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The Ambivalence of the Local Practices of Patenting within the BioValley Network

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Abstract: The production of novelty is more and more rooted in collective processes of interactions based on moving, heterogeneous networks involving new biotech firms, public research centers and big pharma companies. Patenting strategies have been investigated in a survey conducted within the BioValley network. While many firms do not consider patents as efficient in terms of protection, and often favor, for that purpose, secrecy, technological advance, trademark or complementary assets, the results imply that firms use patents as strategic tools devoted to different aims. One is to exclude rivals and create income from innovations. Another aim is that patents are seen as coordination tools, involved in the processes of diffusion and collective creation of knowledge, favoring interactions and facilitating the identification of potential partners.

Keywords: Biotechnology · BioValley · Intellectual Property Rights · Life sciences · Patenting strategies

The traditional approach in economics focuses on the two functions of the patent, which are the protection, and the disclosure of inventions and innovations. A patent offers to its owner a monopoly position, which is a temporary advantage in order to recover the investments done to produce the innovation. The induced market imperfection is compensated in terms of social welfare by the diffusion of the innovation, insofar as the patent has to be codified in a comprehensible way following the state of the art.

Two comments can be made at this stage: first, looking to the Life Sciences, the criteria ruling the attribution of intellectual property rights are rather fuzzy, despite a tremendous – and still increasing – amount of claims for patents: the distinction between invention and discovery is unclear and raises harsh conflicts, the principle of applicability of the patented innovation is not respected, the writing of ambiguous and non-appropriable patents is becoming a strategic business. Second, some empirical studies conducted within traditional industrial sectors during the last twenty years have underlined that many firms do not consider patents as efficient in terms of protection, and often favor, for that purpose, secrecy, technological advance, trademark or complementary assets.

Now the take-off of the biotechnologies has induced some organizational ruptures in the innovation process. Due to the increasing specialization in the research activities, it is actually impossible for a single actor to master the complete chain of innovation, neither from a financial point of view, nor in terms of competences. The production of novelty is more and more rooted in collective processes of interactions based on moving, heterogeneous networks.

Three types of actors perform innovation within those collective devices: New Biotech Firms, Public Research Centers, and Big Pharmas. In such a context, patents are crucial in order to overcome the strongly differentiated bargaining power and the diverging incentive schemes. Start-ups and small-sized firms have generally no alternative means to extract financial gain from their capabilities and know-how. Furthermore, considering the multiplication of the actors, patents provide the possibility to signal competencies and to facilitate the valorization of complementarities, both in terms of financial and of technological resources.

The attention paid to the two properties of the patent, the protection and the disclosure of knowledge, is too often unbalanced. Whereas scholars have extensively studied the former, the latter has been taken into consideration only recently. However the strategic dimension of patenting only relies on the coupling of the two functions, and not upon one or the other taken separately. Moreover, the combination of protection and disclosure by patenting can support two different strategies: a strategy of excludability or a strategy of cooperation.

The two faces of the patenting strategies came out from a study conducted by the BETA team within the BioValley network. As a reminder, the BioValley Association musters around 600 members in France, Germany, and Switzerland. Among them, we focused especially on the 20% (135) firms conducting R&D activities. Information about patenting activities has been obtained through a postal survey and extensive interviews of actors of the Alsatian biotech sector. The aim of the study was to grasp the intensity and the incentives for patenting, as well as the related activities (use of patent databases for technological survey, use of patents in establishing collaboration, *etc.*). We finally got a sample of

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18 firms, providing an interesting insight, even if not 'statistically' representative.

One of the main outcomes of the data is related to the motivations of the patent holders. The first reason for patenting remains the protection of the firm's know-how. Nevertheless, the motives of exploiting the innovation in a monopoly situation and of improving bargaining power are both rated in second place, with an equal mark of 2.9 on a scale from 0 to 4 (the average answer for protection is above 3.6). A third justification of patenting is to collect funds (rated with an average mark of 2.2).

Another outstanding result is the lack of confidence that the firms exhibit towards the ability of the patents to prevent imitation. Patents are ranked at the second position, behind secrecy, and with an average mark equal to the score of lead-time advance and complementary assets.

