Prometheus, 2015
Vol. 33, No. 2, 113–137, http://dx.doi.org/10.1080/08109028.2015.1095976

Routledge
Taylor & Francis Group

RESEARCH PAPER

Implementation challenges in cluster policy making: the case of the Andalusian Furniture Technology Centre

José Quesada-Vázquez* and Juan Carlos Rodríguez-Cohard

Department of Economics, Campus Las Lagunillas, University of Jaén, Jaén, Spain

This article analyses the design and implementation of a cluster organisation, the Andalusian Furniture Technology Centre (CITMA). The case of CITMA illustrates how policy processes are inherently political and far more complex than portrayed in conventional accounts based on the linear model of innovation. Policies are, in fact, unpredictable and fraught with uncertainty, opportunity and local specificity. However, acknowledging this complexity is not enough; it has to be unpacked to foster policy learning. To this end, we have opened the black box of the organisation to understand the political process underlying its creation and dissolution. Through this narrative, we shall witness how the technology centre, initially conceived and approved as a publicly funded organisation with the aim of raising SME's absorption capacity by providing technological services, turned into a semi-public consulting firm focused on selling business services to big companies. The outcome of this policy was precisely the opposite of what had been intended with this initiative and the consequence or the result of a top-down policy approach in which the regional ministry failed to take into account the needs, interests and resistance of the different stakeholders by unilaterally changing the project and the funding model approved by its predecessor. The CITMA case highlights the lack of a multi-disciplinary approach to innovation policy in Andalusia and the fact that innovation policies have been defined and implemented in a hierarchical and siloed fashion with little attempt at policy alignment across different areas and levels of government.

Introduction

In the past few decades and especially since the launching of the Lisbon agenda in 2000, many European regions have implemented a large number of policies and initiatives aimed at supporting industrial clusters as a key element of their strategies to foster innovation and competitiveness. Among them, the creation of support organisations, such as cluster managers and associations (Conejos and Duch, 1995; Benneworth *et al*., 2003; Sölvell *et al*., 2003; De la Maza-y-Aramburu *et al*., 2012; Ketels *et al*., 2012) and technology centres (Pyke, 1994; Hassink, 1997; Mas-Verdú, 2003; OECD, 2004; Morgan, 2013), has dominated the policy maker's tool box.

A prime example of this is Andalusia, where 20 sectorial technology centres have been established over the period from 2001 to 2010, most of them devoted to low technology industries, such as furniture, marble stone, textiles, leather, ceramics and food products. Contrary to what the name might suggest, they are intended not only to provide technology development and business services to firms, but also to act as

*Corresponding author. Email: j.quesada.va@gmail.com

cluster managers, facilitating added-value solutions through enhancing collaborative work and subcontracting (RIM, 2012).

Despite the deployment of technology centres in Andalusia, very little, if anything at all, is known about their effectiveness. The only mention found is the announcement of dissolution in 2013 of one of them: the Andalusian Furniture Technology Centre (CITMA), established in 2007, specifically at the request of cluster companies (Ariza Montes and Fernández Portillo, 2004).[1] This policy outcome is surprising given that the project raised high expectations among the different stakeholders at the time and seemed to meet the key requirements to succeed, as is highlighted in the scarce literature analysing similar initiatives. There was institutional embeddedness in that the technology centre did not start from scratch, but was built upon current work carried out in the cluster by the leader of the project and the most highly-valued actor within the sector, CEMER, a publicly funded training institution (OECD, 1992; Hassink, 1997; Vázquez-Barquero *et al.*, 1999). The cluster companies were strongly supportive and involved from the beginning in the centre's governance, which secured market-oriented strategies (Uyarra and Ramlogan, 2012). And there was a stable funding framework backed by the regional government, which requires that at least 80% of funds should be entirely public (Shapira, 1992; OECD, 1999; Mas-Verdú, 2003; Olazarán *et al.*, 2009; López-Estornell *et al.*, 2014; Morgan, 2013). The dissolution of CITMA provides us with the opportunity to address a key aspect that has been particularly overlooked in the literature, the actual implementation of cluster policies (Borrás and Tsagdis, 2008; Nauwelaers and Wintjes, 2008; Sternberg *et al.*, 2010; Uyarra and Ramlogan, 2012). In order to fill this gap, the paper analyses and describes the implementation of the CITMA initiative. Our main objective is to shed light on how and why this initiative has failed.

The question that arises is how to analyse complex phenomena, such as policy processes, which are inherently political (Mooij, 2003) and rarely linear or logical (Ramalingam *et al.*, 2008; Hallsworth *et al.*, 2011). Indeed, policy making is by no means a top-down and rational activity, as is often claimed in the literature (Sutton, 1990; Uyarra and Haarich, 2002; Hallsworth *et al.*, 2011). Rather, it should be seen as the result of complex interactions among interdependent actors in policy networks (Kenis and Schneider, 1991). In order to unpack this complexity, we shall draw on insights from actor–network theory (ANT), which uses a relational understanding of power to offer a more inclusive and realistic description and explanation of network dynamics than traditional single dimensional approaches (Callon, 1986a; Latour, 1987). The remainder of the paper is structured as follows. A review of the literature on clusters and cluster policies is followed by an explanation of the conceptual framework and methodology employed. The case of CITMA follows and then some conclusions are presented.

Literature review

The concept of cluster is broad and vague (Markusen, 1999; Martin and Sunley, 2003). It encompasses various overlapping theoretical developments around the long-observed phenomenon of agglomerations of similar and related industries in particular places. Although the starting point for conceptual considerations of spatial clusters is Marshall (1890), it was not until the late 1970s that the notion of industrial district was highlighted again in economics. Becattini's (1979) work introduced

the idea of embeddedness as a key analytical concept in understanding cluster functioning. Since then, research efforts devoted to analysing and explaining spatial clustering have seen something of a boom, helped by the success stories of the so-called 'holy trinity': Silicon Valley (Saxenian, 1994), the third Italy and Baden-Württemberg, and the impact among policy makers of the cluster concept as developed by Porter (1990, 1998).

The review of this vast literature shows a shift from an initial emphasis on transaction costs (Scott, 1988; Storper, 1995), flexibility (Brusco, 1982; Piore and Sabel, 1984) and increasing returns to scale (Krugman, 1991) as a means of explaining the emergence and sustainability of agglomerations. The shift is towards a growing interest in how innovation is generated, used and disseminated in systems of interrelated economic activity. In this regard, an increasing number of academics have stressed the importance of systemic connectivity, path dependency and the role of institutions to explain the clustering of innovative activities. These approaches, though heterogeneous, are underpinned by evolutionary economic theory (Nelson and Winter, 1982), and share a common conception of innovation basically understood in broad Schumpeterian terms as an interactive learning process surrounded by uncertainty and thus unpredictable. The learning process is socially and territorially embedded and culturally and institutionally contextualised (Lundvall, 1992).

Two key contributions can be highlighted: (i) the innovative milieu concept (Aydalot, 1980; Maillat, 1995), which emphasises the role of networking in a particular socio-cultural context and the importance of dynamic collective learning processes in supporting innovation (Camagni, 1991); and (ii) the systems of innovation approach, which attained a hegemonic position within the innovation literature and policy practice during the 1990s and 2000s. In fact, its development cannot be understood separately, since some of the most relevant pieces of research have been conducted either by public bodies or commissioned by them, especially the European Commission and the Organisation for Economic Cooperation and Development (OECD) (Mytelka and Smith, 2002; Sharif, 2006). This perspective analyses the network of relationships among firms and the broader institutional setting that supports their innovative activities. While much of the early research on innovation systems was conducted at the national level (Freeman, 1987; Lundvall, 1992; Nelson and Rosenberg, 1993), some considered the region as the appropriate unit for analysis (Asheim and Isaksen, 1997, 2002; Braczyk *et al.*, 1998; Cooke and Morgan, 1998) and for policy design and delivery. Definitions of 'regional innovation system' vary, but the most widely accepted one is that of Asheim and Isaksen (2002) – a regional cluster surrounded by supporting knowledge organisations.

The rationale for economic policy directly deduced from this approach refers to strengthening and improving the performance of the regional innovation system by tackling systemic failures (Dodgson *et al.*, 2011; Havas, 2014), considered deficiencies in the rules or infrastructure that underpin interactive behaviour and in the actors that interact within the innovation system (Carlsson and Jacobsson, 1997; Edquist, 1997; OECD, 1999; Smith, 1999; Woolthuis *et al.*, 2005). Therefore, the main task of the public policy maker has become that of facilitating the clustering process and creating an institutional setting which provides incentives for market-induced cluster formation (Morgan, 1997).

Cluster policies

While the cluster approach remains subject to debate in academia (Pitelis *et al.*, 2006; Duranton, 2011; Martin *et al.*, 2011a, 2011b; Brakman and van Marrewijk, 2013), cluster policies continue to be extremely popular among policy makers worldwide, as reflected in the ever growing number of initiatives implemented in support of clusters at supranational, national, regional and even local level (OECD, 1999, 2007; Isaksen and Hauge, 2002; Sölvell *et al.*, 2003; Oxford Research, 2008; Ketels *et al.*, 2012). Cluster development is identified as part of the Europe 2020 strategy and is considered an important tool in regional smart specialisation strategies for improving business environment, especially for SMEs (Barca, 2009; Foray *et al.*, 2009). Member states of the European Union are able to support cluster activity through structural and cohesion funds (European Commission, 2008; Nam *et al.*, 2012).[2]

Under the umbrella term 'cluster policies', a wide diversity of policies emanating from science and technology, industrial and regional policy domains have traditionally been implemented. These initiatives have ranged from facilitating and traditional framework policies, which are influenced by the cluster concept, to specific cluster programmes (Nauwelaers, 2001; OECD, 2007; Feser, 2008). For the European Commission (2008), strictly speaking only those development policies aiming at creating, mobilising or strengthening a particular cluster category resulting in specific sectoral cluster initiatives should be labelled 'cluster policies'. Even so, specific cluster programmes are highly context specific and differ considerably among European countries in terms of their objectives and rationales, the instruments used, their approach and their level of governance (Boekholt and McKibbin, 2003; Uyarra and Ramlogan, 2012).

