Europäisches Patentamt
European Patent Office
Office européen des brevets

Mapping investors for European innovators

Introducing the Technology Investor Score

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Foreword

Startups play a crucial role in commercialising disruptive ideas with great potential to drive progress. However, as highlighted in Mario Draghi's landmark report, many innovative companies face financial obstacles to growth within Europe, preventing innovation from translating into startups and scalable businesses, and prompting entrepreneurs to expand abroad. Addressing this funding gap is essential to fostering innovation and reigniting sustainable growth in Europe.

Recognising the funding challenges faced by innovators in Europe, the EPO has engaged in multiple initiatives aligned with our mission to foster innovation, competitiveness and economic growth. Our commitment is evident in our updated patent fee system, which now includes significant reductions for micro-entities, simplified fee structures and incentives for digitalisation. As a leading source of technical information on innovation, we are also trusted partners to key players in financing innovation such as the European Innovation Council (EIC).

The EPO's Observatory on Patents and Technology has prioritised financing of innovation as a core area of interest. This focus is reflected in the release of specialised tools such as the Deep Tech Finder, which simplifies the process for discovering European universities, spin-outs and other investment-ready startups with patent applications at the EPO. On the occasion of the launch of this study, the tool has now been updated with a new filter for finding investors. The Deep Tech Finder, related studies and other material relevant for financing innovation are available on a new section of the EPO website (epo.org/financing-innovation-programme).

As the next milestone in our programme, I am happy to present this study providing a comprehensive mapping of technology investors for European startups. The study presents the Technology Investor Score (TIS), a novel metric designed to identify investors specialising in technology-driven companies based on the percentage of patenting companies within their portfolios. Identifying investors that can support tech startups in commercialising their inventions is crucial for startups, innovation agencies, private investors and policymakers seeking to address funding gaps and strategic challenges.

This new measure reveals varying degrees of engagement in tech by investors in European startups, and useful insights for European competitiveness. It finds that investors with higher involvement in tech are more likely to enjoy successful exits and scale-ups. The analysis reveals significant funding gaps between Europe and the US for private investors highly involved in tech, particularly in late-stage rounds. This gap contrasts with a funding surplus for public investors. These results hint at an interrupted pipeline of tech investors in Europe, where public early-stage high-tech investors are not followed by the private late-stage investors that have a major presence in the US market. We identify private investors well positioned to collaborate with European public entities, presenting a strong opportunity to bridge funding gaps and bolster Europe's innovation ecosystem.

This study concludes a project from the EPO Observatory that united experts from the EPO and 21 national patent offices, including Albania, Austria, Belgium, the Czech Republic, Denmark, France, Germany, Great Britain, Greece, Latvia, Lithuania, Luxembourg, Netherlands, Poland, Portugal, Republic of Serbia, San Marino, Slovakia, Slovenia, Sweden and Türkiye. We hope to engage an expanding network of partners in our ongoing programme of activities dedicated to advancing the financing of innovation.

António Campinos
President, European Patent Office

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List of abbreviations

AI	Artificial Intelligence
CIS	Community innovation survey
EIC	European Innovation Council
EIE	European Innovation Ecosystems
EIT	European Institute of Innovation and Technology
EIB	European Investment Bank
EPC	European Patent Convention
EPO	European Patent Office
ESA	European Space Agency
ESA BICs	European Space Agency Business Incubation Centres
ETCI	European Tech Champions Initiative
EU	European Union
EUSPA	European Union Agency for the Space Programme
ICO	Initial coin offering
IPO	Initial public offering
IP	Intellectual property
NIH	National Institutes of Health
NSF	National Science Foundation
R&D	Research and development
SPACs	Special purpose acquisition company
TIS	Technology Investor Score
Taftie	The European Network of Innovation Agencies
VC	Venture capital

List of countries

AL	Albania
AT	Austria
BE	Belgium
BG	Bulgaria
CH	Switzerland
CY	Cyprus
CZ	Czech Republic
DE	Germany
DK	Denmark
EE	Estonia
ES	Spain
FI	Finland
FR	France
GR	Greece
HR	Croatia
HU	Hungary
IE	Ireland
IS	Iceland
IT	Italy
LI	Liechtenstein
LT	Lithuania
LU	Luxembourg
LV	Latvia
MC	Monaco
ME	Montenegro
MK	North Macedonia
MT	Malta
NL	Netherlands
NO	Norway
PL	Poland
PT	Portugal
RO	Romania
RoW	Rest of World
RS	Serbia
SE	Sweden
SI	Slovenia
SK	Slovakia
SM	San Marino
TR	Türkiye
UK	United Kingdom
US	United States

Executive summary

Startups play a vital role in transferring university science to industry and advancing ideas that are too disruptive to be commercialised by established firms. They have the potential to drive economic growth, enhance welfare, generate employment and boost productivity through innovative products. However, they face a critical challenge; their reliance on external capital, coupled with inefficiencies in the allocation of financial resources, often hinders their ability to secure the necessary funding.

This challenge is particularly acute in Europe, as highlighted in the 2024 Mario Draghi report, "The future of European competitiveness". Despite high private sector savings, Europe suffers from underinvestment in key technologies and innovation markets. Fragmented capital markets complicate efforts to mobilise the substantial funding needed for technology development. Compared to the US, venture capital (VC) plays a significantly smaller role in Europe, with a pronounced gap in later-stage funding. This shortfall is critical, as higher investments at this stage are essential to prepare inventions for successful market entry.

Patents play a vital role in helping startups overcome financial obstacles, particularly during the stages of technology and product development, when external funding is critical. However, while patents open doors to funding opportunities, they also present challenges for investors, as radical inventions often carry high risks despite their earnings potential. Investors with strong IP management skills and the capacity to guide inventions from early stages to scaling up are essential.

This study, conducted under the aegis of the EPO Observatory on Patents and Technology, aims to contribute to improving financing opportunities for technology-driven startups in Europe. It introduces the Technology Investor Score (TIS), a novel metric designed to identify investors specialising in tech companies as measured as the percentage of patenting companies in their portfolio. Leveraging this metric, the study creates a comprehensive mapping of specialised technology investors available to European startups and explores key areas of interest for European competitiveness.

Public investors are essential to Europe's innovation ecosystem, working alongside private investors to drive progress. While private investors such as VCs and investment funds dominate high-TIS investments, public ones also play a significant role. Notably, private investors are more evenly distributed across moderate and low-TIS categories, whereas public investors are predominantly concentrated in high-TIS categories, reflecting their focus on fostering investments with high social impact. Among public investors, we observe a significant presence of pan-European institutions such as the European Innovation Council (EIC) under Horizon Europe and the European Investment Bank (EIB), national innovation agencies from the Taftie network such as Bpifrance, Innovate UK and Innosuisse, and regional innovation agencies.

Investors with a higher TIS are in principle better equipped to support innovative companies. We examine their connection with key outcomes for European competitiveness, finding that high-TIS investors produce a higher rate of successful exits and scale-ups. However, this relationship is stronger for US investors, reflecting differences in scaling resources, with a more supportive ecosystem for high-growth companies across the Atlantic. Our analysis reveals significant funding gaps between Europe and the US for high-TIS private investors, particularly in critical technology sectors with high growth potential. These gaps are also most evident in the later-stage funding rounds essential for scaling up. Instead, we find a funding surplus for public investors.

The need for growth capital in technology-driven companies has become a priority for European institutions, prompting initiatives like the EIC's Trusted Investors Network launched in October 2024 to foster public-private collaboration. We analyse co-investor networks to explore how public-private investor relationships influence funding availability throughout the innovation cycle, uncovering key structural differences between Europe and North America. In the US, private late-stage investors hold central network positions, driving extensive scale-up funding, while in Europe public entities focusing on early-stage support dominate. We identify private investors well positioned to collaborate with European public entities, presenting a strong opportunity to bridge funding gaps and bolster Europe's innovation ecosystem.

Key findings

1. The TIS is an effective tool for identifying investors engaged in tech startups.

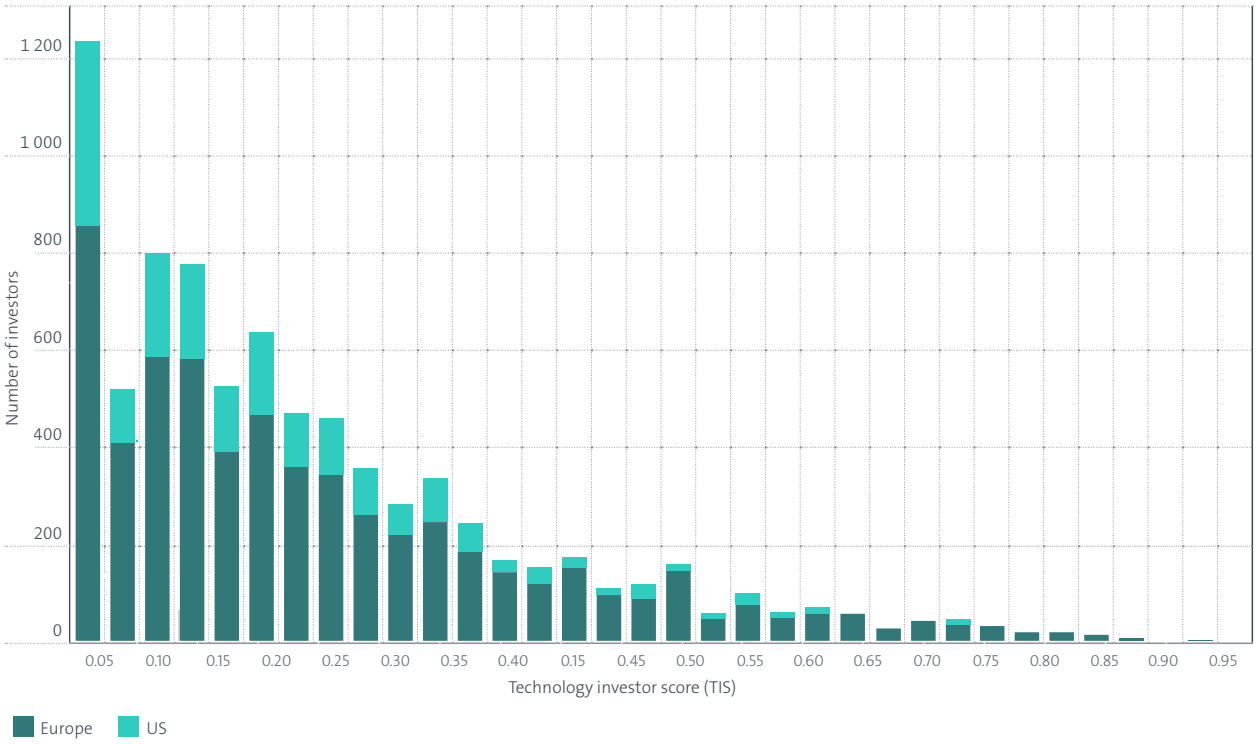
We present the TIS, a new metric that can be used to pinpoint investors with a focus on backing technology-driven companies. The TIS measures the percentage of patenting companies in an investor's portfolio. It ranges between zero and one, with higher values denoting greater engagement in technology-based startups.

Over 6 100 global investors active in Europe are analysed in this study, including both private and public players. To provide a benchmark, we also study over 8 000 investors in US companies.

We find that 88% of European investors have a positive TIS and are therefore involved with innovation. However, the extent of this involvement varies considerably across investors. Although most have a low TIS, 8% have portfolios where more than half of the companies hold patents. US investors present a very similar distribution. The TIS is highly granular, having 1 372 distinct values indicating different degrees of investor engagement in technology-driven startups. This granularity makes it a powerful tool for identifying investors well suited to funding innovation.

Figure E1

European and US investors by TIS



Note: The graph shows the frequency of investors across TIS values for companies headquartered in Europe and the US.

Sources: Dealroom, EPO.

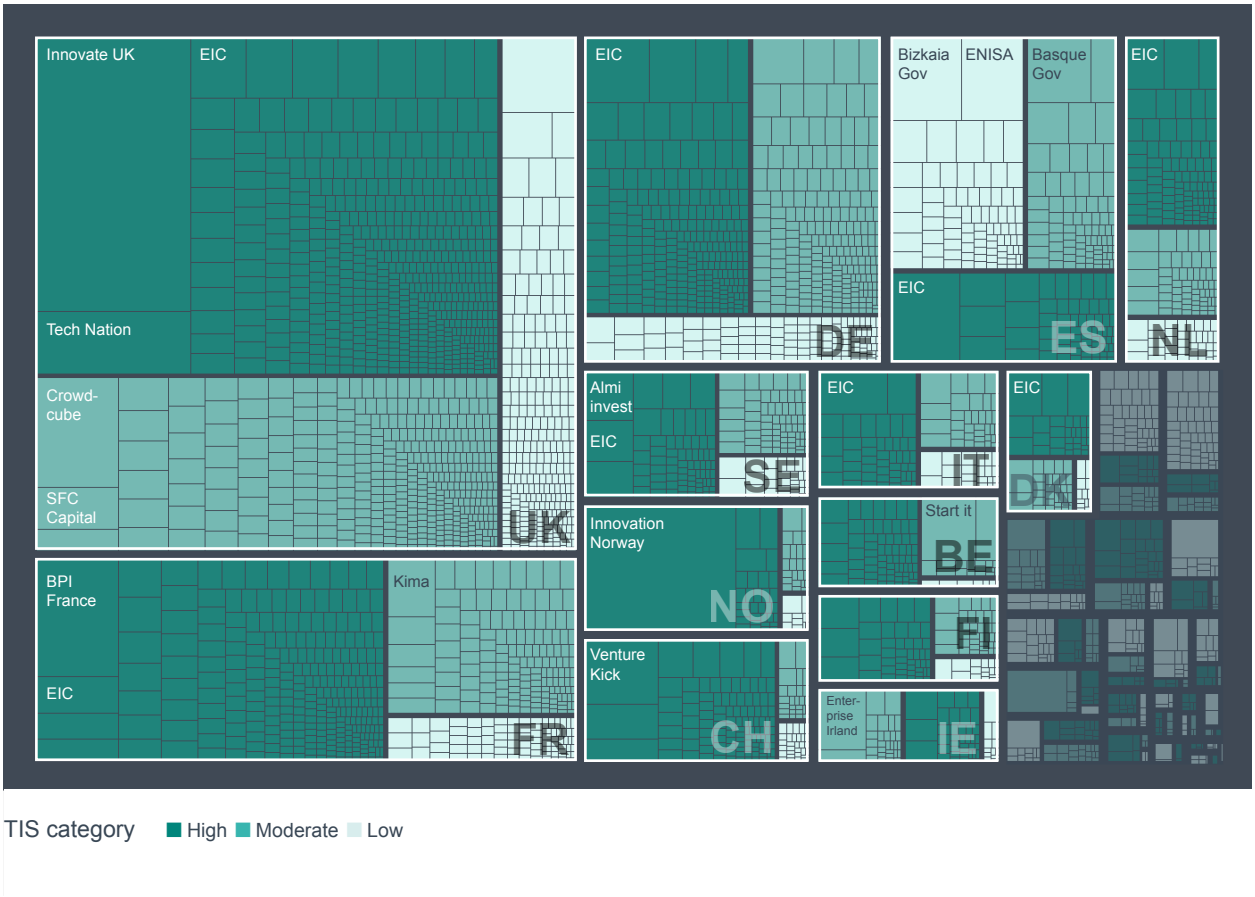
2. The TIS reveals varying degrees of engagement in technology by European investors, with higher values driven by big public programmes and specialised private investors from countries with strong capital markets, like the UK. .

A key use for the TIS is to identify key investors for companies seeking funding. We provide a list of investors with a high, moderate and low TIS. Public investors like the EIC and national programmes such as Innovate UK and Bpifrance are among the most active, all with high scores. Other investors with a high TIS include specialised private players in high-tech industries like health, energy and software.

France, Germany and the UK lead in both total funding and transaction values, with investors in these countries also showing a relatively high TIS. Smaller countries like Belgium, the Netherlands, Norway, Sweden and Switzerland have active risk markets and a high TIS. Southern and Central-Eastern Europe, including Spain—which has a substantial number of transactions and investments—show promising growth potential in TIS and investment levels.

Figure E2

European investors by country and category of TIS



Note: The size of the boxes indicates the number of transactions by investor in each country. The colour of the boxes represents the TIS category. The TIS categories are based on the score's distribution: low (lower tercile, below 0.083), moderate (middle tercile, 0.083 to below 0.2), and high (upper tercile, 0.2 and above). Only investors with at least ten transactions are included. The abbreviated country names of the top 13 countries by number of transactions are provided in the graph. Some investor names are also included in the graph, where possible. For a complete list of the top ten investors in each country, see Annex 2.

Sources: Dealroom, EPO.

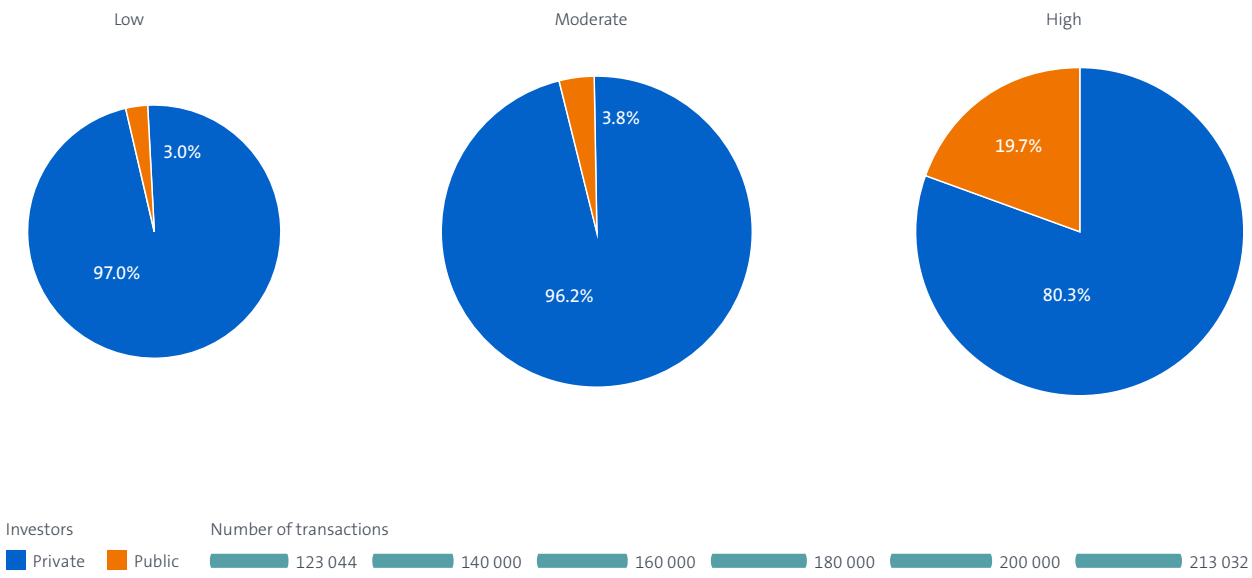
3. While private investors account for the majority of investment volumes in Europe, public investors lead in specialising in technology funding.

The majority of investments in Europe are from private investors, primarily VCs and other investment funds. However, the majority of these are in the low and moderate categories of the TIS. The majority of transactions by public investors, by contrast, have a high TIS, which is consistent with the main mission of public programmes; to seed early-stage innovation.

This is particularly evident in investments by European Union programmes such as the EIC, EIB and EIT, which all have above-average levels of involvement with patenting firms. National programmes also show high levels of engagement with technology, falling under the high category for the TIS, but generally at lower levels than EU programmes.

Figure E3

Share of public and private investors by TIS category



Note: The figure shows the percentage of transactions by public/private investors by category of TIS. The size of the pie charts indicates the total number of transactions per TIS category. The TIS categories are based on the score's distribution: low (lower tercile, below 0.083), moderate (middle tercile, 0.083 to below 0.2), and high (upper tercile, 0.2 and above).

Sources: Dealroom, EPO.

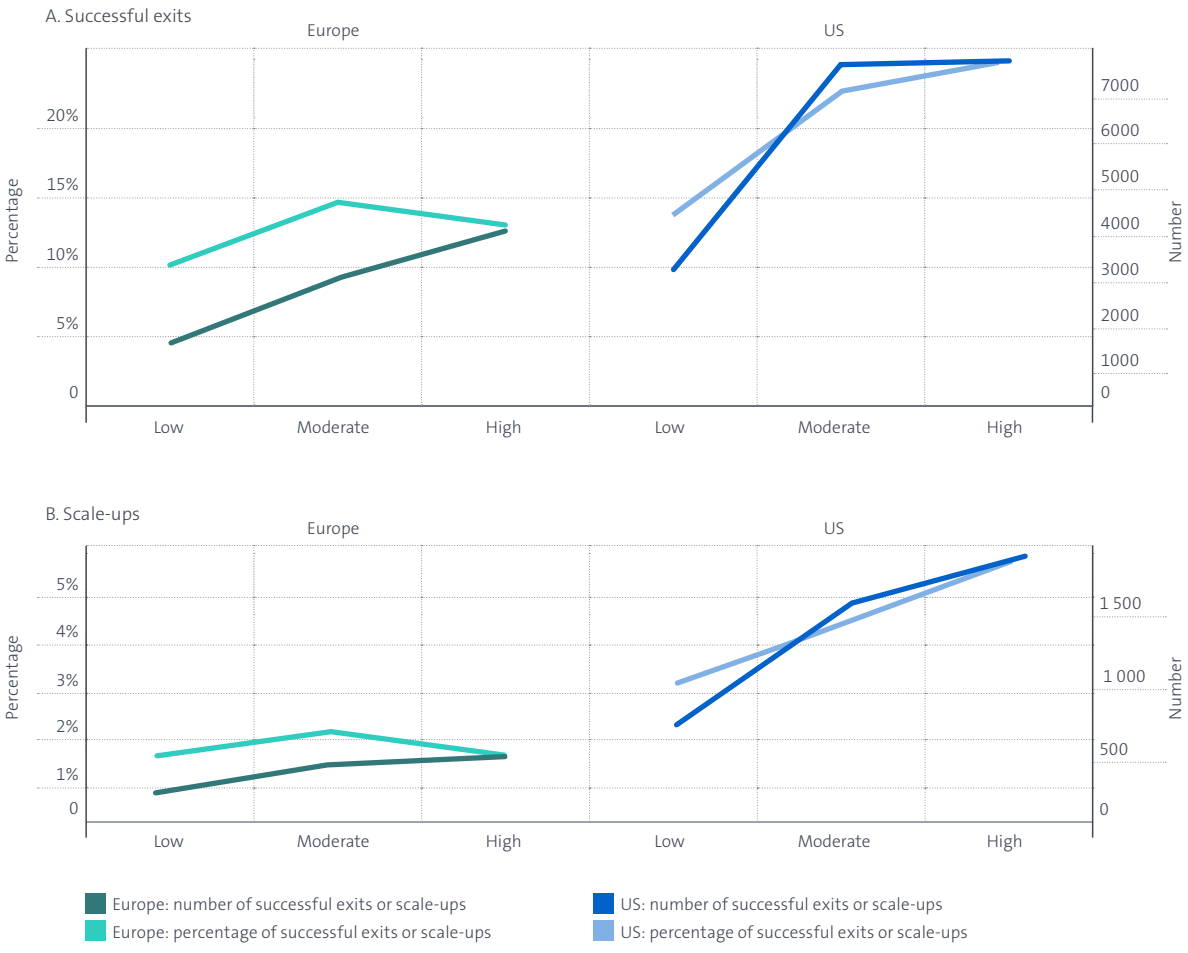
4. Investors with high involvement in technology are more likely to have successful exits and scale-ups, with the US outperforming Europe.

A higher TIS for investors is correlated with more successful exits and scale-ups, emphasising the crucial role played by technology engagement in driving business success. This highlights that investor experience in funding companies with patents can be associated with better investment outcomes.

This relationship is more evident for companies in the US than for European ones, suggesting that European investors may need to strengthen their focus on technology and IP-backed ventures to boost the continent's scale-up ecosystem. The disparity may reflect structural differences in scaling resources available to startups, with investors in the US providing a more supportive ecosystem for high-growth companies.

Figure E4

Successful exits and scale-ups by TIS category



Note: The figure illustrates the number and percentage of successful exits and scale-ups by TIS category for European and US companies. A successful exit is defined as an IPO or acquisition. A scale-up is defined as a company that reaches a valuation of between USD 500m and USD 10bn. The TIS categories indicated in the x-axis are based on the score's distribution: low (lower tercile, below 0.083), moderate (middle tercile, 0.083 to below 0.2), and high (upper tercile, 0.2 and above).

Sources: Dealroom, EPO.

5. Funding gaps between Europe and US companies are particularly wide for high-TIS investors that a) are private, b) specialise in later-stage rounds, and c) invest in high-tech sectors. Public investors show a funding surplus.

We examine funding gaps between Europe and the US across TIS categories. The US operates at a greater scale, with more investors funding more companies and providing larger investments per company. These disparities result in a funding gap by European companies, which is larger for high-TIS investors.

