Available online at www.sciencedirect.com

ScienceDirect

International Journal of Project Management 34 (2016) 1519–1536

International Journal of Project Management

www.elsevier.com/locate/ijproman

The role of social capital towards resource sharing in collaborative R&D projects: Evidences from the 7th Framework Programme

Miguel Linhares Pinheiro [a,*], Paulo Serôdio [b], José Carlos Pinho [a], Cândida Lucas [c]

[a] Department of Management, School of Economic and Management, University of Minho, Braga, Portugal
[b] Department of Sociology, University of Oxford, Oxford, United Kingdom
[c] Centre of Molecular and Environmental Biology (CBMA), University of Minho, Braga, Portugal

Received 14 October 2015; received in revised form 12 July 2016; accepted 14 July 2016

Abstract

This study examines the role of Social capital dimensions towards resource sharing within R&D cooperation projects funded by the 7th Framework Programme (FP7). Data were collected in a survey of 553 FP7 project participants and analysed using two different social network analysis (SNA) methodologies: Logistic regression quadratic assignment procedure and exponential random graph models. Results showed that all Social Capital dimensions helped to explain partners' resource sharing, although to a different extent. Prior ties were often significant, whilst shared vision and commitment were very frequently positive contributors to resource sharing. Trust was rarely significant, and occasionally detrimental, to partners' resource sharing. Therefore, the FP7 provided a collaborative but opportunistic environment for public and private actors. The novelty of this study derives from the combination of social capital theory with SNA to study intra-project partner relationships, contributing to a better understanding on the diversity of partner relationships within R&D projects.

Keywords: Social capital; Resource sharing; R&D projects; Framework programmes; LRQAP; ERGMs

1. Introduction

The European Commission has made substantial efforts, since 1984, to improve Europe's international competitiveness through successive Framework Programs for Research and Technological Development (FPs). These programmes funded many networks in the form of Research Joint Ventures (RJVs) composed of public and private international institutions. Despite the over €40,000 M of funding attributed between 2007 and 2013 (European Commission, 2015), past research on RJVs mostly addressed the composition and size as well as the frequency and diversity of institutional participation (see, for example, Pandza et al. (2011)). The relationships among project partners received little attention in previous studies. Some works have used social network analysis (SNA) to understand collaboration patterns within FP-funded RJVs, but only analysing the coparticipation in RJVs, and not the patterns of de facto internal cooperation (Breschi and Cusmano, 2004; Ortega and Aguillo, 2010; Protogerou et al., 2013; Vonortas and Okamura, 2013). Notwithstanding these contributions, understanding partner relationships is critical for comprehensively understanding R&D cooperation, because inter-organizational contracts and agreements represent only a fraction of the overall set of ties in R&D cooperation (Bekkers and Freitas, 2008; Brennecke and Rank, 2016). As Wang (2016) observed, knowledge resides within and is created by individuals, but it can also be viewed as a social and collaborative process. In fact, network interactions at the individual level among scientists and university researchers have been described as a leading source of new knowledge (Liebeskind et al., 1996), thus suggesting a predominantly social process around resource sharing and

* Corresponding author at: Universidade do Minho, Escola de Economia e Gestão, Campus de Gualtar, 4710-057 Braga, Portugal.
E-mail address: miguelpinheiro@eeg.uminho.pt (M.L. Pinheiro).

http://dx.doi.org/10.1016/j.ijproman.2016.07.006
0263-7863/00/

knowledge creation (Wang, 2016). Moreover, effective relational mechanisms are linked with greater resource sharing among partners (Yli-Renko et al., 2001), which signals interactive cooperation, and increases the likelihood of R&D success. This is particularly important in fast-paced high-technology sectors, such as the Biological Sciences, where both firms and universities frequently depend on network partners to access sources of innovation (Fontes, 2005; Powell et al., 1996).

