

## Consulting and extension services by universities and PRIs

While academic consulting consists of researchers advising or working with firms on particular problems, extension services often consist of providing off-the-shelf solutions to small- and medium-size enterprises' technical problems. Through consultancy and extension services, universities and public research institutes help organizations achieve certain short-term and strategic objectives in their innovation activities. Consultancy and extension services are a form of auxiliary activity that does not have direct innovation output but rather helps other agents to improve their capabilities and identify critical issues needed to produce innovative products, processes, or services.

### What are consulting and extension services by universities and PRIs?

Universities and public research institutes not only actively participate in direct research and development activities but also often share their soft innovation skills through a set of mechanisms, including advice, consultancy and extension services. These mechanisms are usually realized through formal or informal links between the scientific community, business and/or government and may be a result of either contractual relations or informal contacts. As a rule, such services do not imply a transfer of intellectual property but rather aim to help businesses and governments achieve particular short-term and strategic objectives in their innovation activities.

In this context, the following definitions may be applied:

- Academic consulting. Public sector researchers have knowledge and specialized skills, which are valued by firms and are generally unavailable elsewhere. Researchers therefore often engage as consultants, either on their own or through their institutes, to advise or work with firms on particular problems.
- Extension services. Traditional small- and medium-size enterprises (and even larger firms) often lack knowledge of and access to readily available technologies that could improve their productivity or help resolve a particular problem at the later stages of their innovation cycle. Extension services try to modernize SMEs' operations by inducing them to innovate through technology adoption. Assistance often consists of providing off-the-shelf solutions to SMEs' technical problems but they can also channel more recent innovations generated by public sector research to SMEs, especially to those that may not normally have access to such information. Such services are commonly administered by technology centers that have relatively close relations with universities and PRIs.
- Scientific advice. This includes membership in standing expert committees, invitations to contribute to scientific enquiries, and informal contacts with policy makers and regulators. (See Policy Advice and Consulting by Universities and PRIs for details)

### How do consulting and extension services by universities and PRIs contribute to innovation performance?

- As a rule, consultancy and extension services are a form of auxiliary activity that does not therefore transfer specific technologies or research results directly to the customer.

- Patet et al. (2001) noted that consulting and extension services are especially useful with product differentiation and improvement.
- Thus, the main contribution of consultancy and extension services is in sharing innovation knowledge, identifying companies that can recognize the problem that is impeding effective innovation development.
- These services also allow innovative firms to use extension infrastructures through task-specific collaborations with universities and public research institutes.
- Extension services are explicitly designed to diffuse new technologies and practices and can be particularly useful in developing countries where the knowledge base is weak. However, extension services should be taken into account when designing new policies that promote innovation.
- Metrology and standards can be an important type of extension services where university quality of their products, processes and services.
- Universities and PRIs often participate in activities related to proof of concept that are in early stages of development and can identify the strengths and weaknesses of their prototypes and ideas at initial stages.
- The process of collaboration between public research organizations and industrial firms can be a valuable source of knowledge and extension services can have positive impacts on the incremental innovation output of local firms.

#### Conditions ensuring the contribution of consulting and extension services by universities and PRIs to innovation performance

- One of the main rules of consultancy work is not to tell clients what they already know. Proper science-industry links and exposure of scientists and engineers to the real world is a necessary condition for the success of advice, consultancy and extension services.
- Prior business or consultancy experience on the part of university researchers generally has stable relations with industry and policy makers.
- Mutual trust is a critical factor in the success of consultancy and extension services, since it remains within the confines of the partnership.
- Although not to the same extent as is needed for continuous R&D collaboration, coordination and specialization in university-industry and public research-institution experience plays an important role in building trust and sustainable science-industry links.
- Experienced support and administrative staff at universities and PRIs is critical in managing transfer of technology and other related contracts, many of which are important for consultancy.
- The types of university-industry collaboration have not been found to be quite diverse across countries. In general, the most common type of collaboration is in the form of consultancy and extension services. In the case of public research institutes, the most common type of collaboration is in the form of consultancy and extension services. In the case of private research institutes, the most common type of collaboration is in the form of consultancy and extension services. In the case of public research institutes, the most common type of collaboration is in the form of consultancy and extension services. In the case of private research institutes, the most common type of collaboration is in the form of consultancy and extension services.

#### Measurement

Some countries measure income from academic consulting services, but such data tend to be available only at the institutional level and are likely to be incomplete, given the amount of private consultancy academics engage in. Perkmann and Walsh (2007) also mention that the evidence on such activities is obscured by the fact that academics may choose not to report their consultancy work to their respective employers.

Extension services are regularly reported by PRIs at an organizational level, though this information is rarely collated at a national level.

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## What policies relate to consulting and extension services by universities and PRIs?

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### Policy rationales

In general, consultancy is considered a lower-level activity that may be self-regulated by universities and public research institutes, since these services are usually delivered by individual researchers or small groups of scientists. Therefore, the major arrangement to be made concerns the amount of time available to the members of staff for consultancy work in their overall workload. For example, in some western countries, including USA, UK and Germany, universities provide an incentive for researchers to conduct consultancy work by allowing them spend up to 20% of their time on such activities (Schmoch, 1999). Some universities also choose to establish special research departments to concentrate needed resources and specialized expertise in one place for effective contract research (Debackere and Veugelers, 2005).

However, when it concerns systematic science-industry links and consistent knowledge exchanges, the government has every reason to intervene to support these kinds of activities. In this context, extension services should be considered separately from advice and consultancy, since they often imply direct knowledge and technology transfer to SMEs that lack certain capabilities and resources, hence helping them to grow.

Usual market failure arguments are useful as good policy rationales, since consultancy and extension services may resolve certain information asymmetries by disseminating more expert knowledge among market agents, as well as prevent risk aversion by providing scientific evidence of certain phenomena or carrying out a proof of concept.

System failures can also be used as an appropriate policy rationale, as any sort of collaboration between industry and academia permits to resolve capabilities and network failures by improving innovation networks and interactive learning.

Infrastructure failures can be overcome by allowing innovative enterprises to use the R&D infrastructures of universities and PRIs that agreed to provide them consultancy or extension services.

### Policy objectives

Policy objectives regarding consulting and extension services by universities and PRIs include:

- improving legal and regulatory frameworks, allowing for more open collaboration between firms and universities on consultancy projects and beyond
- encouraging firms to establish stable links with universities and PRIs, where advice, consultancy and extension services may be an important first step in building a more stable relationship
- facilitating the participation of researchers in task-specific collaborative activities with firms, even if they will source some knowledge and data from publicly funded research projects
- promoting institutional development, enabling effective science-industry consultancy links and other forms of collaboration.

### Policy instruments

Policy may support consulting and extension services by universities and PRIs by:

- Aligning legal and regulatory frameworks with the objective of better science-industry links. Such frameworks may be easier to adopt to facilitate initial science-industry links in the innovation system.
- Promoting innovation networks and clusters. This could include establishing specialized entrepreneurs may meet each other, exchange ideas and continue to collaborate afterwards.
- Promoting the development of special intermediary organizations such as technology transfer offices to facilitate science-industry links, and providing professional assistance for the management of consultancy and extension service agreements.
- Providing incentives for university researchers to collaborate more openly with the private sector.

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