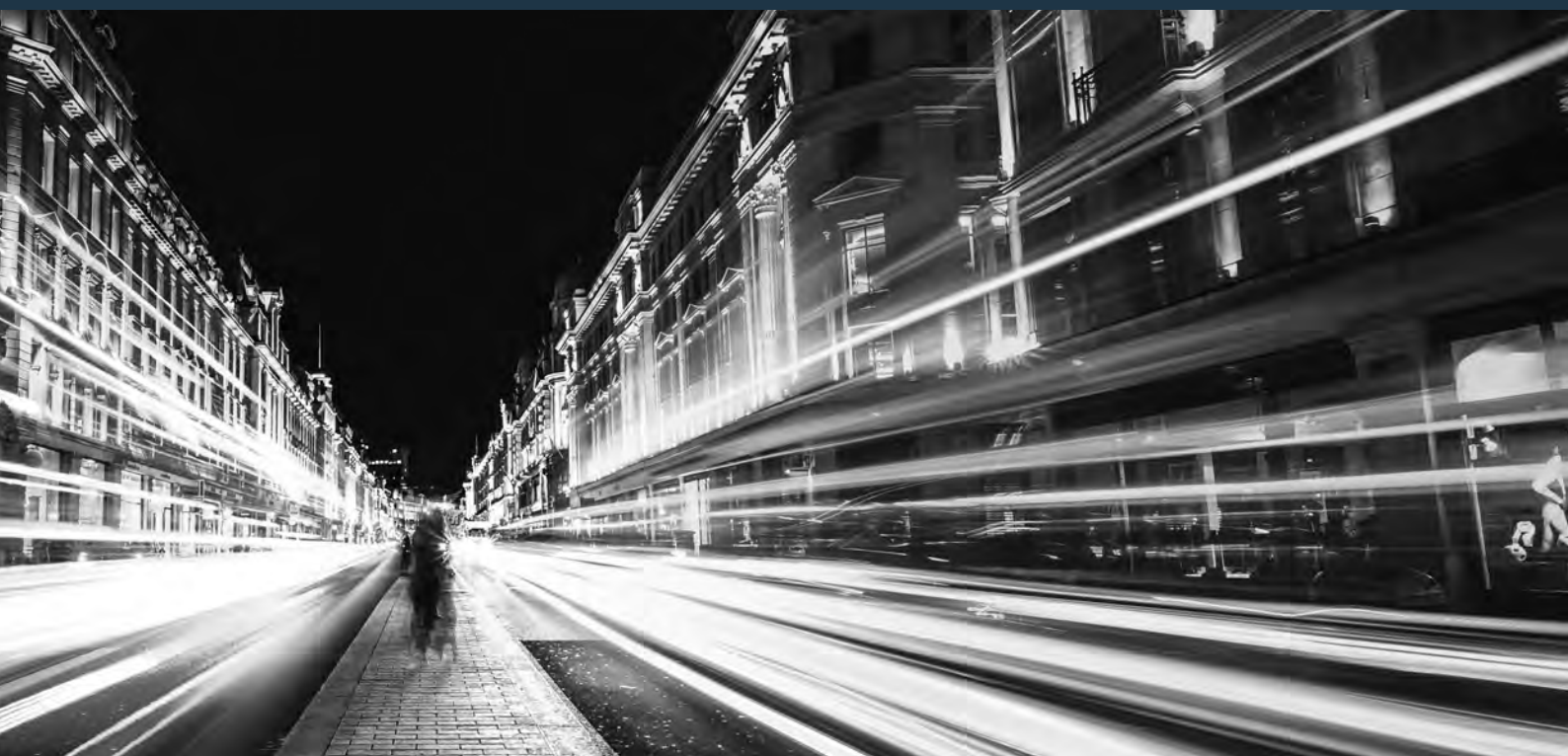


WHITEPAPER

Talent, clusters and scale

Identifying European office markets in the era
of knowledge capitalism

June 2019



For today's investor





Chris Urwin

Director of Research, Real Assets

Main responsibilities

Chris leads the research team, overseeing the production of property forecasts and preparation of key strategy and research reports. His team plays a key role in developing investment views of markets and sectors and identifying strategic opportunities for funds across the globe.

Experience and qualifications

Prior to joining Aviva Investors, Chris worked for CBRE where he was a senior analyst responsible for analysis of market trends in commercial property markets. Before that, he worked as an economist for the Institute of Public Policy Research and also HM Customs and Excise. Chris holds a BA (Econ) in Economics and an MA in Economic History from the University of Manchester. He is also a member of the SPR and committee member of ULL.



Vivienne Bolla

Analyst, Real Assets Research & Strategy

Main responsibilities

Vivienne is responsible for developing market views, forecasts and strategic advice with a primary focus on Europe.