Notwithstanding their heterogeneous nature, cluster policies have generally focused on promoting networking, institution building and enhancing social capital (Boekholt and Thuriaux, 1999; Lagendijk and Charles, 1999; Morgan and Nauwelaers 1999; Raines, 2001; Landabaso and Rosenfeld, 2009) by using soft instruments which seek to affect the participation of selected actors in the governance process itself (Flanagan *et al.*, 2011). The OECD (2007) differentiates instruments directed towards actors' engagement, which have been by far the most widely used, from those which focus on the provision of collective services and the promotion of collaborative research. Given the hybrid nature of the CITMA initiative, as a cluster organisation centred on actors' engagement as well as a technology centre aimed at providing advanced services to companies, our research analyses these two dimensions separately.

Cluster organisations

One of the most widespread instruments, initially focused on engagement of actors, has been the establishment of cluster organisations to take responsibility for fostering and coordinating cluster activities (Conejos and Duch, 1995; Lagendijk, 2000; Benneworth *et al.*, 2003; Sölvell *et al.*, 2003; Del Castillo *et al.*, 2012). The European Commission (2008) refers to cluster organisations as 'the legal entity engineering, steering and managing the clusters, usually including the participation and access to the cluster's premises, facilities and activities'. The rationale behind these interventions is tackling failures in coordination (Giuliani *et al.*, 2014), weak ties

(Carlsson and Jacobsson, 1997) and governance (Jessop, 2000) which hamper interactions between the actors involved, including the regional government, municipalities, businesses and business associations, labour organisations, the financial sector and knowledge providers (e.g. universities and technology centres).

Even though there are no official statistics of the number of these organisations, the European cluster observatory has listed some 1400 of them. Ketels *et al.* (2012) conducted a survey of these with 254 respondents, mostly from Germany (37), Spain (34), Denmark (20), Sweden (18) and Poland (14).[3] These cluster organisations are devoted mainly to such sectors as IT (41), food processing (16), automotive industry (14), energy (16), health care (15) and green technology (14). Half of these organisations have three or fewer employees and their origins vary from sectoral associations, which have been restructured into cluster coordinators, to technology centres. Given the shortage of studies analysing these organisations and the large study sample, the previous outcomes are very helpful in providing a general overview of these initiatives.

Cluster organisations are public–private partnerships that follow, on average, a 60/40 rule with 60% public financing coming from regional (24%), national (17%) and international (13%) bodies. Incomes are obtained primarily from membership fees (25%) and service provision to companies (9%). The private sector dominates organisations' boards (59%), with academia second (17%) and public sector officials third (15%), while the financial sector has a very limited presence (2%). Interestingly, half of these initiatives emerged in 2007 or later, being equally triggered by public (40%) and private (41%) initiatives. A critical aspect is the potential mismatch between the often short-term programme funding schemes and the largely long-term objectives of most of these initiatives (Uyarra and Ramlogan, 2012), which becomes particularly evident when analysing public sector exit strategies (Raines, 2001; Svetina *et al.*, 2009).

The formulated goals of these organisations are often broad and vague, seeking generally to enhance competitiveness and innovation capacity through a variety of instruments. Of most importance tend to be building an identity, a strategy and a brand for the cluster, as well as enhancing innovation through collaboration and joint R&D projects. Business development objectives, such as joint purchasing and export promotion, attract less attention.[4]

The main role played by cluster organisations is that of network facilitator or broker, promoting cooperation among members by providing support in the search for partners sharing common interests. This role usually involves organising meetings and participating in fora as a way of creating channels that enable dialogue with companies, administrations and similar organisations elsewhere. Although networking is an end in itself (OECD, 2007), these activities are often a starting point for more specific initiatives, such as participation in projects for cooperative research, transnational alliances and the implementation of new services (Ybarra and Doménech, 2011).

Despite the popularity of cluster organisations, very little is known about their effectiveness since evaluations are still rare and, when available, the applied methods – asking cluster coordinators about the success of their own activities – do not yield objective information. There is broad consensus on the difficulty of evaluating the impact of such instruments in that it is impossible to establish a causal relationship between the intervention and its outcome because of the indirect nature of the support measures, their long-term orientation and the range of instruments used (Díez, 2002;

European Commission, 2008; Schmiedeberg, 2010; Ybarra and Doménech, 2011; Uyarra and Ramlogan, 2012).

A good example of this difficulty is provided by De la Maza-y-Aramburu *et al.* (2012) and Aranguren *et al.* (2014), who evaluated the effectiveness of Basque cluster organisations in meeting their specified aims, formulated in terms of productivity and competitiveness. They constructed a matched sub-sample of non-cluster associates with statistically-identical characteristics as their cluster counterparts. Although the results suggest that simply being part of a cluster organisation does not imply higher productivity growth, cluster associations appear economically relevant because of their role as knowledge brokers. In fact, the aim of these authors is to urge caution when using statistical analysis to evaluate policy outcomes because of the analytical difficulties in establishing simple cause–effect relationships in systemic, relationship-oriented policies. To overcome these limits, they argue for the importance of nesting empirical analysis within a contextual understanding of the policy. This provides a basis for discussing both tangible and intangible outcomes of such policy (Aranguren *et al.*, 2014).

Technology centres

Since the mid-1980s, many European regions have set up technology centres in industrial districts in order to support the endogenous potential of innovation (Hassink, 1996; OCDE, 2004) through the provision of advanced knowledge services (KBIS) to companies (Miles *et al.*, 1995; Muller and Zenker, 2001; Doloreux *et al.*, 2010). These instruments are intended to overcome infrastructure failures (Edquist *et al.*, 1998; Smith, 1999) and organisational thinness (Amin and Thrift, 1994; Isaksen 2001; Oughton *et al.*, 2002; Tödtling and Trippl, 2005) associated with the shortage of knowledge providers and the weak endowment from innovation-support institutions. Illustrative examples of this are the centres managed by ERVET in Emilia Romagna (Italy) and the IMPIVA technology institutes network in Valencia (Spain) (Pyke, 1994; Hassink, 1997; Cooke and Morgan, 1998; Isaksen and Hauge, 2002; Mas-Verdú, 2003). According to Pyke (1994), the ERVET and IMPIVA systems have several features in common: (i) both are coordinated and partly financed by quasi-governmental agencies; (ii) they work with a mix of sectorally-dedicated and generically-oriented institutes; and (iii) they can both be regarded as a sort of public–private partnership attempting to promote a decentralised bottom-up approach with active involvement of the firms they serve.

Given that Andalusia has clearly mirrored the Valencian experience in that both regions are characterised by local production systems of SMEs mainly in mature manufacturing industries, we shall focus on the IMPIVA network to describe technology centres. Renamed IVACE in 2012, it is composed of 14 technology institutes and 1540 employees, which provide services to their 5961 associated companies and 12,248 customers. The centres are well embedded in the social and economic fabric while being, at the same time, well connected to similar international centres. Hassink (1997) notes that IVACE's institutes hire industry-experienced technicians, who carry out onsite interviews with managers, technicians and workers to help firms formulate their needs. Most of these centres are sector-oriented and located close to the industries they serve: shoes, ceramics, wood and furniture, textiles, toys, etc. Other institutes provide business services to more distributed industries, such as

metal-mechanical and plastics, while the rest are 'horizontal' centres dealing with such industries as optics, packaging, biomechanics, computation and energy.

Technology centres are also public–private partnerships, which may take different legal forms, non-profit association being the most popular (Mas-Verdú, 2007). Their main governing body is the board of trustees, mainly composed of firms' representatives along with the regional government, the university and sectoral associations. IVACE institutes apparently constitute a real network rather than just an infrastructure (Hassink, 1997; Mas-Verdú, 2003). In 2001, they created their own association, REDIT (Network of Technology Institutes of the Region of Valencia), aimed at strengthening and fostering close cooperation between them, as well as defending their positions against the regional government and Spanish public administration (López-Estornell *et al.*, 2014).

Although funding models vary in Europe, technology centres frequently have three main sources of financing: (i) direct public funding that aims to cover a part of the running costs; (ii) competitive public funding obtained through calls and proposals; and (iii) income from services provided to companies and membership fees (Modrego-Rico *et al.*, 2005; Mas-Verdú, 2007; Fernández de Bobadilla, 2009). According to the data provided by REDIT, in 2012, 53% of their income came directly from companies while the rest was obtained entirely through regional competitive calls (33%), national programmes (5%) and European Union projects (8%). In the period between 2009 and 2012, Valencian institutes raised 85 million euro in competitive public funds, helping their company clients to access 231 million euro in public funding.

It is clear that governments effectively control technology centres through funding instruments (Åström *et al.*, 2008). Being self-financing is increasingly seen as the key indicator of success. A clear example of this tendency is evident in Valencia, where direct non-competitive funding from the regional government has declined dramatically since the conservative party (PP) came into power in 1995, forcing technology centres to seek alternative funding sources in the market (Ybarra, 2006), and to move away from their initial public service mission of raising the awareness of SMEs (Vázquez-Barquero *et al.*, 1999).

In this sense, López-Estornell *et al.* (2014) point out that the dichotomy of public versus self-financing is a false dilemma in a framework of public–private partnership which involves two types of risks: (1) the concentration of knowledge-intensive services in larger companies; and (2) the tendency to deal with services with lower value-added, but more explicit, demand. An additional risk is highlighted by Morgan (2013), who identifies a process of institutional cannibalism as technology centres compete with other organisations, such as universities and training institutions, for certain activities and resources. This move threatens to duplicate the work already being done by other actors.

