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European office markets, user costs and speculative bubbles

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Abstract

Over the last years, prices for European office space have reached new peaks. This naturally provokes discussion about a possible overheating in the market. One approach to assess price development of real estate markets is the so-called “user cost approach”. Typically, this approach is applied to housing markets, but it can also be applied to commercial markets. The model follows the idea of no-arbitrage. If one kind of tenure is economically more attractive than another, households or corporates will shift demand, so that both tenures – buying and renting – should equalise over time. Thus, major differences between buying and renting indicate a possible over- or undervaluation of properties. In this contribution, user costs for offices have been calculated for 18 European capitals.

The results indicate that in most European office markets, further price appreciations are likely. In Paris, Helsinki, Prague, Berlin, Stockholm, Amsterdam, Oslo and Luxembourg in particular, huge gaps between prime rents and user costs indicate further price increases, whereas in Madrid, Lisbon, Rome, London and Budapest further price decreases seem plausible. However, these likely price decreases do not follow the typical pattern of a correction of a speculative bubble, but are more or less the result of falling prime rents that have not been fully captured in prices, yet.

The user cost approach has some predictive power, but can only provide an initial pointer towards under- or overvaluations. For instance, structural breaks such as Brexit can change long-term expectations, which cannot be captured properly in a model. However, the approach appears valuable in providing a first assessment. In future, the German Economic Institute will do further research on this topic in order to strengthen its understanding of commercial property markets.

1 Background

Prices in European office markets have increased significantly over the last years. Since 2010, prices for offices in London increased by 43 percent, in Paris by 74, and nearly quadrupled in Berlin. Accordingly, yields – which measure the proportion between rents and prices – decreased to historically low levels.

Against this background, concerns are growing that a speculative bubble could form, i.e. prices could decrease suddenly and heavily. Specifically, since office markets tend to be more volatile than, for example, housing markets and since speculative bubbles occur more often in commercial real estate markets (Benford/Burrows, 2013).

According to Stiglitz (1990), a speculative bubble is defined as follows: "If the reason that the price is high today is only because investors believe that the selling price will be high tomorrow – when "fundamental" factors do not seem to justify such a price – then a bubble exists."

This definition indicates that a speculative bubble is predominantly a psychological phenomenon. Market participants are too optimistic about future developments and therefore their willingness to pay is irrationally high (Shiller, 2016) as they expect even higher selling prices in the future. Hence, this would imply measuring investors' expectations and motivations, which is usually not possible. Thus, most researchers concentrate on the second part of the definition, which implies that prices deviate from fundamentals. Typically, prices in the past are explained by fundamental factors like demand, supply and their determinants, and so the actual price can be compared to a fundamentally derived price. However, in the office market, necessary data for such kind of analysis is usually missing. Data on office employment, construction activities, vacancies and other explaining factors for prices is only available in transparent markets such as the UK or the United States (see for example Hendershott et al. (1999) or Ibanez/Pennington-Cross (2013)). In most other European countries, like Germany, this data is not available. For instance, there is no official data on office employment and data on office stock is completely absent. In addition, detailed data on financing commercial real estate is missing too, which could also provide valuable insight into investor behaviour.

Consequently, an approach is necessary that needs less data. In the housing market, the so-called "user cost of housing approach" developed by Poterba (1984) is a model that fulfils this criteria. Besides rents and prices, only data on interest levels and typical costs for self-occupants is necessary. According to this approach, markets are in imbalance when one kind of tenure is more attractive than another. In the long term, renting and buying real estate should cost the same, since otherwise a shift in demand is expected which would lead to an adjustment of prices. In the following, this user cost approach is applied to office markets – to the best of the authors´ knowledge, this is the first paper that applies this approach to office markets. To do so, PMA, a European market analyst, provided long-term data on rental prices and yields for over 18 European office markets. The main outcome of this analysis is that markets in Europe are mostly sound and that a sudden drop in prices is not likely.

The paper is structured as follows: the next section describes the market development in Europe. The methodological issues are then explained, and the main part presents and discusses the results for the user cost approach. The conclusion provides a summary of the main findings.

2 Data and methodology

The user-cost-of-housing approach originated with James Poterba (1984), who used it to examine the influence of taxation on how housing is consumed: by buying or renting. The approach is based on the idea that households are essentially indifferent to whether their home is purchased or rented. When the relative costs change, however, the demand from households for each form of tenure shifts accordingly. This leads to price adjustments, which then restore equilibrium to the marketplace. For example, Poterba (1984) analysed the effect of tax relief for house-owners, which reduced the costs of owner-occupancy, making the purchase of a home more attractive than renting. The demand for residential property subsequently increased, driving up prices. In the new equilibrium, the user costs of housing are the same for both forms of tenure, though the number of homeowners has increased relative to the number of tenants. The user-cost-of-housing approach was also used by U.S. and Irish central bankers to successfully identify exaggerated activity in their property markets on the eve of the financial crisis (Himmelberg et al., 2005; Browne et al., 2013), since significantly higher prices for owner-occupiers than for renters imply a disequilibrium. Marked differences in these costs indicate a need for correction and thus provide evidence of a market overheating.

In the following, the user cost approach is applied to office users, which are typically corporates. Like households, corporates have to decide whether they buy or rent an office. Since corporates are cost-sensitive, changing user costs should have an impact on tenure choice. And unlike households, which often face liquidity constraints (Voigtländer, 2019), corporates have better access to credits and they regularly move, so that equilibrium should be restored faster than in the housing market.

