Creating Conditions for an Active Role of Public Administrations in Academia-Industry Cooperation: an Overview of Critical Points Through the ExSACT Project

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ABSTRACT

The ATTRACT European Scientific Research Infrastructures (ERIs) have formed an ERI Innovation Ecosystem (ERI-IE) as an essential tool in boosting academia-industry collaboration. The state administration encourages academia-industry (co)operation with financial incentives. However, it still encounters rules and legislation to protect competition in the free market imposed within state aid limitations. Due to limited recognition of state aid practices, the allocation of funding and intellectual property rights (IPR) needs management given state aid restrictions. Ambiguities result in state investments into academia-industry collaboration or research/technology infrastructure (RI/TI) usage needing improvement and simplification. This status quo, therefore, necessitates an examination of this field – to explore the effect of the state administration on financing research, RI/TI and IPR transfer procedures through state aid rules abiding (RI/TI and IPR) management. The following paper presents existing conditions and the most common challenges for creating conditions for an active role of public administrations to mitigate risks in academia-industry cooperation (in the EU). It concludes with state-of-the-art results obtained through the project ExSACT.

KEYWORDS

IPR, Protection, Public Administration, Role, Technology Transfer, Challenges, EU, ExSACT

1 INTRODUCTION

1.1 The Baseline and Status Quo

The ATTRACT European Scientific Research Infrastructures (ERIs) have formed an ERI Innovation Ecosystem (ERI-IE) as an essential tool in boosting academia-industry collaboration. ERI-IE operates in the global competitive environment wherein technological development is one of the few competitive levers capable of added value creation [1, 2].

The state administration encourages academia-industry (co)operation with financial incentives. Still, it encounters rules and legislation to protect competition in the free market imposed within state aid rules. The regulations, however, do allow the granting of aid within substantive exceptions (e.g., particular importance for development), special conditions (advance notification of state aid to the European Commission (EC) and its consent), or in a simplified form up to a certain amount (de minimis rule). Due to limited recognition of the state aid rules, the allocation of funding and IPR needs management given state aid restrictions. Ambiguities result in state investments into academia-industry collaboration or limited and complicated research/technology infrastructure (RI/TI) usage. The provision of state aid and understanding or lack of knowledge thereof may thus support or slow down such investments and the smooth transition of technology through the technology readiness level (TRL) with the involvement of the ERI-IE [1, 2]. Improving the understanding the state aid rules in financing research, RI/TI's use, and IPR transfer procedures within ERIs collaborative projects with industry would improve incentives efficiency for research to the economy transition. To address the current status quo, the following research question(s) have been defined to guide research in the ExSACT project (Enable State Administration to be an Active Contributor in the Process of risk Absorption and Risk Reduction Through IPR and State Aid):

How to simplify and optimise public investments (into):

a) research and technology infrastructures;
b) background and foreground IPR;
c) when academia-industry collaboration is in question, must state aid regulations be considered?

The research will, therefore, in the domain of crucial objective, explore the state administration's effect on financing research, RI/TI, and IPR transfer procedures through the state aid rules abiding (RI/TI and IPR) management. After successfully addressing the crucial objective, a seamlessly integrated ERI supporting research and economy from knowledge creation through defining IP to commercialisation with proper funding, given state aid limitations, would:

a) enhance investments;
b) lower risk; and
c) enable involved stakeholders to bring more science to everyday use.

A better understanding of RI/TI use and IPR contractual issues concerning state aid rules will be easier to implement by the state administrations of the ERI-IEs.

2 METHODOLOGY

To achieve the crucial objective and for a better understanding of RI/TI use and IPR contractual issues concerning state aid rules and more straightforward implementation by the state administrations of the ERI-IEs, quantitative and qualitative research has been carried out, namely:

1. analysis of the critical points of RI/TI and IPR management;
2. preparation of a review of systems for valuing transferring IPR in collaborative projects in the ERI-IE;
3. preparation of a review of the regulation of the state aid system in RI/TI and IPR management;
4. preparation of a proposal for a sustainable system and changes to be implemented for more effective financial support of the innovation system, following and properly manifesting the EU state aid rules in the ERI-IE of ATTRACT.

