Current Issues

International topics

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US house prices declining: Is Europe next?

Strong price rises on most European housing markets. In the last ten years, house prices in Spain increased by 150%, in the UK even by 200% and in Ireland by as much as 300%.

Over the past 10 years, housing markets on both sides of the Atlantic largely moved in sync. Correlation analysis confirms significant ties between the housing markets of the US and eight major European countries. Contrary to expectations, also Germany has been positively connected to the US and European housing markets.

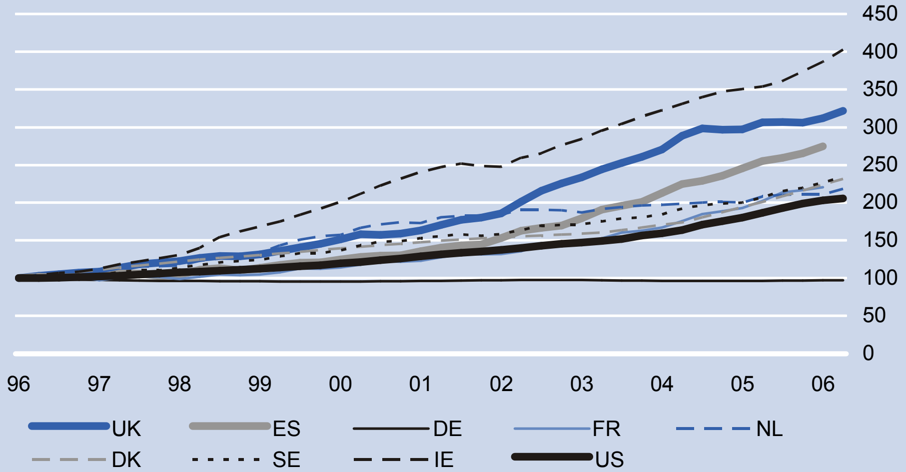
US housing market now in decline. The currently rapidly slowing US housing market not only poses severe risks to the US economy but might also become a threat for some European countries.

Affordability has worsened significantly in the last couple of years in most European countries. Only Germany is a striking outlier with houses today being much more affordable than at any other point during the last 20 years.

Our scoring model identifies Spain and Ireland as the countries where housing markets are most likely to correct in relation to other European countries. Germany registers the lowest score, thus facing the smallest risk of a housing-led slowdown. A hardly surprising result given that German house prices have stayed constant since the mid-1990s. Most important, however, almost all European countries face substantial contagion risk, not only stemming from the US but also from European neighbours.

Upward only?

House prices, 1996=100



Sources: BIS, ECB, Nationwide, INSEE, NVM, SCB, MVIV, OFHEO, TSB, BulwienGesa

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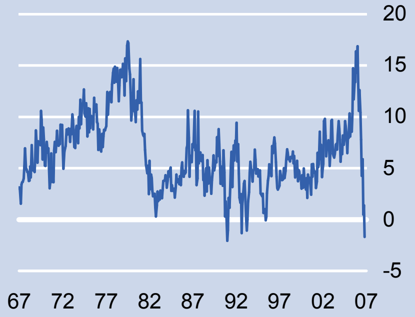
US house prices lost momentum

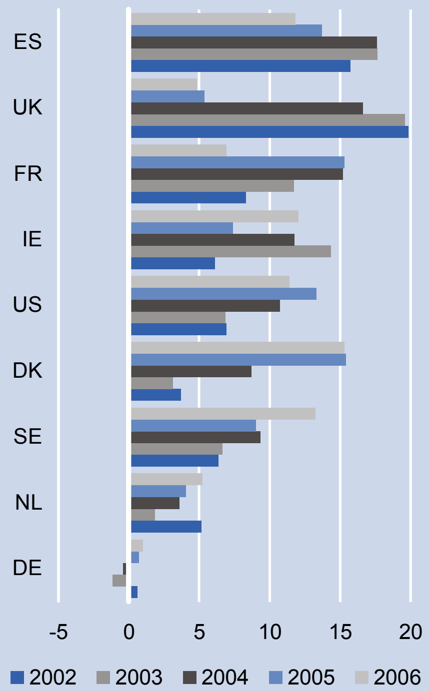
Median existing home prices, % yoy



Source: NAR **1**

Germany is extremely different

House price growth, % yoy



Sources: BIS, ECB, Nationwide, INSEE, NVM, SCB, MVIV, OFHEO, TSB, BulwienGesa **2**