Renting firms' costs are simply the annual cost of renting. Since firm rents are typically subject to tax deductibility, the authors make use of the effective prime rents to measure renting firms' costs. The latter are obtained as

$$ER_{ti} = (1 - \tau_t) \cdot R_{ti}$$

where R_{ti} is the prime rent to be paid by firm i and τ_t denotes the average corporate income tax rate of that country.

With reference to Poterba (1984), the costs of firms possessing their own real estate can be determined by the following equation:

$$UC_{ti} = P_{ti} \cdot [(1 - \tau_t \cdot a_t) \cdot (i_t + c) - g_i]$$

The annual costs of corporate real estate property in period t faced by firm i, UC_{ti}, are described as a share of the purchase price, P_{ti}. The size of this share depends on several variables. Firstly, the firm must bear the loss of interest from not having invested in other assets and it could be obliged to pay interest on a mortgage, i_t. For the sake of simplicity, it is assumed that the rates on equity and debt are equal. Also, costs for reparation and maintenance, c, here assumed to be a constant share of the purchase price, have to be included. Both costs together are applicable to capital allowances granted in the respective country, measured by the product of the average corporate income tax rate, τ_t, and the average rate of tax deductibility for firm buildings, a_t. Secondly, g_i represents the average growth rate of the value of the firm's property. It reduces the user costs if the real estate gains value but has an increasing effect if the value drops.

Table 2-1: Overview of data used

Variable	Data source
Prime net yields	PMA, 2019, European Office Service, Forecasts
Prime rents R_{it}	PMA, 2019, European Office Service, Forecasts
Purchase prices P_{it}, growth rates g_{it}, effective rents ER_{it}	Calculations based on PMA (2019)
Corporate income tax rates t_t	OECD, 2019a, Tax database, Statutory corporate income tax rates
Capital allowances a_t	Tax Foundation, 2013, OECD capital allowances
Interest rate i_t	OECD, 2019b, Main economic indicators, Long-term interest rates

User costs are calculated for 18 European capitals. Therefore, the authors use average data on prime rents and prime net yields for each of the cities involved, stemming from PMA. This company produces detailed analyses of property markets all over the world. As the yields describe the rents as a percentage of the purchase price, the latter can be derived from the data by a simple division. The growth rates of property values are then computed as the average annual rate of change of the purchase prices in each city over the period between 2000 and 2018. In contrast to other papers calculating user costs, we do not use current price rises as a proxy for future developments since recent price increases in most European office markets have been exceptional. In addition, current prices could be the result of a speculative bubble. Therefore, taking current growth rates could lead to misinterpretation. Unlike real estate variables, data on interest rates, tax rates and capital allowances is only available on a country-specific level. Interest rate data is taken from the OECD, and refers to the long-term interest on sovereign bonds. Yields on sovereign bonds are lower than rates on corporate bonds, but the relationship

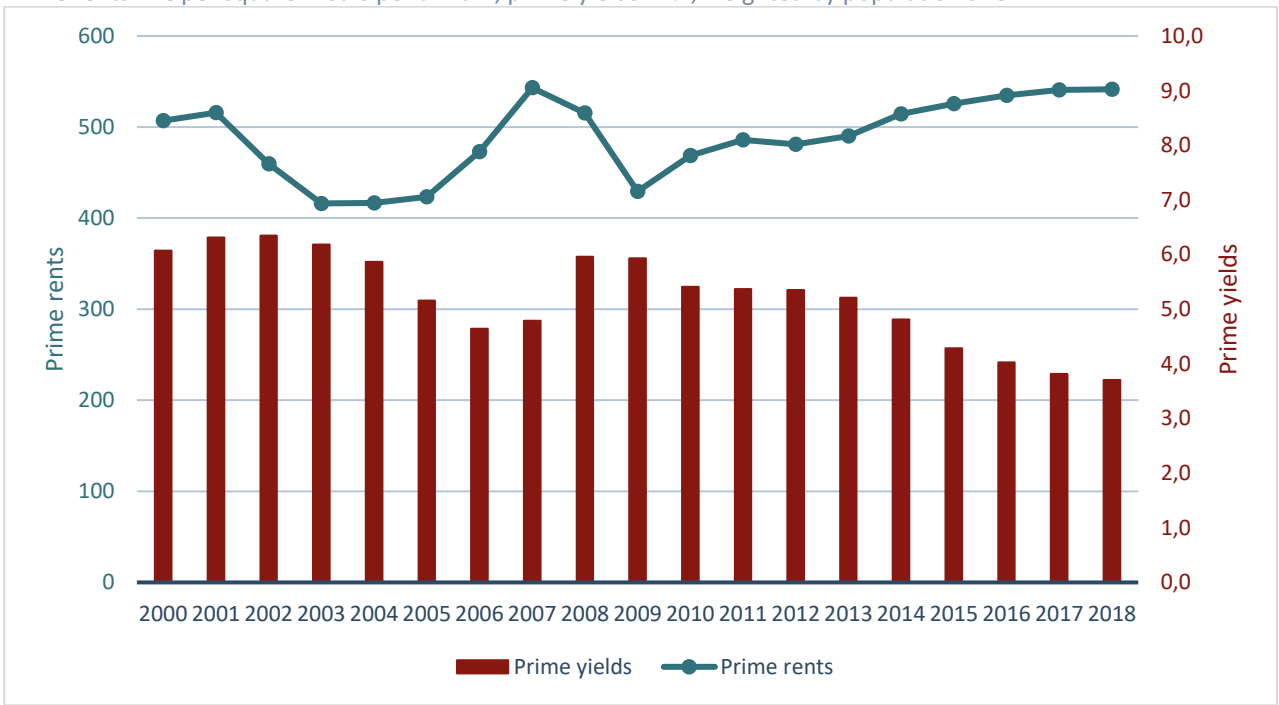
is more or less stable. As mentioned above, the tax rates employed in the calculations represent overall (i.e. central government and sub-central government taxes combined) statutory corporate income tax data, which is also provided by the OECD. The information on capital allowances comes from the American Tax Foundation, a private non-profit organisation that offers research and analyses in the field of tax policy. Lastly, the authors assume a constant share of reparation and maintenance costs of five per cent of the purchase price. Thus, we calculate based on a lifecycle of 25 years of offices and maintenance costs of one percent per year (see for example Hughes et al., 2014). The overview shows which data sources were used for the individual variables in the study.

