

Size, Experience and Innovation Impact

by Nicholas S. Vonortas, Senior Research Fellow



This research note is based on a forthcoming paper "Market, Firm, and Project-Level Effects on the Innovation Impact of FP RTD Projects" *Science and Public Policy*, 2011, by K. Kostopoulos, G.P. Prastacos, K.E. Soderquist, Y.E. Spanos & N.S. Vonortas.

A swath of studies over the past couple of decades have enhanced a widely held impression that the Research Framework Programmes of the European Union have played an important role in developing the European knowledge base and have pointed at significant levels of additionality and European added value. Much lesser agreement exists on the extent and type of direct contribution to the performance, especially in terms of innovation, of the organizations participating in the research projects funded by those programmes. The Innovation Impact Project (www.innovationimpact.org) has explored what determines the impact of publicly funded R&D projects on innovation, along three broad dimensions, namely project-, firm- and market related factors (Doz, 1996; Hagedoom and Roijakkers, 2006). The observations from empirical and qualitative analyses are based on R&D projects funded by the Fifth and Sixth Research Framework Programmes of the European Union (abbreviated FP Programmes).

Even though R&D is a core activity and a starting point (albeit not the only one) for innovation, the link between the two is not straightforward. The commercial exploitation of research results stemming from an R&D project is a complex process governed by a multitude of factors, including the internal dynamics of the project itself as well as the motives and the innovation-related capabilities of the participants in the project, and the characteristics of the market environment towards which the prospective innovation is directed (Sakakibara, 2002; Rothaermel and Deeds, 2004). Among the various factors influencing project success in terms of commercialization, this note focuses on firm size and on prior experience.

The SMEs investigated in our study reported a generally strong strategic alignment with FP funded projects and declared they enter such projects with explicit goals related to innovation outputs such as developing a prototype, developing a patentable technology, or developing a complementary technology that will enhance competitiveness. Medium-sized companies seemed well placed to reap the largest innovation benefits from FP project participation, as these organizations can achieve critical mass for R&D in a focused area. They are often either established players in their industry or quickly growing players that have overcome the threshold of successful commercialization of a first generation of innovation-based products or process technology. Generally speaking, these companies have explicit strategy and goals for innovation. They often take a leading role in projects, and are most frequently found as coordinators, in parallel with Research Organizations.

Small sized firms (<50 employees), conversely, often remain too focused on a core technology and too centered on research (compared to on development) in order to be able to sustain market driven development and commercialization in their own right. Sometimes they also feel victims to the bureaucracy surrounding the participation in the FP projects, as it takes significant resources away from the actual R&D activity.

It is also noteworthy that the organizations presumably best positioned to commercialize an innovation, i.e., large firms with a full blown marketing and sales organization, were much less inclined to do so compared to a number of highly committed-to-commercialization SMEs. Because of the often quite marginal role of FP projects, larger companies reported weaker strategic alignment and less explicit goals. If goals were clear, they would typically be very focused and limited to project dimensions such as developing new knowledge, building partnerships, or exploring a new technology area. Only exceptionally interviewees in larger companies referred to the external dimension of market-related goals.

A rather intriguing finding of the empirical analysis pertains to the positive effect of first-time participation in FP projects on both product and process innovation. One could possibly attribute this to greater motivation of "newcomers", as otherwise there is no reason to believe that they are systematically more capable to drive FP projects to success than repeat participants.

A strong empirical result is that prior experience of an organization with R&D, irrespective of involvement in other FP projects, positively and significantly affects the likelihood of obtaining product innovation from FP projects. On the contrary, firms that have a history of imitative strategy (i.e., introduction of new-to-the-firm products, as opposed to new-to-the-market innovations) are relatively less likely to report process innovation. Overall, the results concerning the "innovation history" of both firms and research organizations largely confirm the hypothesis of a positive association between prior innovation experience and project success.

Case analysis corroborated this result by showing that building up a broader innovation culture was an important underpinning factor behind product and process innovation success. Firms with an explicit R&D / innovation structure and model proved more successful in producing innovation results.

The Innovation Impact project has produced many important results for policy-making. Related to the issues discussed in this note, it is obvious that the participation of SMEs must be encouraged and further facilitated.

References

- Doz, Y.L., (1996), "The Evolution of Cooperation in Strategic Alliances: Initial Conditions or Learning Processes?" *Strategic Management Journal*, 17: 55-83.
- Hagedoom, J. and Roijakkers N., (2006), "Inter-firm R&D Partnering in Pharmaceutical Biotechnology since 1975: Trends, Patterns, and Networks", *Research policy*, 35: 431-446.
- Rothaermel, F.T. and Deeds D.L., (2004), "Exploration and Exploitation Alliances in Biotechnology: A System of New Product Development" *Strategic Management Journal*, 25: 201-221.
- Sakakibara, M., (2002), "Formation of R&D Consortia: Industry and Company Effects", *Strategic Management Journal*, 23: 1033-1050.