Europe's technology transfer landscape

The current state, challenges and avenues for development of technology transfer offices

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Europäisches Patentamt
European Patent Office
Office européen des brevets

In collaboration with

ASTP

Fraunhofer ISI

Foreword

Technology transfer is a matter of increasingly strategic importance for Europe. Despite its extraordinary research base, the challenge remains to turn more of that scientific excellence into technologies, companies and partnerships that strengthen our competitiveness and deliver benefits for society. Across the world, governments are placing greater strategic emphasis on technology transfer as a way to translate research investment into technological and economic capabilities. At a time when technological leadership is increasingly linked to economic security, resilience and growth, improving the journey from research to market has become a strategic priority for Europe.

Patents have an important role to play in that journey. By establishing clear and transferable rights, they facilitate collaboration, licensing and the investment needed to develop early-stage inventions. What happens around the patent – the expertise, funding, incentives, networks and people that move an invention forward – is just as important.

This is precisely the kind of question the European Patent Office's (EPO) Observatory on Patents and Technology was created to explore: putting the EPO's data and expertise at the service of the innovation ecosystem. Our previous studies mapped the growing contribution of European universities, public research organisations and research hospitals to innovation. This study takes the next step. It turns to the technology transfer offices that work within and alongside these institutions to identify promising research, protect intellectual assets and connect technologies with companies, investors and entrepreneurs.

The evidence shows how important this role has become. European universities , public research organisations (PROs) and research hospitals remain major contributors to patenting in strategically important technologies. At the same time, our analysis of the survey conducted by the Association of European Science and Technology Professionals (ASTP) of more than 800 European technology transfer offices (TTOs) reveals a highly diverse landscape. While larger offices manage much more extensive research and invention pipelines and can sustain broader portfolios of specialist capabilities, smaller offices can also perform strongly on individual cases. Interviews with technology transfer professionals show that the challenges extend across the full transfer process: from researcher awareness and reliable patent budgets to technology maturation, specialist skills, workable transaction rules and access to companies, investors and international markets.

The message is clear: Europe does not need a single TTO model, but it does need stronger and better-connected technology transfer capabilities.

The EPO is already contributing to this effort. The European Patent Academy supports universities, research institutions and technology transfer professionals in developing the skills needed to use IP effectively, while the network of patent information centres (PATLIB) combines local knowledge with patent expertise across our member states. Our data tools from the Observatory also help make Europe's innovation landscape more visible. The Deep Tech Finder helps connect patent-rich European startups with potential investors and partners, while the Data Desk provides accessible patent intelligence on technologies, institutions and trends. Together, these services can help TTOs access information, expertise and connections that would be difficult for every institution to develop on its own.

We hope that this study provides useful evidence for TTO professionals and decision-makers at European, national, regional and institutional level. Understanding where the system is working, where capabilities can be strengthened and where promising inventions still lose momentum is an essential first step towards improving the system.

This work would not have been possible without close collaboration across Europe. I would particularly like to thank ASTP and Fraunhofer ISI, as well as the organisations and technology transfer professionals who shared their knowledge and experience with us.

I also warmly thank the experts from national patent offices that participated in the project, providing relevant input to analyse the diverse European reality of TTOs: Albania, Austria, Belgium, Bosnia and Herzegovina, Croatia, Cyprus, Czech Republic, Finland, France, Germany, Hungary, Italy, Latvia, Lithuania, Luxembourg, the Netherlands, Norway, Poland, Portugal, Slovenia, Spain, Sweden, Türkiye and the United Kingdom. Their engagement demonstrates the importance attached to this challenge across Europe.

António Campinos
President, European Patent Office

Key findings

Europe's ability to turn its research into technologies, companies and products has moved to the centre of the competitiveness debate. The reports led by Mario Draghi and Enrico Letta identified Europe's innovation gap as a major challenge, while the European Commission's Competitiveness Compass has placed greater emphasis on strengthening Europe's capacity to innovate, scale technologies and reinforce its technological sovereignty.

This makes technology transfer increasingly strategic. Europe already has a strong research base, but excellent science alone does not guarantee that new technologies will reach companies, investors or markets. Promising inventions have to be identified early, assessed, protected where appropriate, developed further and connected with the actors able to bring them towards commercial use.

One of the main instruments facilitating this process are technology transfer offices (TTOs) – units serving universities, public research organisations (PROs) and research hospitals. While they work closely with researchers to help identify inventions and understand their potential, their role extends much further. As a technology moves from the laboratory towards the market, TTOs may need to combine scientific understanding with intellectual-property expertise, proof-of-concept funding, market knowledge, industry and investor contacts, and support for licensing or the creation of new companies. This can be a long process, and the expertise required changes at each stage.

The role of TTOs is becoming more important as European research institutions increasingly own the inventions generated by their researchers. This means that universities, PROs and research hospitals – and thus their TTOs – increasingly carry the responsibility for deciding which technologies to protect, how to develop them and how to connect them with the market.

This development is taking place in a changing international landscape. The United States has a mature technology transfer ecosystem built over several decades, while China is rapidly expanding university patenting and strengthening policy support for the commercialisation of academic inventions. Europe is now at an important moment: its research institutions own more technologies themselves, making the capacity to transfer them increasingly strategic.

