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Joint comprehensive study report of TT ecosystem

Bulgaria, Croatia, Slovakia, Slovenia, Spain and Türkiye

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1 Content

List of Abbreviations

BCC: Barcelona Chamber of Commerce, Industry, Services and Navigation
BCCI: Bulgarian Chamber of Commerce and Industry
BSO: Business Support Organisations
CVTI SR: Slovak Centre of Scientific and Technical Information
EEA: European Economic Area
EECTI: Spanish Science, Technology, and Innovation Strategy
EIS: European Innovation Scoreboard
ESIF: European Structural and Investment Funds
EU: European Union
HEIs: Higher Education Institutions
ICT: Information and Communication Technologies
IP: Intellectual Property
IPRs: Intellectual Property Rights
IT: Information Tecnologies
JSI: Jožef Stefan Institute
KTU: Karadeniz Technical University
NCTT SR: National Centre for Technology Transfer
NDA: Non-disclosure Agreement
NGO: Non-Governmental Organizations
NITT SK: National Infrastructure for Technology Transfer in Slovakia
OG: Official Gazette released by a patent office
OTC: Oficina de Transferencia de Conocimiento (Knowledge Transfer Office)
PROs: Public Research Organizations
RedOTRI: Network of Spanish Technology Transfer Offices
RIS: Regional Innovation Scoreboard
RTD: Research and Technological Development
R&D: Research and development
SMEs: Small and medium-sized enterprises
STEM: Science, Technology, Engineering and Mathematics
TRL: technology readiness level
TT: Technology Transfer
TTO: Technology Transfer Office
TTP: Technology Transfer Professionals
UNIZG: University of Zagreb
VC: Venture Capital
WIPO: World Intellectual Property Organization

1. Introduction

As World Intellectual Property Organization (WIPO) defines, **Technology transfer (TT)** is the process of transferring scientific knowledge, innovations, or technological advancements from one entity to another. It encompasses sharing expertise, intellectual property, and materials to enable the adoption, adaptation, or replication of technology in a different setting, such as between countries, organizations, or academic institutions.

The **STEIDA Project** aims to strengthen **technology transfer ecosystem** through an innovative and holistic approach which will foster national and international collaboration among universities, academics, businesses, students, entrepreneurs and other stakeholders by developing/using digital platforms and networks.

The project will also contribute to close the gap between academia and industry through providing students with new competencies.

The project involves partners from **6 countries** (Bulgaria, Croatia, Slovakia, Slovenia, Spain and Türkiye):

- PP1: Karadeniz Technical University (KTU) – Türkiye.
- PP2: Bulgarian Chamber of Commerce and Industry (BCCI) - Bulgaria.
- PP3: Barcelona Chamber of Commerce, Industry, Services and Navigation (BCC) – Spain.
- PP4: Slovak Centre of Scientific and Technical Information (CVTI SR) – Slovakia.
- PP5: Jožef Stefan Institute (JSI) – Slovenia.
- PP6: University of Zagreb Faculty of Transport and Traffic Sciences (UNIZG) – Croatia.

As part of the initial project activities, the initiative partners have carried out an analysis of the technology transfer systems in each country.

The aim is to identify the main actors, legislative frameworks, support mechanisms, problems, opportunities and risks on the public, academia and industry sides in TT processes.

To carry out this study, each partner has prepared a report revealing the situation in their country.

This document (Joint comprehensive study report of TT ecosystem in Bulgaria, Croatia, Slovakia, Slovenia, Spain and Türkiye) is the consolidation of all these studies.

Throughout the document you will find the reference to the extended documents of each country, as well as the comparison of the situation in each country in different aspects that are important to understand the degree of maturity and the situation of TT in each country.

Finally, the results of each of the studies and the comparison of the results of this document should serve to identify the elements to be contained in the curriculum developed within the scope of the STEIDA project.

1.1 Work methodology

The methodology used to carry out each of the national studies can be found in detail in each of the national studies.

In general, the different documents have been prepared based on bibliographical references that can be found in the 'bibliography' section of each of them, as well as through interviews with different experts and stakeholders in each of the ecosystems.

Based on the information gathered and the conclusions drawn by each of the partners, this document gathers the main elements of each of them and compares the situation (from the perspective of the project partners) in each of them.

1.2 National comprehensive study report of TT ecosystem

Below you can find the reference to the studies of the TT system in Bulgaria, Croatia, Slovakia, Slovenia, Spain and Türkiye, elaborated by each of the project partners and published on the STEIDA project website.

- Study on the Technology Transfer Ecosystem in **Bulgaria**, elaborated by Bulgarian Chamber of Commerce and Industry.
- Study on the Technology Transfer Ecosystem in **Croatia**, elaborated by University of Zagreb Faculty of Transport and Traffic Sciences.
- Study on the Technology Transfer Ecosystem in **Slovakia**, elaborated by Slovak Centre of Scientific and Technical Information.
- Study on the Technology Transfer Ecosystem in **Slovenia**, elaborated by Jožef Stefan Institute.
- Study on the Technology Transfer Ecosystem in **Spain**, elaborated by Barcelona Chamber of Commerce, Industry, Services and Navigation.
- Study on the Technology Transfer Ecosystem in **Türkiye**, elaborated by Karadeniz Technical University.

2. Background/Environment

The environment for TT should allow to analyse the maturity of each country in terms of innovation, as well as to understand how easy is to develop actions and possible barriers.

In this section, we compare results of Regional Innovation Scoreboard and the legislative framework in each country.

2.1 EIS/RIS comparation

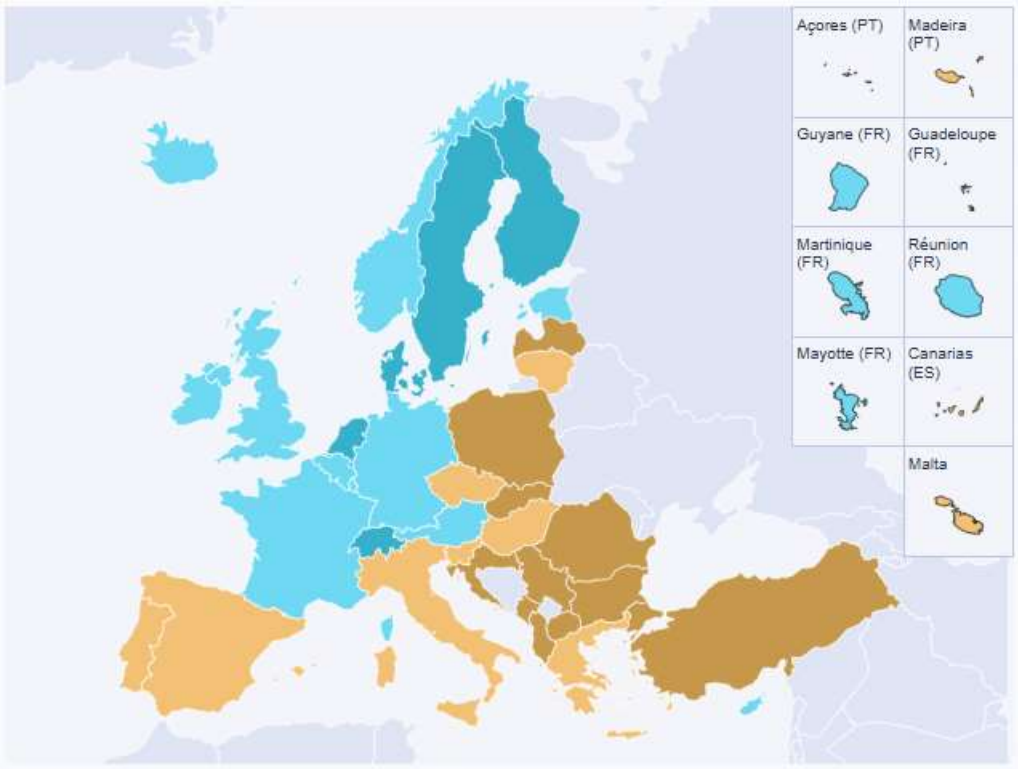
A robust background is essential for technology transfer (TT) analysis because it provides the contextual framework necessary to understand the effectiveness, challenges, and opportunities within TT processes. Below are key reasons why a background is critical.

The **2024 European Innovation Scoreboard (EIS)** is an annual report published by the European Commission to evaluate and compare innovation performance across EU Member States, other European nations, and select global competitors. It serves as a key tool for assessing the strengths and weaknesses of national innovation systems, offering insights to guide policymaking and resource allocation in research and innovation.

In the context of the analysis of the TT in each country participating in the **STEIDA** project, in each of the national reports an analysis of the main environmental factors that influence the TT can be found.

Below we will comparatively analyze these innovation ecosystems based on the information provided by the EU's 2024 EIS and EU's 2023 Regional Innovation Scoreboard (RIS).

