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London is Europe's top Tech City. But few things last forever.

Economists

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- **Every European city is eager to label itself as a “Tech City”. However, the term is fluid and ambiguous. In this research briefing we produce a ranking of European cities based on their levels and growth of tech sector employment, and scale of tech investment. We crown London as Europe’s leading Tech City.**
- To determine which cities truly are Tech Cities we measured the size and growth, in terms of employment, of the tech sector in Europe’s 100 major cities. The sector is captured by the information & communication sector and by three of seven sub sectors of the professional, scientific & technical sector. These include activities such as R&D of biotechnology, software publishing, and telecommunications.
- Paris had the highest level of tech employment in 2018, followed by London, but with positions reversed with respect to growth during the 2008-18 period. Madrid also scores highly for scale and Berlin for growth.
- The level of investment is another key determinant of whether a city is a Tech City or not, with venture capital a key funding source for tech firms. London leads Europe in the level of venture capital invested in technology companies, followed by Berlin and then Paris.
- While London therefore ranks top overall, there is a risk that Brexit will make the UK capital less special and appealing to investors and entrepreneurs. Paris could yet take top place—but Berlin is probably the more dynamic challenger for the crown.

Europe’s top 10 Tech Cities

1. **London**
2. **Paris**
3. **Berlin**
4. **Munich**
5. **Stockholm**
6. **Madrid**
7. **Amsterdam**
8. **Bucharest**
9. **Hamburg**
10. **Barcelona**

Map 1 Europe’s Tech Cities



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There is no single agreed list of Europe's leading Tech Cities.

Differing views on which are Europe's top Tech Cities

Many organisations have produced lists of the cities that they regard as the most important tech centres in Europe. Several examples are shown in Table 1; there are of course others that we could have chosen.

Table 1 Alternative lists of Europe's Top Tech Cities

Lists of leading European Tech Cities						
	CBRE	fDi	GBI	Hubspot	KPMG	Savills
Amsterdam						
Barcelona						
Berlin						
Bucharest						
Budapest						
Copenhagen						
Dublin						
Eindhoven						
Frankfurt						
Hamburg						
London						
Lyon/Grenoble						
Madrid						
Milan						
Munich						
Paris						
Rome						
Rotterdam						
Stockholm						
Stuttgart						

Sources: see list of references

Some cities, such as Paris, are identified by many researchers, and London (uniquely) by all. In contrast, other cities such as Eindhoven, Stuttgart and Bucharest are identified by only a few. Underneath this, different organisations have varying criteria, or give different weights to the same factors, or use different methodologies.

For example, KPMG surveyed over 800 industry leaders and asked them to identify Europe's leading tech hubs based on such factors as digital infrastructure, lifestyle, research-intensive universities, and investment funding. In contrast, Hubspot.com used 23 metrics, also including digital infrastructure and lifestyle, as well as various measures of ease of doing business, cost of offices, and residential rental costs. CBRE produced a list of cities with 70,000 people or more employed in the high-tech sector.

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Fundamentally none of these are right or wrong: the notion of a 'Tech City' is pretty fluid, with no formal definition. At the most basic level it comes down to the size and growth of a city's tech sector as measured by either output or employment. But a problem here is that the boundaries between 'tech' and other sectors are fluid, and increasingly so. For example, much management consultancy activity is concerned with building IT systems, and so can be seen as part of the tech sector. And much medical research involves advanced computer-based modelling. The digital 'sector' also blends seamlessly into, for example, architecture, advertising, and film and TV production.

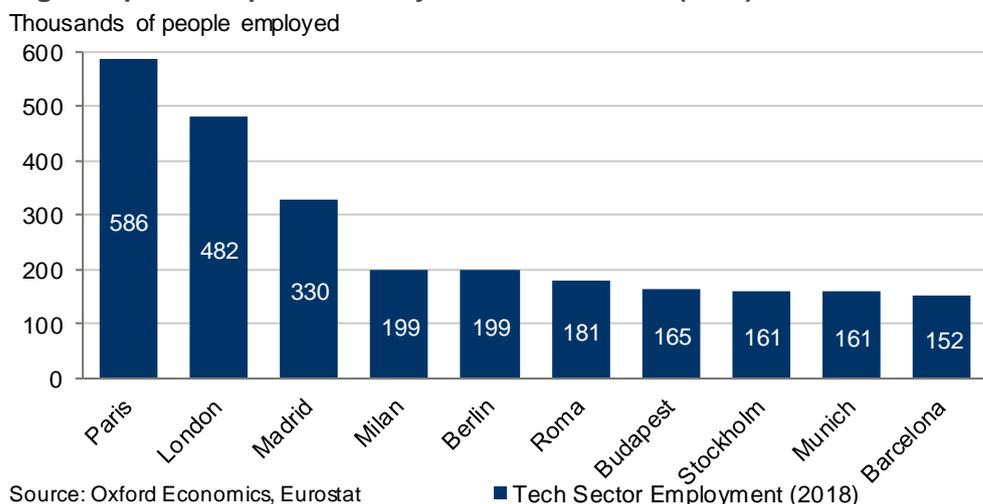
Oxford Economics' estimates of the size and growth of Tech Cities

