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Towards a new paradigm for innovation policy?

Citation for published version (APA):

Nauwelaers, C. C. E. M. G., & Wintjes, R. J. M. (2003). Towards a new paradigm for innovation policy? In B. Asheim, A. Isaksen, C. Nauwelaers, & F. Totdling (Eds.), *Regional Innovation Policy for Small-Medium Enterprises* (pp. 193-210). Edward Elgar Publishing. https://doi.org/10.4337/9781781009659.00020

Document status and date:
Published: 01/01/2003

DOI:
10.4337/9781781009659.00020

Document Version:
Accepted author manuscript (Peer reviewed / editorial board version)

Document license:
Taverne

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Download date: 02 May. 2024

Regional Innovation Policy For Small-Medium Enterprises

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Published by
Edward Elgar Publishing Limited
Glensanda House
Montpellier Parade
Cheltenham
Glos GL50 1UA
UK

Edward Elgar Publishing, Inc.
136 West Street
Suite 202
Northampton
Massachusetts 01060
USA

A catalogue record for this book
is available from the British Library

Library of Congress Cataloguing in Publication Data
Regional innovation policy for small-medium enterprises / edited by Bjørn Asheim . . . [et al.].
p. cm.
Includes bibliographical references and index.
1. Small business – Technological innovations. 2. Technological innovations – Government policy. 3. Regional economics. I. Asheim, Bjørn Terje.

HD2341.R3534 2003
338.6'42 – dc21
2003043906

ISBN 1 84376 398 2

Printed and bound in Great Britain by MPG Books Ltd, Bodmin, Cornwall

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Claire Nauwelaers and René Wintjes

8.1 INTRODUCTION

Innovation ranks higher on policy agendas today, at national, European and regional levels. This evolution is nurtured by the understanding that innovation is the key to economic development for advanced, high-wages countries. It is becoming visible through a gradual shift in policy statements from support for R&D and technology diffusion to the promotion of innovation. The understanding of innovation as something different from R&D and the diffusion of technology is gaining ground: innovation refers to the behaviour of enterprises, planning and implementing changes in their practices in order to come up with new products, processes, services or organization. This change in focus reflects efforts based on the view that innovation is an interactive, rather than linear, process (Rothwell 1992). On this understanding, traditional science and technology policies do not offer the unique response needed to support innovative practices. Instead, many other elements in addition to science and technology play a role in innovation and need to be tackled by innovation policy (Soete and Arundel 1993; Cowan and van de Paal 2000). Envisaged in such an enlarged framework, innovation policies are still in their infancy.

The thesis at the core of this book is that the variety of regional contexts, the diversity in firms' abilities and attitudes, and in driving forces and barriers towards innovation, prevents the search for one permanent 'best practice' policy, valid for each and every situation. This is not to say, however, that nothing general can be concluded in response to the question of how to improve the efficiency of policy instruments to support innovation in SMEs. Rather, the results from the analyses of a variety of innovation policy tools, based on the same conceptual background, provide an answer to this crucial question. The various tools form a rich scope of opportunities for better practice regarding the policy process of addressing innovation of SMEs in their regional context. If one may call the shift from a linear model of innovation towards an interactive one a shift in paradigm,

then the main goal of SMEPOL is to provide evidence for a similar shift towards a new innovation policy paradigm. The aim of this chapter is to bring to light the main elements of such a new policy paradigm.

The points of departure of this policy-oriented study are that innovation is a good thing (both on the regional and firm levels), and that there is a call for public intervention in order to get more of it. As a background, based on the literature, the first two chapters build on these basic assumptions, which include two main arguments.

First, Chapter 1 argues that SMEs are an important target group for innovation policy. It provides three distinctive characteristics of SMEs, which form the basis for arguments and implications for innovation policy directed to SMEs. These distinctive characteristics (compared to larger firms) are: a limited resource base, a distinctive organizational culture linked to the proximity between ownership and management, and a lower ability to shape their external environment. These characteristics, which call for distinctive policy approaches, are at the root of the more informal, uncodified character of management and innovation practices in SMEs. Also, this chapter warns against bold generalizations on 'the' SME: technology-driven, technology-following, and technology-indifferent SMEs have very different needs and aptitudes, and this calls for different types of policy intervention. According to this view, the thrust of policy approaches should be twofold: to increase the availability of external resources for SMEs and to develop their internal absorptive and learning capacities (Cohen and Levinthal 1990). This points to: (i) the crucial role of intermediaries who, working on the basis of personal trust relations, are able to codify SMEs' needs; (ii) the value of 'peer' networks as learning channels; and (iii) the key role of human capital in SMEs.

