



Stimulating science-business links: lessons from the Policy Support Facility

By Manfred Spiesberger, Centre for Social Innovation (ZSI)

Science-business links (SBL) are an important element of research and innovation (R&I) policies in EU Member States and in countries associated to the Horizon 2020¹ funding programme. SBL remain high on the policy agenda of several countries as they try to catch up with innovation leaders in the EU by leveraging their science base and research investment for the benefit of the national economy and society. These vital links foster knowledge transfer from research to business and facilitate research and business collaborations which make companies more competitive, leading to increased employment, and helping to address societal challenges such as clean energy and better health systems.

But where does this much-needed innovation typically emanate from? Universities and public research organisations are not the primary source. Innovation in firms is mostly triggered by market sources through suppliers, customers, and competitors. SBL are a challenging field of R&I policies, because in many countries collaboration between the scientific and business worlds is neither close nor intense enough, framework conditions are often unfavourable for researchers to engage with business, or incentives for science-business cooperation are missing altogether. And reliable evidence on the effects and benefits of SBL measures is still limited.

When designing SBL policies and a portfolio of related measures, it is necessary to take the local situation and purpose of the measures into account. Differences in the development stage of a country, in the state of the public science base, in R&D performance of the business sector, and in sectoral specialisation have to be considered. Measures that work in one country do not necessarily work in another or may need adapting to different contexts. For example, a network of technology transfer offices (TTOs) at major research institutions may be suitable for a technologically advanced country with strong research performers, whereas for a small country, which is catching up on innovation, one centralised TTO can fulfil the purpose. For SBL to flourish, a functioning and sufficiently financed education and science system is required, as well as a set of innovative companies, or companies that are willing to absorb knowledge.

Support for SBL development has been requested under the EU Horizon 2020 Policy Support Facility (PSF), especially from Central and Eastern European and Former Soviet Union (FSU) countries. These countries are marked by a traditional division between science and education, and weak links to business. Science was performed in public research organisations (especially academies), while education was the task of universities. These countries have also typically a limited number of research or high-tech based innovative companies. However, several companies are innovative in the local context by absorbing technology and know-how from abroad, or by developing home-grown solutions for the local market.

Examples of the support provided by the PSF are the Peer Reviews of the Research and Innovation systems of [Bulgaria](#), [Moldova](#), [Ukraine](#) and [Hungary](#), and three Specific Support actions for [Lithuania](#), [Slovenia](#), and [Georgia](#). Also, the most recent Peer Review of [Estonia](#) and a Specific Support to [Tunisia](#) have identified science-business collaboration as an essential challenge of these R&I systems. The EU members among these have been implementing measures for improving science-business links for several years, while in the FSU countries, Ukraine, Georgia and Moldova, SBL are at an early stage of development. Tunisia has no tradition at all of research-business cooperation.

¹ Albania, Armenia, Bosnia and Herzegovina, Faroe Islands, the former Yugoslav Republic of Macedonia, Georgia, Iceland, Israel, Moldova, Montenegro, Norway, Serbia, Switzerland, Tunisia, Turkey, Ukraine.

Furthermore, three Mutual Learning Exercises (MLE) under the Policy Support Facility have dealt with SBL involving a variety of EU countries. The '[MLE widening and synergies](#)' exercise addressed the science-business collaboration as a means of improving participation in the EU's Framework Programmes for Research and Innovation by Member States and countries associated to the programme. Meanwhile, the '[MLE evaluation of complex public-private partnerships \(PPP\) programmes in science, technology and innovation](#)' (STI) covered a broad number of issues along the life cycle of a PPP for R&I, from design to the evaluation. Finally, the '[MLE on stimulating business R&I](#)' examined PPPs as a method to stimulate research and innovation activities in the business sector.

How do science-business links work?

Science-business links foster cooperation between universities and research organisations (mostly public) with businesses (mostly private for-profit). SBL can be stimulated through various channels including favourable framework conditions, collaborative R&I activities in the frame of joint projects or partnerships, and incentives for enhancing SBL. They can be classified into three main groups.

1. **An enabling environment for SBL:** governance of R&I policies, rules and regulations including for intellectual property rights (IPR), knowledge and technology transfer offices, science and technology (S&T) parks and incubators, and entrepreneurship education;
2. **A portfolio of publicly financed support instruments** for stimulating SBL, especially for collaborative research, including innovation vouchers, collaborative R&D grants, PPPs, and cluster policies;
3. **Incentives for SBL** encouraging research organisations and businesses to collaborate with each other, such as making it an important element in performance assessment, and mobility schemes, in particular industrial PhDs, and support for spin-offs.