3 Developments in the European office market

Figure 3-1 displays the development of average prime rents and yields for the average of the 18 European capitals included in the analysis.

Figure 3-1: Average prime rents and yields across 18 European capitals

Prime rents in € per square metre per annum, prime yields in %, weighted by population size



Source: calculations based on PMA, 2019

Prime rents decreased or stagnated between 2001 and 2005 as a result of the New Economy crisis, but increased considerably in 2006 and 2007. Afterwards, due to the financial crisis, prime rents once again decreased. However, since 2009 prime rents have increased steadily, although the peak of 2007 has not yet been reached.

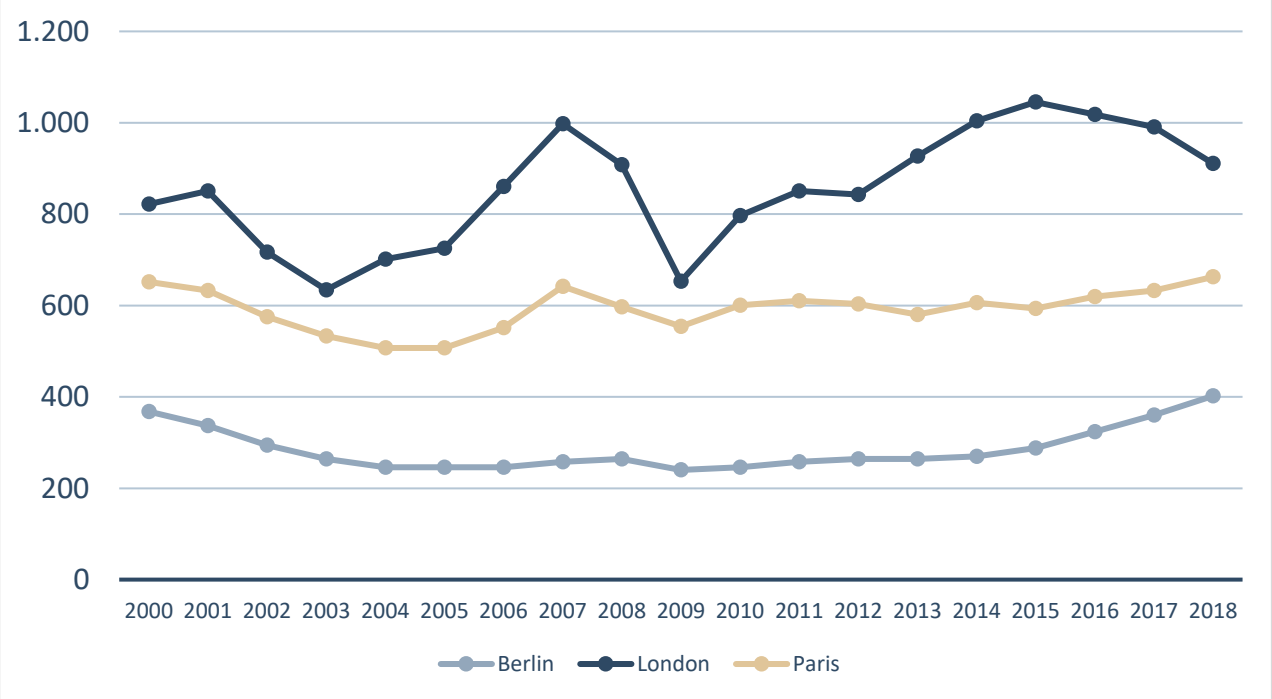
Prime yields, capturing the relation between rents and prices, developed more smoothly. Prime yields only decreased significantly between 2005 and 2007, indicating that prices increased faster than rents. As we now know, this was the outcome of a speculative bubble. As of 2013,

prime yields fell, and thus adjusted to the prevailing low interest environment, triggered not only by ECB policies but also by the sinking global real interest rate. One reason for falling real interest rates are demographics, as Demary and Voigtländer (2018) point out, as the gap between savers and investors is widening. In 2018, the prime yield was 3.7 percent, while it was 5.9 percent in 2009.

Taking a closer look at Berlin, London and Paris, which rank highest in terms of office investment volumes according to PMA data, reveals differences and convergence. Regarding rents, figure 3-2.1 indicates high volatility in London, while rents in Berlin develop more steadily. In addition, Berlin is still cheap for tenants, prime rents in Paris are more than 50 percent higher, and in London, rents are even twice as high as in Berlin. What is even more interesting, although rents in Berlin increased by 67 percent since 2009, rents are only 9.5 percent higher compared to 2000. Likewise, rents in Paris have only slightly exceeded levels compared to 2000. Only in London are rents considerably higher than in 2000. However, in recent years rents decreased, most probably as a result of Brexit uncertainty and the shrinking demand for offices.