The stated goal of Valencian institutes is to increase the competitiveness of firms by providing advanced services. Vázquez-Barquero *et al.* (1999) identified five main activities performed by institutes: offering information and documentation; technical studies; laboratory tests; consultancy and technology transfer; and human resources. The initial focus on technical aspects have broadened to include marketing, export, distribution questions and brokering activities as well, such as supporting firms' research projects and mediating research competence from other knowledge providers (OECD, 2004). In this regard, the activity-based income structure published by REDIT may give us an idea of the importance of each task: research and

development projects (50%); innovation projects (28%); laboratory tests (14%); training (4%); information services (0.8%); and others (3.2%).

In relation to the innovation process, KIBS play a key role as strategic business partners in the development and marketing of new products, processes and services (Muller and Doloreux, 2009). They perform two main functions: (i) sources and facilitators of the innovation process that takes place within the firms (García-Quevedo *et al*., 2013); and (ii) intermediaries acting as 'bridges' to connect businesses with external and internal sources of knowledge (Molina-Morales *et al*., 2002). Therefore, KIBS operate as catalysts in innovation systems (Castellacci, 2008).

As with cluster organisations, the evaluation of technology centres and of the links they establish with the productive sectors is, in general, remarkably underdeveloped. In addition, many of the studies carried out are not widely published, maybe to hide their disappointing results (Hassink, 1996), or circulate as grey literature (Barge-Gil and Modrego, 2011). In the Valencian case, some authors have provided evidence of the positive impact of technology centres on company level of innovation (Molina-Morales and Mas-Verdú, 2008) and export activity (Mas-Verdú *et al.*, 2008). García-Quevedo *et al.* (2013) analyse the typology of Valencian firms that acquire R&D services from universities, technological centres and consulting firms. Their research highlights that 61% of these firms had used these services, technological centres being the most important supplier (37% of firms), whereas 25% and 23% of the firms had bought R&D services from consulting firms and universities, respectively. Two of their results seem particularly relevant: (i) the existence of a threshold in terms of firm size, age and absorption capacity (Cohen and Levinthal, 1990) to make efficient use of KIBS; and (ii) the fact that innovation policy, specifically R&D subsidies aiming at increasing relationships between the different agents of the regional innovation system, has a significant influence on firm decisions to hire R&D services from technological centres.

Summing up, Valencian technological institutes are often presented as a story of relative success because of the following factors: (i) their governing bodies are composed of firm representatives; (ii) the centres are well embedded in the social and economic fabric while at the same time being well connected to other similar international centres; (iii) the institutes hire industry-experienced technicians; (iv) the institutes apparently constitute a real network rather than an infrastructure; and (v) their operations are increasingly self-funded.

Conceptual framework

Popularity and the widespread use of cluster policy contrast sharply with the little progress made with regard to learning in cluster policy making and cluster policy learning (Nauwelaers and Wintjes, 2008). Indeed, despite the European Commission and the OECD increasing emphasis on evaluation, assessment practices are still scarce and weakly developed. Moreover, monitoring, when available, rarely goes beyond efficiency in the use of given resources (Andersson *et al.*, 2004), while completely neglecting the complex multi-actor and multi-level framework in which these policies are designed and implemented (Borrás and Tsagdis, 2008; Fromhold-Eisebith and Eisebith, 2008; Schmiedeberg, 2010; Sternberg *et al.*, 2010; Uyarra and Ramlogan, 2012). This gap is not unique to cluster policy studies. In fact, as noted by Flanagan *et al.* (2011), much of the literature on innovation policy attempting to

deal with this complexity considers policy makers to be translators of theoretical rationales into action, denies agency to actors in relation to policy change, remains focused on a superficial analysis of instruments (despite the supposed emphasis on the mix and interactions), and considers policy interactions to be designed out of existence by 'better' coordination. As a result, there is a tendency to assume a linear model of policy making in policy analysis and evaluation, characterised by a rational analysis of options and a clear separation among the different stages of the process: agenda setting, policy formulation, implementation and evaluation. Once the decision is made, there is only execution or implementation left. Explanations of complex phenomena (such as the policy process) based on such a simplistic view may come at the expense of missing the way in which these results are produced. Thus is policy learning hindered.

The persistence and the widespread use of this rational-comprehensive framework, despite the serious critiques often made (Simon, 1957; March and Simon, 1958; Lindblom, 1959; Cohen *et al.*, 1972; Caracostas, 2007), are a clear example of path dependence at play (Ramalingam *et al.*, 2008), which reduces policy making to a static set of public activities defined *ex ante*, implemented mechanically in a linear and hierarchic structure, and controlled *ex post* that do not reflect reality (Huber, 2011). First, there is nothing natural or automatic in a policy process. On the contrary, policy processes are inherently political and their outcome is influenced by a range of interest groups that exert power and authority over policy making and affect each process stage, from agenda setting to evaluation (Mooij, 2003). There are at least two ways in which policy processes are political: (i) they are bargaining processes in which actors struggle with bounded rationality to negotiate policy outcomes (Scharpf, 1978); and (ii) they are structured by particular discourses and ideas that assume a role beyond representing well-articulated interests becoming the glue that articulates them (Witt, 2003).

Second, policy processes are rarely linear or logical (Young and Mendizabal, 2009). In fact, policy problems and policy solutions frequently emerge together, or even before the need to act has been identified, rather than one after the other (Hallsworth *et al.*, 2011). A clear example is provided by Kingdon (2003), who emphasises the role of policy entrepreneurs inside and outside government who take advantage of agenda-setting opportunities, known as policy windows, to move their solutions, already in hand, onto the political agenda. Third, the stages of policy making not only often overlap, but are commonly inseparable. In addition, policies change many times as they move through bureaucracies to the local level where they are implemented (Lindblom, 1980). One of the most dangerous effects of the division between policy making and implementation is the possibility for policy makers to avoid responsibility. That is because, in case of failure, the blame is often laid not on the policy itself, but rather on a lack of political will, poor management or the shortage of resources for implementing it (Clay and Schaffer, 1984; Juma and Clarke, 1995). Policy implementation, however, should be seen as an ongoing, nonlinear process that requires consensus building, participation of key stakeholders, conflict resolution, compromise, contingency planning, resource mobilisation and adaptation (Grindle and Thomas, 1991).

A much more realistic view of policy making is offered by a related variety of network approaches. Rhodes (2006) groups these under the generic term of 'policy network', which includes iron triangles (Ripley and Franklin, 1981), policy subsystems (Howlett and Ramesh, 2003), advocacy coalitions (Sabatier and Jenkins-Smith,

1993), social fields (Fløysand and Jakobsen, 2011), relational fields (DiMaggio and Powell, 1983; Clegg, 1989) and epistemic communities (Haas, 1992). Although these various notions do not refer exactly to the same phenomena, they do focus on the analysis of power distribution among public and private actors in policy making (Jordan, 1981; Atkinson and Coleman, 1989), and they assume that the structure of these complex interactions explains policy outcomes (Kenis and Schneider, 1991). According to Bressers and O'Toole (2005), the basic characteristics of network relations are: (i) interconnectedness or the intensity of actor interactions, which refers both to contacts in the relevant policy formation process and also to relationships between these actors outside the actual policy process at any particular time; and (ii) cohesion or the extent to which individuals, groups and organisations empathise with each other's objectives insofar as these are relevant to the policy field. To an extent, interconnectedness can be seen as a structural characteristic and cohesion as its cultural counterpart (Ostrom, 1991).

The emphasis on networks in policy research derives from a fundamental question: governmental actors, despite their hegemonic position, depend on the cooperation and support of others (that they do not control directly) to deliver policies successfully. However, this cooperation is by no means simple or spontaneous; network construction and consensus building are required to deal with resistance.

Methodology

Cluster initiatives have emerged around concepts of networking and institution building. Therefore, the challenge lies in analysing the process by which these networks are created and brokered, and how the institutions are built. To this end, and in order to answer our research question – how and why the CITMA initiative has failed – we shall draw on the insights provided by actor–network theory (ANT). According to ANT, everything – people, organisations, technologies, politics, social orders – is the result of heterogeneous networks.[5] As opposed to conventional social network approaches, this analytical framework is not concerned with mapping interactions, but with analysing the connections between heterogeneous actors, focusing on network builders as the primary actors to be followed and through whose eyes we attempt to interpret the process of network creation. An actor-network is simultaneously an actor whose activity connects heterogeneous elements, and a network that is able to redefine and transform what it is made of (Callon, 1987). It seems rather obvious that not all actor-networks become macro-actors – only those who are successful in mobilising and enrolling enough actors in favour of their project, making them act and speak as one by 'black-boxing' them (Latour, 1987). 'Punctualisation' here refers to the process by which complex actor-networks are black-boxed and linked with other networks in order to create larger actor-networks. Through this process, the node which acts as an intermediary or spokesperson for the other actors in the network becomes an obligatory point of passage, which may exercise control over resources and is able to claim responsibility for the success of the network (Law and Callon, 1992). The stability of a network is precarious as it is under constant challenge. Conflicts arise when actors attempt to establish themselves as a point of passage or, as we shall see in our case, when the entry or exit of actors produces changes in alliances that can cause the black boxes to be opened and their contents to be reconsidered (Tatnall and Gilding, 1999).

Using ANT to open black boxes means thus tracing and discovering how actor-networks are formed and analysing how to overcome resistance and strengthen internally, or fall apart. In short, it consists in exploring the process called translation that is the ability of actor-networks to keep other actor-networks involved in the project by interpreting and translating their interests, needs, values and efforts into their own language.

