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THE RANGE OF RESIDENTIAL MARKET YIELDS
**A DIFFERENTIATED ANALYSIS OF CITIES,
INFLUENCING FACTORS AND RESULTING CLUSTERS**

RESEARCH REPORT
JULY 2018

The Range of Residential Market Yields

A differentiated analysis of cities, influencing factors and resulting clusters

Residential property has become increasingly expensive in recent years. This development was very different when comparing locations, however. Future investments can be better planned and decided upon if both the ranges of housing market yields and the factors that contribute to better or worse results are known. This study examines the yield range as well as the contributing factors market size, region, rent level and economic momentum as parameters. The data basis takes into account Germany's housing markets in cities with a population in excess of 75,000.

Contents

REAL EXPERTS.
REAL VALUES.

1. Are investments in residential real estate still economical?

The cash flow returns on residential property investments have declined steadily in recent years. This trend is accompanied by price increases. These are mainly attributable to higher multipliers and only to a lesser extent to the development of rents.

Looking at the large markets (Top 7: Berlin, Hamburg, Munich, Cologne, Frankfurt, Stuttgart, Duesseldorf), there were still top initial yields of around 5% for residential properties 10 years ago, which corresponded to purchase price multipliers of around 20. These were peak values, and less attractive locations and properties were much cheaper to acquire.

Within a few years, the multipliers for properties of the same quality have established themselves at the level of approx. 25, which has made an investment of 20 million (value 10 years ago) more expensive by as much as 5 million (+25%). Properties with effective returns close to 3% (taking into account costs, incentives, loss of rent) barely offer any

distribution potential from the ongoing rental business. Further gains in value are doubtful based on the current very high market level. These can be generated on a case-by-case basis by a growth in rents. By contrast, valuation yields have shown no trend towards a further increase in the price of housing markets in the last three years, remaining instead at their current level.

The adjustment for inflation effects, i.e. the consideration of real returns on real estate, is interesting. Due to recent low inflation rates (consumer price index), these are still clearly in the positive range even after the decline in nominal yields, and in some cases are even above previous values from around 2005 to 2008. Fluctuations in inflation rates (e.g. 2016 = 0.5%, 2017 = 1.8%) lead to high volatility of real rental yields over time. Based on this derived time series (from nominal values and inflation), no discernible trend can be identified.
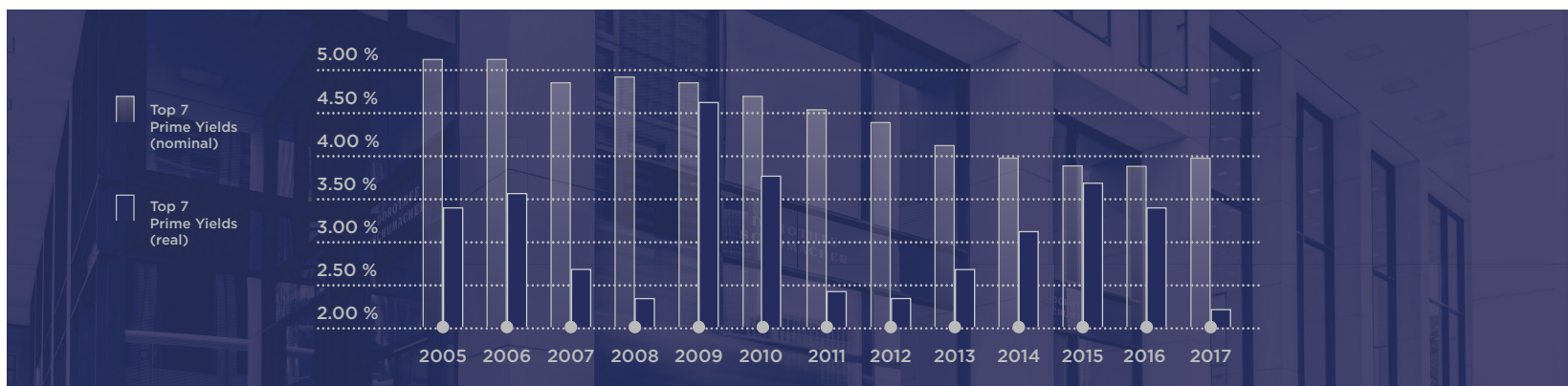
Figure 1: Development of prime yields for residential property in the top 7 locations (arithmetic mean, nominal and real, 2015 to 2017 forecast values)
Sources: Statista (based on BulwienGesa, CBRE, empirica), Federal Statistical Office; own calculation and illustration

When it comes to new investments or portfolio shifts by institutional investors, there is always a selection problem regarding the asset classes suitable for an investment. Are the apparently already very expensive residential property markets still competitive in this respect? For an initial assessment, the current returns

of alternative forms of investment should be compared first (Figure 2). Effects of the change in value are therefore suppressed for the time being. This comparison focuses on the continuous payments and thereby indirectly also on the distribution potential of a sustainable investment fund.

The data basis is extended here to all large and some mid-sized cities in order to include not just the very popular Top 7 locations but also possible alternative real estate investments in other cities. The database contains a time series of the cash flow return on residential properties in the period 2005 to 2017 for 110 German cities in excess of 75,000 inhabitants. To compare the asset class, the annual average value (arithmetic mean) is calculated for all individual cities. Overall, a certain smoothing of the market trend takes place due to the broader basis. This is less dynamic than at the Top 7 locations.

The average cash flow return is 4.18% for 2017, for example. This is well above the yield of 10-year German government bonds, which currently only generate interest rates slightly above zero. Assuming this classic form of investment by many institutional investors, especially insurance companies, housing investments represent a mathematical advantage of almost four percentage points. A significant advantage of investments in apartments is likely to remain in many cases even taking into account efficiency losses from in-

cidental purchase costs, rent losses or a suboptimal market selection.

Investing in equities offers no monetary advantage over investing in residential property markets in terms of annual payments. The dividend yields of the DAX, Germany's leading index, have been relatively low over the past four years at around 2.3 to 2.8%. Nevertheless, it should be noted that corporate profits are also retained and can therefore lead to an increase in the value of the share, irrespective of speculative effects. In the sense of the evaluation of disbursements made here, however, this should not be discussed further.

Other investment opportunities such as savings deposits or time deposits also have relatively low returns. Some of these are below the rate of inflation. They are therefore currently out of the question as an investment alternative, but serve at best as a temporary capital deposit or reserve.

It is also interesting to note that the cash flow return on residential properties in the selected overview is both higher and less volatile than for the investment alternatives over the long term.
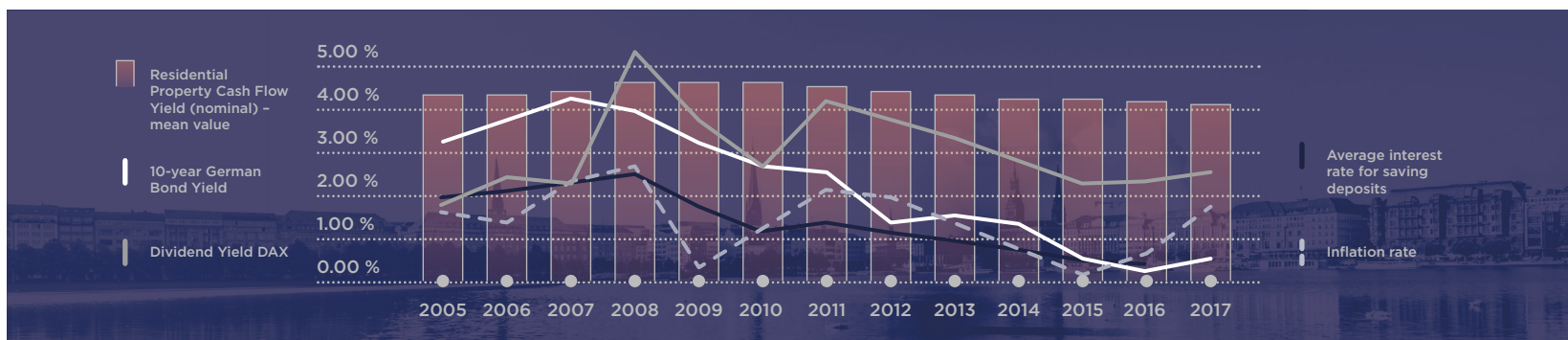
Figure 2: Comparison of various returns on capital market investments with the cash flow return on residential property in the period 2005 to 2017, based on 110 German cities with a population in excess of 75,000.
Sources: F+B GmbH, boerse.de, German Federal Statistical Office, Bloomberg, Deutsche Bundesbank; own calculation and illustration

In addition to the cash flow return, the return on change in value also plays a role in real estate investments. Aggregated as a total return, both key figures are included in the performance analysis. Changes in value are essentially the result of two factors. On the one hand, higher rental income generally leads to

higher purchase prices. The corresponding market value is therefore directly dependent on developments on the respective rental market. On the other hand, rental income is valued differently depending on the market situation in the investment market and the expected return. High return expectations can

only be achieved at given rents with reduced purchase prices. If the expected return drops, this corresponds with a higher willingness to pay -with rents being equal- on the part of potential investors and thus higher market values. The corresponding valuation relationships are shown in detail in the income value method or, in simplified form, using purchase price multipliers.