The following map shows the degree of innovation of each country according to EIS 2024 (Innovation Leaders in dark blue, Strong Innovators in blue, Moderate Innovators in pumpkin and Emerging Innovators in brown)



Innovation index in Europe (Map) – Source: European Innovation Scoreboard 2024

Moderate Innovators		
Slovenia	100.1	▲ 1.5
Spain	98.9	▲ 2.0
Czechia	98.7	▲ 2.3
Italy	98.6	▲ 0.8
Malta	96.8	▼ 1.9
Lithuania	92.0	▲ 3.7
Portugal	91.8	▲ 0.5
Greece	85.3	▼ 1.0
Hungary	77.6	▲ 2.1

Emerging Innovators		
Croatia	76.6	▼ 0.1
Poland	72.5	▲ 3.3
Slovakia	71.6	▲ 1.5
Serbia	69.1	▲ 4.4
Latvia	59.0	▼ 0.2
Turkey	56.9	▲ 5.7
Montenegro	52.3	▲ 0.8
Bulgaria	50.6	▲ 1.9
North Macedonia	49.6	▲ 3.9
Albania	46.0	▲ 0.1
Romania	37.4	▼ 1.6
Bosnia & Herzegovina	36.4	▲ 2.7
Ukraine	35.7	▲ 0.1
Moldova	25.5	▼ 4.1

Innovation index in Europe – Source: European Innovation Scoreboard 2024

Based on the information in this report, we can analyse the main differences between Spain, Bulgaria, Croatia, Slovakia, Slovenia, and Türkiye regarding innovation ecosystems.

Country	Innovation Performance Category	Key Characteristics	Regional Strengths	Key Sectors	Challenges
Bulgaria	Emerging Innovator	Scores below 70% of the EU average. Bulgaria faces challenges in research intensity and technology transfer but shows improvement in select areas.	Key regions like Sofia perform above the national average due to IT outsourcing and software development hubs.	• **Information Technology**: Rapidly growing ICT sector, particularly in Sofia. • **Pharmaceuticals**: Investment in life sciences and generics production. • **Automotive Components**: Emerging supplier role in EU markets.	Low R&D investment, limited public-private collaboration, and brain drain
Croatia	Emerging Innovator	Similar to Bulgaria, Croatia scores below 70% of the EU average but exhibits regional strengths in niche sectors.	Zagreb leads innovation efforts, supported by tourism technology and creative industries.	• **Tourism Innovation**: Digital platforms and sustainable tourism practices. • **Green Energy**: Hydropower and renewable energy projects. • **Agri-Tech**: Technologies enhancing agricultural efficiency. • **Information Technology:** Growing ICT sector in Croatia • **Smart cities/Transport and Traffic**: Development of urban cities, urban mobility and other fields of transport and traffic	Weak industrial-academic linkages and insufficient R&D spending
Slovakia	Emerging Innovator	Scores below 70% of the EU average, with underdeveloped innovation. ecosystems. Industrial and academic	Bratislava stands out with its relatively higher R&D activity and manufacturing capabilities.	• **Automotive**: A stronghold for vehicle production, with a focus on automation. • **Electronics**: Expansion in consumer electronics and semiconductor-related production.	Dependence on foreign direct investment for innovation and limited

		collaboration remains a key challenge		• **Smart Cities**: Development of urban digital infrastructure.	homegrown tech startups
Slovenia	Moderate Innovator	With a performance between 70% and 100% of the EU average, Slovenia demonstrates robust capacity in R&D and technology sectors.	Central Slovenia, including Ljubljana, excels due to a robust research and innovation ecosystem.	• **Green Technology**: Leadership in circular economy and waste management innovations. • **Pharmaceuticals**: Strong export-oriented pharmaceutical industry (e.g., Krka, Lek). • **ICT**: Growth in cloud computing and cybersecurity solutions.	Limited venture capital availability and slower scaling of startups
Spain	Moderate Innovator	Spain scores between 70% and 100% of the EU average. Innovation activity is higher in some regions, with potential in sectors like digital innovation.	Higher innovation performance is concentrated in regions like Madrid, Catalonia, and the Basque Country, driven by digital innovation, automotive, and biotechnology	• **Digital Transformation**: Notable investments in AI and big data. • **Renewable Energy**: Leadership in solar and wind technologies. • **Aerospace**: Strong industry presence in Madrid and Andalusia.	Disparity between regions; some rural areas lag behind urban centers in innovation activity
Türkiye	Emerging Innovator	Türkiye's innovation ranking focuses on industrial contributions and technological growth but is generally behind EU benchmarks.	Innovation is most visible in Istanbul, Ankara, and Izmir, driven by industrial clusters.	• **Defense and Aerospace**: Rapid advances in drone technology and aviation systems. • **Automotive**: Development of electric vehicles like TOGG (Türkiye's national EV brand). • **Textile and Fashion Tech**: Innovative design and sustainable production practices.	Low private sector R&D and gaps in technology commercialization

Comparation between innovation ecosystems based on EIS 2024

Key observations:

- **Spain** and **Slovenia** are the strongest performers among these countries, classified as **Moderate Innovators**. They benefit from higher R&D activity and infrastructure for technological advancement.
- **Bulgaria**, **Croatia**, and **Slovakia** are classified as **Emerging Innovators**, reflecting lower overall innovation performance but with regional potential in targeted areas.
- **Türkiye**, as a non-EU country, participates in a parallel evaluation but generally trails behind the EU average in innovation metrics and is classified as **Emerging Innovator**.

Regarding **technological transfer**, the EIS 2024 indicators allow establishing the following comparison.

Country	Technology Transfer Strengths	Challenges in Technology Transfer
Bulgaria	Progress through EU-funded programs. Emerging tech hubs in Sofia and Plovdiv; increasing international partnerships.	Weak research commercialization infrastructure, limited funding, and fragmented TT policies.
Croatia	Increasing focus on green tech and tourism. EU funding programs boosting TT and knowledge exchange.	Low private sector involvement in TT, underdeveloped university-industry links, and insufficient R&D funding, insufficient academic-industry connection.
Slovakia	Strong in automotive and electronics sectors. EU funding driving technology park development and research collaboration.	Limited domestic investment in R&D and low integration of academic research into commercial sectors.
Slovenia	Robust TT in pharmaceuticals and green technologies. Strong public-private partnerships and active innovation hubs.	Challenges in scaling up TT activities due to limited domestic market size and funding.
Spain	Strong research outputs and innovation linkages. Significant academic-industry collaborations, especially in ICT and renewable energy sectors.	Gaps in scaling up innovations; regional disparities in TT effectiveness.
Türkiye	Industry-driven TT with growing tech parks and regional clusters, especially in defense and aerospace.	Insufficient academic-industry integration, challenges in scaling innovation beyond large companies.

Comparation between TT ecosystems based on EIS 2024

2.2 Legislative Frameworks

Legislative frameworks play a crucial role in technology transfer (TT) by creating the necessary conditions for knowledge and innovations to be effectively transferred from research institutions to the private sector or broader society. Here's why legislative frameworks are important for successful TT.

Based on the information from the different national studies (and therefore from stakeholders and consulted bibliography), the partners of STEIDA assess in this section whether the legal framework of each country is appropriate.

There is an appropriate legal framework?					
BULGARIA (BCCI)	**CROATIA (UNIZG)**	**SLOVAKIA (CVTI SR)**	**SLOVENIA (JSI)**	**SPAIN (BCC)**	**TÜRKIYE (KTU)**
Agree	**Agree**	**Agree**	**Agree**	**Agree**	**Agree**

BULGARIA (BCCI)

Relatively recently (in the spring of 2024) the Law on Promotion of Research and Innovation was adopted, which introduces a legal framework for innovation policy and for technology transfer, including intellectual property rights.

However, there still remain some gaps in the other relevant legislation and regulations, which often change, resulting in a lack of stability. For example, the regulation related to the creation of spin-offs, adopted in 2020, has not been completely accepted by the academic community at universities and its adoption has not been effectively used in practice.

CROATIA (UNIZG)

The current legislative and regulative framework in the Republic of Croatia relevant to the knowledge and technology transfer is well defined.

There is a several number of acts, laws and strategies (for example: Smart Specialization Strategy (S3) until 2029, National Development Strategy of the Republic of Croatia 2030, Patent Act (OG No. 16/20) and Patent Regulations (OG No. 55/20), Labour Act, University of Zagreb has developed the Regulation on the Management of Intellectual Property at the University of Zagreb etc.).

There are several important policies, strategies, and plans in Croatia that emphasize the importance of TT from a strategic point of view but that is not enough for TT development.

SLOVAKIA (CVTI SR)

The current legislative framework is quite complete but same improvements are required.

