AEW RESEARCH - SEPTEMBER 2018

EUROPEAN OFFICE REVIEW

LIMITED NEW SUPPLY DRIVES RENTAL GROWTH

AEW

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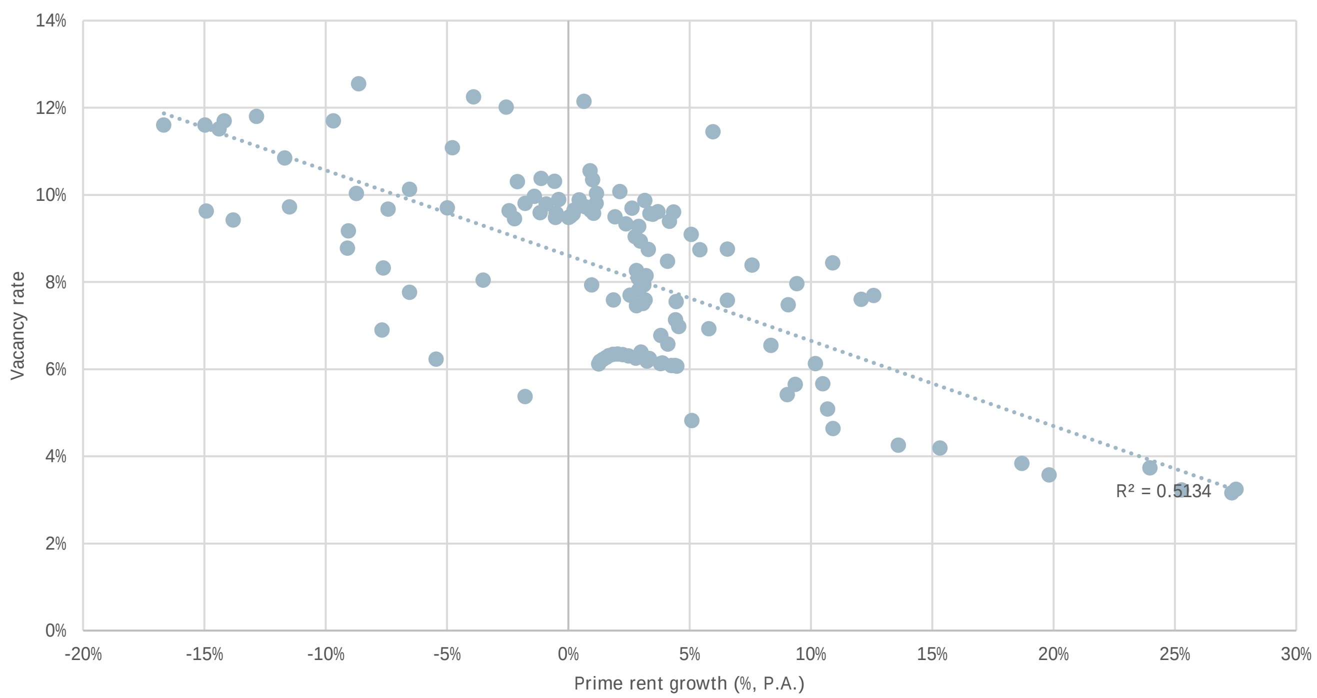
Is new development an imminent risk for European offices?

Over-supply of new office space has posed significant challenges for European investors in the past. New development of office space is typically planned at times of low vacancy rates and abundant availability of debt finance. Due to the time needed to develop new office properties, many of these new developments would be delivered at a time when demand for space has already slowed. This has historically resulted in the '*typical*' market cycle of increased vacancy rates and declines in market rents. In this report, we look at the imminent risk of new development to trigger such a down cycle in rents in the short term. We do this by considering granular historical data on land acquisitions for new development and investment transactions of existing office buildings for purposes of redevelopment and conversions across the eight gateway European office markets. In addition, we compare this bottom-up analysis with the historical trends and forecasts of aggregate stock data.

VACANCY RATE (AS SUPPLY & DEMAND INTERSECTION) DRIVES RENT GROWTH (QTLY 1996- Q1 2023)

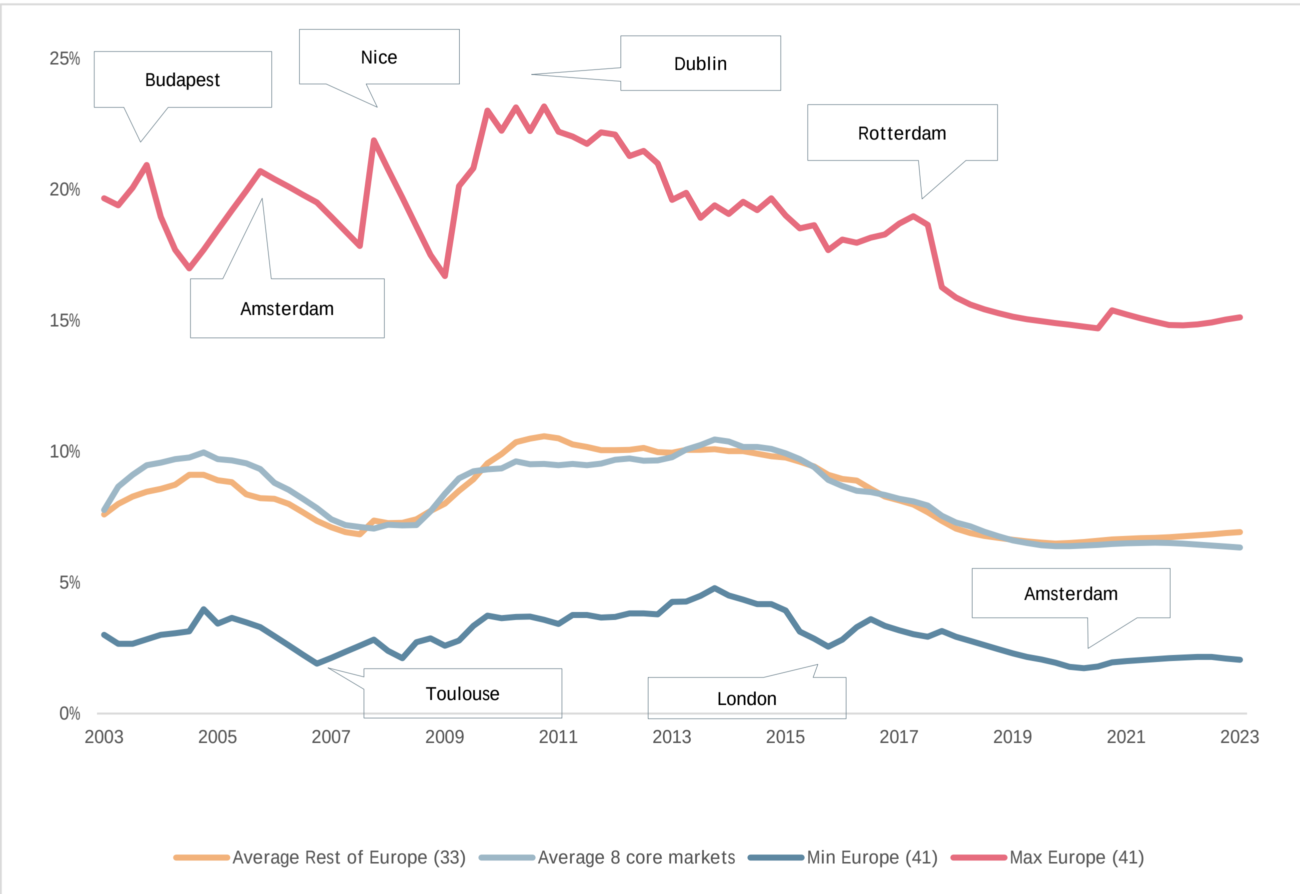


Source: CBRE & AEW

EXECUTIVE SUMMARY:

- In past cycles, increased development activity has been a precursor for increased vacancy and declining rents.
- Current transaction and lending trends show a mixed picture on new development. Development lending as a percentage of lenders' total book has increased to 13% in both the UK and Germany, despite only a 6% share of development-related deals in total European office sector volumes.
- Our new bottom-up estimate of office stock is a leading indicator of new office space to be delivered to the market as measured by the traditional top-down approach.
- Despite a near doubling from the last five years, our forecasts for office stock growth for the next five years remain at only about half the actual levels seen in the five years leading up to the GFC, with non-gateway markets showing stronger development growth.
- Net absorption of office space across all our 41 markets is forecast at about 5mn square meters p.a., about half the level of 2003-07. This is due to a slowdown in employment growth in the next five years, as many markets have reached full capacity.
- With supply and demand projected to be broadly in balance, average vacancy rates across both the eight gateway and 33 non-gateway markets are projected to be at all-time lows at 6.5% and 6.7%, respectively.
- As a result, our forecasts for prime rental growth in the next five years for both the gateway and non-gateway markets are at 2.8% and 2.0% p.a., respectively. In line with historical trends, the average hides more extreme movements for individual markets.

