The next generation of tech ecosystems.

Actionable benchmarks from 201 tech ecosystems based on investment, innovation, talent, and outcome.

December, 2022
Our mission: bringing data transparency to every tech ecosystem.

**Investors**
Source deals & raise capital

**Providers**
Provide services to startups & scaleups

**Strategists & researchers**
Stay at forefront of innovation

**Enablers & public bodies**
Build & foster the ecosystem

**Builders**
Raise capital, recruit, be visible in ecosystem
We empower over 75 governments with innovation data and insights, enabling them to monitor & build their tech ecosystem.
Predictive algorithms to detect emerging tech and promising companies.

### Table

<table>
<thead>
<tr>
<th>Name</th>
<th>Dealroom Signal</th>
<th>Market</th>
<th>Type</th>
<th>Growth 12 months</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foundation Labs, Inc.</td>
<td>95</td>
<td>B2B, B2C fintech media</td>
<td>blockchain commission</td>
<td>277%</td>
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<td>Overtone</td>
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<td>B2C health</td>
<td>manufacturing</td>
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<td>CompPair</td>
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<td>B2B space</td>
<td>deep tech 3d technology</td>
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<td>cadanapay</td>
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<td>Evo Foods</td>
<td>86</td>
<td>B2B food</td>
<td>selling own inventory</td>
<td></td>
</tr>
</tbody>
</table>

### Categories

- (Pre)seed opportunities »
- Series A opportunities »
- Breakout opportunities »
- Unicorns »
Get real-time analytics on any location.
Energy marketplaces keeping the lights on

Energy instability is becoming an increasingly pronounced issue in Europe. While energy marketplaces are just starting to tackle commoditized markets (e.g. energy, precious metals, crude-oil, etc.), many are gaining...

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Market maps across thousands of niche segments

Deep-dives into ecosystems and industries

Investment trends

Compare any tech ecosystem

Investment heatmaps

Top Tech Ecosystems

Latest Reports

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Providing a 360-degree view on tech ecosystems.

Talent
- Job openings
- Founders
- Employment data

Innovation
- Tech stack
- Patents
- Startups
- Scaleups
- R&D projects
- Unicorns

Capital
- VC firms
- Family offices
- Valuations
- Funding rounds
- Exits

Enablers
- Accelerators
- Universities
- Governments
- Grants
- Trade registers
- Workspace

Dealroom.co
The next generation of tech ecosystems

2 Capital & investment
3 Innovation & talent
4 Economic outcomes
5 Regional lens
6 Methodology
During the past three decades, technology has eclipsed all sectors, driven by a series of technological inflection points. Mostly VC-backed companies have seized on the opportunity.

Of the world's 20 most valuable companies, 17 of them are VC backed tech companies. Many of them originated from the Bay Area.
Following the Bay Area’s lead, dozens of tech ecosystems have sprung up globally. Over 40 of them have created over $100B in value.
There are now 168 cities with at least one unicorn or $1B+ exit. Back in 2010, this number was just 12.

Knowledge about building startups has become much more widespread in the last decade.

These cities have acted as platforms that facilitate talent, capital, infrastructure and enablers.

The fact that there are now 168 unicorn cities bodes well for the future, as unicorns can be excellent founder factories, creating a positive flywheel effect.
Now, a new phase of radical innovation has begun, driven by breakthroughs in frontier technologies.

Startups and frontier R&D do not naturally overlap, but the intersection is also where cutting-edge innovation is happening.

**Startups**
- Designed to grow fast
- Exploit existing technologies
- Go-to-market in search for product-market fit from day one
- Lean approach, can be initially bootstrapped
- Scalable product
- Novel technology
- Long cash burn pre revenue
- Long feedback cycle
- Led by scientific team

**R&D**
- Advanced materials
  - CO2 negative materials, Bio-plastics
  - Synthetic diamonds, Graphene
- Synthetic biology
  - FoodTech & Agritech (cultivated meat, modified crops), Bio-fuels & bio-chemicals, DNA synthesis, Health
- Future of Computing
  - Quantum computing, Silicon photonics, AR/VR/MR, Neuromorphic & advanced AI chips, Decentralized computing, Brain-computer interfaces
- Space Tech
  - Reusable and next-gen rockets, Satellites, In-space transportation, In-space manufacturing, Debris removal
- Future of Energy
  - Nuclear fusion, Next-gen battery chemistries, Large-scale storage, Green hydrogen, Supercapacitors, Waste heat recovery
- Artificial intelligence
  - Generative AI, AI-first biology, Privacy-preserving AI, Explainable AI, AI acceleration, Autonomous systems, General purpose AI

Source: Dealroom.co. Examples of novel domains in tech (taken from upcoming Deep Tech report created with Lakestar and Walden).
This decade will require tech ecosystems to bring together entrepreneurship, knowledge, capital, deep R&D, and science into one seamless platform.

**Capital & Investment**
- Ability to attract venture capital across stages (early, breakout, late)

**Innovation & Talent**
- Development of intellectual property (patents)
- Linkage between universities and entrepreneurship

**Economic upside**
- Performance relative to economic stage of development
- Affordability of living

**Entrepreneurialism**
- Conversion from startup to $1B+ company
- Ability to produce flywheel effect of multiple unicorns

Source: Dealroom.co. See Methodology (chapter 6) for more.
How prepared are cities for the next decade? 201 cities in 65 countries were analyzed for this report.

- Tier 1 (20+ unicorns)
- Tier 2 (5-19 unicorns)
- Tier 3 & 4 (0-4 unicorns)

Selection criteria

The dataset starts with 168 cities that have at least one unicorn. An additional 33 cities have at least >$100M in funding and min 50 VC rounds since 2017.

In this report, each “city” is actually a metro area consisting of multiple cities, suburbs and nearby towns.

In forthcoming editions of this report we expect to add more cities and we welcome suggestions from readers.

Number of qualified cities per country (top 10)

- United States: 49
- United Kingdom: 16
- China: 10
- France: 9
- India: 8
- Canada: 7
- Germany: 6
- Netherlands: 5
- Belgium: 5
- Brazil: 4

Source: Dealroom.co
Not all tech ecosystems are created equal. For instance, New York cannot be compared with Oxford. We created three lenses by which to benchmark ecosystems.

**Scale lens**

**Trailblazers**

Leading by metrics such as venture capital and creation of successful startups and scaleups.

Presence of established local venture capital sector and capital markets to support life cycle from seed to IPO.

$1 trillion companies are most likely to get built here. The success of these ecosystems opens up new possibilities across the globe, hence the term Trailblazers.

**Per capita lens**

**Science Hubs**

High output per inhabitant, driven by academic/research footprint. Strong universities-to-startups linkage.

Often smaller cities like Oxford or Leuven. Sometimes part of bigger ecosystems like the Bay Area, London or Boston.

Key for development of novel and cutting edge technology (Deep Tech).