The change in value component can also be negative in residential property markets. This was nominally the case in the Top 7 markets in 2005. Real (inflation-adjusted) losses were incurred over several years (2005 to 2008). Since then, the return on change in value in the Top 7 locations preferred by investors

has made a positive contribution to the total return. It has even exceeded the cash flow return since 2012. At present, the overall performance of the Top 7 real estate markets is almost twice as high as the pure cash flow return with a total return of just under 8% in nominal terms. In this representation, the smaller locations were excluded again, as the largest sales and thus also demand-induced price increases take place in the Top 7. In the overall view, it should also be noted that, for the time being, these are book profits that are not realised until an actual sale. In many cases, a transaction approach is easier to implement in the Top 7 than in smaller, less liquid markets.
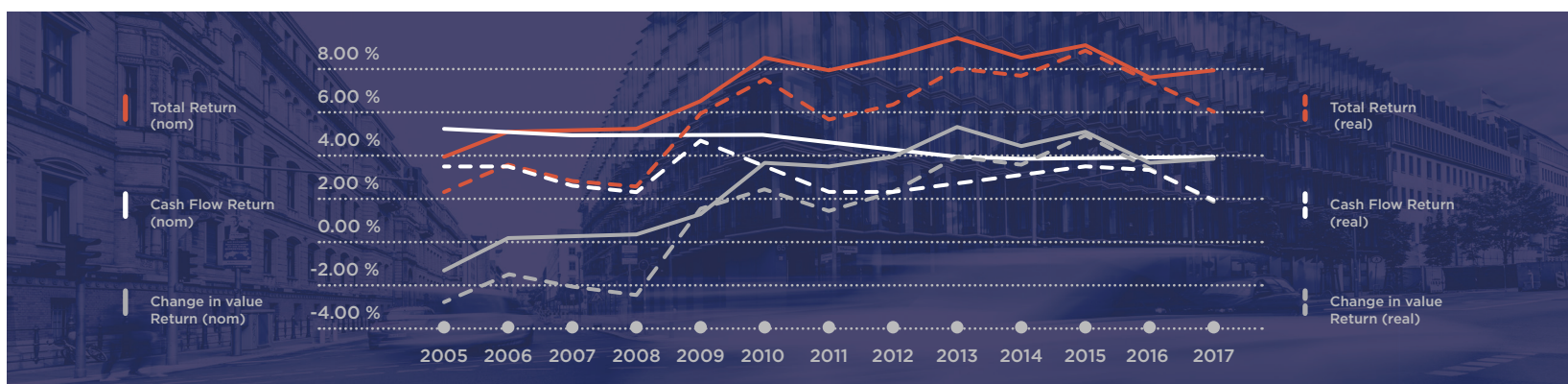
Figure 3: Development of returns on residential property 2005 to 2017 in Germany's Top 7 locations (nominal and real)
Sources: F+B GmbH, Federal Statistical Office; own calculation and illustration

The overall view of the nominal and real time series shows that overall change of value remains positive, but contributions to total return have tended to decline recently. The relative importance of the cash flow component is therefore increasing again. When making a new investment, the focus of the analysis should be on stable, sustainable cash flow returns. By contrast, value increases are welcome but hardly calculable additional components. If value increases do not occur contrary to expectations or if exaggerations in the valuation lead to short-term impairments, criteria such as a holding period and pressure to act come into play. In the case of (gene-

rally or optionally) long-term commitments without selling pressure and without negative valuation consequences (e.g. unfavourable covenants in loan agreements such as capital ratios to be complied with), temporary negative valuation effects can be „waited out" over a longer holding period. Performance risks do not therefore necessarily lead to the exclusion of new investments. In principle, negative total returns cannot be ruled out for real estate investments, but are less likely for German residential property markets than for other asset classes or in foreign markets.

2. Investigation of nominal bandwidths across all individual cities

Decisions on timing and holding period influence investment success as well as decisions on market selection. It is therefore interesting to see whether market developments in terms of cash flow return, change in value return and total return are largely uniform in all markets or show a strong range. If there is a wide spread between top and flop locations, the causes for the corresponding differences must be found out. Regional, socio-economic and market-related characteristics may be considered. The formation of corresponding clusters enables a pre-selection of promising residential property markets.

The range of housing market yields for 110 German cities with a population of 75,000 or more will be examined below. Data series on cash flow return, change in value return and total return are available for the years 2005 to 2017. In this respect, statements can be made on the distribution within the markets, the composition of the total return and the development over time.

The list of cash flow returns in 2017, sorted in ascending order, already shows a considerable spread (see Figure 4). The annual figures are in a range of 2.6% to 5.8%, i.e. a spread of more than three percentage points. The lowest cash flow returns (all below 3%) are in the cities of Freiburg im Breisgau, Munich and Regensburg. This also implies high purchase prices and purchase price multipliers at these locations. By contrast, risks are seen in cities such as Gera, Dessau-Rosslau and Zwickau, and are offset accordingly by the highest returns of over 5.4%.

Figure 4: Cash flow return on residential property in 110 German cities with a population in excess of 75,000 - comparison 2017 to 2005
Source: F+B GmbH; own calculation and illustration

Compared to 2005, the cash flow returns have decreased across most locations. In 2017, cash flow returns exceeded 5.0% in as many as seven cities, compared with 21 cities in 2009 (see Figure 5).

In the median of all locations, however, the decline in the cash flow margin of only 0.2 percentage points since 2005 is less than in the Top 7 shown at the beginning. In 2005, the minimum and maximum were 1.97 percentage points apart, for example. In 2017, this range increased sharply to 3.18 percentage points. Locations differ more strongly, at least in relation to the extreme values, so that the specific sub-markets must be taken into particular consideration when making investment decisions.

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The following table shows an evaluation of further years and key figures:

	2005	2009	2013	2017
Minimum	3.18 %	3.31 %	2.88 %	2.62 %
Lower quartile	4.08 %	4.23 %	4.06 %	3.78 %
Median	4.44 %	4.62 %	4.45 %	4.24 %
Upper quartile	4.71 %	4.92 %	4.75 %	4.62 %
Maximum	5.15 %	5.68 %	5.85 %	5.80 %
Min-Max range	1.97 % P	2.37 % P	2.97 % P	3.18 % P
Standard deviation	0.46 % P	0.48 % P	0.56 % P	0.61 % P
Amount exceeding 0%	110	110	110	110
Amount exceeding 5%	7	21	12	7
Amount over inflation	110	110	110	110
Top 10 cities	Dueren, Gera, Neumuenster, Salzgitter, Wilhelmshaven, Rostock, Dessau-Rosslau, Magdeburg, Halle/Saale, Zwickau	Dessau-Rosslau, Gera, Zwickau, Wolfsburg, Salzgitter, Delmenhorst, Dueren, Bremerhaven, Neumuenster, Rostock	Dessau-Rosslau, Zwickau, Gera, Wolfsburg, Dueren, Salzgitter, Chemnitz, Magdeburg, Delmenhorst, Halle/Saale	Dessau-Rosslau, Zwickau, Gera, Salzgitter, Chemnitz, Dueren, Wilhelmshaven, Magdeburg, Gelsenkirchen, Delmenhorst

Figure 5: Cash flow return on residential property in 110 German cities with a population in excess of 75,000 - descriptive, different dates
Sources: F+B GmbH, German Federal Statistical Office; own calculation and illustration

The evaluation of the return on change in value shows a wider spread than the cash flow return - both between the markets of a given year and in comparison with 2005 and 2017. The return on change in value shows a range between -1.03% (Dessau-Rosslau) and +7.03% (Luebeck) in a city comparison in 2017. This amounts to some notable 8.0 percentage points. Even in the current strong market phase, only 83 out of 110 markets are above inflation. In weaker years (e.g. 2005, 2009), less than half of the markets considered exceeded the general price increase (consumer price index).