Experience and qualifications

Prior to joining Aviva Investors, Vivienne was a Senior Analyst in the International Market Research team at Knight Frank in London. Her experience also spans to include the real estate industry in Australia. She holds a BA in Business Management and a BA in Science from the University of Queensland.

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Key points

- **The role of a city today is to facilitate knowledge exchange and information sharing to nurture idea creation.**
- **The cities that do this best are those that are able to attract talent, cultivate clusters of high value add economic activities and – crucially – have scale.**
- **By bringing together more than 30 different metrics, we have developed a Future City score for each major European city.**
- **We have identified the twelve cities best placed to drive growth in the era of knowledge capitalism. These are the European office markets we are strategically committed to.**



The changing role of cities

The role of a city is vastly different to fifty years ago. Many of Europe's great cities grew up in an era of industrialisation when competition was heavily driven by input costs. Locations benefited from qualities such as a natural harbour, access to a navigable river, proximity to sources of fuel (usually coal) and access to labour, suppliers and consumers. With such qualities, cities enjoyed a durable comparative advantage.

But as global markets opened up, the pace of transportation accelerated, and the cost of communication fell, such qualities no longer provided cities with a competitive edge. Global sourcing rendered the old notion of comparative advantage less relevant.

Yet location matters no less than it did in the past. As leading urban economist Ed Glaeser puts it, "a central paradox of our time is that cities, industrial agglomerations remained remarkably vital, despite easier movement of goods and knowledge across space." Today, a city's success is driven by its ability to facilitate knowledge exchange and information sharing to nurture idea creation. Competitive advantage no longer rests on access to inputs but on making more productive use of inputs and this requires continual innovation.

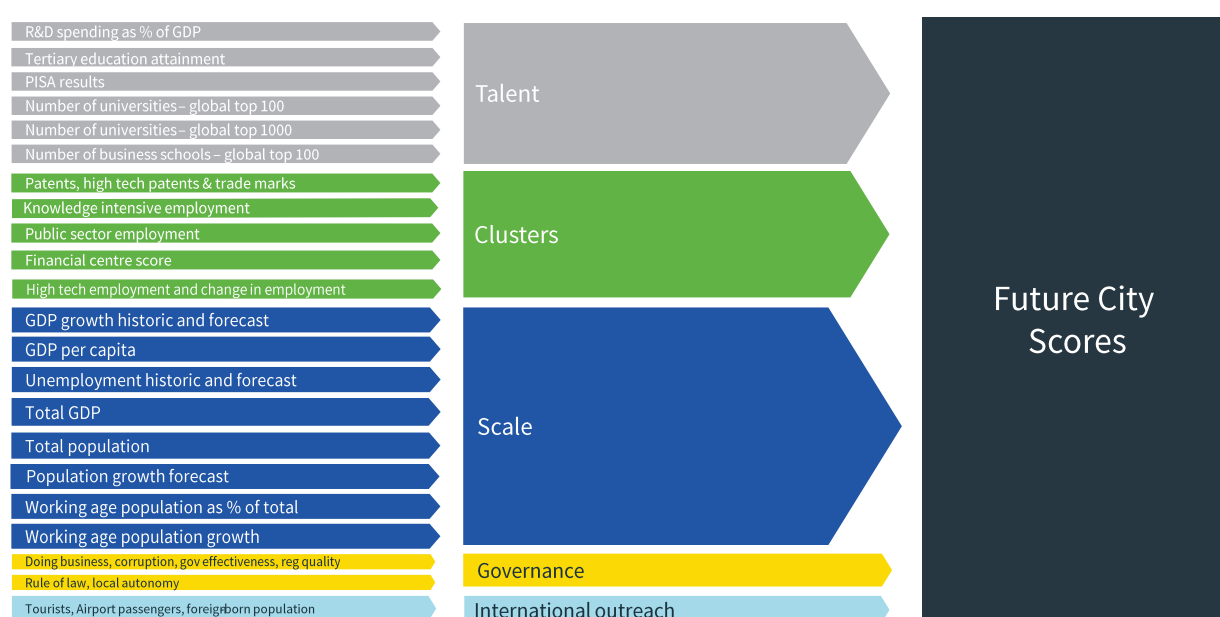
So the characteristics that make a city successful have changed entirely. In an era of knowledge capitalism, cities need:

1. **Talent** – cities need deep pools of highly skilled labour to thrive. As the urbanist Richard Florida says, "access to talented and creative people is to modern business what access to coal and iron ore was to steel-making." Large agglomerations of highly-skilled people are therefore critical to a city's prospects.
2. **Clusters** – established clusters of high value-add economic activities. Being part of a cluster provides companies with easier access to information and technology, while providing efficiencies in sourcing inputs such as labour. This enables a city's firms to be more productive.
3. **Scale** – agglomeration effects are the benefits that arise when firms and people locate near one another. Co-location makes the exchange of goods and ideas easier and cheaper. The larger the agglomeration, the greater the benefits. Indeed, these benefits tend to increase at an exponential rate as cities increase in size. So larger cities are more productive simply because they are larger.

