



Networked by design: Can policy requirements influence organisations' networking behaviour?



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ABSTRACT

An important, but under-researched, question in relation to policies funding networks of innovators is: what kind of innovation networks should be supported, if the policy objective is not just to sponsor successful innovation projects, but also to encourage the participants to form networks with desirable characteristics? Focusing on a set of policy programmes implemented by the regional government of Tuscany, in Italy, between 2002 and 2008, aimed at funding networks of collaborating organisations, we investigate whether the imposition of requirements on the composition of the networks that would be eligible for funding – in particular, the demand that networks should comply with minimum size and heterogeneity thresholds – influenced the participants' networking behaviour in the context of successive policy interventions. Our results show that these requirements immediately affected the size and composition of the project networks that applied for funding, although not always in the intended direction. However, these effects did not extend to the successive periods, when those requirements were no longer in force. This suggests that the imposition of policy requirements, per se, is unlikely to induce persistent changes in organisations' networking behaviour. Other approaches such as implementing outreach actions in order to encourage new organisations to participate in existing innovation networks and to form new ones, and additional measures designed to foster learning opportunities for the participants, might be more effective tools to influence the networking behaviour of participating organisations.

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1. Introduction

Alongside traditional research and development (R&D) policy interventions targeted at individual firms, policymakers are increasingly supporting the formation of innovation networks (such as R&D consortia, networks of excellence, university–industry partnerships) among firms and other types of organisations. Particularly since the early 2000s, numerous policy interventions of this kind have been implemented at national and regional levels (Hagedoorn et al., 2000; Branstetter and Sakakibara, 2002; Caloghirou et al., 2004; Cunningham and Ramlogan, 2012; Crespi and Quattraro, 2013). At supra-national level, the EU Framework Programmes (FP) have provided funding to networks of cooperating organisations for almost three decades (Breschi and Malerba, 2009; Tindemans, 2009; Biggiero and Angelini, 2014).

The stated objectives of policies directed at innovation networks are usually to support joint R&D, technology transfer activities or even, sometimes, networking per se, with a view to create a critical mass of experts or users in a certain discipline or technological area – as in the networks of excellence funded in the EU FPs 6 and 7 (Musiolik et al.,

2012). These policy interventions also allow participating organisations to gain experience in networking with external partners and in collaborating with them on a specific activity, which may improve their ability to engage in further innovation networks. While such behavioural effects are not generally considered the main objectives of these policies, they could constitute important outcomes, since they have the potential to generate long-lasting beneficial changes in the participants' competences and abilities (Clarysse et al., 2009; Duso et al., 2010).

The interest in the behavioural effects of policy interventions in support of innovation networks fits with the recent debate on 'behavioural additionality'. This concept was introduced by Buisseret et al. (1995) to capture the effect of a policy intervention on an organisation's way of undertaking R&D, as opposed to the established concept of input additionality, which simply captured a policy's effect on the amount of R&D that an organisation engaged in. Over time, the concept has been expanded and refined, for example by Georghiou (1998) who suggested that these changes should be permanent in character and should allow for more efficient innovation performance (see Gök and Edler (2012), for a review). Within the broad realm of behavioural additionality, more specific concepts have also been introduced to capture particular kinds of behavioural changes induced by policy interventions, such as 'network additionality', intended as the ability of public funding instruments to increase networking and co-operation to a greater extent than

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would be present without such funding (Hyvarinen and Rautiainen, 2007), and 'cognitive capacity additionality' to capture the increase in an organisation's capabilities to engage in successful innovation (Bach and Matt, 2002, 2005).

While there has been some recent interest in the behavioural effects of policies in support of innovation networks (Fier et al., 2006; Chávez, 2011; Antonioli et al., 2014; Caloffi et al., 2015) the field is still relatively new. In particular, an important question for policy design is what kind of networks should be supported, if the objective of the policy is not just to fund successful innovation projects, but also to influence the participants' networking behaviour, enabling them to form networks with desirable features.

Many of the policy interventions that we observe in practice require the participants to comply with a number of relational features that are deemed to be conducive to successful collaborative innovation. For instance, policies funding networks of organizations tasked with realizing specific innovation projects often require each network to include a minimum number of SMEs and universities. However, the implications in terms of policy design may not be straightforward. In fact, imposing specific requirements on networks 'by design' may be counterproductive, encouraging participants to comply with rules that may not meet their specific needs and, ultimately, may decrease their opportunities for learning and networking.

In this study we investigate whether, by imposing requirements on the design of innovation networks, a policy intervention can affect the networking behaviour of participating organisations. In particular, we explore whether policy requirements induce organisations to set up networks with desirable features not only in order to apply to programmes where these requirements are present, but also in the context of subsequent programmes, where the requirements are removed.