**Growth lens**

**Rising Stars**

Benefiting from globalization of venture capital and distributed teams.

Often emerging economies with lower cost of living.

Presence of local early-stage VCs, but lacking depth of follow-on investors.

Need strong connection with bigger ecosystems to thrive.
Transparent & comprehensive framework to benchmark tech ecosystems globally.

**Trailblazers**

- **Scale lens**
  - Bay Area (#1)
  - New Palo Alto (#2)
  - New York City (#3)
  - Boston (#4)
  - London (#5)
  - Los Angeles (#6)
  - Paris (#7)
  - Tel Aviv (#8)
  - Tokyo (#9)
  - Beijing (#10)
  - Chicago (#11)
  - Bengaluru (#12)
  - Shanghai (#13)
  - Seoul (#14)
  - San Diego (#15)
  - Berlin (#16)
  - Washington DC (#17)
  - Philadelphia (#18)
  - Seattle (#19)
  - Singapore (#20)
  - Toronto-Waterloo (#21)
  - Stockholm (#22)
  - New Jersey (#23)
  - Mumbai (#24)
  - Austin (#25)
  - Delhi (#26)
  - Munich (#27)
  - Raleigh-Durham (#28)
  - Shenzhen (#29)
  - Atlanta (#30)
  - São Paulo (#31)
  - Zurich (#32)

**Science Hubs**

- **Per capita lens**
  - Bay Area (#1)
  - Boston (#2)
  - Cambridge, UK (#3)
  - San Diego (#4)
  - Oxford (#5)
  - Charlottesville (#6)
  - Eindhoven (#7)
  - Munich (#8)
  - Zurich (#9)
  - Santa Barbara (#10)
  - Geneva (#11)
  - Stockholm (#12)
  - Boulder (#13)
  - Leuven (#14)
  - New York City (#15)
  - Basel (#16)
  - Hafia (#17)
  - Seattle (#18)
  - Raleigh-Durham (#19)
  - Tel Aviv (#20)
  - Ghent (#21)
  - Austin (#22)
  - Bristol (#23)
  - London (#24)
  - New Palo Alto (#25)
  - Salt Lake City (#26)
  - Philadelphia (#27)
  - Detroit (#28)
  - Paris (#29)
  - Oulu (#30)
  - Luxembourg (#31)
  - Dublin (#32)

**Rising Stars**

- **Growth lens**
  - Bengaluru (#1)
  - Dublin (#2)
  - Budapest (#3)
  - Bhopal (#4)
  - Mumbai (#5)
  - Chennai (#6)
  - Oslo (#7)
  - Delhi (#8)
  - Woodaw (#9)
  - Belo Horizonte (#10)
  - Istanbul (#11)
  - Warsaw (#12)
  - Jakarta (#13)
  - Pune (#14)
  - Vinnus (#15)
  - Kyiv (#16)
  - Toronto-Waterloo (#17)
  - Riyadh (#18)
  - Tallinn (#19)
  - Angora (#20)
  - Mexico City (#21)
  - Lagos (#22)
  - Prague (#23)
  - Porto (#24)
  - Ho Chi Minh City (#25)
  - Portland (#26)
  - Mannheim (#27)
  - Vancouver (#28)
  - Amsterdam (#29)
  - Calgary (#30)
  - São Paulo (#31)
  - Düsseldorf (#32)

**Points**

- Early stage: 0-100
- Breakout stage: 101-200
- Late stage: 201-300
- University talent: 301-400
- Patents: 401-500
- Unicorns & $1B+ exits: 501-600

**Points**

- Early stage: 0-100
- Breakout stage: 101-200
- Late stage: 201-300
- Universities: 301-400
- Patents: 401-500
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**Points**

- Early stage: 0-100
- Breakout stage: 101-200
- Late stage: 201-300
- Startup success rate: 301-400
- Unicorns: 401-500
- GDP adjusted output: 501-600
- Affordability: 601-700
When looking at the raw scale, the top spots are snagged by the usual suspects (Bay Area, New York, Boston), with noteworthy individual performances.

One new name makes the list: New Palo Alto, a cluster of European cities of close proximity, similar to the Bay Area. Within a four-hour train ride connecting London, Paris, and Amsterdam, lie some of the world’s best universities, diverse talent pools, innovative tech companies, and globally the highest concentration of cities that have produced unicorns.

The Bay Area being the clear #1 won’t surprise anyone. The chart on the left shows it does so by a wide margin. It leads by nearly every metric, but not all.

Tokyo is the frontrunner in Asia. It has a smaller startup ecosystem yet over-indexes on international patent registrations. The total number of active patents is perhaps a crude metric, but adding this quantifies Tokyo’s massive innovative capacity from an industrial point of view.

The positions of Beijing and Shanghai are lower than they might have been a few years ago. China-only patents are not counted and the methodology puts emphasis on what happened since 2019 when China’s tech sector was starting to decline relative to the rest of the world.
The Science hub lens places more emphasis on the development of deep tech, university talent, and patents on a per capita basis. Why? When it comes to science hubs, small can sometimes be a good thing, especially when there is specialization happening. The result is a mix of big generalist and small specialist science hubs.

The Bay Area still tops the list, despite being a large ecosystem. Due to its sheer scale, it is still relatively dense despite being a much larger metro area. It also has a massive patent and deep tech footprint. It is, however, closely followed by Cambridge (UK) and Boston. Both score better on university talent.

Patent data combined with venture capital data helps create a powerful holistic picture of innovation. It helps us identify innovation hubs that would have been far less visible if we were looking only through a venture capital lens.

For instance, San Diego has a strong patent footprint, especially in telecommunications. Leuven, Zurich, and Boston excel in life sciences. Eindhoven and Cambridge are strong in semiconductors. Basel is strong in materials science, sensors & optics.
When looking at growth, many names emerge that are far less obvious. We constructed this benchmark with the explicit goal to discover ecosystems that may be relatively under the radar, but have undergone rapid transformation.

The results also show a very close call within the top 5 and again a very close call between numbers 10 to 32. But there are big differences in the way each city ended up there (their success factors).

For instance, **Bengaluru** tops this category for excelling in its high ratio of unicorns relative to GDP per capita. **Curitiba**, Brazil, does well thanks to its high conversion from series A to unicorn.

While **Bogotá**, the Columbia capital, ranks well thanks to its high conversion from series A to unicorn. **Oslo** scores well in unicorn growth; Amsterdam in terms of growth stage funding (megarounds).

This heterogeneity is visually apparent by every bar having a very different color composition – unlike the Trailblazers chart which is much more uniform.
Rising stars.

