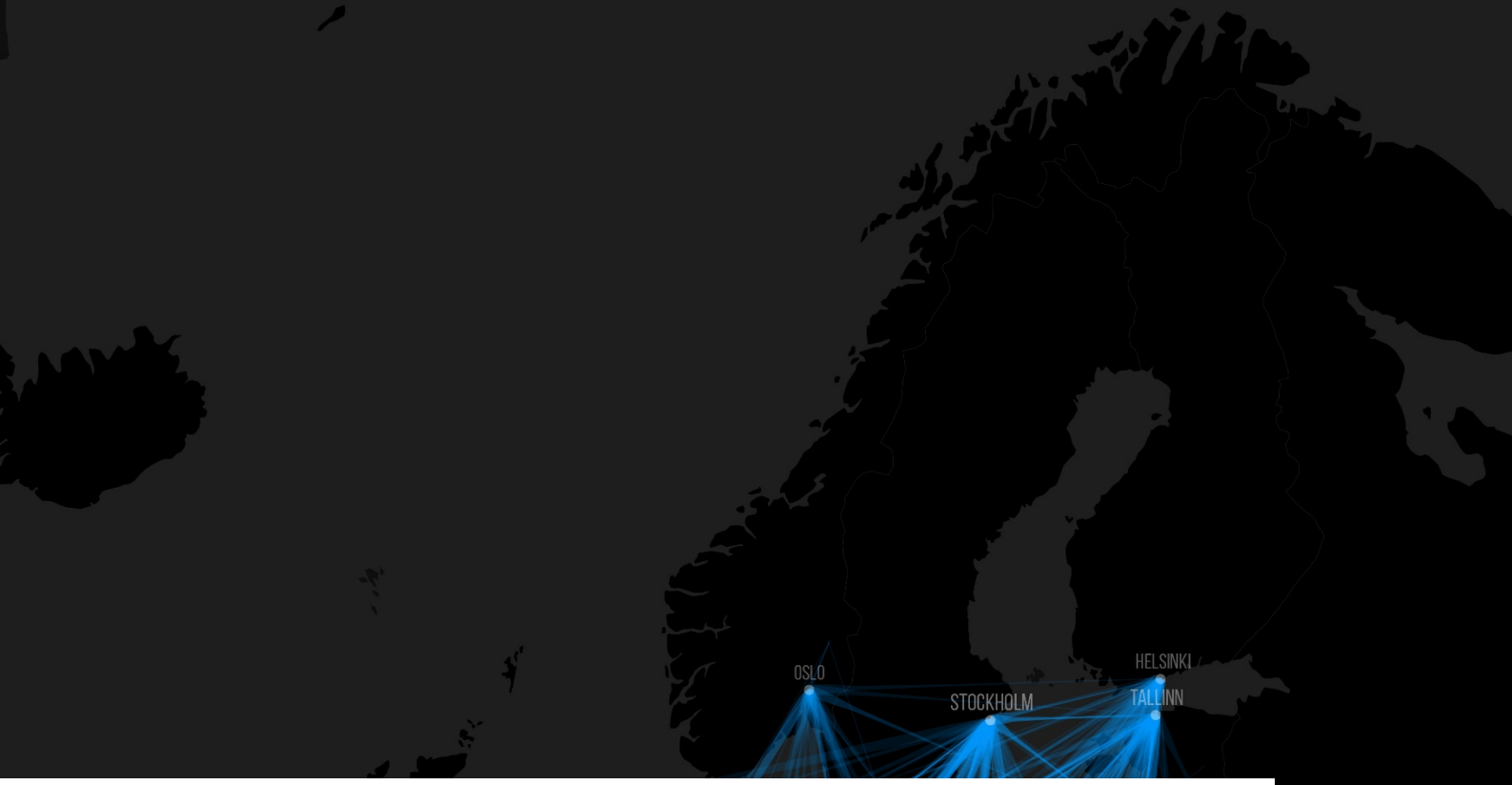
# STARTUP HEATMAP EUROPE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## Introduction: Mapping Startup Europe

There is a hot debate on the question where Europe's hottest startup hub is evolving. Cities like London, Berlin, or Stockholm are showcasing their merits to be viewed as the most innovative spot for startups on the continent.

Indeed, perception is decisive in this competition as it subconsciously influences the choice of location for both startups and investors. The narrative of the Silicon Valley as the land of opportunity is a key prerequisite to its unprecedented triumph. That is why are mapping the perception of startup hubs in Europe – and how far their reputation travels. This allows us to compare more established startup hubs like London and Berlin in their actual reach with up-and-coming startup places, which rally to increase their footprint on the map of Startup Europe.

However, there will never be a European Silicon Valley – and that's a good thing. Because simply imitating another's business model is hardly ever the right way to go. Promoting a thriving European start-up landscape, however, is a target worth pursuing. Instead of endorsing Berlin or London as the biggest start-up hubs in Europe, we want to take you on a journey to find that hidden gem, the regional champion, or even the local underdog, which may become the next big thing in the European start-up landscape.

The Startup Heatmap Europe tracks stories all across the continent – from places within and beyond Europe. We map, analyze, and evaluate the journeys of start-up founders to identify movement patterns and narrate the story of the European start-up landscape. We trace the people that make it happen, not the money or the media.

Our survey builds on start-up founders' perceptions – and perceptions shape the market. Our survey paints a picture of start-up Europe not how it is at the moment, but how start-up entrepreneurs will shape it in the coming years.

The information we present in this report can be used by (future) founders, investors, journalists, government agencies, and community builders alike: We rank future regional champions in the start-up landscape. We analyze the movement patterns and what motivates founders to cross borders. We weigh the key push and pull factors and asses how they relate to the different types of start-ups in the industry, how our regional champions perform in regards to those factors. And we reveal how the media narrative may in fact contradict with what the industry really believes.

For the first time we will visualize the European start-up topography from Lisbon to Helsinki, from Athens to Glasgow and from Warsaw to Barcelona. We invite you on this journey to trace the footsteps of European start-up entrepreneurs.

## The mobility of Europe's startup founders

**The location of a startup's headquarters is one of the most important factors to define its future success, especially at the very beginning of its existence. Therefore, the mobility of startup founders is a crucial factor for success. But how many startup founders in Europe are actually willing to move?**

We tracked the movements of founders on a city, country, and regional level. The numbers speak a clear language: While only about 4% of the general EU population moved to another country within the EU, we observe that an astonishing 23% of our survey participants founded their business in a country that is not their origin. Among this group, most have also left their home region (85%). "Home region" means, in our case, a regional group of countries in Europe, such as the Baltics.

42.7% of the startup founders who participated in our survey have moved to a different city. Although this figure for city-to-city mobility impressed us, we laid our main focus on movements across country borders and across European regions.

*23% of survey participants have founded their company in a country that is not their origin. Most of them have also left their home region (85%).*

23.4% of the surveyed startup founders said that their country of origin is different from the country in which they launched their business. 90.1% of these inter-country movers are male, the rest are female (9.9%). Although we unfortunately reached overall fewer female than male participants in our survey, still only 19.5% among the female founders have moved to another country, compared to 23.9% of male founders. For female startup founders we could ascertain that the willingness to move decreases proportionally as the distance between their place of origin and the destination increases.

Relocating to another sub-region (for example a move from Eastern to Western Europe) requires, without a doubt, the highest willingness of a startup founder to move – and 19.9% of our startup founders were willing to do so. An impressive 85% of those who moved outside their country also left their broader home region. Again, 9.9% of these movers were women, compared to 90.1% men.

*90% of founders who have moved are male. Female startup founders are less likely to move.*

Another question is whether the type of startup makes a difference when it comes to the willingness to move. For this, we categorized our startups into two groups: High-tech startups that require more engineering (like Big Data, Hardware, IoT, Health and BioTech) and internet startups (eCommerce, mobile applications, and SaaS solutions). Especially internet startups are "location agnostic", meaning that they do not really care where they operate. The location does not matter

for them, as their business models typically do not rely so much on non-mobile factors. The internet helps these businesses overcome geographical boundaries, without the need of a physical move or relocation.

In contrast, we expected that high-tech startups – which typically require hardware or special engineering skills bound to certain locations – would be less flexible in their mobility. Surprisingly, the results are contrary to our expectations. When it comes to mobility between countries, 25.9% of high-tech startup founders have moved compared to only 22.2% of internet startup founders. In regards to inter-regional mobility (e.g. moving from Eastern to Western Europe), these numbers change slightly, with 22% of the high-tech startup founders having moved to another European region, against only 19% of the internet related startup founders.

