

OFFICE PROPERTY IN CENTRAL EUROPEAN COUNTRIES

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Developments in the commercial property market are an important factor affecting financial stability, especially given their effect on the probability of default of non-financial corporations. This article analyses the development of the office property markets in five central European countries and compares their main indicators with those for Germany. It then formulates a simple model of office property prices in relation to macroeconomic, demographic and structural determinants. The analysis reveals that both demand and supply factors (GDP, inflation and total office space), and partly also the maturity of the credit market, have an effect. Using this model, property prices are identified as having been overvalued in 2006–2008. Except in Hungary, however, office space currently appears to be slightly undervalued.

1. INTRODUCTION

Besides the residential property market, the commercial property market is often mentioned as a factor affecting financial stability. The role of property prices in influencing the probability of default of non-financial corporations is frequently discussed (for the situation in the UK, see, for example, Whitley and Windram, 2003). Loans to firms active in the commercial property sector meanwhile make up a large proportion of total loans to non-financial corporations (according to ECB, 2008, exposures to real estate firms in the euro area accounted for around one-third of all loans to non-financial corporations just before the financial crisis broke out). In addition to the probability of default (PD), commercial property prices also affect the loss given default (LGD) of such loans. At times of crisis, the correlation between PD and LGD can rise sharply.

There are more international institutional investors operating on the commercial property market than on the residential property market, so a higher degree of cross-border contagion can be expected in the former (see ECB, 2008). The most active investors in the EU are based in Germany.

Commercial property can also play a role in the financial cycle, as the relaxing and tightening of collateral constraints can amplify the procyclicality of the financial sector as a whole (see Iacoviello and Neri, 2008). This effect on procyclicality is probably stronger for commercial property than for residential property and standard corporate loans, as the commercial developers sector is much more highly leveraged.

Although the commercial property markets in Central European countries are generally less mature¹ and have lower bank loan coverage, they are developing apace. This is apparent, for example, from the ratio of office completions to the existing stock, which is several times higher than in Germany (see Chart 1²). Consistent with this sharp expansion is rapid growth in borrowing by institutions active in the commercial property market, as evidenced, for example, by a 585% overall rise in loans in the “real estate activity” sector in the Czech Republic between 2002 and 2013. Such fast growth in borrowing, however, implies an increased risk of banks wrongly assessing property development projects and an increased risk of default on such loans. Loans to developers in the Czech Republic are indeed relatively risky. This can be illustrated by the fact that, together with loans to the construction sector, they account for around 14% of total loans to the non-financial sector but a full 27% of total non-performing loans.

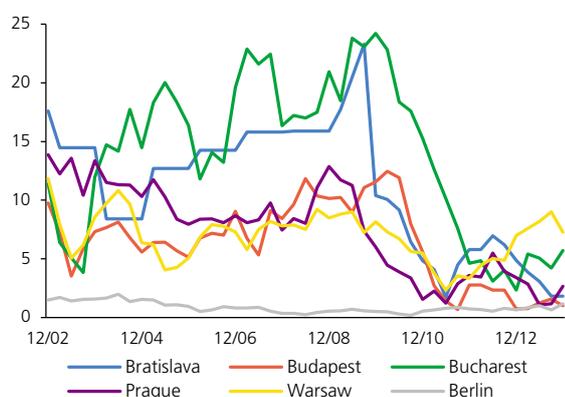
Analysis of the commercial property market is complicated by the fact that this market consists of various segments, each of which is specific and affected by different fundamentals. Residential property developed for commercial rental is also sometimes classed as commercial property.³ The main segments of the commercial property market are office, retail, industrial and hotel property. In this article, we focus exclusively on the office property market as

1 This can be illustrated, for example, by total office space per capita compared to Germany (see Chart 3).

2 The higher completion ratios are of course largely due to a low denominator, i.e. low office space per capita (compare Charts 1 and 3). This also explains why the rate of construction was highest in 2002–2006, when the difference in maturity relative to Germany was largest. Similarly, the ratio of completions to the office stock is highest in Romania, which has the lowest office space per capita of all the countries under review.