MODERATE DEVELOPMENT LOWERS VACANCY RATES FOR EIGHT GATEWAY OFFICE MARKETS IN NEXT FIVE YEARS

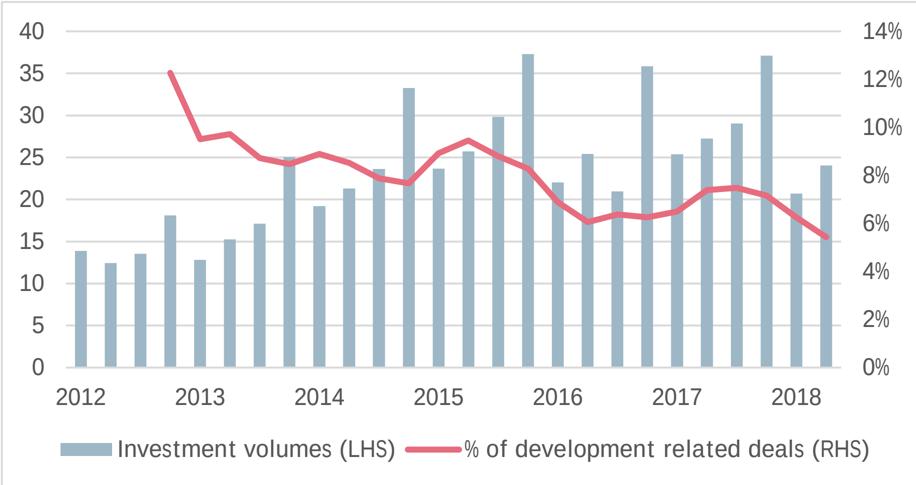


Source: CBRE & AEW

SECTION 1: INVESTMENT & FINANCE DATA ON NEW DEVELOPMENT

EUROPEAN OFFICE DEAL VOLUMES RECOVER, BUT DEVELOPMENT DEALS SLIP TO 6% OF TOTAL (EUR BN)

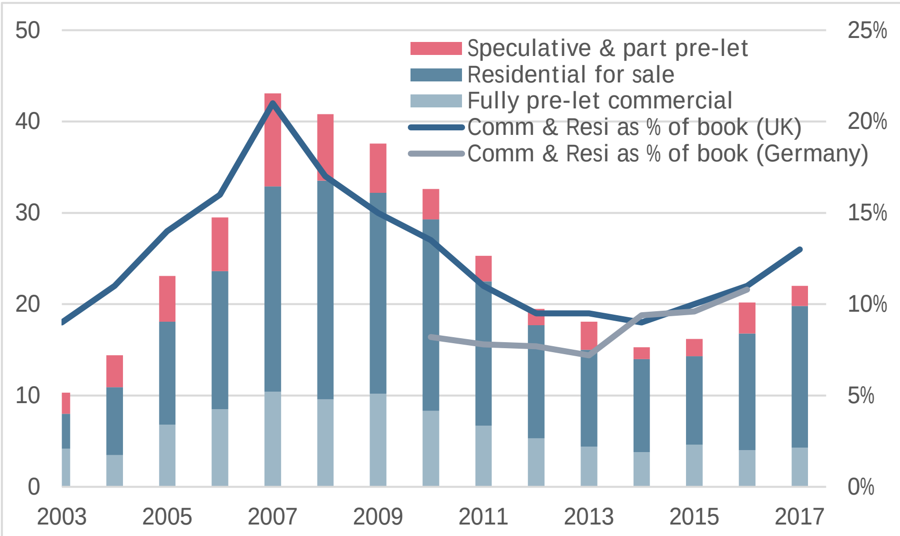
- Office Investment transaction volumes across Europe have recovered in recent years. In fact, 2017 set a post GFC record with a Brexit-impacted, weak sterling triggering strong demand for UK property from overseas investors.
- However, development-related deals (land sales and re-development acquisitions) have not kept up and have slipped to 6% of total in Q2 2018 (measured as a 12-months average). This is only half the level seen in Q1 2013.



Source: RCA & AEW

NEW DEVELOPMENT LENDING AT 13% OF TOTAL BOOK, BUT SPECULATIVE REMAINS SMALL (£ BN)

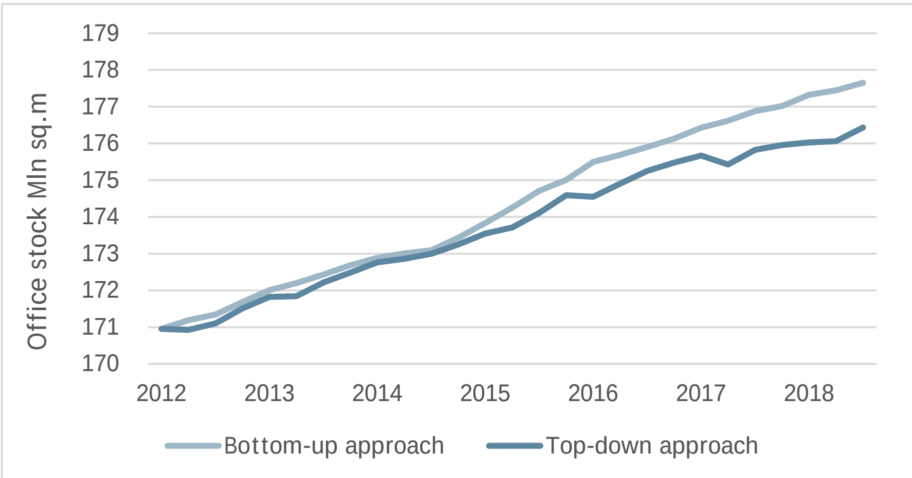
- On the other hand, lending to new development projects has increased in both the UK and Germany to near 13% of total CRE loan books. But, this is still well below the 21% record for the UK in 2007, at the peak of the previous cycle.
- Also, the UK's 2017 share of the highest risk category of development finance (secured by entirely speculative or only partly pre-let developments) is much more modest than in 2007.



Source: Cass Business School, IREBS & AEW

CUMULATIVE STOCK FROM TOP-DOWN SHOWS LOWER ESTIMATE THAN BOTTOM-UP OVER LONG TERM (MN SQM)

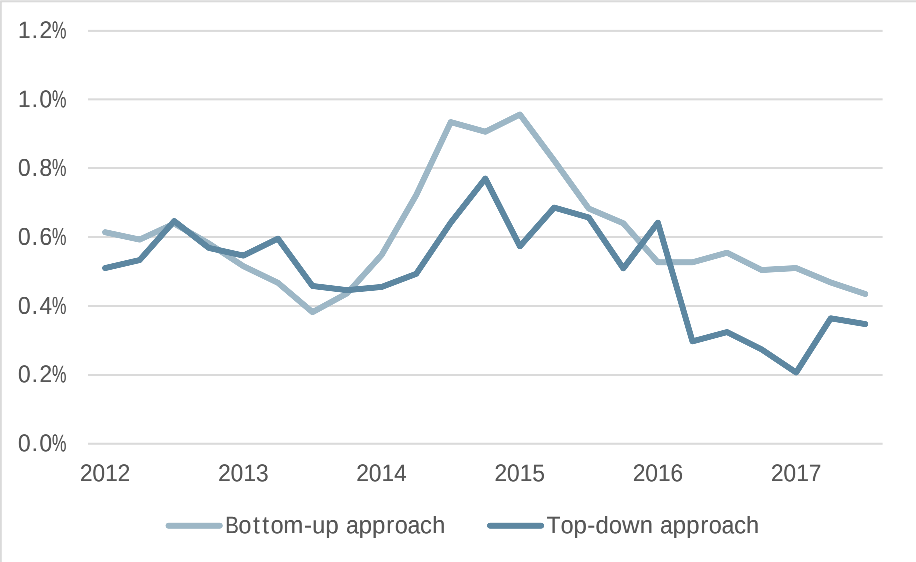
- As an alternative approach to our traditional top-down broker estimate of stock over time, we have come up with a bottom-up approach to use individual land and re-development acquisitions.
- In general, this new approach shows a similar trend in cumulative stock development across the gateway eight office markets.
- The bottom approach is a leading indicator of new office space to be delivered to the market.



Source: RCA, CBRE & AEW

BOTH TOP DOWN AND BOTTOM UP SHOW DECLINE IN OFFICE STOCK GROWTH SINCE 2016 (% P.A. GROWTH)

- A closer look at the annual growth rate of new development shows the differences between the top-down and bottom-up approach more clearly.
- Both series are showing a clear downward trend since the start of 2016.
- This means that the risk for oversupply of new development space in the gateway eight office markets is reducing.