How well equipped is Europe to do this? This study provides an overarching assessment of whether Europe's technology transfer capacity is keeping pace with that growing responsibility. It provides a unique perspective by bringing together several sources of evidence: the latest EPO patent data; analysis of direct and indirect academic inventions developed with Fraunhofer ISI; responses from more than 800 European TTOs responding to the ASTP annual survey; and qualitative insights from interviews with 22 technology transfer professionals across Europe and key European research and innovation stakeholder organisations.

Together, the evidence provides a clear diagnosis. TTOs are being asked to manage more technologies and a broader range of activities, while many remain relatively small and cannot realistically maintain every specialised capability internally. The key findings (KF) therefore point both to the importance of sustained TTO capacity and to opportunities for pooling expertise, information, tools and networks across institutions and countries. The six takeaways at the end of this section translate this evidence into practical messages for research institutions, funders and policymakers.

Recent direct patenting by European research institutions

KF1: Direct patenting by European research institutions has grown strongly, but that growth has recently stopped rising

Patenting by European universities, public research organisations and research hospitals increased strongly over the past two decades at the EPO. The number of European patent (EP) applications involving at least one European research institution rose from 3 235 in 2006 to 8 138 in 2023. The share of all EP applications originating from European entities almost doubled, from 4.8% in 2006 to 9.4% in 2022.

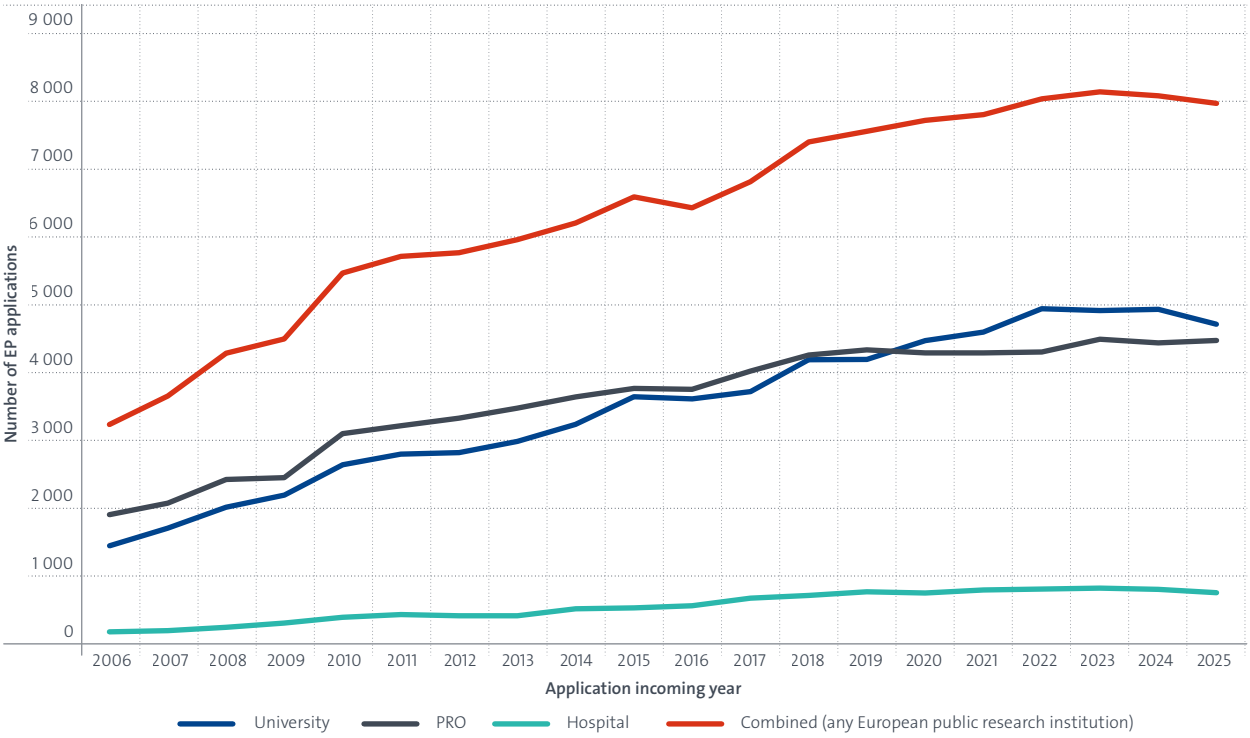
The latest figures, however, show a change in this long-term trend. Applications declined to fewer than 8 000 in 2025, to a share of 9.1%. Universities had been the main driver of the previous expansion: their applications more than tripled between 2006 and 2022, from 1 445 to almost 5 000, but remained below that peak in the subsequent years. Applications from PROs recovered to 4 474 in 2025, while those from research hospitals

continued to rise gradually to over 820 in 2023, but saw a decline to 755 in 2025. Many of these applications are presented by multiple applicants (co-applicants) from public research institutions, so the combined total does not equal to the sum of the three institution types.

While this does not undo two decades of strong growth, it is the first clear interruption of the near-continuous expansion documented in earlier EPO studies. The interviews with TTO professionals help illustrate why this development matters, although they do not establish its cause. A number of them describe pressure on patent budgets and the need to make difficult choices about which inventions to protect and for how long. While patent protection is important for attracting investment or licensing a technology, constraints on resources at this early stage can prevent an invention from progressing further towards the market.