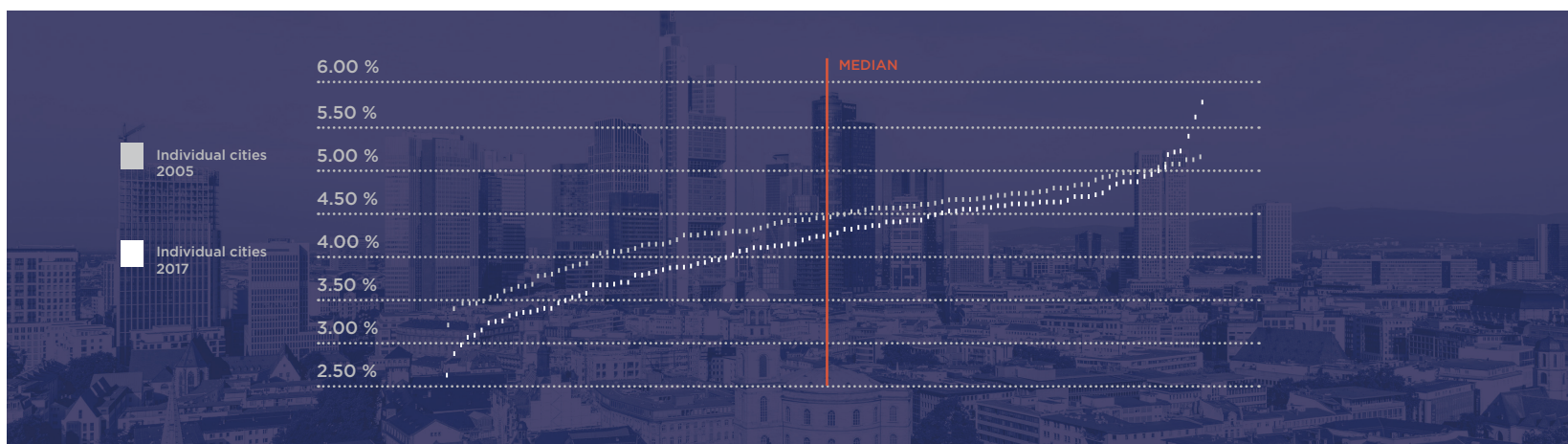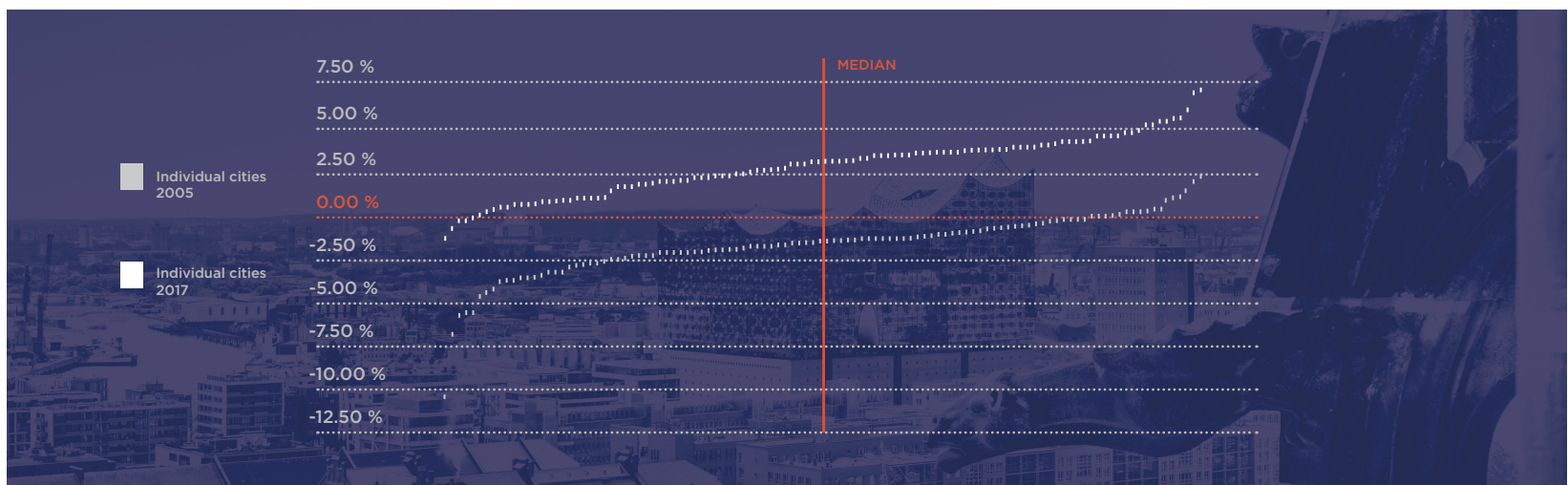*Figure 6: Return on change in value for residential property in 110 German cities with a population in excess of 75,000 - comparison 2017 to 2005 // Source: F+B GmbH; own calculation and illustration*

At 13.15 percentage points (minimum -10.59%, maximum 2.56%), the range of returns on changes in value in 2005 was considerably wider than in 2017, and the median return on changes in value rose from -1.3% to +3.18% between 2005 and 2017. Such annual comparisons are computationally possible and sometimes very impressive, but can be affected by one-off effects with little informative value as returns on changes in value are generally far more unstable than the cash flow returns discussed above. In addition, individual properties and specific portfolios may deviate from the general market trend.

The following overview with further years and key figures can at least be understood as an indication and benchmark:

	2005	2009	2013	2017
Minimum	-10.59 %	-2.86 %	-1.88 %	-1.03 %
Lower quartile	-2.21 %	-0.62 %	1.62 %	1.86 %
Median	-1.30 %	0.20 %	3.64 %	3.18 %
Upper quartile	-0.44 %	0.86 %	5.20 %	3.88 %
Maximum	2.56 %	3.60 %	8.93 %	7.03 %
Min-Max range	13.15 % P	6.46 % P	10.81 % P	8.06 % P
Standard deviation	1.83 % P	1.22 % P	2.35 % P	1.57 % P
Amount exceeding 0%	17	60	102	106
Amount exceeding 5%	0	0	32	9
Amount over inflation	3	49	84	83
Top 10 cities	Flensburg, Paderborn, Trier, Coblenz, Kaiserslautern, Darmstadt, Giessen, Ingolstadt, Hamm, Freiburg i. B.	Hamburg, Munich, Regensburg, Erfurt, Fuerth, Jena, Erlangen, Ingolstadt, Augsburg, Halle/Saale	Augsburg, Fuerth, Nuremberg, Munich, Wolfsburg, Regensburg, Hamburg, Kiel, Potsdam, Freiburg i. B.	Luebeck, Berlin, Mannheim, Hamburg, Offenbach a. M., Würzburg, Heilbronn, Fuerth, Kaiserslautern, Kiel

Figure 7: Return on change in value for residential property in 110 German cities with a population in excess of 75,000 - descriptive, different dates // Sources: F+B GmbH, German Federal Statistical Office; own calculation and illustration

The total return is defined as the sum of the cash flow return and the return on change in value to represent the overall performance of the property. Analysts and investors use this indicator for benchmarking, market selection and also for comparing different asset classes.

In relation to overall performance (measured via total return), the ranking of cities changes again. While cities like Flensburg, Paderborn or Trier were among the cities with the highest total return in 2005, the list of cities for 2017 was led by Luebeck, Offenbach am Main, Mannheim and Berlin. Only Kaiserslautern was among the top locations in terms of total return in both 2005 and 2017. This allows the assumption that peaks are often subject to leading or trailing trends, but are of a rather temporary nature.