A quantitative and qualitative analysis of critical points for the transfer of IPR and the development of guidelines for the management of IPR in joint research and development (R&D) projects has been carried out based on secondary data and primary data, obtained through semi-structured interviews. The research includes:

1. an international comparative review of systems for valuing the market value of IP rights in collaborative projects and a comprehensive process of detection registration of IP as an intangible asset and IP valuation;
2. a review of the regulation of the state aid system and a proposal for a sustainable system of the state aid system and the changes.

3 PRELIMINARY RESULTS

3.1 RI/TI and IPR Management Critical Points

Research infrastructures (RIs) are the scientific community's facilities, resources, and services to conduct top-level research. They can be single-sited, distributed, or virtual. RIs include major scientific equipment or sets of instruments, collections, archives or scientific data, computing systems and communication networks, and any other research and innovation infrastructure of a unique nature that is open to external users. RIs are organised and financed at the regional, national and European levels [1].

Technology infrastructures (TIs) are similar to RIs. Still, they are primarily intended for industrial users, including small and medium enterprises (SMEs), which seek support to develop and integrate innovative technologies to commercialise new products, processes, and services. TIs can have public, semi-public, or private status. Like RIs, TIs are organised and funded on different levels [3].

Although there are some differences between RIs and TIs, many infrastructures fit into both groups. The primary objective of an RI is to establish and operate on a non-economic basis. However, they can carry out limited economic activities if closely related to their principal task and not jeopardise their achievement.

The primary goal of a TI is to support SMEs and industry to develop the technologies with its help. In the case of TIs, economic activities are encouraged. However, these are sometimes partially financially supported by public means.

RIs and TIs should share information about their resources and services publicly. The price for using RIs and TIs can be set on a non-economic basis, using the cost approach, or on an economic basis, using the market approach, the cost approach, or the income approach.

Public higher education and public research institutes may, as stated in Article 21 of the Slovenian Employment Inventions Act (ZPILDR), establish: (i) organisational infrastructures necessary for dealing with inventions; (ii) the rulebook, which regulates the process of taking over official inventions in a way that is adapted to the needs of scientific research work and the publication of scientific achievements; (iii) the shares determined by the regulations, which belong to the institution, the unit of the institution in which the inventor is employed, and the inventor(s), in the exploitation of the invention, whereby the share of the award to the inventors must not amount to less than 20% of the gross license fee that the institution receives from exploitation of the invention. Pursuant to Article 21 of the Act on Inventions from the Employment Relationship, upon fulfilment of the above conditions (i, ii, iii), the state is specifically obliged to provide funds for the organisational infrastructure necessary to deal with inventions according to the provisions of this Act and for their effective exploitation [4].

The EC recommends that public research organisations should have technology transfer strategic missions and policies. IP should be suitably managed by promoting its identification, exploitation and, where appropriate, protection in line with the strategy and mission of the public research organisation and to maximise socioeconomic benefits [5]. To this end, different strategies may be adopted – possibly differentiated in the respective scientific/technical areas – for instance, the ‘public domain’ approach or the ‘open innovation’ approach. Appropriate incentives should be provided to ensure that all relevant staff play an active role in implementing the IP policy.

The Slovenian ZPILDR does not envisage organisational infrastructure and financing for companies, only those intended to prepare, protect, and market IP [4].

Large companies often have their own departments with experts in IP management, while small companies mostly outsource legal, financial and accounting support related to IP. SMEs aware of IP protection often turn to patent attorneys for help preparing and protecting IP. Both companies and public research organisations (ROs) usually hire external patent attorneys to conduct IP protection procedures at the IP offices. Bigger companies that file many patent applications normally also have internal patent attorneys.

Research & technological infrastructures and suitably protected IP rights are key elements that support successful technology transfer from research organisations to industry. In this way, science returns benefits to the economy as the public budget generator. Cooperation of ROs with the economy in general is divided into the following activities [6]:

1. contractual cooperation with the economy, which includes consulting, contract research and collaborative research;
2. commercialisation of IP by establishing spin-off/spin-out companies;
3. licensing and sale of RO's IPR;
4. communication through public announcements and events;

5. teaching;
6. exchange and transfer of personnel.