Introduction

Many people like investing in real estate, especially in owner-occupied residential property, as they reckon with low volatility and a steady increase in the property’s value. Conventional wisdom has it, that owning one’s own home is a good inflation-hedge and ensures stable returns without the heart-pounding uncertainty of volatile capital markets. But as John Kenneth Galbraith put it almost 50 years ago: “The enemy of the conventional wisdom is not ideas but the march of events”.[1] After a breathtaking rally on many European housing markets, many analysts and journalists now question whether this development is sustainable; i.e. the conventional wisdom of steady house price growth might be challenged by sharply falling house prices in the near future.

This fear has recently been fuelled by the dramatic cooling of the US housing market: Within four months the annual growth rate of the National Association of Realtors’ house price index fell from double-digit rates to below zero. It has frequently been highlighted in the media that this slowdown is the sharpest decline in growth rates ever observed in the last 40 years. And still, this does not capture the whole story, as this year-on-year calculation masks the fact that the seasonally-adjusted house price index (not its yoy growth rates) has actually trended south since November 2005. The current growth numbers are then largely reflecting the price rally until last autumn. But why should European home-owners look at the price movements in the United States? In most cases, a house in Florida cannot be substituted for a house in Barcelona. The market link is of course not direct, but via the macroeconomic interdependencies of the US and European economies. The linkage via exports and financial markets thereby plays the biggest part. Weaker US growth due to a deteriorating housing market leads to worsening prospects for Europe as well. And lower income growth in Europe must translate into lower house price growth. Two years ago the IMF already pointed out that housing markets in many countries had been moving in sync over the preceding years. This implies a serious indication of contagion risk in case this relationship continues to hold during a downturn.[2]

In this paper we try to assess the relative risk of a slowdown in eight major European housing markets. After a short description of general trends in these markets, the scoring model that helped us to measure the risk will be presented. Thereby, contagion threats will also be considered.

House price dynamics

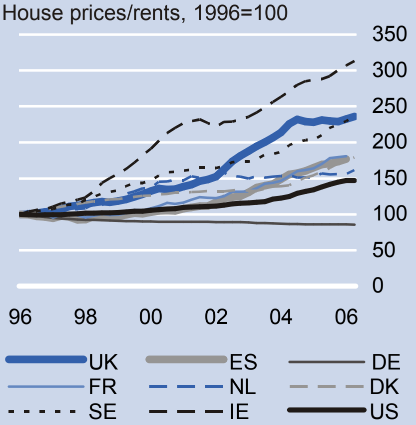
House prices in the US doubled in the last 10 years. But compared to the development in some European housing markets, this even looks benign: Since 1996 Spanish houses have appreciated by 150%, the houses in the UK by more than 200% and Irish house

[1] Galbraith, J.K. (1958), The affluent society, Boston.

[2] IMF (2004). World Economic Outlook, 2004. Gros (2006) also finds that European real house prices seem to follow the US market on average with a lag of two years (see Gros, D. (2006), Bubbles in real estate? A longer-term comparative analysis of housing prices in Europe and the US, CEPS Working Paper 239).