3 The sale of apartments in property development projects in the Czech Republic is analysed, for example, in Hlaváček, Prostějovská and Komárek (2011). However, most apartments in development projects in the Czech Republic are intended for sale and not for rent and thus do not qualify as commercial property even in the broader sense.

CHART 1

RATIO OF OFFICE COMPLETIONS TO TOTAL OFFICE STOCK
 (% , 12-month moving totals)


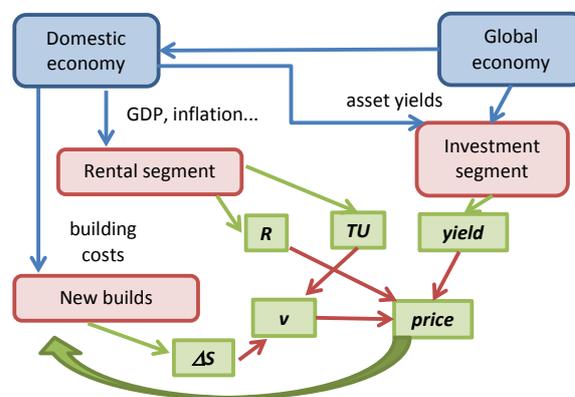
Source: Jones Lang LaSalle, authors' calculations

it is the largest and most homogeneous across countries and has the longest time series.

The commercial property market is to a large extent a specific one. Like residential property, commercial property is tied to a particular location and supply is quite inelastic relative to demand. Office property transactions are monitored solely for the "prime" segment of the market, i.e. only for the very best offices meeting a predefined standard. On the one hand, this means that part of the market, including slightly sub-prime types of offices, is not covered by the analysis and there is a shortage of information about it. On the other hand, commercial property transactions are comparable across economies. This makes it easier for multinational companies active in the commercial property market to decide where to invest and allows them to diversify the risks associated with individual economies. From the analytical perspective, the relative "homogeneity" of the underlying asset facilitates cross-country comparisons. One should bear in mind, however, that the analysis pertains solely to the capital cities of the countries examined and that country-wide data are not available.

This article is structured as follows. In the next section we describe the structure and functioning of the office property market and define some of the main market indicators. We then compare these indicators with those in Germany, illustrating the development of the markets in the countries under review and the evolution of the markets over the business cycle. We go on to discuss the literature on the assessment of equilibrium property prices. In the final section, we formulate a simple model for assessing

CHART 2

STRUCTURE OF THE OFFICE PROPERTY MARKET


Source: authors

Note: R denotes rent, TU take-up, i.e. the volume of newly rented space, v the vacancy rate and ΔS the change in the stock (i.e. the volume of completions).

equilibrium and price determinants for the countries under review.

2. DESCRIPTION OF THE OFFICE PROPERTY MARKET

The office property market is made up of three, to some extent separate, but interlinked segments (see Chart 2). The *rental segment* is where the relatively inelastic supply of rental space interacts with the demand for such space. This demand depends strongly on the local economic situation, but also, for example, on foreign investment inflows, as new investors tend to demand prime office space. The main rental market indicators are the average rent in euros per square metre (denoted R) and the total volume of new rentals ("net take-up", expressed in square metres and denoted TU).⁴

The *investment segment* is where transactions in new and used office buildings take place. A large part of the office space in such properties is usually already rented out. Foreign investors – often institutional investors such as real estate investment trust (REIT) funds – are more prevalent than domestic ones in this segment. An important indicator of this part of the market is the prime yield, which depends partly on the yield on domestic and foreign alternative assets (primarily bonds, but also foreign commercial

⁴ Besides net take-up, gross take-up is monitored. It additionally contains renegotiations of existing rental agreements. Another indicator associated with net take-up is net absorption, which is the change in take-up over a given period of time. Net absorption is calculated by subtracting vacant office space from the total stock of office space.