For the purposes of our research, the question which arises is how to analyse actor-networks when the process of translation is contingent, local and variable. In addition, macro-actors wipe away any traces of their construction, presenting themselves through their spokespersons as being indivisible and solid (Czarniawska and Hernes, 2005). Callon (1986b) outlines a four-stage process of translation that may serve as a guide:

1. *Problematisation* or how to become indispensable. Initial actor-network defines a problem in such a way that others also recognise it as their problem. The goals are making the new definition recognisable for others, making its acceptance an obligatory passage point for entering the network and becoming indispensable in the process.
2. *Interessement*. At this stage, actors are convinced to join an actor-network characterised by the specific context.
3. *Enrolment*. The actor-network enlists, coordinates and gets other actors to carry out their roles through negotiation, persuasion, co-optation, inducement and reward.
4. *Mobilisation*. The network begins to speak as a single entity and to operate as a recognisable actor.

The black box of CITMA can be opened only by speaking with those involved in its creation and dissolution. To this end, we conducted 22 semi-structured, in-depth interviews with the key actors of this technology centre (five), regional and local government representatives (six), cluster firms (two) and sectoral organisations (nine) (see Appendix 1 for a list of acronyms). A briefing containing the objectives and motivation of this research was sent to each participant. Interviews were cross-checked with the inscriptions available in texts and communication artefacts, such as policies and plan documents, government publications, meetings minutes, memos, websites, discussion forums and newspaper clippings. In order to support this case study (Eisenhardt, 1989; Yin, 1989), we have also drawn heavily on the insights provided by Caravaca *et al.* (2002, 2003), who analysed the furniture system in Cordoba at the time the technology centre project was undertaken. Lastly, it is worth stressing that opening black boxes by using the ANT model carries an unavoidable set of drawbacks. While it is true that describing how macro-actors are assembled is straightforward, the answer to the 'why' question remains more elusive.

The case of CITMA

In 1993, the Regional Ministry of Employment created the Wood Consortium – School of Encinas Reales (CEMER) to support the furniture sector in Andalusia by providing vocational and continuing training.[6] CEMER promoters knew from experience that the only way to succeed was to involve all stakeholders effectively in the design of training programmes. To that effect, the CEMER board of directors was

created not only from government and trade union representatives, but also from the newly-created furniture entrepreneurs association of Cordoba (UNEMAC), which included CEMER in its direction committee in exchange. It was the first time that a public organisation had become a member of the board of directors of an employers association in Andalusia.[7]

Within a short period, CEMER became the top-rated institution in the Andalusian furniture sector, expanding its activities beyond training and evolving into a *de facto* sectoral technology centre (TC) (Caravaca *et al.*, 2003). CEMER built trust among companies by speaking their language; that is, by using cognitive proximity (Boschma, 2005; Torre and Rallet, 2005), and following two basic principles: (i) strictest confidentiality in the projects developed with other companies; and (ii) equal access to services regardless of firm size, which could be granted because of its 100% public funding. Companies saw in CEMER exactly what the furniture sector needed, since UNEMAC was a political lobby rather than an active player pursuing companies' interests. In 1996, a reorganisation of the regional government brought CEMER and the regional development agency (IFA) together under the newly-created Ministry of Employment and Industry, in charge of innovation policy.

Problematisation: becoming indispensable

In that new context, policy entrepreneurs seized the opportunity to turn *de facto* into *de jure* and they designed a project to create a fully-fledged sectoral technology centre with similar characteristics to those of the furniture and wood technology institute of Valencia (AIDIMA), sole provider of the specific product tests required by Andalusian companies. CEMER was frustrated after its unsuccessful attempts to negotiate special rates with AIDIMA, which, being an obligatory point of passage, had discretionary power to fix high prices. The activities of the new technology centre would range from laboratory tests, quality certifications, and applied research in technical improvements for production processes to the development of quality programmes, new products and markets. It was considered that the best way to stimulate demand of these services was by subsidising its use, which at the same time would raise companies' awareness of their specific needs. To that end, funding was to be entirely public, although they expected to obtain between 20% and 30% of funding through competitive calls.

Interessement and enrolment

In 2000, the Andalusian furniture sector encompassed around 3000 companies and 25,000 employees, distributed in four main areas: Cordoba (25%), Seville (22%), Jaen (15%) and Malaga (13%). Despite having the highest share of firms (17.8%) and employment (13.5%) in Spain, Andalusia is responsible for only 11.2% of national turnover, 10% of added value and 6.9% of exports (Jiménez, 2004). At that time, the numerous furniture business associations were becoming increasingly aware of the misrepresentation of Andalusia in national furniture manufacturers' federations, key influences in central administration in policy making and design. Valencian and Catalan companies, which accounted for 28% and 20% respectively of Spanish furniture exports, controlled these organisations and this control allowed them to attract central government investment.

Once the TC project was designed, CEMER presented it to UNEMAC, then the largest entrepreneur association in Andalusia with over 250 associates. UNEMAC immediately saw in the TC an excellent chance to bring the Andalusian furniture sector into sharper focus, thus gaining increased representation in national associations. More importantly, the TC project was a win–win deal for companies since they were not expected to support the centre financially. At this stage, another actor became interested in the project, the city council of Lucena. The furniture sector was by far the main engine of the economy in the town, accounting for 49% of total companies registered, 53% of employment and 54% of installed power. The local economy had been fostered by tourist development in neighbouring Costa del Sol (Malaga) in the 1960s. The furniture sector grew rapidly during the 1990s with a business creation rate of 286%. In 2000, there were approximately 400 furniture manufacturing companies, 160 auxiliary firms and 5500 employees, with an estimated turnover of €575 million.

With the intention of turning Lucena into the 'City of Furniture', the city mayor visited CEMER after his first term election in 1999. He quickly understood the TC project was not only an opportunity to raise the visibility of Lucena, but also an electoral asset and committed to granting public lands for the TC building. In addition, the mayor made his political network, including the president of the regional government, available to CEMER. Director positions were assigned as follows: UNEMAC was appointed to chair the TC; the TC management was assigned to CEMER, while the city council of Lucena would be part of the TC's highest governing body (in which companies were asked to participate as members in exchange of a reduced membership fee).

Mobilisation

While work was underway on the TC presentation to government officials, the narrow window to which Kingdon (2003) refers, the window that gives an issue a place on a governmental agenda, opened. Two major developments paved the way for the technology centre. First, IFA proposed that UNEMAC elaborate on the strategic plan of the Cordoba furniture system (PEMC). Although – surprisingly – IFA did not involve CEMER in the project, UNEMAC commissioned CEMER to interview cluster companies to identify their needs. They saw the creation of a technology centre as critical (Ariza Montes and Fernández Portillo, 2004). Secondly, the Lisbon Strategy was approved in March 2000, which stressed the need to promote cluster policies and knowledge transfer between public research organisations and industry. In order to meet these goals, the regional ministry of employment and technological development launched the master plan for innovation and technological development (PLADIT 2001–03) in July 2001, which formally incorporated cluster policies into the overall strategy (Witt, 2003). PLADIT included among its main objectives the development of entrepreneurial networks to promote the creation of sectoral technology centres. The emphasis on such support infrastructure was further influenced by positive experiences in the Basque Country and especially the autonomous community of Valencia, where technology institutes were playing a key role in industrial districts.

Shortly after the PEMC was concluded, CEMER submitted the TC project and its public funding model to the newly appointed regional minister, who approved it. Furthermore, with the aim of ensuring the highest level of political endorsement, the

project was presented to the president of the regional government of Cordoba with the invaluable help of the mayor of Lucena. The presentation event brought together not only high-level authorities, but also over 150 entrepreneurs, showing the mobilisation capacity of the CEMER actor-network.

Between 2001 and 2004, the CEMER actor-network seemed cohesive and appeared to be gaining momentum. The furniture sector, together with aeronautics, the marble stone and biotechnology sectors, was considered of strategic importance by the regional ministry. In June 2001, the Spanish government granted CEMER the distinction of 'office for the transfer of research results' (OTRI), which allows CEMER to participate in competitive calls for proposals.[8] In addition, CEMER was commissioned to monitor the TC, whose design was put out to tender.[9] In 2003, a CEMER branch specialised in furniture upholstery was set up in Villa del Rio (Cordoba). CEMER was well on the way to becoming a macro-actor and an obligatory point of passage within the Andalusian furniture sector. Only various delays in the land expropriation process, which caused the technology centre inauguration to be rescheduled to the second half of 2005, overshadowed the success of CEMER.

Opening CITMA black box

Despite the efforts made by the regional government to coordinate innovation policy, the management of the Andalusian research plan (PAI III 2000–03) remained within the regional ministry of education and science, which added an extra layer to already complex governance and caused the political fragmentation of the R&D process. In order to overcome this shortage, the umpteenth reorganisation of the Andalusian government brought innovation, science and entrepreneurship competencies together under the umbrella of the same regional ministry in 2004. Employment, however, remained separate from the new ministry, resulting in unexpected consequences for CEMER. IFA, in turn, was renamed IDEA (Andalusian innovation and development agency) and was entrusted with the coordination of innovation policy. The first task carried out by the newly appointed regional ministry was the development of the necessary regulatory framework for the research and innovation agenda.

In June 2005, the innovation and modernisation plan for Andalusia (PIMA 2005–10) was adopted, orienting innovation policy towards the development of the knowledge industry, biotechnology, information and communication technologies, energy, aeronautics, space and tourism.[10] Traditionally, such industries as marble stone and furniture would have been excluded, unveiling the regional government's intention to allocate its resources to knowledge-based industries, despite their irrelevant contribution to regional GDP and employment. In order to improve the governance and coordination of the regional innovation system, the Andalusian technology network (RETA) was created, becoming the most relevant actor and relegating IDEA to the mere evaluation of the complex paperwork required by the new subsidy scheme.[11] Similarly, CEMER was left in a weak position since it remained attached to the ministry of employment, which had no stake in the new innovation policy arena.

Conflict arose when the new regional ministry decided to review the policy regulating technologies centres, and particularly their funding. After the creation of the technology centre of stone (CTAP) and the green light was given to CITMA in 2001, TC initiatives had mushroomed to the extent that 15 of them, namely devoted to traditional sectors, were about to become operational. All these initiatives, despite

being based on different funding models, relied heavily on public funding and the regional ministry considered them not only an unbearable financial burden but also an unwanted heritage. In order to establish a common funding framework for Andalusian sectoral technology centres, the regional ministry used CTAP (which had secured nearly half of the financing to companies the previous year), as a yardstick. This called CITMA into question and opened its black box.

