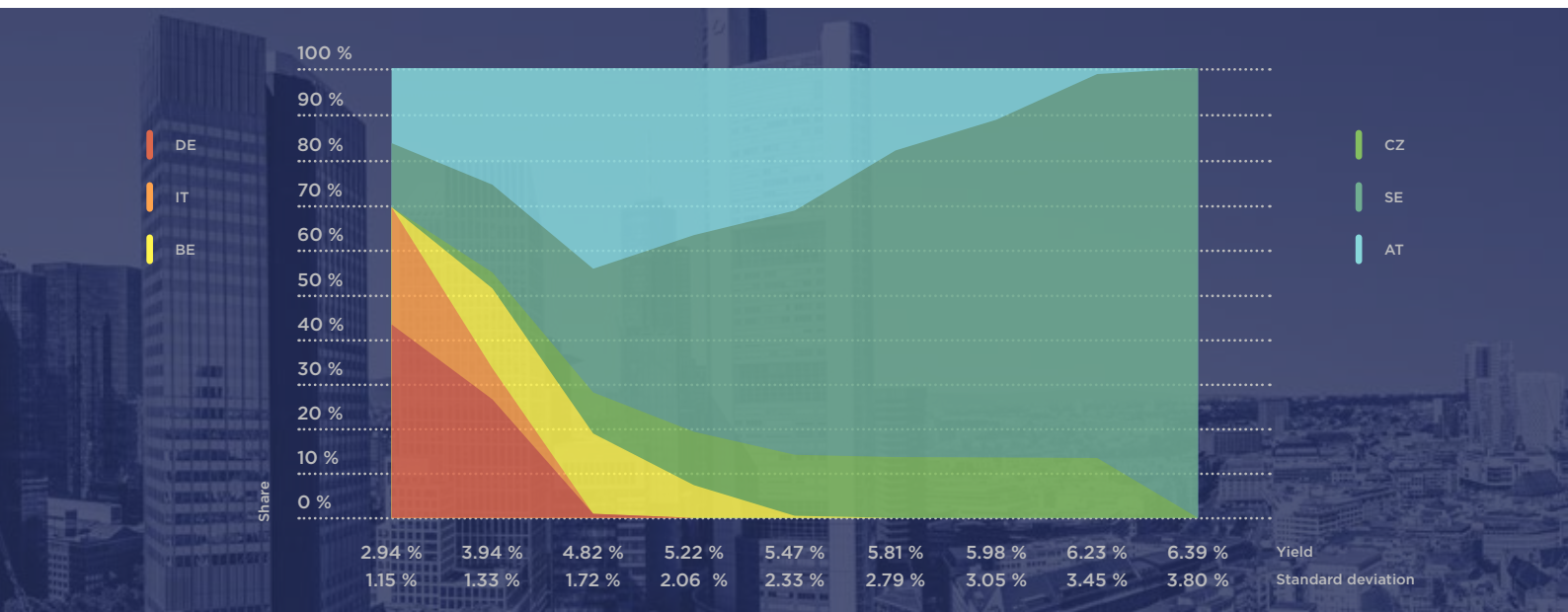
Fig. 21: Illustration of optimum portfolio structures – based on development of the house price index;
source: Eurostat; own calculation and illustration.

Further diversification potential within Germany's polycentric structure

Further diversification of the real estate portfolio can be conducted on the basis of the country selection at a deeper level by choosing specific real estate types, regional locations or properties of differing qualities. Regional diversification potential within a country is determined among other things by whether there are dominant centres – for example the Île-de-France region and the

city of Paris in France or Great Britain with London. Here demands for areas, transactions and accordingly also rents and values are concentrated on one location, while all other locations may at best be regarded as secondary markets. In terms of their size, liquidity and transparency these are clearly subordinate to the capital, something which plays a fundamental role in their evaluation by international investors.
In Germany there are – in contrast to Great Britain for example – several centres, major

cities, each with a similar investment quality in terms of market size, dynamism, and rent size and transaction volumes. There is geographic diversification potential within the country as a consequence of regional differences in economic structures (e.g. proportion of services/ industry) as well as demographic and socioeconomic parameters (e.g. age structure, purchasing power). For a further analysis we would refer to the Empira Research Report November 2019 "Where are residential real

