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DATA BRIEF

# European AI Competitiveness Beyond Frontier Models

Insights From AI Startups in Five Strategic Markets

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# Executive Summary

AI development is frequently described as a race for frontier models. But considerable economic value will also be generated by AI development and adoption in existing markets. This data brief examines where EU competitiveness stands in the five applied markets where most of the EU's AI startup activity in our dataset takes place – horizontal enterprise software, healthcare and life sciences, manufacturing and supply chain, finance and insurance, and research and development tools. Drawing on data from [Dealroom.co](https://www.dealroom.co) covering 24,468 active AI startups launched between 2012 and 2025 across the EU, Switzerland, the UK, and the U.S., we compare geographic patterns at the level of regions, countries, and cities through original analysis.

## Key findings:

- Horizontal enterprise software and healthcare and life sciences dominate across all four geographies, together accounting for almost half (44 percent) of all AI startups in our dataset. This pattern is consistent across geographies, though our data likely skews towards VC-funded, B2B startups and may not fully capture consumer-facing AI activity.
- Based on AI startup numbers in our data, the U.S. outcompetes the EU in four of the five markets analysed. Manufacturing and supply chain is the only market where the EU accounts for a larger share of AI startups than the U.S., though our data likely underestimates the number of U.S. startups in general. This suggests the competitiveness gap across applied AI markets may be even larger than our data indicates.
- National specialisation patterns within the EU are emerging but remain weak: Germany is the only country showing a strong specialisation signal, in the manufacturing and supply chain market. Italy, Spain, France, and Sweden show emerging specialisation signals broadly aligned with existing industrial strengths, though these remain below the threshold of strong specialisation.
- The introduction of ChatGPT produced a surge in AI startup founding numbers in horizontal enterprise software and research and development tools across geographies – average annual startup founding numbers roughly doubled to quadrupled post-2022.
- Other vertical markets like healthcare and life sciences, manufacturing and supply chain, and finance and insurance saw more modest growth, suggesting a diversity of technological approaches persists in these markets thus far.
- AI startup activity in the EU is geographically dispersed: 75 percent of analysed EU AI startups are spread across 95 cities, with no single hub dominating any market. Paris, Berlin, Amsterdam, Munich, and Stockholm are the largest hubs but together account for only a quarter of EU AI startups.
- EU city rankings across markets largely reflect general AI startup hub sizes rather than genuine market specialisation – but specialised niches do begin to emerge at the local level, e.g. Munich in manufacturing and supply chain and Barcelona in healthcare and life sciences. As our data skews towards larger startup hubs, specialisation patterns in smaller cities and regions may not be fully captured.

Our findings have important implications for policymakers. Europe's challenges in AI competitiveness extend well beyond frontier models. The manufacturing and supply chain

market, a strategic priority for the European Commission, presents grounds for cautious optimism, where existing industrial strengths align with national and regional specialisation signals based on AI startup activity, especially in Germany and Munich. The geographically distributed startup activity in the EU can support AI adoption across diverse regional economies and existing industrial strengths. At the same time, it raises questions about whether European hubs can achieve the scale and specialisation needed to compete globally. The technological diversity of AI also presents competitive opportunities that go beyond market specialisation alone. Whether the emerging specialisation patterns identified in this analysis develop into globally competitive positions will depend on continued access to growth capital, compute resources, and cross-border market integration.

## Introduction

AI development is frequently described as a race at the frontier, where ever more capable large-scale models are created and deployed. In this race, the European Union (EU) finds itself caught between the two leading players, the United States (U.S.) and China<sup>1</sup>. But frontier AI is only one component of the story: Considerable economic value will likely also be generated by AI development and adoption in existing markets<sup>2</sup>. The question for European AI policy is not only how to compete on frontier AI, but also how to build a durable competitive advantage in AI in select economic markets, i.e. specialised expertise in specific markets that is difficult for other countries to replicate<sup>3, 4</sup>. As a general-purpose technology<sup>5</sup> with applications in virtually every economic market, AI has the potential to create, shift, and solidify competitive advantages across many markets<sup>6, 7</sup> – reinforcing existing strengths in ways that are difficult for others to replicate, but also enabling new ones to emerge. At the same time, AI's winner-take-all tendencies mean that competitive positions in AI markets may form faster and prove more durable than in traditional industries, making early strategic positioning particularly consequential.

This magnifies the opportunity to identify the most favorable conditions for the EU to

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- 1 Sajadieh, S., Fattorini, L., Perrault, R., Gil, Y., Parli, V., Santarlasci, L., Pava, J., Maslej, N., Altman, R., Brynjolfsson, E., Brodley, C., Clark, J., Dignum, V., Kumar, V., Landay, J., Lyons, T., Manyika, J., Niebles, J. C., Shoham, Y., Tabassi, E., Wald, R., Walsh, T., & Weld, D. (2026). *The AI Index 2026 annual report*. AI Index Steering Committee, Institute for Human-Centered AI, Stanford University.
  - 2 Bick, A., Blandin, A., & Deming, D. J. (2024). *The rapid adoption of generative AI* (NBER Working Paper No. 32966). National Bureau of Economic Research. <https://doi.org/10.3386/w32966>.
  - 3 Porter, M. E. (1990). *The competitive advantage of nations*. Free Press.
  - 4 Krugman, P. (1991). *Geography and trade*. MIT Press.
  - 5 Brynjolfsson, E., & McAfee, A. (2014). *The second machine age: Work, progress, and prosperity in a time of brilliant technologies*. W. W. Norton & Company.
  - 6 Bonfiglioli, A., Crinò, R., Filomena, M., & Gancia, G. (2025). *Comparative advantage in AI-intensive industries: Evidence from US imports* (CEPR Discussion Paper No. 19883). CEPR Press.
  - 7 Mishra, S., Koopman, R., De Prato, G., Rao, A., Osorio-Rodarte, I., Kim, J., Spatafora, N., Strier, K., & Zaccaria, A. (2023). AI specialization for pathways of economic diversification. *Scientific Reports*, 13, Article 19475. <https://doi.org/10.1038/s41598-023-45723-x>
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build on or develop competitive advantages in AI. The EU has defined eleven strategic markets for AI development and adoption in its Apply AI Strategy: healthcare and pharmaceuticals; robotics; manufacturing, engineering, and construction; defence, security, and space; mobility, transport, and automotive; electronic communications; energy; climate and environment; agri-food; cultural and creative sectors and media; public sector. In these markets, the EU seeks to leverage its existing strengths to carve out globally competitive niches. But whether European AI development is currently following the logic of concentrating into niches built on its strengths, or spreading thinly across all markets is an open empirical question. The implications of identifying the right competitive markets will shape how the EU targets public investment, tailors policy measures, and fosters European AI competitiveness.

With this data brief, we offer insights into the current state of European AI competitiveness by analyzing the trends in market specialisation among AI startups headquartered across the EU, Switzerland, UK, and U.S. Startups play an important role in the EU's strategic ambitions for AI: by developing innovative technologies, products, and services, startups can act as drivers of both frontier AI and AI adoption in existing markets. Following the 2025 Draghi and Letta Reports calling for accelerating innovation, improving competitiveness, and for completing the single market, the past year has seen numerous policy initiatives in this regard: the 2025 European Startup and Scaleup Strategy laid out a comprehensive plan to make the EU a more attractive location for innovative companies, including the creation of the Scaleup Europe Fund with a target of €5 billion in order to “invest in the most promising European companies in strategic deep tech areas” including AI<sup>8</sup>. The fund is set to make its first investment in the summer of 2026. Most recently, the EU Inc. proposal aims to reduce regulatory hurdles, making it easier to set up a startup with a fully digital set of corporate rules applying across the EU.

These measures are designed to alleviate some of the most important hurdles for innovative startups to scale in Europe: availability of growth capital as well as barriers to the single market, which have prompted many startups to move abroad. Additionally, for many AI startups the cost of compute infrastructure is an inhibiting factor in developing advanced AI models. Therefore, the EU has green-lit nineteen AI factories to create “dynamic AI ecosystems”<sup>9</sup> as well as five large-scale AI gigafactories, together representing more than €30 billion in compute investment which interface has previously analysed (for an analysis of AI factories see [here](#) and for gigafactories see [here](#) and [here](#)). Other conditions are already relatively favorable for startups: the EU boasts a strong knowledge ecosystem with many leading universities producing world-class AI research<sup>10</sup>. Moreover, as previous interface [analyses](#) have shown, the EU is home to

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8 European Commission. (n.d.). [EU Startup and Scaleup Strategy](#).

9 European Commission. (2025, April 9). [AI Continent Action Plan: Q&A](#).

10 Sajadieh, S., Fattorini, L., Perrault, R., Gil, Y., Parli, V., Santarlasci, L., Pava, J., Maslej, N., Altman, R., Brynjolfsson, E., Brodley, C.,

important AI talent hubs, an asset which startups can draw from.

Our analysis predominantly focuses on broad trends and large startup clusters, both with regard to countries and cities. It is part of a broader research project on mapping AI startups in Europe, Switzerland, the UK and the U.S. Concretely, we analyse 24,468 active AI startups launched between January 2012 and November 2025 across these geographic regions using data gathered by [Dealroom.co](https://www.dealroom.co) and describe patterns that can be found among the startups analysed. We explicitly take a broad approach in our analysis, defining AI startups as companies founded in 2012 or later which state that they are working on or with AI. This includes companies founded across different waves of AI development, from earlier machine learning (ML) applications to recent generative AI models and foundation models, startups building advanced AI, but also those applying AI models to build their products. We classified AI startups into one of 24 markets in a hybrid approach combining existing classification schemes with human expertise and LLM assistance (Claude Sonnet 4 and 4.5, Anthropic) in both category development and final coding using a zero-shot approach with sufficient intercoder reliability.

In our analysis, we derive careful conclusions about broader macroscopic trends across markets and countries. However, it is impossible to provide a complete mapping of the startup population in the countries we analyse. Our data is likely subject to certain biases, for example, towards enterprise software rather than consumer applications, towards the markets that tend to attract more venture capital as well as towards larger AI startup hubs, potentially underestimating the number of startups in other markets and smaller hubs. In particular, our data is likely biased towards AI startups developing products and services for enterprises (B2B), rather than for individual consumers (B2C): among all AI startups we analyse, only 5 percent have a dedicated focus on consumer applications. While there may be products being developed for individual consumers in all markets, our analysis likely underestimates the number of AI startups focusing on individual consumers and our results may not apply to them to the same extent. Policymakers seeking to derive conclusions from the insights presented here should therefore be cautious when trying to apply our findings to more consumer-facing AI applications and markets. For more on data validation please refer to the data and methodology section.