It is remarkable that the median of the total return in 2017 is four percentage points higher than in 2005 (see Figure 8). Even the lowest values in 2017 are above 4%, almost 10 percentage points above the minimum value of 2005 and would even have been in the upper quartile of that year (comparison Figure 9). This development was driven in particular by the return on changes in value.
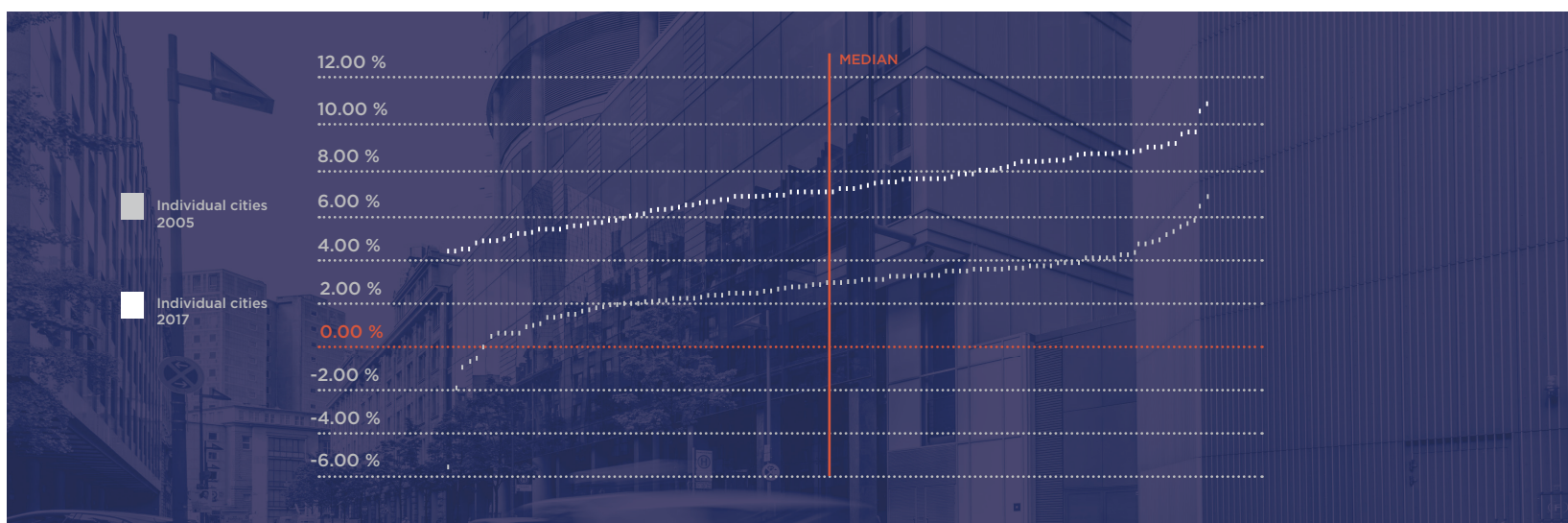
Figure 8: Total return for residential property in 110 German cities with a population in excess of 75,000 - comparison 2017 to 2005
Source: F+B GmbH; own calculation and illustration

The following table shows, among other things, the strongly fluctuating ranges between the minimum and maximum values of selected years:

	2005	2009	2013	2017
Minimum	-5.57 %	1.80 %	3.41 %	4,.0 %
Lower quartile	2.10 %	3.95 %	6.33 %	5.97 %
Median	3.03 %	4.61 %	8.04 %	7.03 %
Upper quartile	3.75 %	5.34 %	9.27 %	8.29 %
Maximum	7.10 %	7.65 %	12.82 %	10.91 %
Min-Max range	12.67 % P	5.85 % P	9.41 % P	6.51 % P
Standard deviation	1.69 % P	1.07 % P	2.04 % P	1.45 % P
Amount exceeding 0%	105	110	110	110
Amount exceeding 5%	8	38	99	101
Amount over inflation	91	110	110	110
Top 10 cities	Flensburg, Paderborn, Trier, Kaiserslautern, Co-blenz, Hamm , Cottbus, Wilhelmshaven, Giessen, Darmstadt	Hamburg, Halle/Saale, Erfurt, Jena, Munich, Dessau-Rosslau, Fuerth, Augsburg, Regensburg, Delmenhorst	Augsburg, Wolfsburg, Fuerth, Nuremberg, Kiel, Braunschweig, Paderborn, Potsdam, Osnabrueck, Flensburg	Luebeck, Berlin, Mannheim, Kaiserslautern, Offenbach a. M., Worms, Magdeburg, Heilbronn, Bremen, Ludwigshafen

Figure 9: Total return for residential property in 110 German cities with a population in excess of 75,000 - descriptive, different dates
Sources: F+B GmbH, German Federal Statistical Office; own calculation and illustration

With regard to a comparison with other higher-yielding asset classes (e.g. Equities), it is interesting to note that yields (with the exception of a few locations in 2005) have always been positive over the observation period and have also exceeded the inflation rate. The housing markets under consideration thus achieved a positive result both for selective and broadly diversified market portfolios. At this point, the additional effects from the specific object selection and the respective asset management are excluded.

3. Investigation of the real (inflation adjusted) bandwidths across all individual cities

Questions of hedges against currency devaluations (inflation) often play a role in the investment decision of real assets. This is illustrated in the following by looking at real, i.e. inflation-adjusted returns.

Due to the fact that there is no further differentiation in the price-increase ratio across Germany, the ranking within the city list for the key figures cash flow return, change in value return and total return remains unchanged. However, specific inflation rates are used annually to convert from nominal to real values. If a nominal yield exactly corresponds to the inflation rate, the real yield is zero. Positive real returns mean that even after deducting inflation a positive contribution can be made (e.g. in the form of positive changes in value). The evaluation shows consistently positive real cash flow returns, but in a few years a contrasting picture in terms of change in value.
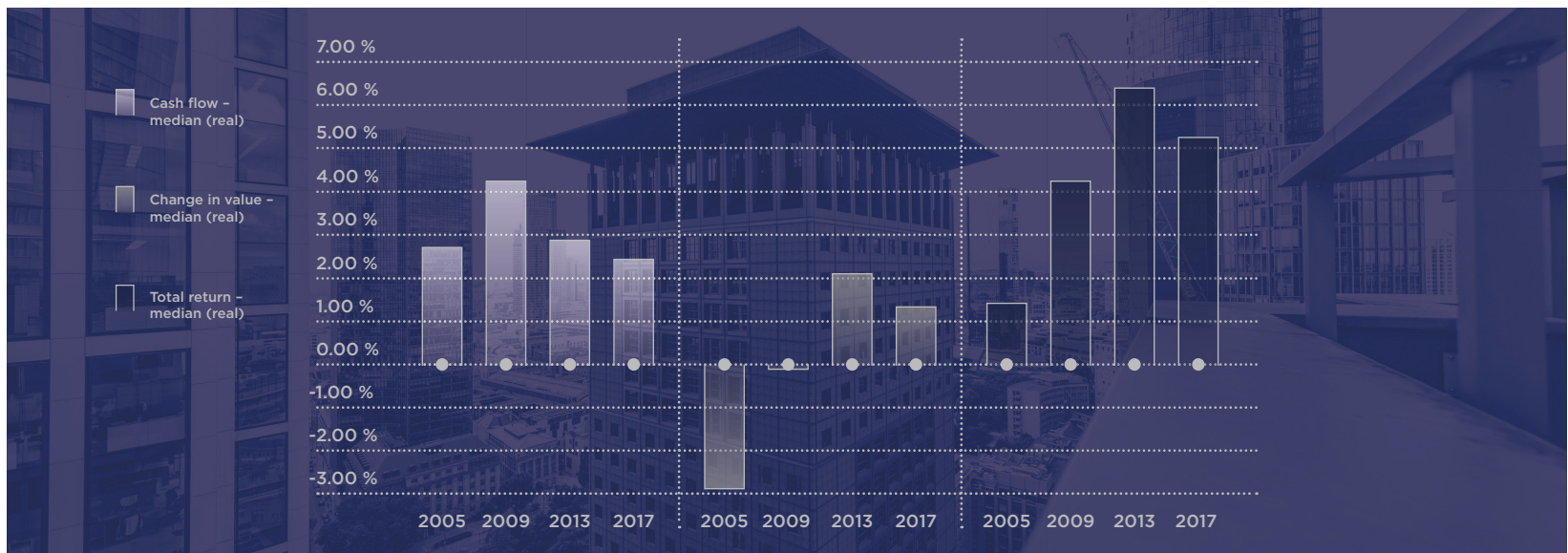
Figure 10: Inflation-adjusted returns for residential property in 110 German cities with a population in excess of 75,000 - median at different times
Sources: F+B GmbH, German Federal Statistical Office; own calculation and illustration

Starting from the median, the results of all periods were also examined with regard to their range and their extreme values. In terms of total return, numerous cities were still above the 5% mark, even when viewed in real terms. In 2013 and 2017 this was more than half of the cities surveyed.

|	CASH FLOW RETURN				CHANGE-IN-VALUE YIELD				TOTAL RETURN			
	2005	2009	2013	2017	2005	2009	2013	2017	2005	2009	2013	2017
Med	2.84 %	4.32 %	2.95 %	2.44 %	-2.90 %	-0.11 %	2.14 %	1.38 %	1.43 %	4.31 %	6,.4 %	5.23 %
Min	1.58 %	3.01 %	1.38 %	0.82 %	-12.19 %	-3.16 %	-3.38 %	-2.83 %	-7.17 %	1.50 %	1.91 %	2.60 %
Max	3.55 %	5.38 %	4.35 %	4.00 %	0.96 %	3.30 %	7.43 %	5.23 %	5.50 %	7.35 %	11,.2 %	9.11 %
> 0 %	110	110	110	110	3	49	84	83	91	110	110	110
> 5 %	0	4	0	0	0	0	10	2	2	30	80	66

Figure 11: Inflation-adjusted returns for residential property in 110 German cities with a population in excess of 75,000 - descriptive, different dates; med=median, min=minimum, max=maximum // Sources: F+B GmbH, German Federal Statistical Office; own calculation and illustration

Starting from the consideration of the overall market and the distribution of results across the 110 individual cities, questions have to be asked regarding the reasons for a higher or lower performance. Knowledge of the relevant parameters makes it possible to differentiate between certain clusters. Markets could thus be distinguished in terms of their strengths and weaknesses and their opportunities and risks. Although this does not allow any forecasts in the narrower sense, investors with a general interest in the German housing market can preselect sub-markets and specifically identify investment opportunities there. Cities in promising clusters that have not yet been the focus of attention may represent hidden champions that can be unearthed.

