



# Complex innovation policy systems: Towards an evaluation mix



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## ABSTRACT

The mix of contemporary innovation policies impacting on a given territory are typically characterised by quite different underlying rationales and instruments. Complexity is further increased by multi-level considerations. Thus policies with different characteristics and from different administrative levels are continually interacting with one another in complex policy systems. These interactions significantly complicate the evaluation of individual policies, and raise a series of difficult questions around how their respective evaluation processes should interact to facilitate learning around the performance of policy systems. This paper contributes with a simplified definition of an innovation policy system as the conjuncture of policy mix and multi-level dimensions, from which a series of steps are proposed for arriving at an evaluation mix relevant for the specific characteristics of a given policy space. These ideas are explored with respect to the case of the Basque Country region of Spain and signal an agenda for further applied policy research.

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## 1. Introduction

The panorama of policies designed to stimulate and facilitate innovation has undergone growth and evolution during the last few decades. In particular, policy rationales have widened. Evolutionary-systemic rationales emphasising the importance of institutions and interactions within ‘systems’ have emerged alongside existing neoclassical rationales focused on boosting investment in science and technology (Borrás, 2009; Laranja et al., 2008; Smith, 2000). This has resulted in a large increase in policy complexity, whereby it is common for many innovation policies to co-exist within the same country or region, based on different rationales, employing different instruments, and corresponding to different policy domains. In this context it has become fashionable to talk about an innovation ‘policy mix’. Yet despite the proliferation of normative assertions about desirable ‘policy mixes’, the term remains ill-defined and under-conceptualised (Flanagan et al., 2011), perhaps unsurprisingly given the “expanding portfolio of innovation policy instruments” (Flanagan et al., 2011, 703). What is more, judgements about what constitutes the policy mix at any given level of territorial analysis are further complicated by the multiple administrative levels from which policies with impact in that territory are designed and implemented.

Leaving aside the precise definition of policy mix employed to capture this complexity, the reality is that a range of different

policies oriented towards improving innovation are continually interacting with one another. As a result of these interactions policy outcomes are generated that do not necessarily correspond neatly with the stated aims of individual policies, and are indeed potentially greater than the sum of their individual impacts. Moreover, as emphasised by Flanagan et al. (2011, 706), the dynamics of the policy process is itself a considerable source of complexity, given that the agency of actors is “enabled, shaped and constrained by the behaviour and expectations of other actors and by institutions, which themselves have been shaped by earlier action and institutions.” They suggest therefore that “the focus for innovation policy analysis should be on incremental/adaptive learning, experimentation, reflection, debate and argument about means/ends, and even creative tensions” (Flanagan et al., 2011, 711).

Policy evaluation should play a central role in these important processes of reflection, learning and constant adaptation. However, the typically-adopted approach of employing specific techniques to evaluate isolated policy interventions has strong limitations in systemic contexts, and its widespread adoption may in fact provide an obstacle to more sophisticated understanding of innovation policy mixes and their evolution. The motivation for this paper is thus rooted in a pressing need for new forms of evaluation processes that can better capture the interactive effects that characterise complex policy systems. Contributions by Arnold (2004) and Edler et al. (2008) have made some conceptual advances with regards the requirements of system evaluations. What is missing is a more precise articulation of the practical steps that can be taken with respect to a given policy space. The paper seeks to fill this gap, providing insight on how policy-makers can practically approach the challenges of increasingly complex policy systems. This is achieved

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through conceptual and methodological developments, and their subsequent application to the case of the Basque Country region in Spain. This is a particularly interesting case from which to learn because it represents a 'policy space' where core innovation policy competences exist at regional level, but are exercised alongside meaningful policies from both higher (Spanish government and European Commission) and lower (Provincial councils) administrative levels. It is also a case in which a significant amount of research has been conducted in recent years, both with regards the evaluation of specific, isolated elements of this policy-mix using a variety of techniques (Aragón et al., 2010; Aragon et al., 2012; Aranguren et al., 2013a,b; Covarrubias et al., 2013; De La Maza-y-Aramburu et al., 2012; Magro, 2012), and with regards the functioning of the system as a whole as a success case in regional innovation upgrading (Bilbao-Osorio, 2009; Navarro, 2010; OECD, 2011).

The paper begins in Section 2 with a theoretical discussion that brings together existing thinking on innovation policy mix and current approaches to policy evaluation. This results in a simplified conceptualisation of 'innovation policy system' corresponding to a given 'policy space' (for example a region), and establishes the need for an appropriate, holistic 'policy evaluation mix' so as to generate dynamic policy learning and continual adaptation within such a system. Section 3 then sets out a methodology for arriving at an evaluation mix relevant for the specific characteristics of a given policy space in a series of practical steps. This 'evaluation mix protocol' is illustrated and explored in the context of the Basque case in Section 4, providing the basis for concluding discussion and arguments for a new applied research agenda in Section 5.