Figure 3-2.1: Prime rents in Berlin, London and Paris

in € per square metre per annum

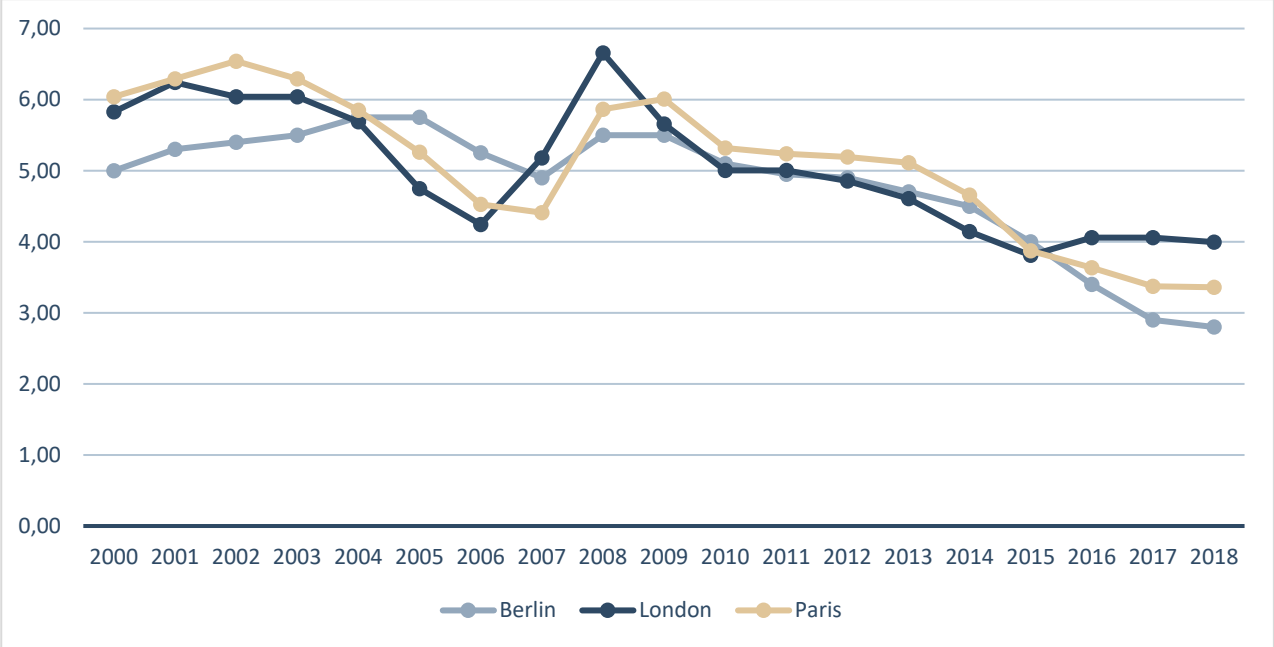


Source: PMA, 2019

With regards to yields, however, convergence is obvious, as can be seen in figure 3-2.2. Prime yields develop in parallel, and levels are quite similar. This mainly indicates that the markets are closely related, primarily because of international investors switching their targets according to yields. Decoupling seldom occurred after 2015, once again rooted in Brexit discussion, as investors seem to demand a risk premium for London.

Figure 3-2.2: Prime yields in Berlin, London and Paris

in %



Source: PMA, 2019

Table 3-1 sums up developments for all 18 capitals included in the analysis. Annual growth rates for prime rents and purchase prices in the period 2010 to 2018 outperform growth rates between 2000 and 2018 considerably. There are only two exceptions: Rome and Warsaw. The office market in Rome suffered from low economic growth in recent years, while Warsaw experienced a long-lasting boom that recently faded out.

Rents and prices increased most in Dublin, Berlin and Stockholm - cities with a booming start-up scene.

Table 3-1: Average annual growth rates of prime rents and purchase prices

in %

City	Prime rents		Purchase prices	
	2000-2018	2010-2018	2000-2018	2010-2018
Vienna	0.6	0.8	2.6	5,4
Brussels	0.3	0.8	2.4	4.5
Prague	0.1	1.0	4.3	6.2
Copenhagen	0.1	0.7	2.8	4.5
Helsinki	0.2	1.5	3.4	6.9
Paris	0.1	1.2	3.4	7.2
Berlin	0.5	6.3	3.8	14.6
Budapest	-0.1	3.1	2.4	6.6
Dublin	1.0	8.2	1.9	16.6
Rome	0.8	-1.6	2.3	2.3
Luxembourg	2.6	3.8	5.6	9.1
Amsterdam	1.4	3.3	4.9	10.6
Oslo	2.2	2.8	6.7	8.9
Warsaw	-0.1	-0.9	4.4	3.0
Lisbon	-1.4	-0.4	0.9	5.3
Madrid	-0.6	3.1	1.5	9.3
Stockholm	1.5	6.4	4.3	11.7
London	0.6	1.7	2.7	4.6

