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## Editorial

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**Biographical notes:** Secondo Rolfo is the Director of the Institute of Economic Research on Firms and Growth (CERIS) of Moncalieri (Turin), within the Italian National Research Council (CNR) since 1998. At CERIS, he started his research career in 1978 covering a large range of themes concerning the technological innovation and the public policies. In the period 1991 to 2005, he thought managerial economics at the Polytechnics of Turin where he was a member of the Academic Senate (2006 to 2012); his academic activity is now concentrated in some PhD programmes. He has been a consultant for public bodies at the regional and national level and member of several technical and scientific committees especially for the evaluation of projects and research institutions. He is also a member of various scientific associations and editorial boards of economic reviews.

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Since the 1980s, the shortening of product and technology lifecycles and the overlapping of technological trajectories have led firms to reconsider their innovation strategies. In this context, cooperation in R&D and innovation broadens the firms' technology base and is used to complement internal resources. A large portion of these strategies concerns the involvement of public research organisations (universities, research labs and centres, agencies, etc.), seen as providers of competences and knowledge that firms are not able to accumulate. Yet, the literature on innovation usually analyses this issue from the point of view of public organisations, in terms of technology transfer and enhancement of public research and, thus, as an argument to support research and innovation policy initiatives. However, less attention has been paid to the point of view of firms, which are affected by major absorptive capacity problems, most likely deriving from forms of cooperation among non-equals, a feature which appears to be much less evident in cooperation among firms.

A large number of empirical and theoretical studies have been devoted to inter-firm cooperation in innovative activities. Generally, these analyses show that cooperation positively affects innovation and, as a consequence, firm performance. Other results suggest that the innovation capability of firms is stimulated by relationships established with external partners.

Strategic alliances concerning innovation are increasing in order to facilitate the coordination of complex projects which firms would not be able to carry out individually. In some cases, cooperation in innovation occurs not in addition to but in place of investing in R&D internally. Of course, these alliances might have antitrust and competition implications, as highlighted by some authors. Yet, in general, national and regional governments are increasingly incorporating public support for coordination among firms into their policies.

In spite of this interest, another strand of the literature emphasises the high rate of failure in cooperative agreements for innovation, especially when direct competitors are involved. Moreover, the rise of these networks as a new cooperation method (also concerning innovation) has opened up new analysis perspectives involving a broader theoretical approach. From this point of view, non-commercial relationships among firms have been analysed in the literature by following certain strands of thought. On the one hand, firm-centred models have made reference to the transaction cost theory and to evolutionary theories based on competences. On the other hand, models focusing on the relationship between firms and their environment have been essentially based on Porter's approach within the field of industrial economics and on the resource dependence model developed by organisational theory.

Within the literature on strategic management, the simultaneous presence of competition and cooperation between two firms gave rise to a new term in the 1990s, i.e., *coopetition*. This concept, elaborated by Brandenburger and Nalebuff (1996) and by Bengtsson and Kock (1999), has spread above all to French-speaking areas, although some major international studies have also been published. The theoretical basis of *coopetition* is found in social networking and, above all, in the resource-based view, since cooperation among competitors can be explained only in terms of lack of internal resources, which can be remedied by drawing on complementary resources available in other firms. So far, all the literature building on the concept of *coopetition* has actually been based on a rather limited number of cases, which have gradually led to the identification of new situations. For instance, scholars have come to understand that *coopetition* concerns relationships not only of the horizontal type but also of the perpendicular type, involves a wide variety of actors, and can change through time (Chiambretto, 2011).

However, some drawbacks of this approach have also been highlighted, as the cases under investigation mostly regard large firms. This is due to the fact that, from an organisational and managerial point of view, large firms are characterised by a clear separation of roles: those who deal with innovation do not deal with selling the finished products. Conversely, in small firms there is often no clear-cut separation between these roles, both of which are frequently fulfilled by the key figure of the entrepreneur. Yet, this does not exclude the presence of success cases among small firms in traditional sectors, such as the wine-making industry described by Granata and Le Roy (2012), as well as among very small firms, as pointed out by Gardet and Mothe (2012).

Another limit, which can be detected in the literature, is the prevalence of *coopetition* in hi-tech sectors: space satellites (Fernandez and Chiambretto, 2012), ERP systems (Pellegrin-Boucher and Le Roy, 2009), and mobile terminals. This is probably due to a series of critical factors characterising these industrial sectors, such as high R&D costs, the convergence of different technologies, and shorter lifecycles (Gnyawali et al., 2010). Moreover, the literature has placed emphasis on the oligopolistic market conditions which would lead to intense competition on the end market but also to cooperation during upstream research phases (Roy and Yami, 2010). Said cooperation would be fostered by the need to elaborate technical standards able to ensure compatibility among end products or services provided by different firms (for instance, ICT and technical textiles).