Our analysis reveals several clear patterns. Across all four geographies, two markets dominate among AI startups across the EU, Switzerland, the UK, and the U.S.: horizontal enterprise software – with roughly one third of all analysed AI startups active in this market – and healthcare and life sciences. The introduction of generative AI and foundation models has produced a marked surge in annual AI startup founding numbers in horizontal enterprise software and research and development tools, while other vertical

markets like healthcare and life sciences, manufacturing and supply chain, and finance and insurance have seen more modest immediate increases. This technological diversity in approaches suggests that the AI technologies startup build on are an opportunity for strengthening European AI competitiveness on par with market niches.

The U.S. outcompetes the EU in almost all of the EU's top five markets for AI startups in our data. The exception is manufacturing and supply chain, which the EU already considers a strategic priority. At the national level, emerging specialisation patterns broadly align with existing industrial strengths, though they remain weak: Germany shows the only strong specialisation signal, in manufacturing and supply chain. At the city level, EU AI startup activity is geographically dispersed, with larger hubs like Paris and Berlin important across all markets by virtue of their overall AI startup ecosystem size rather than genuine specialisation. Nevertheless, specialised niches do emerge: Munich, with an AI startup concentration 57 percent above the EU average in manufacturing and supply chain, exemplifies how regional hubs can anchor pan-European competitiveness in applied AI markets.

## Findings

Our analysis focuses on the five highest ranking markets among the analysed AI startups in the EU: Horizontal enterprise software, healthcare and life sciences, manufacturing and supply chain, finance and insurance, and research and development tools. Table 1 provides an overview of our market definitions.

We employ regional comparisons of AI startup activity in these five markets between the EU, Switzerland, the UK, and the U.S. Comparisons are also conducted at a national level between the six EU member states with the largest AI startup ecosystems by absolute numbers: Germany, France, the Netherlands, Spain, Italy, and Sweden. Many smaller countries outperform these six when accounting for startup numbers per capita: The six EU member states with the largest AI startup ecosystems per capita are Luxembourg, Estonia, Finland, the Netherlands, Ireland, and Denmark. Considering the UK and Switzerland in addition to EU member states, they would rank among the top ten countries with the largest AI ecosystems, in absolute numbers and per capita. Nevertheless, to provide a concise overview, we focus our analysis on the six countries mentioned, which together account for two thirds of all EU AI startups in our analysis.

At the level of regional AI startup hubs, we compare the ten cities ranking among the top five of at least one of the markets in our analysis (ordered by absolute size of AI startup ecosystem): Paris, Berlin, Amsterdam, Munich, Stockholm, Barcelona, Helsinki, Madrid, Tallinn, and Milan. All ten are also among the top 15 cities in our data with the largest AI startup hubs in absolute numbers. Again, per capita numbers show a different picture. For a ranking, please refer to the data and methodology section. Including UK and Swiss

cities would add London and Zurich to the analysis. However, at the city level, we limit ourselves to intra-EU comparisons within the five markets at the core of our analysis.

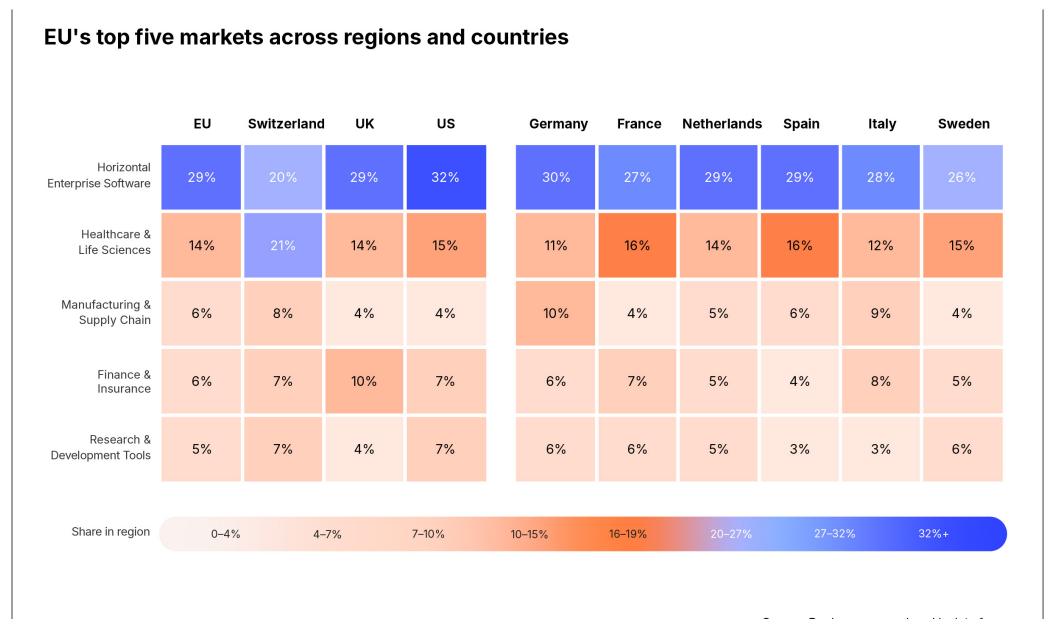
*Table 1. Market definitions*

Markets
<i>Horizontal enterprise software:</i> AI startups in this market develop products targeting diverse business functions – including general business management and productivity, marketing and sales operations, business intelligence and data analytics, human resources and talent management, and legal and compliance operations – that are applicable across a wide range of sector-specific vertical markets like healthcare and life sciences or finance and insurance.
<i>Healthcare and life sciences:</i> AI startups in the healthcare and life sciences market develop products for medical diagnostics, drug discovery, patient care, biotech applications, and robotics for healthcare.
<i>Manufacturing and supply chain:</i> AI startups in the manufacturing and supply chain market develop products for manufacturing and supply chain operations, including industrial tech, engineering, industrial automation, internal logistics, and manufacturing robotics.
<i>Finance and insurance:</i> AI startups in this market develop products and services for banking, investment management, risk assessment, and financial and insurance services.
<i>Research and development tools:</i> AI startups in the research and development tools market develop specialised products and services for research and development, including products for scientific research, experimentation, innovation workflows, and components, such as tools for AI and robotics development.

## The top two markets for AI startups unite geographies – third to fifth priorities diverge

We first analyse whether AI startups headquartered in the EU prioritise different markets than those in Switzerland, the UK, and the U.S. We focus on the five markets in our data with the largest proportion of AI startups in the EU. For each market, we compare the proportion of AI startups active in it across all four geographies. We also analyse the six individual EU countries with the biggest AI startup ecosystems in our data by absolute numbers. Figure 1 shows each market's proportion of AI startups in each geography.

*Figure 1. Top five markets for EU AI startups in geographic comparison*



*Figure 1: Two heatmaps of the five biggest markets among AI startups headquartered in the EU on the y-axis and the EU as a block as well as nine countries on the x-axis. Cells indicate the proportion of AI startups headquartered in each geography active in these markets. Darker colors indicate higher proportions of AI startups. Left: Comparison of AI startups headquartered in the EU, Switzerland, UK, U.S. Right: Comparison of AI startups headquartered in Germany, France, the Netherlands, Spain, Italy, and Sweden.*

The leading market among the analysed AI startups headquartered in the EU, the UK, and the U.S. is the horizontal enterprise software market. Between 29 and 32 percent of analysed AI startups across the EU as well as in the UK and the U.S. develop products or services for this market, double the proportion of AI startups active in the second most important market in these geographies, healthcare and life sciences (14 percent in the EU and the UK, 15 percent in the U.S.). In Switzerland, the horizontal enterprise software market is the second most important market, with 20 percent of the analysed AI startups headquartered there showing activity in this market, meaning the concentration of startups in this market is 9 percent below the EU and the UK and 12 percent below the U.S. The horizontal enterprise software market's importance among AI startups is also reflected at the level of EU member states: It accounts for more than a quarter of AI startups in each of the six EU countries analysed, ranging from 26 percent in Sweden to 30 percent in Germany.

The second biggest market among the analysed AI startups across all regions is healthcare and life sciences, which accounts for 14 percent of EU AI startups (with numbers among the EU's top AI startup countries varying between 11 percent in Germany and 16 percent in Spain) and 14 percent of UK AI startups as well as 15 percent of U.S. AI startups. With 21 percent, healthcare and life sciences is the leading market among the analysed Swiss

AI startups: The proportion of AI startups concentrated in this market is 7 percent above the EU and the UK and 6 percent above the U.S. This finding aligns with the important role the Swiss healthcare and life sciences market plays in Europe: Switzerland is home to 20 percent of Europe's life science companies<sup>11</sup>.

In the top two markets where almost half (44 percent) of all AI startups across the EU, Switzerland, UK, and U.S. are active, we thus see only slight differences across geographies: Swiss AI startups are roughly equally concentrated in the healthcare and life sciences and horizontal enterprise software markets. In comparison, the proportion of AI startups in the horizontal enterprise software market is approximately double their proportion in the healthcare and life sciences market in the EU, UK, and U.S. AI startups' market concentration in horizontal enterprise software and healthcare and life sciences may partially be due to our dataset being biased in favor of markets that tend to receive VC funding. However, robustness checks did not reveal a large difference in market shares among startups where funding data is available and those where it is not.

The markets ranked third to fifth among AI startups headquartered in different countries reveal further emerging differences across geographies: the manufacturing and supply chain market ranks third among the AI startup markets in the EU and Switzerland, but only eighth in the U.S. and the UK. Among the analysed EU countries, Germany and Italy particularly focus on this market with 10 and 9 percent of analysed AI startups in these countries targeting it respectively, almost double the share this market reaches among AI startups headquartered in other EU countries. In the UK, as well as several EU countries like France (7 percent) and Italy (8 percent), the finance and insurance market is an important market for AI startups, ranking third among the top five markets of the EU and UK, and fourth in the U.S. Finally, compared to the EU and UK, the U.S. accounts for a greater proportion of AI startups in the research and development tools market. This market ranks third among the analysed AI startups headquartered in the U.S., but fifth among those in the EU and the UK. Beyond the top two markets, however, all markets only concentrate small proportions of AI startups within them.