0–4 unicorns
1. Bogotá
2. Curitiba
3. Zagreb
4. Riyadh
5. Wrocław
6. Belo Horizonte
7. Columbus
8. Accra
9. Turin
10. Kyiv

5–19 unicorns
1. Oslo
2. Chennai
3. Mumbai
4. Toronto-Waterloo
5. Istanbul
6. Pune
7. Mexico City
8. Malmö
9. Portland
10. Boulder

20+ unicorns
1. Bengaluru
2. Delhi
3. Amsterdam
4. Bay Area
5. Beijing
6. São Paulo
7. New York City
8. New Palo Alto
9. Tel Aviv
10. Paris

Source: Dealroom.co.
The Bay Area is #1 in everything except patent development and university linkage. New York over-indexes on number of unicorns and $1B+ exits. New Palo Alto’s strongest suit is it’s highly connected university and venture capital networks.

- Bay Area (#1)
- New Palo Alto (#2)
- New York (#3)
- Boston (#4)

Paris is over-indexing on university linkage with many startup founders from local universities. Los Angeles is more allround. London over-indexes on early stage funding and Tel Aviv outperforms on number of unicorns.

- London (#5)
- Los Angeles (#6)
- Paris (#7)
- Tel Aviv (#8)

Source: Dealroom.co. Percentage indicates % of possible score reached. #1 has 100%.
Per capita lens: the top 7 Science Hubs …

In the top 7 Science Hubs, the Bay Area is the allround leader, although it scores lower on university linkage (less academic startup founders). Science supercluster New Palo Alto is represented three times with Cambridge (UK), Oxford and Eindhoven.

Bay Area (#1)  Boston (#2)  Cambridge UK (#3)  San Diego (#4)
Oxford (#5)  Charlottesville (#6)  Eindhoven (#7)

Munich scores high thanks to a life science and industrial tech focus. Zurich and Geneva are geographically close by with a similar field of specialisation. Santa Barbara has a high number of unicorns per inhabitant and strong university linkage.

Munich (#8)  Zurich (#9)  Santa Barbara (#10)
Geneva (#11)  Stockholm (#12)
Explore the footprint of 201 cities ... 

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... or go straight to the raw data.

Open Google Sheet »
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There are roughly 207,000+ active VC-backed startups & scaleups globally.

Every year, about 12,000 new startups receive their first investment from a VC.

- **North America**: 84,000+
- **EMEA**: 67,000+
- **Rest of World**: 54,000+

They are created from about 1,686 different cities. There are about 314 known cities with at least 5 rounds in 2021. Some of these cities we have grouped into metro areas, resulting in about 200 metro areas.

When including not VC backed companies, we estimate that about 5x this number of startups is created every year. However this very much depends on the definition of VC backed.

Roughly 1-2% of seed-funded startups reach a billion dollar status.

- **Early stage** ($<1M–15M): 81,600+ companies
- **Breakout stage** ($15–40M): 18,400+ companies
- **Growth stage** ($100M+): 5,700+ companies

- **$100B+**
  - View 19 companies
- **$10B+**
  - View 361 companies
- **$1B+**
  - View 4,000+ companies

**Late stage**
- View 5,700+ companies

**Breakout stage**
- View 18,400+ companies

**Early stage**
- View 81,600+ companies

Source: Dealroom.co
Global venture capital is back to pre-pandemic activity levels.

VC investment in Global startups » view online

$250B

$200B

$150B

$100B

$50B

$50B

$100B

$150B

$200B

$250B

2015 Q1 Q2 Q3 Q4 2016 Q1 Q2 Q3 Q4 2017 Q1 Q2 Q3 Q4 2018 Q1 Q2 Q3 Q4 2019 Q1 Q2 Q3 Q4 2020 Q1 Q2 Q3 Q4 2021 Q1 Q2 Q3 Q4 2022 Q1 Q2 Q3 Q4

$250m+ rounds
$100–250m
$40–100m (series C)
$15–40m (series B)
$4–15m (series A)
$1–4m (seed)
$0–1m (pre-seed)

Growth
Breakout
Early

Explore the data.

North America »
Europe »
Asia »
Oceania »
Africa »
South America »

AMOUNT INVESTED Locations

Greater London
Ile-de-France (Paris Region)
Berlin/Brandenburg Metropolitan Region
Greater Stockholm
Munich Metropolitan Area
Amsterdam Metropolitan Area
Greater Oslo Region
Greater Helsinki Area
Greater Zurich Area
Community of Madrid

2013 2014 2015 2016 2017

$623m $899m $1.3b $1.6b $2.0b
$364m $391m $628m $869m $1.1b
$232m $308m $326m $442m $665m
$67.5m $176m $233m $395m $551m
$99.9m $108m $157m $141m $262m
$99.4m $107m $86m $163m $114m
$15.5m $41.8m $61.7m $82m $127m
$110m $169m $134m $224m $202m
$53m $46.3m $79.5m $85.4m $523m
$89.8m $122m $101m $86.7m $145m
Venture rounds are self-labelled without much consistency. Letters will never give a true sense of where a company is at in terms of their development whereas the amount of capital they consume is a much better reflection – by breaking down funding into phases of capital raised it gives founders a much better sense of what it takes to get from one stage to the next.

**Saul Klein**  
Co-founder of LocalGlobe

If I look back to the beginning of the current tech boom which started around 2009, we often wrote a $3–5 million check and this was called an “A round” and 12 years later in an over-capitalized market this became known as a “Seed Round” but in truth what we do hasn’t changed much at all.”

**Mark Suster**  
Founder of Upfront Ventures

Source: Dealroom. Analysis includes all jobs at startups created by companies founded after 1990 as of October 2022, excluding companies with marketplaces & commerce as business model. More in the methodology section.
The Bay Area startups raise more venture capital than the next three cities combined. But when it comes to early stage investing, the gap is much narrower.
The Bay Area USA

Cities & towns: San Francisco, Palo Alto, Menlo Park, Stanford
Universities: University of San Francisco & University of California
First unicorn: eBay in 1999
Iconic companies: Salesforce, Facebook, Google, Uber and Airbnb
Top patents categories: Information, Semiconductors and Telecommunications
Notable spinouts: Keysight Technologies, Medable and OmniAB
Combined enterprise value: $7.4 trillion
Cost of living: 95% of New York

#1 Unicorns since 2019
#1 Early stage funding
#1 Breakout funding
#1 Growth funding
#3 University alumni
#2 Patents
New Palo Alto has nearly caught up with the Bay Area in early-stage investment. Asia over-indexes in super mega rounds.

Source: Dealroom.co.
Bogotá: #1 ecosystem in Growth in Early VC funding. Today, the Colombian ecosystem has an estimated total combined enterprise value of $12.4B. Last-mile delivery startup Rappi became Columbia’s first $1B+ valued startup in 2018, with the company founded in 2015. Since 2015, over $4.2B has been raised by Bogotá-based startups. While late-stage rounds are still rare, early-stage investment is on an upward trend. Year-to-date, over $700M in VC funding has been raised by Bogotá startups across 55 rounds. Bogotá, Colombia
Cities & towns: Soacha, Facatativá, Mosquera, Chía
Universities: University of the Andes, National University of Colombia and the Pontifical Javeriana University
First unicorn: Rappi in 2018
Iconic companies: LINE, Nexon, Rakuten, Kakao
Notable spinouts: Rappi, Habi and Addi
Combined enterprise value: $12.5 billion
Cost of living: 27% of New York
Unicorn conversion: #5
Early stage funding growth: #1
Breakout stage funding growth: #173
Unicorn growth: #51
Unicorn to GDP ratio: #49
Affordability of living: #6

Explore Bogotá »
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Research & Development (R&D) investment is 6.5x higher than venture capital investment. Over 70% of R&D investment is done by corporates.