Figure 1

Number of EP applications with at least one European university, PRO or research hospital as applicant, 2006-2025



Note: The statistics include published an unpublished patent applications at the EPO. Universities, public research organisations (PROs), and research hospitals were identified specifically for this study using advanced applicant-identification techniques developed by the EPO.

Source: EPO analysis

Academic university patenting in an international comparison

Universities do not always own the inventions created by their researchers. A patent can be filed directly by the university, which then takes responsibility for protecting and commercialising it. However, a university researcher may also be named as an inventor on a patent owned by a company or another organisation, typically as a result of a formal or informal research collaboration. This study refers to these as indirect academic patents.

This distinction matters because direct ownership brings greater responsibility for universities and their TTOs. They must decide which inventions to protect, finance that protection, assess market potential and find companies, investors or entrepreneurs able to develop them further.

The EPO's previous studies on universities and public research organisations showed that academic patenting has grown strongly in Europe (EPO member states) and that universities are the main public research actors increasingly taking direct ownership of inventions. This current study goes one step further by comparing the patenting landscape at the EPO by European and US universities. The United States was chosen because of its long history of university ownership and commercialisation, and the maturity of its technology transfer ecosystem.

KF2: Growing university ownership of patents has reinforced the role of European TTOs

European universities have become much more important patent owners over the past two decades. Academic patents filed at the EPO – patents linked to university researchers, whether owned by the university or another organisation – increased from around 5% of European patents in 2000 to 9% in 2020, close to the US level of around 9.5%. The biggest change is in who owns the patents. By 2020, around half of European academic patents were filed directly by universities, again, broadly the same share as for US academic patents.

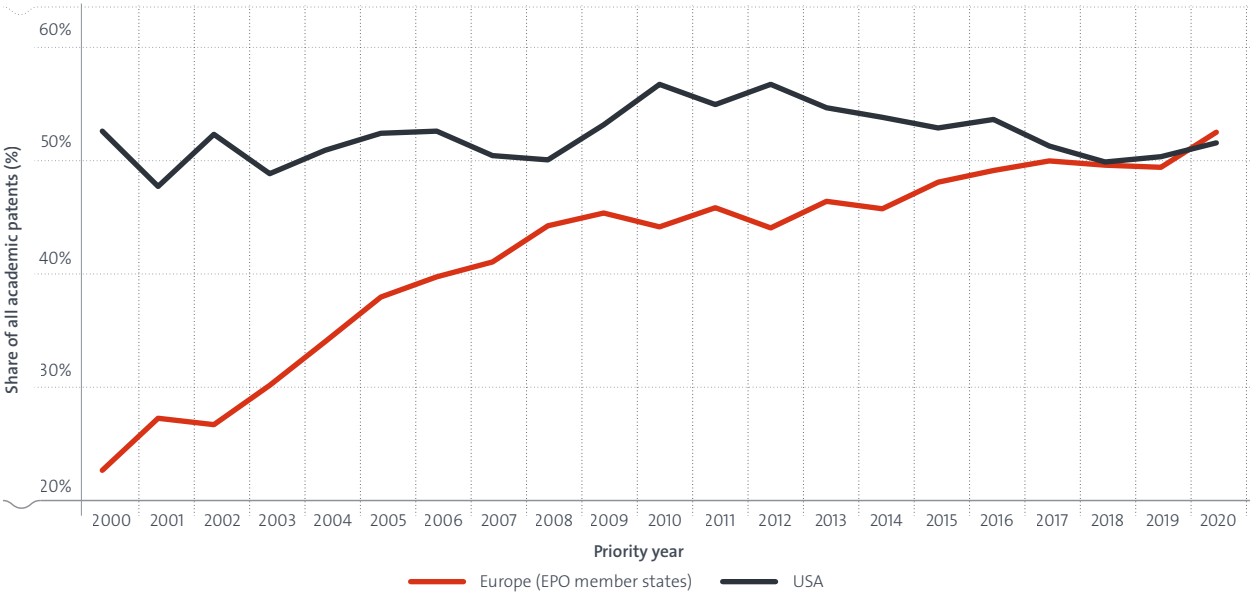
This represents a major shift and is closely linked to changes in IP policies governing publicly funded research across Europe during the 2000s. Universities and their TTOs now take direct responsibility for many more inventions. However, filing the patent application is only the beginning: they may then need to finance further protection, develop the technology, identify industrial partners, market it, negotiate a licence or support the creation of a spin-off.

This change in ownership of academic inventions has gone hand in hand with the professionalisation of technology transfer in European research institutions. The testimonies of interviewed TTOs illustrated this shift. In many institutions, patenting and industry links were previously handled ad-hoc by researchers, legal teams or other university units that were not specialised. Dedicated TTOs have gradually brought these activities together and gained a more strategic role, providing specialised support for licensing, spin-offs and entrepreneurship.

European universities are therefore not only owning more inventions: they have also built more specialised structures to manage them, following a process similar to the institutional development seen in the United States since the 1980s.

Figure 2:

Direct university filings at the EPO as a share of all academic patent applications by applicant country of origin, 2000-2020



Source: EPO – PATSTAT; Elsevier Scopus.