Our findings have implications for European competitiveness in applied AI markets. For the most part, markets show similar trends across geographies, although the Swiss case as well as diverging patterns across third to fifth market priorities suggest that country-specific patterns are possible. Moreover, in all of the five analysed markets except the manufacturing and supply chain market the majority of AI startups are headquartered in the U.S., reflecting the overall strength of the U.S. AI startup ecosystem<sup>12, 13</sup>.

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11 Presence Switzerland. (2023, December 28). [Chemical and pharmaceutical industry](#). About Switzerland.

12 Sajadieh, S., Fattorini, L., Perrault, R., Gil, Y., Parli, V., Santarlasci, L., Pava, J., Maslej, N., Altman, R., Brynjolfsson, E., Brodley, C., Clark, J., Dignum, V., Kumar, V., Landay, J., Lyons, T., Manyika, J., Niebles, J. C., Shoham, Y., Tabassi, E., Wald, R., Walsh, T., & Weld, D. (2026). [The AI index 2026 annual report](#). AI Index Steering Committee, Institute for Human-Centered AI, Stanford University.

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While the EU does not consider horizontal enterprise software a strategic market, the pattern found regarding horizontal enterprise software is consistent with broader evidence that generative AI's economic value is currently expected to be concentrated in enterprise business functions<sup>14</sup>. The research and development tools market has also been under particular scrutiny since the emergence of generative AI, with hopes that AI may speed up scientific discovery<sup>15</sup>.

That policy priorities in both markets remain limited suggests a potential misalignment with market realities. At the same time, building a competitive advantage in these markets may be challenging. EU AI startups in both of these markets are outnumbered by U.S. AI startups in our data: in the horizontal enterprise software market, the U.S. is home to more than half of all analysed AI startups (51 percent), while the EU accounts for 33 percent. The research and development tools market is the most U.S.-dominated of the five analysed, with 57 percent of startups headquartered there, compared to 29 percent in the EU.

A similar picture emerges with regard to the finance and insurance market, an important market among AI startups across all geographies, including several EU countries. The intersection of AI and fintech is one of the top targets of European venture capital<sup>16</sup>. At the same time, the U.S. accounts for 47 percent of analysed AI startups in finance and insurance, while the EU is home to 30 percent. The UK, Europe's leading financial centre, accounts for 19 percent of AI startups in this market, a notably high share given its smaller size relative to the EU.

Considering the two markets the EU does consider strategic priorities – healthcare and life sciences and manufacturing and supply chain – the picture is mixed: the healthcare and life sciences market faces the same broad and global competitive pressure as the horizontal enterprise software market, with 49 percent of all analysed AI startups in this market based in the U.S. and 34 percent in the EU. The EU seeks to leverage established European strengths in medical technologies and pharmaceuticals to build global competitiveness in AI for health and biotechnology.

Previous analyses show that VC-backed AI startups focusing on this market in the EU have increased their value 7x since 2015 to €43 billion<sup>17</sup>. However, this development is set against a global funding boom for AI in health and life sciences<sup>18</sup> and our analysis confirms that the healthcare and life sciences market is important among AI startups

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13 OECD. (2025a). *Entrepreneurial ecosystem diagnostics*. OECD Studies on SMEs and Entrepreneurship. <https://doi.org/10.1787/7096961f-en>.

14 Brynjolfsson, E., Li, D., & Raymond, L. R. (2025). Generative AI at work. *The Quarterly Journal of Economics*, 140(2), 889–942. <https://doi.org/10.1093/qje/qjae044>.

15 OECD. (2023). *Artificial intelligence in science: Challenges, opportunities and the future of research*. <https://doi.org/10.1787/a8d820bd-en>.

16 Prosus, & Dealroom.co. (2026). *State of AI in Europe: The invisible giant*.

17 Dealroom.co. (2025). *Startups driving Europe's AI transformation*.

18 Guerra, S., Kraus, S., Hedin, A., & Jalbut, M. (2026). *State of health AI 2026*. Bessemer Venture Partners.

headquartered in the UK, the U.S., and particularly Switzerland as well. The EU must consider this global landscape when seeking to build a competitive advantage in this market.

The manufacturing and supply chain market presents grounds for cautious optimism: It is a higher priority for AI startups from the EU and Switzerland than for those from the UK and the U.S. Moreover, it is the only one among the five analysed markets where the EU is home to a slightly larger proportion of AI startups than the U.S. in our data: 45 percent versus 39 percent. Additionally, other analyses estimate the combined enterprise value of EU AI startups in manufacturing, engineering, and construction at €9 billion, a 15x increase since 2015<sup>19</sup>. Yet, our data likely underestimates the number of AI startups in the U.S., and we do not account for China, the main competitor at the intersection of manufacturing and AI<sup>20</sup>. Translating these patterns into competitive advantages, in manufacturing as in other markets, will require sustained policy intervention.

## Europe's industrial strengths show up in AI startup market specialisation, but gaps remain

We now analyse whether genuine domestic specialisations are emerging in the EU's top five applied markets for AI startups in our data. We thus calculate the location quotient, a widely used measure of regional economic specialisation, to contextualize the patterns found among the six EU countries. The location quotient is a measure of relative industry concentration<sup>21</sup>. Applied here, it compares the domestic concentration of AI startups in a specific market to the EU average in this market to determine whether a domestic market is over- or under-indexed.

We consider an EU member state to show substantial specialisation in a market when its concentration of AI startups in that market is 50 percent or more above the EU average (location quotient  $\geq 1.5$ ), and substantial underspecialisation when it falls to two thirds of the EU average or below (location quotient  $\leq 0.67$ ). Patterns below these thresholds may indicate emerging specialisations but warrant more cautious interpretation.

Figure 2 shows the results of our analysis for the six EU member states with the largest AI ecosystems in absolute numbers in our data (Germany, France, the Netherlands, Spain, Italy, Sweden). Compared to the EU average, we identify one strong signal of specialisation with regard to Germany and the manufacturing and supply chain market. Most of the six countries analysed show some emerging patterns of market specialisation.

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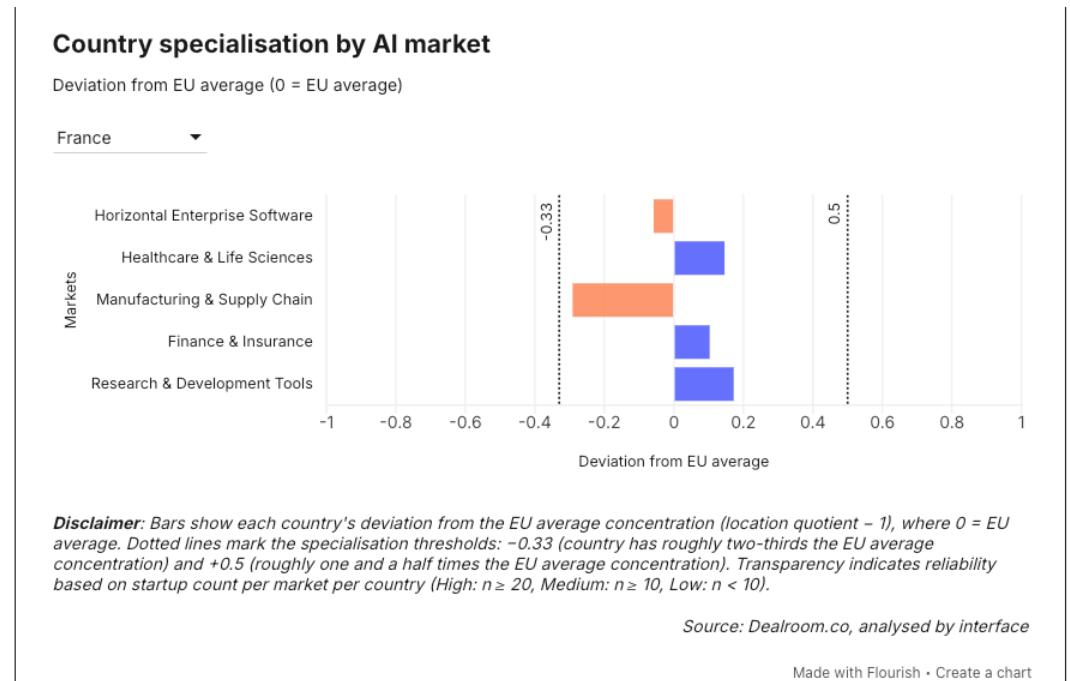
19 Dealroom.co. (2025). *Startups driving Europe's AI transformation*.

20 Kumar, R. (2025, May 23). [The rise of AI manufacturing in China and South Korea](#). The Diplomat.

21 Billings, S. B., & Johnson, E. B. (2012). The location quotient as an estimator of industrial concentration. *Regional Science and Urban Economics*, 42(4), 642–647. <https://doi.org/10.1016/j.regsciurbeco.2012.03.003>.

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Figure 2. Patterns of country specialization by AI market



For a complete presentation of this graph, please see the online version of this publication.

<https://www.interface-eu.org/publications/european-ai-competitiveness-beyond-frontier-models>

Figure 2: Diverging bar plots.  $LQ$  = location quotient.  $LQ = 0$  is the EU average. Bars indicate divergence from EU average. Dotted lines indicate lower and higher  $LQ$  bounds: Lower (0.67) = a country has roughly two-thirds the concentration of a market compared to the EU average, higher (1.5) = a city has roughly one and a half times the concentration of a market compared to the EU average. Transparency indicates reliability, with lower transparency indicating higher reliability. Reliability based on the size of each market in each city ( $n \geq 20$  = "High",  $n \geq 10$  = "Medium",  $n < 10$  = "Low").

In the largest market among the analysed AI startups – horizontal enterprise software – none of the six countries show a clear specialisation, reflecting the broad, cross-sectoral nature of horizontal enterprise software rather than any particular national strength. Specialisation instead takes place in the research and development tools market and the other three analysed vertical markets – healthcare and life sciences, manufacturing and supply chain, and finance and insurance.

In the healthcare and life sciences market, Spain shows signs of an emerging specialisation, with a domestic concentration of healthcare and life science AI startups 18 percent above the EU average, followed by France at 15 percent above. Spain has a strong healthcare and life sciences market, in particular regarding pharmaceuticals<sup>22</sup>. It is also the European leader regarding clinical trials, with Germany second and France third<sup>23</sup>. Similarly, France has a successful healthcare and life sciences market<sup>24</sup>, with

healthtech startups from France being second only to the UK in terms of venture capital raised<sup>25</sup>. Both countries' moderate signals of specialisation regarding markets for AI startups thus seem to be aligned with existing strengths in these markets.