Such characteristics are the most important drivers of cities' success. Of course, in an era of globalisation, cities that have an ability to attract global talent and capital will also benefit from an international profile and global connectivity. An appropriate level of autonomy combined with visionary leadership can also improve a city's prospects.

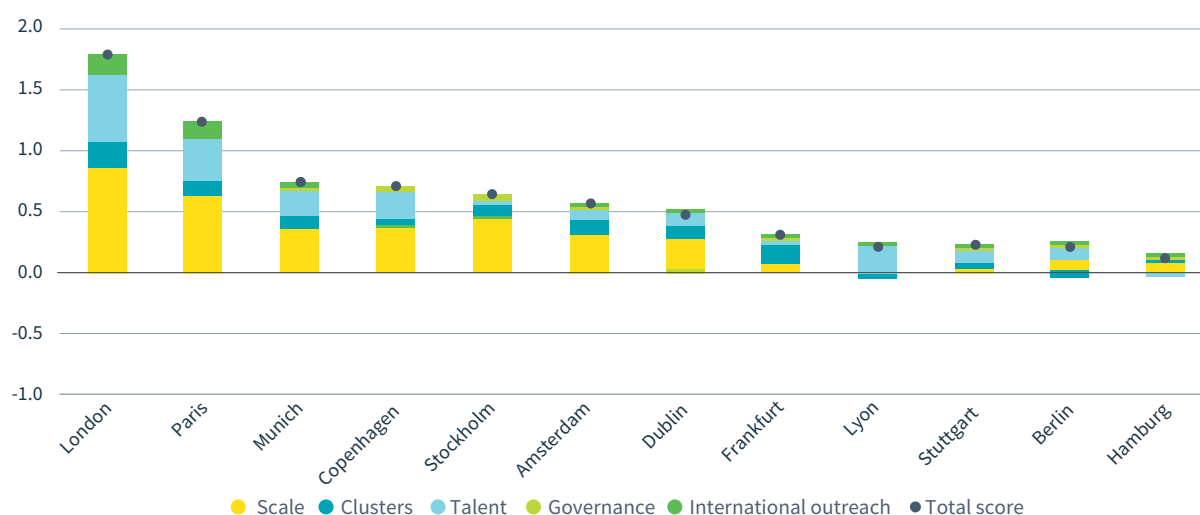
Bringing together around 30 different metrics, we have developed a tool to assess the credentials of European cities in an era of knowledge capitalism and we have assigned a Future City score to each major city in Europe. Those that score well on this basis should see robust demand for office space over the long term. Smaller cities with weak talent credentials are unlikely to fare well in an era of growing geographical inequality. Our tool enables us to discriminate against such cities and in favour of those likely to be most economically successful. And where robust labour markets combine with favourable real estate fundamentals – particularly low supply side risks – long-term real rental growth can be expected.