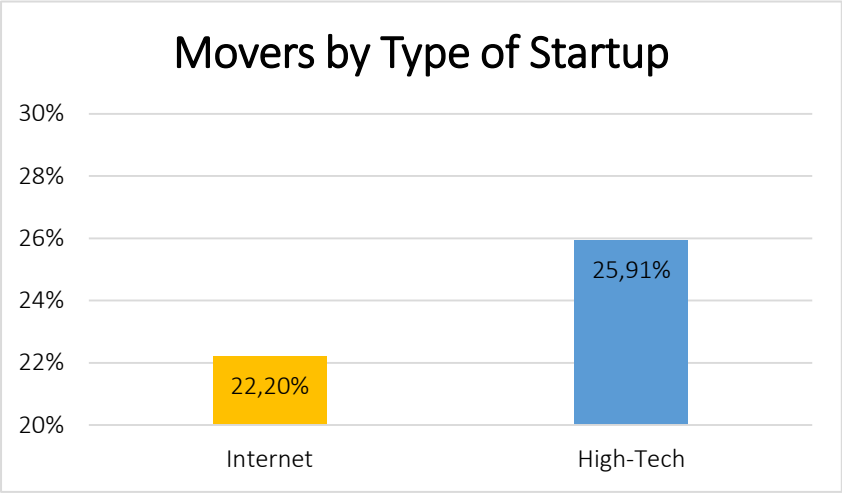


**Figure 1:** High-tech founders move more than their internet peers (cross-country mobility).

Our expectation that founders of high-tech startups are less likely to move has therefore not been confirmed. When thinking about the reasons behind the results, we could argue that internet-focused startups (which we originally considered more likely to move) are in fact able to work from anywhere and therefore decide to stay where they are. They don't need to relocate to take advantage of another location's benefits. On the other hand, some of the internet startups might also need to stay within their own ecosystem, as they are inclined to start up in markets they know well. High-tech companies, in contrast, are more inclined to move to a place where they find the best resources as well as talent. In the end, markets are less restricted for high-tech products, since they cater to specific B2B markets all over the world.

*Even though startup founders are far more likely to move than the average EU citizen, the reasons to move or to stay are also complex for entrepreneurs. Apparently, deciding to move is easier for male founders. Surprisingly, founders in industries that require more engineering like Big Data, Hardware, IoT, Health and BioTech are more likely to move. Internet-based startups focusing on e-commerce and consumer applications rather tend to stay at home.*

## Fighting for entrepreneurial talent

**Since startup founders are far more likely to move to another country (and even to another region) than normal citizens, Europe's startup hubs are fiercely competing to attract highly mobile talents. Which regions are winning in this battle, which are losing?**

Comparing actual movements of founders between regions, we calculated the net migration flows by looking at the origin of founders and their actual startup location. Figure 2 shows (in percentage) how high the inflow or outflow is in comparison to the net excess or decline. Simply put, a 10% net inflow means the region's number of startups is growing by 10%, while a net outflow means that the startup population shrank. The numbers, however, do not even out due to the positive impact of migration into Europe from third countries, which leads to an overall surplus for the whole of Europe.

| startup/location/region | Net % inflow | Net % outflow |
|---|---|---|
| Western Europe | +10% | |
| Northern Europe | +10% | |
| Southern Europe | | -4% |
| Eastern Europe | | -3% |

Figure 2: How did the startup population change in a region due to migration? Percentage of migrants compared to original founders.

The results seem to confirm the common expectation that the strong economies in the North and West are able to attract foreign talent, while the Southern and Eastern regions have a negative migration balance. When dividing Europe into two halves according to GDP per capita, the economically stronger group of countries indeed shows an 8% growth, while the poorer half of Europe shrinks by 3%.

To have a clearer view on which regions are actually winning and losing, we established a common set of European regions:

| | |
|---|---|
| Baltics: | Estonia, Latvia, Lithuania |
| Benelux: | Belgium, Luxembourg, Netherlands, |
| Central Eastern Europe (CEE): | Albania, Belarus, Bosnia, Bulgaria, Croatia, Czech Republic, Hungary, Poland, Pristina, Romania, Serbia, Slovakia, Slovenia, Ukraine |
| Central Europe: | Austria, France, Germany, Switzerland |
| Nordics: | Denmark, Finland, Norway, Sweden |
| Mediterranean: | Cyprus, Greece, Italy, Malta, Portugal, San Marino, Spain |
| UK + Ireland: | Ireland, United Kingdom |

Looking at actual movements of founders, we see that the sub-region of Europe which benefits the most are the Baltics, with a 14% growth of their startup population due to migration. UK and Ireland, Benelux, and Central Europe follow suit with double-digit growth figures. In contrast, the

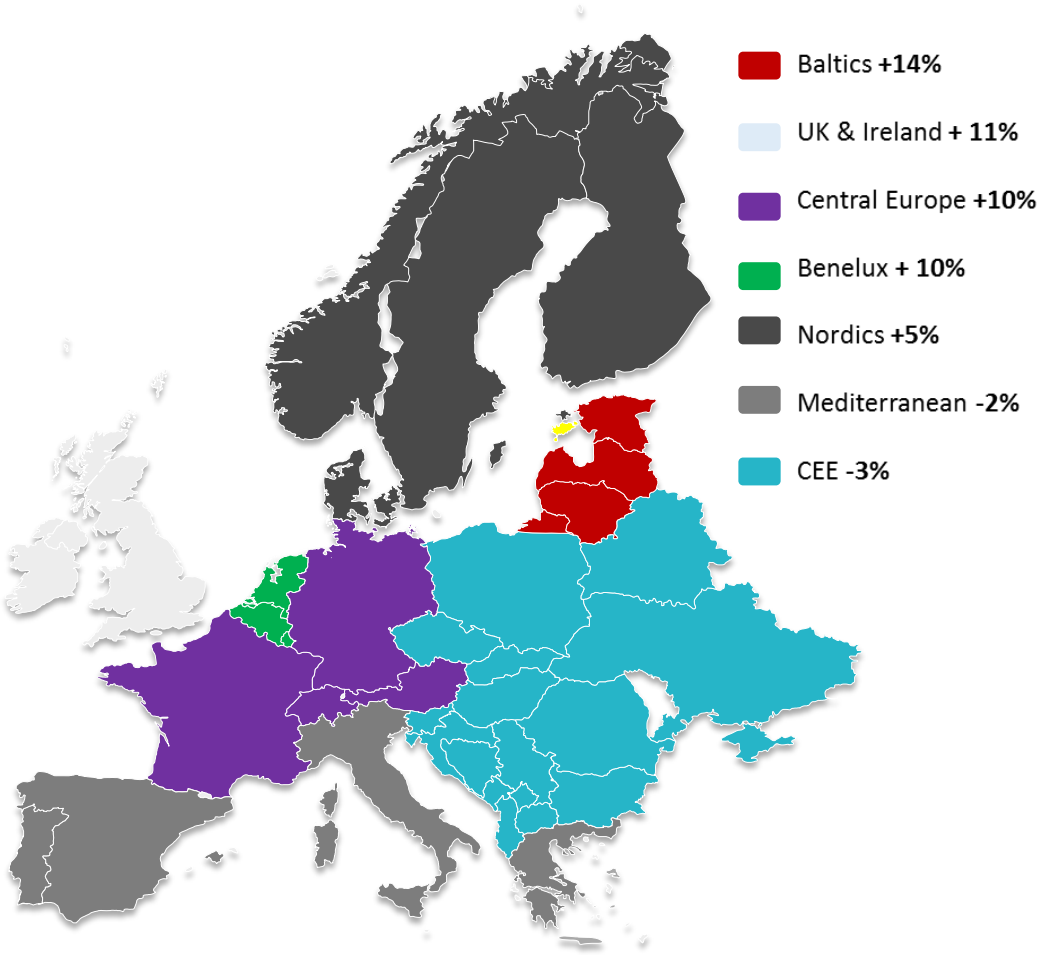


Figure 3: Inflow and outflow of founders in European regions.

Nordics cannot attract as much foreign founders as might have been expected. A negative net migration flow can be observed in Southern and Central Eastern Europe.

While we do not have sufficient data to provide an inflow and outflow analysis for each country, we can highlight some observations from select countries (for which we have at least a minimum of a compound number of 50 startup origins and locations):

| startup/location/description/country | Net % inflow | Net % outflow |
|---|---|---|
| Netherlands | +31% | |
| Austria | +20% | |
| United Kingdom | +17% | |
| Bulgaria | +13% | |
| Poland | +11% | |
| Germany | +11% | |
| Portugal | +3% | |
| Italy | | -29% |

Figure 4: Net migration flows on country level

What we see is that particularly the Netherlands and Italy stand out with the former gaining 31% and the latter shrinking about 29% due to startup migration. Especially for a large country like Italy, this is staggering: We can clearly see that the country is losing entrepreneurs on a large scale.

*Overall, we can both observe gravitation towards the economically strong countries as well as a geographical divide between the Northwest and the Southeast. The strongest region in terms of startup migration is the Baltics with a 14% net inflow. The Mediterranean (-2%) and CEE (-3%) export the most founders. On the country level, the Netherlands stands out with a 31% inflow. An alarming sign comes from Italy, where the net loss of founders is staggering high at -29%.*

## Regional champions

Of course we expect internationally renowned hubs like London and Berlin to be popular among all European startup founders. But we want to look at the competition among regional hubs: Can we find outstanding regional hubs that win the competition for entrepreneurial talent? Which hubs offer the region's most attractive ecosystem and function as a gateway to their region?

One of the key questions in our survey was "Where would you start up if you could begin all over again?" We provided a list of the 30 most prominent European startup cities and gave the survey participants up to 5 votes. To find the regional champions, we grouped the survey participants according to their origin regions and counted the total votes for each of the 30 startup hubs.