Source: RCA, CBRE & AEW

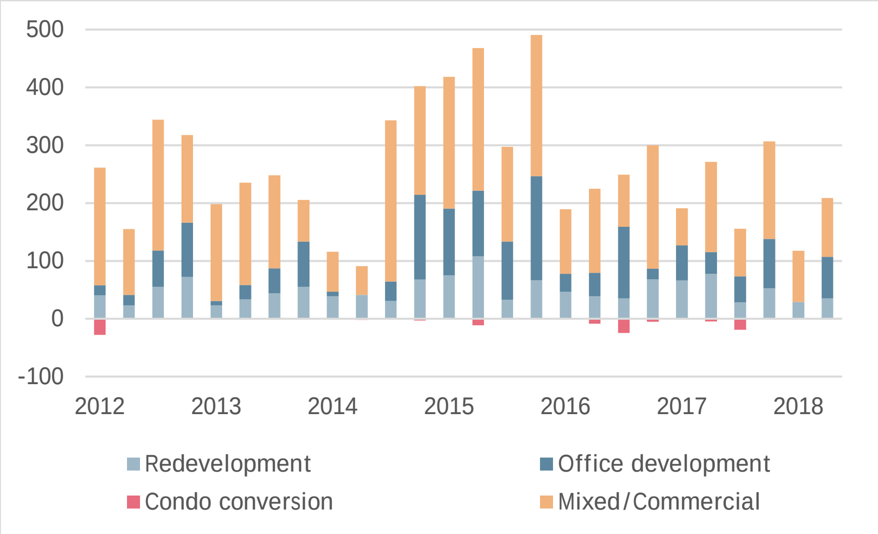
METHODOLOGY & ASSUMPTIONS FOR BOTTOM-UP STOCK ESTIMATES

Our Bottom-up methodology has a number of key assumptions:

- We apply a density for new office development of 2.56 per square meter of office per square meter of land. This is based on the average building density for all office sales for which data on both land and building size were available across Europe (6,073 of sales since 2003).
- A 25% office development component was assumed for all mixed use and other commercial development land acquisitions, while assuming a 100% office use for all land acquisition transactions identified as such.
- We assume a 25% addition of office space for all office re-development acquisitions, while assuming no space expansion for acquisitions focused on renovations of existing office buildings.
- Acquisitions of office buildings for the purpose of conversion into residential is assumed to reduce the office stock by the square meters of the original building.
- Forward sales is disregarded as it is assumed that land acquisitions are the primary source of new supply and represent an earlier stage in the process.
- To deal with possible erroneous outliers, we deleted the largest and smallest 1% of land acquisitions by square meters from the data sample.
- Estimated office developments in excess of 100,000 square meters were deleted from the data to avoid over-estimating the size of new developments, as some land acquisitions had large number of square meters.
- Corporate entity levels transactions allocated to a single site were eliminated as having a high risk of over-estimating the stock associated with a single local market.
- The eight gateway markets we use are: Amsterdam, Berlin, Brussels, Frankfurt, London, Madrid, Milan and Paris.

OFFICE DEVELOPMENT ACROSS GATEWAY EIGHT MARKETS TRENDING DOWN SINCE 2016 ('000S SQM)

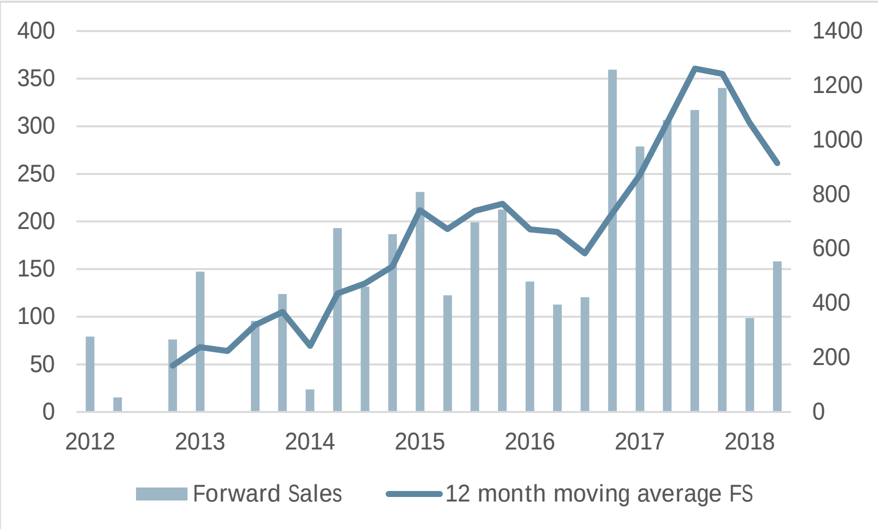
- The single biggest component of new office stock comes from the office component in mixed use and other commercial developments, followed by pure office developments and redevelopments. However, condo conversions play a very small role in our bottom-up estimate.
- More importantly, our bottom-up estimate shows that office development has been showing a downward trend since 2016 across the eight gateway markets.



Source: RCA & AEW

FORWARD SALES HAS BEEN TRENDING UP, BUT DOES NOT INDICATE NEW STOCK ('000S SQM)

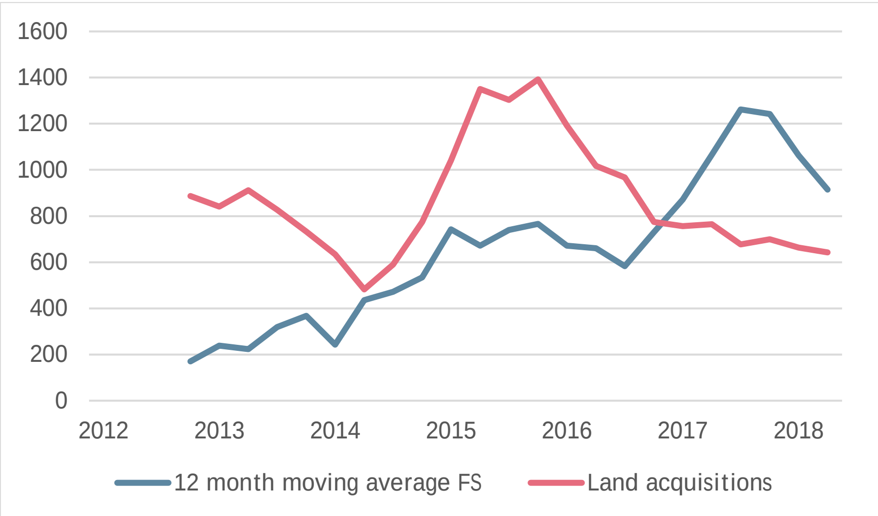
- Forward sales of new development was trending up to over one million square meters over a twelve month moving average until Q4 2017. But, it has dropped off significantly since then.
- In any event, we do not see forward sales as a source of net new addition to stock, as the developer would have already acquired the land at an earlier stage in the process.
- To avoid double counting, we have not included forward sales in our bottom-up stock estimate.



Source: RCA & AEW

FORWARD SALES IS TRAILING INDICATOR OF NEW STOCK ('000S SQM)

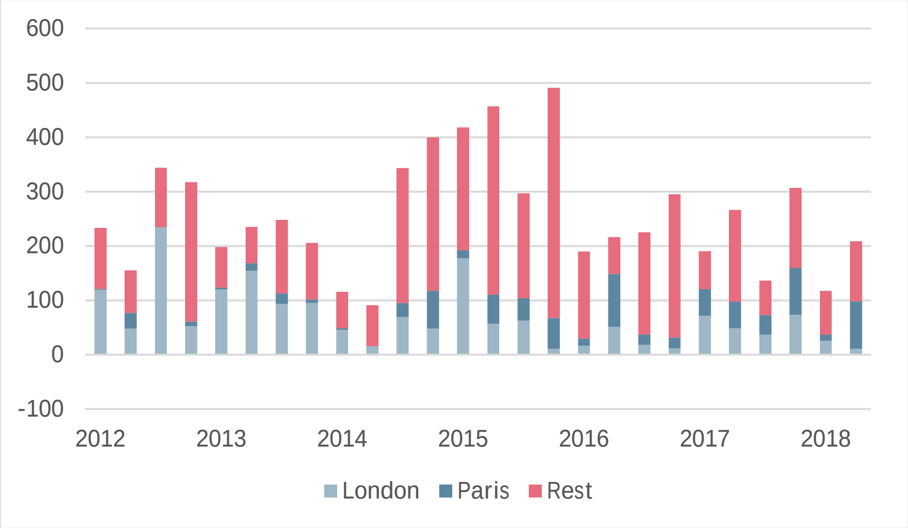
- Our chart shows that land acquisitions from our bottom-up stock estimate are a leading indicator for forward sales.
- The 2014-15 peak in development/land transactions results in more forward sales in 2016-17.
- This makes sense, as developers will look for investor (forward) sales only once the site and planning consents have been obtained.



Source: RCA, CBRE & AEW

EIGHT GATEWAY MARKET DEVELOPMENT LESS DOMINATED BY LONDON & PARIS ('000S SQM)

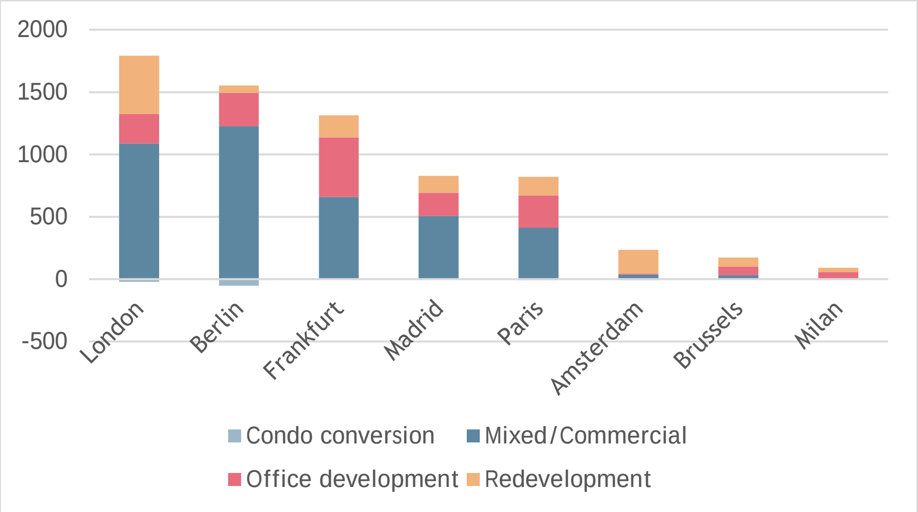
- New office supply in London has subdued since 2016 after robust growth in the 2012-15 period.
- Paris new supply has picked up since 2016, but the other six gateway markets in Europe do show strength across the board – especially in the 2014-16 period.