Figure 1. Assessing European city prospects



Source: Avivia Investors

Figure 2. Strategic target office markets



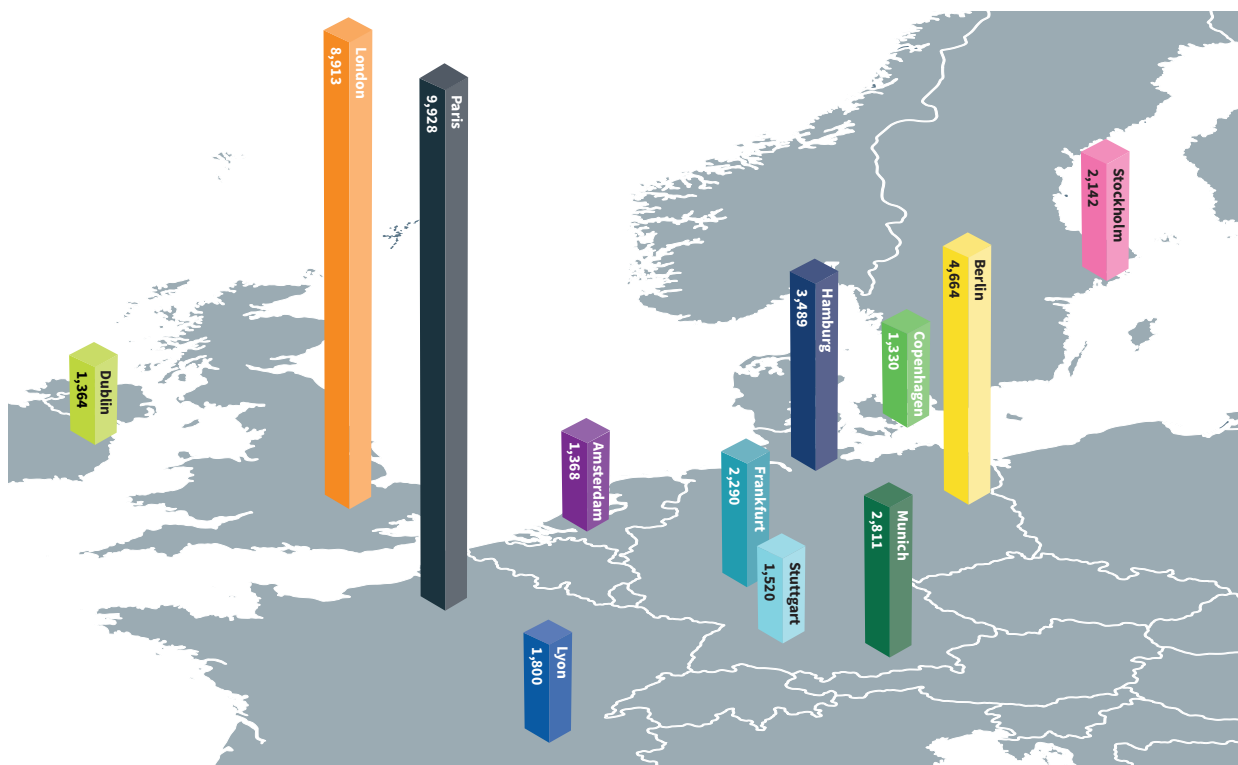
Source: Avivia Investors

Europe's megacities

Europe's two megacities, Paris and London, have a Future City score significantly higher than all the other cities. Both are cities that act as magnets for global talent and their scale gives them a major competitive advantage. They have the right

credentials to drive growth in an era of knowledge capitalism and both have office markets characterised by significant constraints to new development, signalling scope for sustained rental growth over the long run.

Figure 3. Population by metropolitan area (2018, thousands)



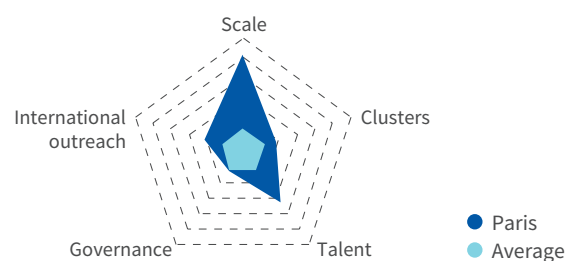
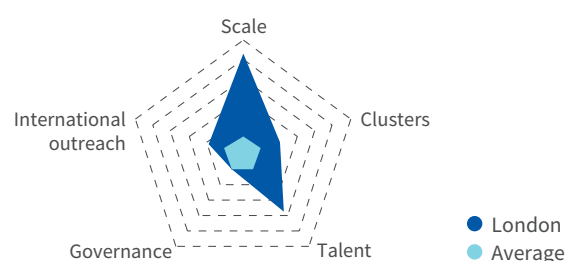
Source: Oxford Economics, April 2019

London

London is a global leader in talent with a relatively youthful population, favourable working age and population growth prospects, and very high number of graduate jobs. Sixty per cent of workers in London are tertiary educated and high skilled jobs total 1.7 million, 50 per cent higher than New York City. Many of these workers are employed in finance – London has the largest cluster of financial and professional services of any global city. And London has a number of highly regarded academic institutions and business schools. There are over 400,000 students in the city, so the future supply of talent is assured.

Paris

Paris is the largest city in Europe and hosts 29 of the 31 French companies listed in the Fortune Global 500. The workforce is highly educated and there is a significant concentration of knowledge intensive business services in the city. Paris is ranked fifth in the QS Best Student Cities Ranking and is home to 18 universities, some of the most famous learning institutions in the world, including the École Polytechnique and Paris Sciences et Lettres Research University.