Apparently, the region plays a strong role in the perception of startup hubs, since we see strong regional variations: While Berlin is ranked first among founders from Western Europe, London remains on the top spot for Southern, Eastern, and Northern Europeans. Also, there are strong regional hubs that rank on average 4 ranks higher when only looking at regional voters. Especially Eastern and Northern Europeans vote their regional hubs up, while in Southern Europe, almost no change can be detected. This might very well have to do with the comparably good performance of Barcelona and Lisbon in the overall ranking.

| Western Europe | Eastern Europe | Southern Europe | Northern Europe | Rank |
|---|---|---|---|---|
| Berlin (0) | London (+1) | London (+1) | London (+1) | 1 |
| London (0) | Berlin (-1) | Berlin (-1) | Berlin (-1) | 2 |
| Amsterdam (0) | Amsterdam (0) | Amsterdam (0) | Stockholm (+4) | 3 |
| Barcelona (0) | Barcelona (0) | Lisbon (+1) | Amsterdam (-1) | 4 |
| Munich (+3) | Dublin (+1) | Barcelona (-1) | Tallinn (+7) | 5 |
| Hamburg (+11) | Warsaw (+9) | Dublin (0) | Dublin (0) | 6 |
| Vienna (+3) | Prague (+9) | Zurich (+4) | Barcelona (-4) | 7 |
| Paris (+5) | Vienna (+2) | Tallinn (+4) | Copenhagen (+1) | 8 |
| Stockholm (-2) | Lisbon (-4) | Copenhagen (0) | Riga (+13) | 9 |
| Zurich (+1) | Copenhagen (-1) | Munich (-2) | Helsinki (+10) | 10 |

Figure 5: How did the regions vote? The top 10 by region.

However, these findings do not seem to support a "winner-takes-all" dynamic, since we see strong competitors emerging in all regions. For Northern Europeans Stockholm, Tallinn, Riga, and Helsinki emerge as top 10 contenders, while Western Europe sees Munich, Hamburg, Vienna, Paris, and Zurich climbing up the ranks. In the East, we have Warsaw and Prague as the strongest regional hubs, which are both improving by 9 ranks compared to the overall ranking. Southern Europe, too, has two attractive ecosystems with Lisbon and Barcelona, who have even developed a strong international appeal.

| City | % of Benelux | % of Baltics | % of UK+Ireland | % of Western Europe | % of Nordics | % of CEE | % of Mediterranean |
|---|---|---|---|---|---|---|---|
| Berlin | 53% | 52% | 37% | 58% | 50% | 46% | 50% |
| London | 49% | 58% | 45% | 36% | 45% | 57% | 64% |
| Amsterdam | 72% | 32% | 27% | 27% | 15% | 32% | 37% |
| Munich | 6% | 6% | 8% | 24% | 8% | 13% | 6% |
| Barcelona | 26% | 16% | 20% | 23% | 13% | 18% | 32% |
| Hamburg | 4% | 0% | 4% | 20% | 3% | 3% | 3% |
| Vienna | 8% | 0% | 6% | 19% | 0% | 17% | 3% |
| Stockholm | 13% | 29% | 12% | 15% | 48% | 9% | 7% |
| Paris | 17% | 3% | 8% | 14% | 8% | 5% | 6% |
| Zurich | 11% | 6% | 10% | 13% | 0% | 8% | 13% |
| Copenhagen | 9% | 13% | 8% | 11% | 30% | 11% | 10% |
| Lisbon | 15% | 3% | 8% | 11% | 5% | 8% | 46% |
| Dublin | 9% | 3% | 33% | 11% | 8% | 20% | 16% |
| Warsaw | 2% | 3% | 8% | 7% | 8% | 17% | 2% |
| Tallinn | 2% | 52% | 8% | 7% | 13% | 10% | 9% |
| Madrid | 9% | 3% | 6% | 6% | 5% | 3% | 10% |
| Prague | 2% | 3% | 8% | 6% | 3% | 15% | 2% |
| Budapest | 2% | 13% | 10% | 4% | 5% | 7% | 6% |
| Oslo | 0% | 6% | 2% | 4% | 8% | 3% | 4% |
| Luxembourg | 17% | 0% | 4% | 4% | 5% | 8% | 4% |
| Riga | 2% | 42% | 8% | 4% | 3% | 1% | 2% |
| Helsinki | 6% | 19% | 4% | 3% | 10% | 5% | 8% |
| Malta | 4% | 3% | 8% | 3% | 13% | 6% | 7% |
| Rome | 0% | 0% | 2% | 2% | 0% | 3% | 9% |
| Glasgow | 0% | 0% | 10% | 2% | 0% | 3% | 2% |
| Milan | 4% | 0% | 0% | 1% | 3% | 1% | 8% |
| Bucharest | 0% | 3% | 2% | 1% | 5% | 5% | 0% |
| Birmingham | 0% | 3% | 4% | 1% | 0% | 3% | 1% |
| Athens | 0% | 3% | 4% | 1% | 0% | 1% | 2% |
| Manchester | 0% | 3% | 12% | 0% | 3% | 3% | 3% |

Figure 6: Who voted for whom? Percentage of sub-regional votes per startup hub.

To better understand which startup city attracts founders from which sub-region, we looked at "endorsements": Asking where they start up if they could begin all over again, we counted how many founders from a sub-region could imagine moving to the respective hubs. This is expressed by the percentage of the regional startup population that gave a vote for a specific city. Stockholm, for example, is attractive to 48% of the founders from the Nordics and 29% from the Baltics, but only to 7% from the South. Dublin, in contrast, is attractive mostly to founders from Britain, CEE, and Southern Europe – while capturing only 8% of the Nordic founders. On the upper end it is exciting to see how Berlin struggles to gain traction in the UK and Ireland (with only 37% endorsing), while London performs weak in Western Europe (36%).

*Our key question: Where would you startup if you could begin all over again?*

That said, we do not see single regional champions emerging, but rather two or more contenders in each area that each manage to attract a good share of the regional startup talent. Thus, there is an even stronger competition among these regional hubs: They need to both stay ahead and further level the playing field with the major international hubs, which always threaten to steal their native entrepreneurial talent. The latter can be seen in CEE, where Warsaw, Prague, and Vienna perform weakly and stay below a 20% endorsement rate. It will be exciting to see which hub in CEE will win this race in the future.

*Warsaw, Prague, and Vienna perform weakly in Central and Eastern Europe*

Furthermore, we can witness a complex network of relations between regions and hubs, which offers them ample opportunity for establishing their ecosystem's brand and attracting international startups. Interesting hints to a successful internationalization strategy are the good results of, for example, Malta in the Nordics (13% endorsements), Munich in CEE (13%), and Dublin in the CEE and the South (20% and 16%). These hubs have managed to establish some kind of brand awareness beyond their regional reach, even though they do not necessarily belong to the top contenders overall.

*We can conclude that the massive movement of founders across Europe has already created a fierce competition for entrepreneurial talent among regions and startup hubs. While a simplistic view of startup Europe's topography might suggest that each region has one champion reigning as the regional hub, we actually see several strong contenders in almost every region. Moreover, the competition does not only take place within regions, since country or sub-regional borders do not stop founders from moving anymore. In fact, 85% of mobility takes place across regions. That is why startup hubs need to compete not only with regional competitors, but also with competitors all over Europe who might have a similar profile.*

## Key factors that drive founders' mobility

**When competing over entrepreneurial talent, one of the most important questions is why founders actually move. Which are the decisive factors for an entrepreneur to choose or leave a startup hub? Is the quality of the ecosystem more important – or access to capital? Which role does the monthly cost of living in a city play and how much do founders value access to talent?**

As it turns out, access to talent and the quality of the ecosystem (access to support, partners, and customers) are considered the most important factors. Respectively 71% and 69% of our survey participants find these factors very relevant, rating them with 4 or the maximum value 5. When considering the whole number of responses on the scale from 0 to 5, these factors score an average of 3.8 (talent) and 3.9 (ecosystem) points, which is clearly ahead of the ratings for the other factors.

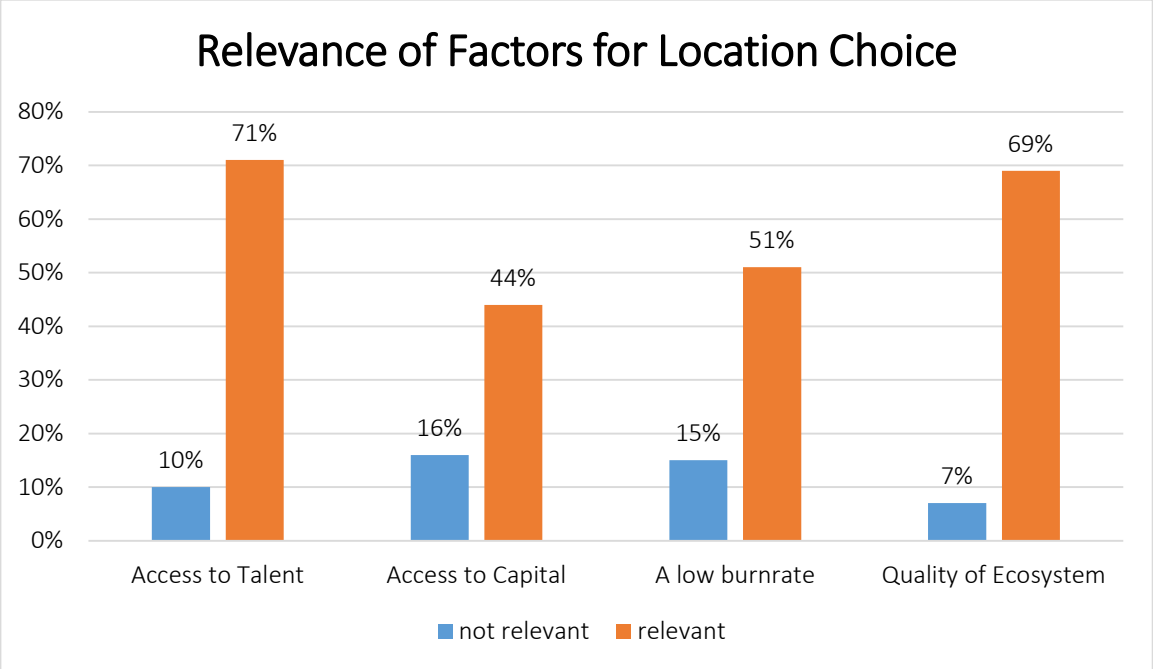


Figure 7: Which factors are rated relevant (more than 3 points out of 5) and irrelevant (less than 2 points)?