House prices grow faster than rents

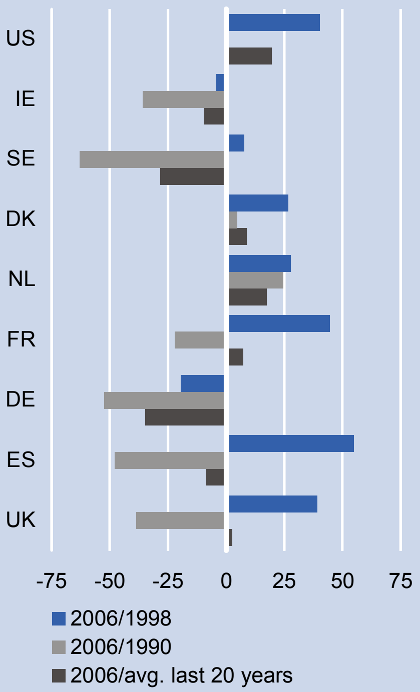
House prices/rents, 1996=100



Sources: BIS, ECB, Nationwide, INSEE, NVM, SCB, MVIV, OFHEO, TSB, BulwienGesa, OECD **3**

Affordability indices tell many different stories

Affordability indices compared to three benchmarks, deviation in %



Sources: BIS, ECB, Nationwide, INSEE, NVM, SCB, MVIV, OFHEO, TSB, BulwienGesa, DB Research **4**

prices have risen 300%. During the same 10-year period house prices in Germany have hardly moved at all.[3]

Many, but not all, of these differences between regional house price growth rates can be attributed to the different economic environments in the European countries.

In addition, house prices were not only rising dramatically, they were even rising much faster than rents. In fact, the relation between house prices and rents has risen significantly in the last ten years in all the countries analysed, apart from Germany. This leads many observers to the conclusion that houses must be overvalued, as prices are not matching potential earnings any more. But the relationship between house prices and rents is not that simple. A less rigid credit market, which allows more flexible mortgages, lower transaction costs or declining risk premiums would justify a trending up of the house price-rent relation.[4] Of course, none of these aspects guarantees an eternal housing price boom.

Are European houses still affordable?

Investment in owner-occupied homes is somewhat different from an investment in stocks or bonds, as houses exhibit not only characteristics of an investment good but also characteristics of a consumption good. Therefore, analyses of potential overvaluations in housing markets are not confined to the relative price of owning and renting residential property, but have to assess the affordability of housing. Our standard affordability indices measure the average mortgage payment as share of average disposable income. A falling index can be triggered by falling interest rates, falling house prices or rising incomes and signals easier conditions to finance a home.[5] Unsustainable house price levels are only reached when rising house prices have been outpacing falling interest rates and rising incomes for many years.

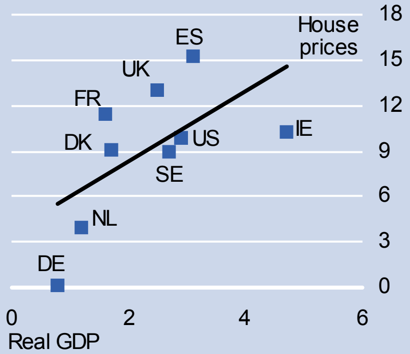
The signals from our affordability index are mixed, though: Since 1998 the affordability of houses has deteriorated in most countries. In the UK, France and the Netherlands the respective affordability indices today are roughly 40% higher than eight years ago. But compared to the average of the last 20 years, only Dutch houses seem to be relatively unaffordable. This mirrors the fact that many European housing markets experienced dramatic appreciation in the late 1980s and early 1990s. Combined with high interest rates this has led to very high levels of the affordability index and triggered price declines or at least much lower growth rates in the 1990s in many markets. Germany is a striking outlier: Here, falling interest rates and slightly rising incomes are making houses much more affordable today than at any other point during the last 20 years.

[3] This holds only on the national level. In many East German cities houses have depreciated significantly in the last ten years.

[4] It could be added that house price data and rent data should be collected with equal scrutiny and accuracy. In markets with a very limited letting market, house price data is much easier to gather than data on rents.

