



Career progress in centralized academic systems: Social capital and institutions in France and Italy

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ABSTRACT

We analyze the role of social capital in academic careers. We distinguish between ties with reputed scientists and laboratories (scientific and technical human capital) and ties with influential actors with respect to recruitment/promotion decisions (political capital). We use institution-wise bibliometric indicators to measure separately the two types of capital for a large sample of French and Italian academic physicists between 2000 and 2003/2005. Controlling for scientific productivity, seniority and gender issues, career progress is explained by: the scientist's affiliation to important public research organizations (scientific and technical human capital – France); his/her social ties with senior members of the discipline, who exercise control over careers (political capital – Italy), and the commitment to work with senior colleagues in his/her own university (political capital – Italy). Significant differences exist between the two countries also with respect to the importance of productivity, seniority, and gender.

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1. Introduction

In the past 15 years or so, the number of empirical contributions to the economics of science has grown considerably (Stephan, 2012). This literature has focused especially on the rate and direction of university research and on how the latter may be affected by changes in funding patterns (Geuna, 1999), and the spread of commercialization practices (surveys by Geuna and Nesta, 2006; Siegel et al., 2007). Several essays have also dealt with the issue of scientific productivity and its determinants at the individual level (Stephan and Levin, 1992; Hall et al., 2007; and in relation to technology transfer: Azoulay et al., 2007; Breschi et al., 2007). Very few, however, have examined explicitly the issue of academic careers, the main exceptions being limited to the US case (as with Ehrenberg, 2003).¹

The present paper contributes to filling this gap, with special reference to highly regulated academic labor markets typical of Continental Europe. In particular, we examine the cases of university careers in France and Italy.

In order to do so, we update the conceptual framework of the Mertonian sociology of science (as received from the new economics of science), build upon early empirical work on academic careers in that tradition (Long et al., 1993; Long and Fox, 1995), and examine useful notions of social capital, specifically tailored to the institutional features of academia in the two countries.

In both France and Italy, academic careers are heavily controlled by disciplines, the latter to be intended as state-sanctioned guilds of professors, over which universities exercise little control. In addition, both countries host large and powerful public research organizations (PROs; such as the CNRS, *Centre Nationale de la Recherche Scientifique*, in France; and the CNR, *Centro Nazionale delle Ricerche*, in Italy), which act as important channels of funding and legitimization of academic research. Finally, both countries exhibit various degrees of localism in their promotion patterns.

By taking into account these national specificities, we propose as set of notions of social capital that are both of immediate relevance for the national cases at hand and of general interest, as they lend themselves to be measured with archival data. We find them

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¹ Outside the economics of science literature we find isolated contributions from economists who are interested in the analysis of recruitment examinations in their own discipline (Ginther and Kahn, 2004; Combes et al., 2008).

to have non-negligible explanatory power for promotion events. In particular, we find that ties to large PROs matter in France, but not in Italy, where connections to senior members' of one's own discipline are of greater importance. We also find significant differences between the two countries with respect to the importance of productivity, seniority, gender, and the importance of localism.

In Section 2, we provide a brief summary of the relevant literature, and discuss the notion of social capital in scientific careers. In Section 3, we discuss the specificities of the Italian and French academic systems, along with the consequences they bear for our analysis. In Section 4 we put forward our analytical statements, and describe our data and methodology. In Section 5 we report and discuss the results of our empirical analysis. Section 6 concludes.

2. Literature review

Academic careers can be analyzed according to four dimensions: participation, position, productivity, and recognition (Long and Fox, 1995). In this paper, we focus mainly on position, in particular on career progress within or across organizations.²

In this respect, the economics of science has taken on board, without much discussion, the classical sociological analysis proposed by Merton (1957), as reformulated by Dasgupta and David (1994). According to such perspective, scientists progress in their careers to the extent that they gain some reputation for their contribution to knowledge advancement. Such reputation must be obtained from academic peers, who rely for their judgement on their colleagues' publication record.

Scientists' individual characteristics, such as seniority and gender, may interfere with this process. The same applies to the prestige of the institution at which the scientist graduates (Long et al., 1993; Long and Fox, 1995).