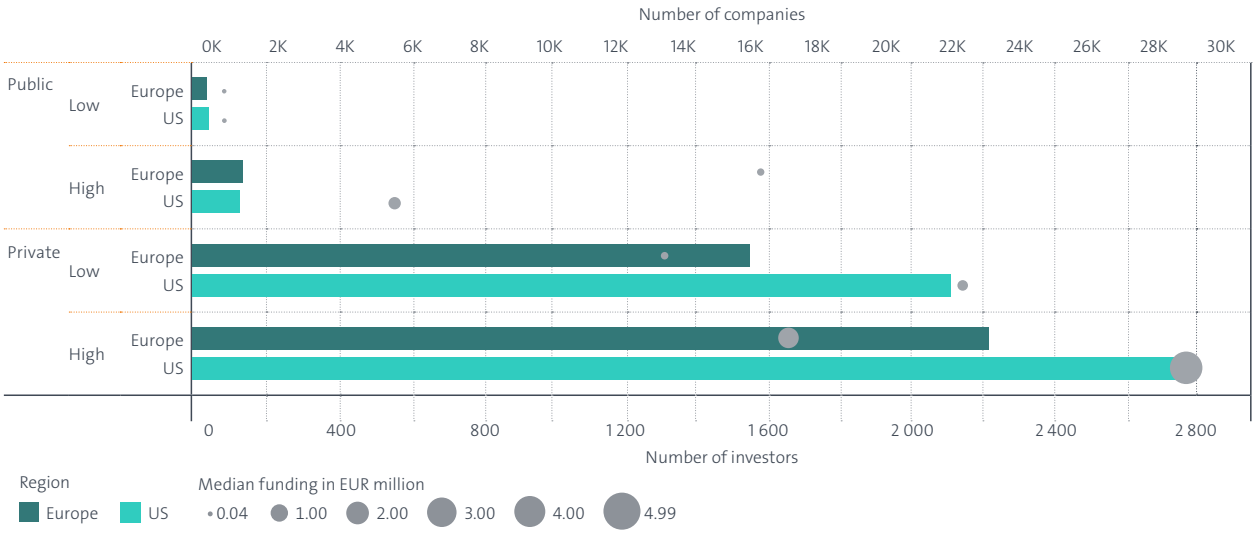
The gaps are most pronounced for high-TIS investors that are private (76%, vs. 59% for low-TIS), invest in later-stage rounds (76%, vs. 59%) or focus on high-tech sectors (74%, vs. 63%). In contrast, public investors in Europe, most of which are high-TIS, show a 20% funding surplus.

These results indicate that high-TIS investors—those best positioned to support highly innovative companies—provide significantly less funding to European firms than to US ones. This shortfall is especially marked in critical technology sectors with the greatest growth potential and in later-stage funding rounds, which are essential for scaling up.

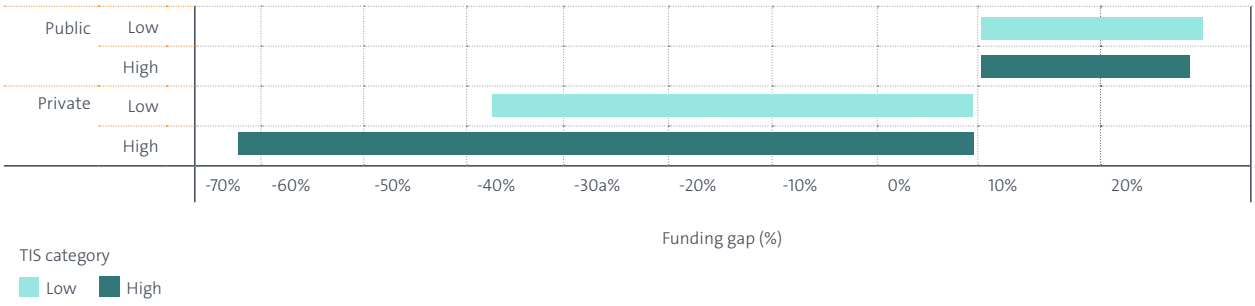
Figure E5

Funding by TIS category

A. Number of investors and funded companies and median funding in EUR million by TIS category



B. Funding gap between Europe and the US by TIS category



Note: Panel A illustrates the number of investors, number of funded companies and median investment per company by TIS category and investor type for companies headquartered in Europe and the US. Bar lengths represent the number of investors (lower axis), dot lengths correspond to the number of funded companies (upper axis), and dot sizes reflect the median funding per company in EUR million. Panel B illustrates the percentage gap in total funding within each TIS category and investor type, calculated as the difference in total funding received by companies in Europe compared to companies in the US, expressed as a percentage of the US total funding. The TIS categories are based on the score's distribution: low (lower tercile, below 0.083), moderate (middle tercile, 0.083 to below 0.2), and high (upper tercile, 0.2 and above).

Sources: Dealroom, EPO.

6. Early-stage public investors occupy central roles in Europe's co-investor network, while late-stage private investors are central in the US.

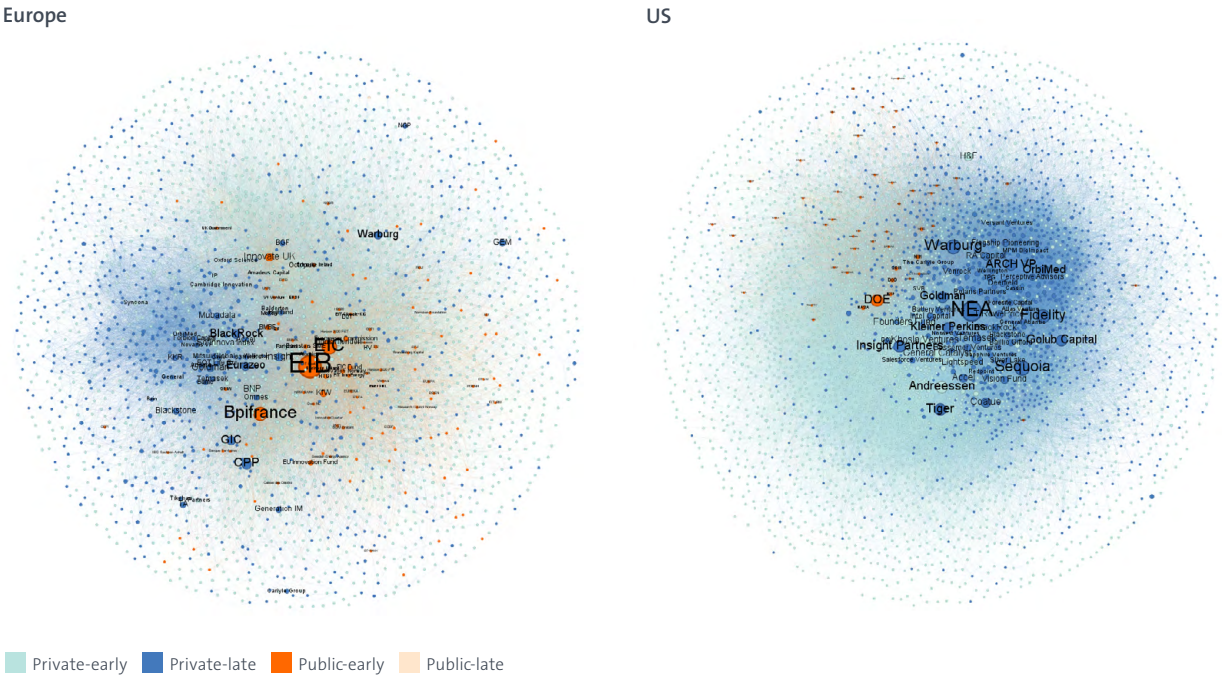
The European and US networks of co-investors reveal distinct structures. In the US, private investors specialising in late-stage occupy central positions, driving a market-oriented environment with extensive scale-up funding. In Europe, public entities dominate, providing early-stage support; growth capital from private investors in later stages is limited.

In Europe, the top five investors by network centrality are major public entities: the EIC, Innovate UK, Eurostars SME Programme, Bpifrance, and the European Institute of Innovation and Technology (EIT). The top 100 also feature 11 additional public entities, mainly pan-European institutions, and national agencies. Among private investors in the top 100, 62% focus on early-stage funding, while only 22% specialise in late-stage, highlighting the limited capital for scaling high-tech companies in Europe.

In the US, private investors account for 98 of the top 100 most central investors, with over half specialising in late-stage funding, reflecting strong private support for scaling high-tech companies. Prominent late-stage investors like Sequoia, NEA and Fidelity occupy central positions. Only two public entities, the National Institutes of Health and the National Science Foundation, are among the top 100.

Figure E6

Network of public and private investors for European and US companies



Note: The graph displays the network of public and private investors for European (left-hand panel) and US (right-hand panel) companies in high-tech sectors (health, semiconductors, energy, space, robotics, consumer electronics and enterprise software). Co-investors are defined broadly as investors that invest in the same company, but not necessarily at the same point in time and transaction round. Private investors include venture capitalists, private equity, corporate funds, and other types of private investment fund. Public investors include pan-European institutions and national or regional agencies from member states. Only investors with a moderate or high TIS are included in the analysis. The network structure was produced using the Fruchterman-Reingold layout algorithm in Gephi. Nodes represent investors and edges represent their connections. The layout reveals clusters and central investors, highlighting the network's key structures and relationships.

1. Introduction

1.1 The main challenges in funding innovation

Entrepreneurial innovation tends to be particularly radical and disruptive (see Kolev et al., 2022). New startups serve as a vehicle for transferring university inventions to industry and advancing inventions that are too novel to be supported by established firms. This form of innovation has the potential to contribute substantially to welfare and has long been heralded as a key driver of economic growth.

A primary challenge for technology startups is that they are entirely reliant on external capital to bring ideas to market. The innovation cycle is long and risky, including basic research, technology development and market launch. Progressing through these stages involves long lags and considerable financial resources (Rassenfosse et al., 2022). The resources come from various types of financing suitable for different stages of the innovation pipeline.

Basic research is normally considered too complex and risky to be funded by external private investors or lenders. It is generally financed by university budgets, targeted R&D subsidies by government innovation agencies, R&D tax credits or internal company funds. The subsequent stages are less uncertain and can attract funding from a combination of public and private stakeholders, including corporations, bank loans, VC and equity.

Obtaining key external financial resources is a primary challenge for startups due to inefficiencies in the markets for allocating capital to inventions (Hall and Lerner, 2010; Brown et al., 2013; Kerr and Nanda, 2015). Multiple factors contribute to the difficulty that innovative firms face in securing external financing for R&D. The nature of innovation often requires disclosing privileged and secret information to investors, which may lead to market failures as financiers hesitate without protection. The uncertain value of inventions and the complexity of assessing R&D projects make it challenging for investors to evaluate potential returns, which in turn increases perceived risk. Likewise, many R&D investments are primarily directed to the wages of researchers, which are considered sunk costs, so companies lack the assets traditionally seen as providing collateral value (Chiappini et al., 2022).

Evidence from past research in Europe highlights significant constraints in accessing external finance, particularly for young, innovation-driven firms (see Savignac, 2005; Hall et al., 2015; García-Quevedo et al., 2018). These constraints significantly reduce the chance that a firm might be involved in innovative activities.

1.2 Europe's innovation financing landscape

As underlined in "The future of European competitiveness", Europe faces underinvestment in key technologies and innovation markets, despite high private-sector savings (Draghi, 2024). Since the 2007-2008 financial crisis a widening gap in private investment has emerged between the EU and leading innovation hubs like the US. While private investment in the US rebounded quickly and then continued to grow, Europe's recovery has been slow, particularly in innovation-driven sectors (EIB, 2024).

Fragmented capital markets in Europe make it especially challenging for private investors to mobilise the large amounts of capital needed to develop technology. VC plays a minor role in Europe compared to the US, with a particularly large gap in later-stage funding, where higher investments are crucial to prepare inventions for market entry (Draghi, 2024; EIB, 2024). Later-stage scale-up funding, primarily in the form of equity and VC, is insufficient to foster real innovation and produce tech champions within Europe.

Europe's high savings rate, combined with low levels of investment, has contributed to a persistent current account surplus, particularly in countries like Germany, Denmark and Austria, and reflects a system where capital is not effectively directed into innovation (Demertzis, 2024). In contrast, the US maintains a dynamic financial ecosystem that continuously drives investment in transformative industries such as AI, quantum computing and biotechnology. Consequently, many European startups choose to scale up abroad, particularly in the US, where capital is more readily available (Weik, 2023). [1]

[1] This was also noted in a previous EPO study, The role of European universities in patenting and innovation, where a considerable share of startups that hold patents developed in European universities (10%), were based in the US. This highlights that the US is an attractive market for the commercialisation of technologies developed in Europe.

Europe has implemented a variety of funding programmes aimed at fostering innovation. Horizon Europe is the EU's largest programme, with a EUR 95.5bn budget to fund research and innovation. As part of this, the EIC targets directly deep tech and high-impact innovations. The EIC funds high-risk projects through grants and equity, supporting innovators from early research stages to scaling up. The European Innovation and Technology Institute (EIT) and the European Innovation Ecosystems are other programmes that provide funding to technology-driven startups (European Commission, 2024).

Further initiatives like the European Tech Champions Initiative (ETCI) by the EIB have a more specific focus on later-stage growth capital and scaling deep tech ventures. The ETCI aims to mobilise over EUR 6bn, invests directly in big Europe-made deep tech ventures, and complements the activity of the European Investment Fund, part of the EIB group, in supplying liquidity and capital for VC funds in Europe (EIF, 2023).

National investors are crucial for funding Europe's innovation ecosystem. While many European countries participate in Horizon Europe programmes like the EIC, national programmes still account for most public investment in innovation. Leading investors by country include Bpifrance, Innovation UK, Innosuisse, and Innovation Norway. Cross-country collaborations such as the Taftie network of key innovation agencies highlight shared challenges across Europe. Public investors, both from the EU and national programmes like these, have been found to be crucial for the development of innovations and fill an important niche, complementing private investors (especially VC funders) in technology and innovation-driven projects (Berger et al., 2024).

Despite these policy advances and funds from national and European budgets, the situation in Europe with regards to financing is still marked by a fragmented capital market. Recent policy reports from Draghi (2024) and Letta (2024) suggest available funds should be increased and current European national and EU public innovation funding programmes harmonised and simplified.

The recent Budapest Declaration from the European Council emphasises the need for substantial investment to address competitiveness challenges, involving both public and private financing. It highlights the strategic use of the EU budget and the EIC to achieve higher public investment and the capital markets union to boost private investment. The EIB's role is set to expand, and there is a commitment to explore and create new financial instruments (European Council, 2024).

1.3 The role of patents and specialised investors in financing innovation

Patents play a crucial role in helping startups overcome financial obstacles, particularly during the critical stages of technology and product development, when external funding is often required (Brassell and Boschmans, 2019). Survey evidence reveals that a significant proportion of innovative companies—especially SMEs and startups—view patent protection as essential for facilitating access to finance (EPO, 2019, EPO/EIB, 2022).

Patent protection grants market exclusivity, enabling startups and their investors to generate returns on their investments (Farre-Mensa et al., 2024; Gans et al., 2008; Gaulé, 2018). Clearly delineated property rights also encourage disclosure of ideas to financiers (Hegde and Luo, 2017). Patents reduce uncertainty by signalling value and support investors in making informed decisions on the quality of new ventures (Conti et al. 2013; Hauessler et al., 2014). Patents can also be used as collateral for debt finance (Hochberg et al., 2018; Mann, 2018). All these mechanisms facilitate access to external finance such as VC, subsidies and grants from innovation agencies or IP-backed loans from banks.

The EPO-EUIPO joint study Patents, trademarks, and startup finance finds that filing patent and trademark applications during the seed or early growth stage is linked to a higher likelihood of securing VC funding (EPO-EUIPO, 2023). Specifically, applying for European patents and EU trademarks is associated with an even greater chance of obtaining VC funding for startups, compared to applying solely for national IP rights. Additionally, filing

patent applications is correlated with more than twice the likelihood of a successful exit for investors. These findings highlight the importance of intellectual property in driving both financial support and long-term success for startups.

While patents create opportunities for raising financing, they also pose significant challenges that not all investors are equipped to harness. Radical inventions, despite their high earnings potential, often carry a greater risk of failure. Bringing these innovations to market requires investors with strong IP management skills and the capacity to support progress through the innovation pipeline toward scaling up. The most sophisticated investors, such as VCs, actively engage through monitoring, governance, and expert advice, which have been shown to positively impact the technological performance of their portfolio firms (Bertoni et al., 2011; Bernstein et al., 2016; Gill et al., 2024; Lahr and Mina, 2016).

More generally, evidence shows that investor characteristics play a crucial role in their ability to create value (Nahata, 2008; Colombo et al., 2023). Experience and reputation are key factors influencing the performance of their portfolio firms (Casamatta and Haritchabalet, 2007; Hochberg et al., 2007; Nahata, 2008). Reputable investors are drawn to the strong quality signals of patents protecting radical inventions and are better equipped to navigate their inherent complexities (Colombo et al., 2023). Moreover, high levels of investor involvement can accelerate innovation in patenting firms by fostering the development of new ideas (Gill et al., 2024).

Identifying those investors capable of helping tech startups bring their inventions to market is of interest to several stakeholders. First, to startups who need to pinpoint investors likely to fund and advance their inventions. Second, to innovation agencies that require a clear mapping of investors who can sustain their seeding efforts through the scaling-up stages. Third, to private investors looking for co-investors in startups. Finally, to policymakers, who will benefit from a comprehensive landscape of investors with the potential to address strategic challenges such as bridging funding gaps.

1.4. The TIS: a tool to identify and assess technology investors

We introduce a metric designed to identify investors specialised in supporting high-tech companies, the Technology Investor Score (TIS). The TIS measures the percentage of patenting companies within an investor's portfolio. A high TIS indicates an investor's engagement with innovation-driven companies.

We focus on 6 135 global investors that invest in at least one company headquartered in EPC member states to study funding available to European companies. This includes both public and private investors focusing on early and late stages. For comparison, we establish an analogous benchmark sample of 8 055 investors in US companies. These are all investors listed in Dealroom with recent activity and portfolios of at least ten companies between 2000 and 2023, providing sufficient data to measure the score with confidence.

The TIS distribution reveals significant variation in investor engagement with technology. While it is skewed toward lower values, most investors have positive scores, reflecting a degree of involvement with patenting startups, and some have fairly large values. Notably, around 40% of investors have a TIS above 0.2, and 8% exceed 0.5, highlighting the metric's ability to identify investors with substantial engagement in technology.

This study is part of a broader effort by the EPO to strengthen the relationship between patents and innovation financing in Europe. The EPO has reduced overall fees for micro-entities and cut language-related fees to make patent protection more appealing to SMEs and startups and support their efforts to raise capital. The introduction of the Unitary Patent harmonises the patent procedure across all signatory countries and enables startups to protect their innovations across the continent. This contributes to the development of a new single market, in line with the recommendations from Draghi (2024) and Letta (2024). Broader geographical scope opens opportunities to larger markets with just one patent application, making startups with Unitary Patents particularly attractive for investors. This is reflected in the uptake of the Unitary Patent system by SMEs and startups; nearly one-third of all proprietors of the Unitary Patent are small entities, 10% more than the share of small entities for all European applications (EPO, 2024).

1.5. Structure of the report

The granularity of the TIS makes it a powerful tool for identifying investors well suited for funding technology startups. Leveraging this tool, we explore several key areas of interest. First, we characterise investors with the highest TIS across European countries. Second, we examine the association between a high TIS and key indicators of startup success, such as exits and scale-ups. Third, we analyse startup funding gaps between the EU and the US across TIS categories. Finally, we investigate the relationship between public and private co-investors, providing strategic recommendations to help close funding gaps and strengthen Europe's innovation ecosystem.

The study is organised into six main sections. Section 2 presents the TIS as a key indicator for identifying technology investors. Section 3 analyses the TIS to uncover characteristics of Europe's funding ecosystems, highlighting prominent investors, with a focus on public investment players. Section 4 contextualises European investment on the global stage, comparing funding gaps with the US and assessing the significance of the TIS for investment outcomes. Section 5 presents a network analysis of public and private co-investors, offering strategic recommendations to address funding gaps in Europe. Section 6 concludes.

2. The Technology Investor Score

2.1. Defining technology investors

We introduce a metric designed to identify investors specialised in supporting high-tech companies, the Technology Investor Score (TIS). The TIS measures the percentage of patenting companies within an investor's portfolio. An investor's portfolio is defined broadly to include all companies that have received at least one investment round from the investor, offering a complete view of their investment history. A high TIS signals an investor's engagement with tech companies.

A company is classified as a patenting company if it has at least one patent application at any time, regardless of its relationship with the investor at the time of filing. This classification captures diverse investment approaches. Sometimes investors target companies with existing patents as indicators of potential returns. On other occasions they invest in firms that may patent during or after their involvement. Often, both scenarios play out, with companies holding some patents initially and expanding their portfolios with the investor's support.

We intentionally include all cases, as each signals the company's commitment to innovation. This approach helps capture a broad view of the investor's association with innovative companies. Additionally, it helps encompass the range of skills required to support companies at various stages of the innovation pipeline, whether before or after a patent event, including nurturing early-stage inventions, developing IP strategies and scaling up operations.

Metrics such as R&D expenditure or data on all company inventions, including those that do not result in patent applications, could offer a more comprehensive view of inventive activity. However, this information is typically available only through surveys like the Community Innovation Survey (CIS), which cover just a subset of companies. Moreover, the anonymised nature of these surveys restricts their utility in identifying the investors behind these companies.

Patenting offers a window into inventive activity. While patents are the primary measure for calculating the TIS, we interpret the score as an indicator of investor engagement with firms that carry out innovative activities, including those that may not patent. Non-patenting companies within high-TIS investor portfolios are likely to be innovators that might not yet have patented or relied on other forms of IP. Therefore the score broadly captures an investor's interest in high-tech firms and those active in R&D.

Technology investors bring critical expertise in guiding innovation, from mentoring to developing robust IP strategies and facilitating access to additional financing. These investors play an active role in steering companies through the challenges of commercialising new technologies and scaling their operations. The case studies in this report highlight the multifaceted value that specialised investors contribute, illustrating both their strategic support for innovation and the complexities involved in high-tech investing.

Box 1: Data sources and criteria for investor analysis

This study draws on Dealroom data from the September 2024 update. Dealroom offers a comprehensive overview of the startup investment ecosystem through three interconnected datasets providing detailed information on transactions, investors and companies. The companies dataset provides information on the number of patents per company, which we enhance with additional data from PATSTAT. A company is classified as a patenting company if it has at least one patent application recorded in either of these sources.

We apply several filters to refine the main sample. First, we include only early- and late-stage transactions with effective dates between 2000 and 2023. Second, we focus on companies founded between 1990 and 2023. Third, we limit the analysis to investors with at least one investment since 2020 and thus likely to be active at present. Finally, we include only investors that have funded at least ten companies, to ensure a robust sample size for the score. For further details on these filtering criteria, please refer to Annex 1.

Investors in European companies (main sample): this study focuses on the funding available to European companies. Accordingly, we restrict the main sample to focus on companies headquartered in EPC member states, hereafter referred to as European companies, and the investors backing them, regardless of location. This comprises 6 135 investors globally, that have funded 52 633 companies headquartered in Europe across 94 213 investment transactions.

Investors in US companies (benchmark sample): for comparative purposes, we establish an analogous US sample that includes companies headquartered in the US and their investors. This sample serves as a valid benchmark, as it describes the availability of investors and funding for US companies. The US sample includes 8 055 investors globally, investing in 61 332 US-based companies across 121 630 investment transactions.

There is considerable overlap in investors across the two regions, with 5 235 investors active in both markets; 85% of investors in European companies invest in US companies, while 65% of investors in US companies invest in European firms.

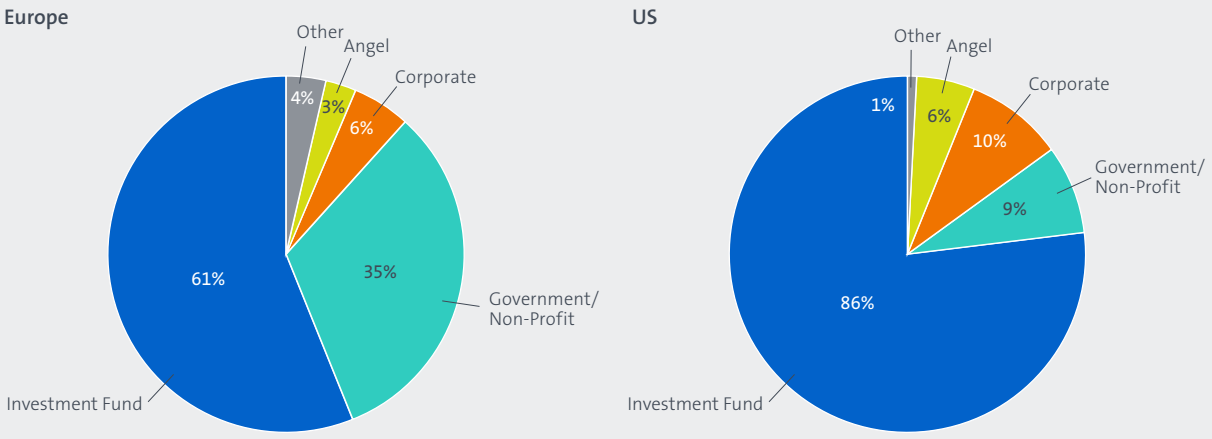
Dealroom identifies company headquarters locations based on a snapshot for the last updates, without providing a detailed location history. Therefore if a company was originally founded in Europe but then moved to the US, it will be recorded as a US company in our analysis. The absence of location histories is a common feature in all startup and transaction databases. Weik et al. (2024) find that 6% of European startups, representing 17% of all startup value, relocate abroad, mostly to the US. Therefore our samples of European and US companies measure location not so much by launch location as scale-up location. This definition is useful for measuring the ability of a startup to generate value in a given location, which is the major goal in our analysis.

The sample includes a variety of funding instruments such as equity investments, grants, debt or support programmes. These are all referred to as investments in this study.