Second, chapter 2 asserts the importance of the regional dimension of innovation. The discussion develops the thesis that proximity linkages can be instrumental in developing 'learning firms' and 'learning regions'. Also, broadening and extending the concept of clusters towards one of coalition development points to a broader scope for innovation policy, that of supporting the social and cultural aspects of innovation and enhancing social capital as a key element behind well-functioning regional innovation systems. Developing collective capacities and networking practices at the local level follows logically from this policy aim, but this goal should also be complemented with support to the development of linkages at national and international levels, in order to avoid being trapped by too strong local ties, possibly leading to lock-in situations.

For the translation of broad policy orientations into operational guidelines, we use the findings of the SMEPOL empirical analyses, as developed in the subsequent chapters: Chapter 3 for the analysis of the variety of regional contexts, which we use to build up context-sensitive policy recommendations, Chapter 4 on the patterns of innovation in SMEs, which illustrates how the generic attributes of SMEs translate into specific barriers and assets for innovation, and Chapter 5 on the typology of policy instruments, which allows us to develop the main thrust of our policy argument into more precise guidelines for each type of instrument. To build up our recommendations, we also consider the reflections on results and impacts, and 'good practice elements' of policy tools, as developed in Chapter 6, as well as the thesis put forth in Chapter 7 on the importance of combining responsiveness and co-ordination in the programming, organization and implementation of policy.

The present chapter is organized as follows. Based on the findings achieved in this comparative research, sections 8.2 and 8.3 lay the claim for a new innovation policy paradigm and propose a shift in rationale (section 8.2) and in the broad orientations (section 8.3) of innovation policy to addressing SMEs in their regional context. These arguments are based on the notions of market failures and system deficits, which show up as barriers to innovation processes in regions and SMEs, and on what we may call government failures, shown by the evaluation of instruments. Using these arguments, section 8.4 discusses how the SMEPOL instruments could be improved, drawing lessons from good practice. The key message of this chapter is synthesized in section 8.5, where a stylized view on the content of a sound regional innovation policy for SMEs is presented. Section 8.6 deals with the question of how to build a coherent portfolio of policy instruments, taking into account both regional situations and specific SMEs' needs in terms of innovation. The message delivered is that there is no 'one-size-fits-all' policy portfolio. The concluding section draws the lessons from the whole exercise of evaluating, in a comparative fashion, a variety of policy tools, within a common conceptual framework. One salient element of the conclusion is the need for more 'policy intelligence' in this complex field.

8.2 THE RATIONALE FOR POLICY INTERVENTION: FAILURES, BARRIERS, AND BOUNDARIES

Whether we talk about markets, systems or governments in relation to innovation, it all concerns communication, a process of exchanging information and knowledge. In order to be useful and valuable to others in a firm, market, system or government administration, technological (and other) knowledge has to be diffused and policy lessons have to be learned.

The typical and traditional approach to communication in economics focuses on markets where price mediates supply and demand whereas, the 'neo-classical' government typically communicates power based on a hierarchical position vis-à-vis the economic agents they govern. In accordance with traditional market-hierarchy dichotomies, the typical argument for government intervention is when markets fail in communication. Either the market or the government would provide the best solution. In general, interactive communication is not considered to be of vital importance in the process of finding and reaching solutions. This linear perspective prevailed even before it had been applied to innovation.

When everybody knows in advance what (products, resources, technologies, capabilities etc.) are being talked about and everybody would agree on its (present and future) economic value, the market is perfectly able to communicate supply and demand. In these situations there is no need for interactive communication. Whether it is the 'demander' or the 'supplier' who names the price, the market will, in a linear response, come up with the proper answer. For the exchange of certain goods or services, the price may be the only aspect that has to be communicated. However, where knowledge or innovation is concerned, the price mechanism may not function very well.

Following the same logic for policy decision-making, a central question for a policy-maker is: how do I recognize where and when markets fail, so that I know where and when to intervene? If it is perfectly clear to policy-makers where markets fail, and it is widely agreed upon what the governed region additionally 'needs' and 'has to offer' (more specifically, what firms 'need' from their region, including government, and what they have to offer their region and its policy goals), then there is no need for interaction. Everything is clear: there is no knowledge left to be codified, there is only information to be passed on. Since interaction is costly in terms of time and energy, linear and top-down communication is likely to be more efficient.