A possible interpretation of those results might be that firms use patents as strategic tools devoted to different aims. One is obviously to exclude rivals and to extract rents from innovations. But in parallel patents can be seen as coordination tools, involved in the processes of diffusion and collective creation of knowledge, favoring interactions and facilitating the identification of potential partners.

The picture rendered by the empirical study is thus very ambivalent: the main declared function of the patent is protection, but the declared best way to achieve protection is secrecy. It suggests that strategies of exclusion still dominate strategies of cooperation, in terms of general industrial behaviors within the BioValley cluster. But the role of patents as collaborative instruments is profiled in the background. This is confirmed when looking at firms intensively engaged in collaborations. Eight out of fifteen have stressed the important role played by patents, before and during the processes of design of collaborative agreements. Furthermore, the importance given to patents as signaling tools increases with the size, the maturity and the level of patenting activity of the firms. It might be derived that fully utilizing the whole range of functionalities offered by patents (protection *and* coordination) implies i) a learning process in terms of strategies of codification and of disclosure of knowledge and ii) important financial resources, especially in order to keep control on how competitors can use the knowledge signaled by patents.

The recognition of the twofold nature of the patent has some important policy implications. Two of them will be mentioned here: the first implication bears on the vital need for start-ups to be accompanied and supported in the building of their intellectual property rights. The second recommendation, tightly coupled with the previous, underlines the need to preserve a subtle balance between favoring profitability and maintaining technological options, when the selection of emergent projects is based on property rights.

The BioValley cluster constitutes a rather emergent network, with numerous 'young' firms acting beside outstanding actors (academic institutions and big pharmas). For most of those SMEs, few products have been delivered to the market yet, and they still behave as being part of the local scientific community (*i.e.* firms disclose knowledge in scientific journals and conferences, which are practices usually reserved for public research institutions). Informal relations are often quoted in interviews (*e.g.* the validation of technical options, the development of examples for the patenting process, the finding of financial or scientific supports, *etc.* are often achieved by project leaders through informal networks of scientific colleagues).

Patenting might thus be seen as a tool for recognition within the local community, and as a competitive instrument to develop further relations with outsiders. In that perspective, supporting patenting activities is a crucial task for the institutional actors in charge of the coordination of the network. Funding activities, technological facilities, and consulting services should be provided in order to improve the registration of patents by new firms. It should be noted that the implementation of such policies is not just a matter of accessibility to resources and services, but has to be designed so as to trigger learning processes related to the drafting and use of patents.

Indeed, for start-ups, establishing IPR is time consuming and extremely costly in relative terms. Furthermore, the time delay to establish a patent generates a double constraint. On the one hand, the firm must be able to 'wait' for the administrative and technical procedure to be completed. An emerging project encounters here a real funding problem. On the other hand, the delay between the application and the publication of the patent is often too short (18 months) to produce further scientific evidence to underpin the record of the patent, because of a lack of financial and scientific resources.

Now, even if support should be enhanced, there is already a strong emphasize on the design of IPR. Clearly, a project without a proper definition of its related property rights will encounter difficulties to gain support within the BioValley institutional frame.

Even if largely justified, such an approach embodies a risk. The importance given to the IPR criterion impinges upon the development trajectory of the local innovation system, in terms of the selection of the biotech projects. Priority is not granted for the most promising or the most innovative projects, but for the most solid from an industrial perspective. If obviously not mutually exclusive, both features do not systematically go hand in hand. Such a selection strategy is likely to raise strong opportunity costs, to potentially lock the region in an 'innovation-followers' trajectory and to favor university spin-off instead of pure private initiatives (the last point is not a problem in itself, but implies, if admitted, specific efforts in terms of public intervention). This opens the discussion concerning the design and the management of the structures able to assess and to shelter very emergent projects, attractive on the long run with respect to their technological content, but at a stage where profitability cannot be clearly expressed according to market criteria.

To conclude, patents are often presented as tools dedicated to the defense of private profits. Reconsidering them as instruments of coordination allows the threat they represent towards the collective interests to be moderated, and opens some promising perspectives in terms of technological policy and management of innovation.

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