EC has set rules on state aid regarding cooperation between academia and industry, more specifically in collaborative research, contract research/research service, licensing and consultancy – COMMUNICATION FROM THE COMMISSION, Framework for State aid for research and development and innovation (2022/C 414/01) [7]. In order to understand these rules and use them in practice, different guidelines and examples have been presented [8, 9]. We however believe that the awareness of these rules is insufficient. Public administrations could be more actively involved by providing educational materials, organizing info days and similar. Relevant stakeholders like technology transfer offices, financial offices, decision-makers in research organizations and companies should be involved.

3.2 Quantitative Analysis of IPR Transfer

As part of the ExSACT project within the ATTRACT phase 2 initiative, a survey was administered to 18 participating research & development & innovation (R&D&I) project partners. Responses from 29 individuals representing 16 different European projects were collected between April and June 2023. The majority of respondents were affiliated with start-ups (10), followed by universities (8), research institutes (5), small enterprises (5), micro-enterprises (3), large enterprises (3), and spin-off companies (2). Notably, seven individuals were employed at two separate institutions. More than 90% of the R&D&I projects our respondents are part of use their own IP. However, less than 25% of them successfully licensed it to other organisations. This implies that organisations are aware of the importance of IP. However, they need substantially more encouragement and assistance in licencing, for example, through better collaboration with their technology transfer offices. Almost 80% of respondents reported that individuals or offices for handling IP are well known in the involved organisations. More than half of the organisations highlight IP as part of their marketing strategies. However, only half of them consistently reward the inventors for the successful commercialisation of inventions. This, coupled with the fact that only 45% of individuals had a positive experience in managing IP rights in collaborative projects involving research organisations and companies, and even less (34%) of them had a positive experience in valuation and determination of the price value of said IP, might discourage employees from seeking appropriate IP registration and commercialisation.

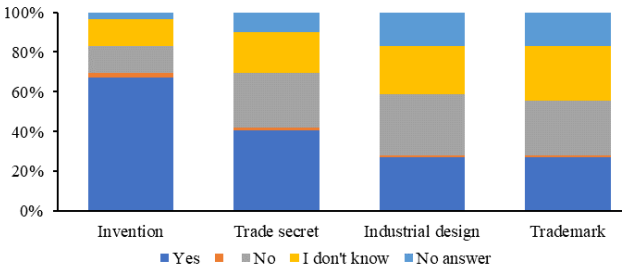

Figure 1: Transparency of procedures for the internal registration of IP.

Internal IP registration procedures in the involved organisations are most transparently regulated for inventions (69%) and trade secrets (41%), such as software and secret know-how, as seen in Figure 1. It is also apparent from the results that certain forms of IP, such as industrial design and trademark, are poorly represented and constitute a potential source of previously unprotected IP. In the involved organisations, the largest share (55%) of marketing is devoted to products and services, followed by marketing of IP (41%). Additionally, more than half of the involved organisations search for market connections through market and potential partner monitoring. Based on our survey results, organisations do not sufficiently encourage joint national or EU project applications (34%) or the joining of consortia (28%).

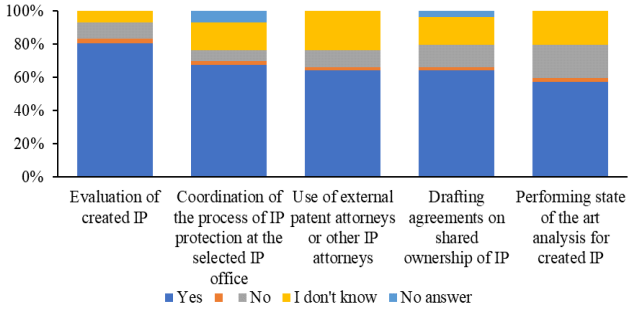

Figure 2: The most well-known offered IPR-related services.

The most common (83%) and well-known offered IP-related process in the involved organisations is the evaluation of created IP. The least common (21%) is the use of patent or IP attorneys, as seen in Figures 2 and 3. Given the frequent occurrence of IP in these projects and organisations, there appears to be great potential for multilevel IP analysis, thereby improving its quality.