Slovakia has a National Strategy for Research, Development and Innovation, which partly focuses on the area of TT.

Slovakia also has standard laws in the area of IP.

However, some laws require amendment in order to remove identified obstacles to the implementation of TT.

A law on Research, Development and Innovation is also in preparation.

SLOVENIA (JSI)

The legal framework in Slovenia is well set and offers appropriate basis for development and strengthening TT ecosystem.

Some laws would still need specific improvements toward clarification to avoid misinterpretations. In practice still too much bureaucracy.

SPAIN (BCC)

The legal framework is quite complete. Although, it can be too bureaucracy (for instance, requirements to create a spin-off).

Although Spanish intellectual property protection has a robust system, it is often notg well-adapted to new technologies and market realities. This includes a lack of clarity in regulations concerning digital content and the use of artificial intelligence (for instance), which generates conflicts over authorship and rights in works created by machines.

The EECTI strategy (Spanish Science, Technology, and Innovation Strategy) is well-developed and has a strong approach to aligning Spanish innovation with the European average by 2030. However, the implementation of these guidelines is rather opaque, making it difficult to clearly ascertain whether the changes and new instruments are effectively applied.

TÜRKIYE (KTU)

The legal framework in Türkiye generally supports TT processes and provides a basis for issues such as protection of intellectual property and organisation of TTO structures.

However, there is room for improvement in terms of reducing bureaucracy and facilitating TT processes. R&D Law No. 5746, Technology Development Zones Law No. 4691 and Industrial Property Law No. 6769 contain basic regulations on the management of intellectual property rights and technology transfer.

However, policies regarding the commercialisation of intellectual property generated at universities are generally determined independently by universities. Although the incentives in the legislation (tax reductions, R&D personnel support, technology development zone advantages) support TT, bureaucratic obstacles in implementation and the complexity of the processes are among the factors that make technology transfer difficult.

CONCLUSION OF THE LEGISLATIVE FRAMEWORK

All STEIDA program partners agree that an appropriate legal environment for TT exists in all six countries.

In general, the six countries demonstrate a commitment to change and share a similar dynamic of European convergence from their respective levels of development. For EU countries, this is partly due to European guidelines like Horizon Europe 2030 and the articulation of implementation funds such as NextGenEU.

In line with this, the states are currently undergoing a period of implementing changes in the field of TT and its legal framework. Different speeds of implementation could lead to a very asymmetrical Europe by 2030. For this reason, the implementation of changes should be more transparent and allow for evaluation. More international mechanisms connecting TT sectors from one country to another would also be necessary.

A common point for improvement is bureaucratic processes. Bureaucratic processes, particularly those related to the public sector, also require an innovative culture and advancements in their digitalization and streamlining. Additionally, these processes need to adapt to emerging non-material technologies such as artificial intelligence.

A more synchronized approach to incorporating new methodologies and strategies for TT is crucial to avoid reaching 2030 with vastly different R&D and TT models, which could complicate stable collaborations over time.

Generally, all member states have a strategic plan to implement changes aligned with the 2030 agenda. EU-driven legal reforms and funding have proven beneficial, as reflected in the data from the European Innovation Scoreboard (EIS). However, excessive bureaucracy remains one of the biggest challenges across countries. The European integration process has, in some cases, increased regulatory complexity instead of fostering innovative approaches to streamline legal processes. Given that this is a shared problem, collaborative efforts are essential to address these issues effectively.

2 TT Structures

Technology transfer (TT) structures are vital in the successful commercialization and diffusion of research and innovation. These structures, including technology transfer offices (TTOs), innovation hubs, incubators, and partnerships, provide the necessary framework and resources to facilitate the movement of knowledge from research institutions to industry. Here's why these structures are important in TT.

In the six national studies, questions arise such as: Is there an efficient TTO structure? Do major players have TTO? Do TTOs have a clear set of services? Are TTOs connected to each other through a network? Are TTOs widely known (in the industry, among companies)? Are TTOs public or private? Do TTOs have physical infrastructure/offices (e.g. accelerators, 3D printers)?

Based on the information from the different national studies (and therefore from stakeholders and consulted bibliography), the partners of STEIDA assess in this section whether the structure of TT is efficient or not in each country:

There is an efficient structure of TTO?					
BULGARIA (BCCI)	**CROATIA (UNIZG)**	**SLOVAKIA (CVTI SR)**	**SLOVENIA (JSI)**	**SPAIN (BCC)**	**TÜRKIYE (KTU)**
Neither Agree nor Disagree	Neither Agree nor Disagree	Neither Agree nor Disagree	Agree	Neither Agree nor Disagree	Agree

BULGARIA (BCCI)

Over the last 20 years, a number of TTOs have been established within the frame of R&D Sectors, in universities as well as in the Bulgarian Academy of Sciences, and some private NGOs.

However, since most TTOs were created within the scope of projects, many of them remain as "artificial" structures with decreasing TT functions and limited impact and recognition among academics and researchers.

The activity in most TTOs is focused mainly on training, project applications, and management, they are rarely engaged in real IP protection and very seldom in IP commercialisation.

CROATIA (UNIZG)

Higher Education Institutions (HEIs) have TTOs but there is an evident lack of adequate management support and connection.

There is no functional TTOs network and there is a lack of efficient communication model and information exchange.

An example of programs supporting technology transfer in Croatia include ZICER which is an incubator that helps founders to turn their innovative, high-tech ideas into startups, and startups into strong and successful companies. Also, there is Nuqleus, the first startup program in Croatia that identifies industry problems, proposes potential solutions based on innovative technologies, and forms interdisciplinary teams to validate ideas and test their business potential as well as national programs related to strengthening technology transfer through the National Recovery and Resilience Plan (NPOO).

SLOVAKIA (CVTI SR)

TTOs are mostly independent in terms of organizational structure, but often do not have full decision-making powers.

TTOs are networked through the NCTT SR (National Centre for Technology Transfer) association.

Larger TTOs have their own websites and defined services. In contrast, some institutions do not have a TTO at all.

SLOVENIA (JSI)

The main stakeholders (Public Research Organizations -PROs-) have TTOs and clear set of services. They are connected among each other through a network, i.e., a consortium of TTOs at PROs, supported by governmental cofunding 2024 - 2029.

The majority of TTOs are public, few at private institutions which has been established by public organisations.

TTOs still lack of awareness or visibility by industry and as well by researchers. They have their own offices, but no other specific infrastructure.

SPAIN (BCC)

The function of TTO (OTC in Spain) and their connection (through a national registry) is clear, but still, they act only in some areas more than in the commercialization/transfer of HEIs technology.

Each TTO has its own catalogue of services, independent of the national RedOTRI network. At a minimum, to qualify as a recognized OTC in the national registry, the law requires these offices to provide intellectual property protection and commercialization services.

Additionally, if they have the capacity, TTOs may integrate research support and advisory services. The specific services offered depend on the university's structure, including whether there is an emphasis on technology transfer and whether a scientific or technological park is part of the institution.

The research personnel also influence the TTO's services. Depending on the staff's expertise and network, the TTO might be more engaged with the private sector and better equipped to promote intellectual property. Alternatively, it might limit its role to procedural services, offering only basic support in IP matters.

TÜRKIYE (KTU)

TTOs in Türkiye are largely publicly funded and have certain services and physical infrastructure. However, service quality and recognition vary among TTOs.

Although there is a widespread network among TTOs, lack of sectoral awareness and infrastructure inadequacies limit efficiency. TTOs generally provide services in areas such as awareness raising, project support, university-industry cooperation, intellectual property management and commercialisation. However, the scope and applications of these services vary among TTOs and there is no specific standard set of services.

While TTOs are generally known in university circles in Türkiye, the increasing interest in industry-university cooperation in recent years has led to a greater recognition of TTOs. TTOs in Türkiyecan be located in both public and private sector universities. TTOs have various physical infrastructures to support research and technology development activities. However, the scope of these infrastructures may vary depending on the budget of the university and the field of activity of the TTO.

TÜBİTAK (The Scientific and Technological Research Council of Türkiye) 1513 and 1601 programmes have enabled the establishment and strengthening of TTOs in 64 universities and technoparks. Today, the number of TÜBITAK-supported TTOs is over 60, and together with all other TTOs, this number exceeds 90.

CONCLUSION OF TT STRUCTURE

Regarding the TT structure in each country, JSI and KTU agree in indicating that in Slovenia and Türkiye the TT structure is efficient, while BCCI, CVTI SR, UNIZG and BCC indicate that in Bulgaria, Slovakia, Croatia and Spain it is sufficient.

In the European context, we observe countries with TT structures at varying levels of maturity. The performance of Technology Transfer Offices is often one of the main indicators of a nation's standing in terms of TT.