estate investments particularly sustainable?". Although the largest city in terms of population and apartment numbers – Berlin – has a higher price level than the average for the country as a whole, this is not considerably greater in a comparison with other German metropolises. Moreover, the price mark-up to the average for the country as a whole is less marked than it is in more centralistic countries such as Great Britain and France (Fig. 22).
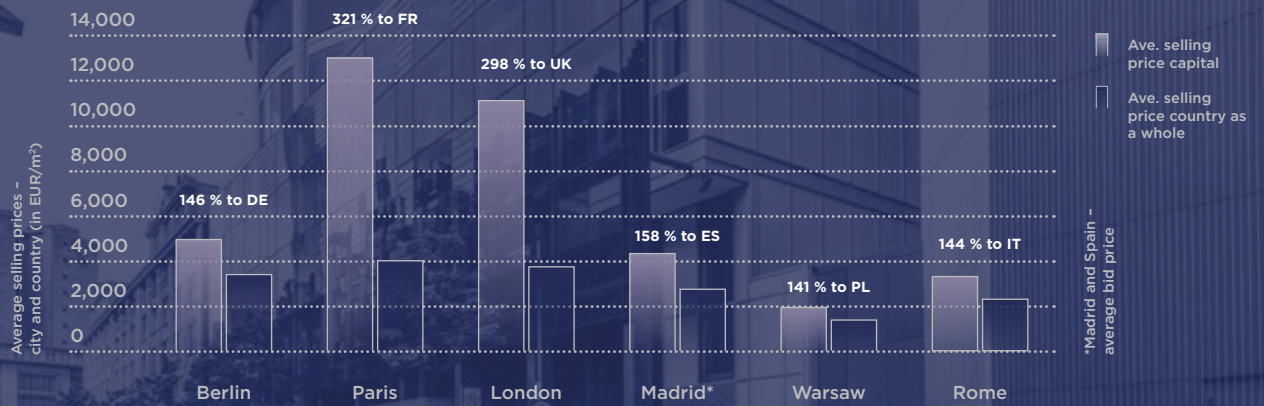
Fig. 22: Comparison of average selling prices in selected capitals and the respective countries (new apartments, 2018); source: Deloitte Property Index (8th issue, 2019); own illustration.

At the level formed by the major conurbations the polycentric structure of Germany already offers numerous options for regional diversification. Institutional investments classically focus on liquid locations with strong growth. In Germany these are usually the Top 7 cities Berlin, Düsseldorf, Frankfurt am Main, Hamburg, Cologne, Munich and Stuttgart.
In recent years, however, investors have increasingly focused on smaller cities, initially in the environs of the Top 7, later also across a wider area. With respect to possible diversification effects within Germany other sub-markets are interesting from case to case, therefore. For

the purposes of analysis and differentiation, as well as the purchase prices the development of rents can also be considered.
While the value- and earnings-relevant apartment rents have risen across the market nationwide, the percentage increases have differed greatly, however. In an analysis of 60 German locations in the time period 2014-2019 the bandwidth ranged from +42.5 % in Berlin to a mere +4.0 % for Chemnitz, which posted hardly any growth at all. For three size-based clusters the respective means for rent increases have also been calculated. In this respect it may be seen that the primary in-

vestment locations (Top 7) do indeed post the largest growth, with +26.6 % over five years. The smaller, tertiary locations (up to 200,000 inhabitants) bring up the rear. At +18.6 % these are, however, only just behind the secondary locations with a development of +18.9 %. Fig. 23 shows the dominant role of the primary locations and the regional differences.