But unfortunately, government statistical agencies do not produce detailed employment (let alone output) measures at the city level in a consistent way across Europe, either for tech narrowly defined, or more broadly. We have therefore produced our own estimates of tech employment, by combining detailed sectoral information at a broader level of geography (NUTS 2) with less detailed sectoral information at a narrow city level geography (NUTS 3) to produce Oxford Economics estimates of tech sector employment for Europe's top 100 cities.¹

Alongside that, we have taken 'tech sector' to mean the whole of the broad Information and Communication sector (J 58-62 in the Standard Industrial Classification), but also included architectural and engineering activities, technical testing and analysis, scientific research and development, and 'other' professional, scientific and technical activities (M71, 72 and 74 respectively), all of which are part of the broad Professional, Scientific and Technical Services sector.

In that way we have calculated tech employment for 2018 (the latest official data). On that basis, Figure 1 shows the 10 European cities with the largest tech sectors in 2018. (We have used the same geographical definitions of cities that we use in our European Cities and Regions Service.)

Fig. 1 Top 10 European Cities by size of tech sector (2018)



¹ Examples of NUTS 2 would be Oberbayern in Germany and West Yorkshire in the UK, while NUTS 3 cities within those would be Munich and Leeds.

On our definition, Paris has Europe's largest tech sector with 586,000 people employed in 2018.

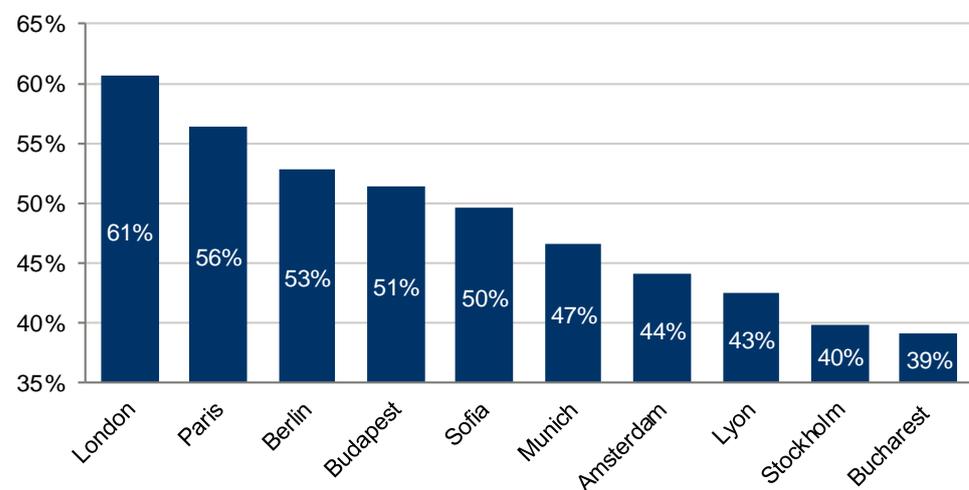
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It can be seen that Paris was some way ahead of London, which in turn was ahead of Madrid, while the other seven cities clustered together, some way behind.

As well as the size of tech sectors, we have also estimated how fast employment has been growing in each city. Figure 2 shows which cities in Europe had the most rapidly expanding tech sectors in the period 2008-18. Once again Paris and London come top, but this time London is ahead of Paris. Indeed, six cities appear in both lists (the other four are Berlin, Budapest, Stockholm and Munich), suggesting that the tech sector has been tending to concentrate in these. This is a clear example of agglomeration, in which success breeds success, as individuals and employers enhance one another's productivity by working in proximity with, and often in collaboration with, one another.

Fig. 2 Top 10 European cities by tech sector growth 2008-2018

Tech sector employment growth 2008-2018



Source: Oxford Economics, Eurostat

The European cities with the best access to tech venture capital

But most people's understanding of what makes for a leading Tech City goes beyond scale, and even growth, to embrace other key factors. These include: whether there is a proliferation of start-up firms within the city; whether it tends to attract capital for investment in growing technology firms; and also whether there is a presence of large well-established tech companies, such that the city can offer highly qualified people attractive career-paths, as opposed to one-off opportunities. This latter group offers other advantages such as networking and business opportunities, some of them perhaps quite intangible—the factors that make the agglomeration, referred to above, actually happen.

We estimate that London had the fastest growing tech sector from 2008 to 2018.