4. Differentiated analysis with regard to market size

The criterion of market size is the obvious one for a differentiated consideration of the achievable returns. Large cities are generally more in the focus of institutional and private investors than smaller locations. To delineate the clusters, various key figures from surface area, transactions or forms of usage are conceivable. The number of inhabitants should be used here as a sufficiently meaningful indicator for the housing market. In order not to distort the results by individual annual effects, multi-year periods with their average values are considered in the further steps of analysis. This smooths out extreme values, especially when the return on changes in value fluctuates sharply. The clusters calculated in this way reflect performance in the sense of an investment with at least a medium-term time horizon.

The 110 individual cities are divided into three groups: mid-sized cities, large cities and major cities. This sub-division is based on the classification of city and municipality types of the Federal Institute for Research on Building, Urban Affairs and Spatial Development. As in borderline cases, increasing or decreasing numbers of inhabitants can lead to a change of the cluster, the allocation does not take place uniformly, but in the three year period considered in each case on the basis of the middle year.

In general, the data should be complete for all considered clusters (and all periods). Since official statistics (here: national accounts of the federal states) show gaps for some cities, only 78 complete data sets for cities with a population of 75,000 or more are included in this step of analysis.

Figure 12 shows cash flow returns, returns on changes in value and total returns for the total and the three clusters differentiated by population. In addition to the graphic display of the arithmetic mean values, the median and the respective minimum and maximum values (mean values of the periods) are listed for the periods in question.

It can be seen that the total returns grow over time across all clusters (median). This is mainly attributable to the change in value component. By contrast, cash flow returns are slightly lower (with the exception of some extreme values).

In terms of the average maximum total return, the group of large cities will deliver the highest value (10.48%) in the years starting in 2013. By contrast, the major cities (with a population of 500,000 or more) have the highest median, which also applies to the return on change in value. This confirms the popularity of this cluster among investors. However, it would be wrong to reverse the conclusion that the minimum performance can be found in the smallest markets of the survey (mid-sized cities). The minimum total returns are usually even slightly higher than in the comparison clusters. There are also some cities with a very low performance among the larger cities (over 100,000 and over 500,000 inhabitants respectively).

In the major cities, on the other hand, the minimum total return and return on change in value over all periods are above the country as a whole (average of all cities included), which indicates greater stability in these mar-

kets. This is particularly interesting in view of the fact that the return on changes in value can also be negative, as shown by the results for the period 2005 to 2009, for example.

		CASH FLOW RETURN			CHANGE-IN-VALUE YIELD			TOTAL RETURN		
		05-09	09-13	13-17	05-09	09-13	13-17	05-09	09-13	13-17
Total GER	**Med**	**4.54 %**	**4.61 %**	**4.35 %**	**-0.49 %**	**2.24 %**	**3.34 %**	**3.99 %**	**6.46 %**	**7.47 %**
	Min	3.25 %	3.09 %	2.72 %	-3.85 %	-0.89 %	0.23 %	1.41 %	4.42 %	5.16 %
	Max	5.30 %	5.78 %	5.81 %	2.09 %	5.98 %	6.00 %	6.42 %	9.73 %	10.48 %
Mid-sized cities (< 100,000 pop.)	**Med**	**5.04 %**	**5.12 %**	**4.82 %**	**-1.09 %**	**0.91 %**	**2.43 %**	**3.90 %**	**6.14 %**	**7.24 %**
	Min	4.70 %	4.71 %	4.27 %	-3.85 %	-0.89 %	0.60 %	1.41 %	4.65 %	6.39 %
	Max	5.30 %	5.78 %	5.81 %	0.49 %	3.28 %	4.59 %	5.50 %	7.98 %	8.86 %
Large cities (≥ 100,000, <500,000 pop.)	**Med**	**4.51 %**	**4.56 %**	**4.29 %**	**-0.47 %**	**2.39 %**	**3.34 %**	**3.96 %**	**6.59 %**	**7.38 %**
	Min	3.48 %	3.38 %	3.03 %	-2.65 %	-0.73 %	0.23 %	2.22 %	4.42 %	5.16 %
	Max	5.19 %	5.40 %	5.30 %	2.09 %	5.00 %	6.00 %	6.42 %	9.36 %	10.48 %
Major cities (≥ 500,000 pop.)	**Med**	**4.17 %**	**4.22 %**	**3.92 %**	**0.05 %**	**2.81 %**	**4.31 %**	**4.04 %**	**7.18 %**	**8.03 %**
	Min	3.25 %	3.09 %	2.72 %	-1.50 %	0.43 %	1.70 %	2.86 %	5.20 %	6.37 %
	Max	4.79 %	4.88 %	4.67 %	1.73 %	5.98 %	6.00 %	5.74 %	9.73 %	9.92 %

Figure 12: Overview of yield development for residential property in different periods - comparison of total federal territory (sample), mid-sized towns, large cities and major cities, basis 78 German cities with a population in excess of 75,000; med=median, min=minimum, max=maximum // Sources: F+B GmbH, VGR der Laender working group; own calculation and illustration

5. Differentiated analysis with regard to rent level

The performance of real estate markets can also depend on the price level already given at the starting point. On the one hand, this could represent demand or certain quality characteristics. On the other hand, it could also represent a peak already reached (without any further potential for improvement) or an existing backlog (with catch-up potential). In the following, the rent level is to be used as a differentiating characteristic of clusters to be examined. The 110 individual cities with a population of 75,000 or more are divided into three clusters: the lower quartile of rent levels, the upper quartile of rent levels and the intermediate 50% of cities with a medium rent level. The analysed periods remain the same and the city clusters are recreated using the characteristic rent level per period. The analysis results (see Figure 13) show a higher performance mainly where locations already have a higher rent level. These housing markets in particular seem to be interes-

ting for investments, a fact which is reflected in consistently higher increases in value (compared to the total value and the clusters of low and medium rents). In particular, the average minimum values (changes in value of the worst location in the cluster) are significantly higher in the high-priced rental markets than in other clusters. In addition, the median value of the return on change in value in the last study period in the cluster of higher rent levels was just over 4%, which was almost one percentage point above the median value in cities with an average rent level (3.07%) and

a good 2.3 percentage points above that of cities with a low rent level (1.65%).

The advantages in the total return of higher-priced cities arise despite a comparatively lower cash flow return, which, however, was more than compensated for in many years by higher value gains. This structure has a negative impact in periods with no significant gains or losses (e.g. from 2005 to 2009). Here, the still positive cash flow return makes too little of a contribution to overall performance, with expensive cities then being close to the over-

		CASH FLOW RETURN			CHANGE-IN-VALUE YIELD			TOTAL RETURN		
		05-09	09-13	13-17	05-09	09-13	13-17	05-09	09-13	13-17
Total GER	Med	**4.51 %**	**4.56 %**	**4.33 %**	**-0.54 %**	**1.88 %**	**3.09 %**	**3.88 %**	**6.25 %**	**7.33 %**
	Min	3.25 %	3.09 %	2.72 %	-3.85 %	-1.37 %	0.23 %	1.41 %	4.18 %	5.14 %
	Max	5.30 %	5.78 %	5.81 %	2.09 %	5.98 %	6.00 %	6.42 %	9.73 %	10.48 %
Low rent	Med	**4.95 %**	**5.02 %**	**4.77 %**	**-0.86 %**	**0.65 %**	**1.65 %**	**3.98 %**	**5.88 %**	**6.58 %**
	Min	4.04 %	4.35 %	4.27 %	-3.85 %	-1.37 %	0.23 %	1.41 %	4.18 %	5.14 %
	Max	5.30 %	5.78 %	5.81 %	0.49 %	3.28 %	4.59 %	5.50 %	7.98 %	8.86 %
Medium rent	Med	**4.58 %**	**4.58 %**	**4.35 %**	**-0.66 %**	**1.73 %**	**3.07 %**	**3.90 %**	**6.19 %**	**7.34 %**
	Min	3.51 %	3.83 %	3.66 %	-2.00 %	-0.25 %	0.63 %	2.70 %	4.52 %	5.16 %
	Max	5.18 %	5.40 %	5.06 %	2.09 %	4.73 %	6.00 %	6.42 %	9.36 %	10.48 %
High rent	Med	**3.86 %**	**3.83 %**	**3.52 %**	**-0.09 %**	**3.04 %**	**4.01 %**	**3.82 %**	**7.05 %**	**7.53 %**
	Min	3.25 %	3.09 %	2.72 %	-0.98 %	1.68 %	3.05 %	2.86 %	5.70 %	6.36 %
	Max	4.39 %	4.47 %	4.24 %	1.73 %	5.98 %	6.00 %	5.74 %	9.73 %	9.70 %

