



## ABSTRACT

**Title:** Cooperating for innovation. Intra-European Union partnerships in times of crisis

**Authors and e-mail of all:**

Antonio García-Sánchez ([acichez@us.es](mailto:acichez@us.es))

Ruth Rama ([ruth.rama@cchs.csic.es](mailto:ruth.rama@cchs.csic.es))

**Department:**

Department of Economics and Economic History. Research Group of Economic Analysis and Political Economy.

IEGD, CSIC, National Research Council of Spain

**University:**

Universidad de Sevilla

CSIC, National Research Council of Spain

**Subject area:** *(please, indicate the subject area which corresponds to the paper)*

3. Economy of knowledge and geography of innovation.

**Abstract:**

One of the few questions on which economists show a general agreement is the positive effect of technological innovation on long-term growth (Mazzucato, 2016). In a context of increasing cost of R&D, a rapid technological change in certain sectors, and a diversity of technological fields needed to produce even “traditional” goods (Molero & García, 2008), firms tend to engage in open innovation (i.e. cooperative activities) with a variety of partners, constituting crucial considerations in times of crisis. Despite the literature suggests that cooperation for innovation is a worthy strategy, the cooperative behaviour in times of crisis is understudied.

Our paper analyses the determinants cooperation for innovation of Spanish firms with partners (external to the focal firm and its business group) located in other countries of the European Union (EU) during 2004-2016. We focus on the understanding of determinants of cooperation for innovation with such partners throughout the business cycle, by dividing the 2004-2016 period into three sub-periods (boom, downturn, and recovery).

Two main research questions arise. First, in which extent the determinants of cooperative innovation with EU partners changed throughout the business cycle? Second, what are the main differences (if there are any) in cooperative patterns between different types of firms similar throughout the business cycle?

For this purpose, we develop an iterative estimation of logit models with panel data (inferences based on panel robust standard errors), using the PITEC database provided by the Spanish National Statistics Institute (INE).

We found both, differences in determinants for innovative cooperation in different phases of business cycle as well as associated to type of firm. In general, previous experience in cooperation for innovation increased the probability that a company cooperates, with a stronger effect during the crisis. The evidence that predictors (hampering factors for innovation, firms' structural factors, knowledge sources, industry characteristics...) may change during crises confirms our H1 and points on the need of longitudinal studies.

Regarding our RQ2, we found significant differences in the propensity to cooperate associated to firms' ownership. Unaffiliated domestic firms show the lower propensity to cooperate in any phase of the business cycle, while the state-owned enterprises (SOEs) are the more prone to develop such types of open innovation activities. In contrast, foreign ownership has a neutral effect in all circumstances, compared with Spanish domestic groups.

Funding: Ruth Rama gratefully acknowledges support from the Consejería de Innovación, Universidades, Ciencia y Sociedad Digital, Generalitat Valenciana (Spain) [AICO/2021/021].

**Keywords:** (*maximum 6 words*)

business cycle, crisis, downturn, MNE, foreign subsidiaries, state-owned enterprises, cooperation for innovation, internationalization of R&D

**JEL codes:**

E32 (Business Fluctuations • Cycles)

F23 (Multinational Firms • International Business)

L32 (Public Enterprises • Public-Private Enterprises)

O31 (Innovation and Invention: Processes and Incentives)

O32 (Management of Technological Innovation and R&D)

O36 (Open Innovation)