Global venture capital has grown 4x over the last decade (ignoring the 2021 hype year).

But there’s innovation happening beyond startups. Venture capital is still dwarfed by R&D investment, which has grown 2x over the same period.

Source: Dealroom.co analysis of OECD data for R&D. EMEA region includes the EU27 countries including the UK, Israel and South Africa. VC data from Dealroom.co
Frontier R&D is dominated by formerly venture-backed companies. Ergo, there’s an indirect link between corporate R&D and venture capital.

<table>
<thead>
<tr>
<th>Corporate R&amp;D spend ($ billions)</th>
<th>United States</th>
<th>EU-27</th>
<th>Japan</th>
<th>China</th>
<th>South Korea</th>
<th>United Kingdom</th>
<th>Germany</th>
<th>France</th>
<th>Israel</th>
<th>Taiwan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internet, software, hardware</td>
<td>114</td>
<td>9</td>
<td>9</td>
<td>15</td>
<td>17</td>
<td>1</td>
<td>4</td>
<td>2</td>
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<td>Semiconductors</td>
<td>39</td>
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<tr>
<td>Pharma, biotech, healthcare</td>
<td>84</td>
<td>52</td>
<td>14</td>
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<td>0</td>
<td>13</td>
<td>8</td>
<td>8</td>
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<td>Automotive</td>
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<td>Aerospace and Defense</td>
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<td>2</td>
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<tr>
<td>Telecom</td>
<td>13</td>
<td>16</td>
<td>2</td>
<td>3</td>
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<tr>
<td>Oil &amp; Gas</td>
<td>1</td>
<td>3</td>
<td>0</td>
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<td>0</td>
<td>0</td>
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<td>0</td>
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</tr>
</tbody>
</table>

This decade will require ecosystems that can combine entrepreneurship, capital, deep R&D and science.

Source: Dealroom.co analysis of 2018 PWC data on 1,000 publicly listed companies.
Patents are an indicator of research output. Additional ecosystems emerge such as Tokyo, Seoul, San Diego when looking through this lens.

<table>
<thead>
<tr>
<th>City</th>
<th>Total</th>
<th>Information</th>
<th>Telecom</th>
<th>Electrical</th>
<th>Energy</th>
<th>Life sciences</th>
<th>Materials</th>
<th>Mechanical</th>
<th>Sensors &amp; optics</th>
<th>Semiconductors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tokyo</td>
<td>513,182</td>
<td>131,819</td>
<td>27,575</td>
<td>73,044</td>
<td>24,681</td>
<td>54,852</td>
<td>37,923</td>
<td>41,372</td>
<td>67,690</td>
<td>53,053</td>
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<tr>
<td>Bay Area</td>
<td>287,776</td>
<td>108,709</td>
<td>35,966</td>
<td>23,066</td>
<td>5,543</td>
<td>20,905</td>
<td>6,309</td>
<td>10,151</td>
<td>21,247</td>
<td>53,546</td>
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<tr>
<td>San Diego</td>
<td>140,394</td>
<td>36,233</td>
<td>47,700</td>
<td>9,856</td>
<td>1,873</td>
<td>15,618</td>
<td>2,168</td>
<td>5,004</td>
<td>10,929</td>
<td>9,369</td>
</tr>
<tr>
<td>Boston</td>
<td>120,420</td>
<td>19,818</td>
<td>5,840</td>
<td>13,795</td>
<td>13,154</td>
<td>29,740</td>
<td>5,612</td>
<td>13,463</td>
<td>11,000</td>
<td>6,642</td>
</tr>
<tr>
<td>Los Angeles</td>
<td>114,772</td>
<td>24,807</td>
<td>11,306</td>
<td>11,268</td>
<td>2,617</td>
<td>16,698</td>
<td>3,288</td>
<td>7,869</td>
<td>8,989</td>
<td>26,750</td>
</tr>
<tr>
<td>Houston</td>
<td>72,077</td>
<td>13,074</td>
<td>3,247</td>
<td>4,398</td>
<td>1,710</td>
<td>3,818</td>
<td>9,826</td>
<td>27,872</td>
<td>4,409</td>
<td>3,657</td>
</tr>
<tr>
<td>Shenzhen</td>
<td>65,947</td>
<td>12,813</td>
<td>29,746</td>
<td>8,490</td>
<td>1,824</td>
<td>1,633</td>
<td>969</td>
<td>2,491</td>
<td>5,001</td>
<td>2,419</td>
</tr>
<tr>
<td>Chicago</td>
<td>56,769</td>
<td>6,963</td>
<td>3,687</td>
<td>6,798</td>
<td>4,025</td>
<td>8,056</td>
<td>7,349</td>
<td>14,496</td>
<td>4,034</td>
<td>1,187</td>
</tr>
<tr>
<td>Seattle</td>
<td>56,397</td>
<td>32,359</td>
<td>5,496</td>
<td>3,304</td>
<td>783</td>
<td>3,173</td>
<td>701</td>
<td>3,265</td>
<td>4,041</td>
<td>3,211</td>
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</tbody>
</table>

Source: Dealroom.co analysis of Cipher data.
Patent data helps identify innovation hot spots (such as Leuven, Eindhoven, Basel) which are less visible if only looking through a venture capital lens.
Many startups have their roots in academia. And universities are a breeding ground for entrepreneurs more generally. This benchmarking measures the linkage between universities and the startup ecosystem.

<table>
<thead>
<tr>
<th>Name</th>
<th>Locations</th>
<th>Alumni-Founded Startups</th>
<th>Alumni-Founded Founders</th>
<th>Alumni-Founded Unicorns</th>
<th>Alumni-Founded Future Unicorns</th>
<th>Alumni-Founded Startups</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stanford University</td>
<td>Stanford Kentucky</td>
<td>828</td>
<td>649</td>
<td>7</td>
<td>14</td>
<td>5132</td>
</tr>
<tr>
<td>Harvard Business School</td>
<td>Boston Massachusetts</td>
<td>752</td>
<td>607</td>
<td>12</td>
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<tr>
<td>University of California, Berkeley</td>
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<td>502</td>
<td>439</td>
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<td>15</td>
<td>3301</td>
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<tr>
<td>Harvard University</td>
<td>Cambridge Massachusetts</td>
<td>619</td>
<td>485</td>
<td>11</td>
<td>18</td>
<td>3281</td>
</tr>
<tr>
<td>Massachusetts Institute of Technology (MIT)</td>
<td>Cambridge Massachusetts</td>
<td>680</td>
<td>461</td>
<td>3</td>
<td>7</td>
<td>3038</td>
</tr>
<tr>
<td>The Wharton School</td>
<td>Philadelphia Pennsylvania</td>
<td>333</td>
<td>261</td>
<td>9</td>
<td>12</td>
<td>2450</td>
</tr>
<tr>
<td>Stanford Graduate School of Business</td>
<td>Stanford Kentucky</td>
<td>405</td>
<td>283</td>
<td>11</td>
<td>17</td>
<td>2323</td>
</tr>
<tr>
<td>University of Cambridge</td>
<td>Cambridgeshire England</td>
<td>1201</td>
<td>1058</td>
<td>12</td>
<td>26</td>
<td>2105</td>
</tr>
</tbody>
</table>
New Palo Alto is a Science Supercluster: three out of the top 10 science hubs within 4 hours commuting distance. A good example of an ecosystem that can combine science, entrepreneurship, capital, and frontier R&D.
Boston USA