Source: RCA & AEW

BOTTOM-UP APPROACH SHOWS STRENGTH ON LONDON & GERMAN MARKETS (Q1 2012 – Q2 2018 IN '000S SQM)

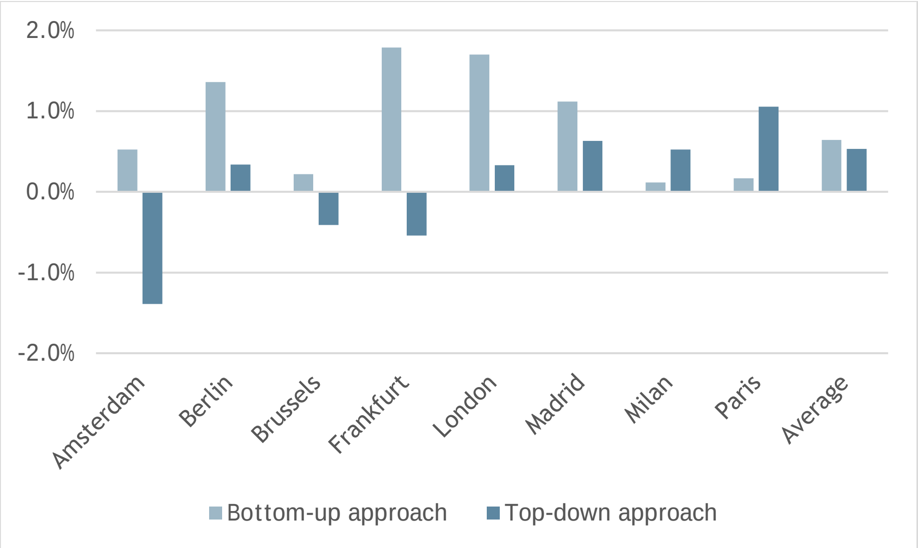
- Since 2012, London has posted the largest amount of new office development, based on our bottom-up analyses.
- Berlin and Frankfurt have shown similarly impressive growth, especially with smaller stock volumes to begin with.
- Paris stands out as having modest new development activity over the period.



Source: RCA & AEW

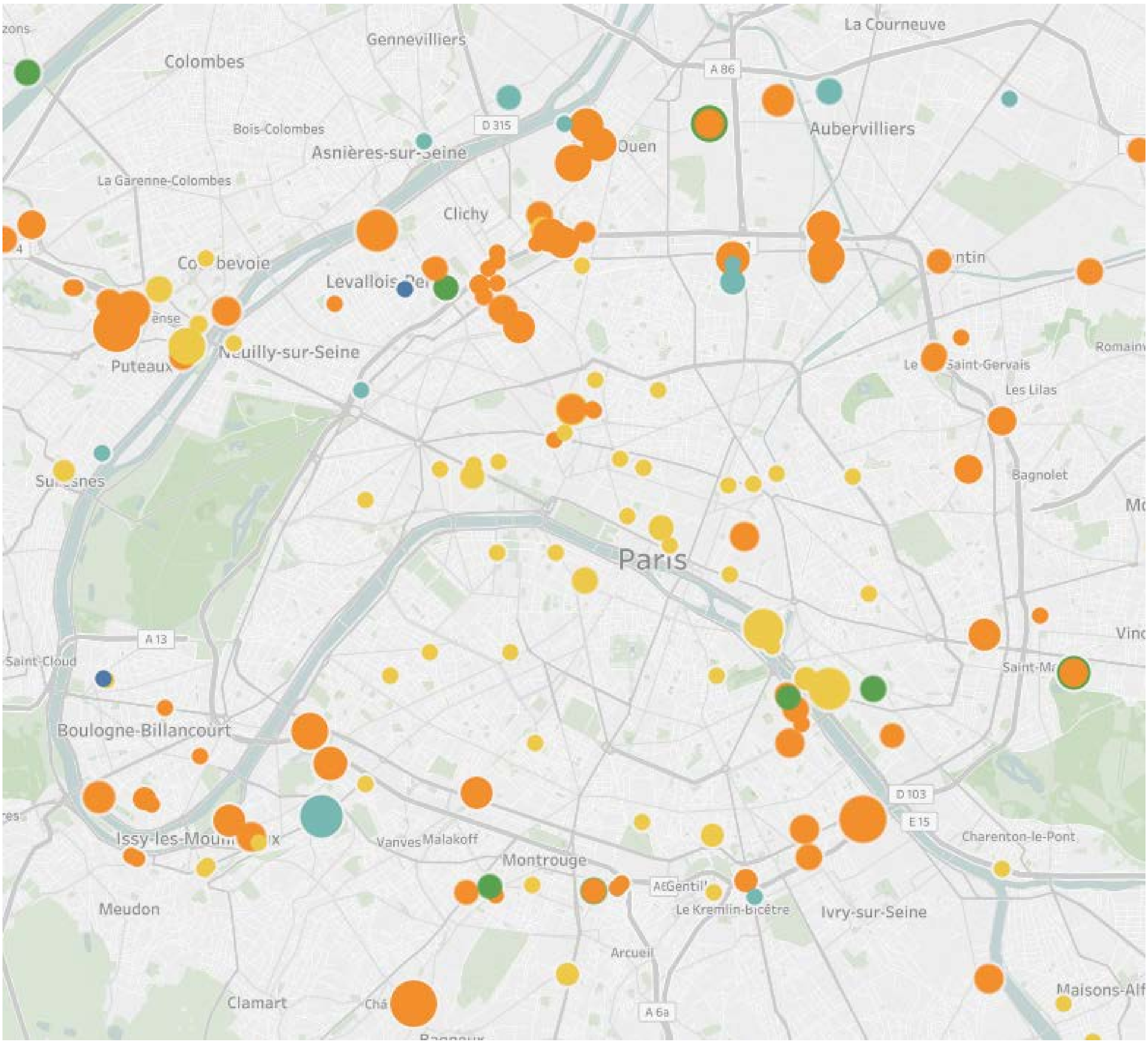
BIG DISCREPANCIES BETWEEN TWO APPROACHES PER MARKET (2012-Q2 2018, % P.A. CHANGE AS % OF STOCK)

- In all gateway markets, except Paris and Milan, our bottom-up estimate shows much stronger stock growth as percentage of existing stock.
- This discrepancy is likely due to an underestimation of conversions of old offices to residential and other uses, which has been a big driver in Amsterdam for example.
- Based on this, we conclude that more work is needed to consolidate these two approaches on an individual market basis.



Sources: RCA, CBRE & AEW

PARIS OFFICE DEVELOPMENT DEALS (2012- Q2 2018)