CEMER and officials of the regional ministry held several meetings to agree a new funding model, but positions were entrenched. On the one hand, CEMER stuck to the following non-negotiable principles: (i) to maintain the link between CITMA and CEMER; and (ii) to have a stable funding framework by which at least 80% of funds should be entirely public. On the other hand, the regional ministry offered a 10-year decreasing model, at the end of which CITMA should be able to self-finance its activities. In addition, the TC should operate under the legal form of a non-profit private foundation, in which companies had to pay an initial membership fee of €15,000. Faced with this reality, CEMER finally gave up and resigned from leadership of the project. Although in private UNEMAC and the mayor of Lucena asked CEMER to reconsider this decision, no one supported CEMER publicly. Such support might have jeopardised their relationships with the most powerful ministry of the government. UNEMAC associates were dependent on the generous subsidies granted by the regional ministry, and the Lucena city council was hoping to attract a technology centre devoted to renewable energy.

Thus it was that the CITMA actor-network was depunctualised and detached from CEMER, changing in the process to the extent that UNEMAC found itself compelled to adopt the unwanted role of network builder. This left the entrepreneur association in a very difficult position. It was not only CITMA's promoter and ultimately responsible for its success or failure in the eyes of stakeholders, but also a member of the CEMER board of directors. In order to avoid conflicts in the future, CEMER and UNEMAC reached a tacit agreement by which CITMA would refuse to interfere with training activities.

The new CITMA actor-network (2007–13)

In May 2007, eight months after its official opening and at an approximate cost of €5 million, CITMA opened its doors with a twofold objective: (i) to support the innovative activities of Andalusian furniture firms by providing business-related services; and (ii) to act as cluster manager, that is, as catalyst of the furniture production systems of Cordoba. To achieve these goals, CITMA was left to its own devices without the necessary financial support from stakeholders. Finally, laboratories were not equipped and the regional ministry paid only initial running costs. The worst case scenario of UNEMAC was that CITMA would attract at least 100 members, yet only 20 companies (18 of which were part of the furniture system of Cordoba) and 10 institutions became trustees. Furthermore, it was decided not to provide extra funding to support the centre beyond the initial capital, which under no circumstances was to be used to finance its activities. This way, the board of trustees rapidly became an ineffective body whose members were limited to attending meetings (as the saying goes, 'keeping their friends close and their enemies even closer'). Additionally, after the general manager appointment, the CITMA president, co-owner of one of the largest local companies, confined himself to representative functions, avoiding managing responsibilities.

Against this background, TC employees, led by the general manager, took over the reins of the TC to secure their jobs. Their background determined the CITMA business model, which focused on the needs of large companies, and especially on the provision of international trade and information and telecommunications services, which were highly subsidised. CITMA also began to compete with UNEMAC by offering the same services to its partners at lower prices, such as the management of the different subsidies granted to the furniture sector. In 2008, the trade promotion agency of Andalusia (EXTENDA) entrusted CITMA with the management of the international promotion plan for the furniture sector in Andalusia, which had been reserved for UNEMAC. Even though CITMA received only €15,000 each year for the plan management, this was a stepping-stone to offering customised services. Such a step intruded on the responsibilities of EXTENDA. By the end of 2009, EXTENDA had announced the termination of the promotion plan because of its poor performance, seriously questioning not only CITMA representativeness, but also its role within the sector.

The lack of support from companies was explained not only by the fact that CITMA had little to offer, but also by its employees, who were seen as outsiders with poor, if any, knowledge of company needs. Besides, most of the services it provided had to be subcontracted to consulting firms or freelancers because CITMA lacked qualified personnel. In-house services, such as design, did not succeed either since companies refused to entrust product development to an organisation that was chaired by a competitor.

Between 2007 and 2010, amidst the bursting housing bubble, only nine companies joined the foundation. During the same period, funding reached a peak of 19% of income, helping to hire 15 employees. During the budgetary cuts between 2010 and 2013, the situation worsened. In 2012, as a result of a reorganisation of the Andalusian government, the regional ministry for economy, innovation and science was created and the regional minister began to dismantle RETA and the IDEA cluster directorate. In the same year 21 sectoral TCs were opened – and the regional ministry announced the termination of TC basic funding, which covered the running costs of centres. At the end of 2013, technology centres unable to self-finance their activities were advised ‘to find a wealth partner to merge with’.

In May 2013, the board of trustees announced its dissolution and the merger of CITMA with the Andalusian technology institute (IAT), located in Seville and dedicated to engineering and knowledge management, which had no relation whatsoever with the furniture sector. Shortly after, UNEMAC, once the largest furniture entrepreneur association in Andalusia, entered into a voluntary arrangement with creditors, discontinuing its activities. Ironically, CEMER was transferred to the regional ministry of education in 2012, precisely when the new regional ministry in charge of innovation finally took over responsibility for employment and training.

Conclusions

The case of CITMA illustrates that policy processes are inherently political and far more complex than portrayed in traditional linear accounts. Policies are, in fact, unpredictable and fraught with uncertainty, opportunity and local specificity. Being aware of this complexity is not enough; it has to be unpacked to foster policy

learning. To this end, and in order to explain how and why the CITMA initiative failed, the present research has analysed and described its emergence, development and dissolution. This narrative shows how the TC, initially designed and approved as a publicly funded organisation aimed at raising SMEs' absorption capacity by providing technological services, turned into a semi-public consultancy that provided big companies with standard business services. The opening of the CITMA black box has revealed that this policy outcome arose from a traditional top-down approach to policy making in which the regional ministry failed to take into account the needs, interests and the resistance of the various stakeholders by unilaterally changing the project and the funding model approved by its predecessor. Consequently, this unexpected financing shift triggered the dissolution of the alliance and the exit of CEMER from CITMA management. In this context and in the absence of stakeholder support, CITMA employees were unable to build a solid and durable actor-network, remaining trapped in the vicious circle of low demand and poor supply. Moreover, the provision of international trade and training services, which was their only remaining option, was blocked by two obligatory points of passage, EXTENDA and CEMER respectively.

The main lesson to be drawn from the case of CITMA is that, despite its popularity, cluster policies face further problems than those often foreseen in policy circles. They are not only designed and implemented in extremely uncertain and complex multi-actor and multi-level environments, but also orchestrated across several policy domains. Therefore, their actual impact may depend as much on the way the policy is implemented as on whether the rationale for its use is correct (Uyarra and Ramlogan, 2012). The case of CITMA highlights the lack of a multi-disciplinary approach to innovation policy formation in Andalusia, where science, technology, employment, industry, entrepreneurship and international promotion competencies were continuously redistributed among different policy domains until 2012. As a result, innovation policies have been defined and implemented in a hierarchical and siloed fashion with little attempt at policy alignment across different areas and levels of government. This is evident in the extensive network of support organisations competing to provide similar subsidised services to companies. At this point, a pertinent question for future research is whether such balkanisation of semi-public, highly-subsidised support organisations is crowding out the private sector by providing basic business services to big companies rather than stimulating the innovative performance of SMEs.

Acknowledgements

We would like to thank Elvira Uyarra, Antonio Vázquez-Barquero, Xavier Molina and two anonymous referees for their invaluable comments and suggestions on this article. We are also grateful for the feedback received at the EU-SPRI conference, held in Manchester in June 2014, where an extended abstract was presented. Lastly, we are deeply indebted to all our interviewees for their availability and patience. Without their participation, this paper would not have been possible.

Disclosure statement

No potential conflict of interest was reported by the authors.

Notes

1. Published in the Andalusian official gazette (BOJA), 22 July 2013.
2. The new Horizon 2020 action, *Cluster Facilitated Projects for New Industrial Value Chains*, launched in 2015, will provide 24.9 million euro to finance projects that involve clusters. It is aimed at defining new industrial value chains to support European growth. Clusters will play a key role in channelling these funds to help enhance the innovation capacities of SMEs and fund large-scale demonstrator projects.
3. Launched under the European Commission's Europe INNOVA initiative in June 2007, it is a service created to inform policy makers, cluster practitioners and researchers, and innovative enterprises about European clusters and national and regional policies and programmes related to innovation and clusters. The project results and the methodology used are available at the website of the European Cluster Observatory, www.clusterobservatory.eu.
4. According to Isaksen and Hauge (2002), the most frequent activity carried out by cluster organisations has to do with government relations, i.e. lobbying governments and coordinating public–private investments. The second most frequent activity is training, which is also a little more frequent in science-based clusters. R&D is the third most frequent activity coordinated by cluster organisations, and it is of equal importance in both cluster types. Beyond that, cluster organisations coordinate a variety of activities among firms in clusters, such as marketing and sales, production (most important in science-based clusters) and inputs.
5. The ANT incorporates what is known as a 'principle of generalised symmetry': human and non-human elements (e.g. artefacts and organisation structures) should be integrated into the same conceptual framework and assigned equal amounts of agency. The importance of both, human and material elements, in constituting organisations becomes evident when we consider what a technology centre needs to fulfil its mission – scientists, laboratories, equipment.
6. The hosting of the organisation was first offered to the city council of Lucena, which declined the offer. The organisation was eventually established at Encinas Reales, 14 km away.
7. CEMER has followed the same strategy with most furniture entrepreneur associations in Andalusia, such as Pilas, Valverde del Camino, Sanlucar de Barrameda, and Ecija.
8. The OTRI is a technical office with two main goals: (i) to promote effective relationships and to catalyse the exchange of knowledge through R&D services with high added value; and (ii) to conduct joint R&D by contracting or by means of competitive funding from public funds.
9. In 2002, the scale model was ready for the visit to Lucena of Prince Felipe de Borbon to inaugurate an industrial park, which was named after him. He was impressed by the building design and asked the mayor to inform him about further development of the project.
10. Aimed at associating the growth of the Andalusian knowledge system, especially universities, to regional development needs, the plan comprised 286 actions grouped into 31 strategic lines, with 82 goals and six lines of action. PIMA had an overall budget of €5700 million, of which nearly €2600 million was assigned to support knowledge-based industries and universities and €1823 million was used to foster entrepreneurship. It was reinforced in 2007 by the Andalusian plan for research, development and innovation (PAIDI 2007–13), which set out the role and functions of the key actors of the innovation system in Andalusia.
11. All subsidies related to innovation were grouped under the incentive order of 5 July 2005, which establishes that any company benefiting from public aids to encourage innovation should contract at least 15% of the total project to public research centres.

