



## PRESS RELEASE WORKING PAPER 4.30

### DO FIRMS COOPERATE IN R&D PERSISTENTLY? EVIDENCE FROM SPAIN

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#### OBJECTIVE

In this research we aim at providing evidence on the dynamics in firms' R&D cooperation behaviour. The main objective is, therefore, to analyse if R&D collaborative agreements are persistent at the firm level, and in such a case, to study what are the main drivers of this phenomenon. Knowing which determinants of persistence are prevalent has important policy implications. If carrying out R&D collaboration activities depends on previous experience in such activities, collaboration-stimulating policy measures, such as government support programmes, are supposed to have a deeper effect because they do not only affect current collaboration agreements but are also likely to induce a permanent change in favour of cooperation. If, on the contrary, persistence is driven by individual characteristics, temporary shocks to technological collaboration will rapidly dissipate, and support programmes are unlikely to have long-lasting effects and policy should focus more on policies trying to improve the specific factors that drive R&D cooperation. In such a case, understanding the determinants of the persistence of firms when undertaking agreements of collaboration would allow policy makers to focus resources on "survival-winners" and avoid wasting resources on "survival-losers". The present research contributes to this issue, providing evidence for a representative sample of Spanish firms for the period 2002-2010.

In addition, following with the well-documented idea that cooperative experience can be considered as an incremental learning process in terms of the management of collaborative agreements (Powell et al., 1996), we aim at providing evidence on the extent to which having participated in technological collaborations with one type of partner in the past may be a significant dimension when it comes to analysing current collaborative agreements not only with the same but also with other type of partners. The literature on organizational learning (Levitt and March, 1988) discusses how firms recurrently cooperating learn how to manage cooperation agreements by repeatedly engaging in them. This gives us arguments to state that this experience of cooperation activities is not restricted to the fact of cooperating with the same partner or even with the same type of partner (i.e. competitors, clients, suppliers or universities and research centers). Firms with experience of technological cooperation

agreements gained through long-standing relationships are likely to join other partners, even if they are of a different nature than the previous ones, just because they have learnt to develop and establish routines, policies and procedures based on their previous experiences (Nieto and Santamaría, 2007). Therefore, a second contribution of the present research deals with the differentiated persistence pattern of collaboration agreements for three different types of partners: customers and/or suppliers, competitors and institutions. We specifically explore the degree of the persistence in R&D collaborative activities when considering them separately as well as the possibility of finding crossed-persistence across these different partner types.

## MAIN RESULTS AND POLICY IMPLICATIONS

Our study is an attempt to analyse persistence in R&D cooperation activities and, as a consequence, understand innovation in a globalised environment. Initially, persistence in cooperation agreements is appealing, as it provides firms with a stream of information that becomes available thanks to being embedded in a network. The results show that there is a high persistence in R&D cooperation activities at the firm level. After discounting the impact of observed and unobserved firm characteristics, in the Spanish case, a firm cooperating in  $t-1$  has a probability of cooperating which is approximately 34 percentage points higher than that of a firm not having cooperated in the previous period. This could be explained by the knowledge accumulation and capabilities that may be gained from past experiences in cooperation projects, the barriers to enter and exit which can arise due to sunk costs, and the success and reliability in past cooperation agreements. In addition, we observe that firms with higher incoming spillovers, higher R&D intensity, large firms and firms that belong to a group of enterprises as well as firms that use protection methods (such as patenting, registered an industrial design, trademark or copyright) are more persistent in their technological collaborative agreements.

When taking into account the different types of partnership, we conclude that the highest persistence is found in the case of collaboration with institutions, followed by customers and clients. One potential explanation may be related to the relative limited spillovers risks in those types of alliances if compared to the one in agreements with competitors, which may imply a higher persistence of the former alliances. Finally, in all the types of partners, we obtain that cooperation agreements with one type increase the likelihood of cooperating in the future with a different type of partner, although with a much lower intensity than in the case of the same partnership group.

From a policy perspective, the fact of R&D cooperation being state dependent implies that collaboration-stimulating policy measures, such as government support programmes, are supposed to have a deeper effect because they do not only affect current collaboration agreements but are also likely to induce a permanent change in favour of cooperation. In addition, since persistence is also driven by certain individual characteristics of the firms, they could be taken into account when designing policies to stimulate cooperation in a persistent way: firms with high R&D intensity, large firms and firms that belong to a group of enterprises as well as firms that use protection methods. Policy makers could decide to focus resources on these “cooperation-survival-winners”.