



Influence of university–firm governance on SMEs innovation and performance levels



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ABSTRACT

The purpose of this paper is to study how different university–firm governance styles impact SMEs' innovation and performance. In this sense, we differentiate between *relational* governance – based on interpersonal links of trust – and *contractual* governance – based on codified scientific and technological knowledge. The empirical analysis is based on data gathered through a questionnaire administered to a sample of 600 Spanish SMEs. The findings show that only *contractual* university–firm relationships have a direct and significant effect on innovation, whereas *relational* activities promote and support *contractual* activities. The findings have managerial implications not just for firms, but also for universities.

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1. Introduction

University–firm relationships contribute to regional and global development, because they foster innovation processes regarding firms' strategies at those levels (Ponds et al., 2010). In this liaison, universities' role usually is to promote knowledge-based economic development, which is basic for sustainable economic growth (Hibbert and Huxham, 2010). Since higher education institutions are facing an increasingly competitive environment with growing financial constraints, universities are strongly motivated to engage more actively with the industry, so as to establish new funding streams and secure additional research investment (Bruneel et al., 2010). This relationship should be beneficial for both firms and universities.

Our paper deals with the challenge faced by SMEs (Small and Medium Enterprises) when opting for one of the two forms of governance, relational or contractual (Lee and Cavusgil, 2006; Poppo and Zenger, 2002), in their relationships with higher educational institutions. Traditionally, contractual-based governance is characterized by formal contracts identifying the obligations to perform specific actions in the future and the mode of resolution when these obligations are not fulfilled (Poppo and Zenger, 2002; Rus and Igluc, 2005). In relational-based governance there are social ties between partners, aimed at consolidating norms, commitment, trust and confidence while solving their conflicts (Granovetter, 2005; Uzzi, 1997). Relational governance thus

prioritizes interpersonal links of trust, and learning through personal bonds. These are features of the DUI (Doing, Using and Interacting) mode of acquiring knowledge (Jensen et al., 2007). Contractual-based governance between firms and universities encourages the production and use of codified scientific and technological knowledge, which are the characteristic components of the STI (Science-Technology Innovation) mode of learning (Jensen et al., 2007). Most research literature underlines the complementarities between relational and contractual governance styles and their positive effect on performance (Huggins, 2000; Lee and Cavusgil, 2006; Poppo and Zenger, 2002; Zaheer and Venkatraman, 1995). However, in the case of SMEs, innovation strategies give prominence to interactions with suppliers and providers, which are typical of the DUI mode of learning (Jensen et al., 2007), thereby neglecting relationships with university.

This scenario of possible relationships between universities and SMEs poses at least two main research questions that had not been previously tackled. On the one hand, does cooperation through mainly relational channels of knowledge transfer facilitate the creation and use of contractual channels by SMEs? And on the other hand, do university–SME collaborations support innovation and performance in this kind of company?

We addressed both issues through an empirical analysis of 600 Spanish SMEs. The Spanish case is especially interesting because just a few Spanish firms collaborate with university in innovation activities, in contrast with what goes on in the rest of European countries.¹

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¹ In Spain only 10.3% of the firms are involved in University collaborations developing product and process innovations. This percentage is 13.1% for the rest of Europe, 18.5% for Belgium, 14.9% for Denmark and 14.3% for Germany.

There are many problems that hamper university–firm relationships, such as lack of knowledge and confidence, shortage of communication tools and support, and insufficient collaboration (COTEC, 2009; CYD, 2010). Additionally, technology transfer from universities to firms in Spain is held back by bureaucracy and it is not sufficiently oriented towards companies' technological needs (COTEC, 2013). This case is also interesting because in recent years Spanish SMEs have received substantial public grants in order to stimulate innovation activities over university–firm relationships (Segarra-Blasco and Arauzo-Carod, 2008). These are the specific circumstances that characterize our analysis.

This paper contributes to literature in the following way. The nature and impact of university–firm linkages remain under-explored in the case of SMEs (Lee et al., 2010). Due to the very fact of their dependency on financial resources, SMEs can hardly conceive an in-house system of assessment to monitor information asymmetries in their collaborative relationships (Heide, 2003). Furthermore, if lack of confidence characterizes collaborative relationships, both the outcomes of projects and the processes leading to them are uncertain. This study follows a research line attempting to identify the most convenient governance modes in such a way as to reduce the importance of information asymmetry to which SMEs are exposed (Heide, 2003; Whipple and Roh, 2010). Our results suggest that SMEs reduce their information asymmetry if their transfer channels with universities implement complementary governance modes (both relational and contractual). Our findings do not just indicate that only contractual university–firm relationships have a direct and significant effect on innovation, but also that relational activities promote and support contractual ones.

These findings support previous studies on the complementarity between contractual and relational governance (Cannon et al., 2000; Poppo and Zenger, 2002), particularly in regard to channels of transfer with universities. In a broader sense, this paper highlights the importance of doing research on strategies aiming at decreasing information asymmetries is extremely advantageous for SMEs willing to get involved in collaborative projects (Brunetto and Farr-Wharton, 2007; Dickson et al., 2006). Our findings have managerial implications not just for firms but also for universities.