In comparison, the other factors (access to capital and monthly costs/burn rate) are less important, as they are considered very relevant by only approximately half of all respondents (44% and 51%, respectively). Access to capital obviously is the least important factor, with an average rating of only 3.1 and a median rating of 3, less than all the other factors. Around one of six entrepreneurs (16%) regards access to capital as not relevant in their considerations about the location of their startup. Similarly, 15% say the burn rate (or monthly costs) is not a relevant factor.

How can we interpret these results? A reasonable explanation is that the access to capital is not crucially linked to the location, as it is rather mobile and can easily be acquired by a startup across large distances and borders. Entrepreneurs therefore don't have to follow the money if they can make sure that the money comes to them. The importance of the burn rate scores an overall average of 3.4 points, which means that it matters for some but not for all.

The importance of the factors access to talent and to a healthy ecosystem (access to support, partners, and customers) in the entrepreneurs' deliberation of their startup's ideal location is overwhelming. Contrary to capital, these factors do not move so easily and entrepreneurs seem to be keener to grow their businesses in an environment where they expect to find talent as well as an established ecosystem. Apparently the most valuable factor is the quality of the ecosystem, as only 7% of our respondents think that it does not matter at all.

***One in six entrepreneurs regards access to capital as not relevant for the location of their startup.***

To investigate these findings further, we wanted to understand whether the importance of the key factors change with various factors ranging from the origin of the founders to the type of startup they are building. To classify the origins of founders we selected a few economic indicators which, we believe, provide an objective picture of the push and pull factors of the respondents' countries of origin. Among these were the GDP per capita and the unemployment rate.

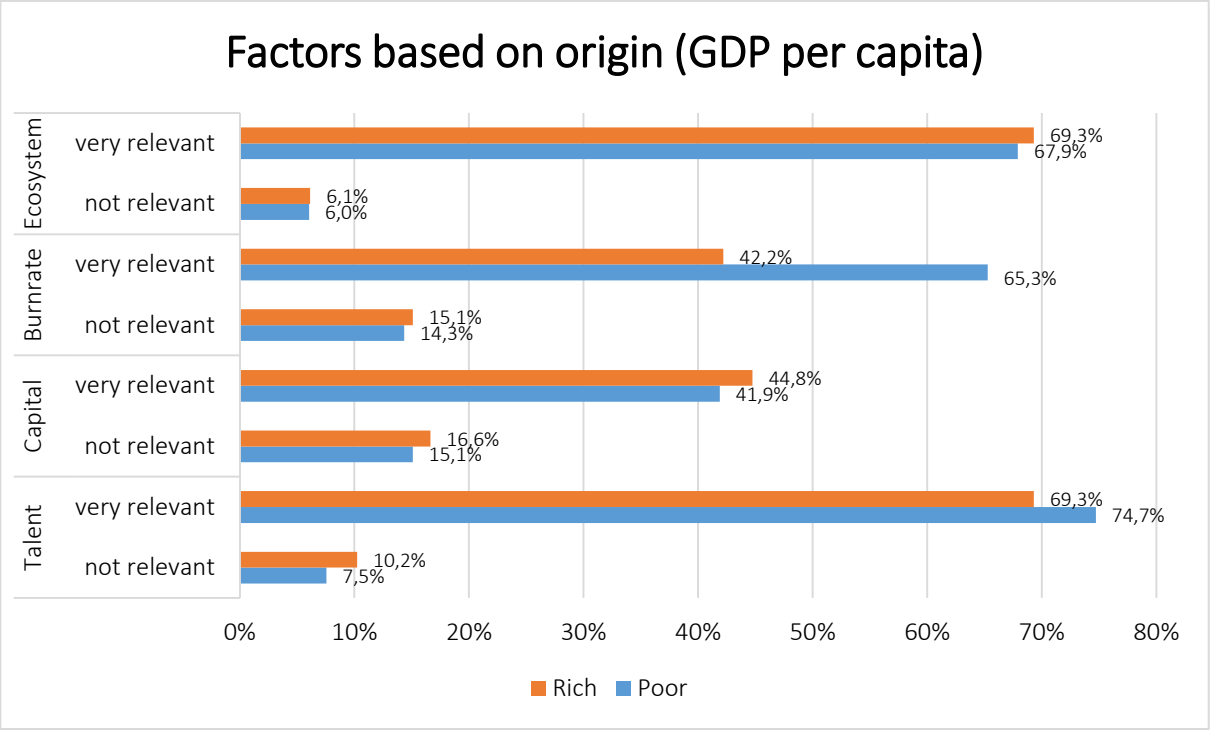


Figure 8: How do founders from rich and poor origins value key factors for their startup's location?

Based on Eurostat's data on GDP per capita, we divided the countries of origin into "rich" (higher than the EU-28 average) and "poor" (below or equal the EU-28 average).[1] Our first (maybe somewhat plain) assumption was that if you come from a "poor" country, you might prioritize to

[1] Eurostat (2016): GDP per capita, consumption per capita and price level indices. Retrieved July 8, 2016, from: http://ec.europa.eu/eurostat/statistics-explained/index.php/GDP_per_capita,_consumption_per_capita_and_price_level_indices.

get money. When applying our data on the factor access to capital, we found only negligible differences. Again, we must assume that the high mobility of capital means that securing access to capital is not a key determinant for deciding on a startup's location. However, we found that respondents who originate from "poor" countries pay a lot more attention to the monthly costs of starting up in a city (burn rate), with 65% saying it is "very relevant" (compared to only 42% respondents from "rich" countries).

*Internet startups clearly value the burn rate higher: 55% say it is very relevant. Among high-tech startups, the share is only 45%.*

In regard to the type of startup a founder is building we found that the burn rate is clearly valued higher by internet startups, with 55% of those founders saying it is a very relevant factor (vs. 45% among the high-tech startups). This matches our expectation that internet startups would need a low cash burn rate to be in a position to scale their workforce quickly and hire a large amount of affordable marketing and customer support personnel.

High-tech startups in contrast value the access to capital higher: They have a 0.3 point advantage in the average rating of this factor and an even clearer 4 point median rating, compared to a median of only 3 points for online startups. More than half of high tech entrepreneurs think access to capital is "very relevant" (51%), compared to only 40% of their internet startup peers. For them, it seems, capital is an important factor because they cannot "bootstrap" as an internet startup, therefore they are likely willing to move to a place that offers better access to capital.

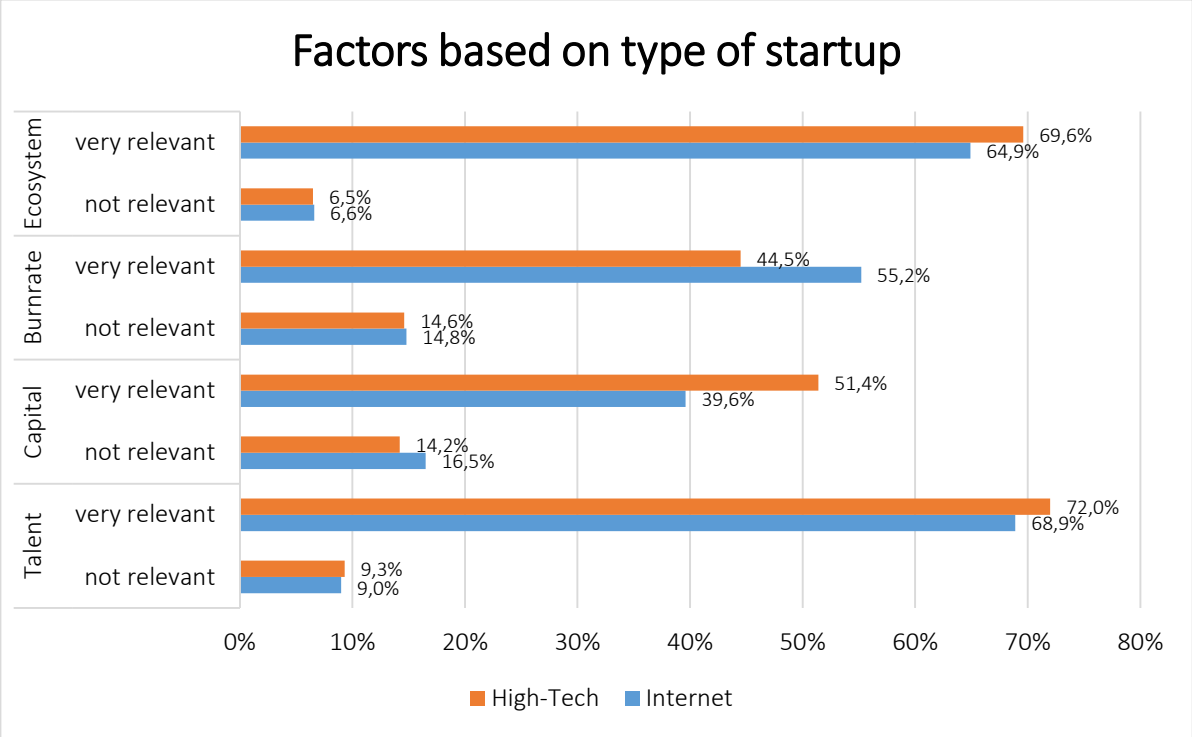


Figure 9: Are there differences between high-tech and internet startup founders?