property) as well as on the risk associated with the domestic office market and on the institutional setup, contract enforceability and so on. If we know the rent, the prime yield and the vacancy rate v , we can calculate the price of property transactions P using the following formula:⁵

$$p = \frac{R(1-v)}{\text{yield}}$$

The final segment of the office property market is the *new build segment*, where the new supply of office space ΔS increases as property transaction prices rise.⁶ In addition, the market depends on the situation in the construction sector, above all on building costs, which are driven by wages, material costs and land prices and also by profit margins demanded in the construction industry. New builds consist of greenfield investments as well as refurbishments of existing premises which were used for completely different purposes in the past (brownfield investments, e.g. redevelopment of disused industrial zones) or were not up to the required standard before reconstruction. Given the long-term nature of rental contracts and the time delay between deciding to build and renting out the property, however, part of the supply tends to be uncovered and the vacancy rate v tends to be positive. The following expression holds for the relationship between the vacancy rate, take-up TU and completions:

$$\Delta v = \frac{\Delta s}{s}(1 - v) - \frac{TU}{s}$$

3. OFFICE PROPERTY MARKETS IN CENTRAL EUROPEAN COUNTRIES

When analysing the office property market in the Central European region, one needs to bear in mind its relative immaturity and its convergence nature compared to Western European countries. Despite having recorded sharp growth over the last ten years, total office space per capita in the countries under review is less than half that in Germany (see Chart 3), where a large proportion of investors in commercial property in those countries are based.

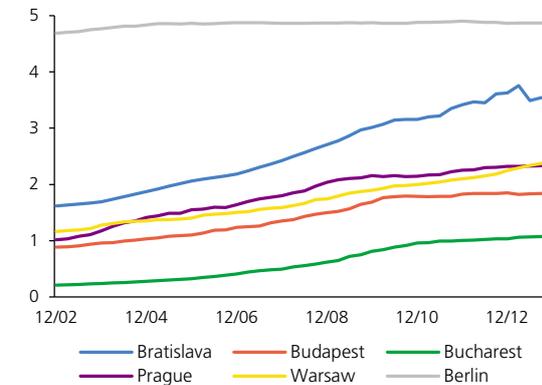
5 The prime yield is calculated from realised investment transactions. If no such transactions take place (as happened in the Czech Republic in 2009), the yield is estimated by analysts. The prime yield is computed as the "current yield", i.e. it reflects only the rental yield and not any capital yields associated with price changes.

6 We assume that completions lead directly to a change in the total office stock S . This means we implicitly assume a zero rate of depreciation of existing offices.

CHART 3

OFFICE SPACE PER CAPITA

(m² per capita)



Source: Jones Lang LaSalle, Eurostat, authors' calculations

The least mature market seems to be the office market in Romania. The amounts of total office space in Poland, the Czech Republic and Hungary are relatively comparable. The rather higher figure for Slovakia is due partly to the lower population of Bratislava, but is closest to the figures for Germany.

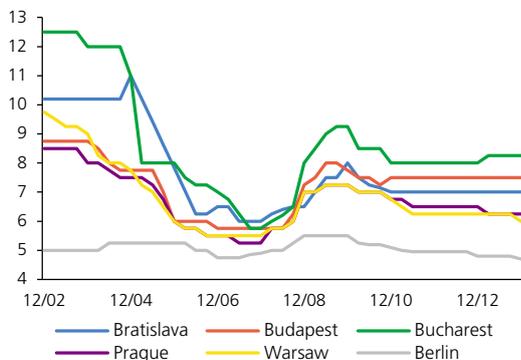
The maturity of the market, which is linked with the risk of office investment transactions, is also reflected in the prime yield (see Chart 4). In all the countries studied the prime yield is significantly higher and less stable than in Germany. For most of the period under review, rental yields were lowest in Poland and the Czech Republic and highest in Romania. The relatively high yield in 2002–2004 was due in part to the above-mentioned low stock of office space manifesting itself in high profitability of this line of business. Yields fell sharply in all the countries in 2005–2007, only to rebound as a result of the financial crisis and the exit of foreign investors from the region. The situation in the investment segment has stabilised somewhat over the last three years, but office property yields are still well above those in Germany.

By contrast, the absolute level of rents across Central European countries is more or less the same as in Germany (see Chart 5). The only exceptions are Poland, where a relative shortage of rental space and solid growth in the local economy is being reflected in higher rents, and Slovakia, where rents are conversely relatively low, possibly due to the above-mentioned higher supply of office property relative to the other Central European countries under review (see Chart 3). Higher rent volatility than in Germany is again apparent in all the countries. The rent cycle is again linked with the impacts of the financial crisis.