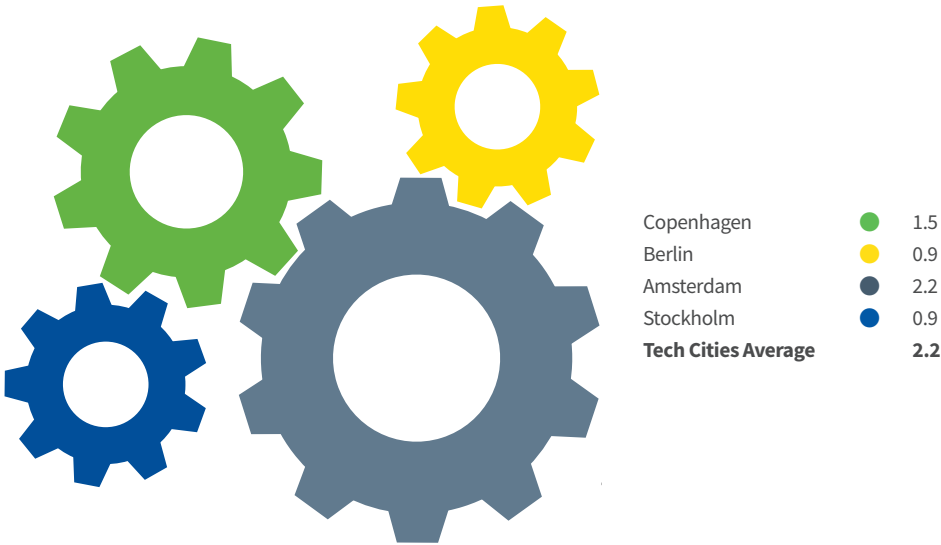


Europe’s tech cities

Among the office markets we are strategically committed to are four tech cities. These are cities with world-renowned clusters in digital and biotech fields. Each enjoy a positive dynamic. The liveability of the city attracts highly skilled

talent, pools of highly skilled labour attract businesses and foster firm creation and this, in turn, encourages more qualified people to choose to live in the city.

Figure4. Start-ups per 1,000 people



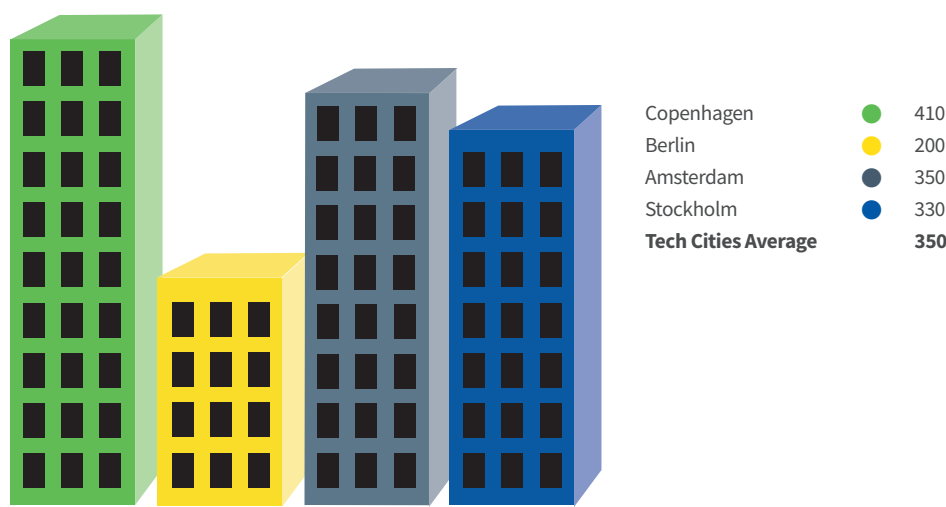
Source: Savills Tech Cities 2019

Figure5. Venture Capital Investment (2016-2018 annual average, USD bn)



Source: Savills Tech Cities 2019

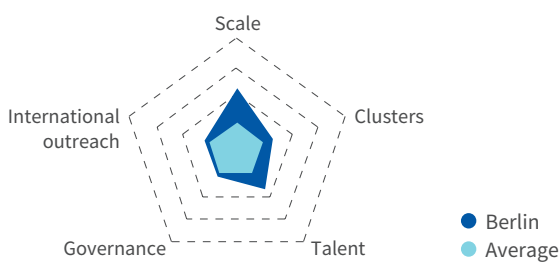
Figure 6. Residential Rents (USD per week)



Source: Macrobond, April 2019

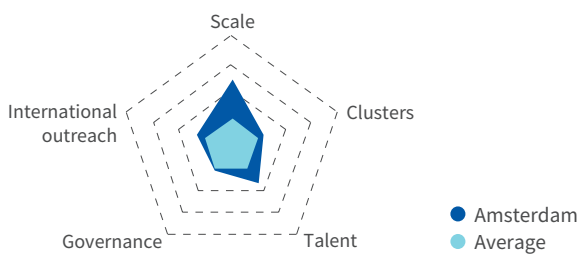
Berlin

Berlin is another city driving innovation. The city is home to 38,000 digital and creative companies and it is estimated that a start-up is founded every 20 minutes there. Over 100,000 professional developers now live in the city, with Berlin’s hipness and tolerance helping to attract talent. Its low cost of living, with rental accommodation one of the most affordable in western Europe, is a further boon. This city is one of Europe’s most important biotech hubs – around 20 pharmaceutical companies with 10,000 employees and 230 biotech firms with 5,300 employees are located there.