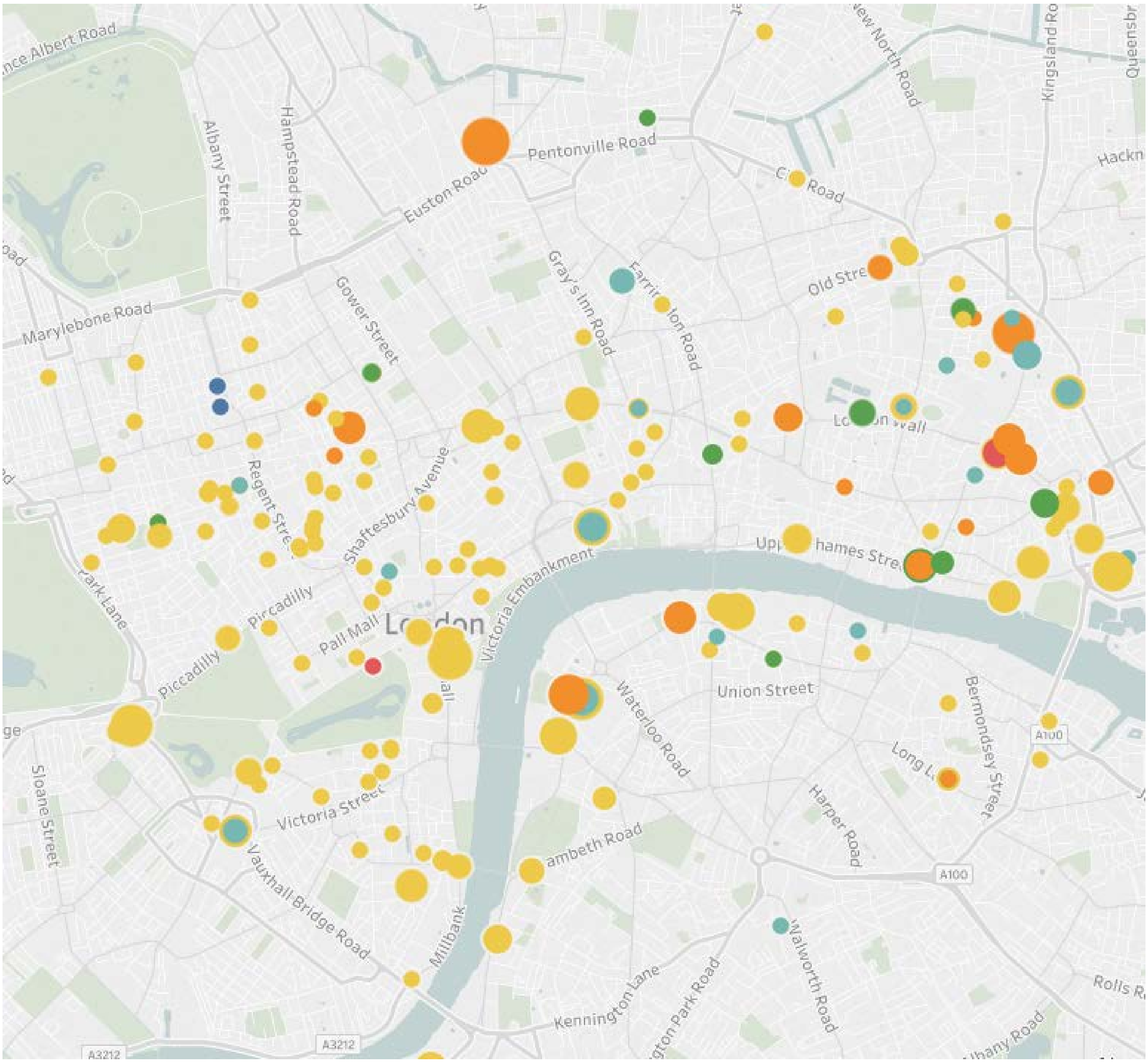
Source: RCA, AEW

Square meters
≤ 10,000
20,000
40,000
60,000
≥ 80,000

Development type:
Condo Conversion
Forward Funding
Land acquisitions Commercial
Land acquisitions Mixed
Land acquisitions Offices
Redevelopment

- In Paris, the addition of new office space was predominantly focused on redevelopment, as only a small number of land acquisition deals came through.
- However, on the fringe of the city (i.e., periphery) many forward sales deals took place (for example La Defense).
- The ownership structure of land by public entities in Paris could be an explanation for the limited number of land sales recorded over the period. In our approach, this lack of land sales underestimates actual development activity.

GREATER LONDON OFFICE DEVELOPMENT DEALS (2012- Q2 2018)



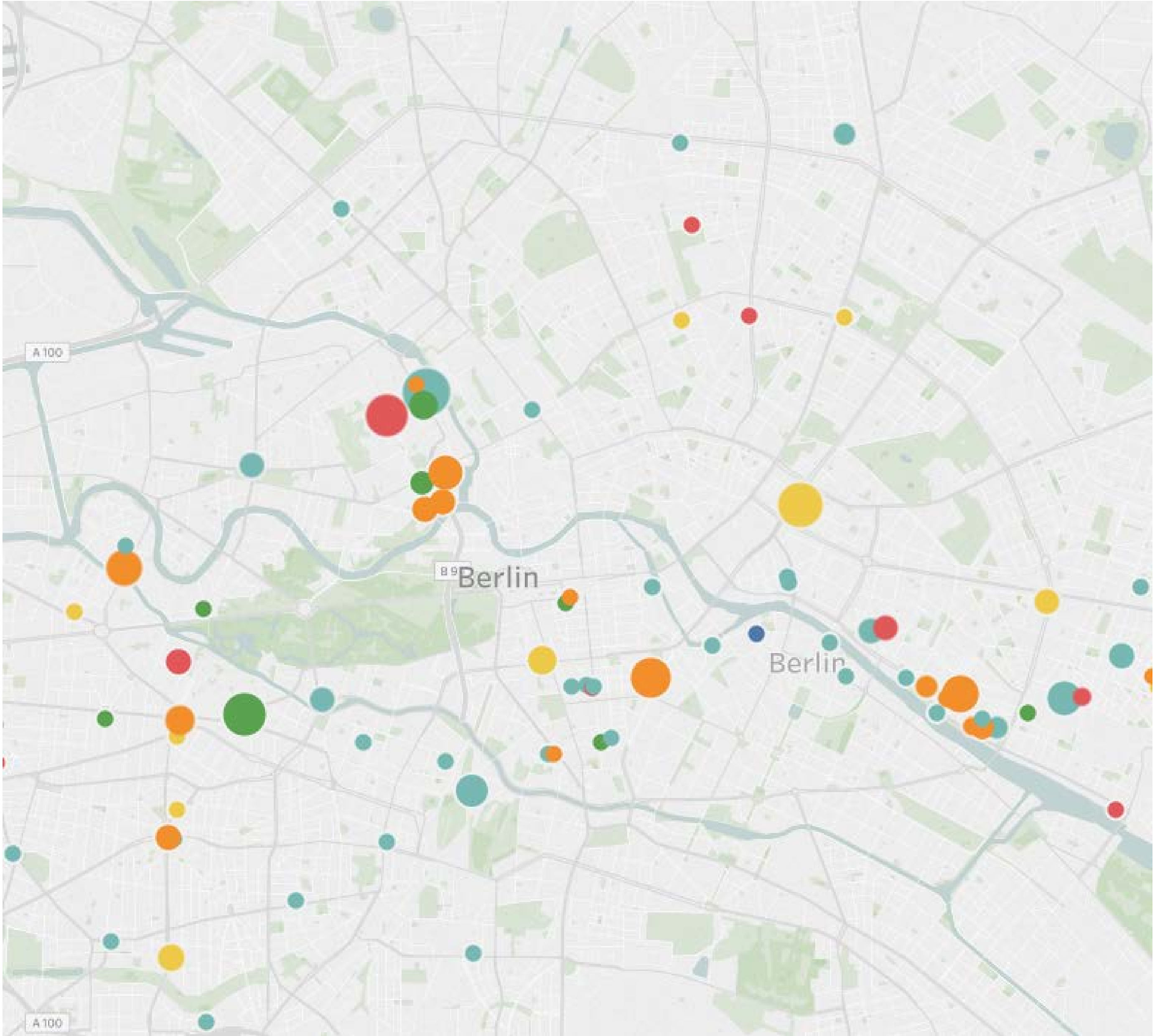
Source: RCA, AEW

Square meters
- ≤ 10,000
- 20,000
- 40,000
- 60,000
- ≥ 80,000

Development type:
- Condo Conversion
- Forward Funding
- Land acquisitions Commercial
- Land acquisitions Mixed
- Land acquisitions Offices
- Redevelopment

- The addition of new office space was highest in London across our eight gateway markets. In London, many redevelopment deals have been made in the city centre together with some larger land acquisition deals in the fringes.
- Only a small number of condo conversion deals have been registered in London over the 2012-18Q2 period.
- In contrast to Paris, the number of forward sales deals in London is lower. However, there are some deals with a considerable lot-size.

BERLIN OFFICE DEVELOPMENT DEALS (2012- Q2 2018)



Source: RCA, AEW

Square meters
- ≤ 10,000
- 20,000
- 40,000
- 60,000
- ≥ 80,000

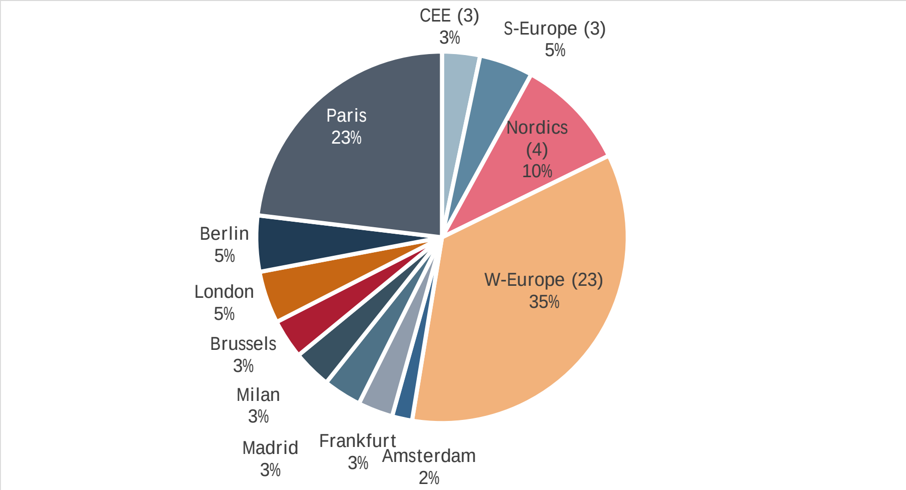
Development type:
- Condo Conversion
- Forward Funding
- Land acquisitions Commercial
- Land acquisitions Mixed
- Land acquisitions Offices
- Redevelopment

- The picture in Berlin is more diverse as many different deal types have been recorded.
- Land acquisition deals for the purpose of mixed use have shown the highest share of new office space over the period.
- In contrast to London and Paris, the trend of city centre redevelopment is less visible as redevelopment deals are dispersed around the city.