[5] The affordability index of the National Association of Realtors (NAR) is constructed similarly. But as it puts income in relation to mortgage payments the NAR's index rises when houses become more affordable.

House prices move up in growing economies
Avg. growth rates 2002-2006, % p.a.



Sources: BIS, ECB, Nationwide, INSEE, NVM, SCB, MVIV, OFHEO, TSB, BulwienGesa, DB Research 5

Summing up, while affordability has definitely worsened in the last couple of years in most European countries – and in some of them significantly – the index has not reached the peaks of the 1990s.[6]

Assessing contagion risk

A closer look at US and European house price data reveals a number of significant correlations between markets, providing useful information on possible contagion risks. Over the past 20 years, most housing markets on both sides of the Atlantic followed a similar growth pattern. On the one hand, the French, Spanish and US housing markets clearly exhibited the strongest co-movements. Germany, on the other hand, has not been positively correlated with any of the other markets – at least at a statistically meaningful level.

Germany not in sync with other housing markets

Correlation coefficients, 1986-2006

	DE	DK	FR	IE	NL	SE	ES	UK	US
DE	1								
DK	-0.67	1							
FR	-0.05	0.09	1						
IE	-0.47	0.27	0.22	1					
NL	-0.24	0.17	-0.27	**0.46**	1				
SE	-0.08	0.19	**0.63**	**0.50**	-0.15	1			
ES	0.10	-0.20	**0.81**	0.06	-0.52	**0.75**	1		
UK	-0.53	0.21	**0.57**	**0.44**	0.06	**0.50**	**0.53**	1	
US	-0.29	**0.52**	**0.81**	0.23	-0.18	**0.50**	**0.51**	**0.53**	1

Note: Statistically significant positive correlations (95% confidence level) are bold.

Source: DB Research 6

German market since 1996 correlated with other markets…

However, shortening the sampling period to only the last decade produces quite a different picture. Against expectations, the German housing market seems highly positively connected to its European counterparts as well as to the US market. After the reunification-induced German housing boom ended in the mid-1990s, cyclical factors like interest rates and GDP growth gained the upper hand again. Hence, German house prices tended to follow the same cyclical ups and downs seen in other countries, with much smaller amplitude, though. In this respect, one should keep in mind that correlation coefficients just provide a measure of the significance of the relationship's direction. They do not contain information about the absolute extent of price fluctuations in different countries. That is why the US and major hot areas in Europe have experienced substantial price increases while German growth rates have only seen a gradual escape from negative territory. In general, high correlation coefficients can either be attributed to macroeconomic interdependencies or similar structures of the respective housing markets. Taking Germany again, it has strong economic relations with France and Spain. By contrast, the correlation with Sweden

[6] It is worth noting that we use a standard affordability index, here. This index-class is short-sighted, inasmuch as it does not factor in expectations of future trends in incomes, interest rates and house prices. See Just, T., S. Hunter (2004), UK house prices: end of the rally in sight, in: Deutsche Bank Research, Current Issues, October 15, 2004 for an affordability index that factors in expectations. In mortgage systems dominated by flexible interest rates, this index points to higher risks today than indicated by the standard affordability index.

rather stems from similar structural developments in the two housing markets, e.g. home ownership ratios and the average size of households are about the same.

… different picture since 1996

Correlation coefficients, 1996-2006

	DE	DK	FR	IE	NL	SE	ES	UK	US
DE	1								
DK	0.01	1							
FR	**0.55**	-0.10	1						
IE	-0.31	-0.14	-0.50	1					
NL	-0.14	-0.10	-0.43	**0.73**	1				
SE	**0.73**	0.22	0.43	0.15	0.06	1			
ES	**0.50**	-0.28	**0.88**	-0.61	-0.64	0.34	1		
UK	0.08	-0.80	0.37	-0.14	-0.31	-0.03	**0.61**	1	
US	**0.67**	0.42	**0.80**	-0.63	-0.54	**0.56**	**0.69**	-0.09	1

Note: Statistically significant positive correlations (95% confidence level) are bold.