Policy recommendations for solving challenges around SBL

Well-established policies among leading innovator countries can be used as inspiration for designing policy measures, but they need to be adapted to local circumstances and/or tested whether they can be applied in a different context. The challenges and weak spots of the countries reviewed under the PSF have been addressed with recommendations along the three main groupings above.

1. **SBL need a proper enabling environment** to tap into their full potential. Coherent **governance** of innovation policy among key governmental actors is a key issue. The ministries responsible for research, regional development and the economy, as well as their implementing agencies for R&I funding and support, need to work in a well-coordinated manner towards the common goal of an innovative economy and society, and therefore towards enhancing science-business links. Weak coordination among the actors responsible for research and those responsible for innovation could be observed in Georgia, for example. A forum or body coordinating ministries and R&I agencies at a working level was lacking, while a high-level Research and Innovation Council under the chairmanship of the prime minister could not fulfil this function. Limited coordination and complementarity of support measures was also highlighted in the Hungarian review. A proliferation of measures, and constant redesign and renewal hampered coherent innovation policy, and key players experienced difficulties in adopting them. In the case of Slovenia, it was found that frequent reorganisations led to an organisational scheme where R&D, on the one hand, and technology and innovation, on the other, were located in different ministries. Such a governance arrangement is not rare in EU countries, but in the case of Slovenia, these actors were disconnected with insufficient strategic and day-to-day cooperation and coordination.

Rules and regulations need to be conducive to SBL. In Hungary's case, representatives of business enterprises stated that universities had slow and complex decision-making processes, which discouraged potential partners from the private sector. Adequate **regulation of IPR** policies at the national level, and at the level of the research institutions, is another enabler for SBL. In most EU countries these regulations foresee ownership of IPR by the research institution, while allocating a share of the exploitation and revenues to the author of the IP (researcher). PSF expert reviews of both Bulgaria and Georgia pointed to the need for establishing such institutional IP policies at public universities and research organisations. In Bulgaria, only the Academy of Sciences had at the time of the review set up some kind of institutional IP policy, while public universities and other public research organisations had not. Only with a reliable IP framework can researchers realise the full potential of their inventions.

Knowledge and technology transfer offices provide support and guidance on IP protection and exploitation. They facilitate contacts with business and other users of technology and knowledge, and they help with academic spin-off creation and the search for funding. In EU Member States these offices are located usually within large universities and public research organisations. Depending on the size and maturity of a country's innovation system, a central office taking care of all research institutions can also be a solution. For Lithuania, the panel saw a need to further

reinforce and “federate” the network of university TTOs and industrial liaison staff. Experts for Georgia suggested a more modest approach, with a network of individual brokers at universities and public research organisations instead of a fully-fledged centralised TTO, which was being considered by the Georgian Innovation and Technology Agency.

Science and technology parks and incubators provide a conducive environment for innovative companies and academic spin-offs to develop. They require a certain investment for establishing them, and also for the running costs if they are not self-sustainable. This was not self-evident in the countries reviewed by the PSF due to the cost involved. In the Moldovan review, the expert panel questioned the performance and use of three S&T parks and seven incubators, calling for an evaluation of their effectiveness in supporting innovation. In the ‘MLE on widening and synergies’, the Slovenian S&T park and incubator infrastructure was offered as a benchmark.

Entrepreneurship education teaches young researchers about business opportunities and equips them with project management skills. This prepares them for collaboration with business and for employment in the private sector, issues that were highlighted in the Hungarian review.

2. A portfolio of stimulation instruments is necessary for SBL, ranging from low-cost measures with low barriers to entry, to large-scale collaborative projects, to competence centres and PPPs demanding significant public investment which is difficult for countries such as Georgia, Tunisia and Ukraine to find. These lower- to middle-income countries, having only recently become associated to the Horizon 2020 programme, are catching up in terms of innovation and SBL policies. Recommendations therefore focused on establishing meaningful portfolios of stimulation instruments including vouchers and collaborative R&I grants, and on putting innovation and SBL policies higher on the agenda in national strategy documents, and on improving coordination among stakeholders.

EU Member States, in particular the newer ones, have benefited from structural funds for introducing and financing SBL measures. This leads, paradoxically, to another challenge; a lack of programme **continuity**, which is necessary for research and business actors to develop lasting collaboration in a stable environment. In the case of Slovenia, experts stated that many instruments suffered from a ‘stop and go’ policy due to discontinuity in financial flows from the structural funds or other budgetary restraints. This situation was evident in Hungary. In Slovenia, some measures including innovation vouchers and schemes promoting young researchers in industry were abandoned, despite being positively viewed by participants. Another effect was that competence centres, which require a long-term commitment, were sometimes only created as short-term or phased projects.