Cities & towns
Boston, Cambridge, Worcester, Providence, Lowell

Universities
Harvard, MIT, Boston University

First unicorn
Wayfair in 2011

Iconic companies
Moderna Therapeutics, Nuance Communications

Top patents categories
Life sciences, Information & Mechanical

Notable spinouts
Boston Meats and Kula Bio

Combined enterprise value
$971.6 billion

Cost of living
80.5% of New York

University talent
University alumni that founded startups that raised >$10M

- New Palo Alto
- Boston
- Bay Area
- Paris
- London
- New York City
- Chicago
- Los Angeles
- Tel Aviv
- Philadelphia
- Cambridge, UK
- Raleigh-Durham
- Barcelona
- Toronto-Waterloo
- Munich
- New Jersey
- Zurich
- Madrid
- Montréal
- Haifa

Percentiles:
90% - 222
80% - 107
70% - 60
60% - 37
50% - 23
40% - 16
30% - 11
20% - 6
10% - 1

Unicorns since 2019
#6

Early stage funding
#6

Breakout stage funding
#4

Late stage funding
#6

University alumni
#2

Patents
#5

Explore Boston »
University talent per inhabitant

Per inhabitant number of university alumni founders who raised >$10M

Cambridge, UK
Boston
Oxford
Charlottesville
Bay Area
Haifa
Ghent
Geneva
Santa Barbara
Munich
Bristol
Raleigh–Durham
Zurich
Leuven
Tel Aviv
New Palo Alto
Paris
Nottingham
London
Oulu

Cambridge, UK
Boston
Oxford
Charlottesville
Bay Area
Haifa
Ghent
Geneva
Santa Barbara
Munich
Bristol
Raleigh–Durham
Zurich
Leuven
Tel Aviv
New Palo Alto
Paris
Nottingham
London
Oulu

Cambridge, St Ives and Huntington
University of Cambridge
ARM in 1998
ARM and Aveva
Semiconductors, Life Sciences and Information
CamSemi, DarkTrace and BitBio
$66.9 billion
63.9% of New York

#6 Deep tech unicorns per inhabitant
#11 Early stage VC per inhabitant
#11 Breakout stage VC per inhabitant
#25 Late stage VC per inhabitant
#1 University alumni >$10M per inhabitant
#14 Patents per inhabitant

Explore Cambridge »

Page / 40  Source: Dealroom.co.
Tokyo JAPAN

Cities & towns
Tokyo, Yokohama, Kawasaki, Saitama, Chiba, Sagamihara

Universities
Tokyo Institute of Technology, The University of Tokyo, Keio University

First unicorn
DeNA in 2017

Iconic companies
LINE, Nexon, Rakuten, Kakao

Top patents categories
Information, Electrical and Sensors & Optics

Notable spinouts
Heptares Therapeutics and Raptuya Robotics

Combined enterprise value
$175.5 billion

Unicorns since 2019
#35

Early stage funding
#11

Breakout funding
#16

Growth funding
#34

University alumni
#142

Patents
#1

Explore Tokyo »
Oslo: #1 ecosystem for $1B+ valued startups growth rate

The Norwegian capital hosts an estimated total combined enterprise value of $23B. The web browser startup Opera became the first $1B+ valued startup in Oslo back in 2016. Since then, Oslo has produced 8 new unicorns - a 9.0x increase in the aforementioned period. Since the start of 2022, the startups Remarkable and Dune Analytics have reached unicorn status, making a total of 9 unicorns from the Oslo ecosystem to date.

Oslo $1B+ Growth Rate over past five years.

- **Municipalities:** Oslo, Ekeberg, Grünerløkka, and Frogner
- **Universities:** University of Oslo and Norwegian University of Science and Technology (NTNU)
- **First unicorn:** Opera in 2016
- **Iconic companies:** Oda, Kahoot, Dune Analytics, and Cognite
- **Notable spinouts:** Cimon Medical, Elliptic Labs, and Seram Coatings
- **Top patent categories:** Mechanical and Sensors & Optics
- **Combined enterprise value:** $23 million
- **Cost of living:** 90% of New York

---

Basel, Switzerland

- **Cities & towns:** Birsfelden, Binningen, Oberwil, and Riehen
- **Universities:** University of Basel
- **First unicorn:** Roivant Sciences in 2014
- **Iconic companies:** Roivant Sciences, CRISPR Therapeutics, and NBE-Therapeutics
- **Notable spinouts:** Advancience and T3 Pharma
- **Top patents categories:** Life Sciences, Materials, and Information
- **Combined enterprise value:** $24.7 billion
- **Cost of living:** 119% of New York

---

Explore Basel »
But there's more innovation beyond VC-backed startups: Patents.

Corporate R&D spend in 2018 ($ billions)

<table>
<thead>
<tr>
<th>Region</th>
<th>Mechanical</th>
<th>Sensors and Optics</th>
<th>Life sciences</th>
<th>Information</th>
<th>Electrical</th>
<th>Materials</th>
<th>Energy</th>
<th>Semiconductors</th>
<th>Telecommunications</th>
</tr>
</thead>
<tbody>
<tr>
<td>North America</td>
<td>114</td>
<td>39</td>
<td>84</td>
<td>19</td>
<td>11</td>
<td>13</td>
<td>1</td>
<td>65,600</td>
<td></td>
</tr>
<tr>
<td>EMEA</td>
<td>9</td>
<td>5</td>
<td>52</td>
<td>46</td>
<td>8</td>
<td>16</td>
<td>0</td>
<td>58,400</td>
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<tr>
<td>Japan</td>
<td>9</td>
<td>3</td>
<td>14</td>
<td>39</td>
<td>0</td>
<td>2</td>
<td>3</td>
<td>32,800</td>
<td></td>
</tr>
<tr>
<td>China</td>
<td>15</td>
<td>1</td>
<td>1</td>
<td>6</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>25,600</td>
<td></td>
</tr>
<tr>
<td>South Korea</td>
<td>17</td>
<td>2</td>
<td>13</td>
<td>4</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>20,400</td>
<td></td>
</tr>
<tr>
<td>United Kingdom</td>
<td>1</td>
<td>0</td>
<td>14</td>
<td>6</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>18,600</td>
<td></td>
</tr>
<tr>
<td>Germany</td>
<td>4</td>
<td>1</td>
<td>8</td>
<td>34</td>
<td>8</td>
<td>1</td>
<td>0</td>
<td>17,300</td>
<td></td>
</tr>
<tr>
<td>France</td>
<td>15</td>
<td>1</td>
<td>8</td>
<td>33</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>16,100</td>
<td></td>
</tr>
</tbody>
</table>

Understanding patents by the most active categories allows to forecast future technology trends. The chart on the left analyzes over 20M+ patents from 2017-2021.