Source: calculations based on PMA, 2019

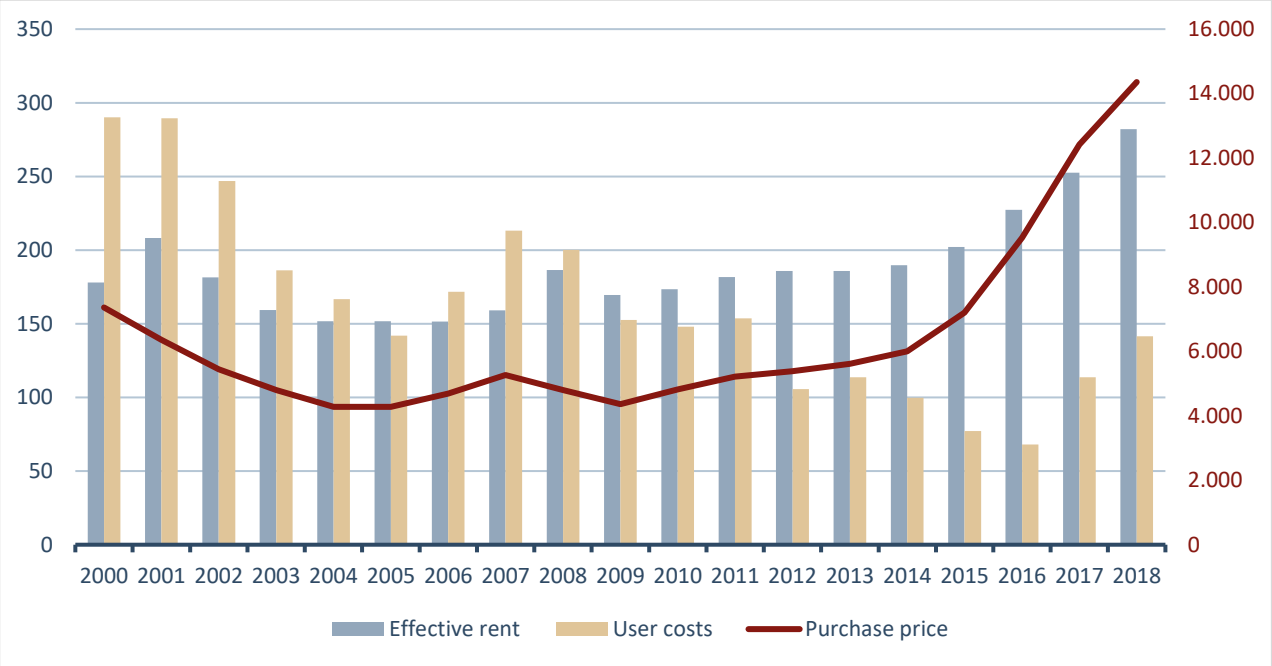
4 User costs and prime rents in the European office market

In the following, user costs are analysed in order to detect possible overheating in European office markets. In the first step, user costs are calculated for Berlin; the results can be found in figure 4-1. Unlike rents, which have increased with even higher dynamics since 2010, user costs decreased between 2010 and 2016. Since then, user costs have increased, but remain lower than in 2011. The main reason for this can be found in the development of interest rates. Between 2011 and 2016, prices increased but interest rates decreased even more, thus overcom-

pensating office owners. However, in 2017 and 2018, prices increased faster than rents. Nevertheless, prime rents are currently twice as high as user costs, indicating that self-occupiers of offices are better off than office renters. Thus, in order to resume equilibrium, either prices will increase further or mortgage rates will increase without affecting prices – or both. Against this background, the strong price increases in Berlin appear to be economically sound.

Figure 4-1: User costs, effective rents and purchase prices in Berlin

User costs and effective rents in € per square metre per annum, purchase prices in € per square metre