CHART 4

OFFICE PROPERTY YIELDS

(%)



Source: Jones Lang LaSalle

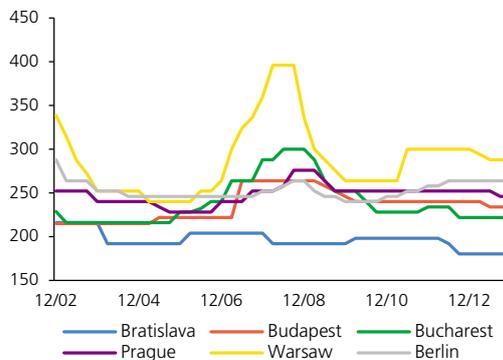
However, unlike in Germany and partly also Poland, where rents have recently been rising, rents remain flat or falling in the other countries.

The vacancy rate (see Chart 6) has also been moving in line with the market pattern described above. It again is comparatively volatile in Central European countries, partly due to a relatively high new office supply (see Chart 1). Before the financial crisis erupted, vacancy rates dropped to very low levels in Poland and Romania, where a shortage of office space was visible at the time (in Poland due to solid economic growth and in Romania due to a relatively low stock). The declines in the vacancy rates in Slovakia and Hungary were substantially smaller. Since the outbreak of the financial crisis, however, vacancy rates have climbed to high levels throughout the region and have stayed there despite a fall in this indicator in Germany. A high vacancy rate testifies to a relatively high level of risk associated with new office construction and may be linked with a relative slowdown in such activity. Another development worth mentioning, besides the market reaction directly after the outbreak of the financial crisis, is the 5.5 percentage point surge in the vacancy rate in Poland since mid-2011, probably linked with an upswing in completions (see Chart 1).

Chart 7 shows office property prices calculated from rents, office property investment yields and vacancy rates. In line with the previous discussion, the price cycle is influenced primarily by the price bubble that built up between 2006 and mid-2008 and the subsequent deflation of that bubble due to the financial crisis. For most Central European countries, however, the price of office property remains higher than it was before the bubble formed and subsequently burst. The chart shows relatively strong

CHART 5

OFFICE PROPERTY RENTS

(EUR per m² and year)

Source: Jones Lang LaSalle

growth in office prices in Germany (a sizeable 30% since the end of 2009), which is probably a result of a “search for yield” and may signal overinflated prices. Office prices have risen similarly strongly in Poland (by 33% between the end of 2009 and mid-2011), although there they have fallen back slightly in the last two years, and partly also in the Czech Republic, where prices went up by 14.8% between the end of 2009 and mid-2013. In Slovakia, Hungary and Romania, by contrast, prices have recently been relatively stable.

4. LITERATURE REVIEW

In contrast to residential property analysis, where there is a whole range of sophisticated theoretical models to explain the interaction between prices and procyclical lending⁷ and where a whole range of empirical studies are available for advanced countries and for countries in which the property market is still developing,⁸ the range of available literature for commercial property is very limited despite the importance of this segment for financial stability. The number of studies for advanced economies is far lower. To the best of our knowledge, there are practically no studies covering the Central Europe region, except for periodical descriptive analyses issued by specialised firms (Jones Lang LaSalle, 2013). We present a survey of the main available studies below.

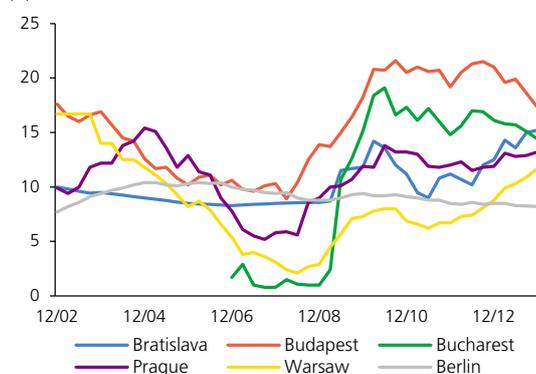
⁷ See, for example, the now almost textbook financial cycle models by Kiyotaki and Moore (2007) and Iacoviello and Neri (2008)

⁸ Residential property prices in the Czech Republic are analysed, for example, by Hlaváček and Komárek (2011).

