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Title: “Career progress in centralized academic systems : an analysis of French and Italian physicists”

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Abstract (600-700 words):

In the past 20 years or so, the number of empirical contributions to the economics of science has grown considerably (Audretsch et al., 2004). This literature has focussed especially on the rate and direction of universities’ research and on how the latter may be affected by changes in university funding patterns (Geuna, 1999) as well as by the spreading of commercialization practices (surveys by: Geuna and Nesta, 2006; Siegel *et al.*, 2007). None of these studies, however, has examined explicitly the issue of academic careers; nor they have paid much attention to the role of wages and tenure, as analysed by the economics of higher education (Ehrenberg, 2003).

Both the classical sociology of science and the new economics of science have devoted considerable efforts to examine how individual *scientific productivity* is affected by biographical variables, such as scientists’ age and gender, and “institutional” or “social” ones, such as departmental prestige and the role of ‘invisible colleges’. (Crane 1965, Hargens and Hagstrom 1967, Clemente 1973, Allison and Stewart 1974, Reskin 1977, 1978, Long 1978, Cole 1979, Allison and Long 1990, Levin and Stephan 1991, Xie and Shaumann 1998, Hall *et al.* 2007). However, much less attention has been given to the effects of productivity on academic careers, possibly because of data constraints or because of the common presumption that scientific productivity, by itself, can be a useful predictor of a scientist’s career. Besides the classical determinants of scientific career (such as productivity, age, gender..) a special attention has been devoted to relational and social variables that might explain the scientists’ success. Network analysis has helped us in analyzing these issues.

Social network analysis has a long tradition of application in the sociology of science, which ranges from the early identification of ‘invisible colleges’ (Crane, 1972) to the recent application of small-world theory to the description of collaboration patterns (Newman, 2001). Both works identify the structure of scientific communities on the basis of co-authorship data. Co-authorship is seen as proof of collaboration and knowledge exchange between two or more scientists. Each scientist is seen as a node on a graph, with ties representing co-authorship instances. This allows both to measure the cohesiveness of a scientific community, and the role of individual scientists therein, whether central or peripheral. Of course networks of collaboration may be seen as systems for the distribution of various types of resources: information (on “hot” research questions, data sources, methods...), knowledge (such as expertise or tacit skills) and status or power (the scientist’s position in the network conveying information on her social capital or influence). For this reason we have tried to build different network measures in order to capture these different roles.

In order to analyse the collaboration patterns among scientists we concentrate on two countries (Italy and France) and we examine scientists’ publications over a 5-year window, from 1995 to 1999. The articles come from a large number of selected academic journals. The 5-year window is meant to capture ongoing or “still fresh” research partnerships. We are therefore interested in studying the determinants of the academic career in the following 5 years (i.e. in 2000-2005 window).

In particular, the data collected for this paper draw from the complete list of Italian and French academic scientists active in a.y. 2004/2005, in the field of physics, which we obtained from the Ministries of Education of the two countries. We concentrate on rank advancements between 2000 and 2005 (that is, our dependent variable is the promotion event that a scientist may incur into).

Our analysis also confirms the importance of classical determinants for academic careers, as found in the literature: scientific productivity, seniority and gender (for French physicists) have a positive impact on the scientists’ career. Moreover, network measures exhibit a strikingly different impact in the two countries: null in France and highly significant in Italy. In particular both classical network variables (being part of the principal component and closeness) and original network variables (such as credit, which captures the social (political) capital), have a positive effect only for Italian physicists. On the other side, for the French case, career are influenced by the connections with CNRS scientists.