Figure 13: Overview of yield development for residential property in different periods - comparison by rent level classification: lower 25%, medium 50%, upper 25%), basis 110 German cities with a population in excess of 75,000; med=median, min=minimum, max=maximum // Source: F+B GmbH; own calculation and illustration

all average of all cities in terms of total return (see Figure 13).
In terms of time, declines in the cash flow return are particularly noticeable in cities with

higher rents. This can be explained by disproportionate increases in value and thus by the reference value in the yield calculation. By contrast, the clusters with medium and low

rent levels appear relatively stable for this key figure. The minimum of the "low rents" cluster is even higher than the maximum of the "high rents" cluster in the period 2013 to 2017. The worst location in the low-priced housing market (Flensburg) was thus able to achieve a higher cash flow return on average than the best location in the high-priced cluster (Offenbach am Main).

Above all, however, the total return has shifted over the years. While the mean as well as the median total return in the period 2005 to 2009 were still at about the same level across the clusters under consideration, a clearly diverging development in favour of cities with high rents can be discerned since then.

In general, rent levels offer an interesting differentiating feature for residential property markets and their performance.

6. Differentiated analysis with regard to economic momentum

In addition to market size and price level, growth effects from upstream markets and the economy as a whole can also influence the performance of the real estate market. In the following, the aspect of economic dynamism is illustrated using medium-term rates of change in GDP (2015 to 2005). Strong, medium and less dynamic markets can be distinguished. The subdivision takes place analogously to the criterion rent level. In terms of nominal GDP growth, three clusters are subdivided: the lower quartile, the upper quartile and the middle 50%. Again, there are gaps in the national accounts data for these countries. 78 cities can be fully evaluated in this analysis step.

Higher economic momentum is regularly accompanied by higher increases in value and total returns (see Figure 14). By contrast, locations with comparatively low economic momentum often have higher cash flow returns. When transferring the basic findings to real estate portfolio management, it should be noted that cities can switch between clusters over time. In this context, reference is made to previous research studies on influencing factors and time lags within the framework of real estate market analysis ("Explaining and forecasting residential rents – Determination of important parameters based on correlation analysis", Empira Group, April 2018). In principle, strategic portfolio allocations must be distinguished from tactical decisions (short to medium-term opportunities).

Overall, the evaluations of the various periods result in the conclusion that a high regional economic growth also arouses the demand for real estate investments and that the corresponding portfolios become disproportionately more expensive. For example, the differences in total return between very and less dynamic cities in the periods studied since 2009 have been more than 1.2 percentage points (median). Since then, the minima achieved have also significantly exceeded those of the other clusters. This is primarily due to the higher return on changes in value. This is higher on average in dynamic locations than the national average (here in relation to 78 cities).

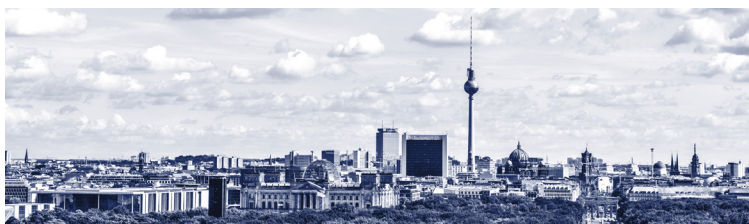|		CASH FLOW RETURN			CHANGE-IN-VALUE YIELD			TOTAL RETURN		
		05-09	09-13	13-17	05-09	09-13	13-17	05-09	09-13	13-17
Total GER	Med	4.54 %	4.61 %	4.35 %	-0.49 %	2.24 %	3.34 %	3.99 %	6.46 %	7.47 %
	Min	3.25 %	3.09 %	2.72 %	-3.85 %	-0.89 %	0.23 %	1.41 %	4.42 %	5.16 %
	Max	5.30 %	5.78 %	5.81 %	2.09 %	5.98 %	6.00 %	6.42 %	9.73 %	10.48 %
Low momentum	Med	4.67 %	4.70 %	4.55 %	-0.59 %	0.89 %	1.80 %	4.14 %	5.66 %	6.59 %
	Min	4.13 %	4.10 %	3.78 %	-1.72 %	-0.25 %	0.63 %	2.98 %	4.52 %	5.16 %
	Max	5.23 %	5.29 %	5.30 %	0.49 %	3.80 %	5.54 %	5.50 %	7.98 %	9.81 %
Medium momentum	Med	4.58 %	4.59 %	4.29 %	-0.62 %	2.45 %	3.65 %	3.91 %	6.63 %	7.51 %
	Min	3.51 %	3.55 %	3.36 %	-3.85 %	-0.89 %	0.23 %	1.41 %	4.42 %	5.45 %
	Max	5.30 %	5.78 %	5.81 %	2.09 %	5.88 %	6.00 %	6.42 %	9.73 %	10.48 %
High momentum	Med	4.20 %	4.23 %	3.99 %	-0.17 %	3.03 %	3.94 %	3.96 %	7.36 %	7.81 %
	Min	3.25 %	3.09 %	2.72 %	-1.91 %	-0.01 %	1.76 %	2.90 %	5.20 %	6.01 %
	Max	5.04 %	5.25 %	5.17 %	0.71 %	5.98 %	6.00 %	4.88 %	9.07 %	9.92 %

Figure 14: Overview of yield development for residential property in different periods - comparison according to economic momentum (classification: lower 25%, middle 50%, upper 25%), basis 78 German cities with a population in excess of 75,000; med=median, min=minimum, max=maximum // Sources: F+B GmbH, VGR der Laender working group; own calculation and illustration

7. Differentiated analysis with regard to region

The economic growth of individual cities often has an impact on the entire region. The economic structures and real estate markets of neighbouring cities interact with each other. In many socio-economic presentations, larger regions, federal states or regions are therefore discussed in groupings and their opportunities and risks are compared with or distinguished from other regions.

As a test, such groupings should also be analysed here. In order to avoid imbalances between larger federal states on the one hand and small city states on the other, several federal states are combined here in such a way that only four clusters remain. Starting from 110 individual cities, each cluster contains several cities and thus allows an evaluable statistic with averages and bandwidths. The clusters are formed as follows from the federal states and their cities:

- North: Bremen, Hamburg, Mecklenburg-West Pomerania, Lower Saxony, Schleswig-Holstein
- South: Baden-Wuerttemberg, Bavaria
- West: Hesse, North Rhine-Westphalia, Rhineland-Palatinate, Saarland
- East: Berlin, Brandenburg, Saxony, Saxony-Anhalt, Thuringia

Even if less and less relevant as an analytical differentiator, the classical east-west comparison is also to be presented once again. Including the assignment of Berlin (entire city), two clusters are distinguished:

- Old federal states: Baden-Wuerttemberg, Bavaria, Bremen, Hamburg, Hesse, Lower Saxony, North Rhine-Westphalia, Rhineland-Palatinate, Saarland, Schleswig-Holstein
- New German states incl. Berlin: Berlin, Brandenburg, Mecklenburg-West Pomerania, Saxony, Saxony-Anhalt, Thuringia

The results (see Figure 15) show the highest cash flow returns in the East cluster (across all periods), while the South, for this indicator, also declines significantly in comparison with northern and western German cities. This picture is reversed for the return on change in value. In summary, the maximum increases in value measured against the median are achieved in the periods 2005-2009 and 2009-2013 in the South. By contrast, the North cluster has dominated overall performance (total return) since 2009.

Overall, the North and South clusters stand out over several periods as more attractive investment locations according to the results. Their returns on changes in value and total returns were often above the German average. In addition, the north cluster shows remarkable cash flow returns over all periods. Only residential properties in the east cluster (here excluding Mecklenburg-West Pomerania) deliver slightly better results with this indicator.