The growing number of alliances and cooperation projects in the field of innovation has motivated scholars, especially those studying the economics of innovation, to look for evidence to support their various theories by performing quantitative analyses on clusters of fairly prominent firms. Starting from the 1990s, the literature has featured a rather

large amount of ad-hoc investigations, carried out by governments or research institutes above all at the regional or supraregional level. Just to mention a few examples, there have been studies on the UK (Freel, 2003), Germany (Fritsch and Lukas, 2001; Harabi, 2002) and, more recently, China (Zeng et al., 2010). Some of these researches have been integrated into European surveys (community innovation survey) which, since the 2000s, have provided scholars with fairly large datasets, concerning especially major countries, such as France (Lhuillery and Pfister, 2009) and Germany (Boente and Keilbach, 2005), but also smaller countries, like Portugal (De Faria et al., 2010) and Slovenia (Jaklic et al., 2008).

The objective of these studies is mainly to describe reality; hence, they tend to quantify the number of collaboration projects and firms involved, which are grouped by sector, size, and geographical area, but also by type of partners (clients/suppliers or competitors) and relationships. Various methodologies of analysis have been adopted, from very simple logit and probit models to complex econometric models (Lhuillery and Pfister, 2009) or multivariate statistical techniques, such as structural equation modelling (SEM). Despite being quite refined, these analyses actually rely on the questionnaires used to gather the data, and much depends on how said questionnaires were originally compiled and later filled out. Furthermore, since the information needed is often of a classified nature or it is available within a firm in a non-structured form and comes from different branches of the organisation, official surveys will most likely be unable to capture the whole picture. This is why managerial literature continues to be essentially based on the analysis of case studies, as also seen in this special issue (Fernandez and Chiambretto, 2012).

Since the aim of this special issue is to reconsider cooperation for innovation within an interdisciplinary approach in which management, industrial organisation, economics of innovation, public policy and local development can coexist and offer a better interpretation, most of the articles concern high-technology industries or innovative activities, such as research and product development. In particular, the article by Thierry Rayna and Ludmila Striukova focuses on patent pools in the optical disc and mobile phone industries. This form of cooperation is typically found in hi-tech sectors but it does not provide conclusive results in the two cases investigated, due to the fact that the major players can impose their standards and also because of increasingly bigger obstacles to the widespread adoption of the technology, which prevent the number of potential partners from increasing. The sector of biotechnologies is examined by Amon Simba in his contribution on the East Midlands region of the UK. The article does not analyse large groups but provides five examples of small born-global bio-tech firms, which confirm the key role played by social and professional networks in implementing international collaboration projects within this sector. Said projects are vital to the very survival of these small bio-tech firms. A neighbouring sector is that of the pharmaceutical industry, which Andreas Braun investigates by looking at two examples of inter-firm collaboration involving two medium-sized German firms. The focus here is on business models and company culture as well as on participating actors, since the analysis of the two collaboration projects reveals that their success/failure depends on the abovementioned factors external to technology.

The paper by Amir Bahman Radnejad and Harrie Vredenburg concentrates on a sector characterised by large enterprises, i.e., the oil industry. The two authors analyse the implementation of a specific structure dedicated to the management of open innovation in Canada. This is a remarkable and perhaps unique initiative combining the bridging

organisation model and the open innovation model to create a national network for cooperation in technology. Lastly, the study by P. Ben Chou and Ellen F. Thomas deals with the theoretical basis of cooperation among firms, which is found in game theory. The authors extend the game theoretical model from symmetric firms to asymmetric firms in new product development alliances, showing that larger firms fundamentally stand better chances of being successful. Indeed, if a broader-scope link alliance tends to benefit the larger firm (and, on the contrary, a narrower-scope scale alliance tends to benefit the smaller firm), the asymmetry of benefits will drive the larger firm to subsidise the smaller one in order to maintain the stability of the alliance. This brings us back to one of the key issues of the debate about cooperation among firms in the field of innovation, i.e., whether collaboration projects are more advantageous and readily accessible in the case of larger firms when compared to smaller ones. Bearing in mind the constraints deriving from the technologies and from the markets, the cases analysed in this special issue do not seem to point to any disadvantages for small firms.

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