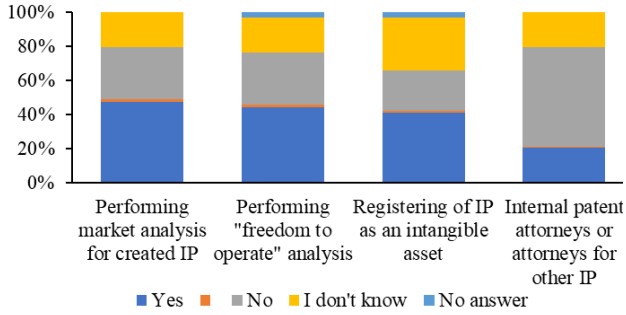

Figure 3: The least known offered IP-related services.

The level of uncertainty about whether a particular IP-related service is offered at included organisations was, except for evaluation of created IP, coordination of IP protection processes and drafting agreements on shared ownership of IP, such as inventions, more than 20%. Notably, 31% of survey participants were uncertain whether their technology transfer office handles IP registration as intangible assets. This could be resolved by better promoting IP-related processes by the designated technology transfer offices.

3.3 Qualitative Analysis of IP and State Aid Rules Within the ATTRACT Project

Five ATTRACT project partners from different R&D&I projects participated in semi-structured interviews, collectively providing insights into various topics related to IP and the application of state aid regulations. Interviewees were mostly researchers and group leaders from research organizations and companies. The prevailing IP form anticipated to emerge from these projects are patents, followed by secret know-how and trade secrets. While all interviewees exhibited familiarity with the EC's regulations about state aid for R&D, a notable point of consensus among them was their shared frustration regarding these rules. They noted how these regulations force them to set an excessively high market price for their products, making them less appealing to potential investors and hindering their progress.

Technology transfer offices are common within academic institutions, whereas start-ups, spin-offs, and SMEs rely on external IP attorneys.

Our interviewees noted a prevalent issue within university technology transfer offices, namely, their understaffing. As a result, the researchers often need to perform specific time-consuming tasks, such as conducting state-of-the-art analyses. Furthermore, a noteworthy observation made by one of our interviewees was the existing disparity between laboratory research and the process of bringing innovations to the market. The absence of direct communication channels between scientists and the industrial sector exacerbates this gap. Interviewees with ties to the academic world expressed frustration over the extended duration of the patent application process. In some cases, they deemed it more advantageous to prioritise publishing research papers to earn recognition for career advancement over safeguarding their IP, particularly when dealing with patents of limited or negligible exploitable potential. Furthermore, laboratories or SMEs occasionally preferred maintaining their developed IP as a trade secret rather than pursuing patent protection, ensuring their knowledge remained concealed.

4 CONCLUSION

Public funding for R&D is subject to critical scrutiny by the public and state-level decision-makers about the effectiveness and rationale for increasing funding for science. The impacts of science on social well-being are long-term and primarily indirect. If we recall – the EC recommends that public ROs should have technology transfer strategic missions and policies. IP should be suitably managed by promoting its identification, exploitation and, where appropriate, protection in line with the strategy and mission of the public ROs and to maximise socioeconomic benefits. To this end, different strategies may be adopted – possibly differentiated in the respective scientific/technical areas – for instance, the ‘public domain’ approach or the ‘open innovation’ approach. Appropriate incentives should be provided to ensure that all relevant staff play an active role in implementing the IP policy.

As seen from the preliminary results of the ExSACT project, they are already an essential source of feedback for public administrations on state aid for R&D. The current recognition of familiarity with the EC's regulations about state aid for R&D is particularly crucial. In our sample, most of the interviewees are familiar with these rules, but their detailed familiarity can be questionable. As observed by interviewees, it is important that supportive units such as technology transfer and financial offices, which (should) understand state aid rules, support academia-industry cooperation. We recommend that all staff of these offices are properly trained and enough manpower is provided to these offices. The preliminary results dictate our future work, which will also focus on those points that we did not initially expect to be given such high priority by the interviewees. In future, a comprehensive overview of awareness in public research organisations and companies about the state aid rules will be a subject of research, including a larger actual sample of organizations and offices. An internationally comparative view on the regulation of the state aid system in infrastructure use and IPR transfer in cooperative R&D projects in the ERI-IE based on good practices of the general procedure for using the state aid system will be prepared to guide the users and the state administrations of the ERI-IE countries for maximum impact delivery with least friction among the stakeholders possible.

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