In a comparison of the new and the old federal states, the total return (median) differs less strongly than perhaps expected. In general, the return on changes in value was higher in the old federal states, while somewhat higher cash flow returns were reached in the new federal states. The catching-up process is clearly visible - by now the median values of the total return in the new and old federal states have almost converged. It should be noted that there is a certain degree of smoothing due to a large number of different cities in both clusters. The cluster of the new German states benefits from the inclusion of Berlin and particularly strong individual cities (Rostock, Leipzig, Potsdam). The cluster of the old federal states contains many smaller cities that are typically not target markets for institutional investors. From an analytical point of view, such a rough distinction between only two parts of the country no longer makes sense. Subdivisions into the four (or even a few more) parts of the country provide sufficiently precise - and yet not too local - statements. Although the work with federal state groups is pragmatic, the imbalance (e.g. with regard to the areas and cities included) does not necessarily lead to the desired results. Alternatively, postal code areas, geographical coordinates or other criteria would also be possible, enabling a comprehensible and automatable allocation.

		CASH FLOW RETURN			CHANGE-IN-VALUE YIELD			TOTAL RETURN		
		05-09	09-13	13-17	05-09	09-13	13-17	05-09	09-13	13-17
Total GER	Med	4.51 %	4.56 %	4.33 %	-0.54 %	1.88 %	3.09 %	3.88 %	6.25 %	7.33 %
	Min	3.25 %	3.09 %	2.72 %	-3.85 %	-1.37 %	0.23 %	1.41 %	4.18 %	5.14 %
	Max	5.30 %	5.78 %	5.81 %	2.09 %	5.98 %	6.00 %	6.42 %	9.73 %	10.48 %
North	Med	4.82 %	4.87 %	4.57 %	-1.04 %	2.47 %	4.18 %	3.71 %	7.21 %	8.28 %
	Min	4.01 %	3.84 %	3.36 %	-1.91 %	-0.12 %	1.35 %	2.91 %	5.17 %	6.50 %
	Max	5.23 %	5.40 %	5.30 %	1.73 %	5.88 %	5.54 %	5.74 %	9.73 %	10.48 %
South	Med	3.69 %	3.74 %	3.50 %	-0.09 %	3.41 %	4.17 %	3.55 %	6.99 %	7.48 %
	Min	3.25 %	3.09 %	2.72 %	-1.15 %	1.09 %	3.05 %	2.86 %	5.32 %	6.36 %
	Max	4.19 %	4.23 %	4.05 %	0.90 %	5.98 %	6.00 %	4.79 %	9.07 %	9.70 %
West	Med	4.58 %	4.59 %	4.40 %	-0.49 %	1.17 %	2.59 %	4.10 %	5.73 %	6.92 %
	Min	3.78 %	3.79 %	3.51 %	-2.00 %	-0.25 %	0.63 %	2.70 %	4.52 %	5.14 %
	Max	5.20 %	5.29 %	5.23 %	2.09 %	3.80 %	4.48 %	6.42 %	7.90 %	9.34 %
East	Med	4.87 %	4.90 %	4.58 %	-0.92 %	1.07 %	1.81 %	3.52 %	6.20 %	6.75 %
	Min	3.98 %	4.14 %	3.85 %	-3.85 %	-1.37 %	0.23 %	1.41 %	4.18 %	5.45 %
		5.30 %	5.78 %	5.81 %	0.30 %	3.67 %	6.00 %	4.83 %	7.81 %	9.92 %
New German states (with Berlin)	Med	4.87 %	4.90 %	4.58 %	-0.92 %	1.23 %	2.80 %	3.52 %	6.20 %	7.28 %
	Min	3.98 %	4.14 %	3.85 %	-3.85 %	-1.37 %	0.23 %	1.41 %	4.18 %	5.45 %
	Max	5.30 %	5.78 %	5.81 %	0.30 %	3.67 %	6.00 %	4.88 %	8.22 %	9.92 %
Old federal states	Med	4.51 %	4.53 %	4.27 %	-0.49 %	1.97 %	3.16 %	3.90 %	6.26 %	7.33 %
	Min	3.25 %	3.09 %	2.72 %	-2.00 %	-0.25 %	0.63 %	2.70 %	4.52 %	5.14 %
		5.23 %	5.40 %	5.30 %	2.09 %	5.98 %	6.00 %	6.42 %	9.73 %	10.48 %

Figure 15: Overview of yield development for residential property in different periods - comparison by regional allocation, basis 110 German cities with a population in excess of 75,000; med=median, min=minimum, max=maximum
Source: F+B GmbH; own calculation and illustration

8. Selection of promising clusters

In summary, the importance of market size, above-average rents and high economic growth for returns can be emphasised - this applies at least to the total return and change in value return of recent years in the corresponding residential property markets. If, on the other hand, one looks only at the cash flow returns - which will probably be maintained even in times of lower value increases for the investor - other clusters come to the fore. Therefore, a prioritisation of markets depends on the investor's objective or investment period.

Figure 16 presents an overview of the analysis results for the differentiators and periods examined. Particular attention should be paid to the range between top and flop, which expresses the additional return between a favourable and an unfavourable cluster. This is calculated on the basis of the median and therefore not on the minimum and maximum values of individual cities that have to be differentiated again within the group. Some of the extreme values are only outliers and therefore not solid criteria for assessing the performance of a cluster.

Differentiation according to		CASH FLOW RETURN			CHANGE-IN-VALUE YIELD			TOTAL RETURN		
		05-09	09-13	13-17	05-09	09-13	13-17	05-09	09-13	13-17
MARKET SIZE	**TOP**	**Mid-sized cities**	**Mid-sized cities**	**Mid-sized cities**	**Major cities**	**Major cities**	**Major cities**	**Major cities**	**Major cities**	**Major cities**
	Cluster median	5.04 %	5.12 %	4.82 %	0.05 %	2.81 %	4.31 %	4.04 %	7.18 %	8.03 %
	FLOP	Major cities	Major cities	Major cities	Mid-sized cities	Mid-sized cities	Mid-sized cities	Mid-sized cities	Mid-sized cities	Mid-sized cities
	Cluster median	4.17 %	4.22 %	3.92 %	3.92 %	0.91 %	2.43 %	3.90 %	6.14 %	7.24 %
	Range Top-Flop	0.87 % P	0.90 % P	0.90 % P	1.14 % P	1.90 % P	1.88 % P	0.14 % P	1.04 % P	0.79 % P
RENT LEVEL	**TOP**	**Low rent**	**Low rent**	**Low rent**	**High rent**	**High rent**	**High rent**	**Low rent**	**High rent**	**High rent**
	Cluster median	4.95 %	5.02 %	4.77 %	-0.09 %	3.04 %	4.01 %	3.98 %	7.05 %	7.53 %
	FLOP	High rent	High rent	High rent	Low rent	Low rent	Low rent	High rent	Low rent	Low rent
	Cluster median	3.86 %	3.83 %	3.52 %	-0.86 %	0.65 %	1.65 %	3.82 %	5.88 %	6.58 %
	Range Top-Flop	1.09 % P	1.19 % P	1.25 % P	0.77 % P	2.39 % P	2.36 % P	0.16 % P	1.17 % P	0.95 % P
ECONOMIC MOMENTUM	**TOP**	**Low momentum**	**Low momentum**	**Low momentum**	**High momentum**	**High momentum**	**High momentum**	**Low momentum**	**High momentum**	**High momentum**
	Cluster median	4.67%	4.70 %	4.55 %	-0.17 %	3.03 %	momentum	4.14 %	7.36 %	7.81 %
	FLOP	High momentum	High momentum	High momentum	Medium momentum	Low momentum	Low momentum	Medium momentum	Low momentum	Low momentum
	Cluster median	4.20%	4.23%	3.99%	-0.62%	0.89%	1.80%	3.91%	5.66%	6.59%
	Range Top-Flop	0.47% P	0.47 % P	0.56 % P	0.45 % P	2.14 % P	2.14 % P	0.23 % P	1.70 % P	1.22 % P
REGION	**TOP**	**East**	**East**	**East**	**South**	**South**	**North**	**West**	**North**	**North**
	Cluster median	4.87 %	4.90 %	4.58 %	-0.09 %	3.41 %	4.18 %	4.10 %	7.21 %	8.28 %
	FLOP	South	South	South	North	East	East	East	West	East
	Cluster median	3.69 %	3.74 %	3.50 %	-1.04 %	1.07 %	1.81 %	3.52 %	5.73 %	6.75 %
	Range Top-Flop	1.18 % P	1.16 % P	1.08 % P	0.95 % P	2.34 % P	2.37 % P	0.58 % P	1.48 % P	1.53 % P

Figure 16: Overview of the top and flop categories for residential property returns (median in each case) in different periods - basis depends on the differentiation criterion 110 or 78 German cities with a population in excess of 75,000
Sources: F+B GmbH, VGR der Laender working group; own calculation and illustration

9. Selection of promising cities

From the above overview it can be deduced that the criteria rent level, economic momentum and market size are not insignificant for distinguishing residential property markets. The key figures on which the classification is based should therefore also be used for the pre-selection of promising clusters. However, the search for concrete investment opportunities will not relate to a cluster in general, but ultimately to a single location.