Source: DB Research 7

… but elasticities are low

Considering all these interdependencies, European markets might well be affected by the slowing US housing market, though not all to the same extent. As denoted above, a high correlation coefficient does not necessarily mean a high risk of contagion. Rather it is elasticities that play a crucial role in measuring the degree of contagion. Take Germany and Spain as an example. The housing markets in both countries are similarly correlated with the US housing market. However, a 1 pp increase in US house price inflation corresponds to a 1.3 pp rise in Spanish house price inflation while German inflation only goes up a 0.25 pp. In the next section, we will set up a simple scoring model in order to asses the relative risk of the European house markets. One important aspect will be contagion risk.

Housing markets differ in Europe

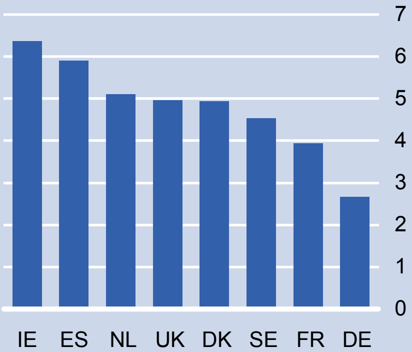
- latest available data -

	Average LTV	Variable or fix rate system	Home ownership ratio	Average size of households
	in %	in %	in %	persons
UK	70	75	69	2.4
ES	83	98	82	2.9
DE	70	10	43	2.1
FR	66	20	56	2.4
NL	112	26	54	2.3
DK	80	25	53	2.2
SE	95	62	46	1.9
IE	65	78	75	2.9

Sources: EMF, Eurostat 8

Ireland receives highest risk score

Overall scores without contagion risk



Source: DB Research 9

Scary scores

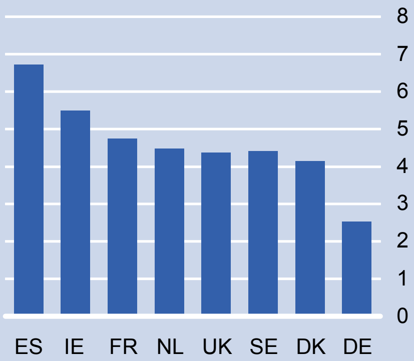
Our scoring model comprises 14 factors in all. We have grouped these factors into six categories: general pricing risk, economic risk, supply risk, market structure risk, risk in the mortgage system and contagion risk.

As we are trying to assess the relative risk of the markets rather than forecasting the likelihood of a crash, we assign relative scores. All the factors analysed are scored similarly (see appendix for a full description of all factors): We construct a rectangular distribution over the range of realised values in the eight analysed European countries. The country with the value indicating the lowest risk is assigned a score of 1 for the respective factor. The country with the value indicating the highest risk is assigned the top score of 10. Between these two extreme values equally-sized intervals are created. For all factors but contagion risk we proceed similarly (we will come back to the contagion risk factor later on). Thus, we can derive an overall relative risk score by calculating the weighted sum of the first five risk groups. In a first step, each of the five groups is assigned an equal weight of 20%.

Ireland achieves the highest overall risk score with 6.4 points, followed by Spain with 5.9 points. Thus, our model identifies these

Germany: two points

Total scores including contagion risk



Source: DB Research 10

two countries as the ones where house prices are most likely to correct without any external stimulus (remember, we have not yet taken into consideration our contagion risk factors). While the UK, Denmark, the Netherlands and Sweden reach medium values, France and particularly Germany register comparatively low overall risk scores (France 3.9 points; Germany 2.7 points).

As we noted earlier, US and European housing markets seem to be moving to a large degree in sync. Therefore, we have considered two additional contagion risk factors – one to cover the potential contagion stemming from the USA and one to cover contagion risk stemming from other European countries. The US-factor is the rated elasticity of price movements between the US housing market and the European ones. Accordingly, the European contagion factor refers to the elasticities among respective European markets. The higher the elasticity, the higher the assigned score. Where markets did not reveal statistically significant correlations, we assigned the lowest value (1 point).