The scheme we will follow presenting our results reflects how research was structured and carried out. The next section reviews pertinent literature and models. We will then present the sample and the methodology used to analyze the data and outline the results of the analysis discussing its main implications. We will conclude with some insights and limitations.

2. Literature review and model

2.1. Relational vs. contractual governance in SMEs' innovation practices

Despite their differences in conceptual approach, numerous contributions underline the decisive function of *social ties* in economic exchange (Ellis, 2000; Ferriani et al., 2013; Haytko, 2004; Uzzi, 1997), emphasizing the “pivotal role” of *personal relationships* in the implementation and diffusion of innovation within SMEs (Ceci and Iubatti, 2012; Lee et al., 2010). The industrial district approach (Becattini, 2004; Marshall, 1890) exemplifies territorial and sociological integration to facilitate SMEs' acquisition and transfer of tacit knowledge, and dynamic innovation (Huggins, 2001; Rus and Igluc, 2005). Direct contact between people is a key pillar for innovation strategies in SMEs (Bishop et al., 2011; Singh, 2005). SMEs carry out innovation in DUI mode, which is based on informal knowledge processes and practical skills, as opposed to what happens in STI mode (Jensen et al., 2007). For instance, SMEs apply the DUI mode in industrial districts, as well as in supply chain collaborations (Tomlinson and Fai, 2013). By contrast, the STI mode is founded on the generation and use of codified scientific and technological knowledge. Only SMEs characterized by developing their internal absorptive capacities (Lichtenthaler and Lichtenthaler, 2009) and by devoting resources to innovation, are capable of innovating in the STI mode, the

way large firms do (Laursen and Salter, 2004; Mangematin et al., 2003; Maranto-Vargas and Gómez-Tagle Rangel, 2007).

Several papers have attempted to define the transfer channels between universities and companies (Bozeman et al., 2013; Markman et al., 2008; Perkmann et al., 2013; Siegel et al., 2007), identifying between ten and thirteen such channels. The “Competence-Based Theoretical Approach” to interface structures sheds light on the complementarity among the governance modes of transfer channels (Alexander and Martin, 2013). To categorize each channel according to its principal form of governance (relational or contractual) five main variables were utilized: (1) *degree of formalization* (formal vs. informal); (2) *degree of face-to-face interaction*; (3) *typology of knowledge* and *degree of tacitness/explicitness* of the knowledge involved in the transfer; (4) *third party intervention*, which underlines a preoccupation to reduce risk through a contractual approach; and (5) *new to the engagement*, which makes reference to past relationships between the partners, and therefore is also an assessment of the trustworthy and reliability of potential partners (Alexander and Martin, 2013). Following this procedure, channels with a dominant contractual mode relate to *Patent or License*, *Contract Research and Consultancy*, *Shared Facilities* and *Spin-outs*. Channels with a dominant relational mode are associated with *Professional Journal Publication*, *Joint supervision*, *Networks*, *Secondment*, *Training and continuing professional development*, and *Joint Conference* (Alexander and Martin, 2013).

However, SMEs have some difficulties to participate in collaborative networks aimed at accessing external resources (Antonelli et al., 2006; Michaelides et al., 2013; Narula, 2004). In addition, studies on “SME–university” relationships show different levels of granularity in their analysis. Thus, some researchers use a descriptive approach, underlining either a positive relationship between SMEs and university (Kodama, 2008; Zeng et al., 2010) or the absence of a significant relationship (Kaufmann and Todtling, 2002). Some other authors refine the analysis introducing new key variables, necessary to understand SME–university relationships, such as the role of knowledge (Yusuf, 2008) or the role of a collective learning process (Keeble et al., 1999).

By contrast, ease of access to external knowledge and university support is clearly apparent in large companies (Mowery et al., 2001; Roberts, 2001; Tidd and Trewhella, 1997), underscoring the prevalence of the STI mode when it comes to acquiring external knowledge. Multinational firms follow an explicit STI strategy, which leads them to relocate facilities closer to universities (Kuemmerle, 1999), and/or to search for complementary capabilities for their R&D activities (Arvanitis et al., 2008; Cassiman and Veugelers, 2006; Veugelers and Cassiman, 2005).

In order to achieve a deeper insight into the relationships between SMEs and university, we propose to explicitly take into account the links between channels of transfer and focus on the complementarity between relational and contractual forms of governance. The interest in the complementarity of “relational/contractual” governance styles for the development of exchange relationships has been stressed by a number of studies on management (Bradach and Eccles, 1989; Ferguson et al., 2005; Poppo and Zenger, 2002).

To facilitate SMEs the use of DUI while introducing the STI mode of innovation, we suggest promoting relationships with universities, activating transfer channels characterized by a dominantly relational governance.

This makes easier the development of interpersonal trust, which in turn allows for the mobilization of more contractual channels of transfer. In other words, we expect the deployment of these two forms of governance – relational and contractual – in the interactions between SMEs and universities to improve innovation practices and SME performance.

2.2. Hypotheses and model

2.2.1. SME–university relational and contractual forms of governance

As already stated, interpersonal relationships play a pivotal role in the collaborative strategy of SMEs (Bishop et al., 2011; Singh, 2005).

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