As shown in Figure 2.1.1, both in Europe and the US most transactions are predominantly by investment funds, mainly VC and other types of risk capital. In Europe, government and non-profit investors represent 35.22%, indicating relatively significant public-sector involvement. US data show a much larger dominance by investment funds, which account for 86.40% of transactions, with all other investor types, including corporate and government players, making up a significantly smaller portion. This suggests greater reliance on private investment funds in the US compared to Europe, where public investment plays a larger role.

Figure 2.1.1

Share of investor types in the European and US datasets



Note: The figure shows the share of different types of investors in the European and US dataset, indicating the share for each type in total transactions registered in each region.

Sources: Dealroom, EPO.

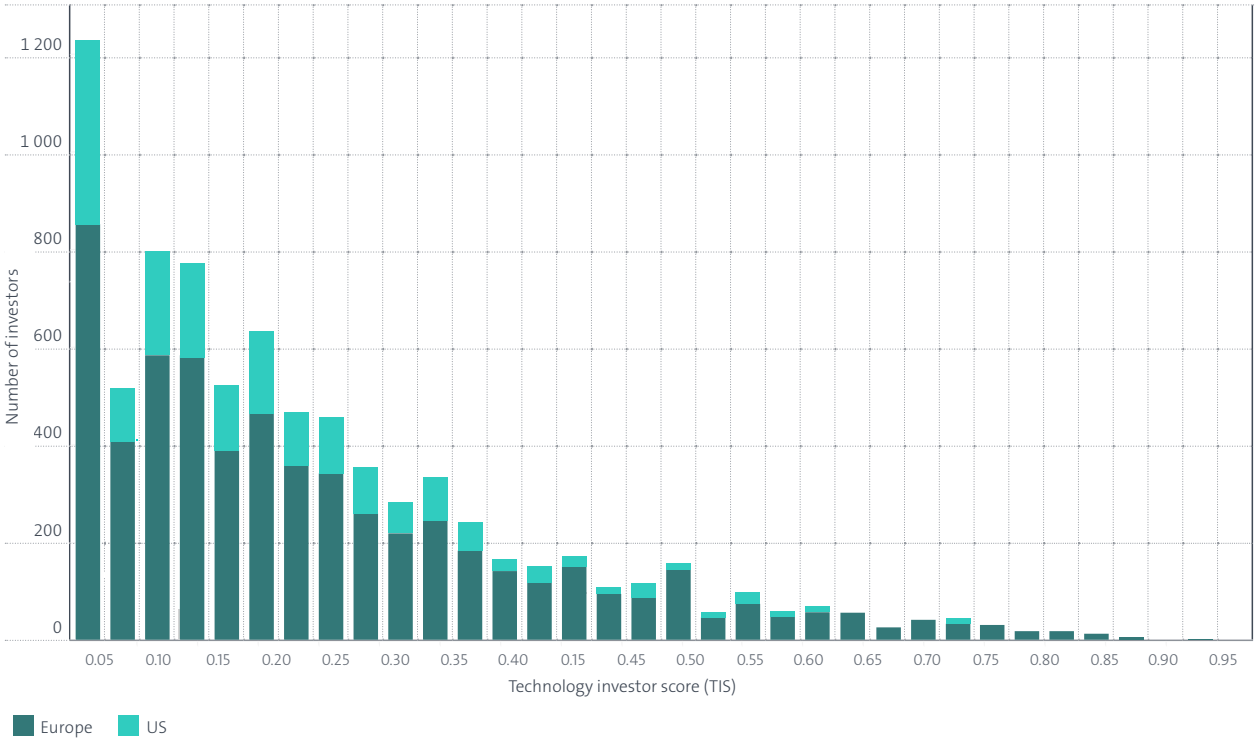
2.2. Exploring the TIS

Figure 2.2.1 illustrates the distribution of TIS for investors in European and US companies, revealing substantial variation in engagement levels with deep tech. Looking at Europe-focused investors, while the distribution is skewed toward lower values, the vast majority (88%) have a positive score, reflecting some level of engagement with patenting companies. Within this group, some have fairly high scores, indicating a stronger commitment with technology startups. Specifically, 40% of investors have a TIS above 0.2, while 8% have scores exceeding 0.5. US-focused investors follow a similar pattern but show a higher concentration in lower TIS values. However, the frequency of investors in the upper range of the distribution (TIS values above 0.5) remains comparable across regions.

The TIS is highly granular, having 1 372 distinct values indicating different degrees of investor engagement in technology-driven startups. This granularity makes it a powerful tool for identifying investors with significant engagement in innovation. While many investors include at least one patenting firm in their portfolio, the degree of their commitment to such firms varies widely. The TIS captures this variation by measuring the intensity of investor involvement with patenting companies, providing a nuanced view of their engagement in high-tech sectors. This allows for a precise assessment of different levels of investor commitment to innovation and technology development.

Figure 2.2.1

Number of investors by TIS in Europe and the US



Note: The figure shows the frequency of investors by TIS for companies headquartered in Europe and the US

Sources: Dealroom, EPO.

To streamline reporting throughout the analysis, we create a categorical variable based on the distribution of the TIS. This variable puts a TIS into one of three categories: low, moderate or high. Low is defined as a TIS within the lower tercile, moderate in the middle tercile and high those in the upper tercile of the distribution. Panel A in Figure 2.2.2 shows the even split across the three categories resulting from this tercile-based classification.

The remaining panels of Figure 2.2.2 show the distribution of investors by TIS category within various sub-groups of interest. Panel B reveals that government investors are significantly more likely to fall into the high category compared to other types, with corporate investors also showing a higher share of high-TIS representation. Panel C indicates that late-stage transactions attract a larger proportion of high-TIS investors than early-stage ones. Finally, Panel D demonstrates that companies in high-tech industries have a larger share of high-TIS investors. While there are some differences across investor types, funding stages and industry sectors, regional differences between Europe and the US are minimal, with both regions displaying similar patterns across TIS categories.

Figure 2.2.2

Percentage of investors across TIS categories

Note: The figure shows the percentage of investors in each category of the TIS by group. The TIS categories are based on the score's distribution: low (lower tercile, below 0.083), moderate (middle tercile, 0.083 to below 0.2), and high (upper tercile, 0.2 and above).

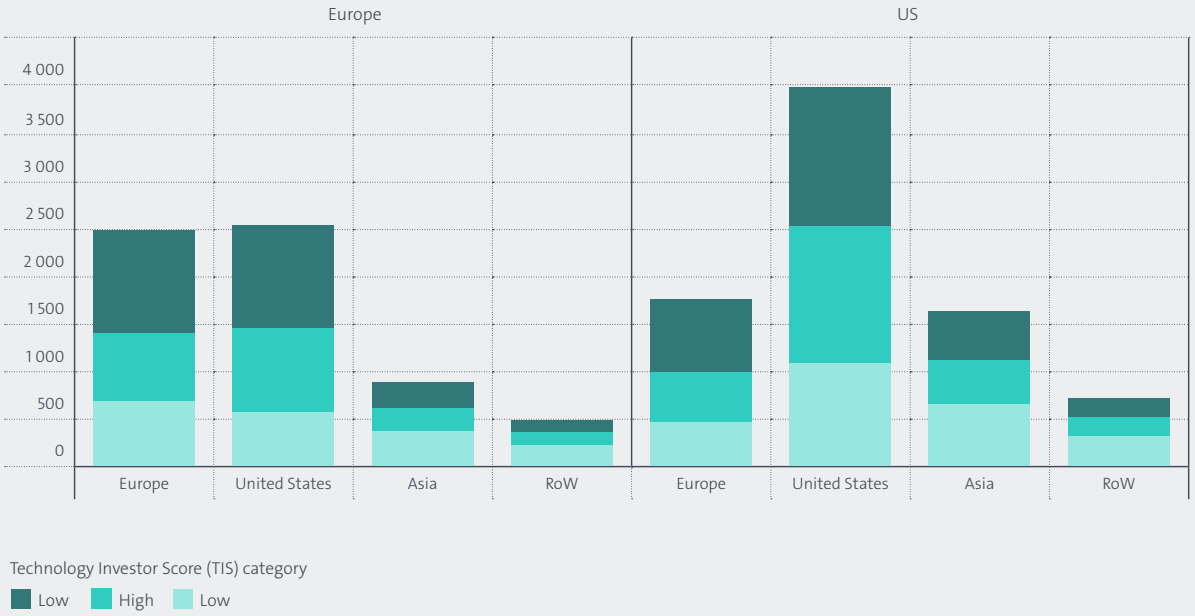
Sources: Dealroom, EPO.

Box 2: The origin of investors in European

When analysing the financing ecosystem for European companies, it is important to consider global investors. Figure 2.2.3 shows that while a significant portion of investors in European startups are based in Europe, the majority come from abroad, with the US the largest source. The proportion of investors with a high TIS is fairly constant among European and US investors, meaning that both regions supply a similar amount of high-TIS investors in European companies. Asia and the rest of the world (RoW) rank a distant third and fourth respectively.

Figure 2.2.3

Locations of investors in European and US companies



Note: The figure shows the distribution of investors by investor headquarters location (lower axis) and headquarters location of the companies they invest in (upper axis). The y-axis represents the number of investors, broken down by TIS range according to the scale given. The TIS categories are based on the score's distribution: low (lower tercile, below 0.083), moderate (middle tercile, 0.083 to below 0.2), and high (upper tercile, 0.2 and above).

Sources: Dealroom, EPO.

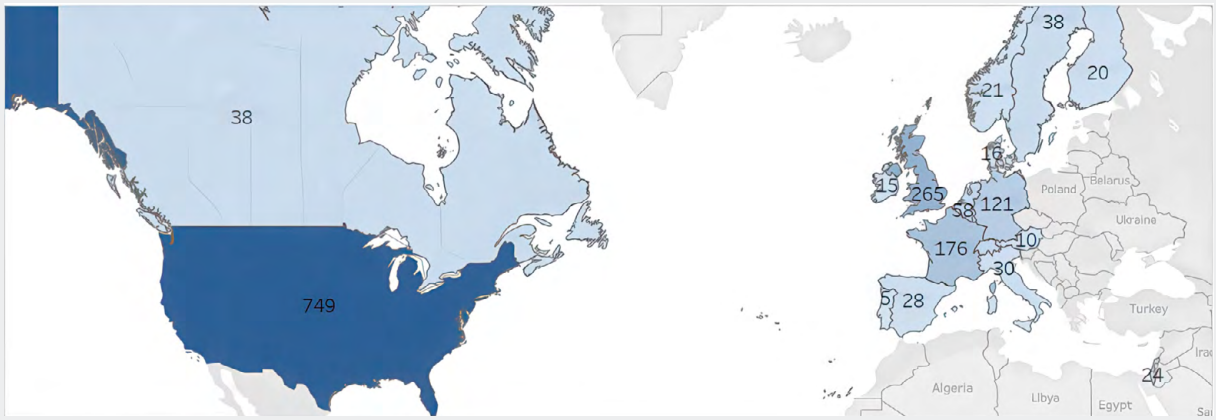
In the US, domestic investors hold a notably dominant position. A substantial majority of investors in US companies are headquartered within the country, forming the largest group by a considerable margin. European investors make up the second-largest group, followed closely by those from Asia. All international investors combined account for nearly half the total foreign investment in US companies, highlighting the critical role played by global capital alongside domestic support in sustaining the US innovation ecosystem.

Figure 2.2.4 breaks down the number of high-TIS investors by country, underscoring the diverse origins of tech-focused investors supporting companies in both Europe and the US. It also highlights the prominent role of the US as a major hub for investors, both in backing domestic companies and in funding international ventures.

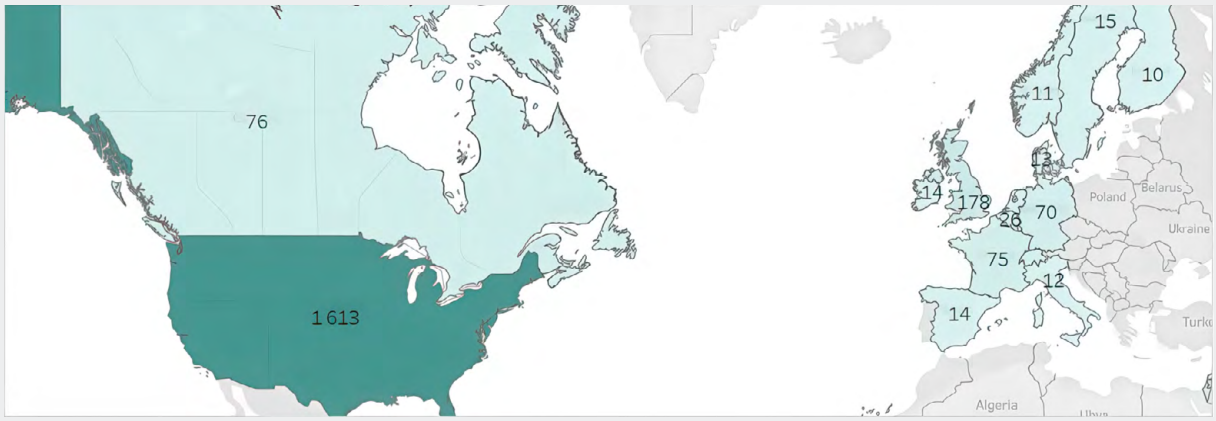
Figure 2.2.4

US and European high-TIS investors in North America and Europe

Investing in European companies



Investing in US companies



Notes: Countries shaded in darker colours have a higher number of investors with high-TIS financing companies in Europe (map above) and in the US (map below).
Some countries include the number of investors active in that country. The map only displays countries with at least ten investors and in North America, Europe and Israel.

Sources: Dealroom, EPO.

Case study: Lightyear

Company:	Lightyear
Headquarters:	Helmond / Venray, Netherlands
Founded:	2016
Products:	Solar roof systems for electric vehicles
Size:	Up to 600 employees

"The IP portfolio was the sole reason a restart was interesting for investors."
Lex Hoefsloot, Founder and former CEO, Lightyear

Determined to achieve their dream of manufacturing a revolutionary solar-powered electric car from scratch, a team from the Technical University of Eindhoven in the Netherlands founded the company Lightyear One in 2016. The engineers' advanced knowledge of solar modules and in-wheel motors, honed through multiple victories in the World Solar Race, combined with an early focus on building a strong patent portfolio, helped them secure sufficient investor interest to start production in 2022. Then bankruptcy struck the company. However, the team's visionary IP portfolio and understanding of investors' needs enabled them to pivot: a leading supplier of cutting-edge solar roof modules and charging systems was born.

Standing out to potential investors

After four consecutive wins at the World Solar Challenge, a 3 000 km biannual solar car race through the Australian outback, students from the Technical University of Eindhoven founded Lightyear One. They wanted to design and manufacture a solar-powered electric car that was largely independent of any charging infrastructure and practical for daily family use. The strong innovation culture created by the founders – CEO Lex Hoefsloot, CTO Arjo van der Ham and three other engineers – enabled the team to start filing patent applications and even pre-sell cars just a year later. This made the startup stand out to potential investors, as did the team's initial high-end car, which was intended to prepare the way for a lower-priced vehicle to be produced at scale with maximum impact.

The focus on creating the best possible technological solutions in-house and patenting them where possible would later provide the team with a strategy for preserving relations with investors even in the face of adversity. Time was routinely made available to work on new solutions and patent applications, and knowledge was liberally shared within the company but never allowed to leak outside. Lightyear also hired a senior in-house corporate IP specialist. The team worked on their technologies with several world-class partners, including the renowned Dutch Institute for Applied Science Research (TNO). Most of these partnerships were on a "work-for-hire" basis, which ensured that Lightyear owned the resulting IP for core technologies.

The quest for sustainable mobility

In 2017 Lightyear unveiled their show car in Silicon Valley and had it approved for driving on the streets of the Netherlands. The innovative design featured a 5 m² solar roof and in-wheel motors to reduce transmission losses. Combined with exceptional aerodynamics (a 0.19 drag coefficient), this lowered energy consumption, battery size and vehicle weight. The aim: ten times less charging than the average electric car.

Driving 40 km daily, a family could rely solely on solar power all summer without plugging in to the grid. The high-end car achieved over 600 km on a 60 kWh battery, with an additional 12 km per hour of solar charging. By 2019 there were 150 pre-orders. By 2022 Lightyear had secured 10 000 reservations for its lower-priced model and some EUR 200 million in financing from investors attracted to its IP portfolio.

Driven by investors

Investors saw Lightyear as a high-risk, high-reward venture. Producing and selling complete solar cars was seen as an ambitious and risky, yet attractive, long-term strategy. However, the company's state-of-the-art technology components and strong IP portfolio provided a less risky avenue for generating additional revenue.. Through discussions with investors, Lightyear learned the value of an IP strategy that protects investor interests. The company even securitised its IP in some cases, to guarantee some returns if the venture failed. However, while this helped close a key funding round, it impaired subsequent rounds, as earlier investors were reluctant to share their securities with new investors.

Lightyear's financing journey began with a modest EUR 100 000 investment from friends and family. High net worth individuals who recognised the potential of the vision and technology provided the next wave of capital. Their support was soon complemented by venture capital and public grants, including funding from Horizon 2020, a European Union research and innovation programme.

2021 was a breakthrough year, as a sustainability-oriented insurance company and a multinational trading group, both Dutch, invested over EUR 100 million. After a consortium of the publicly funded Invest-NL and Dutch regional development agencies invested an additional EUR 74 million, car production commenced in 2022 at a partner manufacturer in Finland. Unfortunately, after the pandemic it proved impossible to raise the capital to scale up production. Bankruptcy struck Lightyear One. However, the firm's visionary IP portfolio had been developed with a plan B in mind: pivoting from car manufacturer to component supplier. The transfer was facilitated by having all the IP in a holding company that was initially unaffected by the bankruptcy.

Some of the early investors who had provided a vital jump-start to the company after becoming familiar with its IP portfolio stayed on to help finance Lightyear Technologies. They were joined by two South Korean venture capital firms. The CEO role passed to Bonna Newman, whose collaboration with Lightyear had commenced in 2020 while at TNO. The current focus is on supplying established car manufacturers with Lightyear Technologies' innovative solutions, including solar modules and electronics, as well as a user interface and data platform. The company is also exploring licensing its solutions and patents which are no longer core to its business to third parties.

3. Identifying European investor funding

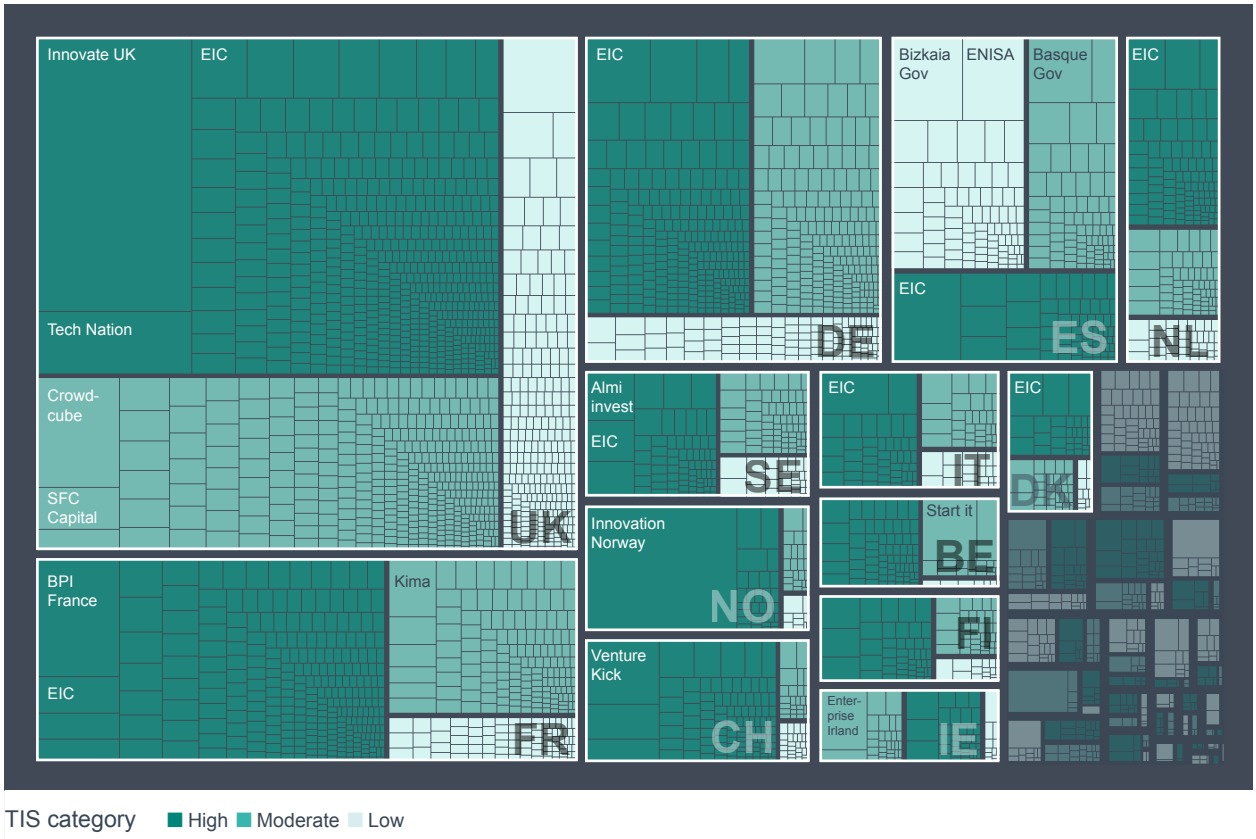
This section emphasises one of the main uses of the TIS: singling out individual investors experienced in investing in technology-driven companies. Looking into investors by TIS makes it possible to identify key players in startups and other tech companies that are searching for IP-sensitive investments. The report first analyses the overall distribution of European investors by TIS and the number of transactions they are involved in by country and industry. It then explores the specific role played by public investors, identifying pan-European, national and local public players and their role in supporting European innovation.

3.1. European investors: a country perspective

European investors are defined as any investor, regardless of headquarters, that invests in companies with headquarters in one of the EPO member states. An overview of investors is shown in Figure 3.1.1, where we note for different countries the number of transactions by investors, classified by their TIS. We note investors are particularly active in the UK, with France, Germany and Spain following in the list by number of transactions in each country. Smaller countries like Sweden, Norway, Switzerland and Finland are also high on the list. Investors seem to be less active in Eastern and Central European countries.

Figure 3.1.1

Investors by TIS in European countries



Note: The size of the boxes indicates the number of transactions by investor in each country. The colour of the boxes represents the TIS category. The TIS categories are based on the score's distribution: low (lower tercile, below 0.083), moderate (middle tercile, 0.083 to below 0.2), and high (upper tercile, 0.2 and above). Only investors with at least ten transactions are included. The abbreviated country names of the top 13 countries by number of transactions are provided in the graph. Some investor names are also included in the graph, where possible. For a complete list of the top ten investors in each country, see Annex 2.

Sources: Dealroom, EPO.

The composition of investors shows the relative levels of importance given to technology by the investors operating in each country. Most investors in Europe are in the high and moderate categories, with public investors like the EIC, Innovation Norway and Innovate UK appearing with a high number of transactions and specialised in technology startups.

To better identify the key trends by country we show Table 1, which portrays the average TIS of the investors operating in each country, the number of transactions, the total funding in EUR million and the number of investors. These data show the different levels of engagement by investors funding patenting ventures in each country. We note that, apart from a few outliers like Spain, Poland and Slovenia, in general countries where investors have more involvement also have higher levels of TIS. This indicates that overall, countries with higher investment in total also have greater involvement in patenting activity, highlighting the importance of IP as an indicator of investment intensity and economic dynamism.

The results match trends in the risk capital markets and draw attention to the investors primarily supporting innovation in startups and smaller companies that are the focus of this study. The UK stands out for its highly active VC market, which accounts for the majority of transactions. In contrast, traditional financing methods such as bank loans are more common in continental countries like Germany and Austria, and also other Central and Eastern European countries lower down the table. Countries such as Belgium, Switzerland, Sweden and Denmark, where TIS is high, have some of the most developed risk capital markets in Europe and a strong focus on tech ventures. Research by Walther (2024) shows that these countries are leaders in VC investments relative to GDP, with the Nordic countries at the forefront; these reach 23% of the region's GDP, more than any other part of Europe. Southern and Central-Eastern Europe, while still developing their risk capital markets, show potential for growth, though their current TIS are more moderate and investment values lower in comparison.

Table 3.1.1

Main finance indicators by country

Country	Average TIS	Number of transactions	Total funding in EUR million	Number of investors operating in each country
United Kingdom	0.25	42 576	224 790	3 991
France	0.29	17 169	82 261	1 775
Germany	0.24	16 017	84 771	2 150
Spain	0.16	11 566	44 844	1 048
Netherlands	0.27	5 903	21 676	1 154
Switzerland	0.37	5 629	20 679	1 215
Sweden	0.27	5 176	27 957	826
Norway	0.24	4 596	11 748	431
Italy	0.26	3 661	13 245	472
Belgium	0.31	3 127	6 387	559
Finland	0.29	3 118	10 238	602
Ireland	0.24	2 891	17 911	678
Denmark	0.28	2 565	10 839	552
Poland	0.13	1 745	3 920	362
Austria	0.27	1527	3 160	382
Portugal	0.20	1 488	3 613	318
Türkiye	0.09	1 474	5 424	275
Estonia	0.16	1111	2 162	362
Czech Republic	0.14	878	2 145	165
Hungary	0.16	868	595	117
Iceland	0.17	773	1 257	101
Lithuania	0.14	674	1 355	175
Bulgaria	0.09	532	312	91
Greece	0.19	458	1 906	155
Romania	0.12	433	535	104
Luxembourg	0.14	407	2 345	197
Slovenia	0.27	316	205	75
Latvia	0.16	297	177	100
Slovakia	0.19	238	156	73
Croatia	0.13	230	815	67
Cyprus	0.17	149	273	68
Serbia	0.11	137	513	64
Malta	0.17	100	1 863	78
Liechtenstein	0.16	96	1 469	67
North Macedonia	0.10	29	136	18
San Marino	0.02	8	2	8
Albania	0.03	4	85	2
Montenegro	0.10	3	4	3
Monaco	0.00	1	0	1

Average TIS category

High Moderate Low

Note: The table shows the average TIS of investors recorded as investing in companies based in EPO member states. Only countries with at least one transaction recorded in Dealroom are included. The values of this graph are limited to the sample used in the study. The sample includes early- and late-stage transactions from 2000 to 2023, focusing on companies founded from 1990 onward and active investors with significant funding activity.

