



Contents lists available at ScienceDirect

Research Policy

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



The importance of pro-social behaviour for the breadth and depth of knowledge transfer activities: An analysis of Italian academic scientists

Roberto Iorio^a, Sandrine Labory^b, Francesco Rentocchini^{c,d,*}

^a Department of Economics and Statistics (DISES), University of Salerno, Italy

^b Department of Economics and Management, University of Ferrara, Italy

^c Department of Economics, Management and Quantitative Methods, University of Milan, Italy

^d Southampton Business School, University of Southampton, Southampton, UK

ARTICLE INFO

Article history:

Received 10 March 2016
Received in revised form 31 October 2016
Accepted 18 December 2016
Available online xxx

Keywords:

Motivation
Knowledge transfer
Third mission
University external engagement

ABSTRACT

The debate on the entrepreneurial university has raised questions about what motivates academics to engage with the external environment and what forms knowledge transfer (KT) activities should take. This paper distinguishes between the variety of forms of engagement (KT breadth) and the intensity of collaboration (KT depth) in the analysis of their motivations. The paper relies on a sample of Italian academics from different scientific fields over the period 2004–2008. Whereas previous literature has shown that academics are essentially motivated by learning opportunities, fundraising and satisfaction derived from puzzle solving in research activities, our paper provides evidence of the positive role of an additional motivation for both the breadth and depth of KT: the extent to which the academic scientist advances the societal role of universities (“mission” motivation). We find that both “funding” and “mission” motivations have a positive effect on the variety and intensity of KT activities, with little effect for learning opportunities. Our results show also a higher effect of “funding” and “mission” on the depth of KT activities compared to their breadth.

© 2016 Elsevier B.V. All rights reserved.

1. Introduction

A central theme in the industrial and technology policy debate in recent years has revolved around the exploitation of knowledge created at universities to spur the development of old and new sectors and eventually economic growth (e.g., European Commission, 1995, 2007; OECD 2002a, 2002b). Governments at regional, national and international levels consider the “entrepreneurial university” as having an important role to play in the economic development of their region via knowledge transfer (KT) to the industrial sector (Etzkowitz et al., 2000; Etzkowitz, 2003).

Although existing studies have recognised that KT activities can take multiple forms (Perkmann et al., 2013; Landry et al., 2007, 2010; D’Este and Patel, 2007; Siegel et al., 2007), most of the studies to date have focused on specific types of KT activities, mainly patenting, spin-offs and licensing (Azoulay et al., 2009; Thursby

and Thursby, 2002; Dechenaux et al., 2011; Shane and Stuart, 2002; Rothaermel et al., 2007). Only recently have a number of contributions considered a broader set of KT activities and focused on the motivation of academics to perform these activities (Ramos-Vielba et al., 2016; Olmos-Peñuela et al., 2014; D’Este and Perkmann, 2011; D’Este and Patel, 2007; Link et al., 2007), their complementarities (Landry et al., 2010) and their effects on effective KT (Landry et al., 2007).

This stream of literature has shown that academic engagement is mainly influenced by individual characteristics (Link and Scott, 2012), organisational and institutional factors (Moog et al., 2015; Ding and Choi, 2011; Jensen and Thursby, 2001), the scientific discipline of the academic (Bekkers and Bodas Freitas, 2008) and a combination of intrinsic and extrinsic motivations: fundraising, access to knowledge and learning (D’Este and Perkmann, 2011; Lam, 2011).

We add to this literature by showing the central role played by an additional type of intrinsic motivation: the desire for academic scientists to advance the societal role of universities (following the transformative potential that universities have for current society). Indeed, the “third mission” of universities has gained momentum

* Corresponding author at: Department of Economics, Management and Quantitative Methods, University of Milan, via Conservatorio 7, 20122 Milano, Italy.

E-mail addresses: riorio@unisa.it (R. Iorio), sandrine.labory@unife.it (S. Labory), francesco.rentocchini@unimi.it (F. Rentocchini).

in recent years and has been strongly promoted by governments as a means to favour territorial development and growth (Etzkowitz et al., 2000). We provide evidence on how scientists are motivated by this “mission” with respect to the variety of forms of external engagement (KT breadth) and the intensity of collaboration (KT depth).

We rely on an in-depth survey of 133 Italian academics from different scientific fields (Life Sciences, Chemistry, Mathematics and Physics, Engineering and Medical Sciences) over the period 2004–2008. Our results show the existence of a positive and significant role of funding and mission motivations on scientists' engagement with the external environment. This role is relevant for both the variety (KT breadth) and the intensity (KT depth) of scientists' external collaboration, but we find evidence for a higher effect of funding and mission motivations on the depth of KT activities compared to their breadth.

The paper is structured as follows. Section 2 provides a review of the relevant literature and the main research questions, section 3 presents data and methodology, section 4 discusses the results and section 5 concludes.