Cipher is recognized as the leading provider of strategic patent intelligence to major patent-owning organizations. Cipher’s Universal Technology Taxonomy is a novel way to map patents to technologies using supervised machine learning.

This breakthrough makes it possible to establish objective and repeatable ways to communicate both the risk and value associated with patents to IP leaders, the board, and the investor community more broadly.
1 The next generation of tech ecosystems
2 Capital & investment
3 Innovation & talent
4 **Economic outcomes**
5 Regional lens
6 Methodology
Tech inevitably means more concentration (while also being competitive). Tech continues to eclipse other sectors …

… with equally massive job creation potential, as demonstrated by #1 Trailblazer: the Bay Area.

The world’s 20 most valuable companies

- Apple: $2.1T
- Microsoft: $1.8T
- Saudi Aramco: $1.8T
- Amazon: $1.6T
- Alphabet: $1.6T
- Facebook: $0.9T
- Tencent: $0.7T
- Berkshire Hathaway: $0.7T
- Tesla: $0.6T
- Alibaba: $0.6T
- TSMC: $0.5T
- Visa: $0.5T
- JPMorgan Chase: $0.5T
- Samsung: $0.5T
- Johnson & Johnson: $0.4T
- Walmart: $0.4T
- LVMH: $0.4T

% of jobs at VC-backed tech companies

- Bay Area: 68%
- USA: 24%
- EU-27: 1.8%
- UK: 0.8%
- Germany: 0.3%
- France: 0.1%
- Italy: < 0.01%
The Bay Area no longer has a monopoly on VC-backed innovation. And no Big Tech company is impervious to disruption.

The Bay Area is not in decline – far from it. However, its share of global VC-backed innovation has dropped from 40% to 20% and stabilized there.

The Tech sector is highly concentrated (“big tech”) but it is not static or monopolistic. It is highly dynamic and competitive. The life expectancy of companies is shorter than ever.

Younger cohorts are able to disrupt big incumbents (e.g. Tiktok). This means there is a massive opportunity for emerging tech ecosystems.

Source: Dealroom.co.

Number of new $1B+ startups

US tech companies are worth $24 trillion (the entire S&P 500 is $32T). They contribute to 50% of all domestic R&D.

About 70% of all AI experts in the USA work for Google, Facebook, Microsoft, Amazon.

However, despite the concentration of economic power, entrepreneurialism is on the rise as startups are able to scale faster than ever.
About 1.0 to 1.5% of seed-funded startups reach the $1B+ milestone – this is similar in both in the US and Europe.

Startup failure, while not desirable, is normal and likely. But are startups set up for success?

Dealroom data shows that a key success factor is the quality of the investor landscape. Dealroom conducted a European study on the performance of seed-stage investors, in partnership with VC firms Atomico and LocalGlobe.

19% of Seed companies raised a Series A after 36 months. But the probability was 40% for top-quartile investors and only 7% for bottom-quartile investors.

An Angellist study showed that in the US, graduation rates are much more uniform across investors. Lower graduation rates might also point to a lack of local follow-on capital (Series A, B, and beyond).
Why VCs care about $1B+ companies.

Unicorns are basically startups that are well on their way to being (very) successful. Important in the context of this report: they also have the potential to be a “fund returner” for a seed investor. The example on the right shows how that calculation works.

The Investor Rank assigns the same number of points to unicorns, whether they are exited or unrealized unicorns. A realized unicorn is a more tangible result. But unrealized unicorns are more forward-looking. Decacorns are valued the same as unicorns (for now).

Revenue is more meaningful than the paper value from a VC round but revenue data is reported with significant delays (if at all) and therefore a lagging indicator in the real world. Valuation, while far from perfect, is a more real-time and ubiquitous datapoint about the state of individual startups.

Illustrative example of a unicorn investment: a $100M seed fund writes $1.5M cheque at a $15M valuation. Company exits at $1B valuation. In this example, fund returns $50M, half it’s fund.
Why ecosystems care about big outcomes: the startup ecosystem flywheel.

Generations of experienced founders and operators.

Local VCs with track record and adopting global standards.

Start up success (whichever way defined).

Founders & angels supporting new startups.

Attracting global LPs and GPs.

More quality startups, setup for success from day zero.

More capital and bigger more ambitious companies.

TALENT

CAPITAL

Why ecosystems care about big outcomes: the startup ecosystem flywheel.

Generations of experienced founders and operators.

Local VCs with track record and adopting global standards.

Start up success (whichever way defined).

Founders & angels supporting new startups.

Attracting global LPs and GPs.

More quality startups, setup for success from day zero.

More capital and bigger more ambitious companies.

Startup mafias identified

Success breeds success. Early tech ecosystem success not only creates value, but breeds a generation of operators with unique experience in starting and rapidly scaling successful businesses, who have the right network and at times the exit capital to start their next venture. It starts a snowball effect of success.

Most famously in the US, the founder and first-hire alumni of the "PayPal Mafia" went on to found Tesla, LinkedIn, Palantir, SpaceX, Square, Slide, Kiva, YouTube, Yelp, and Yammer. Then there are the European Startup Mafias. The training grounds that became the founder factories fuelling the European startup ecosystem. Check out 600+ startups (co-)founded by alumni of European unicorns:

View landscape »
New unicorn creation is back to pre-pandemic level, similar to VC investing.

Only a portion of unicorns will eventually realize a $1B+ exit. Notably, in the 2020-21 period, many new "paper unicorns" still will require more time to grow into that valuation with today’s valuation multiples. Some never will grow into it – and that’s the name of the game.