Sources: Dealroom, EPO.

The data in Figure 3.1.2 show a clear positive relationship between R&D spending and average TIS, suggesting the TIS effectively reflects a country's involvement in research-intensive sectors. Smaller countries like Belgium, Switzerland and Sweden, which have high R&D spending, are also identified in Table 1 as having a higher TIS and therefore investors with greater participation in tech.

Figure 3.1.2

R&D expenditure as a percentage of GDP and average TIS by country

Note: Average TIS is the average TIS of investors operating in each country weighted by number of transactions in the country, i.e. investing in companies headquartered in each country. R&D as a % of GDP is the latest data provided by the World Bank (2024).

Sources: Dealroom, EPO, World Bank.

3.2. European investors: finding key players

Figure 3.2.1 illustrates the top 25 investors in European companies as measured by their number of transactions (Panel A) and amounts invested (Panel B). Investors are ranked by the TIS in both panels. The top 25 investors by number of transactions reported in Panel A include a large number of public investors, represented in orange, with the EIC Fund and the European Innovation Council leading the list. National public investors such as High-Tech Gründerfonds, Innovate UK, Bpifrance and Innovation Norway also rank high in the list. Private investors, with exceptions like the Swiss Venture Kick and the British Business Growth Fund, appear less frequently in the top positions.

In contrast, the list of top 25 investors by investment amount reported in Panel B is dominated by private investors, represented in blue, with the European Investment Bank (EIB) and the European Innovation Council (EIC) being notable public exceptions at the top. Private equity firms such as BlackRock, CPP Investments and Eurazeo,

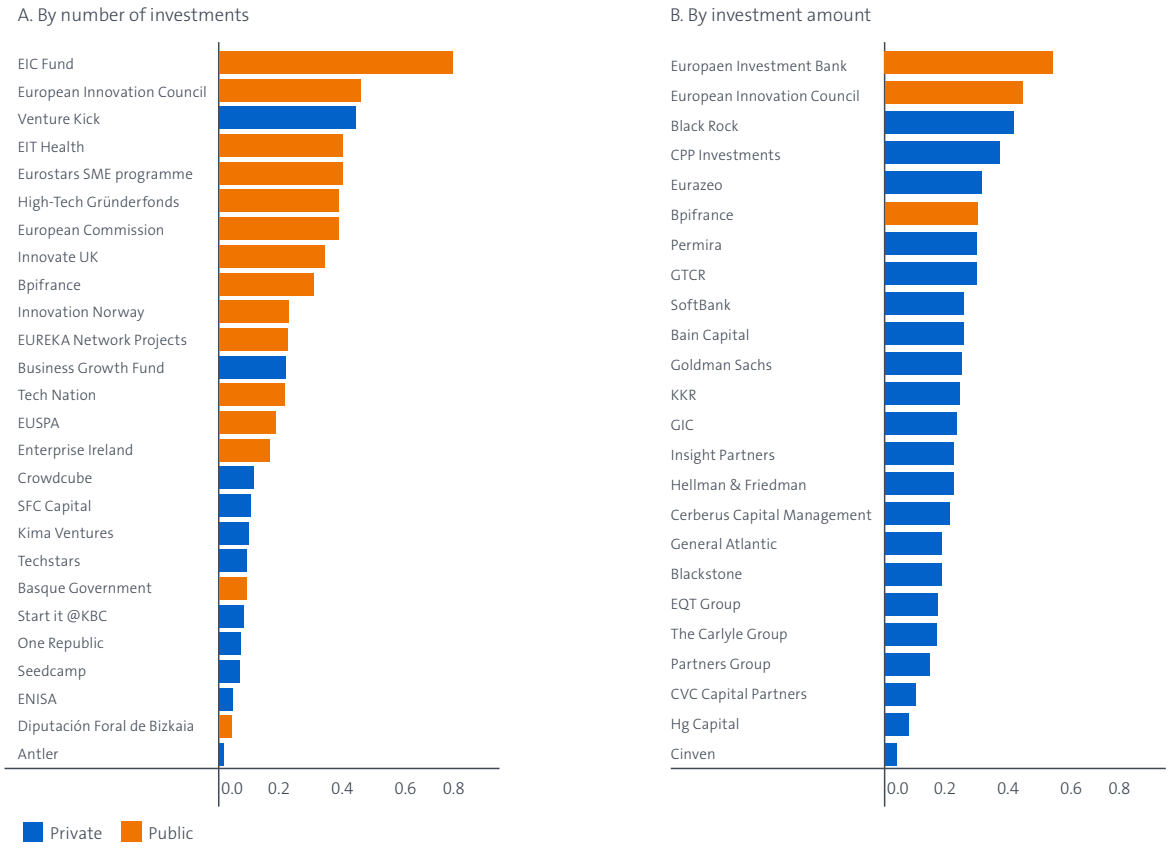
rank highly by investment amount, highlighting their capacity for large-scale funding.

The divergence between the two panels reflects the differences in investment objectives and funding instruments between public and private entities. Public institutions prioritise smaller-scale funding in a broad number of early-stage projects, mostly through grants, which fits with their policy-driven goals to stimulate technological advances. Conversely, top private investors prioritise high-value, targeted investments, which leads them to allocate larger amounts of capital through equity in established companies with proven potential.

To further identify the key investors in European companies, Annex 2 provides a detailed list of the top ten investors ranked by the number of transactions in each European country.

Figure 3.2.1

Top 25 investors in European companies



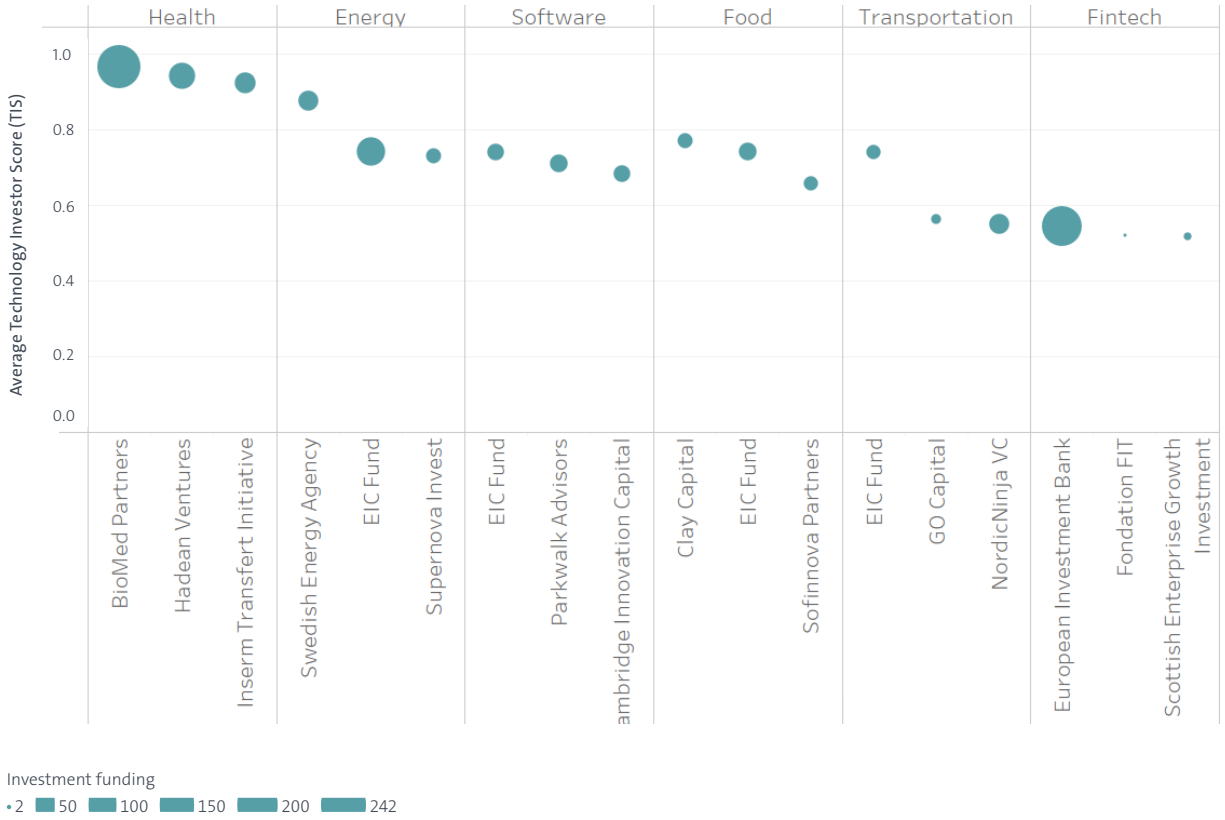
Note: The figure shows the top 25 investors by number of European companies funded (Panel A) and amount invested in European companies (Panel B). Investors are ranked by TIS. Colours indicate if the investor is public or private; public includes government and non-profit organisations, private all remaining types of investor.

Sources: Dealroom, EPO.

Fiigure 3.2.2 highlights the top three investors by TIS across the main industries by number of transactions: health, energy, software, food, transportation and fintech. In the health sector, investors such as Switzerland's BioMed Partners have a TIS of 0.97, indicating that almost all the firms in their portfolio have filed for patent applications. The circle size indicates investment funding in European companies operating in the corresponding industry, with larger circles representing greater funding. For instance, BioMed Partners in health, the EIC Fund in energy and the EIB in Fintech show relatively high levels of funding. In the five most popular fields, investors have a relatively high TIS. These include both public investors (like the EIC Fund and the EIB), specialised ones (like those active in the energy, health and food sectors) and more generalist private funds (like Parkwalk Advisors).

Figure 3.2.2

Top investors in selected industries by TIS



Note: The figure shows the top three investors by TIS in selected industries. The size of the circles reflects the investment funding size in EUR million in each field in European firms

Sources: Dealroom, EPO.

Box 3: Discover the EPO's Deep Tech Finder

The EPO Observatory on Patents and Technology (epo.org/observatory) has launched the Deep Tech Finder, a digital platform designed to make it easier to find and analyse startups in EPO member states that have filed European patent applications.

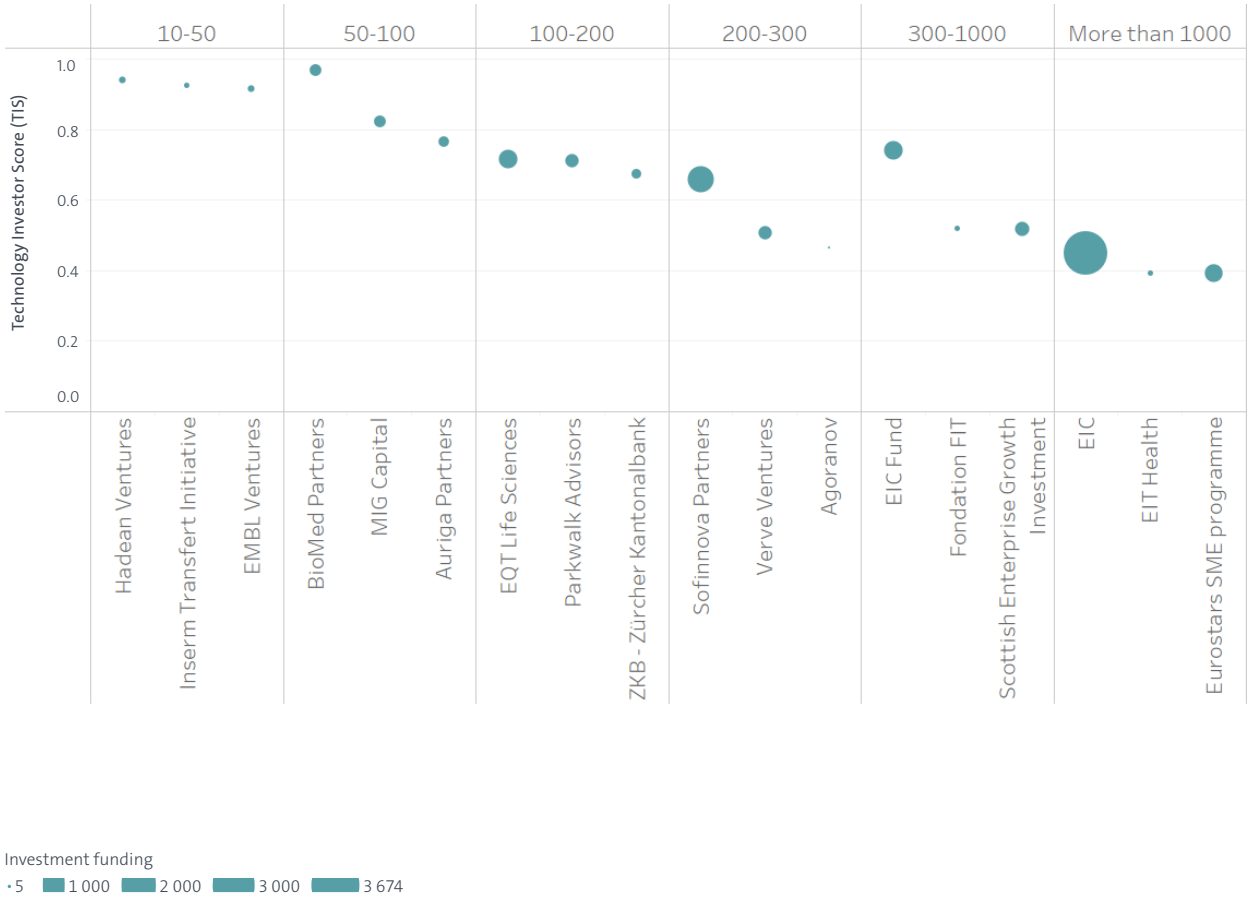
This innovative, free tool is designed for startups, investors, researchers and other key stakeholders in the innovation ecosystem. It provides advanced search functionality based on a range of industry and technology parameters, enabling users to discover emerging ventures poised to introduce groundbreaking technologies at a European scale. The Deep Tech Finder also allows users to identify investors based on the specific technologies behind the patents held by the companies they support. By focusing on specific technology fields, the tool is invaluable for discovering potential partners, investors or the next groundbreaking invention and startup to invest in.

The Deep Tech Finder can be freely accessed online: epo.org/deeptech-finder.

Another notable application of the TIS is identifying investors by size and analysing how small and large investors specialise in technology. The highest TIS are associated with investors that have smaller, more specialised portfolios focused on specific technical fields. These include investors specialising in late-stage ventures and predominantly based in the UK, such as BioMedPartners and Hadean Ventures, as well as investors focused on early-stage funding such as Inserm Transfert Initiative from French public research organisation Inserm. Among investors with the largest portfolios, those with the highest TIS are public players.

Figure 3.2.3

Top investors by TIS, ranked by number of investments in portfolio



Note:The figure shows the top three investors by TIS within each portfolio size group. Portfolio size groups are defined based on the total number of investments in European companies. The size of the circles reflects the investment funding size in EUR million in European firms.

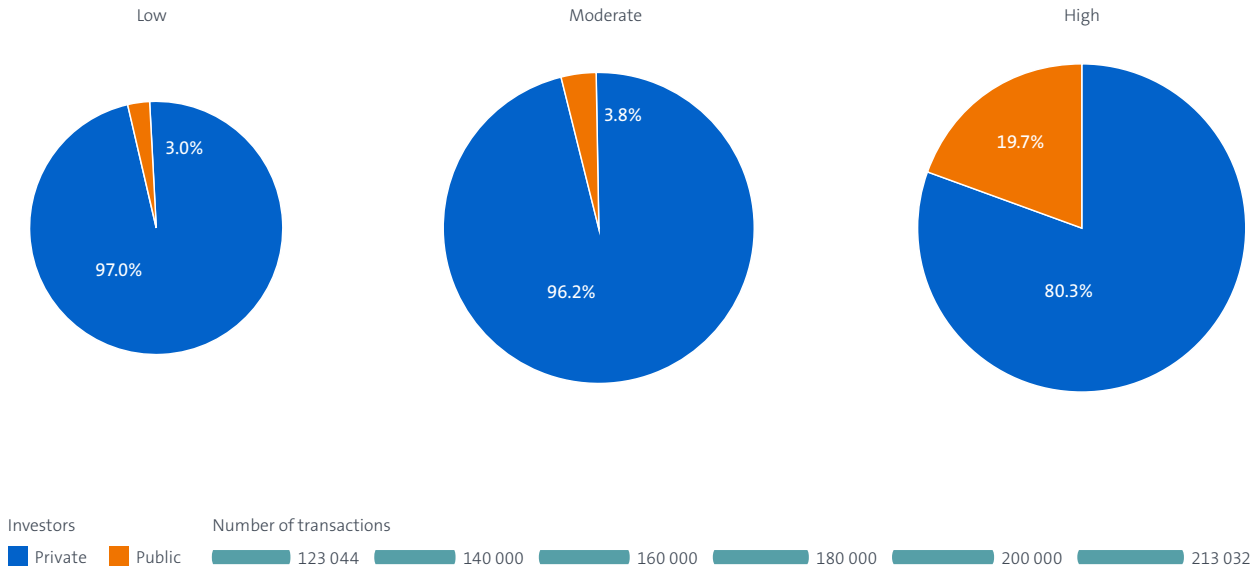
Sources: Dealroom, EPO.

3.3. Focus in European public investors

As noted in the previous section, public investors are highly active in funding patenting firms. Categorising the transactions made by investors in the three TIS categories shown in Figure 3.3.1, we find that while public investors represent a minority of the total number of transactions in Europe, their share grows exponentially when considering only low, moderate and high TIS. This trend is especially pronounced in transactions involving investors with a high TIS, where almost 20% of the transactions are made by public players.

Figure 3.3.1

Percentage of public and private investors by TIS category



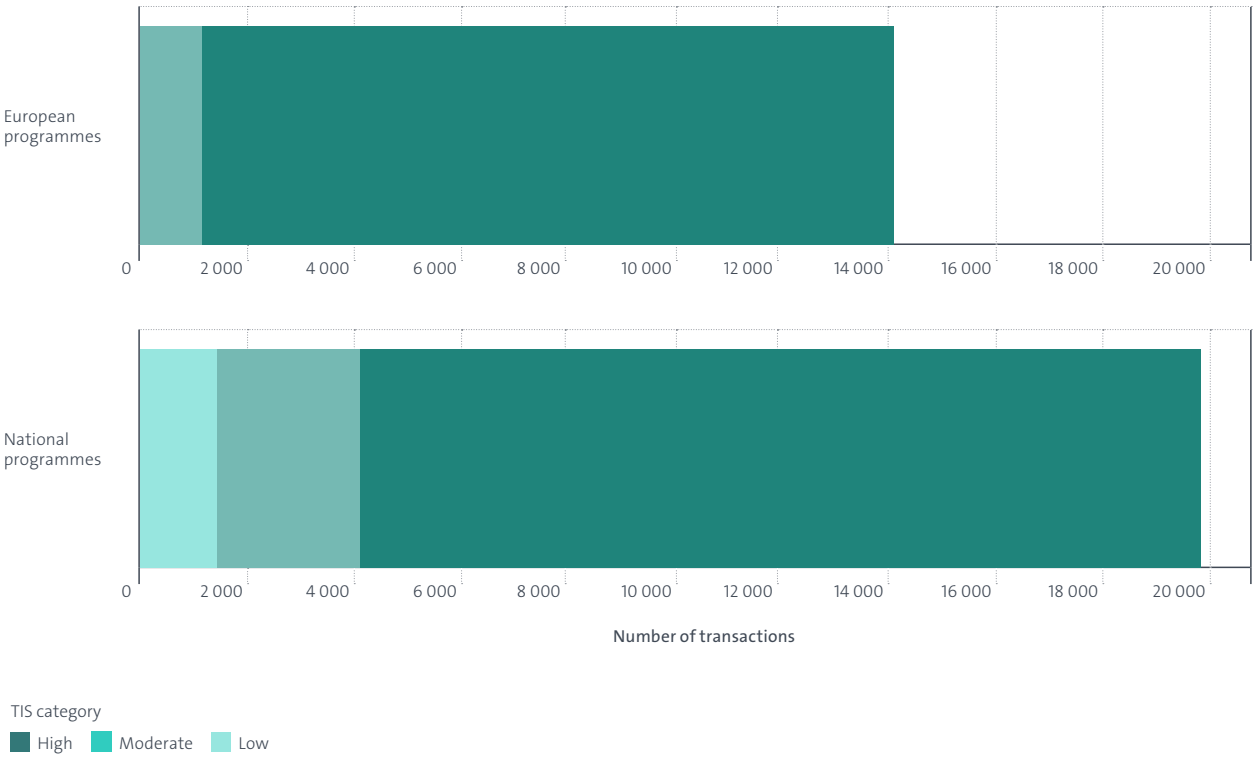
Note: The figure shows the percentage of transactions by public/private investors by category of TIS. The size of the pie charts indicates the total number of transactions per TIS category. The TIS categories are based on the score's distribution: low (lower tercile, below 0.083), moderate (middle tercile, 0.083 to below 0.2), and high (upper tercile, 0.2 and above).

Sources: Dealroom, EPO.

Within the public category, we find both European public investors, which include EU and non-EU pan-European instruments, and national players. The majority of public investment transactions in Europe come from national players, which shows the significant differences in public funding approaches among European countries. Countries like the UK (Innovate UK), France (Bpifrance), and Norway (Innovation Norway), with their large public investment platforms for innovation, account for a substantial share of the transactions from national programmes, as shown in Figure 3.3.2. European programmes represent around 70% of national programmes, but have higher TIS values on average. This indicates that, on average, European investors are more active in funding tech compared to national investors.

Figure 3.3.2

Number of transactions by public investors in Europe



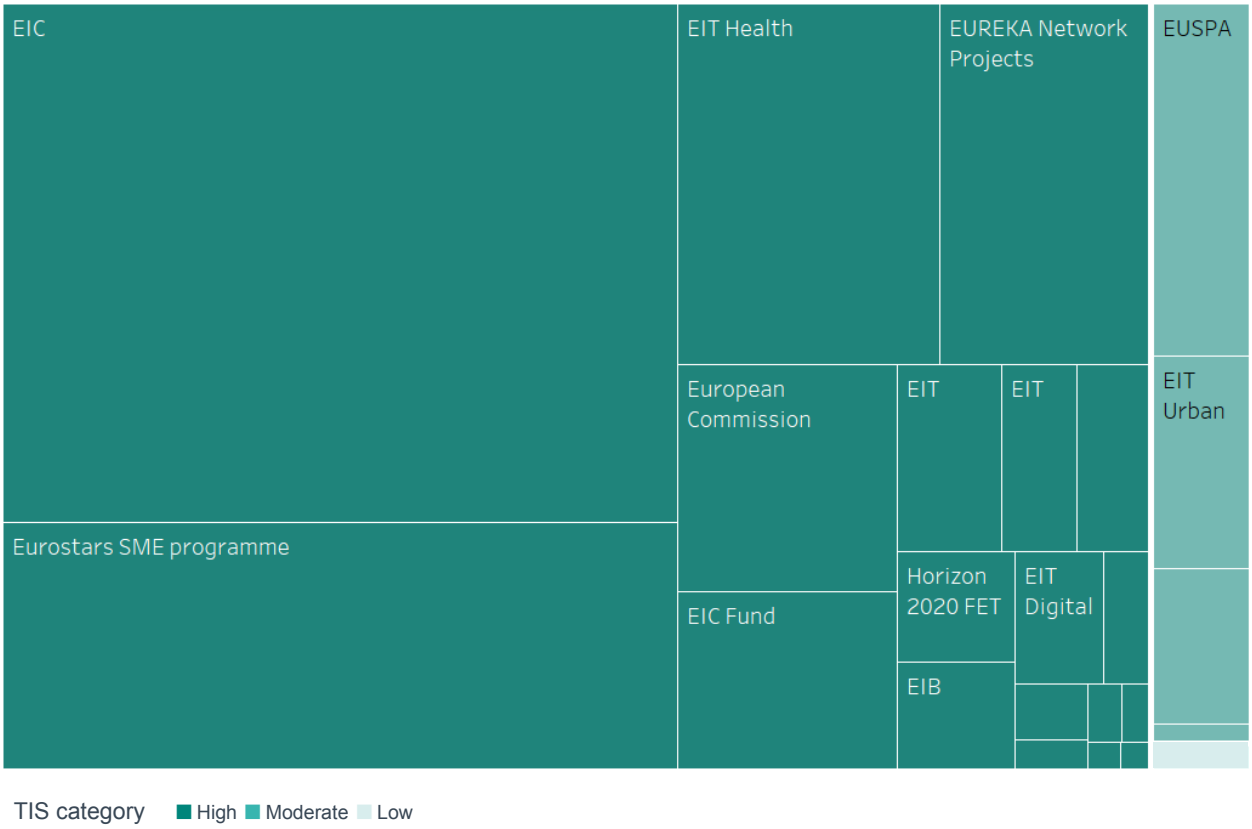
Note: European programmes include all investors identified as belonging to a European organisation or initiative, such as the EU or the ESA. National programmes include all other investors that belong to initiatives by national, regional or local players. The TIS categories are based on the score's distribution: low (lower tercile, below 0.083), moderate (middle tercile, 0.083 to below 0.2), and high (upper tercile, 0.2 and above).