CHART 6

VACANCY RATE

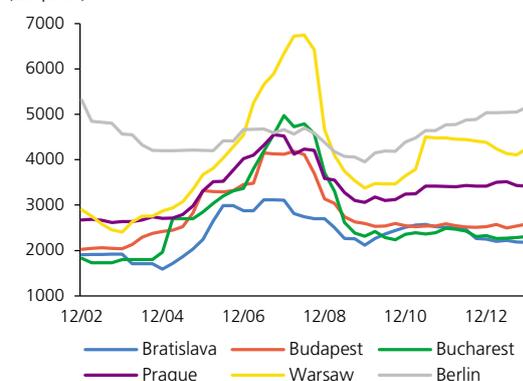
(%)



Source: Jones Lang LaSalle

CHART 7

CALCULATED PRICE OF OFFICE PROPERTY

(EUR per m²)

Source: Jones Lang LaSalle, authors' calculations

Davis and Zhu (2004) explore the interaction between commercial property prices and bank lending. They formulate a theoretical model of commercial property cycles in which the supply of commercial property is fixed in the short run. New construction, which increases the supply in the long run, is funded primarily by collateralised bank loans. Cycles in commercial property prices, which influence the credit financing of new construction, depend on exogenous business cycle shocks and on characteristics of the real estate market, which can amplify the shocks. Davis and Zhu (2004) also conduct an empirical analysis based on a sample of 17 developed economies, for which they determine the interaction between commercial property prices, credit and GDP using a panel error-correction model and Granger causality tests. This interaction was particularly strong for countries hit by banking crises in 1985–1995.

Davis and Zhu (2009) extend the previous article by studying, on the basis of microeconomic data, how commercial property prices influence individual banks' lending decisions and indirectly also their profitability and credit portfolio quality. The linkage between commercial property prices and bank characteristics is found to be quite strong.

Gyourko (2009) explores the relationship between residential and commercial property prices, for which common demand drivers can be expected. On the basis of data from 32 metropolitan areas of the USA, the article finds that the cycles on the two markets do indeed show commonalities.

Lieser and Groh (2011) examine the determinants of commercial real estate investments using a wide panel of 47

countries, including Central European nations, for the period 2000–2009. These determinants form a broad set of 66 factors ranging from characteristics associated with economic activity and demographics through to those reflecting the maturity of the property market, the depth of the capital market, the quality of the legal framework, investor protection, administrative burdens and regulatory limitations, and the socio-cultural and political environment. By applying panel regression analyses the authors find that commercial property investments are supported by GDP growth, rapid urbanisation and population growth, and conversely are hindered by lack of transparency in the legal framework, administrative burdens on doing business, sociocultural challenges and political instability.

Using data from the UK, Whitley and Windram (2007) present an analytical framework for analysing the financial stability implications of developments in the commercial property sector. This framework includes a model of the real estate sector, a model of borrowing by commercial real estate companies and a model of the probability of default for such companies. Although a simulation using this model framework failed to capture all the cyclicity of commercial property capital values and bank lending, particularly between 1990 and 1994, almost all this failure can be attributed to the observed shock to the discount rate. The main result of the article is that it demonstrates a link between commercial property prices and defaults by non-financial corporations.

The commercial property market situation is also assessed by the ECB in its Financial Stability Review (usually in section 1). Its method for detecting value misalignments in commercial property markets, described in ECB (2011) and

partly also in ECB (2008), is based on a fairly straightforward comparison of commercial property market indicators – primarily capital values – with their long-term averages.

5. DATA DESCRIPTION AND METHODOLOGY

Our dataset contains quarterly data covering the period of 2002 Q1–2013 Q4 for five countries (the Czech Republic, Poland, Hungary, Slovakia and Romania). Besides commercial property market indicators for the capital cities of those countries, it contains macroeconomic variables (GDP/domestic demand, inflation, unemployment, foreign direct investment inflow, short-term and long-term interest rates and the exchange rate), demographic factors (population size and growth) and a proxy for credit market maturity (the ratio of loans to non-financial corporations to GDP).