Looking at the results, we found that the factor access to talent showed only very small (and dismissible) variations. Both types of startups exhibit similar ratings in this case, which are almost identical with the overall ratings for the factor. In regard to the quality of the ecosystem, the average and median ratings for both groups are also almost identical. There is, however, a larger share of 70% of high tech startup entrepreneurs who think that this factor is very important, compared to only 65% of online startups.

*It is apparent that access to talent and a good support network (ecosystem) are decisive factors for startup founders in their decision to move. Quite strikingly, access to capital is ranked the lowest among all four factors, showing that founders are not following the money but vice versa: Investments will follow the founders. The results show some variations in terms of the economic situation of founders and the type of startup: Especially founders from "poor" countries look more at the burn rate and high-tech startups have a higher preference for capital. To better understand the competition of startup hubs, it is crucial to know which factors drive founders when picking a location.*

## Europe's startup champions: Our ranking

**Where would you startup if you could begin all over again? Based on this question, we created a ranking of European cities. This way we can better understand the competition among startup hubs in Europe and their potential specializations in the battle for entrepreneurial talent. We then compared our ranking to the reputation of European startup hubs in prominent tech blogs. An obvious expectation would be that those hubs with more mentions in the media are also perceived as stronger and more attractive by our respondents. But it turns out we could actually debunk a few myths.**

The most obvious proxy for the perceived attractiveness of startup hubs in Europe is how media reports on them. While performing a qualitative analysis on the presentation of each hub would have been overwhelming, we concentrated on the number of mentions of startup hubs in key media outlets reporting on the startup scene. Thus, we counted the articles mentioning each city on the following four renowned blogs: Wired, TechCrunch, TheNextWeb, and Mashable. We counted the articles by performing a Google search on the blogs' websites. The resulting scores of 30 selected hubs – based on mentions in the four tech-blogs – were then combined into one average ranking (Figure 10).

| # | City | Wired | TechCrunch | TheNextWeb | Mashable | Avg. Rank |
|---|---|---|---|---|---|---|
| 1 | London | 1 | 1 | 1 | 1 | 1 |
| 2 | Paris | 2 | 5 | 6 | 2 | 3.75 |
| 3 | Berlin | 3 | 4 | 4 | 6 | 4.25 |
| 4 | Amsterdam | 5 | 10 | 2 | 9 | 6.5 |
| 5 | Barcelona | 7 | 8 | 7 | 5 | 6.75 |
| 6 | Madrid | 11 | 6 | 8 | 12 | 9.25 |
| 7 | Dublin | 14 | 15 | 5 | 8 | 10.5 |
| 8 | Manchester | 13 | 23 | 3 | 3 | 10.5 |
| 9 | Milan | 11 | 2 | 12 | 20 | 11.25 |
| 10 | Copenhagen | 6 | 3 | 15 | 22 | 11.5 |

Figure 10: Ranking based on mentions of startup hub on major tech blogs

To test this list of expectations, based on the media mentions, we ranked the same 30 hubs according to the answers in our own Startup Heatmap survey. Each survey participant was asked where he or she would be willing to startup if allowed to begin all over again. The respondents – who all characterized themselves as startup founders – could pick up to 5 cities. Overall, we collected 2.392 votes from 689 startup founders. The top two locations Berlin and London both scored 29%, and the top 10 capture 70% of the total amount of votes. We are convinced that the perceived attractiveness stands more for the quality of the ecosystem than for other factors like personal connections, preference of climate, or culture that might connect the founder with the destinations.

On average, the blogs mismatched with our founders' opinion by 4.4 ranks. The Google search ranking was the farthest off (which is why we decided not to include it in Figure 10 above) with an average 7.3 ranks deviation from our own founders' final ranking. The closest to our survey results were Wired and TheNextWeb with 3.7 and 3.8 deviations on average. TechCrunch mismatched by 5.3 ranks on average, Mashable by 4.6.

| City | # Votes | Rank in our survey | Rank difference from "expectation" |
|---|---|---|---|
| Berlin | 351 | 1 | +2 |
| London | 347 | 2 | -1 |
| Amsterdam | 241 | 3 | +1 |
| Barcelona | 162 | 4 | +1 |
| Lisbon | 110 | 5 | +20 |
| Dublin | 104 | 6 | +1 |
| Stockholm | 99 | 7 | +4 |
| Munich | 92 | 8 | +4 |
| Copenhagen | 83 | 9 | +1 |
| Vienna | 77 | 10 | +3 |
| Zurich | 70 | 11 | +6 |
| Tallinn | 67 | 12 | +17 |
| Paris | 64 | 13 | -11 |
| Hamburg | 55 | 14 | +5 |
| Warsaw | 54 | 15 | +11 |
| Prague | 49 | 16 | +8 |
| Madrid | 45 | 17 | -11 |
| Budapest | 41 | 18 | 0 |
| Luxembourg | 40 | 19 | -3 |
| Helsinki | 39 | 20 | 0 |
| Malta | 36 | 21 | +6 |
| Riga | 32 | 22 | +8 |
| Oslo | 25 | 23 | 0 |
| Rome | 22 | 24 | -10 |
| Milan | 21 | 25 | -16 |
| Manchester | 17 | 26 | -18 |
| Bucharest | 15 | 27 | 0 |
| Glasgow | 14 | 28 | -6 |
| Birmingham | 11 | 29 | -14 |
| Athens | 9 | 30 | -8 |

Figure 11: Overall ranking in our Startup Heatmap Europe survey

This observation led us to two conclusions: One is that founders are not exclusively influenced by the opinions of tech blogs, but rather have their own and independent means to decide where to start their business. Secondly, assuming that the places tech blogs write about are also those they deem to be interesting as startup locations, it seems that they do not always have their fingertips as closely on the startup pulse as they claim.

Therefore, we are convinced that our Startup Heatmap Europe can help to orientate and guide founders, stakeholders, government, and media to gain a better picture of the geography of Startup Europe.

Our findings show some impressive variations from the expectations based on media mentions. In the founders' opinion Berlin ranks number one, even before London. Both cities, however, are extremely popular with the startups, reaching both closely around 350 endorsements out of a maximum of 689. This means around half of all respondents would go to either London or Berlin. Amsterdam with 241 endorsements is the only city that comes anywhere near the top contenders. Barcelona, on 4th place, receives less than half of the votes than Berlin, and Lisbon on 5th place only a third. On the lower end, we find that Athens, Birmingham, Glasgow, Bucharest, and Manchester receive each less than 2.5% of the endorsements.

The most exceptional findings are the rise of Lisbon (+20 ranks), Tallinn (+17), and Warsaw (+11). These locations fare much better than their reputation in the media. In contrast, Manchester and Milan both drop more than 15 ranks. Birmingham, Madrid, and Rome lose more than 10 ranks. And, maybe most notably, Paris falls 11 ranks from 2nd to 13th place.

Some of these stark drops align with anecdotal stories of government-authored hypes about certain places (such as Manchester) that have been built up as a poster city for entrepreneurial development. However, these branding efforts seem not to resonate with European founders. In stark contrast, we see the successful example of Lisbon, as the new home of the Web Summit and as a vivid startup ecosystem on the rise. Apparently, founders indeed see the substance behind the hub's repositioning and reward it with the highest rise in ranks of all cities in the competition. In the case of Paris we are not completely sure whether the political situation played a role, since the survey took place during a time when Paris has been hit by a series of terrorist attacks in 2015/16. This might have impacted the willingness of founders to consider relocating there.

*The results of our survey are both surprising and reaffirming. They debunk certain myths about startup ecosystem development through PR by policymakers and community builders alike, while they endorse successful transformations as in the case of Lisbon. With Berlin taking the top position in the poll, we also see how perceptions of founders are forward-looking: The potential of Berlin trumps the traction of London, even though in the past the British capital surely fared better in terms of startup investments and exits. The rather drastic shifts when comparing our ranking with the mentions in key tech blogs reveals that we still know too little about what makes a hub thrive and why entrepreneurial talent is moving there. That is why below we examine more closely what motivates founders to move and how startup hubs can benefit in this competition thanks to specialization.*

## How startup hubs specialize

**From the outset we strongly believed that when you ask for the best hub in Europe, it makes a difference what kind of startup you ask. The type of startup and the founder's individual preferences indeed significantly shape his or her decision on where to start up.**

Therefore, we wanted to test whether the rankings of startup hubs would change when we only look at founders of high-tech companies. They typically need a much more technology-driven ecosystem. Also, we examined whether it makes a difference what key factors a founder values higher in his or her decision to move. For this purpose, we grouped startups by type and founders by preferences. For type, the two groups we established were startups that classified as high-tech (Hardware, IoT, VR, Big Data, FinTech, Health, and BioTech) and internet startups (eCommerce, mobile applications, SaaS solutions). Additionally, we identified founders who had expressed a particularly strong opinion about any of the factors for moving: Those who said access to capital, access to talent, a low burn rate, or the quality of the ecosystem were of high or very high relevance in their decision to move.