2. Literature review and research questions

2.1. Variety and intensity of knowledge transfer activities: a tale of breadth and depth

Previous literature has provided extensive evidence on the different forms of KT activities (see the review by Perkmann et al., 2013; also Rothaermel et al., 2007). Most of the attention has been devoted both to university–industry interactions and to a restricted number of channels, primarily commercialisation: patents, licensing and spinoffs (Azoulay et al., 2009; Shane and Stuart, 2002; Thursby and Thursby, 2002). Most universities around the world have created facilities specifically devoted to the commercialisation of academic inventions, such as science parks, technology transfer offices and incubators (Hsu et al., 2015). Governments have also supported this form of university–industry interaction by providing funding for these facilities or grants for collaborative projects (Leydesdorff and Etzkowitz, 1996).

However, more recent contributions have highlighted how the actual scale and impact of scientists' overall external engagement activities might be underestimated as a result of neglecting other forms of KT activities, such as R&D contracts, consulting, staff exchange and joint student supervision (Abreu and Grinevich, 2013; D'Este and Patel, 2007; Perkmann and Walsh, 2007). A number of studies have thus considered a broader set of KT activities, focusing on academics' propensity to undertake them (Ramos-Vielba et al., 2016; Olmos-Peñuela et al., 2014; D'Este and Perkmann, 2011; Landry et al., 2010; Grimpe and Fier, 2010; D'Este and Patel, 2007; Link et al., 2007) and their relative effects (Landry et al., 2007; D'Este et al., 2013; Sánchez-Barrioluengo, 2014). For example, D'Este and Patel (2007) are among the first to include contract research and consulting activity in the analysis of KT activities. Similarly, Olmos-Peñuela et al. (2014) and Ramos-Vielba et al. (2016) consider a broad range of KT activities, including direct personal interactions, informal cooperative relations and knowledge dissemination activities. These studies have generally found complementarities between KT activities, suggesting that they appear together, not in isolation (Grimpe and Hussinger, 2013; Siegel et al., 2003; Link et al., 2007).

Building upon the stream of the literature above, we consider both commercialisation (patenting, licensing and spin-offs) and “engagement in collaboration” (as mentioned above, joint and collaborative research contracts and consulting). We also include joint student supervision, external teaching, use of non-academic

literature and participation in private seminars and conferences (informal relational activities) as the literature on KT in networks has shown these activities to play a crucial role (Uzzi, 1996, 1999; Hansen, 1999; Reagens and Zuckerman, 2001). Also, our study refers to the wider literature on external engagement and considers KT activities not only with industry but also with other types of external organisation, such as public administrations, non-profit organisations, and so on (Ramos-Vielba et al., 2016; Olmos-Peñuela et al., 2014; Sánchez-Barrioluengo, 2014).

We propose to distinguish this rich set of KT activities according to two main characteristics, which are important in terms of impact on KT. First, we expect the number of different KT activities (KT breadth) carried out by the scientist to matter. A higher number of KT activities implies the existence of more channels for KT, i.e. more modes of interaction with external organisation(s) which generate KT more effectively. Notably, the presence of different channels for KT activity has been shown to increase a person's ability to convey complex ideas to diverse audiences (Reagens and McEvily, 2003). In a similar vein, Reagens and Zuckerman (2001) show that the interactions among scientists with non-overlapping networks outside of their team improve innovation and creativity by enhancing access to diverse knowledge. In addition, as stressed by D'Este and Patel (2007), academics using a broader range of KT channels are more likely to develop the capabilities necessary to bridge the gap between science and technological application, namely to favour “technology integration,” because the variety of channels induces a higher diversity of the interacting knowledge bases and allows a better alignment of incentive systems between academia and the external environment. This argument can be extended to any type of external organisation with which the academics interact in their KT activities, be they public or private, because the diversity of knowledge bases and different incentive systems characterising the organisations still hold.

Second, we argue that not only the breadth but also the depth of KT channels (KT depth) matters for effective KT to take place. This refers to the frequency through which KT activity is conducted (i.e., the extent to which the relationship is repeated over time) and should also be relevant for the effectiveness of KT. Depth implies stronger ties, which have been shown to be more likely to ease the transfer of complex and tacit knowledge compared to weak ties (Granovetter, 1973; Uzzi, 1996, 1999). Frequent interactions improve the likelihood of developing complementarities between the knowledge bases of interacting individuals (Reagens and McEvily, 2003) as well as the creation of trust and reciprocity (Okada and Simon, 1997). The former literature has provided different explanations on how knowledge depth favours KT. A first class of explanations, which is grounded in cognitive and social psychology, contends that depth favours the development of associative learning and absorptive capacity (Cohen and Levinthal, 1990). Hence, depth is more likely to ease the development of problem-solving skills (Schmoch, 1999) and joint knowledge creation (Huber, 2013). A second set of explanations highlights the embeddedness of KT in social relations. More frequent interactions help in building social capital and developing shared norms and values. This in turn eases communication and understanding and therefore makes KT more effective (Uzzi, 1996; Hansen, 1999).

Since effective KT is expected to require depth and/or breadth of KT activities, the current work focuses on the motivation of academics for both of these dimensions of KT.

2.2. Motivations for knowledge transfer activities

Both the economics and psychology literatures have provided insights on motivations that can be useful in the study of engagement in KT activities. Both literatures have historically distinguished between intrinsic and extrinsic motivations. The former

Download English Version:

<https://daneshyari.com/en/article/5104039>

Download Persian Version:

<https://daneshyari.com/article/5104039>

[Daneshyari.com](https://daneshyari.com)