By contrast, Germany has a domestic concentration of healthcare and life science AI startups 22 percent below the EU average. This is striking given Germany's strong and innovative healthcare and life sciences market<sup>26</sup>. Additionally, the lack of strong national specialisation signals in this market among the analysed EU countries stands out considering the strategic emphasis the EU is placing on it: among the six countries accounting for two thirds of EU AI startups, developments among AI startups in the healthcare and life sciences market do not appear to be driven by strong specialisations in the countries analysed. Instead, most countries' AI startup concentration in this market is at or around the EU average.

Germany's strength lies among AI startups in the manufacturing and supply chain market: the country is home to a third (32 percent) of all EU AI startups in this market. German AI startups also specialise strongly in this market, with a concentration of 57 percent above the EU average – the only strong specialisation signal in our analysis. Italy shows a similar pattern, with a domestic concentration of AI startups in this market 39 percent above the EU average. Both countries boast strong engineering and manufacturing heritages, which AI startups in this market may be able to build on. Moreover, both countries have recently agreed to strengthen their industrial partnership<sup>27</sup>. France, Sweden and the Netherlands, by contrast, all show domestic AI startup concentrations between 22 percent and 35 percent below the EU average in the manufacturing and supply chain market.

In addition to the manufacturing and supply chain market, Italy also specialises in the finance and insurance market, with a domestic concentration 28 percent above the EU average, followed by France at 10 percent above. Again, this confirms the slightly stronger domestic AI startup concentrations these countries have shown in the comparison in the previous section. The financial and insurance sector is a major employer in both France and Italy relative to other EU countries<sup>28</sup>. Parts of France and Italy – like the regions surrounding Paris and Milan – have also developed into major European fintech hubs since 2016<sup>29</sup>. Like in the case of Spain and France for life sciences and Germany and Italy for manufacturing, AI startups' specialisations in the

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22 Farmaindustria. (2025). [Spain as a global hub for pharmaceutical innovation and manufacturing](#).

23 Leem. (2025). [360° barometer study on attractiveness of France for the pharmaceutical industry](#).

24 About France. (2025) [France - a leading country in health innovation](#).

25 Leem. (2025). [360° barometer study on attractiveness of France for the pharmaceutical industry](#).

26 Germany Trade & Invest. (n.d.). [The pharmaceutical industry in Germany](#).

27 Rutelli, G. (2026, January 23). [When in Rome: The Italian-German motor in action](#). European Council on Foreign Relations.

28 Eurostat. (2025, June). [Businesses in financial and insurance activities sector](#). *Statistics Explained*. European Commission.

29 European Central Bank. (2024). [Rapid growth and strategic location: Analysing the rise of FinTechs in the EU](#). *Financial integration and structure in the euro area*.

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finance and insurance market thus seem to be aligned with strong existing bases. Spain has a domestic concentration 31 percent below the EU average in the finance and insurance market.

Lastly, several EU countries show tendencies towards specialisation in the research and development tools market: Germany shows the strongest tendency towards specialisation with a domestic AI startup concentration in this market at 30 percent above the EU average, followed by Sweden at 24 percent and France at 17 percent. Sweden and Germany also have R&D intensities above the EU average, with Sweden being the EU leader at 3.6% of its GDP, Germany at 3.1%<sup>30</sup>. Italy and Spain have domestic concentrations 43 percent and 47 percent below the EU average respectively, the strongest signals in the entire analysis. Both countries' R&D intensities are also below EU average<sup>31</sup>. This again suggests that AI startups in this market may be able to build on existing national strengths.

We focus on the most salient patterns among the six national AI ecosystems rather than covering all country-market combinations exhaustively, and findings should be interpreted accordingly. Within these patterns, we identify one strong specialisation signal – Germany in the manufacturing and supply chain market – as well as several potentially emerging ones: Italy in manufacturing and finance and insurance, Spain and France in healthcare and life sciences, France and Italy in finance and insurance, and Germany and Sweden in research and development tools. For the most part, these emerging specialisations appear to be aligned with existing national and industrial strengths, lending some support to the EU's approach of betting on AI development and application in sectors where it has strong existing foundations. At the same time, an existing industrial strength does not automatically translate into AI startup specialisation, as the case of Germany and the healthcare and life sciences market indicates.

## The generative AI boom has not reshaped every market equally

The introduction of ChatGPT in November 2022 is widely considered the beginning of a new era of AI, dominated by large language models (LLMs), generative AI, and foundation models – large-scale AI models that perform impressively across diverse tasks and serve as bases for downstream applications. Our analysis shows that the effect of this most recent wave of AI development has been most noticeable in the research and development tools and horizontal enterprise software markets. The number of startups founded in both markets has seen a significant jump in 2023, the year immediately after

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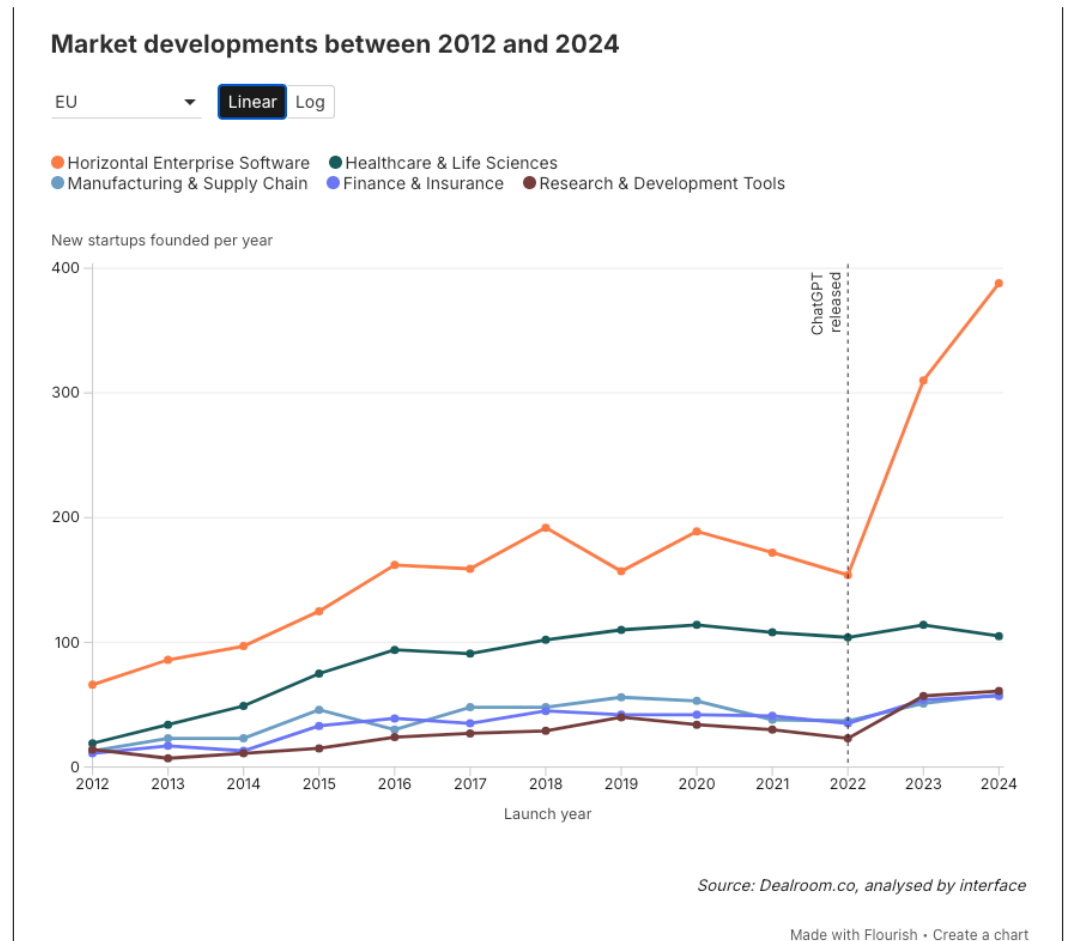
30 Eurostat. (2025, November). [R&D expenditure](#). *Statistics Explained*. European Commission.

31 Eurostat. (2025, November). [R&D expenditure](#). *Statistics Explained*. European Commission.

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the introduction of ChatGPT. Figure 3 shows this development for the EU, the UK, and the U.S. between 2012 and 2024 (years with complete data).

Figure 3. Market developments between 2012 and 2024



For a complete presentation of this graph, please see the online version of this publication.

<https://www.interface-eu.org/publications/european-ai-competitiveness-beyond-frontier-models>

Figure 3: Line plots depicting the number of startups founded each year between 2012 and 2024 in the EU, Switzerland, the UK, and the U.S. separated by market. The x-axis represents years, the y-axis represents startup counts. The dotted red line indicates the year 2023. Colors indicate different markets. Linear scale shows absolute founding numbers; logarithmic scale enables comparison of growth rates across markets with different baseline sizes.

While this trend appears most pronounced in the U.S., it is equally present in the EU and UK. In Switzerland, the more limited observations make trends less reliable and harder to interpret with confidence. Average annual founding numbers in the research and development tools market saw a marked increase comparing the pre-2023 and 2023-2024 periods, although starting from relatively small startup numbers: They increased 2.6x in the EU (23 to 59), 2.3x in the UK (8 to 19), 3.7x in the US (40 to 147) and 1.2x in

Switzerland (3 to 4).

Average annual founding numbers of horizontal enterprise software startups also considerably increased with 2.5x in the EU (142 to 349), 3.1x in the UK (49 to 152), 3.6x in the US (194 to 700) and 2.4x in Switzerland (7 to 17). This finding is particularly significant given that many component markets of horizontal enterprise software, like business operations, marketing, data analytics, HR, and legal, as well as the research and development tools market represent some of the knowledge work functions at the centre of the generative AI productivity debate<sup>32</sup>. The surge of AI startups in these markets suggests that entrepreneurs are already betting on a transformative shift in the way we work materialising at scale. It remains to be seen how the recent trend towards agentic AI will further shape the role of these horizontal markets among AI startups.