Based on the rationale above, Social Capital, i.e. the actual and potential resources embedded in relationships (Nahapiet and Ghoshal, 1998), is likely to play a relevant role in predicting collaboration patterns within FP-funded RJVs, as previously described for networks composed only by firms (Brennecke and Rank, 2016; Lee et al., 2015; Molina-Morales and Martínez-Fernández, 2010). Accordingly, the major drivers of resource sharing might not be the number and diversity of RVJ partners (Beers and Zand, 2014), but rather the commitment, trust, prior ties and shared vision embedded in the relationships among partners (Molina-Morales and Martínez-Fernández, 2010; Pérez-Luño et al., 2011). Instead of researching the role of Social Capital towards Resource Sharing within FP-funded project networks, past studies either focused on inter-project networks and their implications in knowledge diffusion across Europe (Avedas, 2009; Protogerou et al., 2013; Vonortas and Okamura, 2013), or on Social Capital as a driver of innovation without studying the actual network of interactions (Nieves and Osorio, 2013; Pérez-Luño et al., 2011). Therefore, the novelty of this study results from the combination of Social Capital theory with SNA to study intra-project partner relationships and their impact on Resource Sharing in FPs. Ultimately, this study could contribute to a better understanding on what promotes effective R&D collaboration, leading to greater success of FPs. Accordingly, the following research question is addressed:

> To what extent do Social Capital dimensions (structural, cognitive and relational) impact Resource Sharing among participants of FP-funded R&D projects?

By using SNA, this study contributes to a better understanding on the diversity of partner relationship within R&D projects, using data collected in a survey of over 550 FP7 participants. Results showed that Social Capital dimensions increase the odds of Resource Sharing among partners. Prior Ties were often significant, whilst Shared Vision and Commitment were very frequently positive contributors to Resource Sharing. Trust was rarely significant, and occasionally detrimental, to partners' Resource Sharing. Consequently, Framework Programmes are potentially providing a collaborative but opportunistic environment for public and private actors.

2. Theoretical framework

2.1. Social capital for studying R&D cooperation networks

Social Capital theory has helped in understanding how relationships impact resource exchange (Adler and Kwon, 2002; Bourdieu, 1986; Inkpen and Tsang, 2005), value creation (Li et al., 2013; Nieves and Osorio, 2013), and innovation performance (Abbasi et al., 2014; Molina-Morales and Martínez-Fernández, 2010; Pérez-Luño et al., 2011). Most definitions of Social Capital converge to the idea that actors influence and are influenced by their networks, drawing upon the notion that relationships represent a form of capital that can be leveraged to reach individual and collective goals (Adler and Kwon, 2002; Hartmann and Herb, 2015; Inkpen and Tsang, 2005; Nahapiet and Ghoshal, 1998). Over time, consensus emerged regarding the major variables to measure Social Capital, namely: network ties, trust, norms and obligations as well as shared codes and languages (Nahapiet and Ghoshal, 1998). These variables are relational and therefore should be measured between pairs of actors. For instance, it makes little sense to ask a participant his/her overall level of trust in a 5-member network. Trust should be reported at the tie level with each member, since it is not an attribute of a single actor, such as native language, affiliation, or years of experience in FPs. In this particular case, Trust is a directed tie, meaning that A may trust B, but the opposite may not be true. Therefore, in order to properly measure Trust and all the other variables that form Social Capital, research must focus on each tie between every pair of actors, therefore requiring a study of the whole network of actors. Additionally, and just like financial or physical resources, Social Capital is a resource of limited availability. Consequently, partners in R&D networks are likely investing selectively in relationships that allow achieving their goals in the RJV, not necessarily sharing the same relationship engagement with all members. Hence, the study of Social Capital in R&D cooperation networks should be able to measure the availability of these social resources, embedded in partner relationships, and explain the extent to which that availability affects or describes the network of close collaboration and sharing of human, physical and technical resources among partners.

2.2. Social capital dimensions and resource sharing

Nahapiet and Ghoshal (1998) classified Social Capital into three dimensions: Structural, Cognitive and Relational. Tsai and Ghoshal (1998) confirmed the existence of causal relationships between Social Capital dimensions, resource exchange and value creation. This was inferred based on research in a network of subsidiaries from a multinational company, and has since then been extended to other contexts (Atuahene-Gima and Murray, 2007; Hartmann and Herb, 2015; Molina-Morales and Martínez-Fernández, 2010). The present research extends Tsai and Ghoshal's (1998) work into the study of RJV funded by the European Commission.

2.2.1. Resource sharing

Tsai and Ghoshal (1998) dealt simultaneously with resource exchange and combination among firms, by assuming exchange as a requisite for combination. The resulting output of those two activities would be the creation of new resources (Nahapiet and Ghoshal, 1998). However, resource exchange (or transfer) could