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"Academic Patenting in France: evidence on ownership and social structure"

RESUME

Academic inventors have always been there, we simply had trouble measuring their existence and relevance, and this is what my co-workers and I have been trying to achieve. An academic patent is one signed by at least one academic scientist, so we started out by identifying and categorizing the inventors, whether the patents were owned by scientists, universities, companies or public research organizations. We reached a good approximation of the academic scientists' contribution to patented inventive activity.
Because of their lack of financial autonomy and administrative capabilities, many European universities let professors take their own arrangements with companies or sponsors instead of taking patents over their inventions. There is no cultural heritage of dealing with IP matters in European universities as there is in the US. As a consequence, a European academic scientist wishing to patent an invention either does it personally, or sells the invention to a company or another institution. In countries like France, public research organizations tend to retain IP rights over inventions created in cooperation with universities.
APE is quantitatively relevant, but there are more doubts on its qualitative relevance. Many countries have adopted a policy pushing universities to own, manage, and make money with the patents. To see if it makes sense, we also researched whether these academic inventors are just referral players, or important technological leaders in their field.

In order to identify academic patents, we have to classify patents by inventor, which requires a lot of efforts in terms of name disambiguation. The quality of the first step impacting heavily on the results we get, we used much of the funds granted by the European Science Foundation to finance the Name Game Workshop, a free database of inventors that is still in progress.
The number of academic professors we identified with patents from 1994 to 2001 ranges from less than 3% of all professors in hard sciences in the UK and the Netherlands, to 4-4,5% (conservative estimate for six European countries). The technological distribution of patents is all biased toward pharmacology, chemicals, instruments and electronics, with a very little presence in mechanical engineering or consumer goods. And this is basically the same in the US. Differences in other fields clearly depend on industry-side conditions: historical importance of the chemical

industry in Italy and France, policies encouraging biotech research in Denmark, electronics in Sweden...
We combined US data to guess-estimate the distribution of academic patents in the US, and discovered an average of 70% belong to universities. The European landscape is drastically different. The country with the largest proportion of university-owned academic patents is the Netherlands, followed by the UK (two academic systems that imitate the American one in terms of autonomy in management and recruitment), and all others have less than 10% of academic patents owned by universities.
In Italy or in France, professors are civil servants, recruited according to very strict rules, making it harder to manage a patent portfolio. In Europe, most patents are owned by companies, with some differences depending on legal conditions (like the locally enduring “professor’s privilege”). In France, almost a quarter of the academic patents are owned by organizations like the CNRS or INSERM.
It is difficult to interpret these patents owned by companies, because you’ll find giant owners of academic patents like Thales as well as with small companies, sometimes set up by the professor to own the patent and exploit it. We assembled a breakdown of company-owned academic patents by type of company, judging on the portfolio of the company. Companies having less than 20 patents, all being academic, are generally individually owned. Companies with at least 5 patens, and in many cases more than 100, with less than 20% of academic patents are big companies like Total, Ericsson, etc., that are clearly exogenous to the university system.

If you measure the university patenting by looking at ownership, you have the usual picture: in the US, 4% of patents come from universities, and you get miserable percentages in Europe. Then if you measure by inventor, the gap is not there. Sweden does better than the US, and even Italy is doing well. If you break down the share of academic patents over the total number of patents by technology, you notice that in some fields, you reach almost 10% (chemicals, instruments, engineering…), whereas for pharma and biotech at least one out of five patents comes from universities. If the technological determinant is there, innovation in this field will majorly come from universities.
Thanks to a citation-based indicator, we discovered there is no big difference between academic and non-academic patents. A breakdown of academic patents depending on the owner shows that company-owned patents have a higher citation rate than academic or government-owned ones, although they are more general and original if they come from university. In France, the most productive university is Paris Jussieu. If we are looking at technological transfer, it is clear that universities either are not so good at picking the right patents, or they don’t manage them well. The two worst cases are Italy and France, where universities are the least autonomous and the most controlled. According to our provisional results, contrary to the US situation, European university patents are not more cited than non-academic ones.

There are some differences across technological fields in terms of ownership of the invention. Pharmaceuticals and process engineering have the highest percentage of ownership by universities. When we move away from more science-based fields, the share of companies owning patents increases, because they have little value as stand-alone pieces of intellectual property and need to be used in conjunction with many other inventions.

A lot of European policies tend to encourage universities to patent more. In France, we tried to look whether the Loi Allègre pushed universities to own more patents, relaxed some of the rigidity of the system, and regulated the co-ownership of patents, to make licensing easier.

The absolute number of patents filed by universities in France did increase. A Logit regression shows that the Act did increase the propensity of universities to own patents, but in most cases, it is just co-ownership. It looks more like a step than a continuous increase, and we found more or less the same values for 2000-2009 than for 1999. The most important variable is actually having or not having the TTOs since a long time. The Allègre Act seems to scratch the surface of the problem rather than going straight to it.

To be more accurate, we also did a multinational Logit analysis, that shows the Act wasn't very significant for PRO, and the trend is not clear. What the legislator wished for happened: universities want to be added to the list of applicants of the inventions. Differences regarding the type, size and location of universities have more impact than the law.

The conclusion we can draw is that the French universities own or co-own only a minor share of their scientists' patented inventions, because of institutional factors and not because of the technological distribution of the patents. The ongoing changes in the institutional setting increase the co-ownership of patents, at the expenses of companies' exclusive control. Having seen the quality of university-owned patents in France, we may say it is better they mind their own business and leave the management of patents to companies, who know how to do it better. In any case, caution is needed.