KF3: Evidence suggests a gap in the economic impact of patents owned by European universities

Greater ownership also means managing patents over the longer term. This study therefore looks at how long academic patents granted by the EPO are maintained.

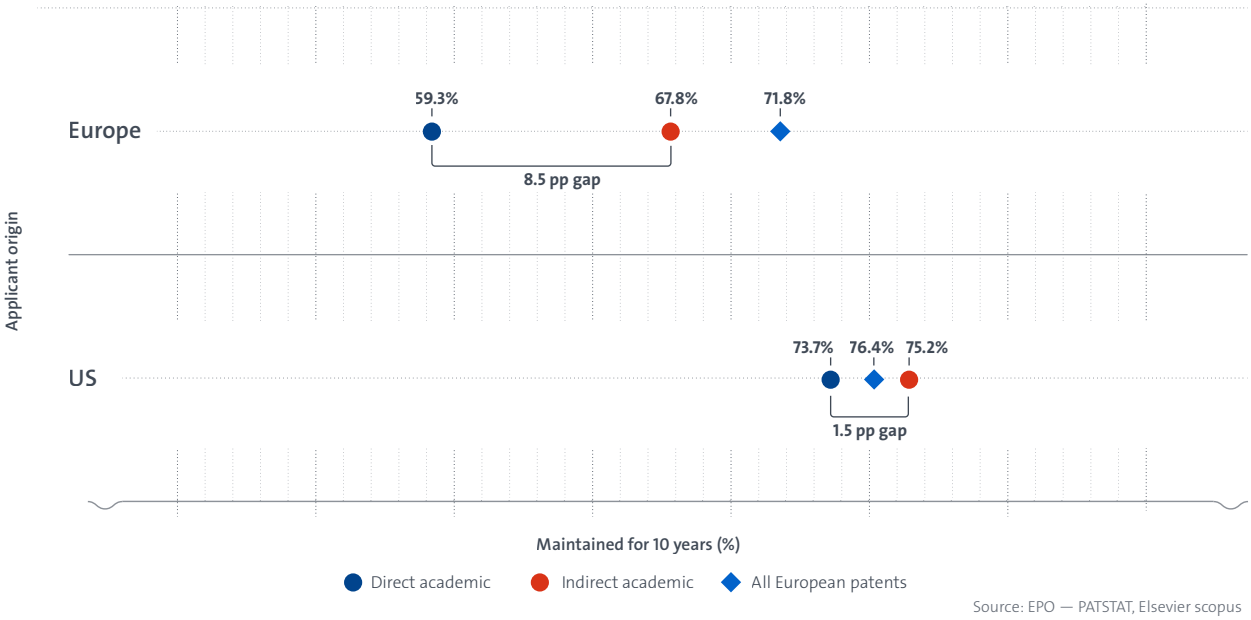
Once a European patent is granted, the patent owner must decide in which countries to maintain protection and pay the corresponding national renewal fees. Since 2023, owners can request unitary effect for their granted European patents, cutting costs and reducing administrative complexity, and thereby enabling more efficient use of the often limited IP budgets of European public research institutions. So-called Unitary Patents provide protection in 18 participating member states through a single system and a single annual renewal fee.

Because patent maintenance involves the payment of annual fees, it is used in this study as a signal of the economic value of an invention. Allowing a patent to lapse can be a sensible decision if its expected value no longer justifies the cost. At the same time, the payment of renewal fees means that the owner still expects some returns for maintaining patent protection. Maintenance is not the same as commercial success, but it provides an indication of whether institutions continue to see enough potential in an invention to keep paying for its protection.

The difference with the United States is substantial. Among directly owned European academic patents granted by the EPO and filed between 2000-2012, just 59.3% were maintained for at least ten years, compared with 73.7% for academic patents from the United States. Within Europe, directly owned academic patents were maintained less often than indirect academic patents, at 59.3% compared with 67.8%. In the United States, the difference was much smaller, at 73.7% compared with 75.2%. These figures, however, need to be interpreted carefully, as universities on the two sides of the Atlantic may follow different IP strategies when patenting at the EPO and maintaining protection in Europe.

Figure 3:

Ten-year maintenance rates for direct and indirect academic patents granted by the EPO, with all patents granted by the EPO benchmarks, by applicant origin (priority years 2000-2012)



Source: EPO — PATSTAT, Elsevier scopus

The interviews nevertheless illustrate why long-term portfolio management can be difficult. Several TTOs reported pressure on patent budgets and cases where protection had to be limited because resources were not available. Some offices also depend on project-based or temporary funding for IP expenditure or specialised staff, making it harder to commit resources to inventions that may take many years to reach the market.

This is particularly relevant for technologies coming from university laboratories, which are often patented while still at an early stage. They may still need proof-of-concept funding, technical development and time to find the right company or investor. Europe has largely caught up with the US in universities taking ownership of inventions, but the next challenge is having the resources and commercialisation capacity to manage and develop those inventions over the longer term.

The current status of European TTOs

The growing responsibility of research institutions raises a simple question: what capacity do European TTOs have to manage these inventions and bring them to market?