The remaining three vertical markets in our analysis have also seen growing annual founding numbers in the generative AI era, although not to the same extent as the horizontal enterprise software and research and development tools markets. Average annual founding numbers in the finance and insurance market have risen 1.7x in the EU (32 to 55), 1.8x in the UK (20 to 38), 2.9x in the U.S. (45 to 131) and 1.8x in Switzerland (3 to 6) in 2023-2024 compared to pre-2023. In the healthcare and life sciences market, average annual founding numbers grew 1.3x in the EU (82 to 110), 1.6x in the UK (29 to 47), 2.0x in the U.S. (110 to 216) and 1.5x in Switzerland (8 to 12) comparing both time periods. The manufacturing and supply chain market has seen an increase in average annual founding numbers of 1.4x in the EU (38 to 55), 1.3x in the UK (8 to 11), 1.5x in the U.S. (31 to 48) and 2.2x in Switzerland (3 to 7) between the pre and post generative AI periods. This comparatively smaller immediate impact may indicate that vertical separation into distinct sectoral market applications has not yet happened among AI startups of the generative AI and foundation model era<sup>33, 34</sup>. This may be due to regulatory barriers in these markets – startups seeking to innovate in the healthcare and life sciences or finance and insurance markets are, for example, subject to a variety of existing legal, compliance, and risk management obligations – as well as longer development cycles.

At the same time, this finding could point to existing variety in the technological approaches of AI startups as well as potential lock-in effects. Some of the earliest AI applications in the healthcare and life sciences market precede the generative AI boom, for example, medical image analysis. Similarly, robo-advisors, or machine learning applications in fraud detection in finance and insurance precede the recent generative AI and foundation model era. In manufacturing and supply chain, examples for such early

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32 Eloundou, T., Manning, S., Mishkin, P., & Rock, D. (2023). *GPTs are GPTs: An early look at the labor market impact potential of large language models*. arXiv. <https://arxiv.org/abs/2303.10130>.

33 Bornstein, M., Casado, M., & Appenzeller, G. (2023, January 19). *Who owns the generative AI platform?* Andreessen Horowitz.

34 Huang, S., & Grady, P. (2023). *Generative AI's act two*. Sequoia Capital.

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applications of AI include computer vision for defect detection or reinforcement learning for inventory optimization. Some of the startups founded before the advent of generative AI and foundation models may have built successful products with earlier technologies and can continue to compete if they manage to leverage their market positions, data and technology in ways that avoid becoming redundant in the foundation model era<sup>35</sup>.

Nonetheless, this does not mean a total absence of adoption of newer AI models in these markets, as indicated by the uptick in average annual founding numbers across all applied markets. Moreover, AI startups founded before the generative AI era may have shifted their approach over time. Yet, the model of the AI stack – with AI foundation models as base layers for fine-tuned sectoral AI applications – does likely not represent the full reality of AI startups in these markets. This may change over time as the idea of the AI stack increasingly translates into real market developments.

However, this finding also points to a larger opportunity for EU AI startups to compete globally not only at the level of markets but also at the level of technical implementation. Newer technological developments in AI continue to be varied: AI agents build on the foundation laid by large language models and generative AI, extending their capabilities into autonomous action. Small language models, by contrast, require less data and are increasingly powerful for specialised applications, making them relevant not only for general enterprise use but also for resource-constrained deployment contexts. World models, AI systems that learn internal representations of how the world works, enabling them to simulate and predict future states, thrive on data quality rather than data quantity.

This could represent a structural advantage for AI startups with access to high-quality domain-specific data, including in markets like healthcare and life sciences or manufacturing and supply chain. Most importantly, the ways in which different AI technologies create value in different markets can present competitive opportunities for Europe on par with specialisation in specific markets. Policy measures seeking to support AI startups therefore must account for these varied technological contexts on top of market realities such as specialised niches.

## There is no European Silicon Valley for applied AI markets

Building on our analysis of broad trends in AI markets across geographies, we turn to the geography of AI startups in the EU. We analyse the ten major EU AI startup hubs across the EU's five largest markets for AI startups in our data, according to their proportion among all EU AI startups in these markets. The ten cities in our analysis are (in order of

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35 Guerra, S., Kraus, S., Hedin, A., & Jalbut, M. (2026). [State of health AI 2026](#). Bessemer Venture Partners.

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AI startup ecosystem size): Paris, Berlin, Amsterdam, Munich, Stockholm, Barcelona, Helsinki, Madrid, Tallinn, and Milan.

We generally find that AI startups in the EU cluster in smaller hubs that are geographically dispersed across the continent. Only Paris and Berlin are home to more than 500 individual AI startups; only Amsterdam, Munich, Stockholm, and Barcelona are home to more than 200. These numbers are small compared to global hubs like London, which is home to more than 2,000 AI startups in the data, or the Bay Area, with more than 3,700. Both London and the Bay Area are considerably larger by population than any of the EU hubs compared here, which partly explains the difference in absolute numbers. Yet the degree of concentration in these hubs is nonetheless striking: London represents two thirds of all analysed UK AI startups, while the Bay Area represents one third of all analysed U.S. AI startups.

In comparison, one third of all analysed EU AI startups are distributed across eight cities, 50 percent across 19 cities, and 75 percent across 95 cities. The median AI startup hub size among the EU cities analysed is one, further underlining the geographic dispersion of the analysed EU AI startups. Most AI startups in the EU are also located in already strong startup ecosystems: Globally, Paris, the EU's primary startup ecosystem, ranks 12th among startup hubs, while Amsterdam places 20th, Berlin 24th, Stockholm 31st, and Munich 34th<sup>36</sup>. Per capita figures add further nuance to the EU picture, with Amsterdam at 40.16, Tallinn at 37.78, Paris at 31.47, Helsinki at 26.17, Stockholm at 25.11, Munich at 18.57, Berlin at 15.69, Milan at 12.22, Barcelona at 11.86 and Madrid at 4.93 AI startups per 100,000 inhabitants. This means that among the larger EU AI startup hubs, only Amsterdam and Paris are also at the higher end of the spectrum regarding per capita concentrations of AI startups.

Our findings suggest that the pattern among EU AI startups is one of geographic dispersion with some concentration in a small number of hubs. This geographic dispersion shapes how we interpret the EU's main local hubs for AI startups across its top five markets. Given the size and internal diversity of the horizontal enterprise software market, we disaggregate it into its five component markets, leading us to analyse nine markets in total. Figure 4 shows the five top cities in each of these nine markets by their proportion of all EU AI startups in that market.

*Figure 4. Top 5 cities in AI markets in the EU*

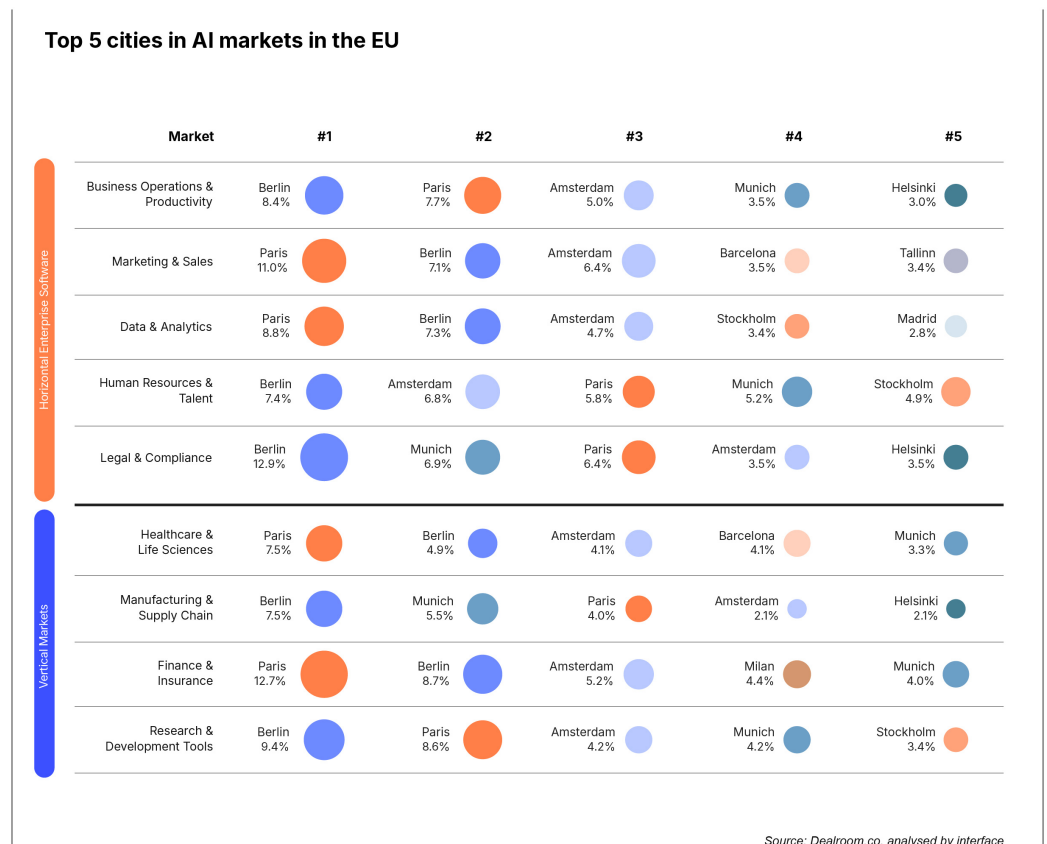


Figure 4: Ranked dot plot displaying nine AI markets on the y-axis (horizontal enterprise software markets are disaggregated) and the top five cities by proportion of EI AI startups headquartered there in each market on the x-axis (ranked from 1st to 5th). The size of the dot indicates the size of the market share a city has in that market. The shares are also indicated next to a city's name. Colors indicate different cities.

The position of EU cities across markets seems to reflect their general AI startup ecosystem size rather than genuine specialisation. With their higher concentration of AI startups, Paris, Berlin, Amsterdam, and Munich are also among the most important EU AI startup hubs across the five largest markets for AI startups in the EU. Paris, the EU's main AI startup hub in our analysis, is also the main hub for AI startups active in marketing and sales, data and analytics, healthcare and life sciences, and finance and insurance. Berlin, the second biggest EU AI startup hub in our analysis, is the main hub in the EU for AI startups active in business operations and productivity, human resources and talent, legal and compliance, research and development tools, as well as manufacturing and supply chain. Both cities also rank second to fifth across numerous markets. Munich ranks second in the legal and compliance and manufacturing and supply chain markets, suggesting a distinct German focus in both markets. Amsterdam ranks second in the human resources and talent market and third in the business operations and productivity, marketing and sales, data and analytics, healthcare and life sciences, finance and insurance, and research and development tools markets.