Our empirical analysis builds upon a rich original dataset of all the organisations participating in a set of regional policy interventions implemented in the Italian region of Tuscany between 2002 and 2008. These interventions competitively allocated funding for the realisation of innovative projects carried out by networks of organisations: each project proposal had to be submitted by a purposefully created (and legally binding) consortium of organisations based in the region.¹ Initially, some of these interventions imposed certain compulsory requirements on the composition of the networks that would be eligible for funding (specifically, on the number and types of organisations that they should include), while other interventions launched at a later stage did not impose any requirements, thereby allowing the participants to structure their networks freely.

As we explain in greater detail in the next sections, our data allow us to compare the behaviour of organisations involved in policy programmes where the requirements were present with the behaviour of the same organisations in programmes that did not include any requirements. In this way, we can observe if the organisations participating in the programmes adjusted their behaviour in line with the policymakers' designed requirements, even when such requirements were no longer mandatory. Our data do not allow us to determine whether the participants' behaviour has changed outside of the policy context, for example we cannot say whether they interact with more or different organisations in other settings. Because of the lack of information on the organisations' overall networking behaviour post-policy, and because of the lack of an external control group, the present analysis cannot estimate the 'behavioural additionality' effects of the policy

programme. However, the analysis captures some behavioural changes that have been induced by the policy, since it captures to what extent the participants have changed their networking behaviour when setting up subsequent consortia in order to benefit from public funding.

The paper is structured as follows. In the next section, we discuss the rationale underpinning the imposition of policy requirements in the formation of project consortia, and their possible results. In Section 3, we describe in some detail the policy programmes that are the focus of our analysis. In Section 4, we present our methodology. In Section 5 we present our empirical results, which we discuss in Section 6. Section 7 concludes.

2. Policy requirements and networking behaviour

When designing policies supporting innovation networks, policymakers may impose different types of requirements depending on their objectives. Policymakers may wish to encourage technology transfer, and therefore choose to fund university–industry relationships. They may wish to strengthen the capability for applied research in a certain field, and therefore fund large-scale R&D projects with a preponderance of universities and research institutions. Or they may wish to encourage SMEs to collaborate in R&D and adopt innovations. In this case – as in the programmes analysed in the present study – policymakers can impose various requirements on network composition. For example, they can require networks to include SMEs, which represent the target of their intervention. They can demand the involvement of universities, research centres, or intermediaries like technology transfer specialists that provide innovation support services. The underlying assumption is that policies are needed to stimulate interactions that would not occur spontaneously, but whose presence would be desirable (Carlsson and Jacobsson, 1997). Given SMEs' reluctance to embark on collaborative relationships (Bougrain and Haudeville, 2002; Narula, 2004; Muscio, 2007), policymakers could require networks to include a minimum number of participants, with the aim of broadening their connections. In order to encourage firms' openness to external sources of knowledge and to avoid knowledge lock-ins, policymakers may require the involvement of extra-regional or international participants (Dettman et al., 2012; Antonioli et al., 2014). Table 1 summarizes these possible requirements and related policy rationales, building on arguments presented by the literature on innovation networks, and presents, by way of illustration, examples of policies where such requirements have been imposed.

The immediate effect of these requirements is to encourage organisations wishing to benefit from public funds to set up networks that meet such requirements. However, policymakers often have more complex goals in mind, for example they might wish to encourage organisations to persistently adopt collaborative behaviours that are potentially conducive to innovation.² This approach is consistent with what the innovation literature refers to as 'behavioural additionality', a concept that captures the extent to which participation in a policy intervention results in a persistent change in the behaviour of the organisations that have benefited from public funds – in what they are doing and in how they are doing it (Buisseret et al., 1995; Clarysse et al., 2009). In the context of policies supporting innovation networks, an important behavioural result would be to encourage the participants to build networks that are potentially conducive to innovation, not only in the context of the programme where these behaviours are explicitly required, but also beyond.

In what follows we consider two types of policy requirements for innovation networks: the imposition of a minimum number of participants (henceforth referred to as 'minimum network size' requirement)

¹ Innovation networks set up in order to benefit from public funding are usually called 'consortia' in policy documents. In the rest of this paper, we use the term 'consortium' to refer to the legal entity set up in order to apply for funding, but we prefer the more general term 'innovation network' when discussing the networking behaviour of the organisations involved in the set up of these consortia. This is because the theoretical arguments about the desirability of certain network characteristics are mainly drawn from the organisational literature on innovation networks, and because our findings can be of relevance to any scenario in which private or public funders are considering the imposition of requirements in the formation of networks of collaborating organisations.

² Such more complex goals underpin, for example, several European Commission programmes which influence national and regional policies in Europe (see, for instance, the FP7-ICT and CIP ICT-PSP programmes, the European Innovation Partnerships, and Horizon 2020).

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