Sources: Dealroom, EPO

Figure 3.3.3 looks in detail at pan-European public investors by TIS. The majority of these programmes come from the EU Framework Programme for Research and Innovation, explained further in Box 4. Apart from the EU programmes, other institutions like the European Space Agency (ESA) are also engaged in supporting and funding Europe's innovation ecosystem. Through programmes like the ESA Business Incubation Centres (ESA BICs), which help startups leverage space technology for non-space applications, the ESA funds cutting-edge space companies. The ESA BIC appears in the mapping of high-TIS investors. We note that over 80% of European public investors have a high TIS. A more detailed list of pan-European public investors can be found in Annex 3.

Figure 3.3.3

European public investors by TIS and number of transactions



Note: The name shown in some of the cells is the investor. The larger the box, the more transactions for each investor in Dealroom. The colour indicates the TIS, coded as shown. The TIS categories are based on the score's distribution: low (lower tercile, below 0.083), moderate (middle tercile, 0.083 to below 0.2), and high (upper tercile, 0.2 and above).

Sources: Dealroom, EPO

Box 4: EU innovation funding projects

Most of the European public investors identified in Figure 3.3.3 are part of the EU Framework Programme for Research and Innovation. The current programme, Horizon Europe, runs from 2021 to 2027 and has a budget of EUR 95bn. Its predecessor was Horizon 2020. Horizon Europe aims to drive scientific and technological advancements, address major societal challenges and promote sustainable growth through cross-border collaboration among researchers, industry and public institutions. A key objective of Horizon Europe is to "facilitate collaboration and strengthen the impact of research and innovation in developing, supporting and implementing EU policies while tackling global challenges" (European Commission, 2024).

One of the programme's standout initiatives is the EIC, which supports breakthrough innovations and the transition from scientific discovery to marketable solution. The EIC is part of Pillar III of Horizon Europe, and is incorporated within the European Innovation Council and SMEs Executive Agency (EISMEA). With a budget of EUR 10.1bn, it operates through three main schemes: EIC Pathfinder for early-stage, high-risk research; EIC Transition, which advances promising research results towards commercialisation; and the EIC Accelerator, which offers blended funding and advisory support for scaling disruptive technologies. All three offer support through grants included in the dataset under EIC. Selected Accelerator companies can also receive much more financing (typically between EUR 0.5 million and EUR 15 million) in the form of equity. These equity investments are provided by the EIC Fund, the venture investment arm of the EIC. This has a budget of EUR 3.5 bn and supports startups through patient capital to reduce risks for private investors. The EIC has just announced a new programme in its 2025 work programme: the EIC Strategic Technologies for Europe Platform (STEP) Scale Up scheme, to help SMEs, midcaps and startups in key technological areas scale up in Europe (European Commission, 2024b).

Pillar III of Horizon Europe also includes the European Institute of Innovation and Technology (EIT), a European Union body dedicated to strengthening innovation ecosystems by fostering collaboration across business, education and research. The goal of the EIT is to find and commercialise solutions to pressing global challenges such as climate, energy, health and digitalisation. For each global challenge, there is an ecosystem of partnerships called Knowledge and Innovation Communities (KICs). Through its KICs, the EIT offers targeted funding for startups, SMEs and innovators, including grants, business acceleration services and access to a network of investors.

Other EU projects that finance innovation exist outside the Innovation Framework. Most notably, the European Investment Bank Group (EIB Group), comprising the European Investment Bank (EIB) and the European Investment Fund (EIF), supports the economic, social and environmental objectives of the European Union by providing a wide range of financial products and services. Their finance and advisory solutions are designed to support investments and businesses through different development stages, considering their financing needs and helping to catalyse additional funding sources and maximise impact.

The EIF, a leading financial institution in the European private equity market, invests in VC, growth and mezzanine funds that support European SMEs, with a high focus on high-growth innovative companies. The EIF's equity activity is principally backed by resources from its main shareholders: the EIB and the European Commission. It invests in venture and growth capital from the very earliest stages of intellectual property development, through to more mature phases of development. Investment activities also cover technology transfer and business incubators. By supporting both well known and first-time teams, the EIF has built a strong track record in the European VC and private equity industry. Over the last 30 years it has committed more than EUR 40bn to funds investing in 28 000 companies. While the EIF's equity instruments aim to improve the availability of risk capital for high-growth and innovative SMEs, it also targets debt activities that support adoption of innovative technologies, e.g. through innovation guarantees.

In 2023 the EIF's equity operations comprised total commitments of EUR 5.6bn, of which EUR 3bn was geared towards innovation, complemented by additional EUR 1bn of innovation-oriented debt instruments. Overall EIF equity investment led to

leveraged volumes of EUR 32.5bn and mobilised EUR 83.8bn of investments at company level. The majority of the activity of the EIF is through indirect instruments, which are not the focus of this report as they cannot be easily tracked in Dealroom or similar datasets, which cover direct transactions. Although the EIB Group emerges as a highly prominent investor in this study, combining direct and indirect funding instruments would position it better and highlight the full extent of European support for innovation.

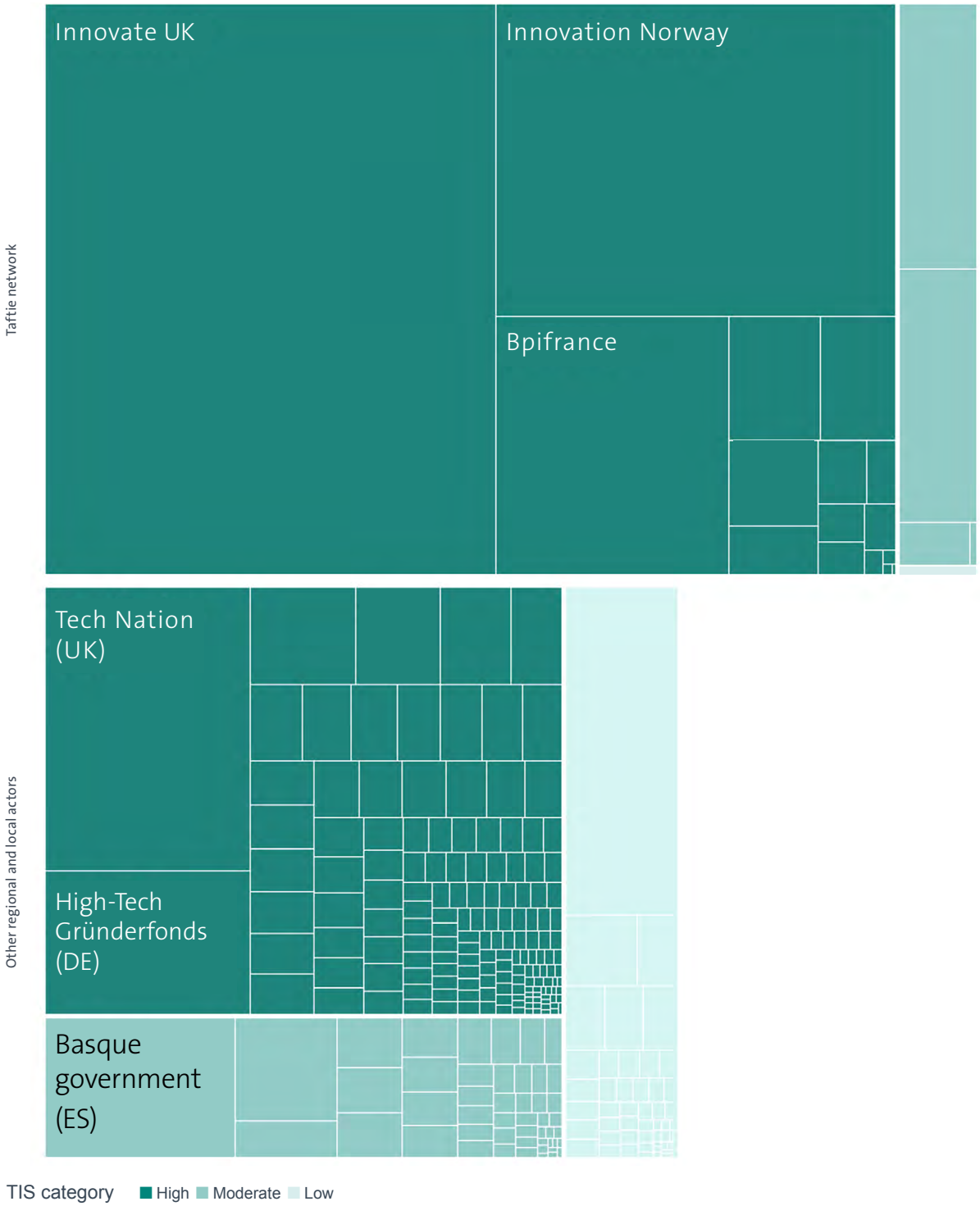
The Eurostars, a joint programme under the Eureka Network, is aimed at supporting SMEs engaged in R&D in international innovation projects. It provides funding and collaboration opportunities for market-driven projects involving multiple countries, fostering cross-border partnerships. Co-funded by national governments and the EU, it accelerates the commercialisation of innovative technologies. Other programmes involved in funding innovation include CASSINI (the European Commission's initiative to support innovation in the space industry), and the European Union Agency for the Space Programme (EUSPA), which is also involved in some innovation funding projects.

Despite the importance of the EU and other pan-European investors, national investors still play a crucial role in supporting innovative companies in Europe. This is particularly true for the UK, Norway and France, which, while participating in Horizon Europe projects—with France as an EU Member State and the UK and Norway as non-EU participants—have generous national programmes, such as Innovate UK and Innovation Norway. The primary national investors from each country are part of the Taftie network (see Box 5), which serves as a community advocating for these organisations in Brussels.

Figure 3.3.4 illustrates that a significant portion of transactions from national investors come from Taftie network members. It is also notable that these members demonstrate similar levels of engagement with technology as pan-European investors, highlighting the critical role of national players in fostering innovation. While other regional and national forums also have a high TIS, the proportion of high-TIS investors is greater within the Taftie network. A more detailed list of national public investors can be found in Annex 3.

Figure 3.3.4

National investors by TIS and number of transactions



Note: The figure identifies investors belonging to the European Network of Innovation Agencies (Taftie) and other regional and local players. The name shown in the cells is the investor, including the country code in some cases. The larger the box, the larger the number of transactions for each investor. The colour of the boxes represents the TIS category. The TIS categories are based on the score's distribution: low (lower tercile, below 0.083), moderate (middle tercile, 0.083 to below 0.2), and high (upper tercile, 0.2 and above). A more detailed list of national public investors can be found in Annex 3.

Sources: Dealroom, EPO

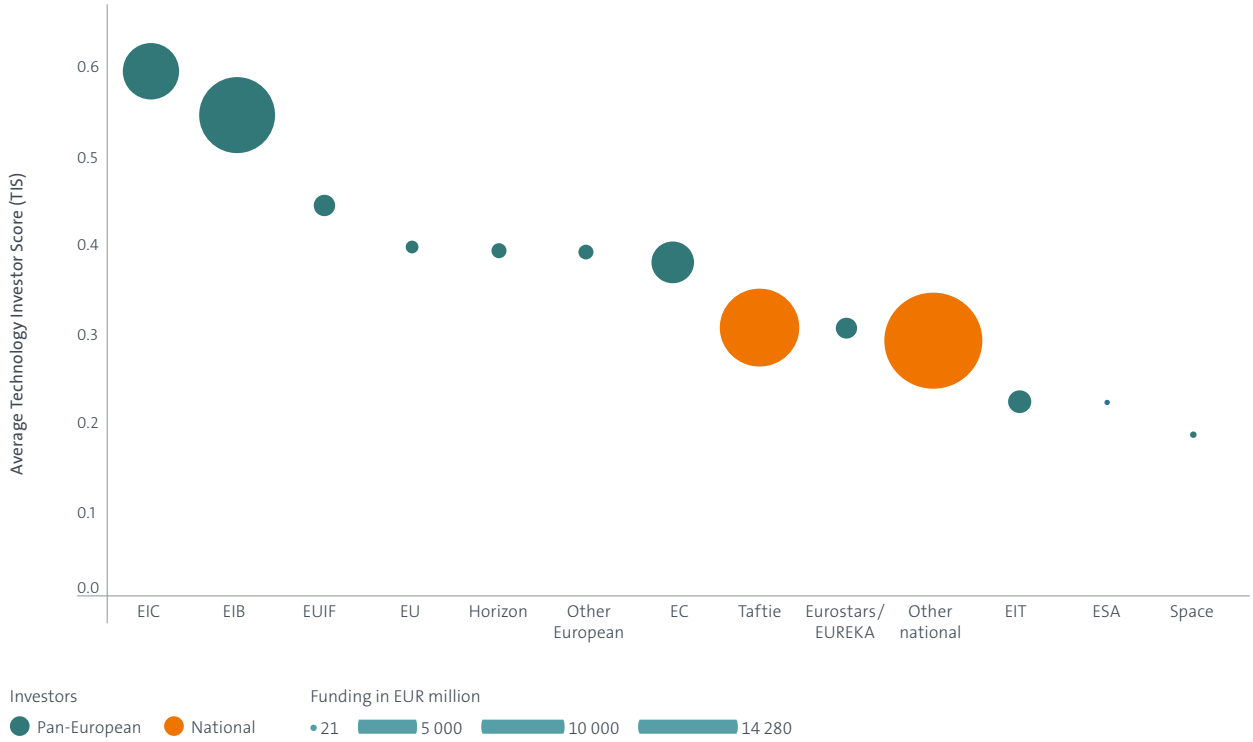
Box 5: The Taftie network

Taftie is the European Network of Innovation Agencies; it connects 34 organisations across European countries, representing the main national investor programmes in each country, such as Bpifrance and Innovate UK. Taftie prioritises joint support of transnational initiatives, especially those geared towards SMEs. Over 8 000 technology and innovation professionals are employed by the member organisations, managing a combined innovation-related budget exceeding EUR 10bn. The network functions as a platform for learning and cooperation, enabling members to analyse and adopt best practices based on each other's approaches, enhancing efficiency and strategic implementation.

Figure 3.3.5 looks at the TIS of the public investors discussed in this section, indicating the scale of their total funding by size of circle. European investors such as the EIC, the EIB and the EU Innovation Fund have the highest TIS and substantial sums to invest. National investment projects have lower involvement in technology ventures compared to the main European projects but still represent substantial sums and remain "high-TIS" in our tercile-based classification. Although Taftie investors have a higher number of transactions (Figure 3.3.4), their total recorded investment funding is lower than that of other national and regional players. They have a higher TIS than other national players, and even some European projects such as the Eurostars programme, ESA BICs and the CASSINI and EUSPA projects (labelled here under "Space").

Figure 3.3.5

Average TIS for selected European public investors in comparison to national players in European organisations



Note: The figure shows the average TIS by public programme. Circle sizes denote total funding provided in the deals in the sample.

Sources: Dealroom, EPO

Case study: Infinite Roots

Company:	Infinite Roots (formerly Mushlabs)
Headquarters:	Hamburg, Germany
Founded:	2018
Products:	Sustainable food innovation using mycelium (the root structure of mushrooms)
Size:	60 employees
Co-founders:	Dr Mazen Rizk, Dr Thibault Godard and Anne-Cathrine Hutz

"Biology can solve a lot of world problems, but science without a strong business focus will not achieve this on its own."
Dr Mazen Rizk, Founder and CEO, Infinite Roots

Infinite Roots, formerly known as Mushlabs, was founded in Germany in 2018 to provide an alternative and more sustainable source of nutrition using mycelium, the roots of mushrooms. The company's early prioritisation of its IP strategy and management, which includes the combined use of trade secrets and patents, enabled it to attract investment and protect its innovations.

Pioneering sustainable food systems

Infinite Roots, founded by Dr Mazen Rizk, is pioneering new methods in the food industry by leveraging mycelium cultivation in fermentation tanks. This innovative process minimises land and water usage while accelerating growth compared to traditional methods.

Infinite Roots drives innovation across the value chain - from innovating new and circular fermentation feedstocks using agricultural byproducts to rethinking formulations of consumer food products to fully utilise the extensive functional advantages of mycelium. The company's vision goes beyond meat alternatives to focus on developing new approaches in food systems to tackle pressing challenges such as food waste, emissions and food security.

Strategic intellectual property development

Initially, Infinite Roots protected its innovations through trade secrets, ensuring proprietary processes remained confidential. As resources became available, the company hired an experienced IP manager, Dr Wassim W. Ayass, and began filing patents to safeguard core technologies at risk of reverse engineering. This approach provided a balance between protection and cost-efficiency, gaining the confidence of investors and positioning the company for growth.

Patent intelligence plays a central role in Infinite Roots' IP strategy. By actively monitoring industry developments, the company ensures its freedom to operate and identifies opportunities in the mycelium industry to strengthen its competitive position in the IP landscape. These insights also guide technological advancements and market strategies.

Leveraging IP for growth and investment

IP has been instrumental in attracting investment and facilitating partnerships. In 2019, seed financing was secured based on the team's innovative technology and potential for a robust IP portfolio. The seed round was led by FoodLabs, which had provided pre-seed funding and has participated in each funding round since. The 2020 Series A round, led by Redalpine and Clay Capital, raised €10 million; with investors recognising technological advancements and encouraging more IP development.

The European Innovation Council (EIC) also evaluated the startup's IP portfolio, emphasising its importance in mitigating business development risks. The EIC ensures that the risks related to business development are mitigated, and therefore IP strategy and IP management are important aspects in both the assessment of proposals and the implementation of projects funded. Before signing the investment agreement, the EIC Fund carried out extensive tech due diligence, which included a thorough check of the IP portfolio held by Infinite Roots, as well as its IP strategy and freedom to operate. In addition to financing, the EIC grant helped to expand Infinite Roots' network and provided it with guidance and business support services to accelerate growth.

By January 2024, Infinite Roots had secured a $58 million Series B funding round. Led by Dr Hans Riegel Holding, the round included contributions from the EIC Fund, REWE Group and Betagro Ventures, highlighting strong confidence in the company's products and patented innovative technology. By this time, the company had successfully shifted from protecting its technology to creating a fully-fledged IP strategy combining different forms of IP rights in its portfolio. Now that Infinite Roots is more established, its patented platform technology is opening up new market and business possibilities, allowing it to create different products and providing valuable data for regulatory approvals.

Business model enabled by IP

The company's business model combines sales of its own products in key European markets with a licensing strategy of its patented technology in other regions such as the Middle East and Asia. This dual approach expands the reach of its technology and fosters innovation through collaborations. The company's commitment to a sustainable, circular food system positions it at the forefront of addressing global food challenges.

4. European competitiveness: European investment in context

Technology-driven startups represent both opportunities and challenges for investors, because despite their high earnings potential radical inventions carry a greater risk of failure. Given these challenges, the role of investors with expertise in technology could increase the chances of startup success. Experienced investors are likely to be equipped with superior IP management skills and other capabilities required to support progress through the innovation pipeline toward scaling up.

We study the extent to which a high TIS predicts successful exits and scaling up, two measures commonly used to track startup progress towards commercialisation. A successful exit, defined as a profitable liquidity event such as an acquisition or IPO, is of interest as it indicates that the company is financially valuable to investors. However, it does not necessarily imply that the company has achieved significant operational scaling. Scaling up, on the other hand, indicates a company's growth and ability to expand operationally to reach a broader market rather than immediate financial returns. Scale-ups are of interest given their potential to generate broad societal benefits. Following the EIB (2024), scale-ups are defined as companies that have secured a deal with a post-money valuation between USD 500m and USD 10bn.

4.1. TIS as a predictor of high-tech startup milestones

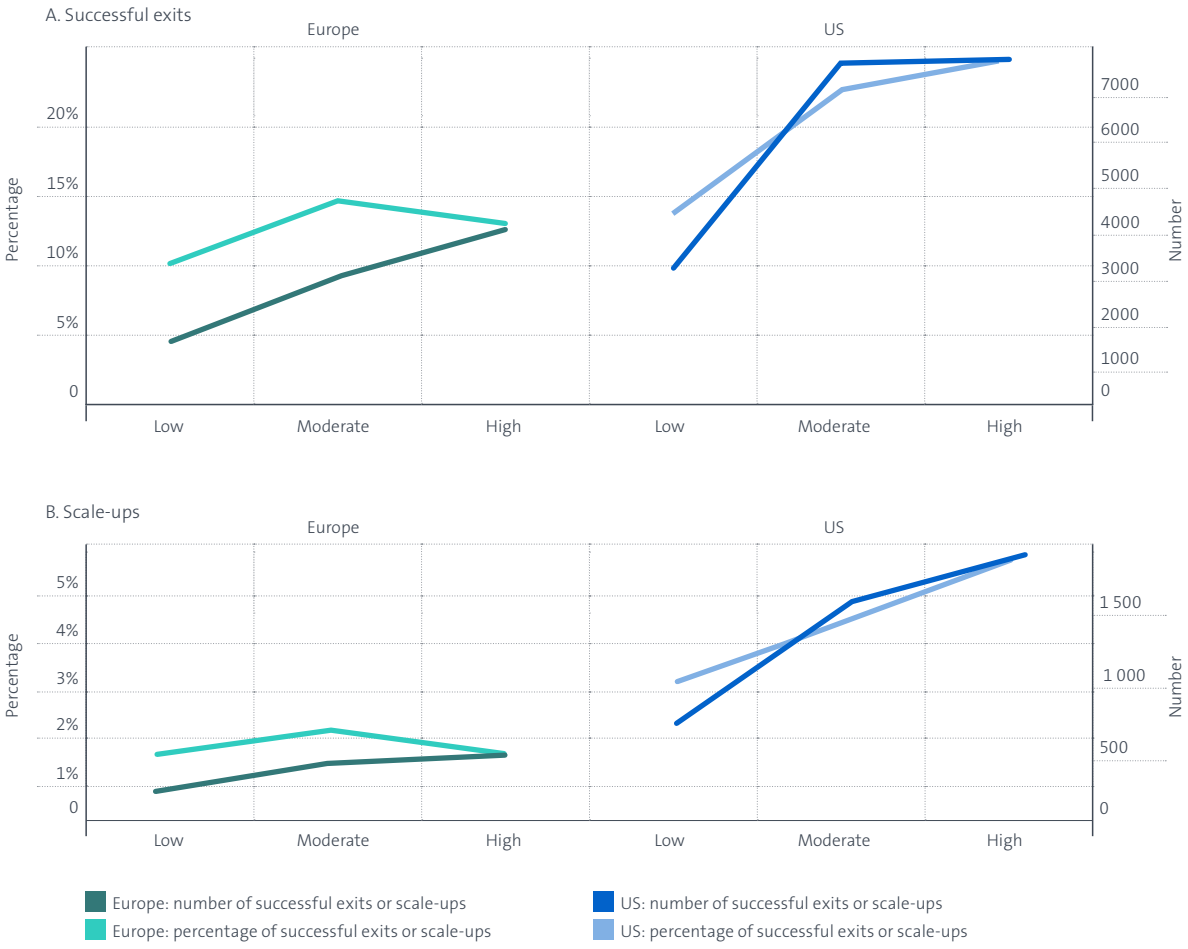
4.1.1 Descriptive evidence

Figure 4.1.1, Panel A, displays the number and percentage of successful exits for investors across different TIS categories in Europe and the US. Successful exit rates increase with higher TIS levels in both the EU and US, highlighting a positive association between technology investor involvement and startup success. However, the relationship is stronger in the US, where the average success rate rises from approximately 0.11 for low-TIS companies to over 0.26 for high-TIS ones. In contrast, European companies exhibit a more modest increase in success rates, with high-TIS companies achieving around a 0.15 success rate.

Figure 4.1.1, Panel B, focuses on the number and percentage of companies that reach the scale-up stage across different TIS categories in Europe and the US. The number and percentage of scale-ups rises in both regions with higher TIS. However, the increase is more pronounced in the US, where high-TIS companies achieve significantly higher scale-up rates. In contrast, European companies show a modest increase in scale-up rates across TIS categories, with a peak in the moderate range and a slight decline for high-TIS companies. This suggests that high-TIS investors in the US are more effective at supporting companies to reach substantial growth and valuation levels.

Figure 4.1.1

Successful exits and scale-ups by TIS category



Note: The figure illustrates the number and percentage of successful exits and scale-ups by TIS category for European and US companies. A successful exit is defined as an IPO or acquisition event. A scale-up is defined as a company that reaches a valuation of between USD 500m and USD 10bn. The TIS categories indicated in the x-axis are based on the score's distribution: low (lower tercile, below 0.083), moderate (middle tercile, 0.083 to below 0.2), and high (upper tercile, 0.2 and above).

Sources: Dealroom, EPO.

4.1.2. Regression analysis

The positive association between the TIS and startup success may be influenced by factors unrelated to the TIS itself. For instance, it could be motivated by the fact that companies funded by high-TIS investors generally possess greater intangible assets or by underlying investor characteristics that are more common in investors with higher scores. To isolate TIS effects from potentially confusing factors, we apply a logistic regression analysis that allows us to control for observable characteristics of the company, investor and transaction.

Table 2 shows estimates of the likelihood of a successful exit or scale-up based on the average TIS of investors in the initial round of a startup. The results use a subsample of companies whose investors funded at least ten startups before the first transaction to ensure a robust sample size for the score calculation. We estimate three specifications: one with only the TIS (columns 1 and 4), a second adding patent stock to control for technological assets (columns 2 and 5), and a third with full company, investor and transaction controls, measured the year before the first transaction to mitigate reverse causality concerns (columns 3 and 6).