Regional diversification based on the polycentric German housing market can, on the one hand, supplement an international investment strategy. On the other hand, it may be used as a substitute insofar as international markets are not possible from case to case (e.g. factual market entry barriers, given investment restrictions). The drawback of lower diversification effects contrasts with benefits such as more cost favourable market processing, existing networks and previous experience.
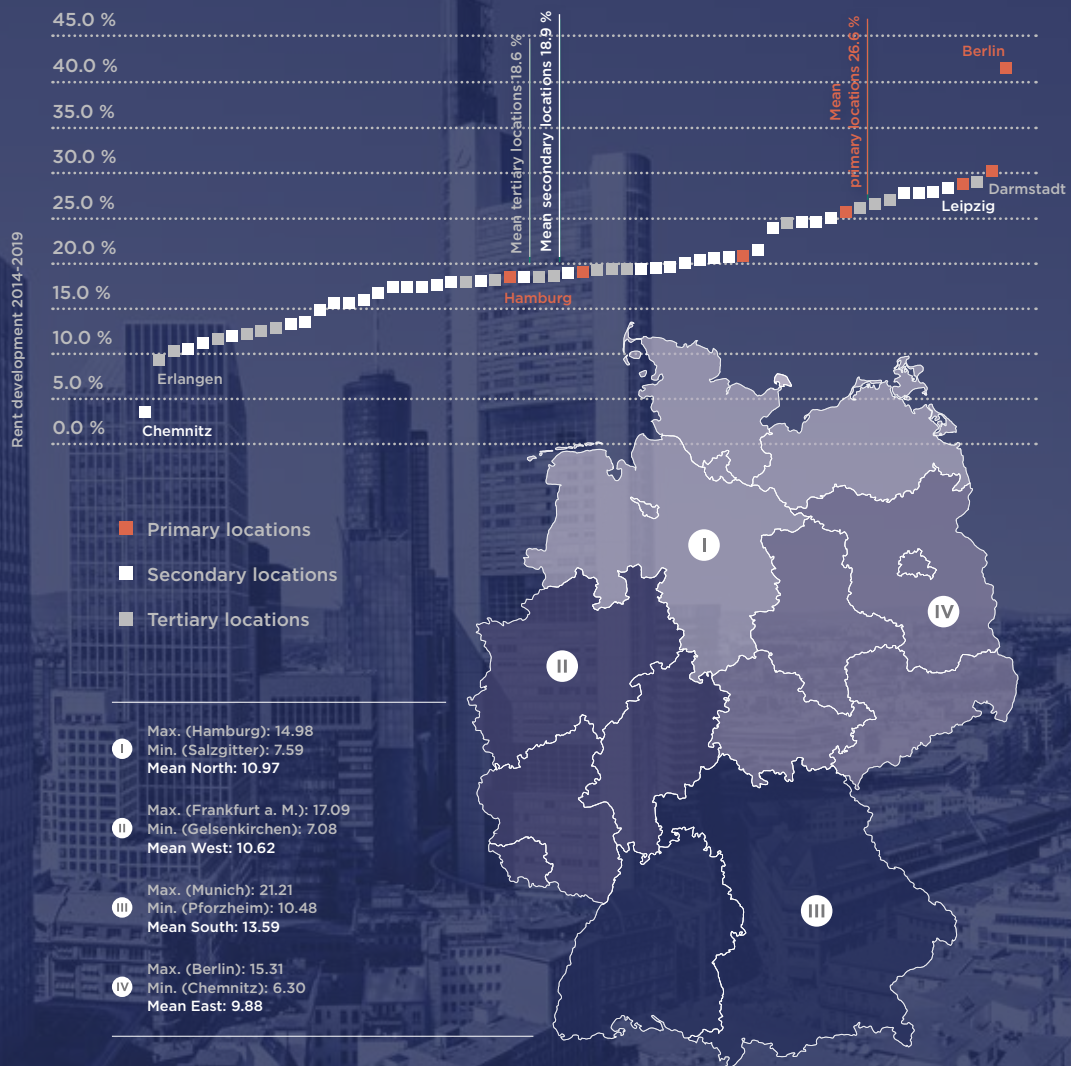

Fig. 23: Rent level and dynamism by cities and clusters (region, size), 60 German cities, new construction rents 2019 and rate of change rent level 2014-2019; source: F+B GmbH; own calculation and illustration.

4. Conclusion

The German residential real estate market is attractive for international investors despite its comparatively moderate value development. The reasons for this are its stable development, the underlying economic factors, as well as the diversification contribution in portfolio optimisation, and in particular in the low risk area (reduction in volatility).

The 14 countries compared in the study present a very heterogeneous picture in terms of their real estate price developments and the dynamism of the parameters considered. Whereas the three eastern European countries Hungary, the Czech Republic and Poland have much higher value developments than Germany (as a result of transformation and catching-up processes), they also have very high fluctuation ranges. Thus they serve investors with a high risk profile.

As a result of the sovereign debt crisis the data from economies such as Greece, Italy, Spain and Portugal also reveal a high level of risk, but this is not accompanied by an adequate yield. Corresponding investment considerations on the part of institutional investors are thus likely to be oriented at best to catching-up effects or a possible recovery, something which can only be assessed to a limited degree at present (with a detectable tendency in Portugal for example).

In view of the increasing uncertainty in many real estate markets the underpinning of the value development with real economic factors is gaining in importance. A comparison of real estate prices, rents, incomes, economic strength and new construction costs is indispensable for an assessment and investment decision.

In the long term the German market offers stability for the asset allocation of Europe-wide investment strategies. Higher yields may be attained through a combination with other markets such as Sweden, Austria, the Czech Republic and Belgium. In the implementation of the investment strategy the German market offers benefits thanks to its size, liquidity and polycentric structure, that is on the one hand offering a wide choice of sufficiently large submarkets and, on the other hand, also allowing for regional diversification.

On the whole, given the very different European markets, various portfolio structures and, consequently, yield-risk profiles are possible for real estate investments. Sustainable, minimal risk investment strategies will, however, continue to attach priority to the German residential real estate market.

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