

Explaining the Balance Between Publications and Patents as Outputs from Public-Private Collaborative R&D

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R&D collaboration between firms and public research organisations (PROs) is considered a key component of national systems of innovation. It has been promoted by science & technology policies of most developed countries in the past 25 years, with the objectives to accelerate the transfer to firms of knowledge and technologies developed in PROs, to better align the activities of PROs on firms and market needs and increase their responsiveness to them. A direct benefit from these collaborations is the production of new scientific and technological knowledge, which is disseminated essentially through publications and patents. The empirical evidence shows that publications are a more frequent output from collaboration than patents (Agrawal & Henderson, 2002) and indeed, several reasons could explain why the productivity in terms of publications may set the upper bound for the productivity in terms of patents. Some are substantive, e.g. the fact that most patentable R&D results are publishable while the reverse is not true. There are also economic reasons. They may relate to the propensity to patent existing inventions, e.g. the fact that patents are costly while their benefits are highly uncertain with the consequence that only knowledge that is expected to yield economic value should be considered for patenting (while this is not the case for publications). But determinants of the productivity of patentable knowledge are also at play. In this paper, we empirically address the issue of the economic factors shaping the publishing and patenting patterns in public-private R&D collaborative settings by drawing on the data from a survey conducted among laboratories of the largest French public research organisations. The dataset provides comprehensive information about the industry co1aborations of 130 laboratories. These labs employ 6,800 personnel and count 875 private partners, which makes it the largest dataset about R&D public-private collaboration in France. We use econometric methods to identify the determinants of the higher frequency of publications as compared to patents. The explaining variables we envision relate to characteristics of the lab (in terms of size, S&T field, workforce profile, number of industrial partners) and of the collaboration itself (modality, outcomes, IP management). We find that three variables are correlated with the frequency difference between publications and patents: consortia as a modality of collaborations with a positive impact, new products as an output of collaborations with a negative impact and the proportion of post-docs in the laboratory's workforce with a negative impact. The first two results are established ones and point at the difficulty to negotiate and secure intellectual property rights in the context on R&D consortia, especially when they mix public and private partners, as well as at the importance of patents to appropriate the knowledge associated with new product development. The result concerning post-docs is newer and deserves special attention. We find that a higher proportion of post-docs in the lab is associated with more patents but not with less publications, and discuss these results. Overall, the demonstration leads to question the generalized use of patents in the literature as a proxy for knowledge output in the context of public-private partnerships, and as an indicator for public policies targeted towards these partnerships. It also highlights the key role played by post-docs for the production of commercially relevant knowledge in the context of public-private R&D partnerships and stresses the need for more explicit human resource management tools and policies directed towards this fraction of the knowledge production workforce.