To answer this question, the study uses anonymised survey data from ASTP, the Europe-wide association of knowledge-transfer professionals. Working with ASTP, the EPO analyses for the first time results across several years of its annual survey. The data includes responses from more than 800 European TTOs that reported at least once between 2017 and 2023, providing the most comprehensive picture to date of their staff, research base and activities. Twenty-two interviews with technology transfer professionals complement the survey and help explain what the numbers mean in practice.

KF4: Most European TTOs are small, but differ considerably in their characteristics and responsibilities.

There is no typical European TTO. Offices serve very different universities, PROs and research hospitals and differ greatly in their size, experience and responsibilities. Most are also relatively young: more than half of the TTOs reporting an establishment year were created in 2005 or later, and one quarter in 2012 or later.

Most TTOs are small specialist teams. The median TTO employs 6.7 full-time-equivalent (FTEs) staff – in other words, the equivalent of fewer than seven full-time jobs. Half of the offices employ between 3 and 14.5 FTEs. A much smaller group of large TTOs raises the average to 11.9.

Their activities vary on a similar scale. In a typical year, the median office receives around nine invention disclosures – the formal notification from a researcher that they may have created research results worth protecting or commercialising. At the same time, the median office files around six patent applications, obtains three patent grants, concludes two licensing deals and creates fewer than one spin-off.

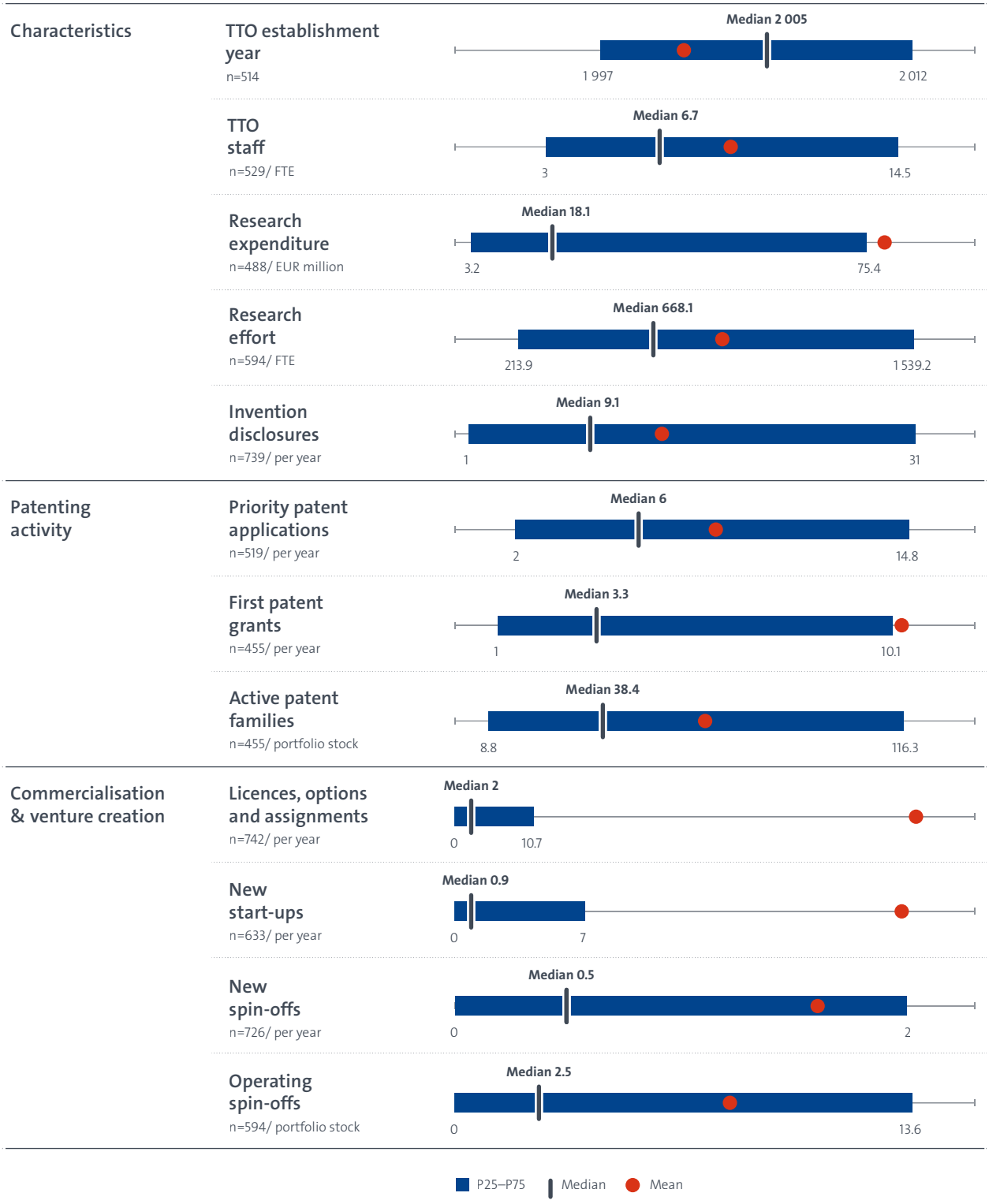
The interviews show how demanding these numbers can be. One office reported around 12 central TTO staff supporting approximately 7 000 researchers. Another described a staff of only five carrying out on-site invention scouting across a research organisation with around 100 000 researchers.