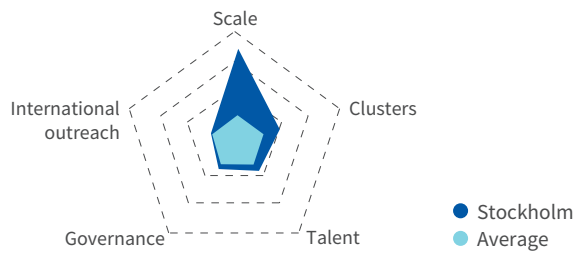
Amsterdam

Amsterdam is a thriving tech hub, home to an open and creative tech scene and numerous innovative companies, including those in the biotech field. Some of the world’s ingenious companies, such as Uber, Netflix, and Tesla have chosen Amsterdam as the location for their European headquarters. Attracted by the depth of talent in the English-speaking workforce, such companies will be hoping to recruit some of the 215,000 software developers working there.



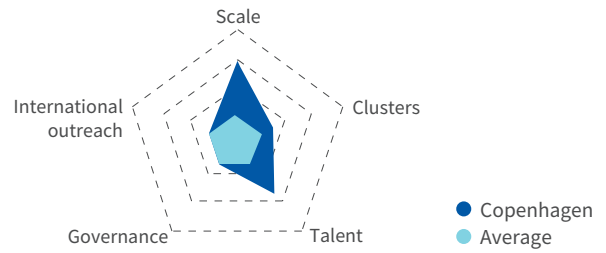
Stockholm

Stockholm has a reputation as one of the world's most innovative cities. It is described as Europe's "unicorn factory" as it is home to more US\$1 billion-plus companies per capita than anywhere outside of Silicon Valley, including globally recognised names like Skype and Spotify. Indeed, a higher proportion of people work in tech-related jobs than any other European city. Supported by strong entrepreneurship culture and excellent sustainability and liveability credentials, Stockholm is recognised as a city that attracts global talent.



Copenhagen

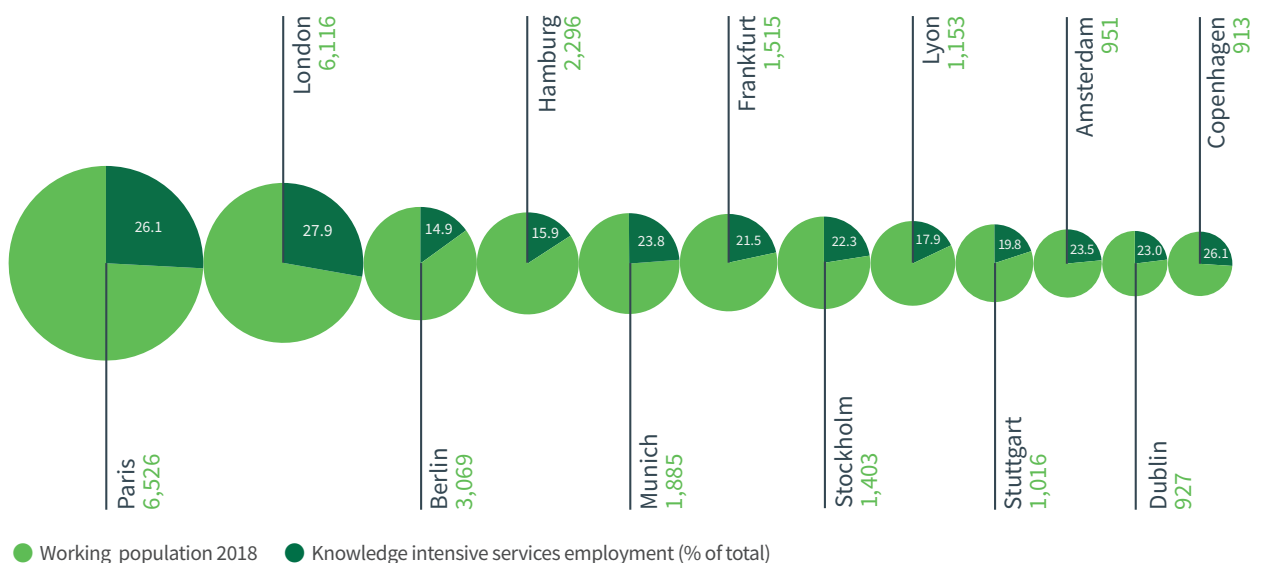
Copenhagen is a bustling startup city home to hundreds of tech companies and includes global success stories such as Zendesk, Unity, Trustpilot, Siteimprove and LogPoint. Online takeaway giant Just Eat has its roots in a Danish basement. The city is the most research-intensive area in Northern Europe with 11 universities, 15 science parks, 14,000 researchers and 150,000 students. The compact nature of the city helps make Copenhagen Europe's most cycle friendly city – over 40 per cent of people cycle to work. Despite a higher cost of living, it has high standard of living and attracts global talent.