Despite these four cities, which account for almost quarter (24 percent) of all analysed EU AI startups, occupying the top ranks in the EU's largest AI markets, the proportion of all EU AI startups they hold is small: The top four cities together are rarely home to more than a quarter (between 19 percent in the manufacturing and supply chain market and 31 percent in the finance and insurance market) of all analysed EU AI startups active in that market.

Additionally, Stockholm, Barcelona, Milan, Madrid, Helsinki, and Tallinn are among the top five cities in at least one of the nine analysed markets. This means that for the most part the AI startup hubs that rank highest in each market do so because of the importance of their startup ecosystems rather than owing to clear patterns of regional specialisation in AI markets: Even in the more important markets among EU AI startups in our analysis, no particular EU AI startup hub truly dominates any market.

These findings underline the dispersed geography of AI startups in the EU. A potential drawback from this geographic pattern of AI innovation is that it could lead to increased challenges for the majority of the analysed EU AI startups in accessing talent or financing: a recent interface [analysis](#) has shown that EU AI talent tends to cluster in places such as Amsterdam, Berlin, and Munich. If AI startups are located far outside these hubs, they may not have easy access to their talent pools. Additionally, startups located far outside existing agglomerations may lack proximity to venture capitalists, which tends to improve access to funding<sup>37</sup>. Moreover, geographic clustering tends to be beneficial for the effectiveness of entrepreneurial ecosystems overall<sup>38</sup>.

Conversely, the EU's decentralised geography for AI startups also means that smaller cities can become relevant players in certain applied markets for AI. In pursuing global competitiveness in strategic markets, the EU must decide how to strategically allocate its resources and whether it wants to reinforce existing concentration or continue to spread resources across the continent to benefit a larger number of locations.

## European cities are beginning to carve out AI niches

Building on the previous analysis, we seek to identify the markets major EU AI startup hubs specialise in among the EU's top five markets in our data, to test whether emerging regional specialisation patterns exist. We again calculate the location quotient to measure how concentrated the markets at the core of this analysis are among AI startups in certain

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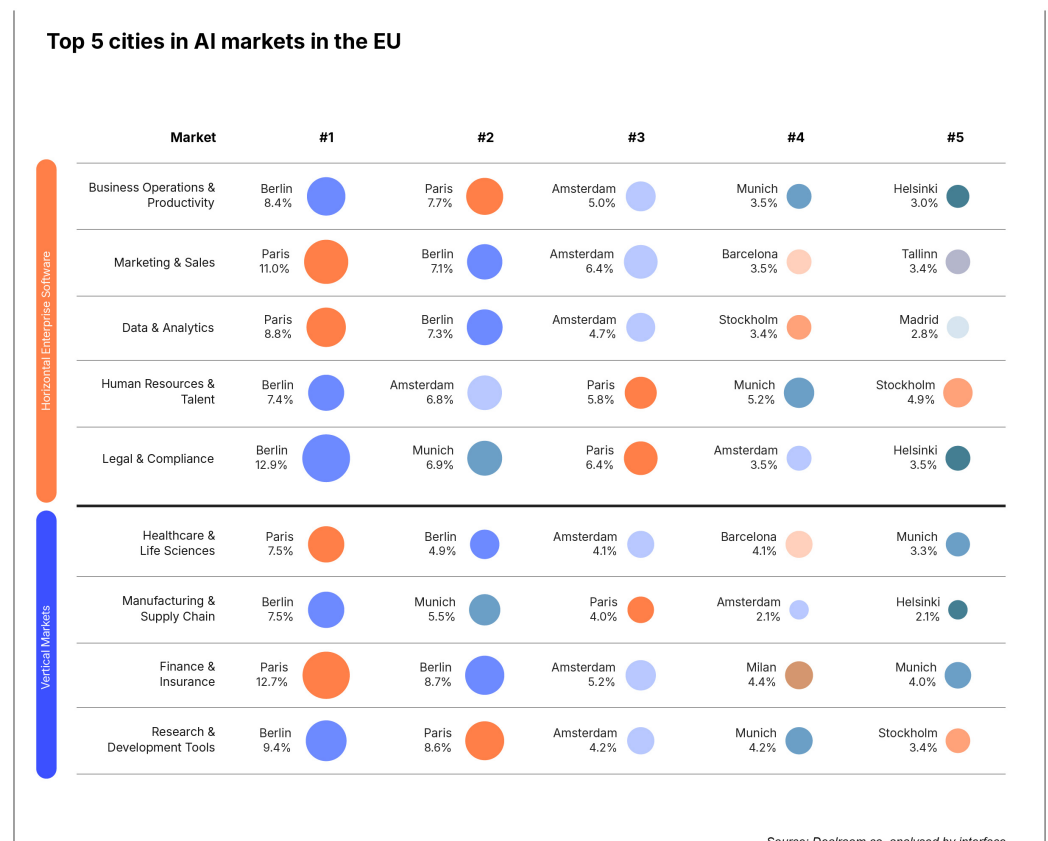
37 Colombo, M. G., D'Adda, D., & Quas, A. (2019). The geography of venture capital and entrepreneurial ventures' demand for external equity. *Research Policy*, 48(5), 1150–1170. <https://doi.org/10.1016/j.respol.2018.12.004>.

38 Delgado, M., Porter, M. E., & Stern, S. (2014). Clusters, convergence, and economic performance. *Research Policy*, 43(10), 1785–1799. <https://doi.org/10.1016/j.respol.2014.05.007>.

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hubs compared to the EU average. We focus our analysis on the ten major European AI startup hubs identified in the previous section (Paris, Berlin, Amsterdam, Munich, Stockholm, Barcelona, Helsinki, Madrid, Tallinn, and Milan). Figure 5 displays the analysed cities' specialisation tendencies across nine markets.

Figure 5. Main European AI startup hubs: market specialization



For a complete presentation of this graph, please see the online version of this publication.

<https://www.interface-eu.org/publications/european-ai-competitiveness-beyond-frontier-models>

Figure 5: Diverging bar plots.  $LQ$  = location quotient.  $LQ = 0$  is the EU average. Bars indicate divergence from EU average. Dotted lines indicate lower and higher  $LQ$  bounds: Lower (0.67) = a city has roughly two-thirds the concentration of a market compared to the EU average, higher (1.5) = a city has roughly one and a half times the concentration of a market compared to the EU average. Transparency indicates reliability, with lower transparency indicating higher reliability. Reliability based on the size of each market in each city ( $n \geq 20$  = "High",  $n \geq 10$  = "Medium",  $n < 10$  = "Low"). Plot only includes cities with sufficient AI ecosystem size ( $n \geq 100$  startups).

Again, we consider these emerging specialisation patterns most reliable where cities have local concentrations of AI startups in a market that are 50 percent or more above the EU average, corresponding to a location quotient  $\geq 1.5$ . Patterns below this threshold must be interpreted more cautiously. Moreover, because the location quotient is sensitive to

smaller sample sizes, we only include cities with at least 100 startups in total, which is the case for all of the cities analysed, and consider results more reliable the more AI startups a city has in a specific market. With both of these rules applied, every city shows at least one substantial specialisation in one of the markets analysed. This allows us to shed light on the city-level trends behind the country-level patterns identified earlier.

Within the horizontal enterprise software market, we see several cities specialising in one of its component markets: Berlin and Munich show substantial specialisation when it comes to AI startups active in the legal and compliance market, in line with their position as major hubs for legal tech<sup>39</sup>. Amsterdam, Stockholm, and Helsinki specialise in the human resources and talent market. Moreover, Madrid, Milan, Barcelona, and Tallinn all show signs of specialisation in the marketing and sales market, although not substantially. Six out of the ten cities analysed have a substantial specialisation in one of horizontal enterprise software's component markets, but not in the others: these patterns underscore that even within the broad trend towards AI startups focusing on horizontal enterprise software, developing regional specialisations in line with local strengths is possible.

Considering the top vertical markets that are part of this analysis, Barcelona is the only one among the six top EU AI startup hubs with a substantial specialisation in the healthcare and life sciences market, in addition to ranking fourth among all EU cities in this market. This aligns with Barcelona's position as a leading hub for life sciences<sup>40</sup> and confirms our earlier finding regarding Spain's emerging specialisation in this market. A similar pattern holds across most vertical market: although the healthcare and life sciences market is important to the EU both for its AI startups and as a strategic priority, developments in this market are not genuinely driven by strong specialisation in the main AI hubs. Paris, Berlin, and Amsterdam represent the largest healthcare and life sciences market hubs in absolute numbers, but that volume is due in part to their overall AI startup ecosystem size rather than each city specialising in the market.

In the manufacturing and supply chain market, Munich shows substantial specialisation. As the city is among the five most important hubs for AI startups in this market, it could lead the development of a European competitive niche, further emphasizing the potential that is present for the EU in this market. Yet, like in the healthcare and life sciences market, the top five cities account only for a fraction of AI startups in the manufacturing and supply chain market, which has to be considered when supporting AI startups focusing on the manufacturing and supply chain market. In Germany in particular – where almost a third (32 percent) of the EU's manufacturing and supply chain startups have their headquarters – the geography of these startups is likely distributed across the country, which historically has a decentralized innovation landscape. Milan in Italy does

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39 Jackson, J. (2025, December 17). [How "trendy" Berlin became Europe's legal tech hub.](#)

40 Barcelona & Partners. (2024, July 11). [Barcelona: A leading hub in the life sciences sector.](#)

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not specialise in this market, suggesting that Italy's focus on manufacturing and supply chain may be driven by developments outside of this hub.

Although the finance and insurance market is not part of the EU's strategic ambitions for AI, certain AI startup hubs develop regional strengths in this market: both Paris and Milan show substantial specialisations, supported by both cities' roles as major fintech hubs in the EU<sup>41</sup>, confirming their role in our earlier finding about France and Italy showing slight specialisation tendencies in this market. This misalignment between political priorities and market realities potentially points to a strategic blind spot the EU has when it comes to this market. Much like in the healthcare and life sciences market, European competitiveness in the finance and insurance market is also challenged by the strong positions of the U.S. and notably the UK.