For smaller offices, the same few people may have to cover a wide range of activities. Larger offices can divide these responsibilities among specialists and build deeper expertise in particular technologies, markets or stages of commercialisation.

This diversity matters when comparing TTO performance. A six-person office serving a regional university operates under conditions very different from those of a large organisation with dedicated specialists across multiple several technologies and commercialisation activities.

Figure 4:

Distribution of European TTO characteristics and activities (averages of FY2017-FY2023) based on ASTP survey evidence



Source: EPO analysis based on the ASTP survey data

KF5: Small TTOs can handle individual inventions effectively, but scale makes it easier to build specialised capabilities

To understand these differences better, the study uses cluster analysis to identify two broad groups of European TTOs based on their staffing, the research base they serve and the number of invention disclosures they receive. Small and mid-scale offices represent 732 of the 809 TTOs analysed, or 90.5%. Only 77 offices, or 9.5%, belong to a group of significantly larger TTOs, serving institutions with a large research base.

The differences between them are substantial. The median large-scale TTO has around six times as many staff, serves almost seven times as many researchers backed by research budgets more than 22 times larger, and receives nearly 16 times as many invention disclosures as the median small or mid-scale office.

But being smaller does not automatically mean being less effective with each invention. The study compares how many patents, licences and ventures are produced relative to the number of inventions disclosed to the TTO. For six of the eight metrics, there is no statistically significant difference between the two groups. Put simply, once an invention enters the TTO, a smaller office is not necessarily worse at moving that individual case forward.

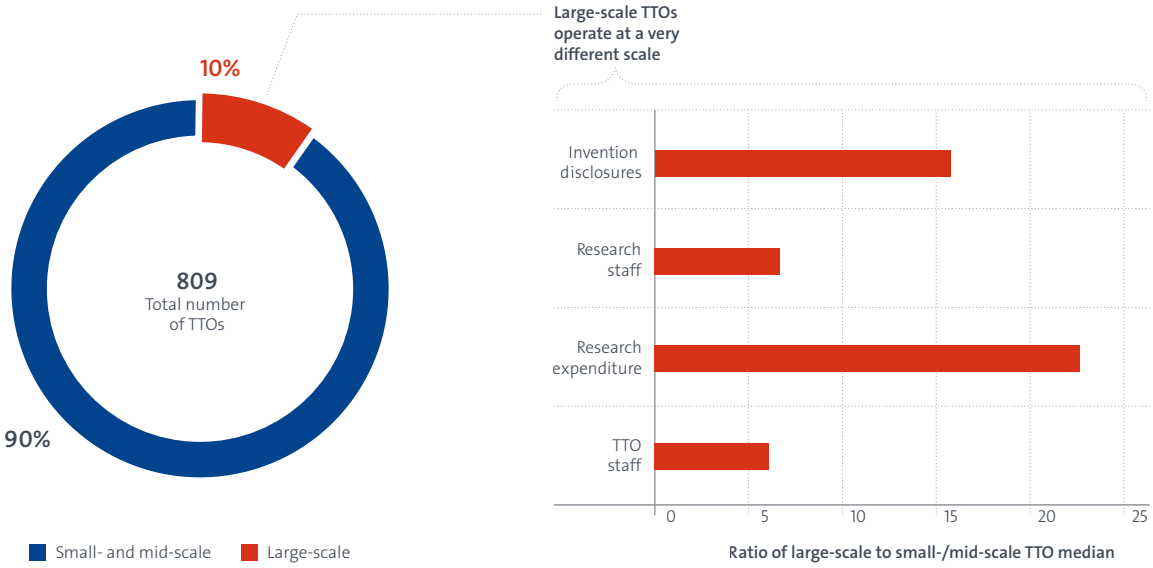
The picture changes when output is compared with the number of TTO staff (see "TTO staff productivity" in Figure 6 below). Large offices produce significantly more patenting, licensing and venture activity per staff member across all eight indicators analysed because they are able to process more invention disclosures.

The interviews help explain why. Scale allows larger offices to scout and manage more cases at the same time and maintain a wider range of specialist capabilities. A small TTO may be very good at working closely with researchers, but the same few people may have to cover patents, contracts, licensing, market analysis and business development. Larger organisations can have specialists in areas such as biotechnology or digital technologies, dedicated licensing and venture teams, staff focused on industry or investors and people whose role is to scout actively for new inventions.

Experience also builds through repetition. Professionals who repeatedly negotiate licences, work with investors or commercialise technologies in the same sector develop contacts, market knowledge and practical expertise that can be difficult to build when an office handles only a few such cases each year.