SECTION 2: OCCUPIER MARKET TRENDS & OUTLOOK

PARIS IS BY FAR THE LARGEST OFFICE MARKET IN EUROPE (2018 Q2 OFFICE STOCK ACROSS 41 CITIES)

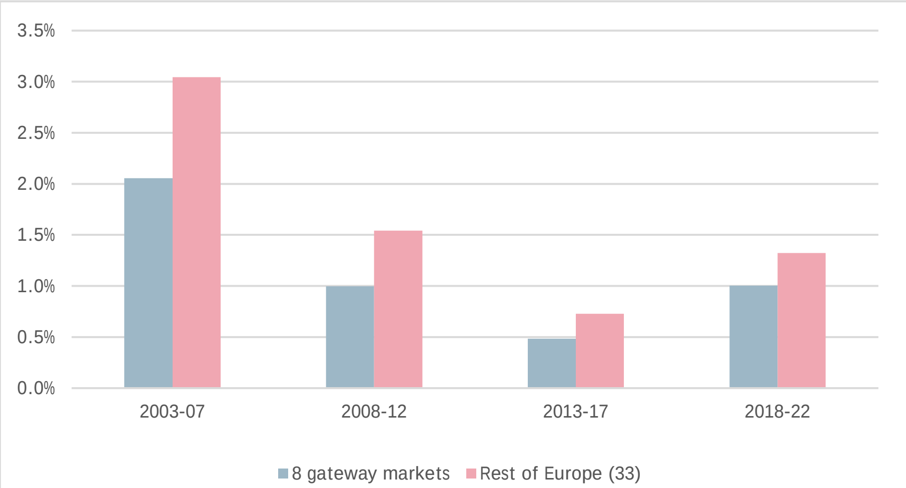
- Trends are reviewed across 41 different European office markets with total stock of 372 million square meters as of Q2 2018.
- We compare and contrast the eight gateway markets, which make up 47% of the total universe (41 markets).
- Paris is by far the largest office market in Europe, partly due to suburban markets not being fully accounted for elsewhere.



Source: CBRE & AEW

STOCK GROWTH FORECASTED AT HALF LEVEL OF YEARS LEADING UPTO GFC (P.A. %)

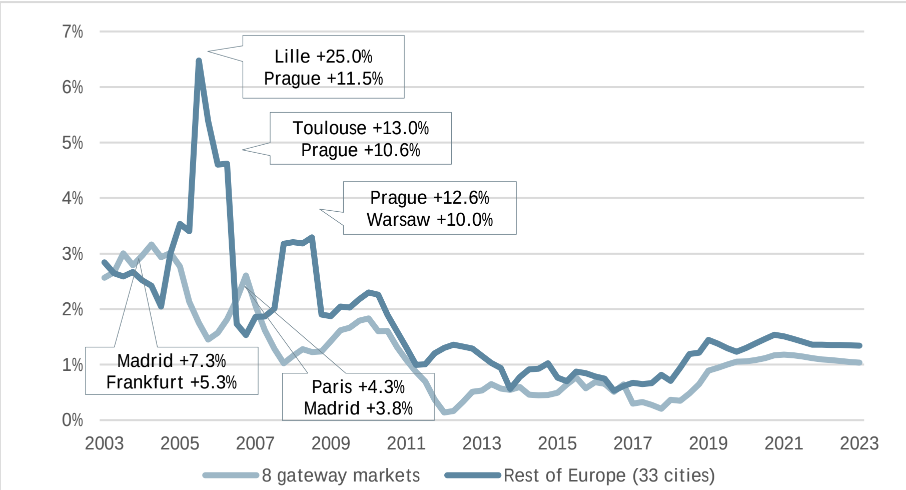
- Forecasts for office stock growth are about half the actual levels seen in the five years leading up to the GFC.
- Non-gateway markets are forecasted to have stronger growth in office stock in the next five years compared to the eight gateway markets.
- This is a continuation of past trends and a reflection of the more mature nature of the gateway markets.



Source: CBRE & AEW

CEE AND FRENCH REGIONAL MARKETS HAVE DRIVEN STRONG NON-GATEWAY STOCK GROWTH (P.A. %)

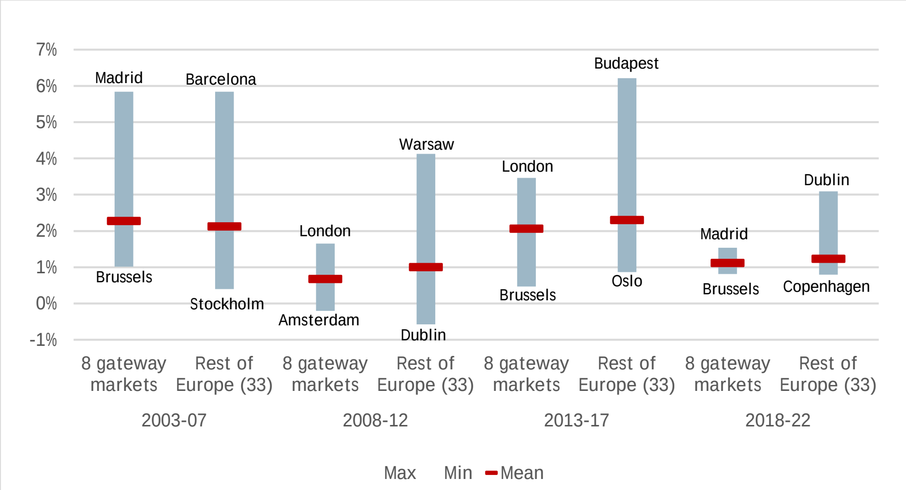
- Unsurprisingly, the emerging CEE markets (like Prague and Warsaw) have been key drivers of historical stock growth.
- However, regional French markets also saw strong stock growth leading up to the GFC – a possible trend to watch closely going forward.



Source: CBRE & AEW

8 GATEWAY AND 33 NON-GATEWAY MARKETS SHOW SIMILAR EMPLOYMENT GROWTH SINCE GFC (P.A. %)

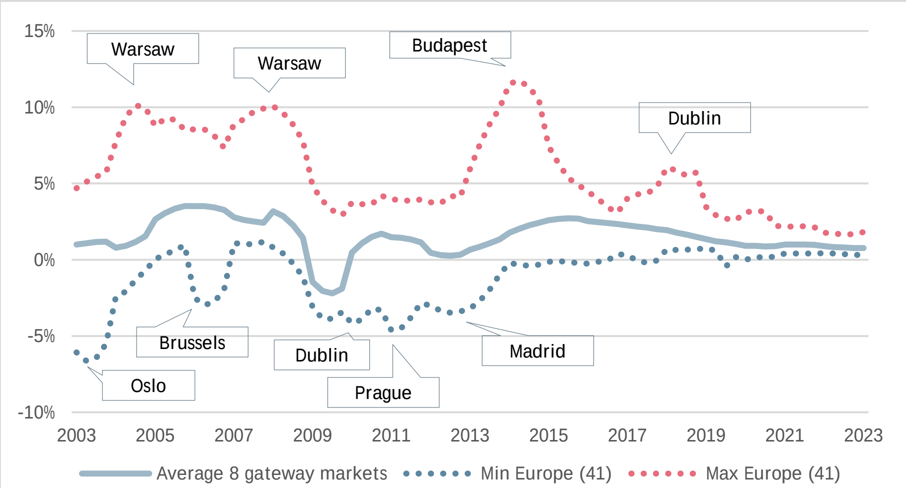
- Local employment growth is the key driver for the demand of office space.
- Average employment growth for the eight gateway markets and the 33 non-gateway markets is forecast to be similar, as it has been in the past.
- However, individual markets do stand out in various periods. Dublin and Madrid are forecast to show strong employment growth in the next five years.



Source: CBRE & AEW

DUBLIN AND CEE MARKETS STAND OUT WITH STRONG RECENT AND PAST EMPLOYMENT (P.A. %)

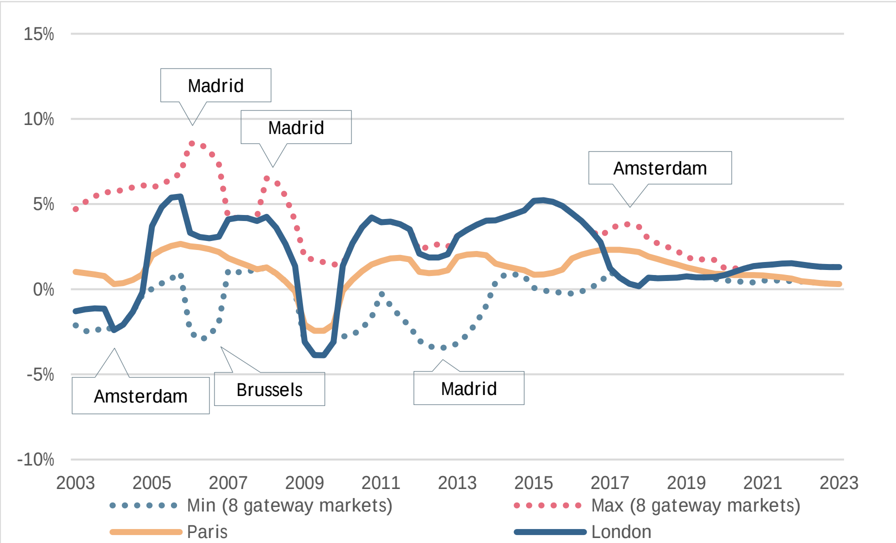
- A closer look at employment trends across non-gateway markets reveals the historical strength in CEE, including Warsaw and Budapest.
- Dublin's current employment growth is strong, but was near the bottom in 2010, implying volatility in employment growth.
- Despite the tight forecast range, it seems unlikely that large variances in employment growth across cities will be avoided in the future.