160 excess unicorns in 7 quarters
**Unicorn to GDP ratio**

Unicorns created since 2019 relative to GDP per capita

<table>
<thead>
<tr>
<th>City</th>
<th>Unicorns to GDP ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bengaluru</td>
<td>10.5</td>
</tr>
<tr>
<td>Mumbai</td>
<td>6.1</td>
</tr>
<tr>
<td>Delhi</td>
<td>6.1</td>
</tr>
<tr>
<td>Bay Area</td>
<td>3.5</td>
</tr>
<tr>
<td>Chennai</td>
<td>2.6</td>
</tr>
<tr>
<td>Pune</td>
<td>2.2</td>
</tr>
<tr>
<td>New York City</td>
<td>1.6</td>
</tr>
<tr>
<td>New Palo Alto</td>
<td>1.5</td>
</tr>
<tr>
<td>Lagos</td>
<td>1.4</td>
</tr>
<tr>
<td>Beijing</td>
<td>1.4</td>
</tr>
<tr>
<td>Jakarta</td>
<td>1.2</td>
</tr>
<tr>
<td>São Paulo</td>
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<tr>
<td>Mexico City</td>
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<tr>
<td>Shanghai</td>
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<tr>
<td>Tel Aviv</td>
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<tr>
<td>London</td>
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<tr>
<td>Los Angeles</td>
<td>0.6</td>
</tr>
<tr>
<td>Shenzhen</td>
<td>0.6</td>
</tr>
<tr>
<td>Ho Chi Minh City</td>
<td>0.5</td>
</tr>
<tr>
<td>Boston</td>
<td>0.5</td>
</tr>
</tbody>
</table>

**Bengaluru**

**INDIA**

- **Districts**: Chikkaballapura, Chitradurga, Davanagere, Kolar, Ramanagaram, Shimoga and Tumakuru
- **Universities**: Indian Institute of Management, Bangalore University
- **First unicorn**: InMobi in 2011
- **Iconic companies**: Infosys and Rajesh Exports
- **Top patents categories**: Information, Life Sciences and Materials
- **Combined enterprise value**: $246.1 billion
- **Cost of living**: 27% of New York

**Unicorns to GDP ratio**

- **Unicorns since 2019**
- **Early stage funding growth**
- **Breakout funding growth**
- **Series A to unicorns conversion**
- **Unicorn growth since 2019**
- **Affordability of living**

Explore Bengaluru »
### Tel Aviv - ISRAEL

#### Cities & towns
- Tel-Aviv, Yafo/Jaffa, Holon and Ramat Gan

#### Universities
- Weizmann Institute of Science, Tel Aviv University and Hebrew University of Jerusalem

#### First unicorn
- ironSource in 2015

#### Notable companies
- Wix, eToro and Monday.com

#### Top patents categories
- Life Sciences, Information and Telecommunications

#### Combined enterprise value
- $181.1 billion

#### Cost of living
- 82% of New York

---

#### Unicorns creation

<table>
<thead>
<tr>
<th>Year</th>
<th>New Unicorn Creation</th>
<th>Cumulative</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>2014</td>
<td>1</td>
<td>2</td>
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<tr>
<td>2015</td>
<td>5</td>
<td>7</td>
</tr>
<tr>
<td>2016</td>
<td>3</td>
<td>10</td>
</tr>
<tr>
<td>2017</td>
<td>0</td>
<td>10</td>
</tr>
<tr>
<td>2018</td>
<td>6</td>
<td>16</td>
</tr>
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<td>2019</td>
<td>5</td>
<td>21</td>
</tr>
<tr>
<td>2020</td>
<td>13</td>
<td>34</td>
</tr>
<tr>
<td>2021</td>
<td>25</td>
<td>59</td>
</tr>
</tbody>
</table>

---

### Tel Aviv - ISRAEL

- **Cities & towns**: Tel-Aviv, Yafo/Jaffa, Holon and Ramat Gan
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- **Notable companies**: Wix, eToro and Monday.com
- **Top patents categories**: Life Sciences, Information and Telecommunications
- **Combined enterprise value**: $181.1 billion
- **Cost of living**: 82% of New York

---

**Unicorns since 2019**

- **#4** Early stage per inhabitant
- **#10** Breakout stage VC per inhabitant
- **#35** Late stage VC per inhabitant
- **#70** Patents per inhabitant
- **#4** Deep tech unicorn per inhabitant

---

**Explore Tel Aviv**
Unicorn growth

Growth in unicorns between 2019-22

Oslo

Source: Dealroom.co.
1. The next generation of tech ecosystems
2. Capital & investment
3. Innovation & talent
4. Economic outcomes
5. **Regional lens**
6. Methodology
### Unicorn Cities in USA

**Trailblazers**

- Austin
- Miami
- Atlanta
- Greater Boston
- New York City

**Science Hubs**

- Greater Los Angeles
- Bay Area
- Seattle
- Denver
- Santa Barbara
- Phoenix
- Salt Lake City
- Atlanta

**Rising Stars**

- Portland
- Boulder
- Bay Area
- New York City
- Philadelphia
- Columbus
- Dallas
- Miami
- Houston

Source: Dealroom.co
Unicorn cities in Europe

**Trailblazers**
- London
- Paris
- Berlin
- Stockholm
- Munich
- Zurich
- Cambridge, UK
- Barcelona
- Amsterdam
- Madrid

**Science Hubs**
- Cambridge, UK
- Oxford
- Eindhoven
- Munich
- Zurich
- Geneva
- Stockholm
- Leuven
- Basel
- Ghent

**Rising Stars**
- Oslo
- Wrocław
- Istanbul
- Warsaw
- Vilnius
- Kyiv
- Tallinn
- Prague
- Porto
- Málaga

Source: Dealroom.co
Middle East and North Africa

VC investment
- $0-1M (pre-seed)
- $1-4M (seed)
- $4-15M (seed)
- $15-40M (series A)
- $40-100M (series B)
- $100-250M (series C)
- $250M+

Enterprise value (companies founded after 1990)
- $0-200M
- $200M-1B (future unicorn)
- $1-10B (unicorn)
- $10B+ (decacorn)

Source: Dealroom.co
**Trailblazers**
- Tel Aviv
- Tokyo
- Beijing
- Bengaluru
- Shanghai
- Seoul
- Singapore
- Mumbai
- Delhi
- Shenzhen

**Science Hubs**
- Haifa
- Tel Aviv
- Singapore
- Tokyo
- Kyoto
- Jerusalem
- Seoul
- Beijing
- Bengaluru
- Taipei

**Rising Stars**
- Bengaluru
- Mumbai
- Chennai
- Delhi
- Jakarta
- Pune
- Ho Chi Minh City
- Riyadh
- Buenos Aires
- Moscow
- Suzhou

**Unicorn cities in Asia**
- **100+**
  - Shenzhen
  - Beijing
  - New Delhi
  - Tokyo
  - Seoul
  - Shanghai
  - Hong Kong
  - Singapore
- **15+**
  - Guangzhou
  - Kuala Lumpur
  - Taipei
  - Jakarta
- **10+**
  - Guangyan
  - Zhengzhou
  - Ningde
  - Guangzhou
- **5+**
  - Qingdao
  - Wuhan
- **1-4**
  - Hangzhou
  - Shenzhen
  - Changsha
  - Qingdao

