J. Eng. Technol. Manage. 27 (2010) 33–51

Contents lists available at ScienceDirect

Journal of Engineering and Technology Management

journal homepage: www.elsevier.com/locate/jengtecman

Configurations of knowledge transfer relations: An empirically based taxonomy and its determinants

L.A.G. Oerlemans [a,b,*], J. Knoben [a]

[a] Department of Organisation Studies & Center for Innovation Research, Tilburg University, the Netherlands
[b] Graduate School of Technology Management, University of Pretoria, South Africa

ARTICLE INFO

Article history:
Available online 25 March 2010

JEL classification:
D83
L14
L25
O30

Keywords:
Innovation
Inter-organizational relations
Configurations
Taxonomy
Knowledge transfer

ABSTRACT

We focus in this study on sets of inter-organizational relationships (IORs) by applying a configurational approach that includes both the diversity and the intensity of knowledge transfer IORs. We use a latent class cluster analysis to empirically explore the kinds of IORs configurations. We then use antecedents derived from the IOR literature to explain firm membership in those configurations. Our tests allow us to identify four configurations ranging from isolated innovators to innovating firms embedded in diverse and deep sets of IORs. We show that internal knowledge use by firms, and the types of innovative activities in which they engage, are strong predictors of firm membership in different configurations.

1. Introduction

Innovation is essentially the combining, recombining and developing of knowledge. As firms seldom have within themselves all of the knowledge that they need to innovate, they form inter-organizational relationship (IORs) with other independent organizations in an effort to access what they lack. We call IORs formed to access and transfer information that contributes to innovation, knowledge transfer IORs. The value of the knowledge a firm is able to acquire in this way depends on the types of organizations with which it maintains IORs, and the quality of its IORs (Gulati, 1998). IORs may be formal or informal, reciprocal or not. They can serve both as a search engine for knowledge, and as a conduit for it (Gulati, 1998; Powell et al., 1996).

* Corresponding author at: Tilburg University, Room P1.159, Warandelaan 2, P.O. Box 90153, 5000 LE, The Netherlands. Tel.: +31 466 3153; fax: +31 466 3002.
E-mail address: l.a.g.oerlemans@uvt.nl (L.A.G. Oerlemans).

0923-4748/$ – see front matter © 2010 Elsevier B.V. All rights reserved.
doi:10.1016/j.jengtecman.2010.03.002

Many innovating firms[1] are embedded in multiple sets of knowledge transfer IORs of different configurations (Goerzen and Beamish, 2005; Parise and Casher, 2003). While several researchers have shown that IORs substantially influence firm innovativeness (Capaldo, 2007; Schilling and Phelps, 2007; Ahuja, 2000), with a few notable exceptions, IORs configurations remain understudied (Bensaou and Venkatraman, 1995; Gemünden et al., 1996; Hansen, 1999; Ozcan and Eisenhardt, 2009), and there is little agreement on a systematic classification of different configurations of IORs. We address that gap in the contemporary literature. We do that in two separate steps.

We begin by focusing on configurations of inter-organizational relationships that can be distinguished empirically. To arrive at those configurations, we combine two dimensions of sets of knowledge transfer IORs: diversity and depth. For firms seeking to make technological innovations diversity means links with (groups of) for example buyers, suppliers, competitors, consultants, public research labs, universities, innovation centers, and sectoral institutes. As different actors possess or control different types of knowledge and information the combination of actors within a set affects the value of knowledge that can be obtained from it. By depth we mean the importance of the set of knowledge transfer IORs to the firm, that is, the extrinsic value that the firm attaches to it.

This study of IORs configurations has relevance because an innovating firm embedded in a set that includes multiple and diverse external sources of knowledge has informational advantages and access to a broader pool of technological opportunities It also benefits from synergetic effects (Duysters and Lokshin, forthcoming). On the one hand, forming a tie in one type of linkage can strengthen the effectiveness of the existing knowledge transfer ties. On the other hand, because of the amount of time and attention that they may require, participation in a set of knowledge transfer IORs with diverse and deep ties can result in an increase in managerial costs which might lead to inferior results. In our second step, we draw on the innovation and IOR literature, looking specifically at factors central to IORs formation and innovative behavior, to analyze what explains firm membership in each of the configurations we identify.

We contribute to the literature on IORs in several ways. First and foremost, we add to the emerging empirical work on (the antecedents of membership of) IOR configurations by mapping the configurations that may occur. This is important as there has been some evidence that different IORs portfolios yield different innovative and/or organizational outcomes (Capaldo, 2007). By focusing on IORs configurations rather than on dyads, we answer the call for inter-organizational research beyond the dyadic level (see Provan et al., 2007).

Moreover, by deriving propositions based on factors identified in the IOR and network literature and exploring the influence of those factors on firm membership in each of the IOR configurations we identify, we are able to determine which factors have the greatest explanatory power. Combined these contributions result in insights with a high level of external validity and provide valuable insights in a field that has to date been predominantly explored using case studies.

We also add to the emerging literature on the open innovation model (Chesbrough, 2003). According to that model organizations can develop an external orientation and successfully commercialize ideas whether they are generated and developed internally or externally (Lichtenthaler, 2008). Firms following open innovation strategies are more inclined to have links with other kinds of organizations and to actively involve them in their innovation processes (Tether and Tajar, 2008). Focusing on IOR configurations implies that the production of innovation is regarded as a distributed process.

Finally, in addition to our theoretical contribution we make a methodological one by introducing a relatively new, advanced, and highly suitable methodology into research on IORs, namely latent class cluster analysis. This allows us to combine in a single variable information on the diversity of partners, i.e. the different nodes, with whom a firm collaborates and that on characteristics of those relationships, i.e. the importance the focal firm attaches to them.

We continue with a review of the sparse existing IORs configuration literature, and subsequently, draw on several theoretical perspectives on the formation of innovative IORs (Barringer and Harrison, 2000; Oliver, 1990), to derive propositions on the antecedents that lead to different IORs

[1] *While we recognize the importance of managerial, financial and marketing innovations, our study looks specifically at the technological innovations of firms and the knowledge required to achieve it.*