## 2. Innovation policy mixes, policy systems and policy evaluation

### 2.1. Towards a simplified concept of innovation policy system

Application of the 'policy mix' concept to the innovation arena is very recent (Nauwelaers et al., 2009; Flanagan et al., 2011; OECD, 2010), and there is not yet a clear understanding of its implications for the design, implementation and evaluation of innovation policies. According to Flanagan et al. (2011), the concept of policy mix originates from Mundell's (1962) observations on the relationship between monetary and fiscal policy and found its way into the innovation policy discourse around 2000 via the R&D considerations emerging in environmental policy debates and macroeconomic policy discussions around the Lisbon Council. Its attractiveness in an innovation context is clear given the progressively increasing complexity that has characterised this policy field over recent decades, which is itself related to an evolution in innovation theories and in the theoretical (and policy) rationales for intervention.

The traditional neoclassical rationale for innovation policy intervention is rooted in market failure analysis, whereby markets are posited to provide sub-optimal knowledge creation given externalities and appropriability concerns. This is linked to so-called 'linear' approaches to innovation, which have a predominantly in-firm focus on boosting science, research and technology, and lead in practice to policies designed to subsidise R&D and/or strengthen innovation incentives through ensuring intellectual property rights (Smith, 2000). The linear model of innovation is no longer the prevailing perspective, however. The last two decades have seen the rise of theoretical rationales that respond to evolutionary or system failures (or problems),<sup>1</sup> which are typically related to the creation and transfer of knowledge within 'innovation systems' (Edquist,

2001; Laranja et al., 2008; Metcalfe, 1995; Smith, 2000). While there is no clear consensus in the literature about these failures (Laranja et al., 2008), there are some attempts at classifying them, both on a theoretical basis (Bach and Matt, 2002; Carlsson and Jacobsson, 1997; Chaminade et al., 2009; Edquist, 2001; Lundvall and Borrás, 1997; Smith, 2000) and from a regional perspective (Laranja et al., 2008).

Despite this evolution of theoretical rationales, there is not a direct substitution of rationales in the policy-making process. Rather, policy path dependency implies a situation in which there are neither pure neoclassical nor pure evolutionary-systemic policies (Flanagan et al., 2011), but a co-existence of policies with different underlying rationales.<sup>2</sup> This can be seen in the evolution of the policy instruments employed (Smits and Kuhlmann, 2004). Innovation policy instruments have traditionally been *hard* instruments, mainly economic instruments, which aim to impact on the quantity and distribution of goods and services (Howlett, 2005). From the 1990s they have become more sophisticated, however, introducing new demand-based and interactive elements. In addition, *soft* and non-coercive instruments, in particular emphasising cooperation between actors, have appeared as a consequence of the evolution towards systemic policy rationales (Borrás, 2009). However new instruments do not simply substitute previous ones, whose objectives can also be modified in order to adapt them to the new systemic rationales (Laranja et al., 2008; Lundvall and Borrás, 2005; Nauwelaers and Wintjes, 2003). In consequence the mix of policy rationales characterising a given innovation system is complemented by a mix of policy instruments, themselves targeted towards a mix of different actors within the system.

Different policy domains add another facet to the policy mix. Innovation theories have evolved from viewing science and technology as the key drivers of innovation, to the assumption that learning in a broader sense is the central process. Moreover, innovation itself is now seen to include non-technological aspects such as organisational and social innovations. A consequence can be appreciated in what Borrás (2009) calls innovation policy deepening. Explicit innovation or R&D policies are not unique in including innovation-related objectives, and there has been widespread infiltration into other policy domains, including industrial policy, financial policy and also sector specific domains such as health, education or energy.

Defining complexity in terms of the policies that impact on a given territory rests therefore on the clarification of innovation policy boundaries (Flanagan et al., 2011), and specifically on the identification of the mix of co-existing policy rationales, instruments (and associated targeted actors), and domains. However, there is a further element of complexity with respect to the different administrative levels from which policies originate. The 'de-territorialisation' of socioeconomic relationships associated with globalisation (Scholte Jan, 2000) has simultaneously served to emphasise the importance of proximity-based relationships rooted in regional and local systems (Morgan, 2004; Scott Allen, 1998; Storper, 1997). This has corresponded on the one hand with a decentralisation in the governance of innovation policies from national to regional and local levels, in line with the theoretical evolution in innovation system analysis from national to regional systems. On the other hand, there has also been an extension of policy competences at certain supra-national levels, for example the European Union. Thus the mix of rationales, instruments and

<sup>1</sup> Edquist (2008) pleads for a substitution of the term 'failure' for 'problem', arguing that failure is a neoclassical concept.

<sup>2</sup> In addition to failures that are linked to economic theories (theoretical rationales), a broadening set of 'policy rationales' can be identified in recent years. This broadening is related to policy-makers' desire to tackle wider societal challenges alongside the traditional economic challenges associated with theoretical rationales. Such a process leads to even more complex sets of innovation policies.

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