References

Amin, A. and Thrift, N. (1994) 'Living in the global' in Amin, A. and Thrift, N. (eds) *Globalization, Institutions, and Regional Development in Europe*, Oxford University Press, Oxford, pp.1–22.

Andersson, T., Serger, S., Soervik, J. and Hansson, W. (2004) *Cluster Policies Whitebook*, International Organisation for Knowledge Economy and Enterprise Development (IKED), Malmö.

Aranguren, M., De la Maza, X., Parrilli, M., Vendrell, F. and Wilson, J. (2014) 'Nested methodological approaches for cluster policy evaluation: an application to the Basque Country', *Regional Studies*, 48, 9, pp.1547–62.

Ariza Montes, J. and Fernández Portillo, L. (2004) 'Productividad, organización empresarial y recursos humanos en un sistema local. El caso del sistema productivo del mueble de Córdoba y afines', *Trabajo y Seguridad Social*, 256, pp.187–204.

Asheim, B. and Isaksen, A. (1997) 'Localisation, agglomeration and innovation: towards regional innovation systems in Norway?', *European Planning Studies*, 5, 3, pp.299–330.

Asheim, B. and Isaksen, A. (2002) 'Regional innovation systems: the integration of local sticky and global ubiquitous knowledge', *Journal of Technology Transfer*, 27, pp.77–86.

Åström, T., Eriksson, M. and Niklasson, L. (2008) *International Comparison of Five Institute Systems*, Forsknings- og Innovationsstyrelsen, København.

Atkinson, M. and Coleman, W. (1989) 'Strong states and weak states: sectoral policy networks in advanced capitalist economies', *British Journal of Political Science*, 19, pp.47–67.

Aydalot, P. (ed.) (1980) *Dynamique Spatiale et Développement Inégal*, Economica, Paris.

Barca, F. (2009) *An Agenda for a Reformed Cohesion Policy: A Place-based Approach to Meeting European Union Challenges and Expectations, independent report prepared for the European Commissioner for Regional Policy*, Danuta Hubner, European Commission, Brussels.

Barge-Gil, A. and Modrego, A. (2011) 'The impact of research and technology organizations on firm competitiveness. Measurement and determinants', *Journal of Technology Transfer*, 36, 1, pp.61–83.

Becattini, G. (1979) 'Dal settore industriale al distretto industriale. Alla ricerca dell'unita` d'analisi dell'economia', *Rivista di Economia e Politica Industriale*, 1, pp.7–21.

Benneworth, P., Danson, M., Raines, P. and Whittam, G. (2003) 'Confusing cluster? Making sense of the cluster approach in theory and practice', *European Planning Studies*, 11, pp.511–20.

Boekholt, P. and McKibbin, S. (2003) *European Trend Chart on Innovation Thematic Report: Cluster Policies*, European Commission, Brussels.

Boekholt, P. and Thuriaux, B. (1999) *Public Policies to Facilitate Clusters. Background, Rationale and Policy Practices in International Perspective*, OECD, Paris.

Borrás, S. and Tsagdis, D. (2008) *Cluster Policies in Europe: Firms, Institutions and Governance*, Edward Elgar, Cheltenham.

Boschma, R. (2005) 'Proximity and innovation: a critical assessment', *Regional Studies*, 39, 1, pp.61–74.

Braczyk, H., Cooke, P. and Heidenreich, M. (eds) (1998) *Regional Innovation Systems*, UCL Press, London.

Brakman, S. and van Marrewijk, C. (2013) 'Reflections on cluster policies', *Cambridge Journal of Regions, Economy and Society*, 6, 2, pp.217–31.

Bressers, H. and O'Toole, L. (2005) 'Instrument selection and implementation in a networked context' in Eliadis, P., Hill, M. and Howlett, M. (eds) *Designing Government: from Instruments to Governance*, McGill-Queens University Press, Montreal, pp.132–53.

Brusco, S. (1982) 'The Emilian model: productive decentralisation and social integration', *Cambridge Journal of Economics*, 6, pp.167–84.

Callon, M. (1986a) 'The sociology of an actor-network: the case of the electric vehicle' in Callon, M., Law, J. and Rip, A. (eds) *Mapping the Dynamics of Science and Technology*, Macmillan, London, pp.19–34.

Callon, M. (1986b) 'Some elements of a sociology of translation: domestication of the scallops and the fishermen of St Brieuc Bay' in Law, J. (ed.) *Power, Action and Belief. A New Sociology of Knowledge?*, Routledge and Kegan Paul, London, pp.196–229.

Callon, M. (1987) 'Society in the making: the study of technology as a tool for sociological analysis' in Bijker, W., Hughes, T. and Pinch, T. (eds) *The Social Construction of Technological Systems*, MIT Press, Cambridge MA, pp.85–103.

Camagni, R. (1991) 'Introduction. From the local milieu to innovation through cooperation networks' in Camagni, R. (ed.) *Innovation Networks*, Belhaven Press, London, pp.1–9.

Caracostas, P. (2007) 'The policy-shaper anxiety at the innovation kick. How far do innovation theories really help in the world of policy?' in Malerba, F. and Brusoni, S. (eds) *Perspectives on Innovation*, Cambridge University Press, Cambridge, pp.464–89.
Caravaca, I., Gonzalez, E., Méndez, R. and Silva, R. (2002) 'Innovación y territorio. Análisis comparado de sistemas productivos locales en Andalucía' Consejería de Economía y Hacienda, Junta de Andalucía, lección Pablo de Olavide, Sevilla.
Caravaca, I., González, G. and Silva, R. (2003) 'Redes e innovación socio-institucional en sistemas productivos locales', *Boletín de la A.G.E.,* 36, pp.103–15.
Carlsson, B. and Jacobsson, S. (1997) 'Diversity creation and technological systems: a technology policy perspective' in Edquist, C. (ed.) *Systems of Innovation: Technologies, Institutions and Organizations*, Pinter, London, pp.266–94.
Castellacci, F. (2008) 'Technological paradigms, regimes and trajectories: manufacturing and service industries in a new taxonomy of sectoral patterns of innovation', *Research Policy*, 37, pp.978–94.
Clay, E. and Schaffer, B. (eds) (1984) *Room for Manoeuvre. An Explanation of Public Policy in Agriculture and Rural Development*, Heinemann, London.
Clegg, S. (1989) *Frameworks of Power*, Sage, London.
Cohen, M., March, J. and Olsen, J. (1972) 'A garbage can model of organisational choice', *Administrative Science Quarterly*, 17, 1, pp.1–25.
Cohen, W. and Levinthal, D. (1990) 'Absorptive capacity: a new perspective on learning and innovation', *Administrative Science Quarterly*, 35, 1, pp.128–52.
Conejos, J. and Duch, E. (1995) 'La creación de ventaja competitiva a nivel de microcluster', *Economía Industrial*, 303, pp.159–70.
Cooke, P. and Morgan, K. (1998) *The Associational Economy: Firms, Regions and Innovation*, Oxford University Press, Oxford.
Czarniawska, B. and Hernes, T. (2005) 'Constructing macro actors according to ANT' in Czarniawska, B. and Hernes, T. (eds) *Actor-Network Theory and Organizing*, Liber/CBS, Malmö/Copenhagen, pp.1–8.
De la Maza-y-Aramburu, X., Vendrell-Herrero, F. and Wilson, J. (2012) 'Where is the value of cluster associations for SMEs?', *Intangible Capital*, 8, pp.472–96.
Del Castillo, J., Barroeta, B. and Paton, J. (2012) *Converting Smart Specialisation into a Regional Strategy*, INFYDE Working Paper.
Díez, M. (2002) 'Evaluating new regional policies. Reviewing the theory and practice', *Evaluation*, 8, pp.285–305.
DiMaggio, P. and Powell, W. (1983) 'The iron cage revisited. Institutional isomorphism and collective rationality in organizational fields', *American Sociological Review*, 48, pp.147–60.
Dodgson, M., Hughes, A., Foster, J. and Metcalfe, S. (2011) 'Systems thinking, market failure, and the development of innovation policy: the case of Australia', *Research Policy*, 40, 9, pp.1145–56.
Doloreux, D., Freel, M. and Shearmur, R. (2010) *Knowledge-intensive Business Services: Geography and Innovation*, Ashgate, Farnham.
Duranton, G. (2011) 'California dreamin': the feeble case for cluster policies', *Review of Economic Analysis*, 3, pp.3–45.
Edquist, C. (ed.) (1997) *Systems of Innovation: Technologies, Institutions and Organizations*, Pinter/Cassell, London.
Edquist, C., Hommen, L., Johnson, B., Lemola, T., Malerba, F., Reiss, T. and Smith, K. (1998) *The ISE Policy Statement—The Innovation Policy Implications of the Innovations Systems and European Integration Research Project*, Linkoping University, Linkoping.
Eisenhardt, K. (1989) 'Building theories from case study research', *Academy of Management Review*, 14, pp.532–50.
European Commission (2008) *The Concept of Clusters and Cluster Policies and their Role for Competitiveness and Innovation: Main Statistical Results and Lessons Learned*, SEC (200) 2637, Brussels.
Fernández de Bobadilla, S. (2009) *Dinámicas de Crecimiento y Características del Modelo de Centros Tecnológicos*, Servicio editorial de la Universidad del País Vas, Bilbao, Serie Economía y Empresa.