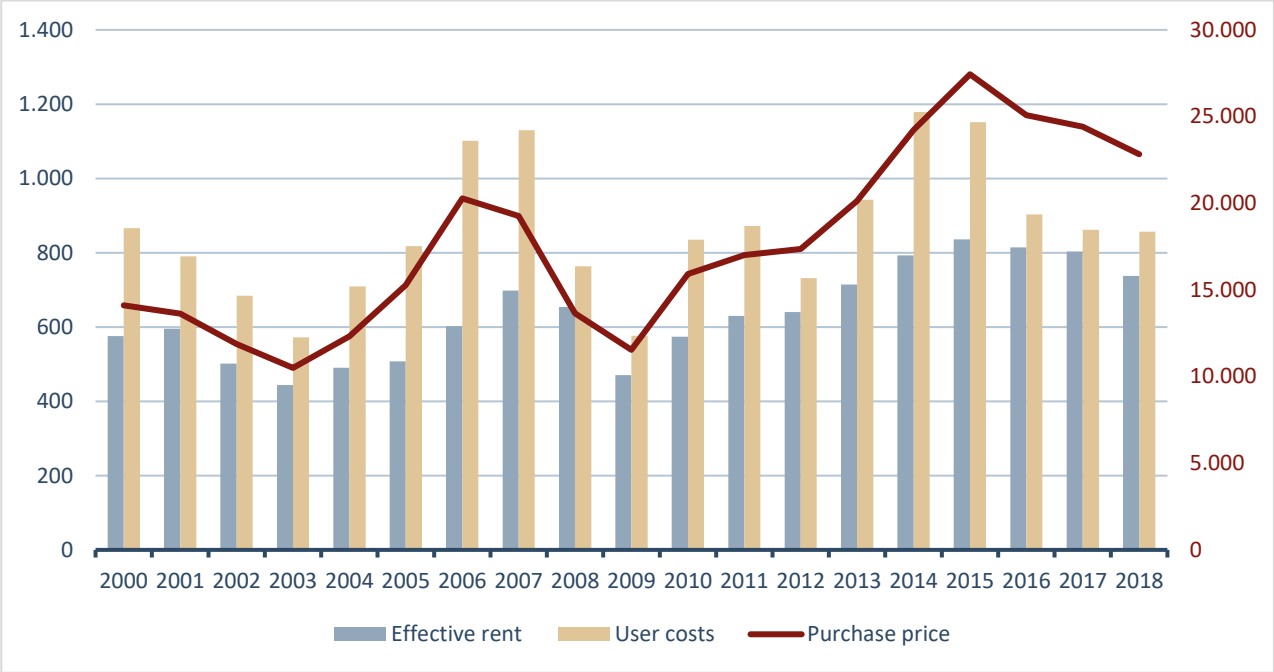


Source: calculations based on PMA (2019), OECD (2019a, 2019b) and American Tax Foundation (2013) data

In contrast, in London user costs are higher than prime rents, indicating decreasing or stagnating prices. Indeed, in 2014 and 2015, user costs were significantly higher than prime rents, and as theory predicts, prices decreased thereafter. However, since prime rents tend to fall further, prices have to go down even more to reach an equilibrium in the market. The model also predicted a fall in prices before the financial crises, as user costs outperformed prime rents significantly from 2006 to 2008, thus stressing the usefulness of the user cost approach.

Figure 4-2: User costs, effective rents and purchase prices in London

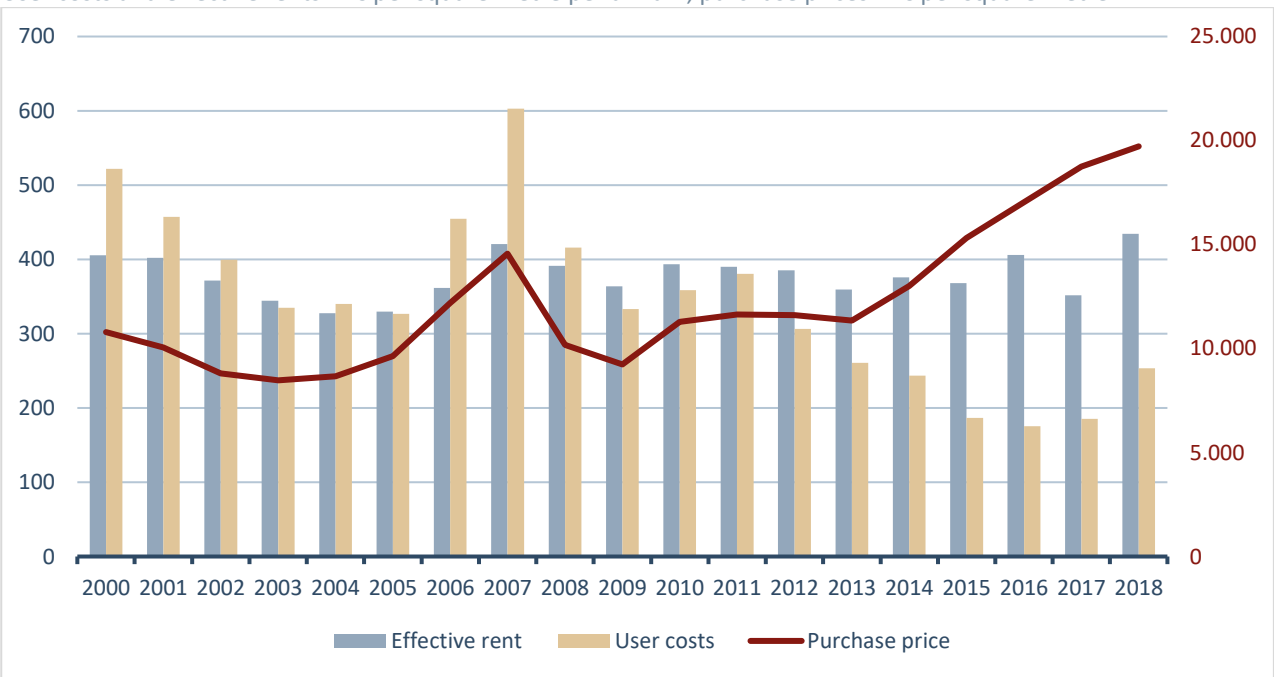
User costs and effective rents in € per square metre per annum, purchase prices in € per square metre



Source: calculations based on PMA (2019), OECD (2019a, 2019b) and Tax Foundation (2013) data

Figure 4-3: User costs, effective rents and purchase prices in Paris

User costs and effective rents in € per square metre per annum, purchase prices in € per square metre



