

Technological flows and choice of joint ventures in technology alliances

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Abstract

This paper analyses the influence of technological flows in the choice of joint ventures as a governance form of technology alliances, using a theoretical framework based on Transaction Costs Economics and the Economics of Intellectual Property Rights. We argue that the formation of a joint venture is only necessary in situations for which technological flows make the monitoring of alliance activities and the distribution of cooperation rents difficult. Our hypotheses have been confirmed using a sample of technology alliances created by companies from the European Union between 1992 and 1999.

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1. Introduction

The R&D boundaries of the firm, i.e. the governance choices in the R&D process, constitute a mainstream topic in the fields of technology and strategic management (Pisano, 1990, 2006; Oxley, 1997; Veugelers and Cassiman, 1999; Arora et al., 2001; Arora and Merges, 2004; Tallman and Phene, 2006). Many papers have studied this issue, whose importance has been rising due to the growing trend to use external sources of technology (von Hippel, 1988; Nooteboom, 1999). In effect, technological change and global competition have forced firms to search for external sources of knowledge through a wide diversity of alliances (Hagedoorn and Osborn, 2002). In fact, firms are also looking for external sources for specific R&D services, even from emerging countries

(UNCTAD, 2005). Thus, the R&D process that was once performed in house is now organized through a network of technological alliances in order to reap the benefits of complementary skills and fast product development (Rothaermel and Deeds, 2004; Colombo et al., 2006). Given this proliferation of technological alliances, their effective governance becomes a key factor in designing a technology strategy.

The identity of the main drivers behind the use of joint ventures (henceforth JVs) as a governance form in technology alliances is a puzzling question, still not fully understood despite research carried out by Pisano (1989), Osborn and Baughn (1990), Gulati (1995), Oxley (1997), Colombo (2003), and Sampson (2004). The literature on contractual form in strategic alliances shows that JVs are an appropriate governance form for dealing with complex alliances (García-Canal, 1996; Colombo, 2003) and those entailing high appropriability hazards (Oxley, 1997). By setting up an administrative hierarchy as well as a basis for distributing the rents of the cooperation, JVs can protect their partners from opportunism.

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Table 1
Previous empirical evidence of determining factors of the creation of JVs

	Factors	Positive influence	Neutral effect (not significant)	Negative influence
Functional domain of the agreement	R&D	Gulati (1995), Oxley (1997) ^b , Oxley (1999), Pisano (1989) ^c , Osborn and Baughn (1990), Gulati and Singh (1998)	Colombo (2003)	García-Canal (1996), Pisano et al. (1988) ^a , Rialp and Salas (2002) ^c , Casciaro (2003)
	Several functional areas	García-Canal (1996), Colombo (2003), Oxley (1997) ^b , Oxley (1999), Pisano et al. (1988) ^a , Pisano (1989) ^c , Rialp and Salas (2002) ^c , Oxley and Sampson (2004), Sampson (2004)		
	Production	Casciaro (2003), Pisano et al. (1988) ^a , Tallman and Phene (2006)		
	Technology transfer		Pisano et al. (1988) ^a	
	Marketing		Casciaro (2003), Pisano et al. (1988) ^a	Tallman and Phene (2006)
	License			Casciaro (2003), Tallman and Phene (2006)
Other domains of agreement	Supply		Tallman and Phene (2006)	Casciaro (2003)
	Number of partners	García-Canal (1996), Colombo (2003), Croisier (1998) ^b , Oxley (1997) ^b , Oxley and Sampson (2004), Rialp and Salas (2002) ^c	Gulati (1995), Gulati and Singh (1998), Sampson (2004)	
	Number of products or technologies	Croisier (1998) ^b , Oxley (1997) ^b , Oxley (1999), Pisano (1989) ^c , Sampson (2004) ^d	Oxley and Sampson (2004)	
	Cooperation covers several countries	Croisier (1998) ^b		García-Canal (1996), Oxley (1997) ^b
	Duration	Croisier (1998) ^b		
	Interdependence	Gulati and Singh (1998)		
	Diversification product/market	Rialp and Salas (2002) ^c		
	Competitors	Rialp and Salas (2002) ^c	Oxley (1997) ^b , Colombo (2003)	Oxley and Sampson (2004) ^d
	International partners	Gulati (1995)		Oxley and Sampson (2004) ^d
	Previous relationships	Colombo (2003)	García-Canal (1996), Oxley (1997) ^b , Oxley and Sampson (2004), Sampson (2004)	Gulati (1995), Casciaro (2003) ^d Gulati and Singh (1998)
Partners' characteristics	Partners' experience in alliance management		Oxley (1997) ^b , Colombo (2003), Hagedoorn et al. (2005)	
	Companies' technological diversity	Sampson (2004) ^e , Colombo (2003), Hagedoorn et al. (2005)		
	Reputation		Sampson (2004)	
	Effectiveness of the intellectual property protection systems			Oxley (1999)
	Cultural distance	Hagedoorn et al. (2005) ^d	Oxley (1999)	
Domain of the alliance	Industry's technological intensity	Osborn and Baughn (1990)		Hagedoorn and Narula (1996) ^a , Hagedoorn et al. (2005)
	Number of potential allies			Pisano (1989) ^c

^a Bivaried tests.

^b Tests based on ordered logit model of three categories in which the JVs are the third category.

^c Minority shareholdings are grouped together with JVs.

^d Only partial evidence.

^e Relation in the shape of inverted U.

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