Table 4.1.1

Relationship between TIS and startup success

	Europe			US		
	(1)	(2)	(3)	(4)	(5)	(6)
	Successful exit					
TIS t-1	0.106***	0.063**	0.011	0.308***	0.247***	0.165***
	(0.033)	(0.031)	(0.018)	(0.044)	(0.045)	(0.026)
Ln (Patent stock t-1)		0.029***	0.011***		0.037***	0.016***
		(0.004)	(0.004)		(0.004)	(0.003)
Pseudo R2	0.003	0.003	0.222	0.007	0.009	0.245
Observations	33 734	33 734	33 734	35 879	35 879	35 879
	Scale-up					
TIS t-1	-0.005	-0.013	-0.007	0.142***	0.121***	0.051***
	(0.009)	(0.009)	(0.005)	(0.014)	(0.014)	(0.011)
Ln (Patent stock t-1)		0.005***	0.001		0.011***	0.003**
		(0.001)	(0.001)		(0.002)	(0.001)
Pseudo R2	0.000	0.0154	0.478	0.020	0.254	0.333
Observations	33 734	33 734	33 734	35 879	35 879	35 879
Company controls	No	No	Yes	No	No	Yes
Investor controls	No	No	Yes	No	No	Yes
Transaction controls	No	No	Yes	No	No	Yes

Note: The table shows logit estimates of the probability of startup success (IPO or acquisition) and reaching scale-up state. The reported coefficients are marginal effects. Clustered-robust standard errors (at first investor level) in parentheses. *** p<0.01, ** p<0.05 and * p<0.1 denote statistical significance at the 1, 5 and 10 percent levels respectively. The company-level controls include: three binary variables indicating if the company has a promising founder, a strong founder or a super founder; a binary indicator indicating if the company is a university spinout; company launch year, country and industry fixed effects. The investor-level controls include: a continuous variable indicating investor experience (number of investments up to the year prior to the investment); launch year, country and investor type fixed effects. The transaction-level controls include: transaction year and type fixed effects. The three first columns focus on the sample of companies headquartered in Europe, while the last three columns focus on the sample of companies headquartered in the US.

Sources: Dealroom, EPO

The results in the top half of Table 4.1.1 indicate a positive and statistically significant association between TIS and successful exits. This association remains significant when the company's patent stock is added, suggesting that the TIS captures investor-specific effects beyond the startup's technological assets. In Europe the coefficient remains positive but becomes insignificant in the most demanding specification including the full set of controls. In the US the effect remains both positive and significant. The bottom half of Table 4.1.1 indicates that the relationship between the TIS and the likelihood of scaling up is also positive and significant in the US for the three specifications. For Europe, TIS does not show a significant effect on scale-up probability. In terms of magnitudes, the coefficient of the most demanding specification in the US indicates that an increase in the TIS from zero to one is associated with an approximately 16.5% higher probability of success and a 5% higher probability of scaling up.

Overall, these results indicate that the TIS of first-round investors is a stronger predictor of startup success in the US than in Europe. This disparity may reflect structural differences in scaling resources available to startups, with the US providing a more supportive ecosystem for high-growth companies. One possible interpretation is that investors in the US focused on high-tech have a greater capacity to guide startups from initial funding rounds through to successful exits and scale-up. Alternatively, given that scaling startups requires a series of follow-up rounds often led by new investors, the result could hint at an interrupted pipeline of investors in Europe, where early-stage high-tech investors are not followed by late-stage ones.

These results could also reflect attenuation due to European startups migrating to the US for scaling up. Weik et al. (2024) show that about 7% of startups launched in Europe migrate abroad. Conti and Guzman (2023) find that migrant startups raise larger funding amounts, are more likely to be acquired than non-migrants and achieve a higher acquisition value. Startups founded in Europe but migrating to the US are recorded as successful exits and scale-ups in the US sample. Therefore the absence of statistically significant results for Europe in the most demanding specification could reflect the fact that European migrants receiving initial rounds by high-TIS investors attain positive outcomes and generate value in the US market.

4.2. Funding gaps between Europe and the US across TIS categories

This section examines potential reasons behind the weaker link between the TIS and startup performance in Europe. Specifically, it analyses funding disparities between companies in Europe and the US across various TIS categories. Additionally, we assess whether these disparities are more pronounced for certain investor types, funding rounds, and industries with high technological intensity. We aim to identify segments where a shortage of investors and funding are particularly acute. To streamline reporting, the section focuses solely on the low and high TIS categories, excluding the moderate one.

4.2.1. Funding gaps by TIS category

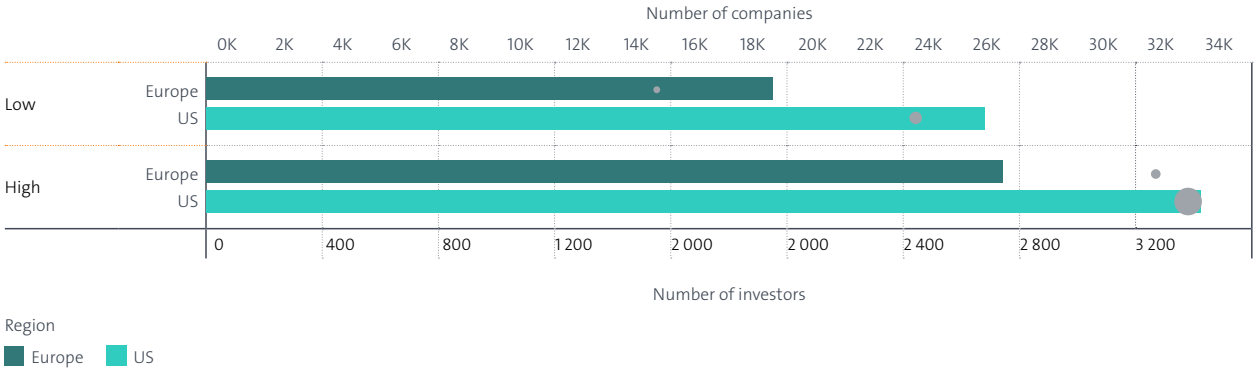
Figure 4.2.1 describes funding patterns across TIS categories for Europe and the US. Panel A shows that the US operates at a greater scale, with a higher number of investors funding more companies and providing larger median investments per company. Notably, while high-TIS investors fund a comparable number of companies in both regions, US companies receive significantly higher median funding. The funding gap in median investment by high-TIS investors between European and US companies is 88% (EUR 7.7m in the US vs. EUR 0.96m in Europe), considerably wider than the 66% gap observed for low-TIS investors (EUR 1.4m in the US vs. EUR 0.46m in Europe).

Panel B in Figure 4.2.1 shows that these disparities compound into a notable gap in total funding received by European companies compared to their US counterparts across TIS categories. This funding gap remains relatively consistent across categories, with the 69% gap in the high-TIS category only slightly larger than the 65% gap observed for low-TIS investors. It is important to bear in mind, though, that the gap for the high-TIS category remains relatively low due to the large number of companies funded by high-TIS investors in Europe. However, these companies are significantly underfunded at the intensive margin, with severe gaps in median funding.

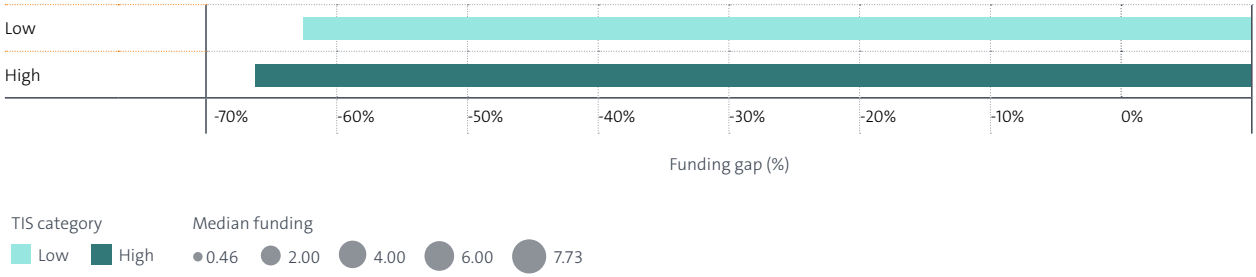
Figure 4.2.1

Funding by TIS category

A. Number of investors and funded companies and median funding in EUR million by TIS category



B. Funding gap between Europe and the US by TIS category



Note: Panel A illustrates the number of investors, number of funded companies and median investment per company by TIS category for companies headquartered in Europe and the US. Bar lengths represent the number of investors (lower axis), dot lengths correspond to the number of funded companies (upper axis), and dot sizes reflect the median funding per company in EUR million. Panel B illustrates the percentage gap in total funding within each TIS category, calculated as the difference in total funding received by companies in Europe compared to companies in the US, expressed as a percentage of US total funding. The TIS categories are based on the score's distribution: low (lower tercile, below 0.083), moderate (middle tercile, 0.083 to below 0.2), and high (upper tercile, 0.2 and above).

Sources: Dealroom, EPO.

4.2.2. Funding gaps by TIS category and investor type

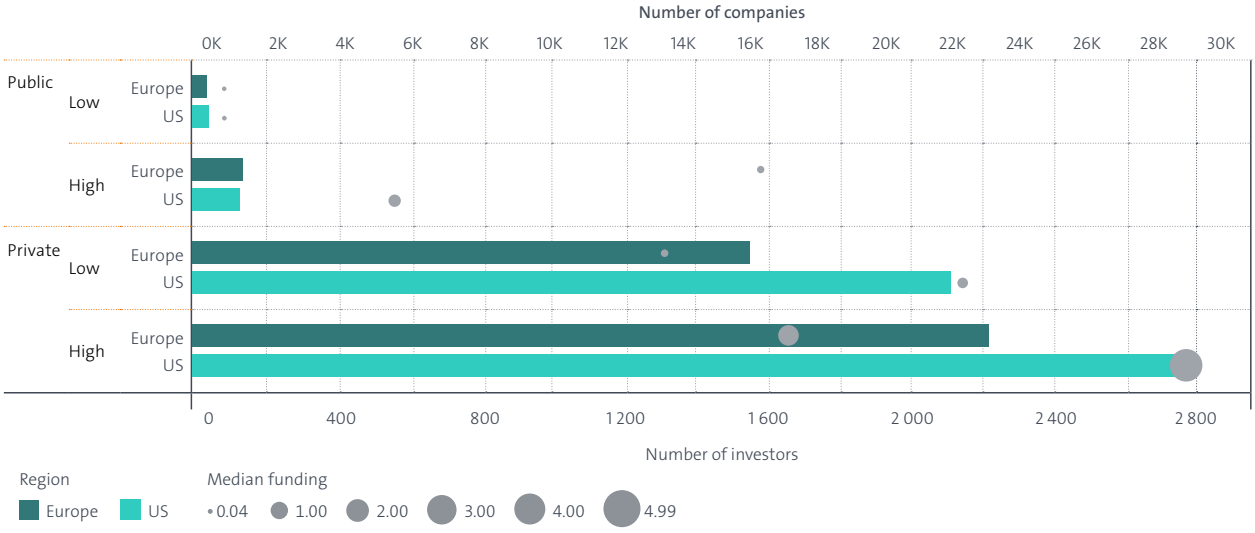
Public and private investors complement each other. Public investors focus on early-stage funding, de-risking development to enable private capital in subsequent stages. Private investors can focus on early stages, but they also provide the larger sums of later-stage capital essential for scaling up, along with mentorship and industry connections.

Figure 4.2.2 breaks down funding by TIS category and investor type. A notable insight in Panel A is that high-TIS public investors in Europe fund more companies than their US counterparts. However, the median funding per company by European high-TIS public investors (EUR 0.21m) is significantly lower than that provided by their US counterparts (EUR 0.63m) and by other US investors such as investment funds (EUR 13m). Despite the important role of high-TIS European public investors, Europe lags in both number of companies funded and median funding per company by private investors. Panel B of Figure 4.2.2 shows that these disparities translate into a funding surplus for public investors and a notable gap for private investors that widens as TIS increases, reaching 76% for high-TIS compared to 59% for low-TIS.

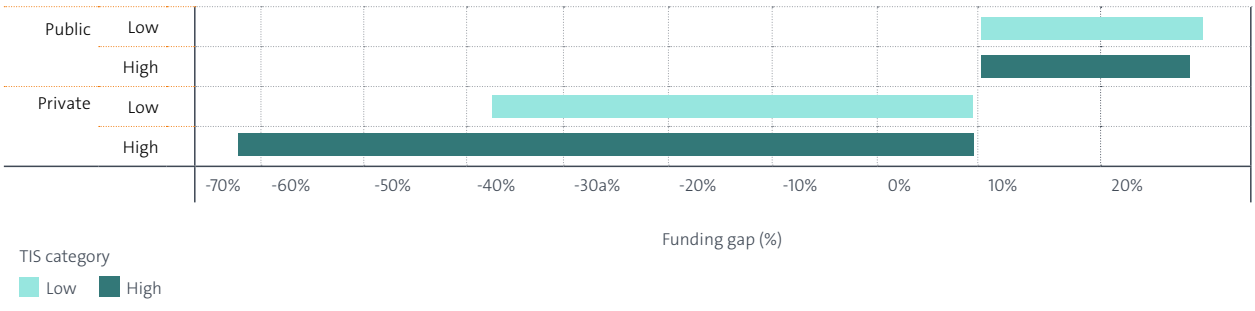
Figure 4.2.2

Funding by TIS category and investor type

A. Number of investors and funded companies and median funding in EUR million by TIS category



B. Funding gap between Europe and the US by TIS category



Note: Panel A illustrates the number of investors, number of funded companies and median investment per company by TIS category and investor type for companies headquartered in Europe and the US. Bar lengths represent the number of investors (lower axis), dot lengths correspond to the number of funded companies (upper axis), and dot sizes reflect the median funding per company in EUR million. Panel B illustrates the percentage gap in total funding within each TIS category and investor type, calculated as the difference in total funding received by companies in Europe compared to companies in the US, expressed as a percentage of the US total funding. The TIS categories are based on the score's distribution: low (lower tercile, below 0.083), moderate (middle tercile, 0.083 to below 0.2), and high (upper tercile, 0.2 and above).

Sources: Dealroom, EPO.

4.2.3. Funding gaps by TIS category and round type

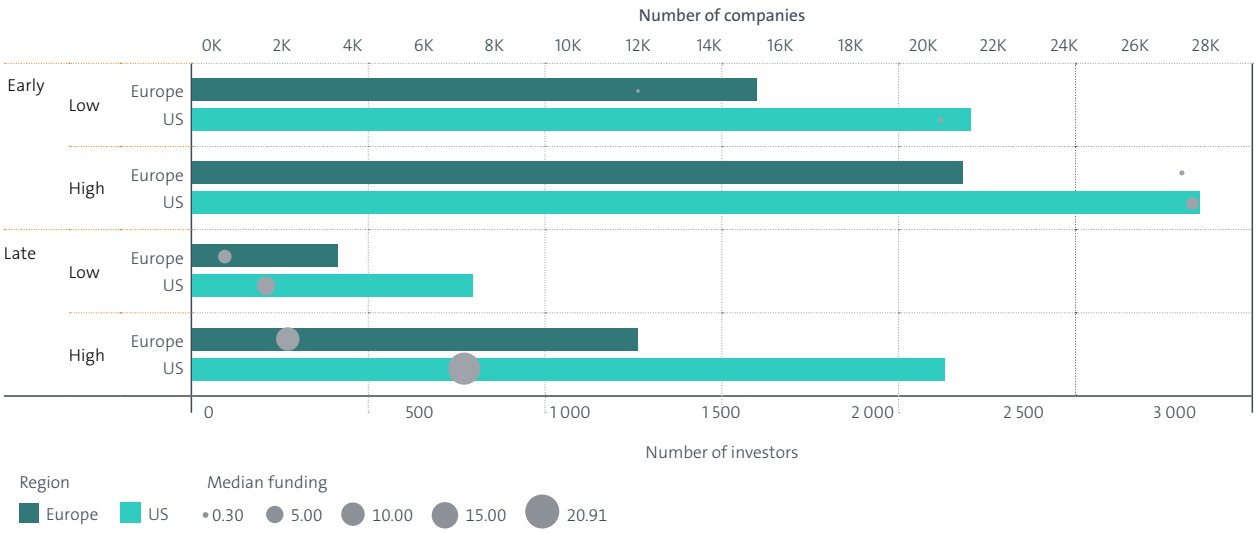
Innovation funding is divided into early and late stages, reflecting different needs in the innovation cycle. Early-stage funding focuses on activities such as developing prototypes, validating technologies and advancing initial R&D. Late-stage funding supports scaling up, market entry and commercialisation. Both stages are critical for bringing startups from initial concepts to market readiness and eventual growth.

Figure 4.2.3 breaks down funding by TIS category and transaction round type. Panel A shows that Europe funds fewer companies and provides lower median funding per company across all round type and TIS category combinations. Panel B shows that these disparities result in significant gaps in total funding in both early and late stages. In early stages, funding gaps are less pronounced and remain relatively stable across TIS categories. In late-stage rounds, however, funding gaps are more pronounced and widen with higher TIS, reaching 76% for high-TIS compared to 59% for low-TIS.

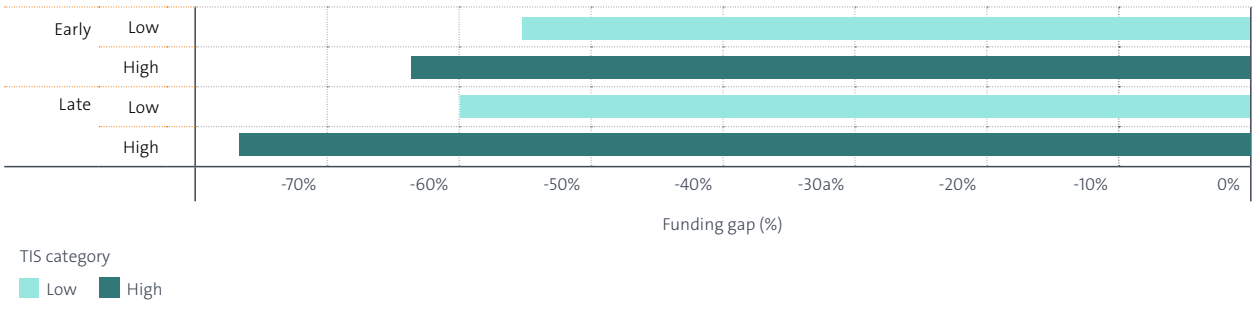
Figure 4.2.3

Funding by TIS category

A. Number of investors and funded companies and median funding in EUR million by TIS category



B. Funding gap between Europe and the US by TIS category



Note: Panel A illustrates the number of investors, number of funded companies and median investment per company by TIS category and round type for companies headquartered in Europe and the US. The TIS categories are based on the score's distribution: low (lower tercile, below 0.083), moderate (middle tercile, 0.083 to below 0.2), and high (upper tercile, 0.2 and above). Bar lengths represent the number of investors (lower axis), dot lengths correspond to the number of funded companies (upper axis), and dot sizes reflect the median funding per company in EUR million. Panel B illustrates the percentage gap in total funding within each TIS category and round type, calculated as the difference in total funding received by companies in Europe compared to companies in the US, expressed as a percentage of the US total funding.

Sources: Dealroom, EPO.

4.2.4. Funding gaps by TIS category and industry technological intensity

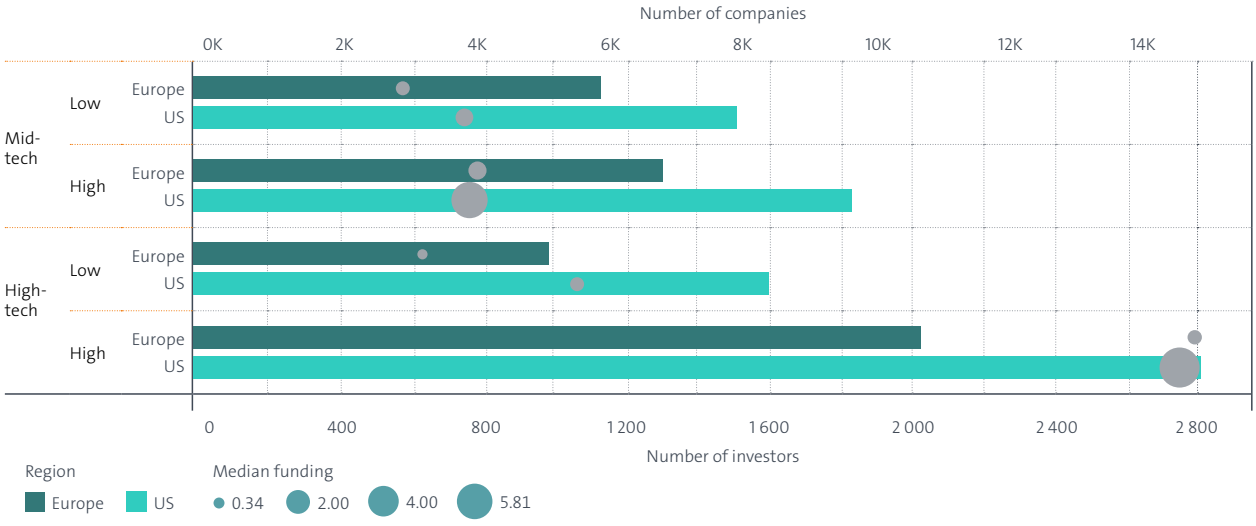
European specialisation in mid-tech, also known as the "middle technology trap", has been highlighted as an important factor hampering innovation performance in the EU (Fuest et al., 2024). Mid-tech sectors like automobiles and parts do not require the same R&D intensity or offer the same growth potential as high-tech industries that produce the newest technologies, such as software and computer services or pharmaceuticals and biotechnology. To enhance innovation in Europe, a shift in focus from mid-tech to high-tech sectors is needed. For this to occur, investors specialised in supporting high-tech sectors are needed.

Figure 4.2.4 examines whether high-TIS investors in Europe and the US have a comparable capacity or willingness to direct funding toward high-tech sectors. Panel A reveals that high-TIS investors in Europe and the US fund a comparable number of companies in both mid-tech and high-tech sectors. Despite this, the median funding per company remains substantially higher in the US. For instance, high-TIS investors in high-tech sectors provide median funding of EUR 5.8m in the US compared to EUR 0.76m in Europe. Panel B shows wide funding gaps for Europe; these are most pronounced for high-TIS investors in high-tech sectors, with a gap of 74%, compared to a 63% gap for low TIS investors in high-tech sectors.

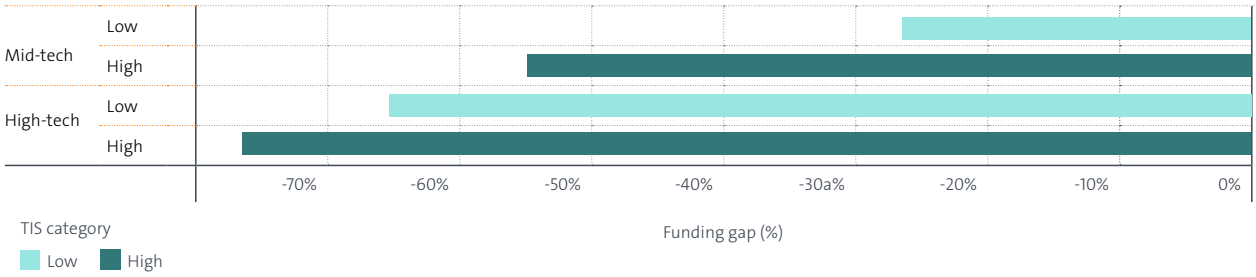
Figure 4.2.4

Funding by TIS category and industry technological intensity

A. Number of investors and funded companies and median funding in EUR million by TIS category



B. Funding gap between Europe and the US by TIS category



Note: Panel A illustrates the number of investors, number of funded companies and median investment per company by TIS category and industry technology group for companies headquartered in Europe and the US. Bar lengths represent the number of investors (lower axis), dot lengths correspond to the number of funded companies (upper axis), and dot sizes reflect the median funding per company in EUR million. Panel B illustrates the percentage gap in total funding within each TIS category and industry technology group, calculated as the difference in total funding received by companies in Europe compared to companies in the US, expressed as a percentage of the US total funding. The TIS categories are based on the score's distribution: low (lower tercile, below 0.083), moderate (middle tercile, 0.083 to below 0.2), and high (upper tercile, 0.2 and above).

Sources: Dealroom, EPO.

4.2.5. Funding gaps: conclusion

Funding gaps between Europe and the US are most pronounced for high-TIS investors that a) are private, b) specialise in later-stage rounds, and c) invest in high-tech sectors. Public investors with high TIS values in Europe, show a funding surplus, partially offsetting the gap. However, addressing private-sector disparities remains crucial for scaling startups and enhancing Europe's competitiveness.

Case study: Arevo

Company:	Arevo
Headquarters:	Umeå, Sweden
Founded:	2015
Products:	Eco-friendly plant nutrition for forestry and agriculture
Size:	16 employees

"An advisor with IP, legal and business expertise is rare, but highly beneficial for a technology startup."
Torgny Näsholm, Founder and Chief Technical Officer, Arevo

Arevo is a Swedish startup founded by Professor Torgny Näsholm in 2015. At that time, the company developed sustainable plant nutrition for the forestry sector. After almost a decade in forestry Arevo aimed to enter the agriculture sector, prompting the need for investment. Collaborating closely with investors proved invaluable, enabling the company to refine its IP strategy, attract investors, develop new products, hire expert staff and successfully expand into new markets.