Figure 5:

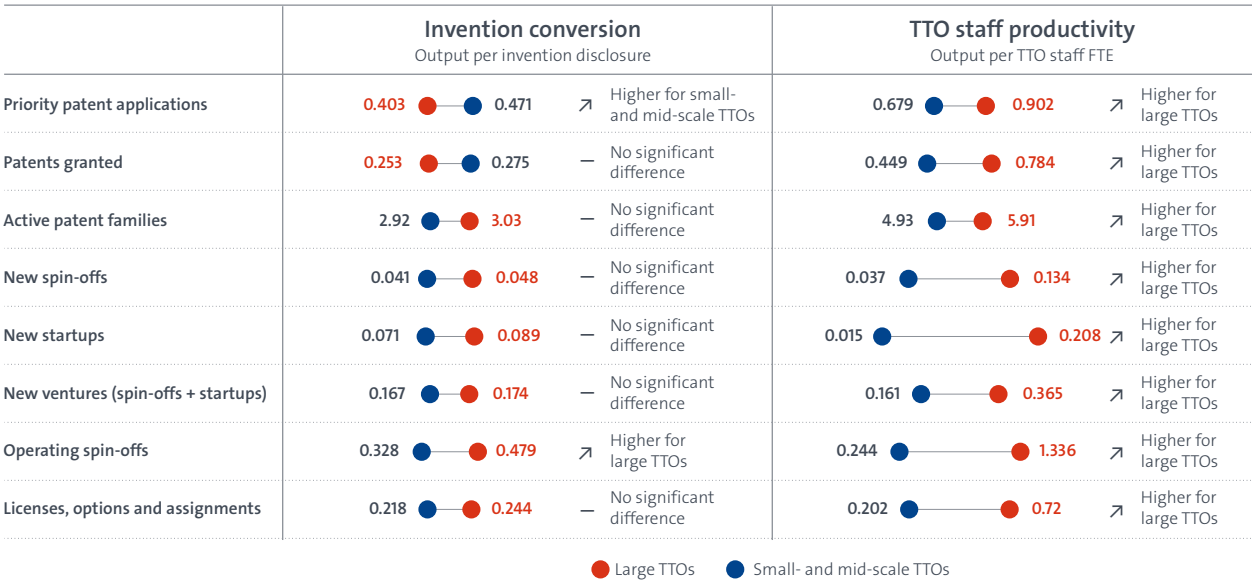
Two dominant profiles in the ASTP survey population of European TTOs



Source: EPO analysis based on the ASTP survey data

Figure 6

Comparison of TTO output per invention disclosure and per TTO staff FTE



Note: Significance at 5%; ↗ indicates a stastically significant difference; — indicates no statistically significant difference.

Source: EPO analysis of ASTP survey

KF6: TTO capacity matters for commercialisation

The next question is whether the stronger performance of large TTOs simply reflects the fact that they serve larger research organisations and receive more inventions.

The study examines 256 TTOs with directly reported data on staffing, research expenditure, invention disclosures and country. This makes it possible to account for some of the main differences in the environments in which TTOs operate, such as the research base and the number of invention disclosures, and provide a more like-for-like comparison.

The results show that larger TTO teams are associated with higher levels of all the commercialisation outputs analysed, even after accounting for these differences. A doubling of TTO staff, with the other factors in the analysis held constant, is associated with approximately 53% more new startups, 43% more new ventures, 36% more new spin-offs, 23% more operating spin-offs and 21% more licences, options and assignments.

These are associations, not causal effects. There is no evidence that simply doubling the staff of an individual TTO would necessarily produce these increases. Larger teams tend to have more mature processes, greater specialist expertise, stronger networks and more accumulated experience.

The interviews show what this additional capacity can make possible. Some offices described moving from waiting for researchers to contact them towards actively scouting for inventions and maintaining regular relationships with research teams. In one case, annual invention disclosures increased from around 15-20 to 55-60 after more systematic scouting was introduced.

Several TTOs also highlighted the importance of commercial expertise. Patent or legal advice can sometimes be purchased externally for an individual case. It is harder to buy, case by case, the continuous knowledge of a sector, companies, investors and potential markets that develops through repeated commercialisation work.

Staff numbers should therefore be understood as a sign of something broader. TTO capacity means not only headcounts, but also experience, specialised skills, stable processes, tools, market knowledge and networks. These capabilities determine how much of the transfer journey an office can realistically undertake.

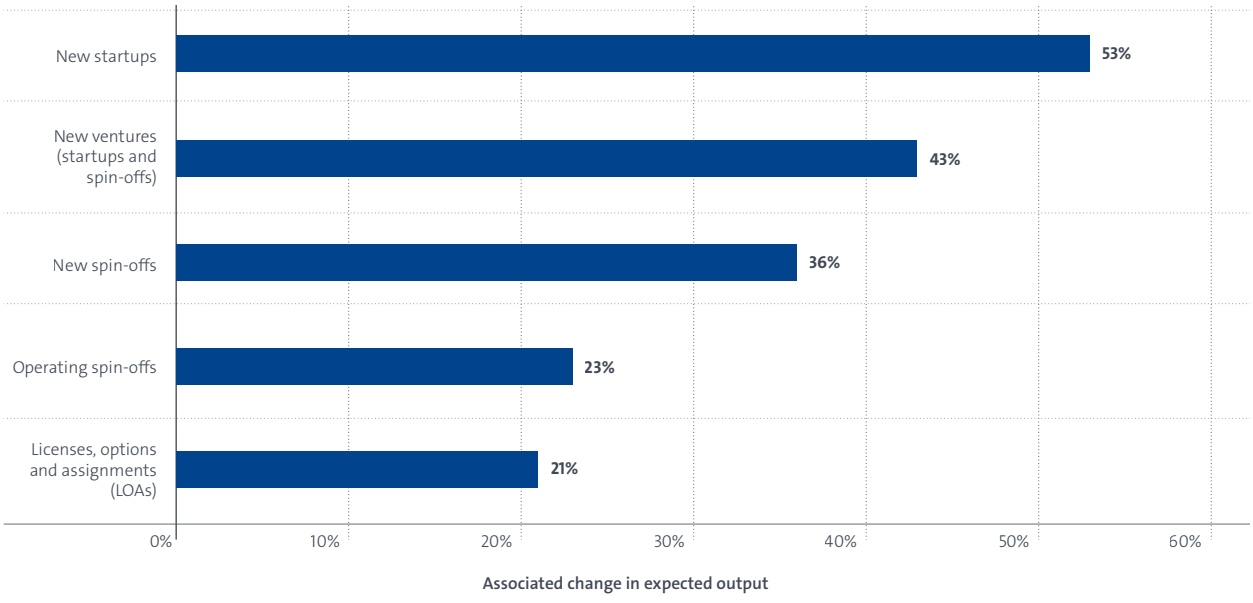
The results also suggest that smaller TTOs do not necessarily need to become large organisations, if they are able to access capabilities they cannot realistically maintain themselves. Some activities depend on being close to researchers. Others – such as specialist market expertise, patent analytics, valuation, investor networks, founder matching or training – can potentially be pooled across institutions.

