



Finding the right partners: Institutional and personal modes of governance of university–industry interactions

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ABSTRACT

We study two different governance modes of university–industry interactions: in the institutional mode, interactions are mediated by the university through its administrative structures (such as departments or dedicated units such as technology transfer offices), while in the personal contractual mode interactions involve formal and binding contractual agreements between firms and individual academics, carried out without the direct involvement of the university. We argue that the choice of which form of governance to adopt involves different decision-making processes for firms and that both governance forms have important roles to play in the context of university–industry knowledge transfer. Relying on a representative sample of firms in the Italian region of Piedmont, we examine the characteristics and strategies of firms that interact with universities under different governance modes. Our results indicate that ignoring personal contractual arrangements with individual researchers, as the previous literature does, amounts to overlooking at least 50% of university–industry interactions. The econometric estimations suggest that personal contractual interactions are used relatively more by small firms involved in technology and open innovation strategies, while institutional interactions are mostly used by large firms that vertically integrate R&D activities.

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1. Introduction

In recent years, university–industry relationships have been extensively studied by academic researchers and have often been debated by policymakers. Empirical analyses emphasize the contribution of university–industry knowledge transfer to the promotion of higher productivity and greater economic growth, as well as the role of universities as key sources of innovation (Mansfield, 1991; Cohen et al., 2002; Mueller, 2006). Various features of university–industry interactions have been studied – focusing on the characteristics of individual researchers (previous experience, entrepreneurial capacity to win both public and private funding, seniority and tenure, gender, etc.), universities (size, disciplinary orientation, culture, academic quality, existence of formal knowledge transfer infrastructure, attention to local development, features of the local environment, etc.) and firms (size, ownership

structure, technology/industry sector, research and development (R&D) intensity, openness to external knowledge sources, proximity to academic research, etc.). Focusing on different forms of interaction – whether they are formal or informal, collaborative or contractual, involving the enforcement of intellectual property rights (IPR) on research outcomes or not – the existing literature has stressed that several forms and mechanisms of interactions are often used at the same time (Cohen et al., 2002; D'Este and Patel, 2007), and that there are crucial inter-industry and inter-disciplinary differences in the intensity and typology of interactions used (Schartinger et al., 2001; Bekkers and Bodas Freitas, 2008).

However, most of these studies have constrained their analysis only to university-mediated interactions and, even when they focused on academic consulting activities carried out by individual researchers, they usually considered these activities to be mediated by the university (Perkmann et al., 2009; Jensen et al., 2010). Our study shows that the analysis of university-mediated interactions captures only a part of the complex set of interactions going on between firms and universities. Firms can also collaborate with university researchers through contracts and agreements signed directly by individual university researchers, and the latter have not been yet properly studied.

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Therefore, in our study, we focus on two forms of governance of university–industry interactions, which, we argue, currently co-exist and involve different decision-making processes for firms: (i) institutional governance, which refers to formal relationships and contracts with a university, usually mediated by administrative structures such as faculty departments or dedicated Knowledge Transfer Organizations (KTOs) and (ii) personal contractual governance, which refers to direct contract-based arrangements with university researchers.

Recognizing the existence of two governance modes (institutional and personal contractual) is of utmost importance for the correct development of policy interventions. For the last thirty or so years, policies in this area have built on the assumption that universities are not interacting sufficiently with firms and that, therefore, there is a need for governmental action to incentivize and facilitate the interaction. This policy paradigm was (and is) based on the assessment of institutional interactions only, as personal contractual governance was (and still is) often ignored or neglected by university managers and policy-makers.¹ The lack of appreciation of the role played by personal contractual relationships may lead to the development of policies to support institutionalization of knowledge transfer that could result in an overall reduction in knowledge transfer, as only a small group of firms have capabilities and resources to benefit from institutional forms of transfer. Institutional forms of interaction with university may not simply substitute for personal contractual relationships with individual university researchers. A better understanding of the two forms of governance and of the characteristics of firms that are involved in one or the other mode of interaction is needed in order to develop policies to support institutional interactions only when the knowledge needs of firms are not met either by other actors in the knowledge market or by direct interaction with university researchers.