Sowing the seeds of success

Professor Näsholm's research at the Swedish University of Agricultural Sciences revealed that plants can absorb organic nitrogen, specifically the amino acid arginine, unlike the typical ammonia-based nitrogen found in conventional fertilisers. In 2000 he made a pivotal discovery when he observed that arginine actually benefits plants across a range of growing environments. He knew that with this discovery he could engineer a new generation of nitrogen fertilisers and biostimulants to improve plant growth, increase yields and support sustainable plant nutrition.

The " professor's privilege" rule in Sweden allowed him to retain full ownership of his invention, as universities cannot claim rights to researchers' work. Professor Näsholm began to pursue commercialisation, which meant taking on the responsibility of securing funding and protecting his IP. An early partnership with a forestry company provided funding for his first patent application, filed in 2000. At the same time, he partnered with SweTree, a company that carries out research and development both in-house and collaboratively, serving forest and biomass clients. SweTree enabled him to branch out of the lab by financing several patent applications based on his research.

New company, new markets

By 2015, Professor Näsholm's research had evolved; he had filed additional patent applications and begun to develop new products. He founded Arevo, transferred all IP rights from SweTree to the new company and registered a trademark for arGrow, Arevo's first product line. Between 2015 and 2022, Arevo drew funding from several backers and used it to develop new product formulations, file patent applications, build a manufacturing facility and hire expert staff to fill key roles. Initially the company sold its products directly to large companies in the forestry sector. It later became clear that Arevo's arginine-based technology could be just as beneficial for crops. However, to enter the agriculture sector Arevo needed to develop new product formulations, adapt its marketing approach and protect its new technologies, for which funding was needed.

Investor perspectives: pivotal for growth

In 2023 Arevo needed additional capital to expand into agriculture. Acting CEO Rikard Höög drafted a new business plan that was reviewed by stakeholders and potential investors. External evaluations from VC firms helped the company refine its strategy and develop a pitch emphasising its strong patent portfolio.

With a presentation tailored to appeal to investors, Arevo caught the eye of Industrifonden, a Swedish capital fund. Investors in technology-driven companies expect startups to demonstrate a solid understanding of IP basics and have a strategy in place. Industrifonden's due diligence included an extensive IP audit that reviewed the scope, validity and enforceability of Arevo's patents. This served two purposes: first, to confirm the commercial viability of the technology, and second, to ensure that its patents provided solid protection in a highly competitive market. The audit also evaluated any potential gaps that might leave the company vulnerable to competitors or infringe on other patented technologies.

Industrifonden joined as a lead investor in a EUR 6.6 million series A round which successfully closed in 2024 with continued support from existing backers. This milestone not only underscores the role of a solid IP strategy for startups, but also the value of investor engagement in building that foundation. By actively supporting IP management and guiding strategic refinements, investors help startups protect their innovations and strengthen their market position.

5. Public and private investors

Public and private investors play complementary roles that are both essential to the innovation pipeline. Public investors typically fund high-risk, early-stage projects through grants or loans, supporting initial R&D and technology validation. Private investors provide the larger amounts of later-stage capital crucial for commercialisation, along with mentorship and industry connections. By seeding innovation and de-risking early development, public funding creates a foundation that enables private capital to bring transformative technologies to market at scale.

The funding gaps documented in the previous section suggest that Europe may lack a balance in the participation by public and private investors. Government investors play a prominent role in supporting technology companies, showing positive funding levels compared to the US and backing a significant number of firms. However, private investors exhibit notable funding gaps, which appear to contribute to a shortage of funding for late-stage growth. These gaps are particularly wide for investors with high technology expertise.

We examine how the relationship between public and private investors affects fund availability across the innovation cycle. We also identify investors that could help close late-stage funding gaps. The focus is on segments with the largest funding disparities compared to the US, specifically high-tech companies supported by investors with high or moderate TIS.

5.1. Network analysis

To understand the interplay between public and private investors and how these relationships vary between Europe and the US, we conduct a network analysis based on pairwise co-investor connections. Here, co-investors are broadly defined as investors that fund the same company, though not necessarily at the same time or in the same transaction round. This inclusive definition allows us to map the investment supply chain, capturing the range of investors available at various stages of a company's technological maturity. For this analysis, we focus on transactions in high-tech sectors involving investors with high or moderate TIS.

The network analysis focuses on eigenvector centrality to identify the most influential investors. This measures an investor's influence by evaluating connections to other prominent investors within the network. High eigenvector centrality indicates that an investor is not only well connected, but also linked to other influential nodes, positioning them as key players within the high-tech investment landscape. The metric highlights those investors with the greatest potential to drive network-wide impact by leveraging their connections to other central, high-impact investors. Recent research by the OECD suggests that collaboration with private investors makes public programmes more efficient at producing highly cited patent applications with their investments, and also boosts exit and scale-up performance (Berger et al., 2024). This network analysis is therefore useful to further understand funding ecosystems in Europe.

Figure 5.1.1 displays the network for European companies. Investors that are closer to one another in the network layout display a higher frequency of common co-investments. Public investors appear large (node size represents total funding in high-tech companies) and occupy central positions. Private early-stage investors are more numerous, but generally positioned at the periphery. Private late-stage investors are fewer and provide relatively modest funding, despite focusing on stages that typically require substantial resources. Statistical network analysis supports these observations. The top five investors by eigenvector centrality are major public entities, including the EIC, Innovate UK, Eurostars SME Programme, Bpifrance, and the EIT. The top 100 investors include 11 additional public entities, primarily pan-European institutions such as the EIB but also national agencies. Among private investors, 62% focus on early-stage funding, but only 22% in late-stage, underscoring the limited capital available for scaling high-tech companies in Europe.

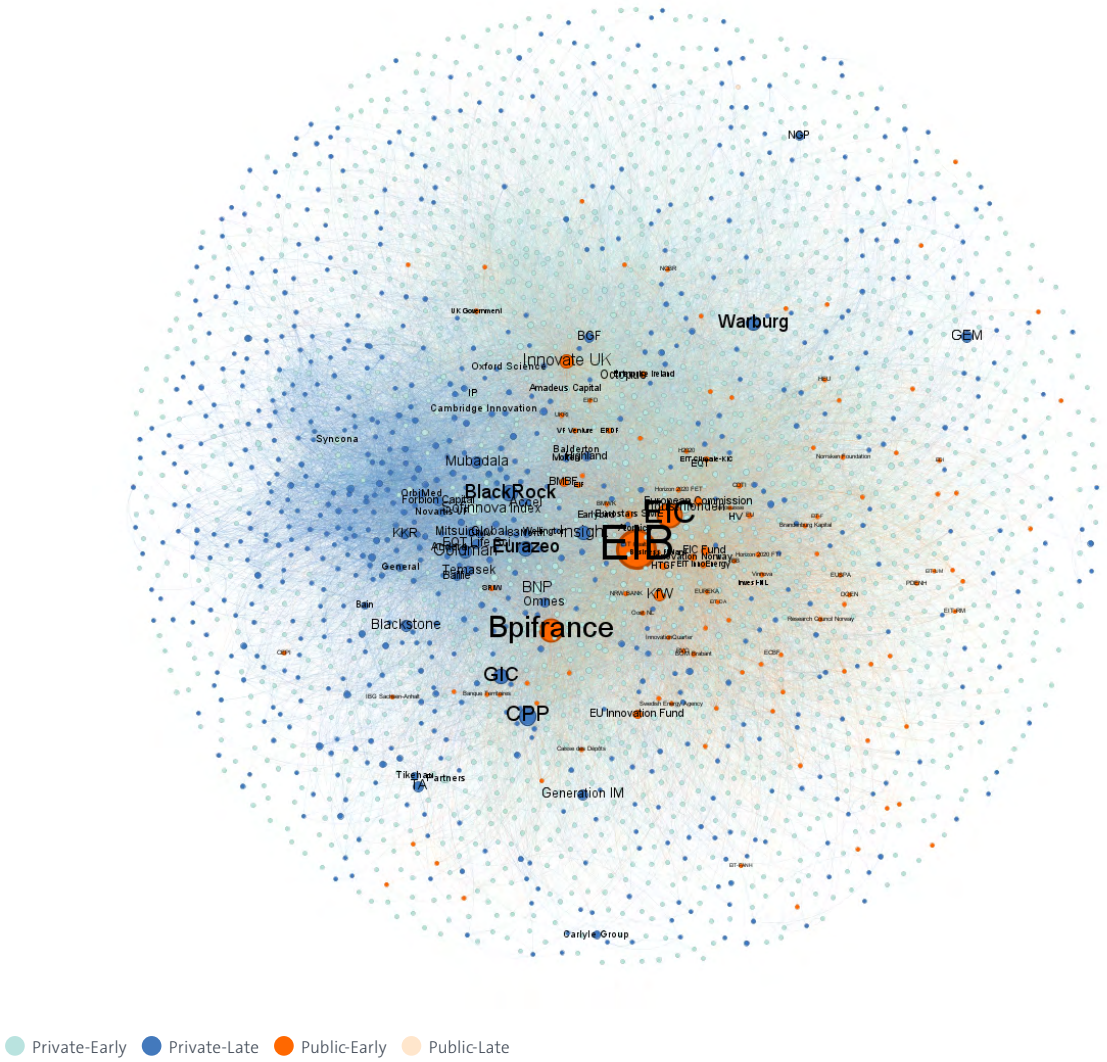
Figure 5.1.1 shows that in the US, private investors dominate the high-tech investment landscape. Private investors focused on late stage—such as Sequoia, NEA, and Fidelity—occupy central positions and are among the largest nodes, indicating substantial funding power and influence. Early private investors are numerous, but somewhat more peripheral and with smaller node sizes. Contrary to Europe, government investors are centrally located but smaller in size than late private investors. Statistical network analysis confirms these

insights. Private investors account for 98% of the top 100 investors by eigenvector centrality. Of these, over half are late-stage investors, indicating strong private support for scaling high-tech companies. Only two public entities, the National Institutes of Health (NIH) and the National Science Foundation (NSF), appear among the top 100, suggesting a market-driven investment ecosystem led by private capital supporting commercialisation.

The contrasting US and European networks reveal distinct structures. In the US, private investors specialised in late stage rounds occupy central positions, driving a market-oriented environment with extensive scale-up funding. In Europe, public entities lead, providing critical early-stage support, but growth capital from private investors in later stages is lacking.

Figure 5.1.1

Network of public and private investors in European companies

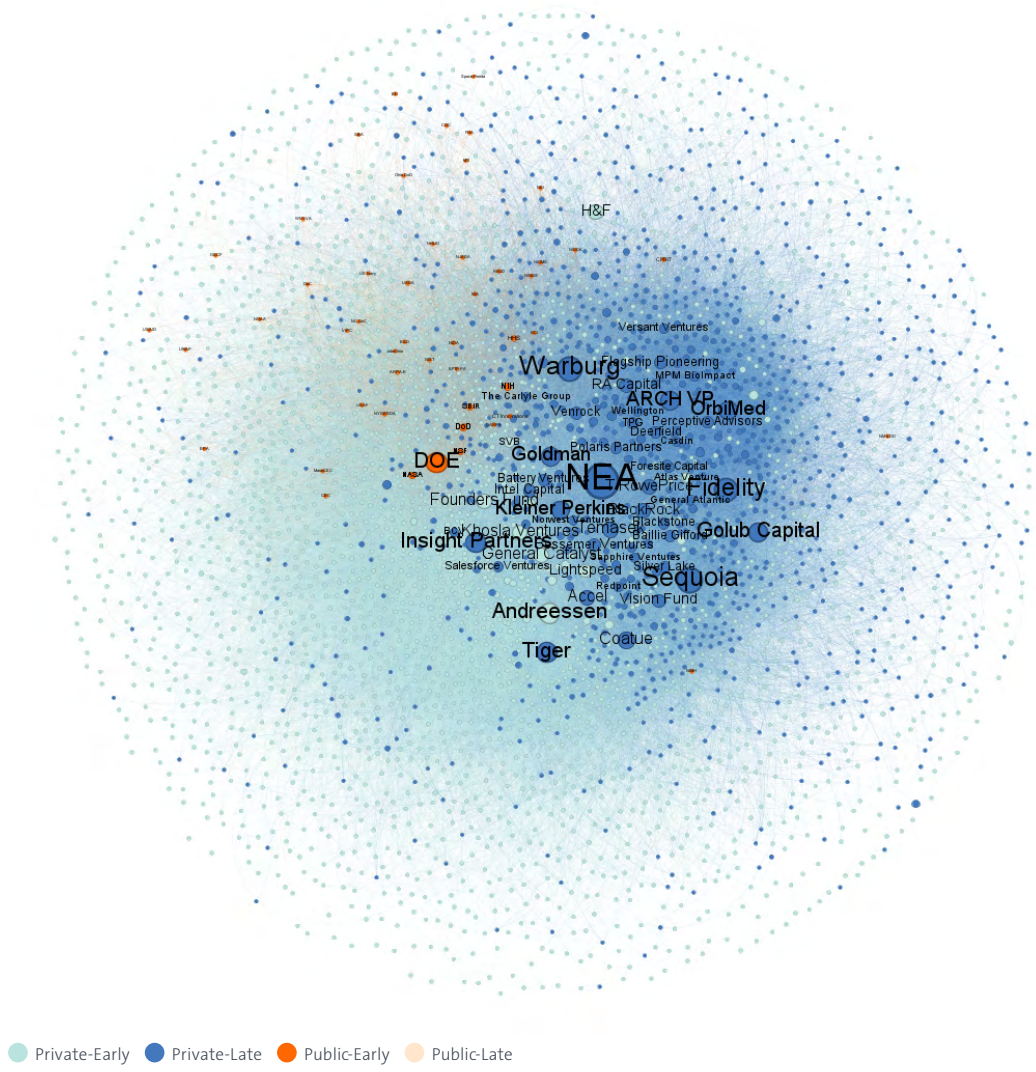


Note: The graph displays the network of public and private investors for European companies in high-tech sectors (health, semiconductors, energy, space, robotics, consumer electronics and enterprise software). Co-investors are defined broadly as investors that invest in the same company, but not necessarily in the same point in time and transaction round. Private investors include venture capitalists, private equity, corporate funds and other types of private investment fund. Public investors include pan-European institutions and national or regional agencies from member states. Only investors with a moderate or high Technology Investor Score (TIS) are included in the analysis. The network structure was produced using the Fruchterman-Reingold layout algorithm in Gephi. Nodes represent investors, and edges represent their connections. The layout reveals clusters and central investors, highlighting the network's key structures and relationships.

Sources: Dealroom, EPO.

Figure 5.1.2

Network of public and private investors for US companies



Note: The graph displays the network of public and private investors for US companies in high-tech sectors (health, semiconductors, energy, space, robotics, consumer electronics and enterprise software). Co-investors are defined broadly as investors that invest in the same company, but not necessarily in the same point in time and transaction round. Private investors include venture capitalists, private equity, corporate funds and other types of private investment fund. Public investors include federal institutions as well as state and local government agencies in the US. Only investors with a moderate or high TIS are included in the analysis. The network structure was produced using the Fruchterman-Reingold layout algorithm in Gephi. Nodes represent investors, and edges represent their connections. The layout reveals clusters and central investors, highlighting the network's key structures and relationships.

Sources: Dealroom, EPO.

5.2. Gap fillers in Europe

In this section we aim to identify private investors with a high TIS that specialise in late-stage funding and high-tech sectors. These have the potential to bridge the most pronounced funding gaps affecting European companies. We take two approaches.

The first focuses on identifying investors in this segment that already have Europe as their primary market. They possess valuable knowledge, but the limited depth of capital markets may restrict their ability to channel larger funds to innovators. If initiatives like the capital markets union succeed in pooling and mobilising European savings, these investors may be able to manage larger funds in future and invest at greater scale within their target markets. Figure 5.2.1 displays these investors.

However, this approach risks overlooking investors that do not have a significant presence in Europe, but play a significant role in the US. These missing investors may represent the important high-impact funders that Europe currently lacks. Thus, a second approach consists in identifying private investment funds that meet the high-TIS, late-stage, high-tech criteria but have a strong presence in the US rather than in Europe. These investors are represented in Figure 5.2.2.

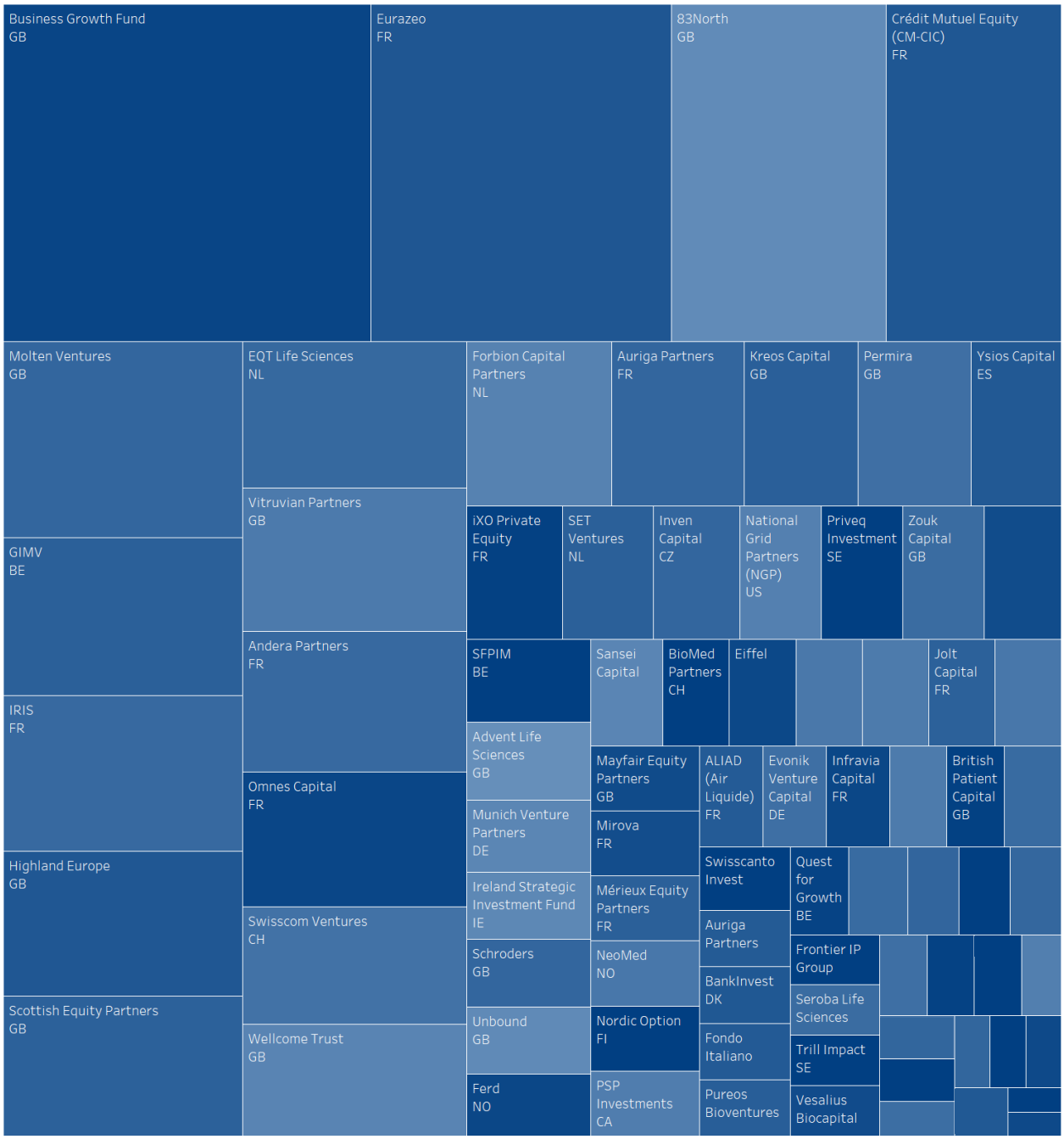
Box 6: The Trusted Investors Network

The need for growth capital in high-tech companies across Europe has become a priority for European institutions. Several programmes, such as those from the EIB and the EIC, are addressing these needs (see Figure 3.3.3). As an example of the interactions and complementarities of public and private sectors, in October 2024 the EIC launched the Trusted Investors Network, which includes all private investors co-investing with the EIC. The network aims to connect private investors with the EU's funding efforts.

The network currently consists of 71 investors, including VC funds, public investment banks, foundations, and corporate venture funds from across Europe. Most of these investors belong in the private-early category of Figure 5.1.1. Together, they manage assets totalling over EUR 90 bn. The purpose is to facilitate co-investment alongside the EU in deep tech startups, particularly in areas requiring high levels of research and development, such as advanced manufacturing, biotechnology and quantum technologies.

Figure 5.2.1

Investors with a strong presence in Europe

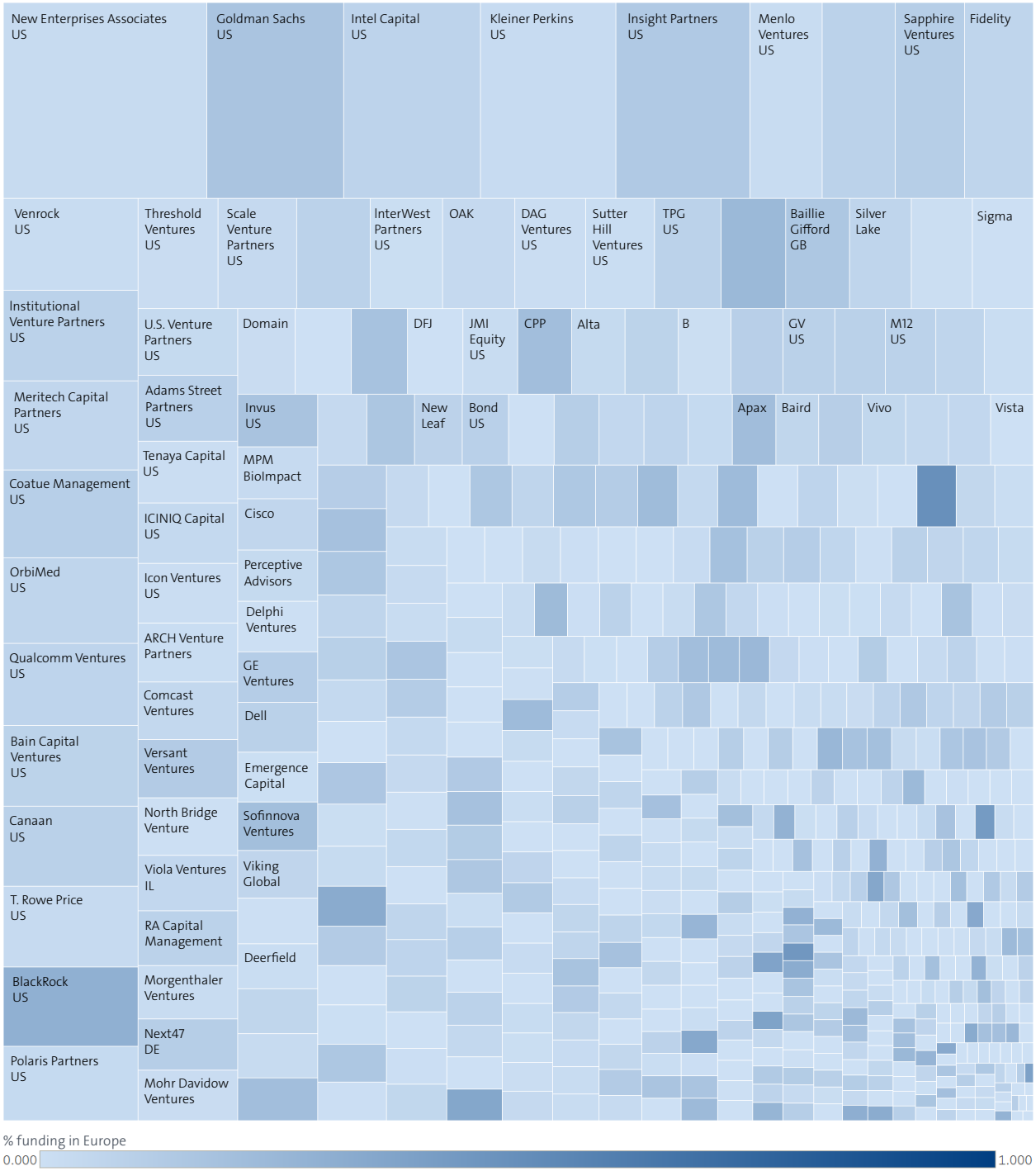


Note: The figure identifies investors with Europe as their primary market (at least 50% of investments directed to companies headquartered there) that i) are in the high-TIS category, ii) are private investment funds, iii) focus on late-stage funding rounds, and iv) allocate at least 20% of their investments to high-tech sectors. Box size represents the number of investments; colour intensity reflects the percentage of funding directed towards European companies.

Sources: Dealroom, EPO

Figure 5.2.2

Investors in the US that do not have a strong presence in Europe



Note: The figure identifies investors with the US as their primary market (at least 50% of investments directed to companies headquartered in the country) that i) are in the high-TIS category, ii) are private investment funds, iii) focus on late-stage funding rounds, and iv) allocate at least 20% of their investments to high-tech sectors. Box size represents the number of investments; colour intensity reflects the percentage of funding directed towards European companies.