In order to construct a total score considering contagion risk, we assign to each of the (now) six groups equal weight (16.7%). As Spain shows much higher elasticities to the US and to European markets than Ireland does, now Spain seems to bear the highest risk of all analysed markets; but Ireland still comes second. Then France, the Netherlands, the UK, Sweden, and Denmark follow with very similar values. Though the German housing market has been correlated with some European markets and also with the US market, the elasticities were too low to change the picture of the German housing market: It remains by far the least risky market of all European countries – which hardly comes as a big surprise.

Scoring Tool

Weight			UK	ES	DE	FR	NL	DK	SE	IE
0.8	0.2	General price risk	6.5	5.5	1.0	6.0	6.5	5.0	4.0	6.5
		Price-earnings ratio 2006/1996	6.0	4.0	1.0	4.0	3.0	4.0	6.0	10.0
		Affordability index 2006	7.0	7.0	1.0	8.0	10.0	6.0	2.0	3.0
	0.2	Economic risk	5.0	7.3	6.0	5.7	6.0	8.3	7.3	7.0
		Surprise growth: difference previous 3 to next 3 years	6.0	8.0	1.0	4.0	4.0	8.0	6.0	10.0
		Interest rate development trough to peak	1.0	7.0	7.0	6.0	6.0	8.0	9.0	10.0
		Population forecasts (2020)	8.0	7.0	10.0	7.0	8.0	9.0	7.0	1.0
	0.2	Supply risk	1.0	4.0	1.0	2.0	2.0	2.0	1.0	10.0
		Supply growth in relation to population growth	1.0	4.0	1.0	2.0	2.0	2.0	1.0	10.0
	0.2	Market structure risk	7.7	7.0	3.7	4.7	3.7	5.3	5.3	4.7
		Home ownership ratio	7.0	10.0	1.0	3.0	3.0	3.0	1.0	8.0
		Number of previous peaks	10.0	10.0	1.0	5.0	1.0	5.0	5.0	5.0
		Average size of households	6.0	1.0	9.0	6.0	7.0	8.0	10.0	1.0
	0.2	Risk in the mortgage system	4.7	5.7	1.7	1.3	7.3	4.0	5.0	3.7
		Average loan-to-value-ratio	1.0	4.0	1.0	1.0	10.0	3.0	6.0	1.0
		Variable or fix rate system	7.0	10.0	1.0	2.0	2.0	2.0	6.0	7.0
		Mortgage debt to GDP ratio	6.0	3.0	3.0	1.0	10.0	7.0	3.0	3.0
		Overall rating score (without contagion risk)	5.0	5.9	2.7	3.9	5.1	4.9	4.5	6.4
0.2		**Contagion risk**	2.0	10.0	2.0	8.0	2.0	1.0	4.0	2.0
		US-related	1.0	10.0	2.0	8.0	1.0	1.0	4.0	1.0
		Europe-related	3.0	10.0	2.0	8.0	3.0	1.0	4.0	3.0
		Total score	4.4	6.7	2.5	4.7	4.5	4.1	4.4	5.5

Source: DB Research 11

How robust is the model?

