Networks, proximities and inter-firm knowledge exchanges

Stefano Usai, Emanuela Marrocu, Raffaele Paci

University of Cagliari, CRENoS

Abstract

The exchange of knowledge among firms is facilitated by their spatial proximity given its well known tacit nature, which usually bounds the spatial scope of spillovers (Jaffe et al. 1993; Audretsch and Feldman 1996). At the same time the concept of closeness has several other dimensions which may have an a-spatial nature, such as technological, institutional or organisational proximity (Boschma, 2005; Torre and Rallet, 2005; Marrocu et al., 2013). Moreover, economic agents may establish social links within different networks which may facilitate the exchanges of knowledge and moderate the adverse effects of other distances. The literature has extensively analysed the characteristic of these knowledge networks and their effects on innovation diffusion considering various forms of connections among agents. Participation in research programmes (Autant-Bernard et al., 2007; Maggioni et al., 2007; Balland 2012), co-patenting (Cantner and Meder, 2007; Maggioni et al., 2007, Cassi and Plunket, 2012), citations (Maurseth and Verspagen, 2002, Paci and Usai, 2009), co-publications (Ponds et al., 2007), applicant-inventors relationships (Maggioni et al, 2011, Picci, 2011) and human capital mobility (Miguelez-Moreno, 2011 and Breschi and Lissoni, 2009).

In this paper we intend to follow a different route by looking at the knowledge exchanges which are due to two particular modes of agreement among firms, i.e. joint ventures (JV) and strategic alliances (SA). The management literature (Kogut, 1988; Inkpen, 2000; Oxley and Sampson 2004) has remarked how such inter-firm agreements, whatever their specific nature and motivation, create the conditions for knowledge sharing and thus represent an important channel of knowledge exchanges among the companies involved. Indeed, firms perform several activities before, during and after the agreements which allow partners to access and share knowledge-based resources which are often embedded within the organisations (Muthusamy and White, 2005; Janowicz-Panjaitan and Noorderhaven, 2008; García-Canal et al., 2008). These activities encompass information flows among managers starting from the preliminary stages. These flows

may include either access to new technologies and organizational competencies or integration, sharing and transfers of capabilities and human and organizational resources, or, finally, formal and informal interorganizational learning processes

We pursue this aim by focussing on Italy, a peculiar case among the western rich economies' scenario. Italy, despite a strong growth in latest years, is not big player in the foreign direct investment market as it is in export market. The main reason rests on the fact that in Italy SME's are prevalent and they are often unable to sustain the cost of entry in foreign market as investors. For this reason Italy is specialized in other softer forms of internationalization, such as joint ventures and strategic alliances. This makes the Italian one a case in point to analyze international knowledge exchanges which operate mainly thanks to firms' agreements rather than mergers and acquisitions.

We base our empirical analysis on announced agreements with at least one firm localised in Italy over the period 2005-2012. We also collect data for the years 2000-2004 to control for the previous participations in collaboration networks. Data are retrieved from the SDC Platinum database (Thomson Financial) and include both domestic and international collaborations. In total we consider 631 agreements over the eight years 2005-2012 which involve 1078 firms (of which 511 Italian). These 631 agreements covers all economic activities and this allow us to offer quite a wide-ranging scenario with respect to previous contributions on the role of proximity based on individual data. All of them, to the best of our knowledge, have been, so far, limited to single industry, such as footwear (Boschma and Ter Wal, 2007), nanotechnology (Autant-Bernard et al., 2007), aviation (Boschma and Broekel, 2009), biotechnology (Fornahl et al., 2011), global navigation satellite system (Balland, 2012) and genomics (Cassi and Plunket, 2012). Other studies give a global picture of the role of proximity with respect to the entire economy even though while using data aggregated at a regional level (Marrocu et al., 2012, Maggioni et al., 2012). Our study is, therefore, the first one to operationalise all dimensions of proximity within a multi-sector framework and to test their substitutability or complementarity in a complex economic system.

The econometric analysis is based on a logit model for rare events, where the dependent variable takes value one for each pair of firms which have actually announced a collaboration and takes value zero for potential pairs, defined as any two firms that could have set up an agreement but did not. The estimated logit model is, then, used to assess the effects of the different proximities on the probability that two firms exchange knowledge, thanks to an inter-firm agreement.

Two results are worth mentioning.

First of all, as in Marrocu et al. (2013), geography and the other dimensions of proximity are not substitute but rather complementary. As a matter of fact, results show that all dimensions of

proximity have a positive and significant impact on the decision process of firms with respect to the exchange of knowledge thanks to agreements with other firms. Secondly, the higher marginal impact on probability is due to technological proximity rather than to geographical proximity; whereas the other proximities (social, institutional and organizational) have a more modest effect.

Keywords: knowledge flows, strategic alliances, joint ventures, proximities