Feser, E. (2008) 'Clusters and the design of innovation policy for developing economies' in Blien, U. and Maier, G. (eds) *The Economics of Regional Clusters: Networks, Technology and Policy*, Edward Elgar, Cheltenham, pp.191–213.
Flanagan, K., Uyarra, E. and Laranja, M. (2011) 'Reconceptualising the policy mix for innovation', *Research Policy*, 40, 5, pp.702–13.
Fløysand, A. and Jakobsen, S. (2011) 'The complexity of innovation: a relational turn', *Progress in Human Geography*, 35, 3, pp.328–44.
Foray, D., David, P. and Hall, B. (2009) *Smart Specialisation – The Concept*, Knowledge Economists Policy Brief 9, June.
Freeman, C. (1987) *Technology Policy and Economic Performance: Lessons from Japan*, Frances Pinter, London.
Fromhold-Eisebith, M. and Eisebith, G. (2008) 'Looking behind façades: evaluating effects of (automotive) cluster promotion', *Regional Studies*, 42, pp.1343–56.
García-Quevedo, J., Mas-Verdú, F. and Montolio, D. (2013) 'What types of firms acquire knowledge intensive services and from which suppliers?', *Technology Analysis & Strategic Management*, 25, 4, pp.473–86.
Giuliani, E., Maffioli, A., Pacheco, M., Pietrobelli, C. and Stucchi, R. (2014) *Evaluating the Impact of Cluster Development Programs*, CIRCLE, Lund University Working Paper 2014/10.
Grindle, M. and Thomas, J. (1991) *Public Choices and Policy Change: The Political Economy of Reform in Developing Countries*, John Hopkins University Press, Baltimore, MD.
Haas, P. (1992) 'Epistemic communities and international policy coordination', *International Organization*, 46, pp.1–35.
Hallsworth, M., Parker, S. and Rutter, J. (2011) *Policy Making in the Real World, Evidence and Analysis*, Institute for Development, London.
Hassink, R. (1996) 'Technology transfer agencies and regional economic development', *European Planning Studies*, 4, 2, pp.167–84.
Hassink, R. (1997) 'Technology transfer infrastructures: some lessons from experiences in Europe, the US and Japan', *European Planning Studies*, 5, 3, pp.167–83.
Havas, A. (2014) 'Trapped by the high-tech myth: the need and chances for a new policy rationale' in Hirsch-Kreinsen, H. and Schwinge, I. (eds) *Knowledge-Intensive Entrepreneurship in Low-Tech Sectors: The Prospects of Traditional Economic Industries*, Edward Elgar, Cheltenham, pp.193–217.
Howlett, M. and Ramesh, M. (2003) *Studying Public Policy: Policy Cycles and Policy Subsystems*, Oxford University Press, Oxford.
Huber, W. (2011) 'Federal coordination: policy making beyond command and control', paper presented to seminar on Territorial Dimension of Development Policy, Ostroda, Poland, July.
Isaksen, A. (2001) 'Building regional innovation systems: is endogenous industrial development possible in the global economy?', *Canadian Journal of Regional Science*, 22, 1, pp.101–20.
Isaksen, A. and Hauge, E. (2002) *Regional Clusters in Europe*, Observatory of European SMEs, 3, Office for Official Publications of the European Communities, Luxembourg.
Jessop, B. (2000) 'Governance failure' in Stoker, G. (ed.) *The New Politics of British Local Governance*, Macmillan, Basingstoke, pp.11–32.
Jiménez, M. (2004) 'El sector del mueble', *Boletín Económico de ICE, 2823*, pp.157–66.
Jordan, A. (1981) 'Iron triangles, woolly corporatism and elastic nets', *Journal of Public Policy*, 1, pp.95–123.
Juma, C. and Clarke, N. (1995) 'Policy research in sub-Saharan Africa: an exploration', *Public Administration and Development*, 15, pp.121–37.
Kenis, P. and Schneider, V. (1991) 'Policy networks and policy analysis: scrutinizing a new analytical toolbox' in Marin, B. and Mayntz, R. (eds) *Policy Networks: Empirical Evidence and Theoretical Considerations*, Campus Verlag, Frankfurt am Main, pp.25–59.
Ketels, C., Lindqvist, G. and Sölvell, Ö. (2012) *Strengthening Clusters and Competitiveness in Europe. The Role of Cluster Organisations*, Center for Strategy and mpetitiveness, Stockholm.
Kingdon, J. (2003) *Agendas, Alternatives, and Public Policies*, Longman, New York, NY.

Krugman, P. (1991) 'Increasing returns and economic geography', *Journal of Political Economy*, 99, 3, pp.483–99.
Lagendijk, A. (2000) 'Learning in non-core regions: towards "intelligent clusters" addressing business and regional needs' in Boekema, F., Morgan, K., Bakkers, S. and Rutten, R. (eds) *Knowledge, Innovation and Economic Growth. The Theory and Practice of Learning Regions*, Edward Elgar, Cheltenham, pp.165–91.
Lagendijk, A. and Charles, D. (1999) *Clustering as a New Growth Strategy for Regional Economies? A Discussion of New Forms of Regional Industrial Policy in the United Kingdom*, OECD, Paris.
Landabaso, M. and Rosenfeld, S. (2009) 'Public policies for industrial districts and clusters' in Becattini, G., Bellandi, M. and De Propris, L. (eds) *A Handbook of Industrial Districts*, Edward Elgar, Cheltenham, pp.739–53.
Latour, B. (1987) *Science in Action: How to Follow Scientists and Engineers through Society*, Harvard University Press, Cambridge MA.
Law, J. and Callon, M. (1992) 'The life and death of an aircraft: a network analysis of technical change' in Bijker, W. and Law, J. (eds.) *Shaping Technology/Building Society: Studies in Sociotechnical Change*, MIT Press, Cambridge MA, pp.21–52.
Lindblom, C. (1959) 'The science of "muddling through"', *Public Administration Review*, 19, 2, pp.79–88.
Lindblom, C. (1980) *The Policy-Making Process*, Prentice Hall, Englewood Cliffs NJ.
López-Estornell, M., Barberá-Tomás, D., García-Reche, A. and Mas-Verdú, F. (2014) 'Evolution of innovation policy in Emilia-Romagna and Valencia: similar reality, similar results?', *European Planning Studies*, 22, 11, pp.2287–304.
Lundvall, B.-Å. (ed.) (1992) *National Systems of Innovation. Towards a Theory of Innovation and Interactive Learning*, Pinter, London.
Maillat, D. (1995) 'Territorial dynamic, innovative milieus and regional policy', *Entrepreneurship and Regional Development*, 7, pp.157–65.
March, J. and Simon, H. (1958) *Organizations*, Wiley, New York, NY.
Markusen, A. (1999) 'Fuzzy concepts, scanty evidence, policy distance: the case for rigour and policy relevance in critical regional studies', *Regional Studies*, 33, 9, pp.869–84.
Marshall, A. (1890) *Principles of Economics*, Macmillan, London.
Martin, F., Mayer, T. and Mayneris, F. (2011a) 'Public support to clusters: a firm level study of French "local productive systems"', *Regional Science and Urban Economics*, 41, pp.108–23.
Martin, F., Mayer, T. and Mayneris, F. (2011b) 'Spatial concentration and firm-level productivity in France', *Journal of Urban Economics*, 69, 2, pp.182–95.
Martin, R. and Sunley, P. (2003) 'Deconstructing clusters: chaotic concept or policy panacea?', *Journal of Economic Geography*, 3, pp.5–35.
Mas-Verdú, F. (2003) 'Centros tecnológicos y sistemas regionales de innovación: modelos europeos', *Investigaciones Regionales*, 3, pp.129–61.
Mas-Verdú, F. (2007) 'Services and innovation systems: European models of technology centres', *Service Business*, 1, 1, pp.7–23.
Mas-Verdú, F., Babiera-Puig, A. and Martínez-Gómez, V. (2008) 'Internacionalización, servicios y política de innovación. El papel de los Centros Tecnológicos', *Revista de Economía*, 844, pp.155–65.
Miles, I., Kastrinos, N., Flanagan, K., Bilderbeek, R. and den Hertog, P. (1995) *Knowledge-intensive Business Services. Users, Carriers and Sources of Innovation*, PREST, Manchester.
Modrego-Rico, A., Barge-Gil, A. and Núñez-Sánchez, R. (2005) 'Developing indicators to measure technology institutes' performance', *Research Evaluation*, 14, 2, pp.177–84.
Molina-Morales, F., López-Navarro, M. and Guía-Julve, J. (2002) 'The role of local institutions as intermediary agents in the industrial district', *European Urban and Regional Studies*, 9, 4, pp.315–29.
Molina-Morales, F. X. and Mas-Verdú, F. (2008) 'Intended ties with local institutions as factors in innovation: an application to Spanish manufacturing firms', *European Planning Studies*, 6, 6, pp.811–27.
Mooij, J. (2003) *Smart Governance? Politics in the Policy Process in Andhra Pradesh, India*, Overseas Development Institute Working Paper 228.