We just calculated 100 models…

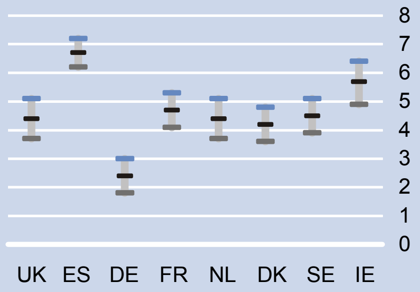
… to test sensitivity

So far, our scoring model uses equal weights for all factor groups. Thus, it might be argued that it ignores the possibility that some factors are more important than others. Therefore, the results' sensitivity to changes in weights was evaluated by estimating 99 additional models with differing weights. Of course the results changed. But they did not change dramatically. The median score of all 100 models for Spain for example was 6.7 points, i.e. very close to the 6.6 points of our equal-weight model. And two thirds of all model results for Spain were in the interval 6.4 and 7.0 points (one standard deviation is 0.3 points). The median result for Ireland again ranks second and the UK, France, Sweden, Denmark and the Netherlands follow some distance behind. Germany's score is in all but two cases the lowest of all countries. In the two outlier cases Germany ranks second from last.

We therefore feel confident that Spain and Ireland can be considered the European countries (within our sample) with the biggest housing market risk.

Results robust to changes in weights

Distribution of scores of all 100 models



Median plus one standard deviation
Median minus one standard deviation
Median

Source: DB Research **12**

Concluding remarks

We analysed eight European housing markets and found that the Spanish and the Irish markets are in relative terms the most likely to correct in the future. While the Irish market is to be negatively affected by very strong supply growth and the effect of rising interest rates in a flexible mortgage system, the Spanish housing market is facing particular contagion risk.

If anything goes wrong in the world economy, do not call for housing markets to save the economies

It is important to understand that this kind of model is not indicating the absolute likelihood of a downturn in any of the analysed markets. Rather, the model assesses the relative risk of the European housing markets. This implies that in a benign scenario, all markets might escape significant price cuts. But of course, the likelihood of such a benign scenario is decreasing with every item of bad news from the USA and with every strong house price growth year in Europe due to rising interest rates. And of course, if anything else is going awry in the world economy, don't call for the housing markets to save the economies again.[7] They are not waiting in the wings this time.

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[7] In March 30, 2002 the title on the cover of the *Economist* was "The houses that saved the world", as the appreciation in house prices had cushioned the crash in the equity markets and thus helped especially the US economy to absorb the last recession.

Appendix: Definition of factors in the scoring model

1. General pricing risk

— Price-earnings ratio: %-change in the house price-rent ratio from 1996 to 2006. Ceteris paribus, rising price-earnings ratio indicates rising risk (source: see chart 3).

— Affordability index: This is a weighted average of the % share of the current affordability index to the highest and lowest level in a country. Rising value of this factor signals rising risk (source: see chart 4).

2. Economic risk

— Surprise growth: Difference between expected GDP growth over the next three years and GDP growth of the previous three years. This assumes adaptive formation of expectations. Falling factor signals rising risk (source: DB Research).

— Interest rates: Absolute difference between the lowest value of the 10-year government bond in the last two years and the highest forecast value until end-2008. Higher values indicate rising risk (source: DB Research).

— Population forecast: %-change in population between 2005 and 2020 (source: UN Population Division).

3. Supply risk

— Supply risk: Difference between growth of housing stock and population growth in the years 2005-2008. Higher values indicate higher risk (source: Euroconstruct).

4. Market structure risk

— Ownership ratio: Share of population living in owner-occupied homes. The higher this value, the more households are affected by falling house prices (source: Eurostat).

— Number of previous peaks: Looking at the last twenty years (source: Gros, 2006).

— Average household size: This indicates catch-up potential in the future (source: Eurostat).

5. Risk in the mortgage system

— Average loan-to-value: Higher LTVs indicate higher risks (source: EMF).

— Share of variable rate: The higher the share of variable rate mortgages, the higher the default risk for households when interest rates rise (sources: Eurostat, EMF).

— Mortgage debt to GDP ratio: Higher ratio indicates rising risk (source: EMF).

6. Contagion risk (source: DB Research)

— US-related: How does 1 pp change in US house prices impact the respective house prices in European countries. In case of insignificant relationships the elasticity was set to nil.

— Europe-related: Sum of the elasticities between European markets weighted with the countries' risk scores.

Compiled and calculated by DB Research

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