Based on the reports we have compared; we can distinguish two different contexts. On one hand, in the case of Spain and Slovenia—both of which hold a similar position in the European Innovation Scoreboard (EIS)—we find a comparable situation in terms of both positive and negative aspects. Both countries enjoy a consolidated network of Technology Transfer Offices with fairly well-defined competencies, though they still face challenges stemming from regional innovation asymmetry.

This model of a consolidated structure provides significant support for national TT but retains chronic issues such as excessive bureaucratic processes, a lack of incentives for research staff, and weak relations with the local private sector, as contacts often depend on individual office employees.

On the other hand, countries such as Bulgaria, Slovakia, and Croatia lack a mature structure and still do not have a synchronized network of offices or well-defined competencies. As Spain did in the 1990s or Türkiye who started more recently, these countries need a regulatory and implementation process to establish technology transfer offices with adequate fundings and competences.

At the European level, more efforts could have been made to strengthen the role of TTOs. The only funding these entities have received has been indirect project funding rather than resources directly allocated to the instrument itself.

It would be beneficial for the European Union to better manage these entities, creating a European network that connects offices from different nations working on similar projects. This would encourage international collaboration and staff mobility. In this way, there would also be greater assurance of progress in line with European guidelines. Also, it would help those less evolved offices to approach a better function.

3 Funding

Funding is essential for technology transfer (TT) because it directly impacts the ability to move innovations from research institutions to the marketplace.

Through each of the national studies, partners have analyzed questions such as: Do TTOs have enough government funding to operate? Do TTOs have specific financing to provide services?

(patents)? Is there (public) funding for intellectual property protection? Is there a good venture capital ecosystem? What is the source of financing for the different services (intellectual property protection, evaluation, marketing, etc.)?

Based on the information from the different national studies (and therefore from stakeholders and consulted bibliography), the partners of STEIDA assess in this section whether the is enough funding or not in each country:

There is enough funding?					
BULGARIA (BCCI)	**CROATIA (UNIZG)**	**SLOVAKIA (CVTI SR)**	**SLOVENIA (JSI)**	**SPAIN (BCC)**	**TÜRKIYE (KTU)**
Agree	Disagree	Disagree	Disagree	Disagree	Agree

BULGARIA (BCCI)

The current programming period (2021-2027) offers several funding opportunities for TT. Under the Recovery and Resilience Plan, which is the main source of funding for the research activities, up to 10 % of this funding should be spent on Intellectual Property (IP) protection and TT.

Operational Programme "Programme for Research, Innovation and Digitalisation for Smart Transformation" provides EUR 50 million Technology Transfer Fund (for equity) combined with additional EUR 10 million grant scheme (including Proof of Concept), which is directly related with the TT ecosystem upgrade.

CROATIA (UNIZG)

Through the National Recovery and Resilience Plan (NPOO), Croatia finances various technology transfer programs, as well as through incubators and startups like Nuqleus and ZICER, which provide financial support for technology transfer. There is an evident lack of TT staff with relevant skills at universities and PROs in Croatia which means that on average each TTO has 1 or 2 specialized staff.

This makes it very difficult to implement TT activities at HEIs and PROs.

In addition, the lack of dedicated and continuous funding on both national and institutional levels in Croatia for TT makes it even more difficult. There is no specialized training for the TT staff engaged in TT units at research organizations in Croatia. Most of them are developing their skills through the learning-by-doing model.

SLOVAKIA (CVTI SR)

Here is the situation different.

Some universities (e.g. STU, UNIZA) have their own budget, including for IP protection. Others do not have their own budget.

To TTOs has been and is currently being supported at the national level in the form of services and payment of administrative fees through CVTI SR and NCTT SR.

However, overall, the available funds are insufficient.

SLOVENIA (JSI)

Permanent governmental funding dedicated for TTOs is not available, although regular funding of PROs may cover activities of TTOs.

Recently established Consortium of TTOs at PROs received governmental financial support through a project 2024 - 2029, but long-term financial sustainability of TTOs still remains a challenge.

SPAIN (BCC)

There is funding available for projects and for companies that want to implement TT and there is a growing ecosystem of VC.

But still more funding for TTO is needed, more VC is needed (compared to other countries) and the access (bureaucracy) should be easier.

TÜRKIYE (KTU)

Although government funding supports TTO operations and certain services (e.g. intellectual property protection) in Türkiye, some challenges remain in terms of long-term financial sustainability.

TÜBİTAK and other public funding sources provide the most significant financial support to TTOs, while private venture capital is limited.

TTOs can generate income through training, consultancy, UIC contracts, shares from entrepreneurial investments and by working on patents and intellectual property rights owned by universities or research institutions. TÜBİTAK and other public institutions run various programmes for universities and entrepreneurs, offering financial support in areas such as patent applications, commercialisation processes and IP management. These subsidies are used to cover part of the expenses for the protection of intellectual property. In addition, universities and research centres provide financial support for these services through various funding programmes and investments from the private sector.

CONCLUSION OF FUNDING

Regarding funding for TT in each country, BCCI and KTU agree in indicating that in Bulgaria and Türkiye the TT structure is efficient, while BCC, CVTI SR, UNIZG and JSI indicates that in Croatia exists but is slightly insufficient and in Spain, Croatia and Slovenia it's not enough.

Europe finds itself in a general situation of financial stagnation and resource scarcity, which creates challenges such as a lack of venture capital to initiate marketable projects and to foster qualified personnel join TTO's.

Funding for Technology Transfer across all member states had been in a state of underfinancing. However, with the arrival of NextGen funds, this trend shifted. By 2023, all countries achieved some of their best figures in investment.

Despite this progress, once the NextGen funds supposed a less injection, they failed to incentivize private investment. A general trend emerged, with figures returning to levels below those seen prior to 2023. Countries with less resilient economies, like Bulgaria, became more dependent on European funds. For these countries, the funds acted more as a temporary injection of capital rather than a tool for accelerating development in member states.

The maturity of technology transfer structures also affects investment sources. More mature ecosystems, such as Spain and Slovenia, are beginning to enjoy private investment levels comparable to public funding. Their goal is for private capital to dominate by 2030, along with an increase in venture capital. Models like Türkiye's, rely more on public support as the private sector is not sufficiently developed to invest in research and development.

The structure of funding and benefits varies greatly between countries, depending on the maturity of their models. In countries like Spain or Slovenia, Technology Transfer Offices (TTOs) and centers often operate autonomously, allowing them to manage their own funding without direct dependence on third parties. In contrast, countries like Slovakia or Bulgaria, where TTOs and technology centers lack autonomous status, have limited control over expenses and benefits. They remain heavily reliant on administrative directives, with no authority over their financing.

The potential for improvement in this area is significant for both countries with less developed models.

For countries like Bulgaria, Slovakia, and Croatia, the primary focus should be on granting Technology Transfer actors greater autonomy. This would require considerable effort in terms of legal reforms, budget adjustments, and targeted funding to ensure appropriate incentives for the participation of qualified personnel. Strengthening collaboration between research units and regional businesses is also crucial for fostering private investment. A noteworthy example of best practices in consolidating a TTO network is Croatia's Technology Transfer Office Support Program.

Countries with more developed models also face substantial room for improvement in similar areas. While they may have established networks of Technology Transfer Offices, not all these offices operate with the same level of autonomy, and their funding structures vary. This leads to disparities among offices, reflecting the regional development asymmetries present in countries like Spain. These development imbalances among offices also affect the level of interest the

private sector shows in the projects being undertaken. Additionally, there is a widespread shortage of qualified personnel due to limited labour incentives in this sector.

4 Stakeholders

Stakeholders play a crucial role in TT, as they are the key actors who influence, support, or directly participate in the transfer of knowledge and innovation from research institutions to the marketplace.

Stakeholders such as researchers, entrepreneurs, universities, and businesses are vital to ensuring the flow of knowledge and technology from academia to industry. Researchers generate the innovations, while businesses are often the entities that can commercialize and scale them. Universities and TTOs act as intermediaries, -facilitating partnerships and connecting the research world to the commercial sector.

4.1 Interest of stakeholders

One of the aspects that most influences the role of stakeholders in TT is their own interest.

Their active engagement and alignment with the goals of the TT process can greatly influence the speed, effectiveness, and sustainability of technology commercialization. Here's why stakeholders interest matters.

Through each of the national studies, partners have analyzed questions such as: - Are researchers motivated enough for TT? Are there specific incentives for TT (financial, non-financial)? Are companies motivated enough for TT? Are students involved in TT (e.g. entrepreneurship)?