With this aim in mind, our study intends to provide evidence on how firm characteristics may affect the choice between institutional and personal contractual modes of governance for interaction with university researchers. We focus on a subset of firm characteristics (such as size, absorptive capacity and technology openness) that have often been investigated to explain the presence and intensity of university–industry relationships, but that have not yet been used to explain the choice of governance structure.

The empirical investigation presented in this study relies on an original dataset of 1058 representative firms localized in the North-Western Italian region of Piedmont (the sample was developed and validated by Piedmont's Chamber of Commerce). Our results suggest that, compared to institutional interactions, personal contractual ones are used relatively more by small firms involved in open technology and innovation development strategies, thus providing an important alternative knowledge transfer channel for these firms.

The article is organized as follows. Section 2 frames the discussion in the general context of the literature on university–industry relationships, and presents the two governance forms and a related discussion of how the characteristics and strategies of firms may influence their choice of governance for university–industry interactions. Section 3 describes the data used in order to test the determinants of this choice, and Section 4 describes the methodology used. Section 5 presents the results of the empirical analysis. Some concluding remarks and policy implications are discussed in Section 6.

¹ One of the most striking examples of this policy myopia is the case of major changes in regulation for academic patenting in Europe. See, among others, Lissoni et al. (2008) and Crespi et al. (2010).

2. The relationship between firm characteristics and choice of governance mode

This section introduces the two governance modes for the university–industry interactions that we intend to investigate – institutional and personal contractual – and describes some of their key characteristics and relative advantages. On the basis of these arguments, some expectations about the relationships between firm characteristics and choice of governance mode are derived.

It has been pointed out that at least two different models of governance of university–industry interactions have developed over time and now are co-existing (Geuna and Muscio, 2009). On the one hand, university–industry knowledge transfer can be governed by personal contractual interactions between university researchers and firms, a form of governance that pre-dates the institutionalization of university–industry links and has been in place since the end of the 19th century, in Germany, and the early 20th century, in the US (Meyer-Thurrow, 1982; Liebenau, 1985; Swann, 1989; MacGarvie and Furman, 2005). This type of governance is often the result of the participation of university and industry researchers and engineers in the same social and professional networks (Colyvas et al., 2002), and is based on some degree of trust (sometimes due to a common educational background, as in the case of alumni associations in the US or the *Esprit du Corp* of the French Grandes Écoles and Italian Politecnici). These interactions are not informal: although the university structure is not involved, they are usually formalized through binding contracts and agreements.

On the other hand, since the late 1980s there has been an increase in institutional university–industry interactions, mediated by units such as departments, university technology transfer offices and other kinds of KTOs (Santoro and Gopalakrishnan, 2000). Universities are increasingly providing organizational support for such interactions. In a small number of cases, the creation of an institutional infrastructure for the exchange of knowledge between universities and firms has resulted from the university's own drive to regulate and benefit from industry contracts and has sometimes been advocated by academics themselves. In most cases, however, this is a direct or indirect result of policy actions aimed at the promotion of structured knowledge transfer activities within universities (see Geuna and Muscio, 2009, for a discussion).

It is important to appreciate that the two models of governance can and do coexist – particularly in countries, such as Italy, where there has been less emphasis on public policies to support the institutional model. Most policy actions supporting the development of university–industry interactions in various European countries were premised on the argument that universities were not doing enough to develop activities relevant for economic development – a view based on an assessment of institutional activities of the university only.² These policies were mainly informed by the large body of literature dealing with third stream activities, such as the Triple Helix approach (Leydesdorff and Etzkowitz, 1996; Etzkowitz, 2001) to the university's new role (sometimes referred to as the second academic revolution), which argued for the support and further development of the institutional knowledge transfer model. The recognition of the coexistence of different governance structures implies that firms' engagement in interactions with universities under one or the other governance modes involves different decision-making processes.

² See for example the discussion of how European countries have implemented Bayh–Dole act-like regulations for institutional ownership of academic patents partly on the basis of an incomplete evaluation of the patenting output of European universities (Geuna and Rossi, 2011).

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