Finally, none of the analysed regional AI startup hubs specialise in the research and development tools market. This suggests that earlier findings about Germany, Sweden, and France showing signs of specialisation in this market is not due to the main startup hubs in these countries specialising in it. Instead, the distribution of main cities in this market neatly represents the overall distribution of AI startups in our data, suggesting that most strong AI startup hubs will have some startups active in the research and development tools market without this necessarily leading to specialisation. At the same time, for European AI competitiveness in this market, it is worth noting that the U.S. dominates more than in any other market analyzed.

The analysis of market specialisation patterns among the top European AI startup hubs lends nuance to some of our earlier findings: First, they confirm that the leading European hubs for AI startups active in the EU's top five markets are leading – for the most part – because of their overall stronger AI startup ecosystems, not because of genuine patterns of specialisation. Second, every city analysed shows emerging specialisation patterns in one or more of the EU's top markets, indicating that there is potential for these cities to develop into growth engines for the EU's strategic ambitions in applied markets for AI. Specialisation patterns can even be found in the horizontal enterprise software market. Third, in many cases, these regional specialisations also contribute to the country-level patterns described earlier. A good example is the manufacturing and supply chain market, where Munich shows patterns of specialisation and emerges as one of the five top hubs in this market. The city is thus well equipped to become a leader of a European advance in this area.

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41 European Central Bank. (2024). [Rapid growth and strategic location: Analysing the rise of FinTechs in the EU](#). *Financial integration and structure in the euro area*.

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## Conclusion

Europe's AI competitiveness challenges extend well beyond frontier models. AI startups, both as drivers of frontier AI development and enablers of AI development and adoption across existing markets, can contribute to the EU's competitiveness goals for AI. In this data brief we draw on data on AI startups in the EU, Switzerland, the UK, and the U.S. gathered by [Dealroom.co](https://dealroom.co) to reveal insights for understanding Europe's position in the global AI landscape. Instead of the AI race at the frontier, we focus on emerging competitive niches for Europe regarding AI development and adoption in select markets. To identify trends and patterns, we focus on the big picture: We analyse the EU's five largest markets for AI startups in our data – horizontal enterprise software, healthcare and life sciences, manufacturing and supply chain, finance and insurance, and research and development tools – and compare geographic patterns at several levels of analysis: we compare the EU to Switzerland, the UK and the U.S., the six EU member states with the largest AI startup ecosystems in absolute numbers – Germany, France, Spain, the Netherlands, Italy, and Sweden – and ten European cities which represent some of the largest AI startup hubs in absolute numbers in our data (Paris, Berlin, Amsterdam, Munich, Stockholm, Barcelona, Helsinki, Madrid, Tallinn, and Milan). Our analysis reveals several trends and patterns with implications for policymakers seeking to support European startups and AI competitiveness.

The U.S. currently outcompetes the EU in the majority of the EU's top five markets for AI startups according to our data. This means that the EU faces an uphill battle not only with regard to competitiveness in frontier AI, but also in the applied markets most EU AI startup activity takes place in. The rise in importance of the horizontal enterprise software market after the introduction of generative AI and foundation models, combined with U.S. dominance in this market, suggests that U.S. trends in AI often become global ones, especially when considering that many funders for European AI startups are from the U.S.<sup>42</sup>

While generative AI has many promising applications in the horizontal enterprise software market, European competitiveness there faces significant pressure, with AI leaders like Anthropic increasingly focusing their products on this market. Additionally, none of the six countries analysed exhibit a strong specialisation in the horizontal enterprise software market. This does not mean that European competitiveness in this market is entirely out of reach: regional specialisation patterns among European cities reveal that there is the potential for developing competitive niches in this market. Several

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42 Saari, L. J. M. (2026). Capital ecosystem of European AI: Patriotic billionaires, development banks, and the evolution of state-finance nexus. *Competition & Change*. Advance online publication. <https://doi.org/10.1177/10245294261429545>

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European AI startup hubs, for example, specialise in legal and compliance, human resources and talent, or marketing and sales. Trusted European solutions in these often sensitive areas that will impact many individuals in their daily work may have a place in the market. However, in the horizontal enterprise software market U.S. incumbents are well-positioned and European players face significant pressure, making it harder to build durable advantage on trust alone.

In the healthcare and life sciences market, U.S. dominance becomes an even more relevant consideration for EU policymakers, because this is a market the EU considers a strategic priority for AI development and adoption. Yet, while the healthcare and life sciences market is universally important across the six EU countries analysed, none of them show strong specialisation patterns in healthcare and life sciences, with only France and Spain being somewhat specialised in this market. Among the ten European AI hubs analysed, Barcelona is the only one that truly specialises in healthcare and life sciences, building on existing strengths in the life sciences industry.

At the same time, Barcelona is home to only 4.1 percent of European AI startups in the healthcare and life sciences market. Most of the European AI startup activity takes place either in larger startup hubs that do not show particular specialisation in this market – like Paris, Berlin, Amsterdam, and Munich – or in smaller startup hubs all over the continent. Policymakers seeking to transform this market into a competitive advantage for Europe must consider this geographic pattern as well as the challenges that may emerge from it.

Among the five markets analysed, the manufacturing and supply chain market presents the strongest grounds for optimism regarding EU AI competitiveness. This market ranks third among AI startups headquartered in the EU, but only eighth among those in the UK and U.S. Moreover, the EU already counts this market among those that are of strategic priority for AI. This is also the only market where the EU accounts for a higher proportion of AI startups than the U.S. in our data.

Within the EU, Germany and in particular Munich have the potential to be a driver of EU competitiveness in this market. In Europe more generally, Zurich is also a specialised hub for AI startups in this market, suggesting that truly European solutions rather than focusing on the EU alone are called for in the global competition surrounding AI. Moreover, with 7.5 percent of European AI startups active in the manufacturing and supply chain market based in Berlin, 5.5 percent in Munich, 4.0 percent in Paris, and 2.1 percent in Amsterdam and Helsinki respectively, most of the startup innovation in this market again takes place outside of Europe's main centralised AI hubs. Additionally, Chinese providers, which have shown particular strengths at the intersection of AI and manufacturing, represent a significant challenge to European competitiveness in this market.

For both the healthcare and life sciences market and the manufacturing and supply chain

market, European policymakers must consider the distributed geography of the European AI startup ecosystem. This geographic distribution presents both opportunities and challenges for the Union's strategic ambitions. On the one hand, the concentration of a quarter of analysed AI startups in just five cities – Paris, Berlin, Amsterdam, Munich, and Stockholm – provides critical mass for talent, capital, and collaboration. Berlin, Amsterdam, and Munich in particular, with their strong and diverse AI talent hubs, could transform into growth engines for European AI startups across AI markets, as evidenced by a recent interface [analysis](#). However, not all of these cities specialise in the most relevant markets for the EU and 75 percent of all analysed EU AI startups are dispersed across 95 cities, indicating a more fragmented innovation landscape.

On the other hand, this pattern may enable AI adoption across diverse regional economies and existing industrial strengths. It also raises questions about whether European AI hubs can achieve sufficient scale and specialisation to compete with potentially more concentrated ecosystems elsewhere. European policymakers must account for these geographic realities when targeting policy interventions and decide whether prioritising concentration in key hubs over geographic diversity is the right trade-off to achieve EU-wide AI competitiveness.

Moreover, neither the healthcare and life sciences market nor the manufacturing and supply chain market have experienced the immediate generative AI and foundation model effect present in the horizontal enterprise software market. This effect may simply be lagging, for example due to higher regulatory burden in these markets, such as product regulations but also the EU AI Act. At the same time, the more modest founding surge in vertical markets suggests that AI startups in these markets are not yet building primarily on top of foundation models to the same extent as those in horizontal enterprise software and research and development tools.

This may reflect a combination of factors: Regulatory barriers slowing adoption, longer development cycles, and the persistence of earlier approaches that remain competitive in specific applications. Rather than assuming a uniform transition to foundation model-based AI stacks, policymakers should recognise this diversity in technological approaches when planning interventions, since it represents opportunities for building competitive niches at the intersection of established markets and domain-specific AI technologies.

Two concrete examples from the healthcare and life sciences and manufacturing and supply chain markets help illustrate this point. In the healthcare and life sciences market, for example, smaller, domain-specific models trained on medical literature and clinical data can sometimes outperform generalist models on clinical tasks<sup>43</sup> and thus be a

genuine competitive asset for AI startups in this market. Embodied AI, AI systems that perceive and act in the physical world through robotic systems, is particularly promising for the manufacturing and supply chain market. Embodied AI often builds on advances in LLMs, which help the models interpret and break down tasks given in natural language. At the same time, it also builds on world models, which help the model process rich sensory inputs from the outside world and make predictions about its future states.

Recent industry analysis suggests that world models may represent a shortcut to scaling robotic capabilities, and that in the near term, vertically integrated players rather than pure foundation model companies are expected to lead in robotics, with data and capital, not just compute, emerging as the key competitive moats<sup>44</sup>. To improve the performance of embodied AI models, high quality, real-time data is crucial and increasingly key to competitiveness. EU countries are home to many world-leading engineering companies which possess such data generated in real-world manufacturing environments. European AI startups could turn this data into a real competitive advantage. China's open AI strategy is, for example, already generating real-world data advantages through widespread deployment in manufacturing and robotics, creating feedback loops that may be difficult to replicate even for technically superior models<sup>45</sup>, underscoring both the urgency and the potential of Europe's own data advantages in this market. Data – not just the compute frequently debated – are a major policy lever.

Taken together, the findings we present in this data brief underscore that Europe's challenges regarding AI competitiveness do not only lie with frontier AI models. With Paris, the EU already has a hub that shows promising developments in the frontier AI space, home to leading labs including Mistral AI, H Company, and Poolside. However, Europe's fragmented AI startup landscape, with activity spread across dozens of cities and no single dominant hub, underscores the value of coordinated approaches rather than 27 separate national ones. Still, application-layer hubs such as Munich in manufacturing and supply chain or Barcelona in healthcare and life sciences show that existing European industrial and research strengths can serve as foundations for globally competitive AI ecosystems beyond frontier AI.

But realising this potential requires concerted, cross-border approaches. Developing the commercial underpinnings for true European AI competitiveness requires strategic policy intervention: Whether the emerging specialisation patterns identified in this analysis develop into globally competitive positions depends on continued access to growth capital, data, compute resources, and cross-border market integration. These are precisely

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*Do we still need clinical language models?* arXiv. <https://arxiv.org/abs/2302.08091>

44 Levine, J., Goldberg, T., Teng Wade, J., Sukin, A., Nagda, B., & Scheller, J. (2026). *Bessemer predicts: Robotics and physical AI*. Bessemer Venture Partners.