Source: CBRE & AEW

CYCLICAL EMPLOYMENT GROWTH IN MADRID AND AMSTERDAM (P.A. %)

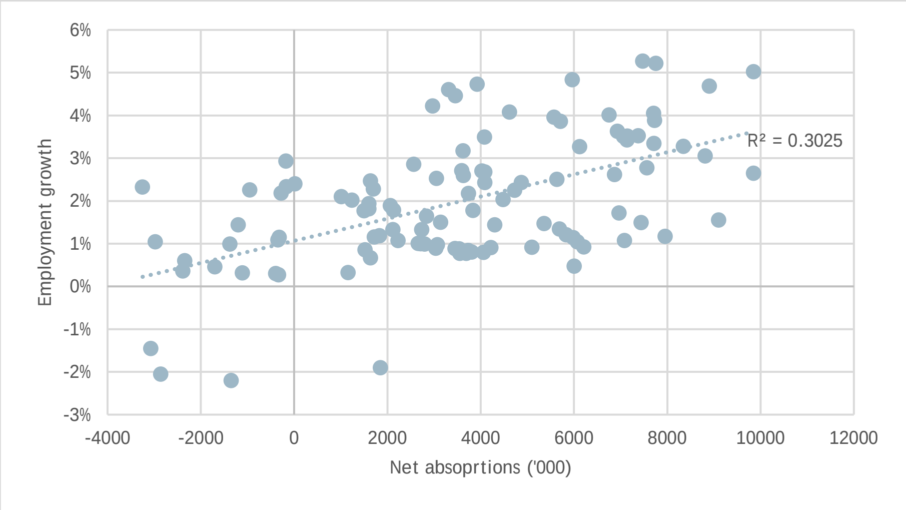
- Employment trends across the eight gateway markets reveal the historical strength in Madrid and London.
- Amsterdam looks strong now, but was near the bottom in 2004, implying volatility in employment growth.
- As before, we think it is unlikely that large variances in employment growth across cities will be avoided in the future.



Source: CBRE & AEW

EMPLOYMENT GROWTH TRIGGERS NET ABSORPTION ACROSS GATEWAY MARKETS (QTLY 1996- Q1 2023)

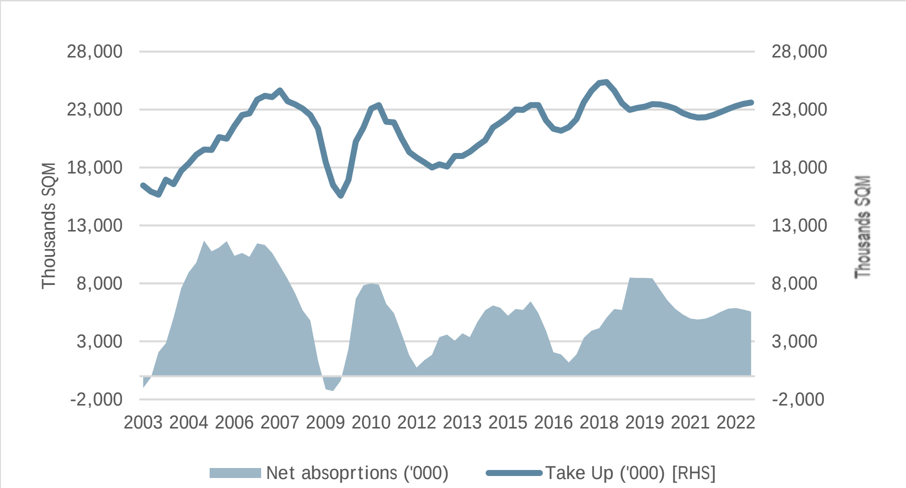
- In general, higher employment growth triggers higher net absorption, when we consider the historical evidence for the eight gateway markets' historical quarterly average.
- However, we note that there were still quarters with negative net absorption, even when there was positive employment growth (implying a lag-lead relationship).
- Specific corporate moves drive net absorption, but employment growth is confirmed as key driver.



Source: CBRE & AEW

NET ABSORPTION ACROSS 41 MARKETS FORECAST AT HALF OF 2003-07 LEVELS

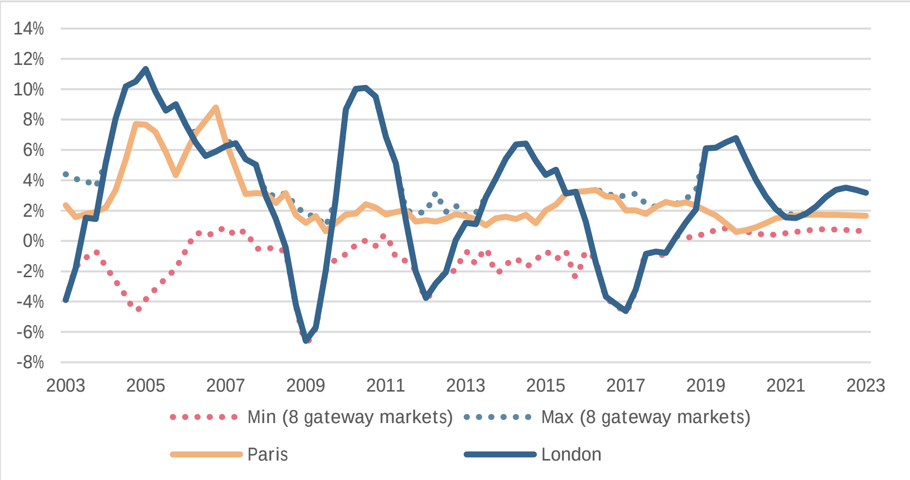
- Gross take-up, which includes lease renewals, is correlated to net take up (absorption). But, it is not a true reflection of demand for office space.
- Net absorptions across the 41 markets are forecast for the next five year at about half the levels compared to those seen in the five year period leading up to the GFC.



Source: CBRE & AEW

LONDON SHOWING MOST VOLATILE NET ABSORPTION TREND ACROSS EIGHT GATEWAY MARKETS (% OF STOCK P.A.)

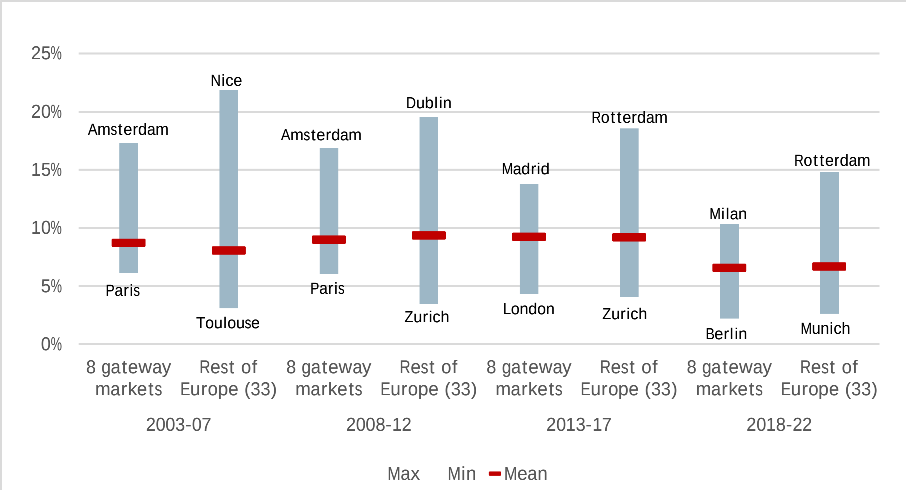
- Across the eight gateway markets, London and Paris have consistently shown the highest growth in net absorption over the last 15 years. This is unsurprising given their size.
- After a post-referendum decline of net absorption in London, net absorption is forecast to recover strongly. At the same time, the Paris market seems bound for some temporary weakness in net absorption.



Source: CBRE & AEW

GERMAN MARKETS VACANCY RATES FORECAST TO BE LOWER THAN BEFORE GFC

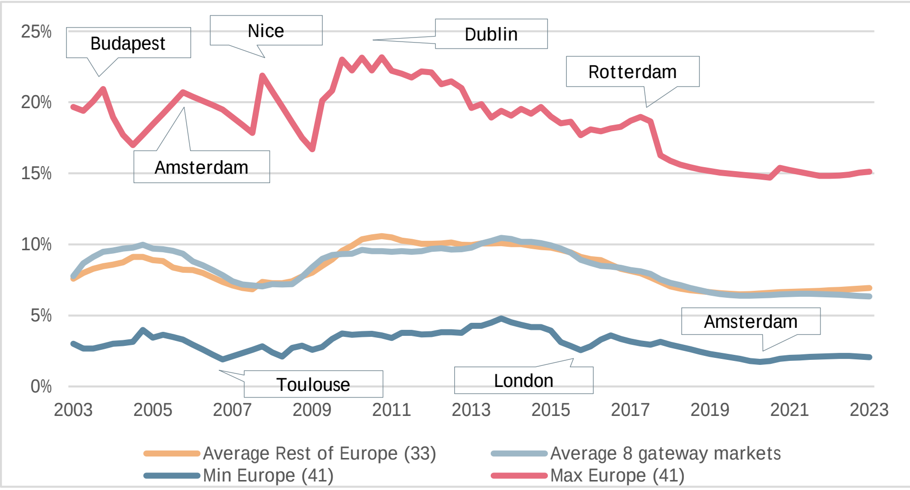
- Vacancy rates are a key indicator and resultant of the intersection between supply and demand.
- Average vacancy rates for the eight gateway markets and the 33 non-gateway markets are forecast to be similar, as they have been in the past.
- Again, individual markets do stand out in various periods. Berlin and Munich are projected to have very low vacancy rates in the next five years.



