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Public policies towards Research Joint Venture: Institutional design and participants' characteristics

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ABSTRACT

In this paper, we present several insights regarding the influence of institutional design on the process of Research Joint Venture (RJV) formation. Our results are obtained with a firm-level dataset on RJVs formed under the umbrella of the Eureka initiative and of the European Union's Framework Programmes (EU-FPs) for science and technology. We focus on firms that are known to have a high probability of forming RJVs, with the latter identified as firms with a past experience in collaborative research. The results indicate that EU-FP RJVs are consistent with a "top-down" and "mission oriented" research policy. By contrast, Eureka RJVs appear as more market driven and "bottom-up".

1. Introduction

Research Joint Ventures (RJVs) are agreements whereby firms decide to share technological knowledge while, in principle, continuing to compete against each other in the product market. During the last two decades, specific public policies towards RJVs have been developed. On the one hand, competition law determines the nature of inter-firm cooperation that is legally accepted. On the other hand, subsidies are sometimes granted to encourage RJV creation, as these arrangements are believed to have some socially beneficial characteristics, such as the reduction in the duplication of R&D costs and the internalisation of spillovers (Klette et al., 2000).

In this paper, we exploit institutional differences between two pan-European programmes aimed at promoting RJV formation. These two policy initiatives are the Eureka initiative and the EU Framework Programme (EU-FP). In short, Eureka is a fairly decentralised programme with few eligibility requirements, and public funding tends to be limited in the majority of cases. By contrast, the EU-FP's eligibility criteria are more rigid and the administrative burden is larger compared to Eureka, but the amount of subsidisation is larger. These differences allow us to relate programme design with RJV participants' characteristics.

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Recent contributions have highlighted the complex mechanisms that underlie RJV participation.[1] First, these models show that strategic interactions in the product market affect the decision to participate in RJVs. Second, RJVs involve the internalisation of technological spillovers, R&D cost-sharing, and the assimilation of knowledge that may be of strategic importance. Third, the degree of size-related asymmetries between firms influences participation decisions. Finally, the research paths (complementary vs. substitute R&D) affect the incentives to form an RJV.[2]

Given the complexity of the problem, empirical research has been hampered by a twofold constraint: lack of microdata, and the unobservability of a key number of parameters highlighted by theoretical models, such as the level of technological spillovers or differences in absorptive capacity across firms. As a result, a limited number of papers apply econometric techniques to the analysis of RJV formation. A first set of papers analyse the determinants of RJV participation. Röller et al. (1998) exploit a large US firm-level dataset that spans various industries. They show that size symmetry between participants and complementarity in the product market enhance the likelihood of two firms pairing in an RJV. Hernán et al. (2003) analyse the determinants of participation in European RJVs. Their findings confirm the importance of R&D intensity and the fixed costs associated with forming an RJV. Their results also serve to highlight the role played by knowledge flows in the process of RJV formation. A dummy picking-up the effect of past participation in collaborative projects turns to be highly significant, indicating that firms most likely to form an RJV today are the ones with a previous RJV experience.

The second set of contributions focus on the relationship between RJV formation and firm performance. For instance, Branstetter and Sakakibara (1998, 2002) study RJVs sponsored by the Japanese government, and report that membership of these consortia significantly increased participants' patenting activity. Irwin and Klenow (1996) focus on RJVs within a single industry, and provide evidence on the effect of participation in the US Semiconductor Manufacturing Technology Consortium (SEMATECH) on firms' profitability.

Publicly supported pan-European RJVs launched during the last two decades fall into two broad categories, as they have been formed under the umbrella of either the Eureka Programme or the EU-FP for science and technology. As far as we know, the only paper that exploits the existence of two distinct pan-European programmes is Benfratello and Sembenelli (2002). They focus on the effect of RJV participation on firms' performance, as proxied by three statistics: labour productivity, total factor productivity growth, and accounting price–cost margins. Their findings indicate that participation in Eureka RJVs has improved firms' performance on all three counts, while there is no discernible effect stemming from EU-FP RJVs.

In this paper, we extend the analysis of Hernán et al. (2003) by exploiting differences in institutional design and relate them to RJV participants' characteristics. We focus on firms that are known to have a higher probability of forming RJVs, with the latter identified as firms with a previous experience with collaborative research. The findings pertaining to EU-FP RJVs are consistent with a "top-down" and "mission oriented" research policy. By contrast, Eureka RJVs appear as more "diffusion" and "bottom-up" (the distinction between "mission" and "diffusion" oriented science and technology policies has been popularised by Ergas, 1987).[3] These results are consistent with those of Branstetter and Sakakibara (2002) who also find that the design of Japanese research consortia influences outcomes.

The remainder of the paper is organised as follows. The next section briefly outlines the salient features of Eureka and the EU-FPs and describes the data. Section 3 identifies testable conjectures, and presents our empirical specification. Section 4 contains the empirical results, while Section 5 provides concluding remarks.

2. Programme design and data sources

The set of RJVs which are analysed in this paper are retrieved from the "STEP to RJV" database, constructed as part of an EU financed TSER project (see Hernán et al. for a comprehensive description). These RJVs have been formed under the umbrella of either the Eureka Programme or the EU-FP. While the declared aim of these two programmes is pretty similar (foster cross-border technological cooperation), their operation differ substantially.

2.1. The research programmes

Eureka was launched in the mid-1980s as a European "response" to the US's Strategic Defence Initiative (also known as "Star Wars"), with France as its main sponsor.[4] Initially, Eureka was viewed with much suspicion by the EU Commission, which was at the time trying to lay the basis of an EU research policy endowed with its own resources (Georghiou, 2001). Despite its original aim, Eureka quickly evolved into a decentralised structure coordinated by a small secretariat. In general terms, survey evidence strongly indicate that firms' appreciate the light bureaucratic burden associated with participation to an Eureka project (Georghiou, 2001). The bulk of ventures consist of civilian applications, and are "close to the market". Participating countries include EU and EFTA members as well as Turkey. Eureka RJVs have to involve firms from more than one participating country. Apart from this requirement, firms are pretty free to design the project they wish, that is the approach is very much "bottom-up". For instance, Eureka allows for "variable geometry", which means that it

[1] See, among others, Kamien et al. (1992), Poyago-Theotoky (1995), Katsoulacos and Ulph (1998), Röller et al. (1998), and Petit and Towlinski (1999).

[2] The theoretical literature on RJVs is extensive and the review provided here is very partial. See De Bondt (1997) for an in depth treatment.

[3] "Diffusion oriented" science and technology policies are more market driven and focus on the adoption of existing technologies within the economic fabric, while "mission oriented" policies involve a set of goals established by public authorities.

[4] Eureka is not an acronym, but the name was chosen when ministerial discussions focused on the creation of an European Research Co-ordination Agency.