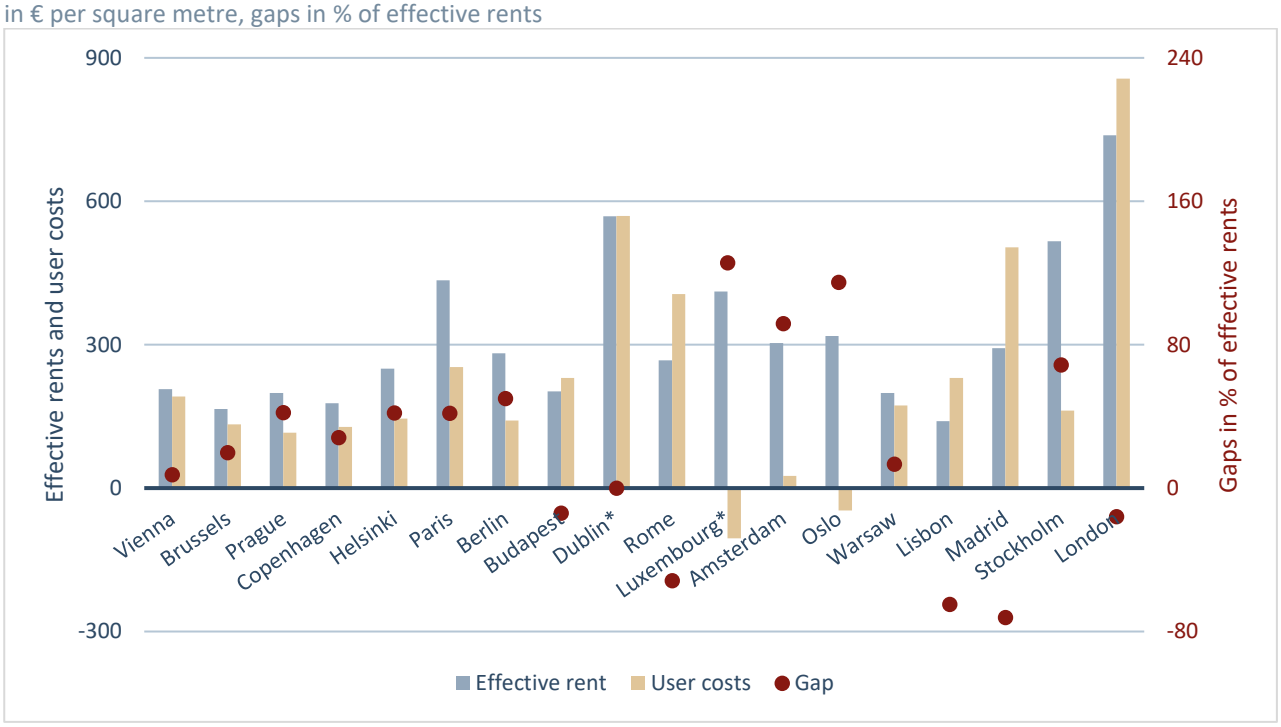
Source: calculations based on PMA (2019), OECD (2019a, 2019b) and Tax Foundation (2013) data

While London is a special case due to Brexit uncertainty, Paris is similar to Berlin, although the development is less extreme (Figure 4-3). As in Berlin, the gap between prime rents and user costs grew between 2010 and 2016, and closed slightly in recent years. Currently, prime rents are still more than 70 percent higher than user costs, implying further price increases. Also similarly to London, the extreme divergence of user costs and prime rents in 2007 resulted in a price drop over the following years.
Figure 4-4 shows the rent cost gap for all 18 cities. The rent cost gap is defined as the relative difference between prime rents and user costs. A negative value implies higher user costs than prime rents, implying the potential of overheating in the market. Positive values, correspondingly, imply that prime rents are higher than user costs, thus prices could increase further.

Given that negative values for gaps indicate potentially overheated markets, investors should avoid purchasing offices in Madrid, Lisbon, Rome, London and Budapest, as in all these cities buying is less attractive than renting. In contrast, in Paris, Helsinki, Prague, Berlin, Stockholm, Amsterdam, Oslo and Luxembourg, prime rents exceed user costs by more than 40 percent, suggesting further price increases. All other markets are more or less in equilibrium.

Figure 4-4: Rent-cost gaps in 18 European capitals in 2018

in € per square metre, gaps in % of effective rents



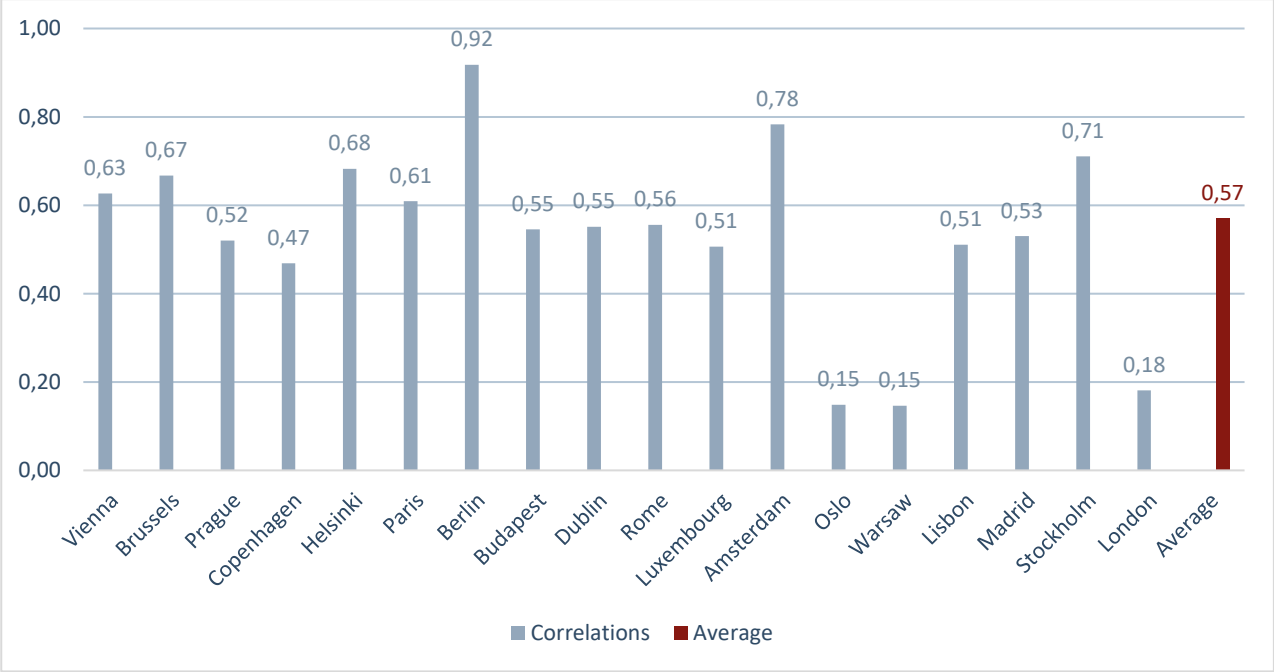
Source: calculations based on PMA (2019), OECD (2019a, 2019b) and Tax Foundation (2013) data
* data for Dublin and Luxembourg refers to 2017