Source: Dealroom.co
Australia & New Zealand

VC investment

- $0-1M (pre-seed)
- $1-4M (seed)
- $4-15M (seed)
- $15-40M (series A)
- $40-100M (series B)
- $100-250M (series C)
- $250M+

Enterprise value (companies founded after 1990)

- $0-200M
- $200M-1B (future unicorn)
- $1-10B (unicorn)
- $10B+ (decacorn)

Funding into startups in Oceania, 2015-2021

- 2015: $2.5b
- 2016: $2.5b
- 2017: $1.5b
- 2018: $1b
- 2019: $500m
- 2020: $900m
- 2021: $1.1b

Projected (2021): $3.5b
Latin America

**VC investment**
- $0-1M (pre-seed)
- $1-4M (seed)
- $4-15M (seed)
- $15-40M (series A)
- $40-100M (series B)
- $100-250M (series C)
- $250M+

**Enterprise value (companies founded after 1990)**
- $0-200M
- $200M-1B (future unicorn)
- $1-10B (unicorn)
- $10B+ (decacorn)

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**Panama**
- **$13.1B**

**Mexico City**
- **$3.5B**

**New York**
- **$2.9B**

**San Francisco**
- **$0.7B**

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**São Paulo**
- **$10B**

**Berlin**
- **$5B**

**London**
- **$200B**

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**Belo Horizonte**
- **$7.7B**

**Buenos Aires**
- **$453B**

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**Santiago**
- **$6.8B**

**Montevideo**
- **$1.4B**

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**Quito**
- **$2022**

**Bogotá**
- **$2022**

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**Source:** Dealroom.co
Sub-saharan Africa

VC investment
- $0-1M (pre-seed)
- $1-4M (seed)
- $4-15M (seed)
- $15-40M (series A)
- $40-100M (series B)
- $100-250M (series C)
- $250M+

Enterprise value (companies founded after 1990)
- $0-200M
- $200M-1B (future unicorn)
- $1-10B (unicorn)
- $10B+ (decacorn)

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Ghana
- **Unicorn**: Chipper
- Notable startups: [...]
- VC funding since ’15: $241m over 49 rounds, incl. $104m over 13 rounds in 2021, YTD.

Nigeria
- **Unicorns**: Opay, Interswitch, Jumia
- Notable startups: [...]
- VC funding since ’15: $1.9b over 204 rounds, incl. $474m over 34 rounds in 2021, YTD.

South Africa
- **Unicorns**: Prosus
- Notable startups: [...]
- VC funding since ’15: $931m over 272 rounds, incl. $175m over 31 rounds in 2021, YTD.

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Source: Dealroom.co
1. The next generation of tech ecosystems
2. Capital & investment
3. Innovation & talent
4. Economic outcomes
5. Regional lens
6. Methodology
A unique combination of criteria and weightings is applied to each lens.

<table>
<thead>
<tr>
<th></th>
<th>Trailblazers Absolute values 2019-2022</th>
<th>Science Hubs Per capita values 2019-2022</th>
<th>Rising Stars Growth rates From ’15–’18 to ’19–’22</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Weightings / total possible points</strong></td>
<td>500</td>
<td>500</td>
<td>500</td>
</tr>
<tr>
<td><strong>Capital &amp; investment</strong></td>
<td>Early stage venture capital Investment in $1–15M rounds</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td>Breakout stage venture capital Investment in $15–100M rounds</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td>Late stage venture capital Investment in $100M+ rounds</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td><strong>Innovation &amp; talent</strong></td>
<td>University talent &amp; linkage Founders from local universities that raised &gt;$10M</td>
<td>100</td>
<td>150</td>
</tr>
<tr>
<td></td>
<td>Number of patents developed Powered by Cipher.ai</td>
<td>50</td>
<td>150</td>
</tr>
<tr>
<td></td>
<td>Deep tech Number of deep tech unicorns &amp; $1B+</td>
<td>-</td>
<td>50</td>
</tr>
<tr>
<td><strong>Entrepreneurship</strong></td>
<td>New unicorns and $1B+ exits Startups that reach $1B+ valuation milestone</td>
<td>200</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Conversion score Series A to unicorn</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Economic upside</strong></td>
<td>Adjustment for GDP per capita GDP per capita from World Bank</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Affordability of living An index by Numbeo relative to New York</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>
Each of the 201 hubs is benchmarked against all three lenses.

On the right is an example calculation for Boston, Massachusetts. Boston scores 13 points for early stage investing, where it ranks #6. The #1 scores 50 points. So Boston is at 13/50 of the #1 (the Bay Area).

Boston ranks #4 in the Trailblazer lens, #2 in the Science Hubs lens, and #87 in the Rising Stars lens.

The same total quantum of points is awarded in each lens so that useful comparisons between the three lenses can be made.

### Example: Boston, Massachusetts

- **Trailblazer lens**
  - 166 points (out of 500)
  - Ranked #4 (out of 195)

- **Science Hubs lens**
  - 313 points (out of 500)
  - Ranked #2 (out of 195)

- **Rising Stars lens**
  - 75 points (out of 500)
  - Ranked #87 (out of 195)
There are roughly 207,000+ active VC-backed startups & scaleups globally based on data by Jellysmack, Levallois-Perret.

Enterprise value:
- **Central Paris**: $163B, 26 unicorns, 11,500+ startups
- **Ile-de-France**: $53B, 8 unicorns, 3,600+ startups
- **Relocated**: Mostly to US & UK, $27B, 11 unicorns

For each metro area, we consolidated suburbs and nearby towns. Relocated companies are also counted towards their founding location (as well as their new location).

Source: Dealroom.co.
What is a startup?
Companies designed to grow fast. Such companies are VC-investable but not always VC-backed. This report focuses on VC-backed companies for consistency. When startups are successful, they develop into scaleups, and grownups and result in big companies; this is their objective by definition.

What is a unicorn or $1B+ exit?
Unicorns or $1B+ exits are (former) startups that reached a US$ 1B valuation or exited at one point in time.

Venture Capital
Investment numbers refer to rounds such as Early stage (Pre-Seed, Seed, and Series A), Breakout stage (Series B and Series C) and Late stage (Megarounds $100M+). VC investment figures exclude debt or other non-equity funding, lending capital, grants, ICOs, and SPAC Private Placement.

Valuation
The combined valuation of the tech ecosystem is based on its market cap or latest transaction value.

Transaction value is realized from an exit or implied unrealized valuation from the latest VC round, which is either announced or estimated by Dealroom based on benchmarks.

Patent data
Patent analysis based on Cipher data. Considered are all active patents per ecosystem, but excluding are China-only patents. E.g. we count patents by a Chinese company when the patent rights are located in territories outside of China, otherwise it’s excluded.

Underlying Data
Dealroom’s proprietary database and software aggregate data from multiple sources: harvesting public information, user-submitted data verified by Dealroom, data engineering. All data is verified and curated with an extensive manual process. The data on which this report builds is available via app.dealroom.co. For more info please visit dealroom.co or contact support@dealroom.co.