45 Luong, N. (2026). *Two loops: How China's open AI strategy reinforces its industrial dominance*. U.S.-China Economic and Security Review Commission.

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the challenges ongoing policy initiatives like the Cloud and AI Development Act, the Common European Data Spaces, the Scaleup Europe Fund, and the EU Inc. proposal seek to address – and where timely policy interventions will be decisive.

## Data and Methodology

The analysis presented in this data brief is part of a broader research project mapping AI startups in the EU, Switzerland, the UK, and the U.S. The goal of the present analysis was to meaningfully describe variation among startups in our data and draw conclusions about macroscopic trends. Most of the present analysis focuses on two key variables: the markets AI startups operate in and the geographies they are headquartered in.

*Data source:* For our analyses, we rely on data collected by [Dealrom.co](https://dealroom.co), a widely recognized global data platform for startups, venture capital, and tech ecosystems. For this data brief, we analyze 24,468 active startups founded between January 2012 and November 2025 that Dealroom has classified as active AI startups across Europe (EU and non-EU unless otherwise specified), the United Kingdom (UK), and the United States (U.S.). Dealroom creates its dataset through a multi-step process, combining web scraping, automatic and manual verification to identify and classify startups. To ensure data quality for our research purposes, we implemented supplementary verification procedures. Our initial manual review indicated some variation in company activity status, which is common in dynamic startup ecosystems where business conditions change rapidly. We therefore conducted additional verification of startup activity status by systematically checking website activity. The website variable provided by Dealroom was available for 99.9 percent of startups, allowing us to query the startups' websites for their status and subsequently drop those where we had low confidence that the website was still active (5,171 startups).

*Startup definition:* For the purpose of this analysis, we define AI startups as companies founded in 2012 or later which state working on or with AI in some capacity. This allows us to capture the full trajectory of AI innovation from founding through scaling. With our cut-off at around 13 years (covering startups founded in 2012 up to November 2025) we are slightly above established practice, which tends to set the cut-off at around 10 years. The OECD for example defines startups as  $\leq 5$  years old, scaleups (“middle-age”) as 6-10 years old<sup>46</sup>. Startup Genome<sup>47</sup> defines a startup as “an innovative or technology-driven company that was founded within the last 10 years and that has technology and/or scalability at the core of its business model.” However, our data primarily captures the contemporary AI innovation landscape, with 90% of companies founded since 2015 and

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46 OECD. (2025b). *Measuring science and innovation for sustainable growth*. <https://doi.org/10.1787/3b96cf8c-en>

47 Startup Genome. (2025). *The global startup ecosystem report 2025*.

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56% founded since 2020, ensuring our analysis reflects modern AI entrepreneurship patterns rather than historical artifacts (cf. Table 1).

*Table 1. Breakdown of startup formation periods*

Measure	2012-2014	2015-2019	2020-2025
Total	2.504	8.267	13.697
Share	10%	34%	56%

A considerable limitation of our analysis is the fact that we are not able to determine the degree to which a company actually uses AI. AI has become a major selling point for startups. Therefore, we are likely overestimating the total number of AI startups, potentially including startups using AI with less intensity or simply claiming to use AI. Nevertheless, we argue that our broad definition – both in terms of AI intensity and time range – is useful for estimating general patterns of AI startup activity, especially when considering patterns of AI adoption in applied markets.

*Market variable:* Since AI comprises technologies applicable across sectors, we classified startups by target market. To classify AI startups according to the markets they operate in, we adopted a pragmatic approach to categorisation, drawing on authoritative existing classifications where possible and adapting them to our analytical needs. Our approach was hybrid, combining human expertise with LLM assistance (Claude Sonnet 4 and 4.5, Anthropic) in both category development and final coding. AI was one input alongside deliberation within the research team and with external experts; all final decisions were made by the lead researcher and research team.

We defined 24 market categories by synthesising four existing taxonomies (Global Industry Classification Standard, Dealroom, Crunchbase, and Sifted) with Claude Sonnet 4.5 (Anthropic), then refining categories and their definitions based on domain knowledge and pilot hand coding ( $n = 100$ , two coders). For classifying the startups into these market categories, we relied on Dealroom's long description variable where it was available ( $n = 22,490$  startups) and on scraped data from startup websites where it was not available ( $n = 5,017$  startups). Intercoder reliability for market classification was strong for human coders (81% agreement,  $\kappa = 0.797$ ) and acceptable for human-LLM agreement (76%,  $\kappa = 0.74$ ) for the data classified according to the long description variable.

*Geographic comparison:* This analysis focuses predominantly on six EU countries, Germany, France, the Netherlands, Spain, Italy and Sweden. It also draws broad comparisons between the EU as a whole and Switzerland, the UK, and the U.S.. The six EU countries analysed were selected according to the size of their AI startup ecosystems in absolute numbers in the data. Moreover, we analyse the ten EU cities which emerge as main hubs in absolute numbers in the five markets we analyse: Paris, Berlin, Amsterdam,

Munich, Stockholm, Barcelona, Helsinki, Madrid, Tallinn, Milan. When considering AI startup hubs per capita, this pattern changes. Table 2a and 2b summarize Europe's main AI startup hubs both in absolute numbers and per capita.

*Table 2a. Main European AI startup hubs (countries)*

Rank	Main hubs (absolute numbers)	Main hubs (per capita)
1	United Kingdom*	Luxembourg
2	Germany	Estonia
3	France	Switzerland*
4	Netherlands	Finland
5	Spain	Netherlands
6	Switzerland*	Ireland
7	Italy	United Kingdom*
8	Sweden	Denmark
9	Finland	Sweden
10	Poland	Norway

*Table 2b. Main European AI startup hubs (cities)*

Rank	Main hubs (absolute numbers)	Main hubs (per capita)
1	Paris	Luxembourg
2	Berlin	Zurich*
3	Amsterdam	Amsterdam
4	Munich	Lausanne*
5	Stockholm	Tallinn
6	Zurich*	Leuven
7	Barcelona	Paris
8	Helsinki	Delft
9	Dublin	Dublin
10	Madrid	Eindhoven
11	Tallinn	Helsinki
12	Milan	Stockholm

13	Copenhagen	Porto
14	Warsaw	Gent
15	Lisbon	Copenhagen

The per capita data numbers show that smaller, specialised startup clusters can play a highly relevant and outsized role in the EU's strategic ambitions for AI and also reveal weaknesses in the EU's main economies like Germany and France, which are falling behind in per capita analysis. However, these smaller AI startup clusters are not the focus of the current analysis. For the geographic analysis, we rely on Dealroom's variables for where a startup is headquartered, which manual checks confirm to be accurate. A main limitation of this data brief is that it cannot deliver insights on China, a major player in the AI space.

*Internal validity:* We did several robustness checks to ensure the internal validity of our results. First, we checked the differences in market distributions between the startups classified based on their long description variable (n = 22,490) and the web scraped startups (n = 5,017). The differences between both sets of data are below 2 percent in all markets, apart from horizontal enterprise software and healthcare and life sciences where differences are slightly larger but still below 3.5 percent. Second, we tested whether the market distribution meaningfully changes when excluding small countries (n < 100 startups) and found almost no meaningful differences in market distributions when comparing all countries to larger ones. Third, market distributions held up for startups for which funding data was available (n = 13,149) and for which funding data was not available (n = 11,319).

*External validity:* Many of the findings presented in this analysis are consistent with findings from other recent analyses of the AI startup landscape. Additionally, the total number of European AI startups in our data is comparable to the number reported in a recent analysis by PitchBook<sup>48</sup>. Moreover, Dealroom data has particular strengths in the European market<sup>49, 50</sup>. Nevertheless, several notable limitations to the external validity of our findings warrant attention.

Given Dealroom's focus on Europe, our dataset likely provides a conservative estimate of startup numbers in the U.S. We may thus underestimate the extent of the competitiveness gap with the U.S. Additionally, Dealroom data is particularly well known for its coverage of startups receiving funding, and several biases likely stem from this. First, our data is

48 Rajan, N. (2026). *The state of European AI: Exploring the startup, dealmaking, and exit landscape*. PitchBook.

49 Berger, M., Calligaris, S., Dechezleprêtre, A., Dernis, H., Greppi, A., Kirpichev, D., & Muñoz Alvarado, A. (2026). *The OECD Start-ups Database: A new lens on the global entrepreneurial ecosystems* (OECD Science, Technology and Industry Working Papers No. 2026/04). OECD Publishing. <https://doi.org/10.1787/be8e5317-en>

50 OECD. (2025b). *Measuring science and innovation for sustainable growth*. <https://doi.org/10.1787/3b96cf8c-en>

likely skewed toward markets that tend to attract venture capital investment. Only 5% of startups in our dataset are active in consumer applications, suggesting our data may undercount consumer-facing AI startups relative to their true prevalence. Second, our data is likely skewed toward large cities, where venture capitalists tend to be more active and where more data on startup activity is available in general. This bias is further compounded by our focus on the largest AI startup hubs by absolute numbers, which are disproportionately located in major cities. This may lead us to underestimate the role of smaller cities and more distributed startup activity.

Moreover, we noticed an English language bias in our own web scraped descriptions, which is likely present in the Dealroom data more broadly given that their method also relies on web scraping. This may lead to an underrepresentation of startups in non-English speaking markets. While some of these patterns may reflect real-world trends in AI startup activity, researchers, practitioners, and policymakers should interpret the geographic and market findings presented here with these potential biases in mind.

*AI disclosure:* This research used AI assistance at several stages. First, LLMs (Claude Sonnet 4 and 4.5, Anthropic) were used as one input in the development of market categories and in the zero-shot classification of AI startups into these categories, as described in the methodology section. All category definitions and final classifications were reviewed and approved by the lead researcher and research team. Second, AI assistance (Claude Sonnet 4.6, Anthropic) was used during the editing process to improve clarity and consistency of the text. Third, AI tools (Claude Sonnet 4.6, Anthropic) were used for research support tasks throughout the project, including supporting literature searches, reference retrieval, and code review. All analytical and methodological decisions, interpretations, and conclusions are those of the author and research team, and AI was one input among many alongside human expertise and peer review.

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