However, to deal with the uncertainties attached to knowledge and innovation (Dosi 1988), economic and policy agents may want to communicate more than price or authority. The traditional concept of markets and (state) hierarchies with their anonymous, linear and formal communication, fails to incorporate these broader information needs. A reason why markets as co-ordination and communication mechanisms may not function very well regarding innovation is related to the uncertainties attached to predicting the future (Cowan and Foray 1997). The market may fail to predict the economic value of new technologies, new products, new resources, new firms or new entrepreneurial capabilities. Typically, the market will, for instance, not be able to value a start-up firm. Although policy-makers also have difficulties in predicting the future, this kind of

market failure is a widely accepted justification for public intervention. For example, a generic national policy tool, like a tax-reduction scheme, seems relevant to 'protect' these young, new entrepreneurial experiments, providing them a chance to prove themselves and to convince the market (that is, customers, but also financial and labour markets) of their potential and, moreover, to convince the government of their potential contribution to the region and its policy goals. The same arguments may hold for new sectors or technologies or a young regional cluster of firms, or even older non-innovative firms that want to and are trying to become innovative.

Other places where the market obviously fails is in communicating certain environmental and social costs and benefits. If economic agents do not take these kinds of 'costs' into account, governments may want to intervene and extend the boundaries of the rationality of the agents they govern, e.g. by influencing their cost–benefit calculations with environmental taxes.

The justification for traditional technology or R&D policy has been put forth by Arrow, and is based on the macro-level argument that when social effects are taken into account, there is under-investment in R&D. The risk and uncertainty attached to R&D by private actors calls for public intervention because, at the macro-level, it is considered worthwhile to publicly take the risk for the sake of society, e.g. by financing public R&D in universities or, again, by influencing private, micro-level cost–benefit calculations with tax deductions or subsidized facilities.

The idea that there is a role for policy-makers, if markets fail, does not imply that policy-makers are perfect, but that the above-mentioned general or structural market failures may very well be effectively and efficiently addressed by generic policy instruments, designed and delivered at the national policy level. Further, to diffuse information on needs and support, linear communication seems appropriate. However, knowledge differs from information. For instance, distance does not seem to be a barrier to the transmission of information, but in the transmission of knowledge it does.

The importance of the tacit dimension (Polanyi 1996), the informal, uncodified and disembodied aspects of the knowledge concerned, both at the regional level and for SMEs, underscores the localized nature of knowledge spillovers (Storper 1997). The linear communication arguments using the old market–hierarchy approaches fail to address this. Proximity matters to knowledge spillovers and interaction between regional agents (both private and public) matters in dealing with the uncertainties attached to innovation processes in regions and SMEs. The variety of situations regarding innovation, SMEs and regions call for communicative interaction (Nauwelaers and Morgan 1999). Local discussions, private and public–private ones, can shed more light on the uncertainty issues. Exchanging tacit visions, converging ideas and co-ordinating investment

decisions (public, private and public–private ones) may provide the knowledge base for an innovation strategy concerning SMEs and their regions (Lundvall 1996).

Especially concerning innovation processes in regions and SMEs, the concept of systems (or networks or clusters) seems a more realistic model to follow than the traditional concepts of markets and hierarchies (Grabher 1993a). A regional innovation systems approach stresses the importance of the diffusion of knowledge and interactive learning within the region as a system (Morgan 1997). The non-anonymous relations, the complementarity of activities, and the historical setting are stressed in specifying the regional context and the profile of the region's SMEs. These give the regional system its identity, so to speak (Feldman 1994). Further, in order to find out and articulate what a particular region or firm needs, or what is lacking concerning innovation, regional proximity and communicative interaction are appropriate to address the tacit and latent aspects of such needs (Landabaso 1997). Providing R&D tax reduction or subsidies may not be enough to change the rationality (nor its boundaries) of SMEs regarding innovation processes. Those arguments underpin the growing importance taken by cluster policies, as the concept seems to fit quite well the prescriptions of an interactive view on innovation (Nauwelaers 2001).

8.3 LESSONS FROM EVALUATING 40 INNOVATION POLICY TOOLS IN 11 EUROPEAN REGIONS

Having discussed the rationale for policy intervention in innovation, this section deals with the content of such policies, proposing general principles for their design and implementation (section 8.3.1) and observing how these principles compare with practice in the case-study regions (section 8.3.2).