Morgan, K. (1997) 'The regional animateur: taking stock of the Welsh Development Agency', *Regional and Federal Studies*, 7, 2, pp.70–94.
Morgan, K. (2013) 'The regional state in the era of smart specialisation', *Ekonomiaz*, 83, pp.103–26.
Morgan, K. and Nauwelaers, C. (eds) (1999) *Regional Innovation Strategies: The Challenge for Less Favoured Regions*, Routledge, Abingdon.
Muller, E. and Doloreux, D. (2009) 'What we should know about knowledge intensive business services', *Technology in Society*, 31, 1, pp.64–72.
Muller, E. and Zenker, A. (2001) 'Business services as actors of knowledge transformation: the role of KIBS in regional and national innovation systems', *Research Policy*, 30, pp.1501–16.
Mytelka, L. and Smith, K. (2002) 'Policy learning and innovation theory: an interactive and co-evolving process', *Research Policy*, 31, pp.1467–79.
Nam, C., Schoenberg, A. and Wamser, G. (2012) *Lisbon Agenda, Regional Innovation System and the New EU Cohesion Policy*, CESifo Working Paper 3564.
Nauwelaers, C. (2001) 'Path-dependency and the role of institutions in cluster policy formation' in Mariussen, Å. (ed.) *Cluster Policies – Cluster Development?*, Nordregio, Stockholm, pp.93–107.
Nauwelaers, C. and Wintjes, R. (2008) 'Innovation policy, innovation in policy: policy learning within and across systems and clusters' in Nauwelaers, C. and Wintjes, R. (eds) *Innovation Policy in Europe: Measurement and Strategy*, Edward Elgar, Cheltenham, pp.225–68.
Nelson, R. and Rosenberg, N. (1993) 'Technical innovation and national systems' in Nelson, R. (ed.) *National Innovation Systems: A Comparative Analysis*, Oxford University Press, New York, NY, pp.3–21.
Nelson, R. and Winter, S. (1982) *An Evolutionary Theory of Economic Change*, Belknap Press/Harvard University Press, Cambridge MA.
Olazarán, M., Albizu, E. and Otero, B. (2009) 'Technology transfer between technology centres and SMEs: evidence from the Basque Country', *European Planning Studies*, 13, 3, pp.345–63.
Organisation for Economic Cooperation and Development (1992) *Regionally-based Technology Transfer Strategies*, OECD, Paris.
Organisation for Economic Cooperation and Development (1999) *Boosting Innovation: The Cluster Approach*, OECD, Paris.
Organisation for Economic Cooperation and Development (2004) *Global Knowledge Flows and Economic Development*, OECD, Paris.
Organisation for Economic Cooperation and Development (2007) *Competitive Regional Clusters National Policy Approaches*, OECD, Paris.
Ostrom, E. (1991) 'Rational choice theory and institutional analysis: toward complementarity', *American Political Science Review*, 85, 1, pp.237–43.
Oughton, C., Landabaso, M. and Morgan, K. (2002) 'The regional innovation paradox: innovation policy and industrial policy', *Journal of Technology Transfer*, 27, pp.97–100.
Oxford Research (2008) *Cluster Policy in Europe: A Brief Summary of Cluster Policies in 31 European Countries*, Report for the Europe Innova Cluster Mapping Project, available from http://www.clusterobservatory.eu [accessed 7 April 2013].
Piore, M. and Sabel, C. (1984) *The Second Industrial Divide: Possibilities for Prosperity*, Basic Books, New York, NY.
Pitelis, C., Sugden, R. and Wilson, J. (2006) *Globalisation and Governance: The Development of Urban and Regional Economies*, Edward Elgar, Cheltenham.
Porter, M. (1990) *The Competitive Advantage of Nations*, Free Press, New York, NY.
Porter, M. (1998) 'Clusters and the new economics of competition', *Harvard Business Review*, November–December.
Pyke, F. (1994) *Small Firms, Technical Services and Inter-firm Cooperation*, International Institute for Labour Studies, Geneva.
Raines, P. (2001) *The Cluster Approach and the Dynamics of Regional Policy Making*, Regional and Industrial Policy Research Paper 47, University of Strathclyde, European Policies Research Centre.

Ramalingam, B., Jones, H., Reba, T. and Young, J. (2008) *Exploring the Science of Complexity. Ideas and Implications for Development and Humanitarian Efforts*, Overseas Development Institute Working Paper 285.
Regional Innovation Monitor (RIM) (2012) *Regional Innovation Report: Region of Andalusia*, Technopolis, available from https://ec.europa.eu/ [accessed February 2014].
Rhodes, R. (2006) 'Policy network analysis' in Moran, M., Rein, M. and Goodin, R. (eds) *Oxford Handbook of Public Policy*, Oxford University Press, Oxford, pp.423–45.
Ripley, R. and Franklin, G. (1981) *Congress, the Bureaucracy and Public Policy*, Dorsey Press, Homewood IL.
Sabatier, P. and Jenkins-Smith, H. (1993) *Policy Change and Learning: An Advocacy Coalition Approach*, Westview Press, Boulder CO.
Saxenian, A. (1994) *Regional Advantage: Culture and Competition in Silicon Valley and Route 128*, Harvard University Press, Cambridge MA.
Scharpf, F. (1978) 'Interorganizational policy studies: issues, concepts and perspectives' in Hanf, K. and Scharpf, F. (eds) *Interorganizational Policy Making: Limits to Coordination and Control*, Sage, London, pp.345–70.
Schmiedeberg, C. (2010) 'Evaluation of cluster policy: a methodological overview', *Evaluation*, 16, 4, pp.389–412.
Scott, A. (1988) *New Industrial Spaces*, Pion, London.
Shapira, P. (1992) 'Modernizing small manufacturers in Japan: the role of local public technology centers', *Journal of Technology Transfer*, 17, 1, pp.40–57.
Sharif, N. (2006) 'Emergence and development of the national innovation systems concept', *Research Policy*, 35, pp.745–66.
Simon, H. (1957) *Administrative Behavior: A Study of Decision-Making Processes in Administrative Organizations*, Free Press, New York, NY.
Smith, K. (1999) 'Innovation as a systemic phenomenon: rethinking the role of policy' in Bryant, K. and Wells, A. (eds) *A New Economic Paradigm? Innovation-Based Evolutionary Systems*, Department of Industry, Science and Resources, Canberra, pp.10–47.
Sölvell, Ö., Lindqvist, G. and Ketels, C. (2003) *The Cluster Initiative Greenbook*, Ivory Tower AB, Stockholm.
Sternberg, R., Kiese, M. and Stockinger, D. (2010) 'Cluster policies in the US and Germany: varieties of capitalism perspective on two high-tech states', *Environment and Planning C: Government and Policy*, 28, 6, pp.1063–82.
Storper, M. (1995) 'The resurgence of regional economies, ten years later: the region as nexus of untraded interdependences', *European Urban and Regional Studies*, 2, 3, pp.191–221.
Sutton, R. (1999) *The Policy Process: An Overview*, Overseas Development Institute Working Paper 118.
Svetina, A., Jaklic, M. and Zagorsek, H. (2009) 'Cluster policy implementation and evaluation in Slovenia: lessons from a transition economy' in Farshchi, M., Janne, O. and McCann, P. (eds) *Technological Change and Mature Industrial Regions*, Edward Elgar, Cheltenham, pp.321–40.
Tatnall, A. and Gilding, A. (1999) 'Actor–network theory and information systems research', paper presented to the 10th Australasian Conference on Information Systems (ACIS), Victoria University, Wellington.
Tödtling, F. and Trippl, M. (2005) 'One size fits all? Towards a differentiated regional innovation policy approach', *Research Policy*, 34, pp.1203–19.
Torre, A. and Rallet, A. (2005) 'Proximity and localization', *Regional Studies*, 39, 1, pp.47–59.
Uyarra, E. and Haarich, S. (2002) 'Evaluation, foresight and participation as new elements for regional innovation policy practice: lessons from the regional innovation strategies (RIS)', paper presented to the ERSA 2002 Conference, Dortmund.
Uyarra, E. and Ramlogan, R. (2012) *Cluster Policy: A Review of the Evidence*, National Endowment for Science, Technology and the Arts (NESTA), available from https://www.nesta.org.uk [accessed January 2014].
Vázquez-Barquero, A., Alfonso Gil, J., Sáez Cala, A., Viñas Apaolaza, A. and Atienza Ubeda, M. (1999) *SME Policy and the Regional Dimension of Innovation: The Spanish Report*, SMEPOL Report 6, Departamento de Estructura Enómica y Enomía del

Desarrollo, Facultad de Ciencias Enómicas y Empresariales, Universidad Autónoma de Madrid, Madrid.
Witt, U. (2003) 'Economic policy making in evolutionary perspective', *Journal of Evolutionary Economics*, 13, 2, pp.77–94.
Woolthuis, R., Lankhuizen, M. and Gilsing, V. (2005) 'A system failure framework for innovation policy design', *Technovation*, 25, pp. 609–19.
Ybarra, J. (2006) 'La experiencia española en distritos industriales. Realidad de un concepto para la pyme y el territorio', *Economía Industrial*, 359, pp.89–94.
Ybarra, J. and Doménech, R. (2011) 'Las agrupaciones de empresas innovadoras y la política industrial española basada en el territorio', *Economía Industrial*, 380, pp.143–52.
Yin, R.K. (1989) *Case Study Research Design and Methods*, Sage, Newbury Park.
Young, J. and Mendizabal, E. (2009) *Helping Researchers Become Policy Entrepreneurs. How to Develop Engagement Strategies for Evidence-based Policy-making*, Briefing Paper 53, Overseas Development Institute (ODI).

Appendix 1. Acronyms

ANT	Actor–Network Theory
APEM	Marble Entrepreneurs Association of Almeria
CEMER	Wood Consortium – School of Encinas Reales
CITMA	Andalusian Furniture Technology Centre
CTAP	Technology Centre of the Stone
EXTENDA	Trade Promotion Agency of Andalusia
IDEA	Andalusian Innovation and Development Agency
IFA	Andalusian Development Agency
LPS	Local Production System
PEMC	Strategic Plan of the Cordoba Furniture System
PIMA	Innovation and Modernisation Plan for Andalusia
PLADIT	Master Plan for Innovation and Technological Development
RETA	Andalusian Technology Network
RIS	Regional Innovation System
TC	Technology Centre
UNEMAC	Furniture Entrepreneurs Association of Cordoba