Based on the information from the different national studies (and therefore from stakeholders and consulted bibliography), the partners of STEIDA assess in this section whether the is enough interest of stakeholders in TT or not in each country:

There is an interest of stakeholders in TT?					
BULGARIA (BCCI)	**CROATIA (UNIZG)**	**SLOVAKIA (CVTI SR)**	**SLOVENIA (JSI)**	**SPAIN (BCC)**	**TÜRKIYE (KTU)**
Neither Agree nor Disagree	Neither Agree nor Disagree	Neither Agree nor Disagree	Disagree	Neither Agree nor Disagree	Neither Agree nor Disagree

BULGARIA (BCCI)

While incentives for stakeholders to participate in the success and proceeds that come to the university or R&D institution from their commercialisation efforts are rather limited, several universities offer entrepreneurship programmes to support students in the creation and development of start-ups.

CROATIA (UNIZG)

As mentioned before, through the National Recovery and Resilience Plan (NPOO), Croatia provides finances for varous technology transfer programs (like The Targeted Scientific Research Program which supports collaborative industrial research projects carried out in partnership between companies and research organizations). Some Universities (Rijeka) have developed funding programs for financing or co-financing interdisciplinary scientific and development project proposals, but it is mostly on institutional level.

There is a lack of HEIs staff motivation to participate because there is no general reward model.

For SMEs there is more opportunities but not enough.

Students have the biggest support in establishing companies and knowledge-based businesses.

SLOVAKIA (CVTI SR)

The motivation for individual R&D institutions to engage in technology transfer support schemes was probably more related to generating additional income for the institution than to an awareness of the importance and need for managed IP protection and commercialisation.

This can be seen in the decrease in the number of staff and budgets for these activities after the completion of the national support projects in TT, unless they were replaced by other sources outside the R&D institutions.

The topic of technology transfer is still marginal at individual R&D institutions and there is minimal initiative from within the institutions.

SLOVENIA (JSI)

Still very low motivation for TT by researchers at PRO, because there are not well-defined evaluation criteria which would award researchers for the success in TT.

Also, the motivation of companies for TT is relatively low mainly due to big gap in TRLs offered by PRO's and TRLs anticipated by companies. Students know little about IP and TT.

SPAIN (BCC)

The teaching-research staff is not enough motivated to implement TT, as in the evaluation and reward system, TT does not have enough weight.

Companies are motivated, but they are looking for more applied technologies, and they are concerned about IP of collaborations.

Spanish Science and Innovation Strategy for 2027, counts with detailed strategies and incentives to promote and the participation of students and researcher personnel. Currently, those projects are involved in some European initiative.

TÜRKIYE (KTU)

Although there are both financial and non-financial incentives for TT in Türkiye, there is a lack of motivation for commercialisation, mainly among researchers, but also among students, graduates and some companies. Especially some universities implement reward systems to increase motivation. More effort is needed to improve the TT process and to ensure the participation of more researchers and students. Incentives given to R&D centres established by companies indirectly increase the motivation of companies in TT processes.

In Türkiye, state institutions encouraging technology transfer provide various incentives for commercialisation of R&D projects and strengthening university-industry cooperation. These supports contribute to increasing Türkiye's scientific and technological capacity.

The 1812 Investment-Based Entrepreneurship Support Programme (BiGG Investment) developed by TÜBİTAK is a programme designed to support technology and innovation-oriented initiatives in Türkiye. This programme provides financial support and mentorship to entrepreneurs to implement their technology and innovation-based business ideas.

CONCLUSION OF THE INTEREST OF STAKEHOLDERS

Regarding interest of stakeholders for TT in each country, there is a consensus between the partners that in general, it is sufficient, but it needs to be improved. The exception is JSI, that considers not enough this interest in the case of Slovenia.

In this case, the degree of maturity is reflected in the diversity of actors involved in technology transfer, their level of engagement, and the number of private entities, whether research-oriented or industrial, that are participating.

However, the main issue is shared across all countries: the lack of interest from the private sector in purchasing intellectual property. To address this, progress must be made toward a technology transfer model where the private sector also participates in intellectual production in cooperation with public research centers. This would align the interests of businesses with research, making it more suitable for commercialization. Additionally, it would lead to greater private investment and increased mobility of personnel, which could help mitigate the shortage of qualified professionals in TTOs.

This deeper integration of the private sector would bring the countries discussed closer to more modernized TT models, such as those in the United Kingdom or Germany, where collaboration occurs not only in the sale process of intellectual property but also in its production.

The maturity of the national Technology Transfer system also consists in the capacity to integrate new entities focused on different research areas. Ensuring adequate public-private collaboration in these areas generates greater interest from all stakeholders in the practice of technology transfer and represents progress towards a higher degree of maturity like the most advanced European countries in technology transfer.

Another important aspect to favour the integration of stakeholders is the promotion of TT and the creation of a culture of innovation where students generate interest in participating. In this area all countries are making progress also thanks to the European guidelines that favour student mobility. However, this promotion must be accompanied by economic incentives such as internship contracts to provide a job viability that generates student interest. Examples include (CRG Summer Internship Programme, Marie Skłodowska-Curie Actions, Slovenian Young Researcher Program).

4.2 Capacity Building

The other aspect related to the participation of different people interested in TT is their academic preparation.

Capacity building for TT is crucial for ensuring that innovations move efficiently from research institutions to the marketplace. It focuses on equipping the relevant stakeholders (such as researchers, universities, businesses, government agencies, and TTOs) with the necessary skills, resources, and infrastructure to effectively manage the entire TT process.

Through each of the national studies, partners have analyzed if researchers have enough knowledge and awareness about IP and TT. This is a fundamental aspect for the objectives of the STEIDA project, since it is one of the points where it has the greatest impact.

Based on the information from the different national studies (and therefore from stakeholders and consulted bibliography), the partners of STEIDA assess in this section whether the is enough capacity building and awareness raising or not in each country:

There is enough capacity building and awareness raising?					
BULGARIA (BCCI)	**CROATIA (UNIZG)**	**SLOVAKIA (CVTI SR)**	**SLOVENIA (JSI)**	**SPAIN (BCC)**	**TÜRKIYE (KTU)**
Neither Agree nor Disagree	**Neither Agree nor Disagree**	**Neither Agree nor Disagree**	**Disagree**	**Disagree**	**Neither Agree nor Disagree**

BULGARIA (BCCI)

The majority of university professors consider as their main tasks teaching and research.

The third mission consisting in development of IP, Commercialisation of research and creation of relevant "value" for their university and for society is not a clear mandate and, in most cases, seems to be unknown.

CROATIA (UNIZG)

There is no formal education or training in IP and TT at HEIs which leads to a lack of understanding of the importance and implications of these areas in the work of researchers, staff, students. There is Postgraduate specialist university study programme Intellectual Property at University of Zagreb and some workshops or seminars on IP and TT which are available. EU funding and Horizon Europe projects are helping to increase the focus on innovation, IP, and technology transfer in Croatia. These programs encourage knowledge transfer between universities and industries, but Croatian institutions may still be in the process of fully developing their strategies and capabilities around these areas.

SLOVAKIA (CVTI SR)

Within the EU, however, the level of systematic support is at a higher level and it is therefore essential to significantly strengthen awareness and information about technology transfer among Slovak business as well as other research entities focused on the commercialisation of applied research.

SLOVENIA (JSI)

No formal education or training in IP and TT at HEIs.

Some faculties and research institutions offer basic understanding of IP and TT within other courses.

The new Consortium of TTOs at PROs plan to provide some trainings on these topics to raise awareness.

SPAIN (BCC)

The RedOTRI offers training on TT for TTOs staff.

However, several key competencies, such as commercialization skills, are still underdeveloped, and other areas, like patent information management, require greater emphasis and support.

Among students and teaching-research staff, there is currently no specific content or structured programs focused on TT, highlighting a gap in the integration of TT concepts into academic and professional development.

TÜRKIYE (KTU)

Türkiye's capacity building efforts in the field of technology transfer are progressing, notably through the active activities of technology transfer offices.

However, intellectual property (IP) and TT knowledge still remains limited due to resource constraints and lack of motivation among researchers and students.

While efforts to raise awareness among researchers and students continue, these efforts need to be strengthened to achieve more effective results. Many programmes are being launched and many TTOs are funded through incentives and support provided by TÜBİTAK and the Ministry of Industry and Technology. Within the programmes, there are opportunities to receive mentoring and training from leading TTOs.

While researchers who benefit from these programmes and TTO activities have the opportunity to learn more about IP and TT issues, the same cannot be said for researchers who are far from this ecosystem and do not continue their activities in this field. In this case, more efforts should be made to reach a wider segment and involve all researchers in these processes. There is no general training programme for TT in universities.

CONCLUSION OF THE CAPICITY BUILDING

Regarding capacity building in each country, there is a consensus between the partners that there are not enough tools.

One of the main issues is the lack of qualified workers with full-time contracts, which affects all models -but is more pronounced in less mature ones-. This reduces the professionalism and quality of research, as it is often carried out by less qualified personnel.