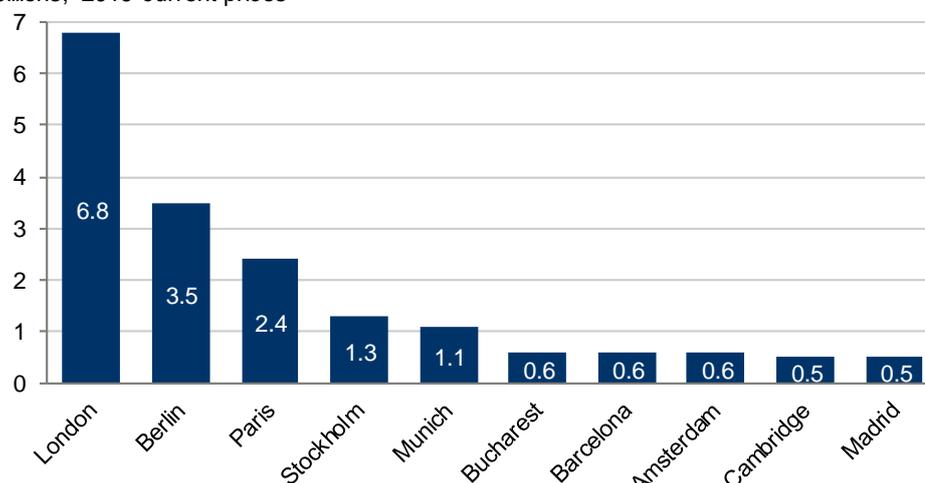
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London took the lion's share of tech venture capital in 2019.

Figure 3 shows one element of this. It identifies the cities in Europe that in 2019 were the largest recipients of venture capital investment funding in technology companies. London's predominance is clear. But more generally it is striking that all the cities in Figure 3, with the exception of Cambridge, appear in either Figure 1 or Figure 2, or both.

Fig. 3 Top 10 European cities by VC investment in the tech sector (2019)

£ billions, 2019 current prices



Source: Tech Nation 2020; Dealroom 2020 ■ VC investment in tech sector

Again, there is likely to be a self-reinforcing circle here. Those cities with a large and growing tech sector act as magnets for tech sector investment, and the investment helps the cities' tech sectors to grow and become large.

Oxford Economics' ranking of Europe's Top 10 Tech Cities

Table 2 provides a simple ranking of Europe's top 10 Tech Cities based on these three criteria. Perhaps unsurprisingly, London tops our list. It is the European capital of tech sector investment and is home to the fastest growing sector in Europe (at least until 2018—Brexit may have taken the gloss off, somewhat). Developments such as Silicon Roundabout/Shoreditch, and the emergence of the Kings Cross cluster are well known, but they build on huge strength in relevant sectors that act as customers or suppliers to the sector, or indeed as partners—finance, media, academic research, and so on.

Paris comes a close second. It has more people employed in the tech sector than London or indeed any other European city. However, its tech sector is not growing as fast as London's and its level of venture capital investment in the sector lags behind London and indeed Berlin, placing it third on that metric.

Perhaps less predictable is the fact that Munich ranks fourth. The city, along with its broader region, is most commonly associated with manufacturing, but it tends itself to be very tech-intensive, including aerospace and premium automobiles, and has spawned a network of independent tech companies with a very different market profile to the more consumer and service sector focused tech companies of London, Paris and Berlin. Munich's tech sector does not grab the headlines, but it quite literally does the business.

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Unsurprisingly, London emerges as the tech capital of Europe. Some other top-10 cities are perhaps less obvious.

Table 2 OE's European Tech Cities composite indicator

OE European Tech Cities composite indicator				
	OE ranking	Size of tech sector ranking	Growth of tech sector ranking	VC investment ranking
London	1	2	1	1
Paris	2	1	2	3
Berlin	3	5	3	2
Munich	4	9	6	5
Stockholm	5	8	9	4
Madrid	6	3	14	9
Amsterdam	7	16	7	6
Bucharest	8	14	10	6
Hamburg	9	13	11	18
Barcelona	10	10	34	6

Source: Oxford Economics, Eurostat, Tech Nation 2020, Dealroom 2020

Possibly also surprising are some cities that are not in the top 10. Dublin is an example: it is, after all, host to the European head offices of both Facebook and Google. However, the deeper one digs the more dubious the evidence for Dublin becomes. In terms of 2018 tech sector employment in European cities, Dublin comes only 24th, with 73,900 people working in the sector in 2018. And in 2019 there was only £0.3 billion invested in Dublin tech companies by venture capitalists, meaning that its level of tech sector VC investment was tied with that of Bristol. Ireland's low corporation tax rate has apparently succeeded in attracting headquarters functions to Dublin, that has not translated into particularly large employment or investment gains.

Conclusions

There is no definitive list of which are the top Tech Cities in Europe, and it is not even completely clear what the expression means. What is clear, however, is that 'tech' is a sector, or an activity, where success tends to be self-reinforcing. And, as in so many other areas, London and Paris come out on top, but with London definitely ahead of its centuries-old rival.

But with Brexit about to be implemented in full, and the possibility that London may be somewhat side-lined as a result, that could yet change. In which case it may be nimble-footed Berlin, with its stronger venture capital sector, that most effectively challenges London's position, rather than behemoth Paris.

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