Researchers are more likely to disclose early – and sometimes sensitive – ideas to people they know and trust, so invention scouting and the first assessment of a technology benefit strongly from local presence. Yet, proof-of-concept funding programmes, investor access, market intelligence, training and international partner search can often operate across multiple institutions or even be subcontracted to external providers. Regulatory sandboxes can complement proof-of-concept support by allowing emerging technologies to be tested under realistic technical, market or regulatory conditions before wider deployment.[1]

The question for Europe is therefore not simply how to make every TTO bigger: it is how to ensure that every promising invention can access the capabilities it needs, whether these are available inside the local TTO or through wider national and European networks. The study includes detailed showcases of national initiatives, such as SATT and shared TTO networks, to help stakeholders understand how different models work in practice and identify possible solutions that could be adapted to national and regional contexts.

Figure 7

Association between TTO staffing and commercialisation output



Note: The graph shows the approximate percentage difference in expected output associated with a doubling of staff FTE in cross-sectional negative-binomial models controlling for research expenditure, invention disclosures and country. The estimates are associations, not causal effects.

Source: EPO analysis based on ASTP survey data

1 See, for example, European Commission, Ensuring EU legislation supports innovation, available at the European Commission webpage (accessed 25 September 2026).

Main takeaways for strengthening technology transfer in Europe

Taken together, the evidence gives a clear picture. European research institutions are taking greater responsibility for their technologies at a moment when turning research into innovation has become increasingly important for European competitiveness and technological sovereignty.

This makes TTOs strategic actors. However, technology transfer is about much more than filing patent applications. Moving an invention towards the market can require years of technical development, financing, market assessment, partner search and negotiation. Hence, while a patent, licence or spin-off is an important step, it does not automatically mean market success. Whether a technology ultimately becomes a successful product or company also depends on investors, entrepreneurs, companies, regulation and market demand. The study identifies six takeaways:

Table 1

Main takeaways

Takeaway	Message
1. Recognise TTOs as strategic actors	TTOs are not simply administrative units. They are one of the instruments Europe needs to turn public research into technologies, companies and capabilities that can strengthen its competitiveness and technological sovereignty. Governments, funding agencies and research institutions should therefore treat technology transfer capacity as part of Europe's innovation infrastructure and support it accordingly.
2. Policies and support initiatives should reflect the diversity of European TTOs	European TTOs differ greatly in size, maturity, institutional setting and resources. A small office serving one small university faces very different conditions than those of a large TTO supporting a major research organisation or even multiple research organisations. Policies and support therefore need to reflect these different starting points rather than apply one model or one way to measure their success.
3. Strengthen capacity across the whole transfer journey	TTOs need stable resources to achieve impact. This includes: stable staff, reliable budgets (including for IP protection), access to technical, commercial, IP and entrepreneurial expertise and tools required to support inventions, from scouting and proof-of-concept right through to licensing and venture creation.
4. Combine local proximity with shared capabilities	While close contact with researchers is essential for identifying inventions early and supporting them over time, smaller TTOs may not realistically be able to maintain every specialist capability internally. Expertise, training, information, tools, and industry or investor networks can therefore be pooled across institutions and supported at regional, national or European level by institutions such as the EPO, or networks like the ASTP and PATLIB.
5. Build a more connected European market for technology	The right company, investor, entrepreneur or expert may be located in another region or country. Stronger technology visibility, brokerage and cross-border networks can help promising inventions find the partners they need beyond their local ecosystem.
6. Align incentives and focus on long-term impact	Researchers need recognition to engage in technology transfer, while TTO professionals need institutional support and appropriate career structures. Success should also be measured beyond patent counts or licensing income, looking at whether technologies ultimately reach the market, attract investment and generate economic or societal impact.

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Use of artificial intelligence: AI-assisted tools were used in the preparation of visualisations, textual review, and the transcription and analysis of qualitative interviews, as further explained in Box 4.1.

Design
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The report can be downloaded from
epo.org/tech-transfer-study

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