Interestingly, the biggest impact on the ranking was observed in the group of high-tech startups, with an average change of rank of 1.8, followed by the group valuing access to capital particularly high (1.46). In the following Figure 12, we compare the top 10 results for these two groups with the overall ranking:

| | Rank Overall | High-Tech | Access to Capital |
|---|---|---|---|
| 1 | Berlin | Berlin (0) | London (+1) |
| 2 | London | London (0) | Berlin (-1) |
| 3 | Amsterdam | Amsterdam (0) | Amsterdam (0) |
| 4 | Barcelona | Zurich (+7) | Barcelona (0) |
| 5 | Lisbon | Munich (+3) | Munich (+3) |
| 6 | Dublin | Stockholm (+1) | Dublin (0) |
| 7 | Stockholm | Barcelona (-3) | Stockholm (0) |
| 8 | Munich | Dublin (-2) | Copenhagen (+1) |
| 9 | Copenhagen | Vienna (+1) | Lisbon (-4) |
| 10 | Vienna | Lisbon (-5) | Zurich (+1) |

Figure 12: Rankings based on votes from high-tech founders and those who prioritize access to capital.

In both groups we see large shifts: Lisbon drops significantly in the ranks both for high-tech and for access to capital while, for example, Zurich and Munich climb up the ladder. Most impressively, Zurich is able to jump 7 ranks in the group of high-tech founders, showing that it is perceived as an outstanding ecosystem for this field. Also Munich establishes itself as a place recognized both for its technology prowess and an active capital market. Interestingly enough, the top 3 hubs stay untouched in both rankings – only London, not surprisingly, overtakes Berlin in the group that values access to capital particularly high.

In order to find hints for each city's relative strengths and weaknesses, we calculated the percentage of endorsements for each hub coming from the special interest groups (e.g. respondents that show a strong preference for capital) and from the two distinct types of startups we identified (high-tech vs. internet). We then compared these group endorsements to the city's overall ranking. What we found out, for example, is that Tallinn is more popular with internet startups and founders who value a low burn rate. Similarly, Warsaw is recognized for a low burn rate, rising 3 ranks within this group. Malta has an edge when it comes to access to capital and talent, while Hamburg suffers from a bad reputation regarding the high burn rate and comparably low access to capital for startups. Prague is popular with internet startups but is believed to offer little in terms of access to capital.

***Zurich is able to jump 7 ranks in the group of high-tech founders, showing that it is very well perceived as a high-quality ecosystem for this field.***

Figure 13 below highlights the respective strengths and weaknesses of the hubs – regarding their ability to attract certain types of startups and to position themselves as an attractive spot in terms of access to talent and capital as well as having a low burn rate and a thriving ecosystem. Policy-makers and community builders should pay close attention: To improve their hub's attractiveness they should build on the strengths and try to limit the weaknesses shown here.

*By analyzing the endorsements of those founders with a particularly strong opinion of key factors in their decision to move, we can approximate the strengths and weaknesses of major European startup hubs. These observations are important indicators in the European competition of the best places to start up, based on how they are perceived by startup founders. Our findings show that there is definitely room for specialization and that also smaller hubs can achieve a strong position on the startup map. This became most evident when looking at the rankings of the high-tech and access to capital groups. The examples of Zurich and Munich as go-to locations for capital-intensive technology startups disprove the belief that the top choice is only Berlin or London. Startups rather look out for a match between their particular needs and the qualities of a location when considering moving.*

| City | Internet | +/- | High-Tech | +/- | Talent | +/- | Capital | +/- | Burn rate | +/- | Ecosystem | +/- |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Amsterdam | 10.8% | 0 | 9.3% | 0 | 10.0% | 0 | 10.4% | 0 | 10.1% | 0 | 9.6% | 0 |
| Athens | 0.3% | 0 | 0.5% | +3 | 0.4% | +1 | 0.5% | +4 | 0.5% | +2 | 0.4% | +2 |
| Barcelona | 8.0% | 0 | 4.5% | -3 | 6.7% | 0 | 6.7% | 0 | 7.9% | 0 | 7.3% | 0 |
| Berlin | 15.3% | 0 | 14.8% | 0 | 14.6% | 0 | 14.0% | -1 | 14.9% | 0 | 14.9% | 0 |
| Birmingham | 0.6% | +1 | 0.5% | +2 | 0.5% | +1 | 0.5% | +3 | 0.7% | +3 | 0.4% | 0 |
| Bucharest | 0.6% | 0 | 0.5% | +1 | 0.7% | +1 | 0.5% | +2 | 0.5% | 0 | 0.6% | +1 |
| Budapest | 2.0% | +1 | 1.5% | -1 | 1.7% | -1 | 2.2% | +3 | 1.8% | +1 | 1.7% | -1 |
| Copenhagen | 3.0% | 0 | 3.5% | -1 | 3.7% | 0 | 3.7% | +1 | 3.3% | +2 | 3.7% | 0 |
| Dublin | 4.3% | 0 | 4.2% | -2 | 4.1% | -1 | 4.4% | 0 | 3.9% | 0 | 4.3% | 0 |
| Glasgow | 0.6% | +2 | 0.5% | 0 | 0.4% | -3 | 0.4% | -3 | 0.4% | -3 | 0.3% | -3 |
| Hamburg | 2.1% | -2 | 2.7% | +1 | 2.4% | +1 | 2.1% | -2 | 1.8% | -3 | 2.5% | +1 |
| Helsinki | 1.5% | +1 | 1.5% | +1 | 1.6% | 0 | 1.7% | +1 | 1.5% | 0 | 1.7% | +3 |
| Lisbon | 5.1% | 0 | 3.5% | -5 | 5.2% | 0 | 3.7% | -3 | 6.6% | 0 | 5.5% | 0 |
| London | 15.1% | 0 | 14.2% | 0 | 14.4% | 0 | 14.8% | +1 | 14.3% | 0 | 14.4% | 0 |
| Luxembourg | 1.4% | -1 | 2.2% | +3 | 1.6% | -1 | 1.8% | +2 | 1.6% | 0 | 1.5% | -1 |
| Madrid | 1.3% | -5 | 3.0% | +5 | 2.0% | 0 | 1.7% | -2 | 1.9% | +1 | 2.0% | +1 |
| Malta | 1.7% | +3 | 0.7% | -4 | 1.8% | +3 | 1.8% | +4 | 1.3% | -1 | 1.5% | +1 |
| Manchester | 0.6% | +1 | 0.7% | +1 | 0.8% | 0 | 0.5% | 0 | 0.6% | -1 | 0.7% | 0 |
| Milan | 0.6% | 0 | 0.9% | +2 | 0.9% | 0 | 0.7% | 0 | 0.8% | 0 | 1.0% | +2 |
| Munich | 3.6% | +1 | 4.9% | +3 | 3.8% | 0 | 4.7% | +3 | 3.3% | +1 | 4.0% | 0 |
| Oslo | 1.1% | 0 | 1.3% | +2 | 1.1% | 0 | 1.1% | 0 | 1.0% | -1 | 1.0% | 0 |
| Paris | 2.6% | +2 | 2.7% | 0 | 2.5% | +1 | 2.9% | +1 | 2.1% | -1 | 2.3% | -2 |
| Prague | 2.4% | +3 | 1.9% | -2 | 2.0% | 0 | 1.5% | -5 | 2.0% | +1 | 1.7% | -1 |
| Riga | 1.4% | +2 | 1.2% | 0 | 1.3% | 0 | 1.3% | 0 | 1.5% | +2 | 1.2% | 0 |
| Rome | 0.7% | 0 | 0.9% | +1 | 1.1% | +1 | 1.0% | 0 | 1.1% | +1 | 0.9% | -1 |
| Stockholm | 3.4% | -1 | 4.7% | +1 | 4.3% | +1 | 4.2% | 0 | 3.3% | 0 | 4.2% | 0 |
| Tallinn | 2.9% | +2 | 2.2% | -4 | 2.4% | -1 | 2.5% | -1 | 3.1% | +2 | 2.8% | +1 |
| Vienna | 2.5% | -2 | 3.8% | +1 | 3.3% | 0 | 3.2% | -1 | 3.1% | 0 | 2.9% | 0 |
| Warsaw | 2.2% | 0 | 2.3% | 0 | 2.1% | 0 | 2.4% | +1 | 2.5% | +3 | 2.5% | +1 |
| Zurich | 2.2% | -3 | 4.9% | +7 | 2.7% | 0 | 3.3% | +1 | 2.5% | -1 | 2.8% | -1 |

Figure 13: Strengths and weaknesses of startup hubs according to startup type and key factors.