This issue arises because the working conditions that can be offered do not match the level of specialization of researcher personnel. As a result, in less developed centers where research and innovation are not the primary focus, activities often serve as learning opportunities for undergraduate or doctoral students. Consequently, it is challenging for these centers to produce marketable outcomes.

In more specialized structures, there is also participation by students in research, but it is not an educational activity per se. Instead, it involves mobility programs where students gain sector experience in research ecosystems focused on commercializing intellectual property. These programs are beneficial for both parties and encourage doctoral students to view research as a viable career option.

It is also necessary to review the incentive systems in the countries under discussion. All reports indicate that the respective countries have incentive programs in place. However, a consistent

trend of a significant decline in the number of doctoral candidates over time persists across all nations.

The only country showing a recovery after a downward trend since 2017 is Bulgaria (European Innovation Scoreboard). This improvement is attributed to its focused efforts on increasing access to education and creating incentives for doctoral research, such as the establishment of Centres of Excellence.

5 Relevance of services from TTO

Through the different national studies, the different services offered by the TTOs in each country have been analysed.

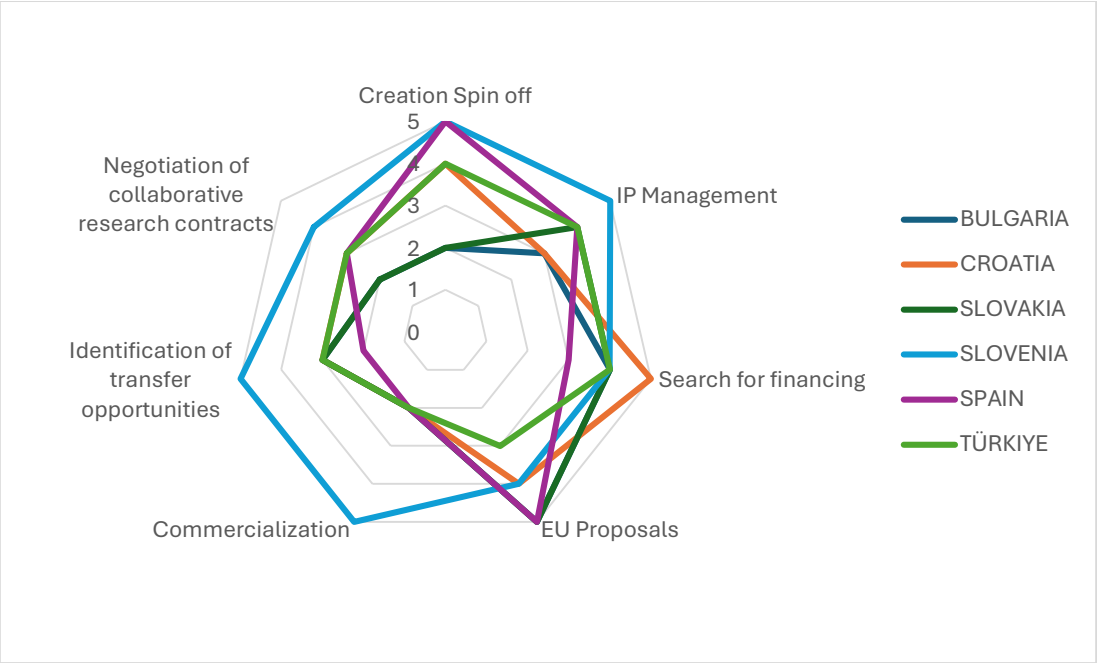
TTOs provide a wide range of services that help universities, research institutions, and other innovation-driven organizations successfully transition research and technological innovations to the marketplace. These services facilitate the commercialization of new ideas and the growth of innovation ecosystems. Some of the key services provided by TTOs in the countries analized include:

- **Creation Spin offs and spin outs**: TTOs play a key role in nurturing spin-offs and startups based on university research. This includes:
  - Incubation Programs: Providing office space, mentoring, and access to networks for new technology-based ventures).
  - Entrepreneurship training: Offering training to researchers on how to launch and manage a startup, including the development of business models and commercialization strategies.
- **IP Management**: TTOs help researchers and institutions manage and protect their intellectual property (IP), including patents, copyrights, trademarks, and trade secrets. This includes:
  - IP Identification: Identifying potentially valuable innovations that can be patented.
  - IP Protection: Filing patents, registering copyrights, and ensuring legal protection for inventions.
  - Licensing: Negotiating licensing agreements that allow companies to use the technology in exchange for royalties or other benefits.
- **Search for financing**: TTOs often assist in securing the necessary funding to develop and commercialize technology, including:
  - Identifying Funding Sources: Helping to identify public and private funding sources, such as grants, venture capital, and angel investors.
  - Pitch Support: Assisting researchers and entrepreneurs in preparing business pitches for investors.
  - Supporting Startups: Offering guidance on securing seed funding for startups based on new technologies
- **EU Proposals**

- **Commercialization**: TTOs support the process of bringing new technologies to the market by:
  - Business Development: Creating business plans, identifying commercialization pathways (licensing, startup formation, joint ventures, etc.).
  - Industry Partnerships: Facilitating collaborations between academia and industry to enhance commercialization opportunities
- **Identification of transfer opportunities**: TTOs support the identification of transfer opportunities by:
  - Market Assessment: Analysing the commercial potential of innovations through market research.
  - Industry Connections: Connecting researchers with potential industry partners, investors, and other stakeholders.
- **Negotiation of collaborative research contracts**: TTOs help negotiate contracts related to:
  - Licensing Agreements: Negotiating the terms of licensing deals, including royalty rates and sublicensing.
  - Collaboration Agreements: Drafting contracts for research collaborations and partnerships between academia and industry.
  - Non-disclosure Agreements (NDAs): Assisting with the legal agreements that protect sensitive information during discussions with potential commercial partners

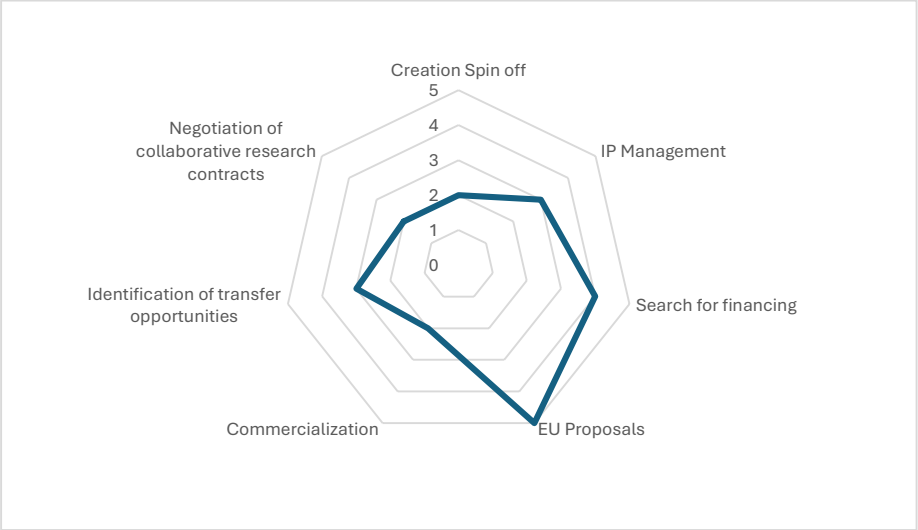
Based on the information from the different national studies (and therefore from the actors and the bibliography consulted), STEIDA partners assess in this section the relevance of these services offered by TT in each country.

For each of these services, the partners have evaluated if they are relevant from 1 (strongly disagree) too 5 (strongly agree).