International business hubs

Amongst the cities that score well as office locations are three cities which compete globally as headquarter locations and are supported by strong labour market credentials.

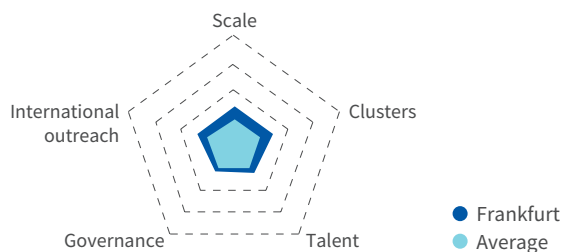
Figure 7. Working population 2018 ('000)



Source: Oxford Economics, April 2019

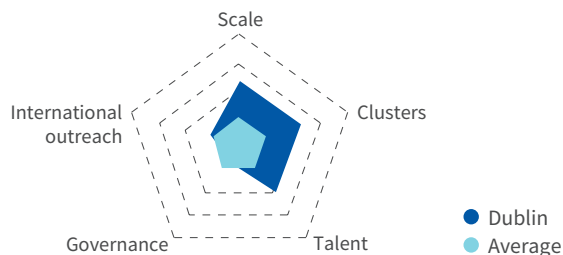
Frankfurt

Frankfurt is the financial capital of continental Europe. It is home to over 200 banks with banking and finance services accounting for 28 per cent of its GDP. Ninety fintech firms are based in the region and the Government of Hesse has a target to attract 500 firms over the next few years, developing the region as a leader in fintech. Adding to the city's appeal to international companies is its connectivity. It is well connected with Europe and the rest of the world. In terms of passenger numbers, its airport is one of the three largest in Europe.



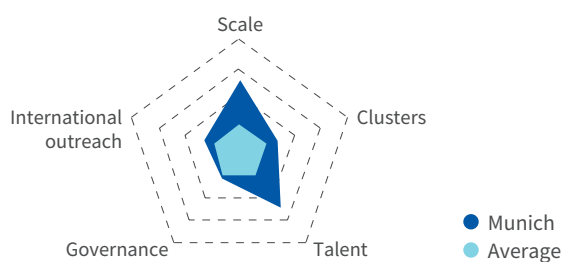
Dublin

Dublin is a significant international business hub with very strong economic and demographic prospects. It has a young and affluent population with 40 per cent aged under 29 years. Attractive in terms of a highly qualified, English-speaking workforce and a favourable regulatory climate, Dublin is a hotspot for international companies and has an established cluster in the technology sector. Google, Facebook and Twitter all have their European headquarters in the city.



Munich

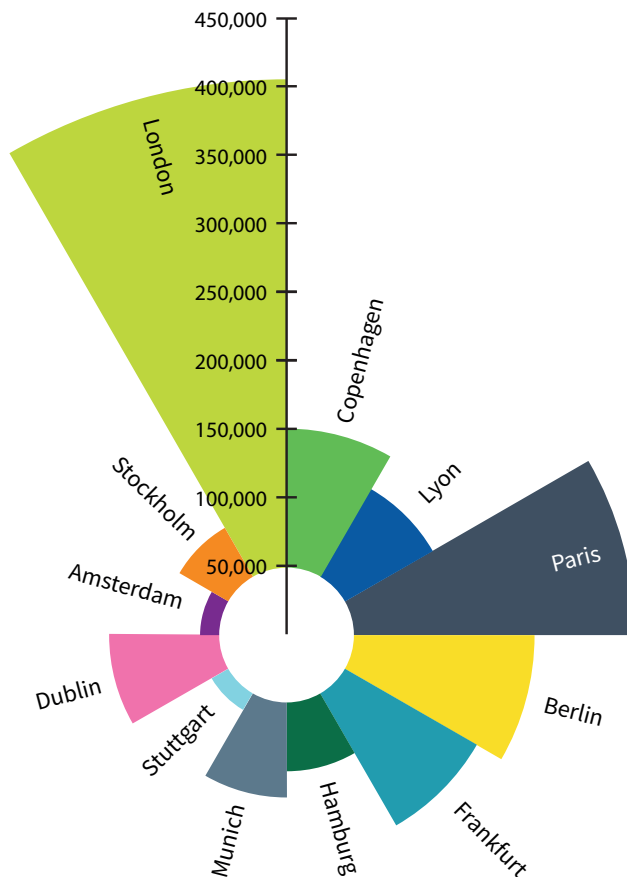
Munich is an important headquarter location for domestic and international companies. Highly diversified with a high-performing economic base, the city has vibrant clusters in financial, automotive, ICT and media, cultural and creative industries, and engineering sectors. Twenty per cent of the workforce is in export-led manufacturing, while services and high-tech capital-intensive clusters have thrived, accounting for 24 per cent of the workforce. Demographic projections for the city are positive and the labour force is set to grow and outpace its German counterparts.