Innovation vouchers are a widely used instrument for encouraging small and medium-sized enterprises (SMEs) to take on or absorb more R&I. They are usually low-cost (about EUR 5,000-10,000) project-specific measures benefiting from little or no barriers to entry. The effort required for application and reporting is usually light as well which suits SMEs. Lithuania has had innovation vouchers in place for several years. As a result of the PSF review, it was recommended to establish an additional follow-up programme with more substantial funding. Vouchers can obviously help solve smaller specific problems for SMEs, but in a larger value chain for innovation more substantial funding is also required.

Grants for collaborative research have become a standard instrument for stimulating joint research-business collaboration. However, in some countries a linear understanding of innovation is still prevailing, putting too much focus on technology push and technology transfer, while support for collaborative research is weak. Bulgaria was advised to redesign its R&I policy mix with a view to building a more modern and complex innovation understanding. Ukraine was lacking a complete set of key support instruments for SBL, and the panel recommended introducing innovation vouchers, collaborative research grants, and eventually competence centres over the longer term. Georgia already had a collaborative grant scheme in place, but company involvement was limited as they could not access public funding. The PSF panel of experts therefore suggested to let also companies receive public funding, to stimulate truly collaborative and innovative projects. In the Hungarian review, stakeholders suggested that publicly co-funded collaborative R&D projects, involving science and industry, could sometimes be perceived as disguised fundamental research projects. Scientists needed industry partners to comply with the eligibility criteria, but the companies were not really interested in the project outcomes.

Public-private partnerships are advanced instruments for science-business collaboration. PPPs are strategic (often virtual) centres for promoting sector- or challenge-based research involving multiple partners and promoting public-private R&I collaboration. PPPs often come in the form of competence centres around specific topics. They are usually long-term projects, and require careful governance arrangements taking into account the specificities of the public- and private-sector actors involved. PPPs tend to be high-risk projects and failure needs to be accepted by the programming and funding authorities. They achieve an impact at the level of the innovation system, in that they stimulate more inter- and trans-disciplinary research. They seek to make industry collaboration for universities and public research organisations a normal practice with an element of

prestige attached to it. PPPs can be used as an instrument by countries at different levels of technological advancement.

In several of the PSF activities (e.g. Georgia), competence centres were recommended as a tool for stimulating research-business collaboration. In technologically less advanced countries, competence centres can link fields that have available research competence with relevant private-sector actors. In technologically more advanced countries, they also serve to develop new niches. Successful examples of PPPs were cited repeatedly in the PSF studies, such as the UK catapult centres and the Austrian COMET programme/K-Plus centres. The programme for K-Plus centres has been in operation for 20 years. A looser organisational form of PPPs are **clusters**, as highlighted in the Slovenia PSF study. The recommendation was to reinforce clusters with the aim of building long-term, stable actions between private and business spheres. In this cluster review, specific modifications were suggested, such as the introduction of evaluations to make the cluster policy more dynamic (i.e. non-performing clusters leaving the support scheme to make way for new entrants).

3. In the innovation policy mix, incentives for science business collaboration also play an important role. One such incentive concerns the inclusion of science-business cooperation in the performance measurement of public universities and research organisations. In these performance-based research funding systems (PFRS) indicators are integrated for so-called 'third mission' activities. The Slovenian PSF panel suggested concrete indicators; first, on funding generated from the private business sector for collaborative research projects; second, on demonstrated proactive policy and support structure for academic spin-offs; and third, on the number of spin-offs created per year by faculty members, researchers, or graduate students. Access to research infrastructure for business is an important element for stimulating SBL, and this can be reflected in the indicator set. For example, an indicator could measure business usage of research infrastructure.

Another objective within SBL is to stimulate **knowledge circulation** between research and business, and a range of incentives can be used to this end. Researcher mobility, in particular of postdocs and PhD students to the business sector, is supported; and vice versa from business to research institutions. In terms of industrial PhDs, students share their research time between the university and a company. This helps to integrate scientific knowledge within companies, while giving students more practical experience. In the Hungarian review, the experts recommended that cooperation between universities, the Hungarian Academy of Sciences and industry be promoted. Measures proposed included dedicated grant programmes to encourage researchers to work in industry and vice versa. The Finnish PoDoCo programme was given as an example of a targeted and successful programme for matchmaking postdocs with business. It supports the long-term competitiveness and strategic renewal of companies while employing young PhDs in the private sector.

Another interesting incentive scheme identified is the spin-off fellowships implemented by the Austrian Research Promotion Agency (FFG). Researchers can apply for such fellowships to establish a spin-off company. They need to dedicate 100% of their time to establishing the spin-off, and no research or teaching is foreseen during the fellowship period. Coaching and mentoring is offered within the scheme.

Lastly, according to many of the PSF reviews, the importance of evaluation mechanisms should not be underestimated as a **vital health check** on the success of SBL support measures and instruments. This is key to improving their impact and to adapting them to emerging needs.