Comparation of the relevance of TTO services in each country. Source: STEIDA

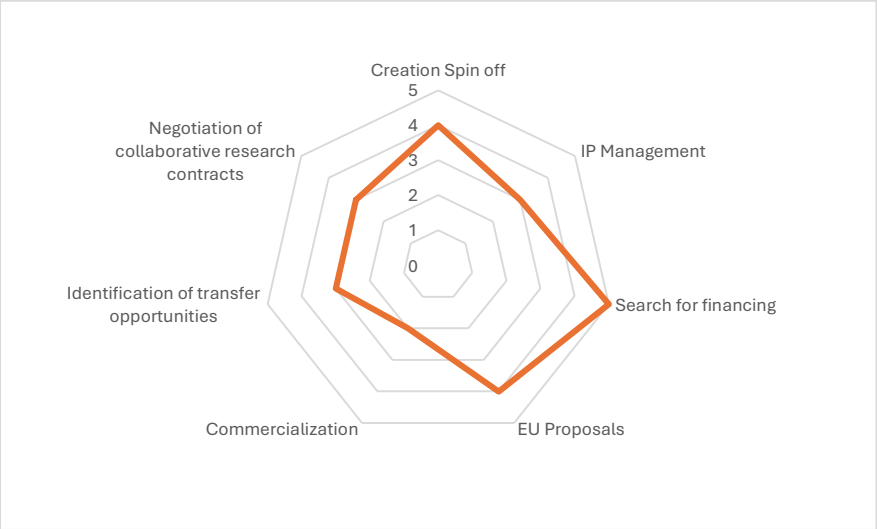
BULGARIA (BCCI)



Comparation of the relevance of TTO services in Bulgaria. Source: STEIDA

Service	Description
Creation Spin off	The spin-off option is a very recent opportunity for Bulgarian universities, which was introduced in 2020 with the adoption of the relevant legislation.
IP Management	Although TTOs offer IP management services, in some cases researchers prefer to manage IP themselves.
Search for financing	One of the main activities carried out by TTOs is related to the search for funding opportunities.
EU Proposals	TTOs are actively involved in applications, management and implementation of EU-funded projects.
Commercialization	TTO's competencies and capacity in IP commercialisation and marketing, with a few exceptions, are rather limited. They are rarely engaged in real IP protection and very seldom in IP commercialisation.
Identification of transfer opportunities	The cases of successful technology transfer are limited, though there are several good practices of identification of transfer opportunities, such as licensing and effective collaboration and contractual research.
Negotiation of collaborative research contracts	Researchers often avoid formal contracts or choose to enter into contracts with industry only on private basis.

CROATIA (UNIZG)

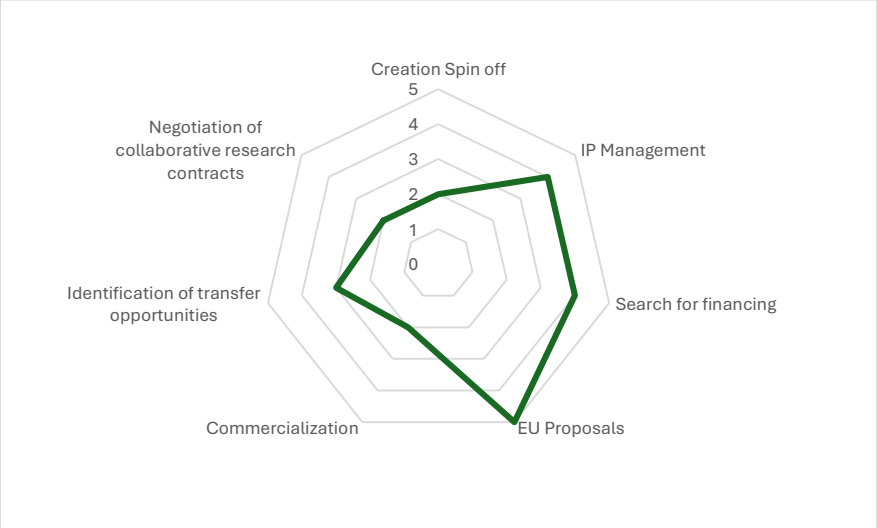


Comparation of the relevance of TTO services in Croatia. Source: STEIDA

Service	Description
Creation Spin off and spin out	In Croatia the biggest support related to TT is based on encouraging the entrepreneurial activity of young researchers through incentives for starting their own start-up/spin-off companies. It is relevant option because is available to most stakeholders (several programs and funding options).
IP Management	Although HE institutions have legal framework for IP management (Guidelines and Rules on Technology Transfer form University of Zagreb) which regulate IP ownership and set guidelines for industry engagement, the process of patenting and licensing of IPRs is time-consuming, intensive, and legally complex and (due to lack of experienced staff) usually there is a need for external experts in that field.
Search for financing	The main TTO activity is to find funding opportunities and disseminate the information.
EU Proposals	TTOs are involved in project applications through support about the relevant Calls for proposals, project applications and project management but mostly in providing legal information, documents and similar.
Commercialization	There are programs through NPOO, Zicer, Nuqleus that provide support but there is not enough capacities or experts to provide full commercialization support through TTOs since this is very specific skill.
Identification of transfer opportunities	There are programs through NPOO, Zicer, Nuqleus that provide support but. This is relevant but there is no established network for sharing this kind of information and every HE institutions manages this on individual level through some internal contacts and networks.
Negotiation of collaborative research contracts	There are programs through NPOO, Zicer, Nuqleus that provide support as well as Technology Transfer Center at the University of Zagreb which provides technical support.

	There is not a lot of this kind of contracts, so it is quite new for Croatian ecosystem. Contracts are mainly managed by TTOs with the support of law experts.

SLOVAKIA (CVTI SR)

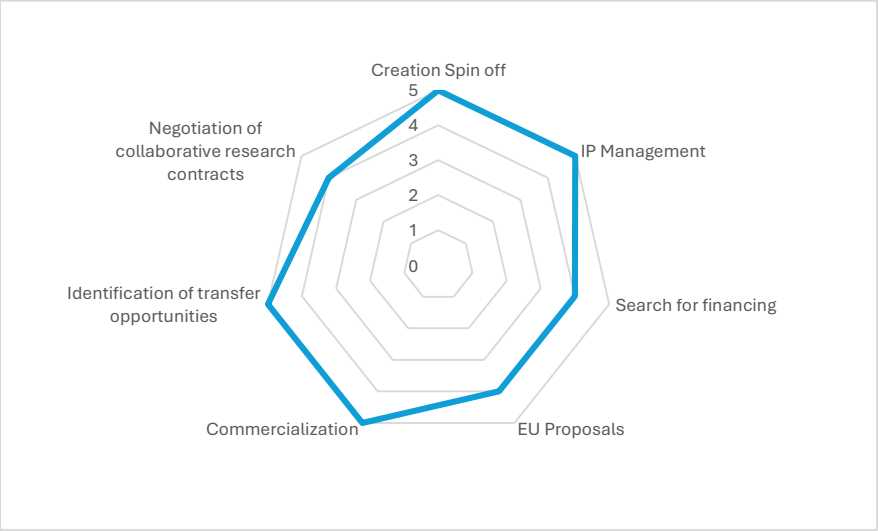


Comparation of the relevance of TTO services in Slovakia. Source: STEIDA

Service	Description
Creation Spin off	Establishing innovative companies in the form of spin-offs is a little-used method of commercialization, the only exceptions are individual Slovak universities, which pay special attention to this form of commercialization.
IP Management	This is one of the main functions performed by TTOs. Established centers providing comprehensive support for the management of intellectual property rights in a given institution.
Search for financing	CVTI SR created and operates a nationwide infrastructure to support the transfer knowledge and technologies into practice through national projects (National infrastructure for the support of technology transfer in Slovakia - NITT SK in 2007-2013 program period and NIIT SK II implemented in 2014-2020.
EU Proposals	Slovakia is one of the most dependent countries on EU funds in the EU-27, ESIF and the Framework Programme for RTD (Horizon) form the core, while EEA and Norway Grants also provide opportunities for collaborative bottom-up innovation projects, also involving SMEs. TTOs and project offices at the universities and public research institutions are helping researchers in the management of EU programs.
Commercialization	Of all forms of commercialization, direct collaborations between commercial entities and specific departments within a scientific research institution predominate. These include forms such as joint research, commissioned research and consultations. Commercialization in the form of so-called classic transfer – in the form of licensing protected technologies – is minimal to zero. TOs do not have competences in the area of direct cooperation of

	institutions with industry. In the area of licenses, things have improved a little. TTOs develop basic activities in the area of commercialization, improvement is inevitable. They are currently supported in this by CVTI SR.
Identification of transfer opportunities	TTOs provide sufficient support in identifying technology transfer opportunities within their personal capacities that are often limited.
Negotiation of collaborative research contracts	Institutions cooperate with practice, but TTOs do not have competence in this area, so they do not provide them with direct support.