Sources: Dealroom, EPO

6. Concluding remarks

Access to finance for innovation is recognised as one of the main hurdles preventing the European economy from becoming more competitive internationally. Recent reports by both Mario Draghi and Enrico Letta have highlighted the lack of proper financial mechanisms to enable European technology startups to scale up at home (Letta, 2024; Draghi, 2024). As a result, many of these companies expand in other markets, predominantly the US. This has long-term consequences for Europe in terms of less economic growth, brain drain and lower long-term productivity.

In response to these challenges the EPO, which supports Europe's innovation, competitiveness and economic growth through the patent system, undertook this study to better understand the investors backing technology in Europe. The Technology Investor Score (TIS) identifies investors based on the number of companies they support that hold patent applications, which shows their commitment to innovation.

Using this new measurement, we find that Europe has overall high levels of TIS than the global average. Higher values in Europe are often associated with large public investment programmes and private investors specialising in specific industries such as health or energy, and countries with well developed risk finance markets like the UK and the Nordic countries.

European investors are not significantly different from their US counterparts in terms of the share of high TIS investors. The difference lies in the impact that such investors have on startup performance. Greater involvement in companies with patents is correlated with higher chances of achieving exits and scale-ups for investors, even after controlling for factors such as IP portfolios, industry and other variables. This relationship is more marked in the US than in Europe, indicating a lack of effective support in sectors where financing is most needed for competitiveness, particularly R&D-intensive, high-tech fields such as software and computer services or pharmaceuticals and biotechnology. The gap is also more significant in the private investors that are essential for scaling up more mature technologies in the market, which is precisely where Europe is underperforming overall.

The relevance of these differences between Europe and the US shows that Europe faces a specific challenge in funding tech companies, especially startups in IP-intensive sectors. Private investors such as VC and equity funds are constrained in Europe due to the lack of a unified capital market that would enable them to be less risk-averse and distribute risk across multiple large investments. The Budapest Declaration (see European Council, 2024) suggests that the capital markets union is next on the policy agenda, which may help narrow the gap identified in this paper. We also note that regional disparities within Europe persist, with South and Central Europe still showing relatively lower involvement of their investors in technology. The capital markets union could be instrumental in reducing these intra-EU gaps.

Despite the importance of private investors, public players remain crucial in the European ecosystem, particularly in supporting tech companies. As highlighted in our study using the TIS, initiatives like the EIC EIB demonstrate significant engagement with patenting firms. National investment initiatives also play a critical role in terms of funding volumes. National projects that collaborate across borders, such as those within the Taftie network connecting major national innovation agencies across Europe, tend to achieve more involvement in technology.

While public investors excel at evaluating and funding early-stage tech ventures, they cannot fully address the lack of private market funding. Later-stage private investors are essential for scaling up these companies. Public programmes like the European Tech Champions Initiative by the EIB and the EIC Step Scale Up scheme, which aims to bridge the European scale-up gap, can provide vital support for European innovation. Collaboration between public and private investors can also be beneficial, combining the technology expertise and experience of public investors, as indicated by their high TIS, with the budget and profit-driven approach of private investors. Our network analysis indicates that public investors can leverage their central position in the ecosystem to strengthen these relationships through initiatives like the EIC Fund or the newly announced Trusted Investors Network. Encouraging greater private co-investment is consistent with the insights and

recommendations from the latest interim evaluation of Horizon Europe, conducted under the leadership of Manuel Heitor (European Commission, 2024c).

The EPO Observatory on Patents and Technology (epo.org/observatory) supports the European innovation ecosystem by providing evidence-based insights into technology trends and the future of innovation. The Observatory is actively exploring the topic of innovation, using the rich data and insights from patent data. A new section of the EPO website is available, offering information on the EPO's support, tools, and findings relevant for investors, startups seeking funding, and other interested stakeholders (epo.org/financing-innovation-programme). Future initiatives include a comprehensive mapping of resources provided by national patent offices, enabling companies across Europe to access these resources, supporting both innovators looking for finance and investors for resources and knowledge on IP, conveniently in one place.

ANNEX 1: Note on the methodology

Sample construction

To obtain the sample used in the analysis we applied the following filters:

1. **Transaction round types:** we included all the transaction types in Dealroom except for the following: acquisition, IPO, post-IPO transaction, SPAC IPO, spinout, media for equity, lending capital, merger, secondary, corporate spinout, ICO and real estate. It is important to note that while certain transaction types were excluded from the main analysis, they were still used to define key variables. For example, acquisitions, IPOs and spin-outs helped determine whether a startup experienced a successful exit. This information was then applied to companies included in the main analysis, specifically those receiving investments in the round types that were retained.

2. **Effective dates:** only transactions between 2000 and 2023 (both inclusive) were considered.

3. **Company founding date:** conly companies founded between 1990 and 2023 (both inclusive) were considered.

4. **Active investors:** only investors with at least one transaction (meeting criteria 1-3) since 2020 were considered.

5. **Investors with portfolios of ten or more companies:** conly investors that have invested in at least ten companies (in transactions and companies meeting the criteria above) were considered for the analysis. This restriction is to ensure that the score is calculated on a sufficiently large number of companies per investor.

Note that the last filter means that only 9% of investors are retained out of the sample that meets filters 1 to 4. However, these investors account for 81% of companies receiving investments, 81% of transactions, and 87% of funding. By focusing on the largest investors we only miss a relatively low percentage of transactions.

Identification of public investors

To identify public investors, we began by using the "investor type" variable in Dealroom, selecting the "Government/Non-Profit" category. However, due to occasional inaccuracies in this classification, we implemented additional steps to refine and ensure its accuracy.

Member states including AT, BE, DE, DK, FR, GR, NL, PL, and TR reviewed the Dealroom investor type classification for investors in their own countries. They refined the original classification where inaccuracies were found. They also coded additional information that facilitated the identification of pan-European and national public investors.

Finally, we used a combination of coding and manual checks to further classify public investors in Europe. This process enabled us to identify pan-European investors and major national innovation agencies affiliated with the Taftie network. We categorised the remaining investors flagged as "Government/Non-Profit" by Dealroom, but which could not be identified as members of the Taftie network or pan-European institutions by our procedure, as other national investors.

Definition of early and late-stage rounds

We use the following definition of early and late-stage investment rounds:

- **Early:** early VC, angel, seed, series A, series B, grant, convertible.
- **Late:** series C to series I, late VC, growth equity VC, growth equity non-VC.
- **Other:** debt, support programme, private placement VC, private placement non-VC.

Definition of high-tech and mid-tech sectors

We classify companies into broad industry groups following the criteria in Fuest et al. (2024):

- **High-tech:** health, semiconductors, energy, space, robotics, consumer electronics, enterprise software.
- **Mid-tech:** transportation, chemicals, fintech, engineering and manufacturing equipment, service provider, gaming, hosting.
- **Other:** industries not in high-tech or mid-tech, such as dating, home living, jobs recruitment, kids, legal, wellness beauty, marketing, music, real estate, sports, travel, food, media, fashion, education, event tech.

Patent data

Patents are exclusive rights that can only be granted for technologies which are new, inventive and industrially applicable. High-quality patents are assets that can help to attract investment, secure licensing deals and provide market exclusivity. Inventors pay annual fees to maintain those patents that are of commercial value to them. Once they lapse, the technical information in them becomes free for everyone to use. A patent can be maintained for a maximum of 20 years. We enriched Dealroom data with EPO PATSTAT data, matching 6 698 269 published patent families, with priority date between 1970-2023, to 23 746 Dealroom companies.

Annex 2 TIS of top investors by country

Table A2 shows the top ten investors by number of transactions in each European country that is a member of the EPO. This includes only those investors that completed at least ten transactions between 2000 and 2023 in companies launched in or after 1999 and with at least one transaction in or after 2020. If the top ten investors in a country have fewer than ten transactions, they are excluded. Therefore only countries where investors have at least ten recorded transactions are represented. Investors are categorised based on the location of their investments, not their headquarters. The TIS is colour-coded into three categories: light blue for low, blue for medium and dark blue for high.

Table A2

Top investors by country

Country	Name of investor	Technology Investor Score (TIS)	Number of transactions
Austria	EIC	0.448	132
	aws Gründungsfonds	0.319	52
	eQventure	0.591	49
	ESA BIC Austria	0.212	47
	Austria Wirtschaftsservice	0.294	37
	Austrian Research Promotion Agency	0.233	32
	Tecnet equity	0.500	40
	tech2b Inkubator GmbH	0.182	41
	Speedinvest	0.120	89
	Eurostars SME programme	0.391	66
Belgium	Start it @KBC	0.083	539
	imec.istart	0.164	224
	PMV	0.49	119
	EIC	0.448	95
	Eurostars SME programme	0.391	85
	SRIW	0.560	58
	EIT Health	0.391	58
	Qbic Fund	0.667	45
	LRM	0.375	41
	SFPIM	0.677	39
Bulgaria	Eleven Ventures	0.046	144
	Innovation Capital	0.020	67
	LAUNCHub Ventures	0.038	55
	Vitosha Venture Partners	0.017	50
	Impetus Capital	0.067	20
	EIC	0.448	19
	New Vision 3	0.067	15
Croatia	Fil Rouge Capital (FRC)	0	73
	EUREKA Network Projects	0.221	35
	Feelsgood Capital	0	10
Cyprus	Eurostars SME programme	0.391	15

Average TIS category
Low Medium High

Country	Name of Investor	Technology Investor Score (TIS)	Number of transactions
Czech Republic	EUREKA Network Projects	0.221	102
	StartupYard	0	43
	Eurostars SME programme	0.391	39
	ESA BIC Czech Republic	0.054	38
	Nation 1	0.063	37
	Lighthouse Ventures - LHV.VC	0.029	31
	Reflex Capital	0.053	30
	EIC	0.448	28
	Miton	0.043	27
	Presto Ventures	0.043	25
Denmark	EIC	0.448	247
	VF Venture (Export and Investment Fund of Denmark (EIFO))	0.280	182
	Eurostars SME programme	0.391	168
	Seed Capital Denmark	0.173	138
	Accelerace	0.205	85
	PreSeed Ventures	0.152	75
	Innovation Fund Denmark	0.246	70
	Heartcore Capital	0.260	46
	Novo Holdings	0.697	33
	Antler	0.018	33
Estonia	Startup Wise Guys	0.014	169
	EIC	0.448	62
	Specialist VC	0.192	24
	ESA BIC ESTONIA	0.353	22
	Change Ventures	0.147	21
	Superangel	0.194	20
	Icebreaker VC	0.194	20
	EIT Health	0.391	18
	SmartCap	0.200	17
	Lemonade Stand	0	15
Finland	Business Finland	0.298	205
	EIC	0.448	177
	Lifeline Ventures	0.336	152
	Innovestor	0.464	89
	Finnvera Venture Capital	0.448	73
	Gorilla Capital	0.072	71
	Invesdor	0.161	69
	Inventure	0.263	68
	Tesi	0.433	13

Average TIS category Low Medium High

Country	Name of Investor	Technology Investor Score (TIS)	Number of transactions
France	BPI France	0.303	1 339
	EIC	0.448	420
	Kima Ventures	0.098	387
	Eurazeo	0.319	296
	Eurostars SME programme	0.391	252
	Agoranov	0.464	232
	EIT Health	0.391	207
	Crédit Mutuel Equity (CM-CIC)	0.346	193
	Partech	0.191	184
	Crédit Agricole	0.362	169
Germany	High-Tech Gründerfonds	0.381	601
	EIC	0.448	429
	HV Capital	0.093	344
	Eurostars SME programme	0.391	305
	IBB Ventures	0.160	204
	Bayern Kapital	0.425	187
	EIT Health	0.391	174
	Free University of Berlin	0.121	171
	Atlantic Labs	0.181	150
	b2venture	0.255	138
Greece	Openfund	0.129	33
	EIC	0.448	30
	VentureFriends	0	25
	Uni.fund	0.150	23
	Eurostars SME programme	0.391	22
	Metavallon VC	0.296	15
	Genesis Ventures	0.065	15
	EIT Health	0.391	15
	Velocity Partners Venture Capital	0.056	14
	EUSPA	0.186	13
Hungary	Hiventures	0.064	313
	EIC	0.448	82
	EUREKA Network Projects	0.221	41
	PortfoLion	0.077	30
	EIT Health	0.391	30
	Bonitás Ventures	0.174	29
	Startup Campus	0	24
	Eurostars SME programme	0.391	24
	STRT Holding	0	21
	Solus Capital	0.063	16

Average TIS category Low Medium High

Country	Name of Investor	Technology Investor Score (TIS)	Number of transactions
Iceland	Icelandic Centre for Research	0.108	431
	EIC	0.448	61
	Technology Development Fund	0.167	44
	Frumtak Ventures	0.043	25
	Brunnur Ventures	0.222	22
	Crowberry Capital	0.111	19
	Eyrir Venture Management	0.200	11
	Eurostars SME programme	0.391	10
Ireland	Enterprise Ireland	0.164	459
	EIC	0.448	153
	Act Venture Capital	0.222	110
	EIT Health	0.391	105
	NDRC	0.058	95
	SOSV	0.173	92
	Frontline Ventures	0.155	73
	Delta Partners	0.149	67
	Kernel Capital	0.300	50
	Halo Business Angel Network	0.273	37
Italy	EIC	0.448	461
	CDP Venture Capital	0.248	184
	LVenture Group	0.093	158
	Italian Angels for Growth	0.380	88
	Digital Magics	0.080	86
	Regione Lombardia	0.091	74
	European Commission	0.380	72
	EUSPA	0.186	71
	Lazio Innova	0.161	63
	EIT Health	0.391	62
Latvia	Imprimatur Capital Fund Management - ICFM	0.118	71
	Startup Wise Guys	0.014	39
	FlyCap	0.182	19
	Buildit Accelerator	0.167	17
	Expansion Capital	0.200	15
	ZGI Capital	0	14
	EIC	0.448	13
	Commercialization Reactor	0	11

Average TIS category
Low Medium High

Country	Name of Investor	Technology Investor Score (TIS)	Number of transactions
Lithuania	Startup Wise Guys	0.014	87
	Practica Capital	0.145	77
	Coinvest capital	0.038	34
	Eurostars SME programme	0.391	32
	EIC	0.448	28
	Verslo Angelų Fondas	0.056	24
	70Ventures	0.038	20
	Open Circle Capital	0.063	17
	Iron Wolf Capital	0.091	17
	Lithuanian Business Angels Network	0	15
Luxembourg	Luxembourg-City Incubator	0.033	62
	Ministry of the Economy Luxembourg	0.070	51
	Expon Capital	0.161	19
	EIC	0.448	10
Netherlands	EIC	0.448	299
	Eurostars SME programme	0.391	279
	BOM Brabant Ventures	0.367	153
	EIT Health	0.391	129
	Rockstart	0.097	110
	NLC Health Ventures	0.113	89
	Rabobank	0.158	84
	Oost NL	0.433	83
	Antler	0.018	75
	Startupbootcamp	0.087	74
Norway	Innovation Norway	0.223	2 756
	EIC	0.448	149
	Eurostars SME programme	0.391	116
	Investinor	0.473	96
	StartupLab	0.087	84
	Antler	0.018	63
	Research Council of Norway	0.447	38
	Viking Venture	0.188	30
	ProVenture	0.367	27
	EIC Fund	0.741	27

Average TIS category
Low Medium High

Country	Name of Investor	Technology Investor Score (TIS)	Number of transactions
Poland	EIC	0.448	96
	The National Centre for Research and Development	0.153	62
	Black Pearls VC	0.037	43
	Space3ac	0.016	42
	EIT Health	0.391	34
	Smok Ventures	0	31
	LT Capital	0.034	30
	Innovation Nest	0.053	30
	MCI Capital	0	29
	GreatPoint Ventures	0.398	29
Portugal	Portugal Ventures	0.152	196
	EIC	0.448	115
	EIT Health	0.391	55
	Caixa Capital	0.243	42
	Startup Braga	0.068	38
	Armilar Venture Partners	0.352	37
	Shilling VC	0.023	33
	ESA BIC PORTUGAL	0.103	33
	Eurostars SME programme	0.391	31
	Indico Capital Partners	0.114	30
Romania	GapMinder Venture Partners	0	45
	SeedBlink	0.045	37
	EUREKA Network Projects	0.221	32
	Early Game Ventures	0	31
	ROCA X	0.059	22
	EIT Health	0.391	21
	Innovx - BCR	0	18
	Eurostars SME programme	0.391	15
	EIC	0.448	15
	Catalyst Romania	0	13
Serbia	EUREKA Network Projects	0.221	18
	Eleven Ventures	0.046	10
Slovakia	Neulogy Ventures	0.103	28
	EIC	0.448	18
	CB Investment Management	0.053	18
	EUREKA Network Projects	0.221	17
	Wayra	0.063	13
	Vision Ventures	0	11
	Slovakia Venture to Future Fund	0.364	10

Average TIS category
Low Medium High

Country	Name of Investor	Technology Investor Score (TIS)	Number of transactions
Slovenia	EUREKA Network Projects	0.221	92
	EIC	0.448	54
	Eurostars SME programme	0.391	23
	European Commission	0.38	16
Spain	EIC	0.448	891
	Bizkaia Gov	0.047	851
	ENISA	0.049	734
	Basque Gov	0.09	605
	BIC Gipuzkoa	0.126	246
	Diputación Foral de Gipuzkoa	0.138	241
	BIC Bizkaia	0.048	220
	Eurostars SME programme	0.391	215
	EIT Health	0.391	200
	Lanzadera	0.038	173
Sweden	Almi Invest	0.379	356
	EIC	0.448	294
	Vinnova	0.313	256
	Eurostars SME programme	0.391	166
	Industrifonden	0.414	154
	Chalmers Ventures	0.43	139
	EIT Health	0.391	111
	Antler	0.018	90
	Creandum	0.173	77
	Propel Capital	0.037	76
Switzerland	Venture Kick	0.436	704
	Fondation FIT	0.52	376
	EIC	0.448	245
	Eurostars SME programme	0.391	190
	Verve Ventures	0.506	152
	ZKB - Zürcher Kantonalbank	0.673	133
	Innosuisse	0.576	97
	Swiss ICT Investor Club (SICTIC)	0.153	82
	ESA BIC Switzerland	0.5	77
	Swisscom Ventures	0.506	69

Average TIS category
Low Medium High

Country	Name of Investor	Technology Investor Score (TIS)	Number of transactions
Türkiye	Aslanoba Capital	0.058	52
	Alesta Investment	0	39
	APY Ventures	0.053	28
	Revo Capital	0.091	32
	Keiretsu Forum	0.271	39
	fonbulucu	0	54
	Eurostars SME programme	0.391	31
	EUREKA Network Projects	0.221	52
	EIC	0.448	37
	Boğaziçi Ventures	0	33
United Kingdom	Innovate UK	0.337	5 781
	Tech Nation	0.209	1 308
	Crowdcube	0.114	1 237
	OneRepublic	0.074	802
	SFC Capital	0.103	473
	EIC	0.448	460
	Scottish Enterprise Growth Investments	0.516	391
	Business Growth Fund	0.216	383
	Octopus Ventures	0.283	330
	Seedcamp	0.07	319

Average TIS category
Low Medium High

Annex 3 TIS of European public investors

This Annex shows in detail the data from Figures 3.3.3 and 3.3.4, including the TIS for a series of public investors, both for Pan-European programmes, mostly all related to the EU (Table A3.1) and for national ones (Table A3.2). As for Annex 2, the TIS has been colour-coded to reflect our three categories: high (dark blue), moderate (middle blue), and low (light blue). Table A3.1 shows the total number of transactions in Europe as a whole, using Dealroom data. This includes only those investors that completed at least ten transactions between 2000 and 2023 in companies launched in or after 1999 and with at least one transaction in or after 2020.

Table A3.1

Pan-European public investors

Name of investor	TIS	Number of transactions
European Innovation Council	0.45	5,104
Eurostars SME programme	0.39	2,491
EIT Health	0.39	1,447
EUREKA Network Projects	0.22	941
European Commission	0.38	721
EIC Fund	0.74	571
EUSPA	0.19	529
EIT Climate-KIC	0.31	306
EIT Urban Mobility	0.14	305
CASSINI Initiative	0.18	241
EIT InnoEnergy	0.44	216
Horizon 2020 FTI (Fast Track to Innovation)	0.32	203
Horizon 2020 FET (Future and Emerging Technologies)	0.44	196
European Investment Bank	0.55	183
EIT Digital Accelerator	0.31	183
European Union	0.40	81
European Regional Development Fund	0.31	65
European Data Incubator	0.11	44
ClimAccelerator	0.04	41
Horizon 2020	0.48	32
EU Innovation Fund	0.44	31
EIT Food	0.50	29
European Investment Fund (EIF)	0.38	26
EIT RawMaterials	0.15	26
Team Europe	0.25	20
European Circular Bioeconomy Fund (ECBF)	0.67	14
Horizon Europe	0.33	11
EIT FAN Helsinki (Food Accelerator Network)	0.60	10

Average TIS category

High Moderate Low

Table A3.2

Public investors from national and local programmes

Type of public investor	Country	Name of Investor	TIS
Taftie network	AT	Austrian Research Promotion Agency	0.233
	BE	VLAIO	0.467
	CH	Innosuisse	0.576
	DK	Innovation Fund Denmark	0.246
	ES	CDTI	0.299
	FI	Business Finland	0.298
	FR	Bpifrance	0.303
	IE	Enterprise Ireland	0.164
	IS	Icelandic Centre for Research	0.108
	NL	Netherlands Enterprise Agency (RVO)	0.270
	NO	Innovation Norway	0.223
		Research Council of Norway	0.447
	PL	The National Centre for Research and Development	0.153
	SE	Vinnova	0.313
	UK	Innovate UK	0.337
Other national and local players	AT	Austria Wirtschaftsservice	0.294
		aws Gründungsfonds	0.319
		tech2b Inkubator GmbH	0.182
		Tecnet equity	0.500
		Vienna Business Agency	0.083
	BE	SRIW	0.560
	CH	NEAR Foundation	0.000
	DE	Beuth Hochschule Startup hub	0.000
		Brandenburg Kapital	0.349
		Deutsche Bahn Digital Ventures	0.333
		EXIST	0.261
		Fraunhofer Venture	0.818
		FTTF	0.391
		German Federal Ministry for Economic Affairs and Climate Action	0.409
		German Federal Ministry of Education and Research (BMBF)	0.773
		German Investment Corporation (DEG)	0.021
		Hessen Kapital	0.211
		High-Tech Gründerfonds (DE)	0.381
		Humboldt Innovation	0.118
		IBB	0.167
		IBG Beteiligungsgesellschaft Sachsen-Anhalt	0.571
		IFB Hamburg	0.200
		Innovationsstarter Fonds	0.203
		KfW	0.463
		L-Bank	0.133
		LBBW Venture Capital	0.550
		MBG Baden-Wuerttemberg	0.471

Average TIS category
High Moderate Low

Type of public investor	Country	Name of Investor	TIS
Other national and local players	DE	NRW.BANK	0.389
		Saarländische Wagnisfinanzierungsgesellschaft	0.364
		SIBB Digital Transition Incubator	0.077
		Silicon Allee	0.077
		Smart Cities Innovation Programme	0.000
		SpinLab	0.182
		Startup Incubator Berlin	0.019
		Strascheg Center for Entrepreneurship (SCE)	0.171
		WISTA Management GmbH	0.188
	DK	BioInnovation Institute	0.143
		Export and Investment Fund of Denmark	0.370
		VF Venture (Vækstfonden)	0.280
	ES	ADEGI	0.176
		Basque Government	0.090
		Comunidad de Madrid	0.105
		Diputación Foral de Álava	0.059
		Diputación Foral de Bizkaia	0.047
		Diputación Foral de Gipuzkoa	0.138
	FI	Finnfund	0.000
		Finnvera	0.353
	FR	Agoranov	0.464
		Banque des Territoires	0.177
		Caisse des Dépôts	0.429
		France Active	0.200
		La French Tech	0.333
		Ouest Valorisation	0.304
		Region Nouvelle Aquitaine	0.500
		Reseau Entreprendre	0.200
		Wilco	0.333
	IT	Regione Lombardia	0.091
	LU	Ministry of the Economy Luxembourg	0.070
	NL	ACE Incubator	0.111
		BOM Brabant Ventures	0.367
		Brabant Startup Fonds	0.404
		DOEN Participaties	0.237
		ENERGIIQ	0.100
		FMO Entrepreneurial Development Bank	0.063
		Graduate Entrepreneur Fund	0.091

Average TIS category
High Moderate Low

Type of public investor	Country	Name of Investor	TIS
Other national and local players	NL	Innovatiefonds Noord-Holland	0.169
		InnovationQuarter	0.362
		Invest-NL	0.605
		LIOF	0.321
		NOM	0.167
		Oikocredit	0.000
		Oost NL	0.433
		PDENH	0.286
		PhotonDelta	0.636
		PortXL	0.278
		ROM InWest	0.100
		ROM Utrecht Region	0.211
		StartLife	0.071
		UNIIQ	0.295
	NO	Coalition for Epidemic Preparedness	0.600
	PL	Space3ac	0.016
	SE	Norrsken Foundation	0.353
		Swedfund International	0.000
		Swedish Energy Agency	0.875
	TR	Kosgeb	0.000
		TÜBİTAK	0.000
	UK	British International Investment	0.058
		Defence and Security Accelerator	0.514
		Earthshot Prize Council	0.167
		European Bank for Reconstruction and Development	0.034
		Government of the United Kingdom	0.463
		Greater Manchester Combined Authority	0.067
		NC IDEA	0.110
		NHS England	0.600
		Tech Nation (UK)	0.209
		UK Department for Business and Trade	0.500
		UK Research and Innovation (UKRI)	0.377
		UK Space Agency	0.333
		United Kingdom Department For Business	0.500

Average TIS category
High Moderate Low

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