On the basis of this relatively wide set of variables, we used only four factors that were at least vaguely significant in our models in order to model property prices.⁹ For these variables we formulated the following error-correction model:

$$\begin{aligned} \Delta \log p_{i,t} = & \alpha + \beta_1 \log s_{i,t} + \beta_2 \Delta \log gdp_{i,t} + \beta_3 \Delta c_{i,t} + \beta_4 \Delta \log cpi_{i,t} \\ & + \delta (\log p_{i,t-1} - \gamma_1 \log s_{i,t-1} - \gamma_2 \log gdp_{i,t-1} - \gamma_3 c_{i,t-1} \\ & - \gamma_4 \log cpi_{i,t-1}) + \varepsilon_{i,t} \end{aligned}$$

where $p_{i,t}$ denotes the office property price index calculated using the formula in section 2, $s_{i,t}$ is the existing stock of office space, $gdp_{i,t}^*$ represents potential real GDP in euros per capita, $gdp_{i,t}$ stands for the output gap as measured by the HP filter, $c_{i,t}$ is the ratio of credit to GDP and $cpi_{i,t}$ denotes the harmonised consumer price index (HCPI). Fixed effects are added to the model to capture unobserved heterogeneity, which is constant over time. The standard errors are robust to heteroscedasticity and are clustered at country level.

The error correction model allows us to model the short-run (β) and long-run (γ) relationships. Coefficient δ denotes the speed at which the model returns to equilibrium. A similar model was used in Davis and Zhu (2004), which studied determinants of commercial property prices based on a sample of developed economies (see the previous section). We should point out that given the small number of observations the results should be interpreted with caution.

9 The coefficients on the other variables listed above were not significant.

TABLE 1

	Long-run relationship			Short-run adjustment		
	coefficient	t-stat	p-val	coefficient	t-stat	p-val
Stock	-0.756	-6.220	0.000	-0.631	-4.850	0.008
GDP	1.546	7.070	0.000	0.381	1.640	0.176
Loans/GDP	0.009	3.390	0.001	0.011	1.640	0.176
CPI	1.040	2.990	0.003	1.065	2.800	0.049
Constant	-7.325	-3.240	0.001	0.006	1.570	0.191
Lagged residual	-	-	-	-0.086	-2.280	0.085
R ² : within		0.391			0.109	
between		0.790			0.085	
total		0.416			0.108	

Source: Jones Lang LaSalle, authors' calculations

In particular, it is important to emphasise that the period under review essentially covers only one cycle in commercial property prices and additionally that structural breaks – linked primarily with low market maturity at the start of the period – can also be expected. It also holds that while the office property market indicator reflects the situation in the capital city of the country (data for other cities are not usually available), the macroeconomic indicators mostly relate to the situation in the country as a whole. Economic misalignments between the capital city and the rest of the country may of course distort the results of the analysis.

That said, we can draw some conclusions. First, only four of the relatively wide set of potential explanatory variables proved to be at least vaguely significant (see Table 1). On the other hand, the estimated coefficients on all these variables were consistent with economic intuition. The stock of office property was shown to have a negative effect on office property prices, i.e. prices fall as supply rises. This effect is rather stronger for the countries under review than for countries with mature commercial property markets, thanks mainly to a shortage of prime office space in Central European countries at the start of the period under analysis. Real GDP¹⁰ proved to be a significant macroeconomic determinant: higher economic development increases prices of office space. The effect of potential GDP was more significant in the long-run relationship, while the cyclical contribution of the output gap was not statistically significant. The maturity of the credit market had a similar effect; in the long-run relationship it fostered higher office prices, while in the short-term one its estimated coefficient had the expected sign but was relatively low in absolute

10 As an alternative to GDP we tested the effect of domestic demand. The results of the model were similar, but the significance of the coefficient on demand was lower.