The following matrix (Figure 17) shows the cities assigned to the clusters. The axes contain the allocation to the respective clusters with regard to the criteria rent level and economic momentum in the period 2013 to 2017, which means that the cities are already distinguished in two dimensions, resulting in nine clusters. In addition - as a third dimension, so to speak - market size is added. This results in a triple differentiation in the matrix, which enables the selection of locations according to the results summarised in Figure 16 on the basis of ex-post analysis of returns.

According to the study, cities in the segment with high rents and a high economic momentum have the best results if the focus is on the return on change in value and the correspondingly influenced total return. According to Figure 17, these would be cities such as Munich and Cologne, which also belong to the more successful cluster of the largest markets (cities with a population of 500,000 or more), or smaller locations such as Ulm, Erlangen and Regensburg.

On the other hand, cities in the lower left segment show below-average growth and comparatively low rents. For the period from 2013 to 2017, this allocation applied to cities such as Cottbus, Gelsenkirchen and Flensburg, i.e. locations distributed regionally in Germany. Although these cities are leaders in cash flow return based on their cluster allocation, they fall sharply in terms of change in value and overall performance. For cities with less than 100,000 inhabitants (e.g. Cottbus and Flensburg), this corresponds with a further allocati-

ECONOMIC MOMENTUM	City size	RENT LEVEL — Lower quartile	RENT LEVEL — Mid-50%	RENT LEVEL — Upper quartile
Lower quartile	major cities			Hanover
Lower quartile	large cities	Salzgitter, Duisburg, Bremerhaven, Hagen, Gelsenkirchen	Krefeld, Leverkusen, Muelheim an der Ruhr, Remscheid, Koblenz, Bottrop, Osnabrueck, Bochum	Offenbach am Main, Muenster
Lower quartile	Mid-sized cities	Delmenhorst, Wilhelmshaven, Cottbus, Flensburg		
Mid-50%	major cities		Dresden, Essen, Bremen, Dortmund	Nuremberg, Hamburg, Frankfurt, Stuttgart, Duesseldorf
Mid-50%	large cities	Herne, Halle/Saale, Chemnitz, Hamm	Wuppertal, Trier, Fuerth, Solingen, Braunschweig, Kassel, Oldenburg, Luebeck, Mannheim, Bielefeld, Moenchengladbach, Wolfsburg, Heilbronn, Oberhausen	Bonn, Wuerzburg, Augsburg, Karlsruhe, Wiesbaden, Mainz, Darmstadt
Mid-50%	Mid-sized cities	Schwerin, Gera, Dessau-Rosslau, Kaiserslautern		
Upper quartile	major cities	Leipzig	Berlin	Munich, Cologne
Upper quartile	large cities	Magdeburg	Pforzheim, Rostock, Ludwigshafen am Rhein, Potsdam, Erfurt, Jena, Kiel	Freiburg im Breisgau, Erlangen, Ulm, Heidelberg, Ingolstadt, Regensburg
Upper quartile	Mid-sized cities	Neumuenster	Worms	

Figure 17: Matrix of locations according to rent level and economic momentum - period 2013 to 2017, basis 78 German cities in excess of 75,000 inhabitants

on to a cluster (mid-sized cities) with a rather below-average total return.

It is also interesting to take a closer look at cities that have above-average rents but little momentum. Offenbach and Muenster are in this quadrant (top left), which can be explained at least in part by special conditions. Offenbach benefits from the economically strong Frankfurt am Main, which is characterised by a comparatively stronger momentum. As a student city, Muenster has a stable high demand for housing in an economically less dynamic environment, which justifies the corresponding rent level.

On the other hand, there are cities like Leipzig and Magdeburg, where relatively low rents coincide with high momentum (bottom right). The higher cash flow return and the expected increase in rents tend to make an investment in such locations advisable. The size of the market can be seen as a supporting factor, especially for Leipzig (approx. 590,000 inhabitants). A rise at least into the medium-rent segment, which cities such as Jena or Potsdam have already reached, is likely in the medium term and promises a (continued) strong performance according to the results of this study.

The highest cash flow returns are found in mid-sized cities with rather low rents and low or medium economic growth. These cities can be found in the left and middle lower quadrant in the matrix. Moreover, the East seems to dominate here. Cottbus, Dessau-Rosslau and Gera are notable examples of this.
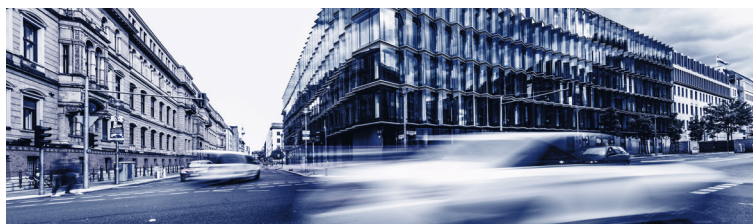
This matrix thus provides a basis for evaluation and discussion but is not to be understood schematically in the sense of an ultimate selection of a "best segment". The performance of individual cities can differ from the characteristics of their respective clusters or matrix segments. An interesting example of this is Wolfsburg, which is located in the middle quadrant based on the amount of rent and economic momentum and therefore does not represent particularly high returns on changes in value or a high total return. However, between 2013 and 2017, the home city of Volkswagen will only be surpassed by three other locations in terms of average value growth and, at 10.5%, has the highest average total return in this period.

Leipzig is also an upwards outlier. The lower quartile of the low rent-cluster reaches only 6.58% (2013-2017) in median total return, while the Saxon metropolis achieves 8.19% on average - a value that even exceeds the top cluster of high-priced rental markets with 7.53%. This figure is only surpassed by Flensburg at 8.86% - despite its position in the lower left quadrant.

Heidelberg is the opposite. From 2013 on, the city fell into the most attractive segment in terms of rents and economic momentum, but with a total return of 6.36% it will be almost 2.5 percentage points behind the best location in Ingolstadt (total return of 8.75%) and only 88th in the overall comparison of all 110 cities surveyed (total return 2013 to 2017).

In general, the assignments are based on the evaluation of past years. When making investment decisions based on the classification made here, a forecast of the relevant parameters rent level and economic growth would be important. Moreover, deviations cited as examples show the necessity of specific analyses in individual cases. The methodology shown serves as a pre-selection and orientation aid with regard to the basic characteristics of markets.

10. Conclusion: Practical application and further need for research

This study examined the performance of residential property markets in German cities with more than 75,000 inhabitants and identified various clusters. Certain characteristics of these clusters seem to have a significant influence on the respective cash flow return, the change in value return and the total return.

Despite the declining cash flow returns over time, the performance of residential properties in comparison to other types of investments is convincing. This can be attributed in particular to significant returns on changes in value, which were observed in almost all the cities surveyed. It was not only shown that the returns almost always compensated for the general price increase. In addition, it was also evident from a time perspective that the more volatile returns on changes in value and consequently also the total return produced frequently changing top or flop locations. However, in the recent past, the overall performance of the locations examined was less disparate than a few years earlier.

The criteria and assignments applied as part of cluster formation are used for pre-selection. It does not automatically include a recommendation for specific investments or divestments. The clusters described with median, minimum and maximum show a fundamental differentiation of markets within the 110 cities examined. However, individual markets may deviate (strongly) from the median of their cluster in terms of performance. In addition, the typically longer term of a real estate investment does not rule out a change of characteristics and thus a switch to a new cluster. In the complex process of investment and portfolio management, the highlighted clusters can at least serve as analytical support.

If one wants to forecast the future yield performance, economic and real estate market-related indicators should always be examined and compared in a targeted manner. Among other things, labour market indicators can provide important information for assessing the opportunities and risks of a location (see Empira Research Report, April 2018, et al.). Corresponding forecasts and differentiation of markets are indispensable when making investment decisions. This is where further research must begin. Based on this study, the research of the Empira Group will therefore focus more on the investigation of trends, cycles and their influencing factors.

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