In order to evaluate the predictive power of this approach, we check for the correlation coefficient between the lagged gap of user costs and prime rents and the price development. If the gap widens, i.e. if prime rents increase faster than user costs, prices should increase, and vice versa. Of course, correlations are only a preliminary test – more sophisticated approaches are

necessary to scientifically prove the relationship. Nevertheless, a high correlation coefficient indicates at the very least a stable relationship.

Indeed, the correlation coefficient between the lagged rent gap and the price development is 0.57, indicating a close relationship. In most cities, the correlation coefficient is even higher, with a maximum of 0.92 in Berlin. Only three cities show considerably lower correlations: Oslo, Warsaw and London. With regards to Warsaw and London at least, structural breaks could be a reason. For instance, if investors assume a different long-term growth rate of prices, due to political changes or changing perspectives for the long-term development of the economy, the applied user cost could deviate from the user costs practitioners implicitly apply. In general, real estate prices are primarily the result of expectations of future discounted rents. Such changes in long-term expectations are difficult to account for. Nonetheless, the applied user cost approach was able to predict over- and undervaluation in a high number of European capitals in the past.

Figure 4-5: Correlations between rent-cost gaps and price increases in 18 European capitals



Source: calculations based on PMA (2019), OECD (2019a, 2019b) and Tax Foundation (2013) data

5 Conclusion

In the past years, prices for European office space have reached new peaks. This naturally provokes discussion about a possible overheating in the market. One approach to assess price development of real estate markets is the so-called user cost approach. Typically, this approach is applied to housing markets, but it can also be applied to commercial markets. The model follows the idea of no-arbitrage. If one kind of tenure is economically more attractive than another, households or corporates will shift demand, so that both tenures – buying and renting – should equalise over time. Thus, major differences between buying and renting indicate a possible over- or undervaluation of properties. In this contribution, user costs for offices have been calculated for 18 European capitals.

The results indicate that in most European office markets, further price appreciations are likely. In Paris, Helsinki, Prague, Berlin, Stockholm, Amsterdam, Oslo and Luxembourg in particular, huge gaps between prime rents and user costs indicate further price increases, whereas in Madrid, Lisbon, Rome, London and Budapest, further price decreases seem plausible. However, these likely price decreases do not follow the typical pattern of a correction of a speculative bubble, but are more or less the result of falling prime rents that have not been fully captured in prices, yet.

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6 References

Benford, James / Burrows, Oliver, 2013, Commercial Property and Financial Stability, in: Bank of England Quarterly Bulletin, Vol. 53, No. 1, pp. 48–58

Browne, Frank / Conefrey, Thomas / Kennedy, Gerard, 2013, Understanding Irish house price movements - a user cost of capital approach, Research Technical Paper, 04/RT/13 [2014-12-19]

Demary, Markus / Voigtländer, Michael, 2018, Reasons for the Declining Real Interest Rates, IW-Report, 47/18

Hendershott, Patric H. / Lizieri, Colin M. / Matysiak, George A., 1999, The Workings of the London Office Market, in: Real Estate Economics, Vol. 27, No. 2, pp. 183–387

Himmelberg, Charles / Mayer, Christopher / Sinai, Todd, 2005, Assessing High House Prices. Bubbles, Fundamentals and Misperceptions, in: Journal of Economic Perspectives, Vol. 19, No. 4, pp. 67–92

Hughes, Will / Ancell, Debbie / Gruneberg, Stephen / Hirst, Luke, 2014, Exposing the Myth of the 1:5:200 Ratio Relating Initial Cost, Maintenance and Staffing Costs of Office Buildings, Reading

Ibanez, Maria R. / Pennington-Cross, Anthony, 2013, Commercial Property Rent Dynamics in U.S. Metropolitan Areas: An Examination of Office, Industrial, Flex and Retail Space, in: The Journal of Real Estate Finance and Economics, Vol. 46, No. 2, pp. 232–259

Poterba, James M., 1984, Tax Subsidies to Owner-Occupied Housing: An Asset-Market Approach, in: The Quarterly Journal of Economics, Vol. 99, No. 4, pp. 729–752

Shiller, Robert, 2016, Irrational Exuberance, 3rd edition, Princeton

Stiglitz, Joseph E., 1990, Symposium on bubbles, in: The Journal of Economic Perspectives, Vol. 4, No. 2, pp. 13–18

Voigtländer, Michael, 2019, Homebuyers, Liquidity Constraints and Private Market Solutions – European Best Practices, in: Intereconomics, Vol. 54, No. 1, pp. 53–58