Social capital may also play a role. An individual's set of contacts in the scientific community may serve as an indicator of the knowledge resources he/she has access to, which in turn indicates their potential productivity. Alternatively, such contacts may be mobilized in order to influence the committees in charge of examining a job application or a request of promotion. In this respect, social capital can be ideally split into *scientific and technical human capital* (S&T HU, as defined in Bozeman et al., 2001; see below) and *political capital*, the latter to be intended as the number and strength of useful contacts a scientist may have among his/her peers, senior colleagues or other agents from whose decision his/her career depends.

2.1. Evidence on productivity and individual characteristics

Several studies over a long period of time have tried to assess the importance of scientific productivity for academic careers. In particular, many efforts have been made to distinguish the effect of quantity (number of publications) and quality (impact of publications, usually measured with citations). While the impact of quantity is beyond doubt (see, for example, Clemente, 1973), the role of quality is more controversial. Early work by Hargens and Farr (1973) found that the number of citations received is positively associated with promotion, but their results were not confirmed by later works (such as Long et al., 1993).

For what concerns the issue of gender, women in science appear both to enjoy fewer promotion opportunities and also to suffer from a productivity gap, other things being equal (Allison and Stewart, 1997; Long, 1978; Levin and Stephan, 1991; Stephan and Levin,

1992; Xie and Shauman, 1998; Zainab, 1999; Prpic, 2002; Hall et al., 2007).³ Long et al. (1993) find that even after controlling for productivity, female scientists have a lower promotion probability. Similar results have been found by Cole (1979), Everett (1994) and Modena et al. (1990).

Similar issues arise when examining the role of seniority. In many jobs, career progress is a matter of time: seniority is rewarded (either formally or informally) with promotion. Academic jobs are no exception (Long et al., 1993; Modena et al., 1990). The time spent by a scientist in a given academic position is always found to be one of the most important factors determining promotion, either directly (more senior researchers stand higher chances of being promoted, *ceteris paribus*) or indirectly, via scientific production (more senior scientists accumulate a longer list of publications, which may be of help in getting promoted).

2.2. Social capital: scientific and technical vs. political

It is reasonable to assume that universities, when deciding to fill a vacancy or offer a promotion, give positive consideration to the size and reach of candidates' personal network (for example, PhD supervisors or co-authors) to the extent that the latter may add to the university's visibility and access to resources (Gonzalez-Brambila et al., 2006). As individual performances are often hard to evaluate only on the basis of past scientific production and citations (especially when junior scientists are considered, whose publication list is necessarily short), prospective recruiters may look for other signals of quality, and past collaborations are one of these.⁴ They constitute a form of social capital from which the individual can draw knowledge resources either to increase or to match his/her own.

In order to capture this aspect of social capital, which is highly complementary to the individual human capital, Bozeman et al. (2001, pp. 5–6) put forward the notion of scientific and technical human capital (S&T HU) "as the sum of scientific, technical and social knowledge, skills and the resources embodied in a particular individual", [...] which "encompasses not only the individual human capital endowments but also researchers' tacit knowledge, craft knowledge, know-how [and] the social capital that scientists continually draw upon in creating knowledge—for knowledge creation is neither a solitary nor singular event".

Expanding further this notion, all social ties an individual may have established in prestigious universities and research labs, either by moving across different institutions or by collaborating with several scientists, can be considered as a relevant form of social capital.

The relationship between career advancement and the prestige of the universities has been widely investigated. On the one hand, having graduated or worked in a prestigious institution gives access both to information and to knowledge embedded in other productive scientists, which makes promotion easier. On the other hand, more prestigious university departments apply stringent selection criteria, which signal their graduates as individuals with great potential (Long et al., 1993).

Evidence for the US suggests that departmental reputation affects productivity, but that the prestige of the PhD-granting institution is one of the most useful predictors of career advancement, even after controlling for productivity (Hargens and Hagstrom,

² According to Long and Fox (1995), *participation* merely regards the employment in science, *productivity* refers to contributions to scientific knowledge and *recognition* concerns the reputation within the scientific community.

³ Several reasons have been put forward to explain why women appear to be less productive than their male counterparts: limited access to relevant social networks (exclusion from "old boys" social circles; Cole and Zuckerman, 1984); a tendency to deal with applied, rather than more prestigious pure research; lower graduation rate from prestigious universities; more severe family-career trade-offs.

⁴ For some evidence in this direction, albeit not within the academic realm, see Seibert et al. (2001).

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