## Profiles of challenger cities

**When investing on the stock market it is little use to know which the most valuable company in the world is – you rather want to know which company will be rapidly increasing its value in the future. It is quite similar for startup hubs, if you consider the benefits of early birds against latecomers: Early birds will benefit from ample resources and an overload of attention, while the others will have to fight for access in an over-crowded space.**

Ideally, you are ahead of the curve and identify the coming stars early on. Of course, you don't always need to invest in the overall winner, but could instead concentrate on a category that suits your needs best. That is why you want to analyze strengths and weaknesses of potential locations ahead of time.

To analyze a location's profile more profoundly, we had to include questions about key hubs in our survey. Of course this could only be done for a limited number of places. So we chose 7 hubs with the potential to challenge the current champions: Copenhagen, Dublin, Manchester, Milan Munich, Stockholm, and Vienna. We identified them as potential rising stars since they are on the ranks 7 to 13 in the ranking based on the number of mentions on major tech blogs. Interestingly enough, all but two of the selected cities climbed up at least one rank in the opinion of our founders. The other two crashed completely and dropped 16 and 18 ranks.

To get a good grasp of the profiles of the selected cities, we used a method inspired by the net promoter score: We analyzed endorsements for each of the key factors that drive startup founders to move – the same ones we had identified before (access to talent, capital, burn rate, and ecosystem). We only looked at the strongest opinions either endorsing a hub based on a specific factor (rating it with 4 or 5 stars out of 5), or slashing it (with a rating of 0 or 1 stars).

By subtracting the number of low votes of the endorsements and expressing it as a percentage of the new group total we gained a normed factor between $-1 < x < 1$. Values around 0 signify that low votes and endorsements are balanced. Values higher than 0 show there are more endorsements, while values below 0 signify a proportionally higher number of people who believe the factor in question is a handicap of the city.

| Hotspot City | Access Talent | Access Capital | Burn rate | Ecosystem | Ranking Points |
|---|---|---|---|---|---|
| Dublin | 0.62 | 0.65 | 0.16 | 0.61 | 24 |
| Munich | 0.64 | 0.71 | -0.06 | 0.55 | 22 |
| Stockholm | 0.68 | 0.68 | -0.28 | 0.60 | 21 |
| Vienna | 0.47 | 0.41 | 0.05 | 0.33 | 17 |
| Copenhagen | 0.46 | 0.41 | -0.32 | 0.51 | 11 |
| Manchester | 0.03 | 0.04 | -0.03 | -0.07 | 10 |
| Milan | 0.04 | -0.19 | -0.07 | -0.18 | 7 |

Figure 14: The appeal of 7 challenger cities based on key factors (higher than 0: especially attractive; below 0: especially unattractive).

Our overall ranking shows Dublin, Munich, and Stockholm significantly in the lead with overall rankings points (for this we added up the positions in each of the factor-based rankings). Evidently there is a great deal of confidence in Stockholm, Munich, and Dublin and quite some uncertainty over Milan, Manchester, and Copenhagen. Milan ends up at the bottom, scoring less than 1/3 of the points of Dublin.

Dublin as the leader of the pack was mostly endorsed for access to capital (44% gave 4 or 5 stars) and talent (42%), even though it did not earn the top spot in these categories. Also, Dublin scored especially well with internet startups, which ranked the city overall 2 ranks higher than the high-tech startups. When looking at its appeal region by region, Dublin surprised to have a good reputation in the CEE and the Mediterranean regions, capturing 20% and 16% of the possible votes. Dublin's top competitor to watch out for is definitely Lisbon, which shot up through the ranks which is both strong in Southern Europe and with internet startups. Barcelona and Amsterdam, too, are strong contenders.

Munich reached an excellent 8th rank overall, rising 4 ranks higher than mentions in tech blogs would let you expect. Clearly, this is due to its superb profile as a high-tech hub with a strong access to capital. 50% of all founders give 4 or 5 stars to the city in terms of access to capital, 48% for access to talent. High-tech startups even voted the city on rank 5, on a par with Zurich. Its international reach into CEE (13% of the vote) is also remarkable (although it does not have a special appeal on any of the other regions). Undeniably, Munich is a serious competitor to hubs like Stockholm and Zurich, both due to its regional appeal and high-tech profile.

*Munich has a superb profile as a high-tech hub with a strong access to capital.*

Stockholm is the regional champion for the Nordics, where it captured 48% of the vote. It has a strong profile in terms of access to talent (50% endorsements) and capital (46%). It fares better with high-tech than with internet startups (2 ranks up), but suffers from its reputation for having a considerably high burn rate. Again, Stockholm's top competitors are Munich and Zurich in the high-tech field as well as Copenhagen in the regional appeal.

*Manchester and Milan dropped significantly in the overall ranking compared to their reputation in the media.*

Being ranked as number 10 overall, Vienna performs less well compared with the six other hotspot cities we identified as top challengers. Only 28% endorse the ecosystem and only around a third believe it offers good access to capital and talent. Moreover, Vienna is not yet able to appeal to the neighboring CEE region, where it only captures 17% of the vote. Its international appeal beyond the neighboring region is even more sluggish, with almost no votes coming from the Baltics and the Nordics. However, Vienna is considered a good place for high-tech startups (3 ranks up) and it therefore competes directly with Munich as a hub for the CEE region. Warsaw and Prague, too, are contenders to watch.

Similarly, Copenhagen is not able to rise above a 32% endorsement rate for access to capital and 35% for access to talent. However, as number 9 in the overall ranking it stands out from Vienna, with a slightly stronger appeal to internet startups and less edge for high-tech startups. What is remarkable is the outstanding international appeal of the hub, as it was able to attract noteworthy numbers of founders from all European regions.

Manchester and Milan dropped significantly in the overall ranking compared to their media presence (-18 and -16) ranks. This is mirrored by low results in their profiles: Only 14% of founders think the ecosystem in Milan is good or very good, while Manchester reaches 18%. Their international appeal is strikingly limited, as the respondents from several European regions did not vote at all for them. Milan's performance resonates strongly with the 29% net migration outflow we see in Italy, especially since the only other Italian city in the ranking, Rome, did not score much better. For Manchester one could say that London is casting its shadow over the city internationally. However, it also only received 12% of votes from the UK and Ireland (compared to Dublin's respectable 33%).

*Looking at these results, we find that many of the challenging cities have managed to build a strong brand for their ecosystems and set out to build an even stronger international appeal. We didn't analyze in-depth the profiled cities' particular developments. But we believe it is fair to say that government and policy-makers should be aware of the fact that founders know very well what a good ecosystem looks like – and what's just PR.*

## The influence of government policies

**The next logical question is how governments can influence the development of startup ecosystems. While we couldn't analyze all the government policies aiming to support various startup hubs, we believe that we revealed certain tendencies by analyzing macro-political indicators and startup migration trends.**

Startup activity is commonly believed to thrive more in an economically free environment – an environment that offers freedom to enter markets and compete in them, and where individuals and property is protected from aggression by others.

The 2016 Index of Economic Freedom (IEF)[2] aims to measure the extent of government influence in economic activity and whether institutions and policies in place protect economic freedom. We chose the IEF as a proxy for government intervention, as it also emphasizes the entrepreneurial environment of a country.

[2] The Heritage Foundation (2016): 2016 Index of Economic Freedom. Retrieved May 23, 2016, from http://www.heritage.org/index/about.

IEF assesses countries in four key aspects of the economic environment over which governments exercise policy control: Rule of law, government size, regulatory efficiency, and market openness. When evaluating these four categories, the index measures ten specific categories of economic freedom, namely property rights, freedom from corruption, fiscal freedom, government spending, business freedom, labor freedom, monetary freedom, trade freedom, investment freedom, and financial freedom. Each of these components varies between 0 and 100, with 100 indicating the freest and most favorable entrepreneurial environment (and 0 indicating a completely unfree economy).

*One unit increase of economic freedom increases the net migration flow of startups coming to a country by 2.5%*

First, we analyzed how the scores of the 2016 IEF index affect migration streams of startups. We found that for each increase in the IEF score by one unit, there will be a 2.5% increase of net inflow of startups. The results are statistically significant at the 1% significance level (see Figure 15).

```
. regress ofnetmovement score, r

Linear regression                               Number of obs =      35
                                                F(  1,    33) =   25.51
                                                Prob > F      =  0.0000
                                                R-squared     =  0.3513
                                                Root MSE      =  .27405

------------------------------------------------------------------------------
             |               Robust
ofnetmovem~t |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       score |   .0253437   .0050183     5.05   0.000     .0151339    .0355535
       _cons |  -1.802206   .3253785    -5.54   0.000    -2.464194   -1.140219
------------------------------------------------------------------------------
```

Figure 15: Regression model on economic freedom and startup migration

By comparing the 2016 IEF scores with the net migration flows, we got an overview of the influence of government on the migration streams of startups (see Figure 16).[3] The green shades stand for different ranges of surplus net movement, while the red colors indicate a net deficit of startup migration.

The majority of the economies mentioned in our survey are at least “moderately” free according to the index. Only one (Switzerland) is ranked “free” with a score of 81. Four economies that appeared in our survey are ranked “mostly unfree” (Croatia, Bosnia, Greece, and Russia) and Ukraine is labeled as a “repressed” economy with the lowest score of 46.8.