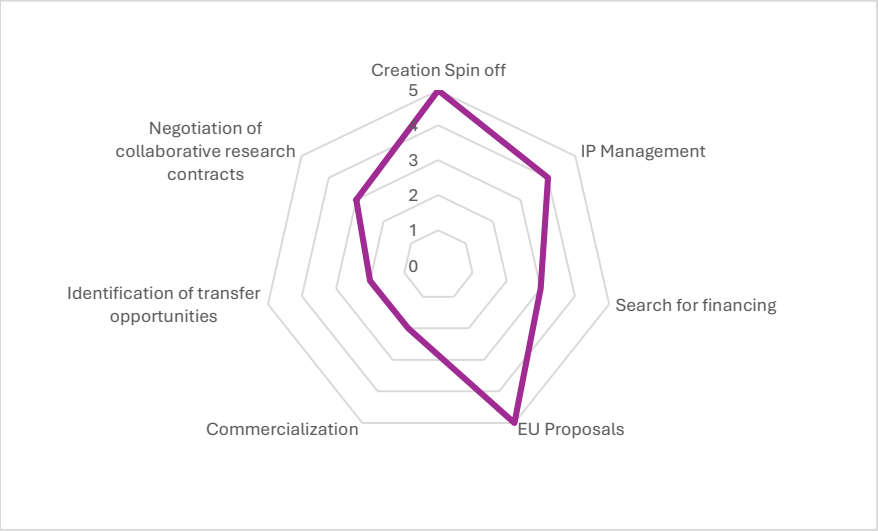
SLOVENIA (JSI)



Comparation of the relevance of TTO services in Slovenia. Source: STEIDA

Service	Description
Creation Spin off	The biggest HEI established incubator which offers full support in creation of innovation technology startups and spin-offs/outs. Also, technology park offers some specific programmes. TTOs at the major research institutes help researchers to create spin-offs/outs.
IP Management	TTOs cover full support in IP management and work with external patent offices and attorneys in IP protection.
Search for financing	TTOs collect and disseminate information on different financing mechanism to support IP topics (national and international calls, venture capital schemes, various other financial supportive mechanisms).
EU Proposals	TTOs actively participate in EU proposals on topics concerning IP protection, commercialization, exploitation. They also distribute information on different calls and help to match partners for joint proposals.
Commercialization	TTOs are fully involved and highly active in commercialization of knowledge (market search, looking for partners and end users, offering basic support for business proposition).
Identification of transfer opportunities	TTOs help researchers to identify most appropriate transfer opportunity (licensing or selling IP, collaborative or contractual research).
Negotiation of collaborative research contracts	TTOs provide support in negotiating research collaboration agreements in topics concerning IP topics.

SPAIN (BCC)



Comparation of the relevance of TTO services in Spain. Source: STEIDA

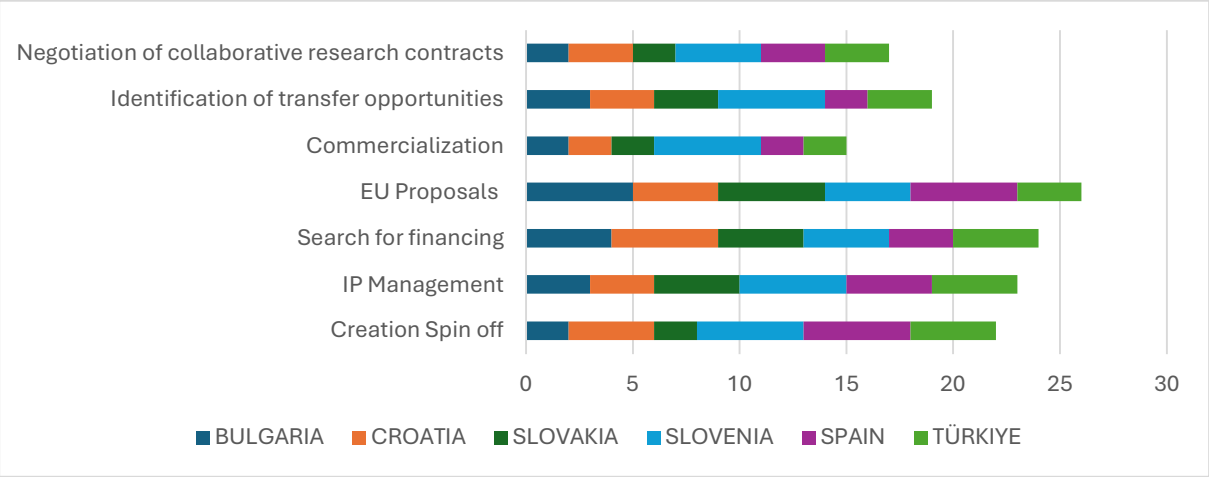
Service	Description
Creation Spin off	Most (nearly all) universities have acceleration programs. The technological parks also offer services and space for them. Nevertheless, it still is not a successful business in many cases for universities.
IP Management	This is one of the main functions of TTO, although in most cases is externalized.
Search for financing	TTO usually offers search for funding related to EU programs specifics for research. The search of private funding (VC) or other public funding has to be improved.
EU Proposals	Many TTO have their main activity helping researchers in the management of EU Programs (request, justification...).
Commercialization	The lack of contact with companies (and the match with their needs) and the lack of resources are some of the factors that explain this.
Identification of transfer opportunities	In many universities, it is difficult for the TTO to access all research groups and so, to all the projects.
Negotiation of collaborative research contracts	Not all contracts are managed by TTO, but when they are, TTO offers support for this activity.

TÜRKIYE (KTU)

Comparation of the relevance of TTO services in Türkiye. Source: STEIDA

Service	Description
Creation Spin off	TTOs play an adequate role in encouraging the formation of spin-off companies, most TTO's have acceleration and/or pre incubation programs but more resources and support are needed to accelerate the process
IP Management	Intellectual property management is one of the main services of TTOs and support is provided in this area, but lack of resources limits effectiveness
Search for financing	There are financial resources established for TTOs. For entrepreneurs and R&D, there are investors and public funds.
EU Proposals	Although support is provided by TTOs in applying for EU projects, there is a need to improve the knowledge and experience required for international projects.
Commercialization	While TTOs have an important role in commercialization processes, more resources and collaboration are needed to accelerate startups to market
Identification of transfer opportunities	TTOs provide sufficient support in identifying technology transfer opportunities, but need to be more proactive in the discovery and assessment of opportunities
Negotiation of collaborative research contracts	TTOs provide support in negotiating research collaboration agreements (preparing contracts, arranging meetings, etc.). Capacity building is needed to manage negotiations more effectively

CONCLUSION OF THE RELEVANCE OF SERVICES FROM TTO



Comparation of the relevance of TTO services in each country. Source: STEIDA

There is consensus among partners that most TTOs dedicate their efforts to finding and managing funding opportunities (such as EU projects).

The third most relevant activity is also administrative, it's the management of IP.

The creation of spin-offs is the main activity for generating business opportunities.

Activities specifically related to links with other actors (identification of transfer opportunities, negotiation of collaborative research contracts or commercialization) occupy the last places of relevance in all the countries analyzed.

The difficulties that the countries share in the aspects discussed in this section are generated by the structural problems that have been repeated throughout the study.

All reports agree that the effectiveness of the services provided by the offices is limited by a lack of funding and expert staff. The service most affected by this problem in all countries is the commercialization of IP. To this we must add the general phenomenon of weak relations with the private sector. This coincides with the great European problem of the difficulty of commercializing our intellectual property.

With the exception of Bulgaria and Slovakia, all countries agree that the main activity of OTTs is the creation of new spin-off companies. This is due to the maturity of a system of scientific and technological parks and incubators (integrated in both the public and private systems) that generate an ecosystem conducive to the creation of new spin-offs with the capacity to commercialize their product.

Croatia, although it has a level of development like Bulgaria and Slovakia, has focused the efforts of its state plan on creating a system of infrastructure and financial aid that has allowed the creation of spin-offs and start-ups to be one of the main activities of its technology transfer offices. This has favored the emergence of new technology-based companies with a high participation of young research personnel.

With respect to the European Union, we observe that in general all countries maintain a strong commitment to the EU guidelines and the respective offices support the European programs that are being developed in the field of TT. However, these programs represent more of an effort than a return of benefits for the development of TTOs, since they are not the beneficiaries of the policies, but rather the intermediaries.

6 Conclusions

Finally, below is a summary of the main differences and similarities observed through the national TT reports carried out in this STEIDA activity.

Key Similarities observed though the national TT reports:

1. **EU Funding**: All countries benefit from EU-funded programs like Horizon Europe to support research and innovation.
2. **Growing Focus on Innovation**: There is a general trend towards increasing governmental and institutional focus on fostering innovation and improving the commercialization of research outputs.
3. **Industry-Academia Collaboration**: Many of the countries have established initiatives or organizations focused on improving the connection between universities/research institutions and the business sector, though the extent of this collaboration varies.

Key Differences observed though the national TT reports:

1. **Maturity of TT Systems**: Spain has the most mature TT system (although with many regional differences), while Bulgaria and Croatia have emerging systems with a strong emphasis on EU support.
2. **Key Organizations**: Each country has its own leading bodies for TT, with Spain and Türkiye having a variety of government agencies dedicated to supporting R&D and commercialization.
3. **Challenges**: The biggest challenge across the countries is the gap between academia and industry, but it is more pronounced in countries like Bulgaria, Croatia, and Slovakia, which are still developing their TT frameworks.

The studies carried out also highlight the need for spaces that facilitate technology transfer, as well as improving the training and skills of TTO staff.

In this context, the digital platform and the different training materials that the STEIDA project will provide will contribute to the mitigation of these two aspects.