Source: CBRE & AEW

AVERAGE MARKET VACANCY RATES TRENDING DOWN, BOTH IN GATEWAY AND NON-GATEWAY

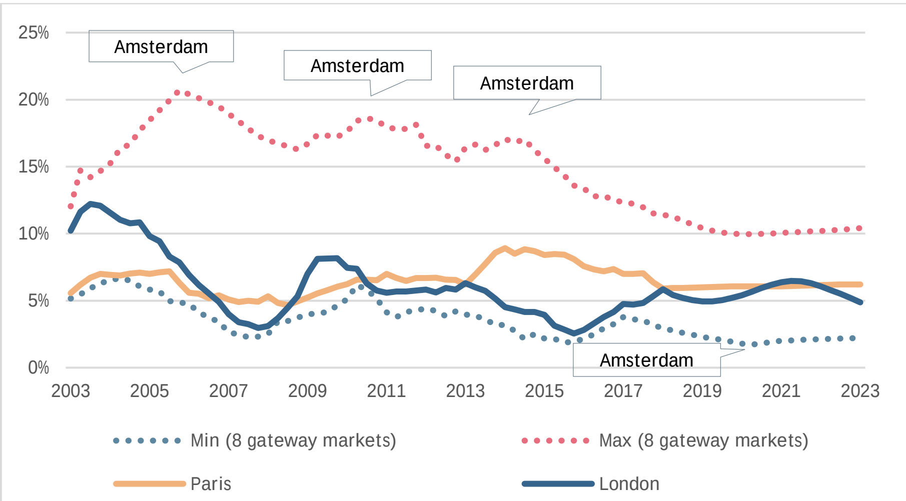
- Average vacancy rates across both the eight gateway and 33 non-gateway markets are projected to be at all-time lows at 6.5% and 6.7%, respectively.
- There are a number of exceptions, as some markets, like Rotterdam, are delayed in their recovery and have vacancy rates above average.
- Amsterdam stands out with the lowest current vacancy rate, while it had a vacancy rate of above 15 percent around the GFC.



Source: CBRE & AEW

AVERAGE EIGHT GATEWAY MARKET VACANCY RATES LOWER, WITH AMSTERDAM SHOWING BIGGEST MOVE

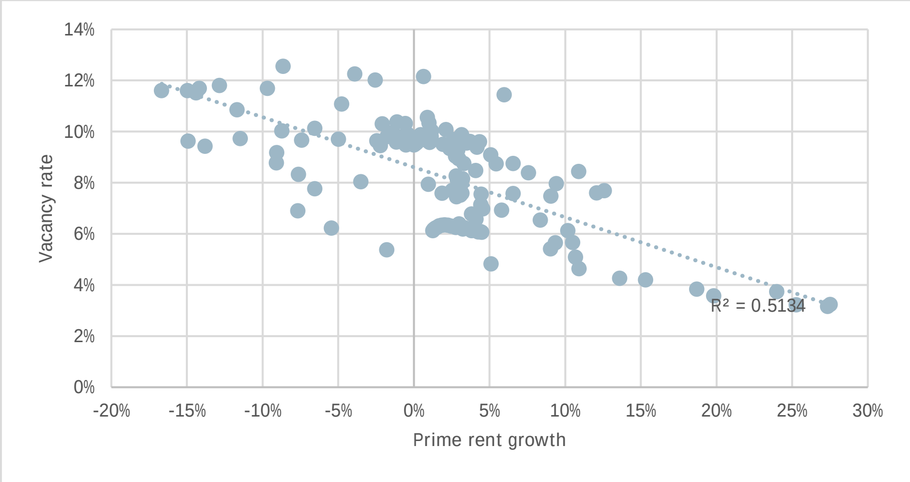
- Paris and London have shown relatively stable trends in vacancy, relative to other gateway markets.
- Forecasts for vacancy rates in both leading markets are between 5-6%, which is a level that can be expected to trigger more new office space developments in the future.
- Despite its recent record low vacancy, Amsterdam showed record high vacancies among gateway markets until 2014.



Source: CBRE & AEW

LOWER VACANCY RATES DRIVE RENTAL GROWTH FOR GATEWAY MARKET AVERAGE (QTLY 1996- Q1 2023)

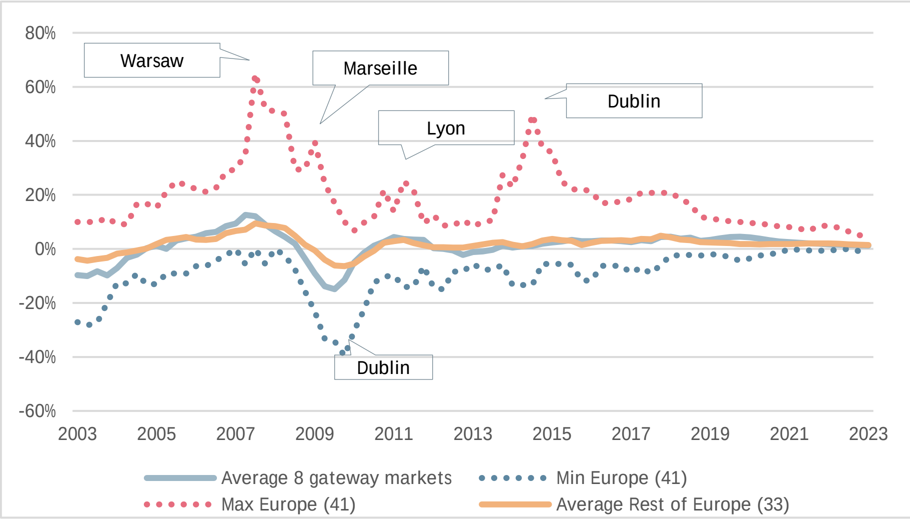
- Lower vacancy rates drive higher prime rental growth, when we consider the historical evidence for the eight gateway markets' historical quarterly average.
- However, we note that there were still quarters with negative prime rent growth, even when there was low vacancy.
- Negotiation between tenants and landlords drive prime rents, but overall vacancy is the key driver to rental growth.



Source: CBRE & AEW

AVERAGE PRIME RENTAL GROWTH ACROSS GATEWAY MARKETS FORECAST AT NEAR 3.0% P.A.

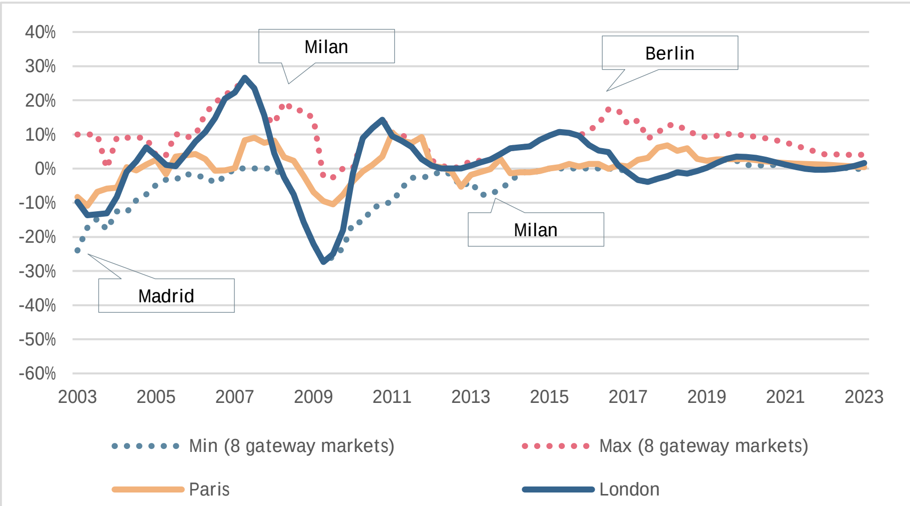
- Forecasts for average prime rental growth in the next five years are modest for both the gateway eight and 33 non-gateway markets at 2.8% and 2.0 % per annum, respectively.
- This is not really a departure from the historical trend, but the average hides more deliberate movements for individual markets.
- In that respect, Dublin stands out for showing largest negative and positive movements over the last 10 years.



Source: CBRE & AEW

LONDON AND PARIS PRIME OFFICE RENT GROWTH FORECAST NEAR LOWEST ACROSS GATEWAYS

- London prime office rents are forecast at 1.1% for the next five years on average, which is near the low end for the eight gateway markets.
- Paris is showing better forecast prime rental growth at 2.0% for the same period.
- Berlin on the other hand, is showing strongest prime office rent across the gateway markets at 7.7% per annum.



Source: CBRE & AEW

ABOUT AEW

AEW is one of the world's largest real estate asset managers, with €62.1bn of assets under management as at 30 June 2018. AEW has over 680 employees, with its main offices located in Boston, London, Paris and Hong Kong and offers a wide range of real estate investment products including comingled funds, separate accounts and securities mandates across the full spectrum of investment strategies. AEW represents the real estate asset management platform of Natixis Global Asset Management, one of the largest asset managers in the world.

As at 30 June 2018, AEW managed €29.8bn of real estate assets in Europe on behalf of a number of funds and separate accounts. AEW has close to 400 employees based in 9 offices across Europe and has a long track record of successfully implementing core, value-add and opportunistic investment strategies on behalf of its clients. In the last six years, AEW has invested and divested a total volume of over €19.4bn of real estate across European markets.

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