[3] The in- and outflows are presented as percentages showing how high the inflow or outflow is in comparison to the net excess or decline.

| Rank | Country | IEF 2016 | startup net movement | | |
|---|---|---|---|---|---|
| free | Switzerland | 81.0 | 45% | | |
| moderately free | Ireland | 77.3 | -6% | | |
| | Estonia | 77.2 | 47% | | |
| | **United Kingdom** | | | 76.4 | 17% |
| | Denmark | 75.3 | 18% | | |
| | Lithuania | 75.2 | -67% | | |
| | **Netherlands** | | | 74.6 | 31% |
| | **Germany** | | | 74.4 | 11% |
| | Luxembourg | 73.9 | -30% | | |
| | Czech Republic | 73.2 | 17% | | |
| | Finland | 72.6 | -29% | | |
| | **Sweden** | | | 72.0 | 9% |
| | **Austria** | | | 71.7 | 20% |
| | Norway | 70.8 | 0% | | |
| | Latvia | 70.4 | 11% | | |
| | **Poland** | | | 69.3 | 11% |
| | Cyprus | 68.7 | -50% | | |
| | Spain | 68.5 | 50% | | |
| | Belgium | 68.4 | -19% | | |
| | Malta | 66.7 | 13% | | |
| | Slovak Republic | 66.6 | -63% | | |
| | Hungary | 66.0 | -25% | | |
| | **Bulgaria** | | | 65.9 | 13% |
| | Romania | 65.6 | -6% | | |
| | **Portugal** | | | 65.1 | 3% |
| | France | 62.3 | -42% | | |
| | Turkey | 62.1 | -14% | | |
| | **Italy** | | | 61.2 | -29% |
| | Slovenia | 60.6 | 0% | | |
| mostly unfree | Croatia | 59.1 | -23% | | |
| | Bosnia and Herzeg | 58.6 | 0% | | |
| | Greece | 53.2 | -71% | | |
| | Russia | 50.6 | -67% | | |
| repressed | Ukraine | 46.8 | -60% | | |

**Figure 16:** Economic freedom scores compared with net migration of startups. Countries with high significance of data highlighted.

Figure 16 shows that Northern and Western European countries have a higher IEF score than their Eastern and Southern European counterparts. Remarkably, the Baltic States (Estonia, Lithuania, and Latvia) clearly outperform older EU members such as France, Greece, Italy, and Portugal with regard to economic freedom.

*The survey results suggest that economic freedom has a slightly positive effect on startup migration.*

Further, the data from our survey gives us mixed results with regards to the effect of government intervention on startup migration streams. There seems to be a general tendency that countries who count as "free" or "mostly free" with low government interference are better able to grow their startup population than their peers. But the opposite holds also for a specific number of countries. For example, Luxembourg has a net outflow of 30% of its startup population, despite reaching the relatively high IEF score of 73.9. Also, Portugal manages to grow its startup population by 3% even though its level of economic freedom is below average.

As we do not yet have sufficient data to provide a thorough inflow and outflow analysis for each country, Figure 16 represents a mere snapshot of how startup migration is influenced by economic freedom. We can, however, highlight some outstanding observations from select countries, for which we have sufficient numbers of startup origins and locations. They are indicated by the boxes that stand out on the right side (see Figure 16).

For instance, countries such as the UK, the Netherlands, and Germany substantially grow their startup population, while the index characterizes them as favorable entrepreneurial environments. Also, the net migration inflow of our "surprise" candidates, namely Poland and Austria, can be partially explained by comparatively high levels of economic freedom (or less government intervention).

*Italy suffers from a "brain drain" with a 29% net outflow of startup entrepreneurs. Can its low score in economic freedom explain this?*

On the other side, the severe "brain drain" in entrepreneurial activity suffered by Italy in form of a 29% net outflow might be less surprising given its low score in economic freedom. It remains quite unclear, though, what causes the substantial differences in net inflow of the countries whose scores are relatively close. For example, while Germany and the Netherlands have a similar score around 74.5, the Netherlands achieves 20% more net inflow than Germany.

One very interesting observation is that Bulgaria and Portugal seem to defy the common expectation that less economic freedom causes a net outflow of the startup population. Both countries score below average with 65.9 (Bulgaria) and 65.1 (Portugal) in economic freedom, but manage respectable 13% and 3% net inflows. Clearly, looking at economic freedom is not enough to explain the migration flows of startup founders across Europe.

*We found some strong hints that economic freedom has an influence on net migration flows of startup founders. This suggests that government policies can help the growth of startup hubs. Even though our results are – not unexpectedly – mixed and based on a modest sample, we can make one important point: If you want to capture a portion of the vast amounts of entrepreneurial talent moving around in Europe, you need to take startups seriously. Talking about the benefits of a startup location is not enough – you need to improve it. Also, don't waste your time and money to fly in investors, as it probably won't change much: Investments follow founders. Only investing in better policies and better communities will have a significant impact on a hub's perception and performance.*

## Annex: Data quality

The data set included 702 responses after closing the online questionnaire. The questions were in English and data has been collected from November 2015 until March 2016. We invited participants through our partner networks that include startup accelerators across Europe and through dedicated social media groups for entrepreneurs in Europe.

We assume that the total number of startups in Europe is around 3 million (based on the level of self-employment recorded for the EU-28 and the assumption that 10% of this number would fall in the relevant category). In total, the study is therefore representative for founders in Europe at a confidence level of 95% and a margin of error of 4%.

The country distribution of the survey is not proportional to the population of EU countries. However, the deviations remain in an acceptable range for most of the countries. The table below (Figure 17) shows the distribution of participants according to the country of their current location against the share of the EU population living in that country. Noteworthy differences appear in France, UK, Spain, Italy, and Portugal. Some countries (like France) are underrepresented and others (like Portugal) overrepresented. Concerning the final ranking of hotspots, a deviation of 1% in the number of participants from a specific country results in a maximum 0.3% impact on the total votes. This means that for example the Portuguese vote weighs around 2% more and the French 3% less than it should.

In a review of the raw data, we cleaned up the results in two steps: First, we corrected mistakes and irregularities concerning the responses, such as translating city and country names into English and correcting mistakes in spelling.

In the second step, we applied common standards of data quality control for online surveys and excluded the whole data set of responders who did not meet our quality standards. This was the case when someone gave exactly the same answer on a vast majority of the requested numerical items, known as "straight-liners". Another indicator for bad data and therefore a reason to exclude the whole set of the responder were contradictory statement. This was the case when someone rated one of the hotspot cities very low on the factors, but then gave the same city a high rating in the hotspot-ranking (“consistency check”).

Other indicators, such as one word answers and all or single checkbox answers, were accounted for but did not apply to our data. We did not insert a trap-question (Red Herring Question) and were technically not able to check for “speeders” in our questionnaire.

| Countries | % of EU | % of participants | Difference |
|---|---|---|---|
| Germany | 15.2% | 20.2% | 5.0% |
| Portugal | 2.0% | 9.3% | 7.3% |
| Bulgaria | 1.4% | 6.8% | 5.4% |
| United Kingdom | 12.0% | 5.8% | -6.2% |
| Netherlands | 3.2% | 5.6% | 2.4% |
| Poland | 7.2% | 5.0% | -2.2% |
| Austria | 1.6% | 4.3% | 2.7% |
| Italy | 11.3% | 3.6% | -7.7% |
| Sweden | 1.8% | 3.1% | 1.3% |
| Spain | 8.9% | 2.8% | -6.0% |
| Switzerland | 1.5% | 2.8% | 1.3% |
| Latvia | 0.4% | 2.7% | 2.3% |
| Ireland | 0.9% | 2.3% | 1.4% |
| France | 12.4% | 2.1% | -10.2% |
| Romania | 3.8% | 2.1% | -1.7% |
| Estonia | 0.3% | 2.1% | 1.9% |
| Slovenia | 0.4% | 2.1% | 1.7% |
| Belgium | 2.1% | 1.9% | -0.3% |
| Denmark | 1.1% | 1.6% | 0.5% |
| Croatia | 0.8% | 1.4% | 0.6% |
| Malta | 0.1% | 1.1% | 1.0% |
| Luxembourg | 0.1% | 1.0% | 0.9% |
| Serbia | 1.3% | 0.9% | -0.4% |
| Czech Republic | 2.0% | 0.9% | -1.1% |
| Hungary | 1.9% | 0.9% | -1.0% |
| Finland | 1.0% | 0.7% | -0.3% |
| Norway | 0.9% | 0.6% | -0.3% |
| Bosnia | 0.7% | 0.4% | -0.3% |
| Slovakia | 1.0% | 0.4% | -0.6% |
| Greece | 2.1% | 0.3% | -1.8% |
| Lithuania | 0.6% | 0.3% | -0.3% |
| Cyprus | 0.2% | 0.1% | 0.1% |

Figure 17: Distribution of survey participants compared to EU population

Applying these standards, we excluded 12 responders from our data, which left us with 689 observations. To enhance the scope of our results, more data was added to our survey results. This included location data, GDP per capita, and the unemployment rates of the European countries.

*We are aware that our results have to be considered with care. Although we do have a proper sample size, some countries might be under- and others over-represented. For the follow-on survey a more even distribution among European founders is essential. Also, some detail questions regarding sub groups of the survey suffer from a lower representativeness. Nevertheless, the results of the conducted research give a strong tendency regarding insights and outlooks of the European start-up scene of today and tomorrow.*