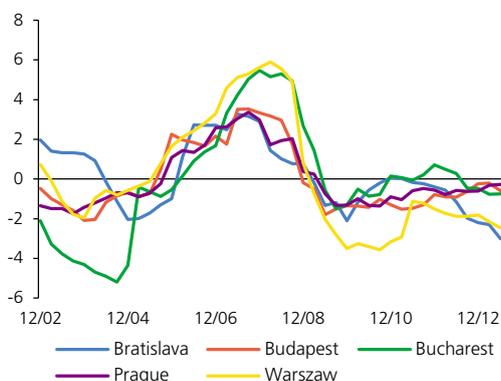
terms and not statistically significant at the 10% level. The consumer price index, which we used as an indicator of construction costs or general inflation pressures in the economy, turned out to be significant in both the long-term and short-term relationship.

The estimated coefficient δ shows that if office property prices deviate from their long-term fundamental level, they will converge to that level at a rate of around 8.6% a quarter.

The model also allows us to compare the estimated “fundamental” office prices with the actual ones and thus to determine how overvalued or undervalued such property is (see Chart 8). However, given the above-mentioned short length of the time series and the related not very high overall statistical significance of the model (R^2 of the short-term relationship only 11%), these price misalignment estimates are only illustrative and subject to a high degree of uncertainty. Overall, the residuals for individual countries indicate initial undervaluation in 2002–2005, particularly for countries where the market was only starting to develop (Romania), a subsequent bubble in prices until 2008 before the outbreak of the financial and debt crisis, and deflation of that bubble in 2009–2010. At the moment, the price equilibrium assessment varies from country to country. In countries that are maintaining relatively high GDP growth rates in the European context (Poland and Slovakia), office property seems undervalued, while in the Czech Republic, Hungary and Romania prices appear to be close to, or only slightly below, their equilibrium levels. These discrepancies in the assessment of the current market situation across countries can be explained in terms of relative price stickiness, with the estimated degree of overvaluation being driven from below primarily by fundamentals. This, of

CHART 8

MODEL RESIDUALS BY COUNTRY (OFFICE PRICE “GAPS”)
(% of price)



Source: Jones Lang LaSalle, authors' calculations

course, further increases the uncertainty in the interpretation of overall price misalignment.

The cross-country comparison of the degree of office overvaluation/undervaluation also indicates higher volatility of overvaluation for Romania and Poland than for Hungary, Slovakia and the Czech Republic.¹¹ Looking at the results of similar studies for euro area countries (see, for example, ECB, 2011), the patterns in Central European countries seems similar in terms of the timing of overvaluation/undervaluation, but in most euro area countries the volatility of overvaluation is rather lower.

6. CONCLUSION

Commercial property, which played a major role in many countries during the financial crisis and which has significantly influenced banking sector indicators and financial stability in general, is becoming increasingly important for Central European countries as well. The commercial property market, which is funded in large part by bank loans, is developing dynamically in these countries. Analysis of the commercial property market will therefore be an important element of financial stability assessment for these countries. This article set out to contribute to such analysis, at least in the office property segment.

Despite the said rapid development, the commercial property markets in these countries are still relatively immature. This is reflected in higher volatility in their indicators than for other EU countries.

Using an error-correction model, we tried to express the dependence of office property prices on macroeconomic, demographic and structural determinants. This analysis indicated that demand factors are significant, demonstrating the statistical significance of GDP and the effect of consumer prices. Supply factors linked with total office space, and partly also the maturity of the credit market as proxied by the ratio of credit to GDP, also seem to be statistically significant. On the basis of the model, property prices were identified as having been overinflated

¹¹ For the Czech Republic one can also compare the degree of price misalignment between residential and office property (compare, for example, Chart 8 with Chart V.20). Residential and office property have essentially the same overvaluation/undervaluation profiles. However, the latest “bubble” started to inflate around one year earlier in the office market than in the residential market, and subsequently “deflated” about six months earlier.

in 2006–2008, but office space currently appears to be slightly undervalued.

Given the immaturity of the market and the short time series used, the results of our analysis should be interpreted with caution. Nevertheless, they may lay the foundations for further debate of developments in the commercial property market. This market should play a more prominent role than it has so far in the discussion of financial stability and new regulatory approaches.

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