

3.3 *Scientific incentive versus economic incentive*

Does patent production follows the same incentives of scientific production, i.e. reputation based reward, associated with recognition by peers, new position in better locations and wage increase?

Carayol (2004) considers that patents follow a slightly different incentive regime, since the research leading to high performance in publication can be different from the one leading to patents (therefore patents are not often a by product of publications); and the reputational reward of patent may not be evaluated in the same way by scientific community and not produce the same effect in terms of career.

The question therefore is if and how publishing affects patenting. Following Agrawal and Henderson (2002), patenting is not affected by publishing activity. Carayol (2004) explores the non neutrality of publishing, on the basis of two different hypothesis: that one may expect a positive effect of publication (best researchers can exhibit both the best patenting and publishing profile) and on the other hand that some researchers specialize in patenting.

His conclusion is that the academic reward system doesn't provide incentives for patenting. The reputational reward of patent seems low and this is a disincentive for young researcher to patent, while older researchers are more sensitive to value the application of their research and its pay off. In sum, patenting should ask for a specific strategy, often in collaboration with industry.

Calderini, Franzoni and Pezzulli (2004) also studied the effect of quantity and quality of scientific publications over the decision to patent, controlling for the effect of personal, institutional and environmental characteristics by a sample of 1323 Italian public researchers. They find that the probability of patenting with private company increases with quantity and quality of publications, the expertise of TTO and the presence of firms in the area of scientist location; the probability to patenting depends on reputation accumulated along the career, but the probability of patenting for a top scientists is

very low. This can be probably due to the fact that top scientists "do not engage in contract research because their time is fully financed". In sum the effect of scientific productivity is higher than scientific quality on the probability of patenting with industry.

3.4 *The role of regulatory framework*

As to the patent regulatory framework (patent laws and related administrative regulations), some authors (Meyer Kramher and Schomch, 1998) see it as one important factor explaining the different national patterns in university patenting. Nevertheless there is a lack of in - depth study on the national patent laws impact on public patenting. An interesting track can be found in Harhoff and Hoisl (2004) work on the German Employees' Invention Act and particularly on the monetary compensation for inventors, that in Germany is regulated by law and not (as in other countries, included Italy) by negotiations between employer and employee inventor. Their study is based on a survey collected within the scope of a European project (PatVal) started in 2002 and even if it is not specifically dedicated to public inventors, it gives a good insight into the functioning of a patent's economic compensation scheme and its capacity of creating incentive to patent for employee inventors.

Policies on ownership of patent at public research organisation are changing within Oecd countries and encouraging the ownership of invention by the institution where the research have been performed. A way for realising these change in Europe passed through modifying the employment laws, so that university professors are not exempted from legislation that gives employers the ownership of the intellectual right generated by employees.

In Italy, as presented above, two kinds of change, with different rationale, happened in a short time:

- in 2001 (L 383, art 7) the IP title was recognised to the individual researcher employed by a university or a public research organization; as a consequence the