Regional powerhouses

Among our strategic locations are three cities set to drive growth in some of Europe's most successful regions. They are all well-rounded cities that host knowledge intensive business activity and boast strong demographic credentials.

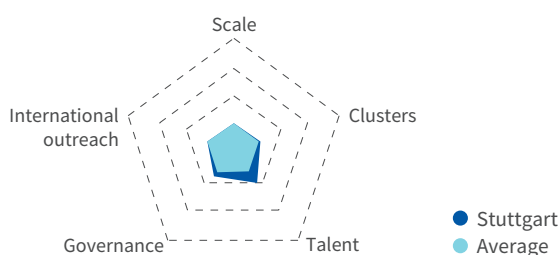
Figure 8. Total students by city



Source: QS, April 2019

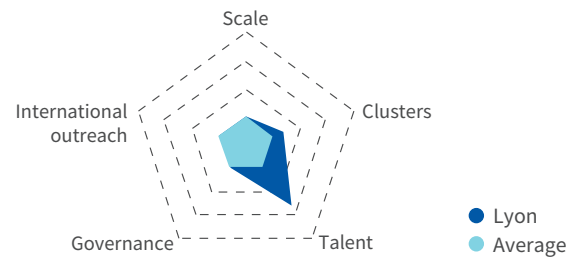
Stuttgart

Stuttgart is home to several major companies including Daimler AG, Porsche, Mercedes-Benz, Bosche and Mahle. Many SMEs that act as suppliers to the automotive, electronics and machinery industries are also located in and around the city. The city has a highly qualified and highly international workforce and has one of the leading research and development landscapes. The Baden-Wurttemberg region boasts unusually high levels of research and development expenditure and patent creations.



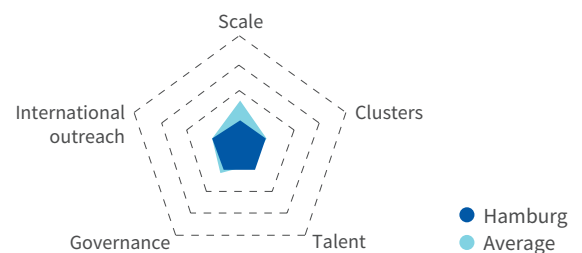
Lyon

Lyon sits at the heart of Europe's fifth most prosperous region, Auvergne-Rhone-Alps. The region ranks highly in terms of levels of foreign direct investment too, with a broad range of businesses targeting the area, including research organisations, life sciences companies and digital firms. Over 65 per cent of Lyon's population is under 45 years of age, compared to 57 per cent for France. This is partly explained by a large student population – 144,500 students, 10 per cent of whom are international. Lyon has a wealth of higher-education establishments and renowned schools with five universities in the world's top 1000.



Hamburg

Hamburg is the economic centre of northern Germany and transportation hub for both Scandinavia and Eastern Europe. Hamburg's harbour is the principal northern European distribution centre. It is the third largest in Europe and the fifteenth largest in the world. The city has close relations with the Nordic and Baltic regions and has emerged as a key European bridgehead for Asian companies. 550 Chinese firms have branches in the city and, for most, Hamburg acts as their German or European headquarters. The city has an innovative and highly diversified economic structure, including a thriving start-up scene and a globally significant hub for the civil aerospace industry.



Conclusion

Selecting these cities for office investments is a very focused strategy. There are 800 cities in the EU, including over 100 with a population of over a quarter of a million. Our strategy is to focus on just 12 of those cities.

While some cities do seem well placed to drive growth in an era of knowledge capitalism, they offer limited opportunities for office investors, either because they are small markets – such as Oslo or Helsinki – or because there are very few barriers to entry, as is the case in Warsaw. Each of the 12 cities we have identified for office investment have either significant barriers to entry or have specific submarkets in which supply risks are low.

More notable, perhaps, is the exclusion of some major European cities including, for example, Madrid and Milan.

While both cities are very established office markets, neither city looks particularly well placed to succeed as knowledge economies. The overall educational attainment levels of both cities compare unfavourably with northern Europe. Emigration of young talent is a key concern in both Spain and Italy, undermining their talent credentials. Furthermore, Madrid's working age population is set to gradually decline in the years ahead, while Milan's prospects are hindered by relatively high long-term macroeconomic risks in Italy.

Excluding such cities demonstrates our conviction in assessing which cities have what it takes to drive growth in the years ahead. But more importantly, it makes clear our commitment to a focused approach. Focus generates local expertise. And local expertise gives us an information advantage in these 12 cities of the future.



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