8.3.1 Basic Principles for Innovation Policies

Building on the conceptual and empirical findings of the SMEPOL project, this analysis puts forth the following proposition: since the main distinguishing features of the majority of SMEs, with regard to the innovation process, are that they have a limited resource base, they need external orientation to understand and (pro-actively) adapt to their environment, and they engage in innovation in an informal mode, therefore the main role for innovation policy, which aims to increase the capacity of a region and the capabilities of its SMEs to innovate, is to foster interactive learning within the firms and within the region. This calls for an interactive mode of policy intervention.

Of course, this statement stands as quite a bold generalization of both SMEs' characteristics and policy challenge. Some SMEs have quite an advanced knowledge base (e.g. new technology-based firms), others have developed excellent innovation management capabilities and explicit innovation strategies, and some firms in niches really shape their business environment rather than being dependent on it. Also, there are problems of another nature which keep SMEs from innovating, such as the need for risk financing[10] or the necessity to access state-of-the-art technology. However, the meaning of this proposal is to point to new orientations of policies to address the key needs of the majority of SMEs in most regions, which are not properly taken into account in traditional policy approaches. This does not imply that linear approaches and tools are not relevant any more, but rather, it puts the latter in perspective. It means that providing resources to innovate (finance, technology) is not sufficient if the firms do not possess the managerial and organizational abilities to deal with the innovative process (Cobbenhagen 1999). The view of an 'automatic' flow of technological resources through the firm, or from the R&D sector into the firm, is argued against here, while increased attention is given to the innovation process (within and around the firm) itself, in a broader sense (Nauwelaers 2000).

Nevertheless, fostering interactive learning, as a policy goal, should not be read in a dogmatic egalitarian sense, limiting the view to the development of 'Third-Italy' type of horizontal networking and relationships as an ideal way to foster that process. Hierarchical relationships might be very relevant ways to achieve such an objective too, depending on the environment. As developed in section 8.2, the role of geographical proximity might be important to nurture learning relationships, but it is not a necessary ingredient everywhere. The point here is that being open to outside sources of knowledge, and having the capacity to integrate these with internal knowledge in the firm in a continuous mode, is key to the innovation process. Such an objective has implications both on the supply side (outside resources should exist, be organized and accessible to firms) and on the demand side (the firm's absorption capacity and its willingness to entertain links with the outside should be enhanced). Developing strategic capabilities, at the firm, organization and policy levels, lies at the heart of this challenge.

The idea of an interactive mode of policy implementation means not only that services should be both designed and delivered in co-operation with the beneficiaries, but also that the policy implementers can be partners in the supported action or project, so that learning can happen both ways – between policy implementers and firms, that is what we called 'communicative interaction' in section 8.2 above. In this approach, the tacit nature of innovation in SMEs is better addressed than in more hierarchical policy modes.

8.3.2 Application of the Basic Principles

With the above proposal as a theoretical challenge for policy, how does it compare with practice, as experienced in the regions covered by the SMEPOL study? The horizontal overview and comparison of the analyses of 40 policy tools in 11 European regions shows that such a challenge is hardly met by the actual policies. Both the content and the modes of delivery of policies are in most cases not interactive and fit better with a market-hierarchy than a system approach. More precisely, the SMEPOL analyses deliver the following picture:

1. The general situation is that linear tools are dominating the policy scene, but that everywhere an evolution towards more interactive support is visible. The following quotes from the national studies illustrate this point.

   In Belgium: 'One can analyse the actual state of the emerging Walloon innovation policy as follows: this policy is in fact founded on two different paradigms – broadly-speaking the linear and the interactive views on innovation – the former being embodied in the "mainstream" policy while the latter is translated in the "fringe", an unarticulated and rather fuzzy set of initiatives, trial-and-errors efforts, inspired by the "localized externalities" approach and much less linear in scope' (Nauwelaers et al. 1999).

   In Austria: 'The Austrian innovation support system is dominated by a few funding organizations, mainly offering direct support like grants and loans within the framework of several programmes. Institutions and programmes are organized along the linear innovation model. [However] There are serious doubts about the efficiency of traditional direct support for R&D and innovation' (Kaufmann and Tödtling 1999).

   However in the Netherlands: 'The "interactive" content of Limburg's innovation policy is largely due to the RTP Limburg initiative. The RTP framework and the way Limburg has implemented it has led to an extension of the "interactive" policy. "Interactive" instruments are not "delivered" on paper at the front door, but are mainly implemented in personal communicative interaction with the actors involved. The regional intermediates Syntens and LIOF play a vital role in the implementation of Limburg's "interactive" policy' (Nauwelaers et al. 1999).

2. A set of policy instruments, in general, does not form a system: lack of co-ordination and of synergies among tools, or 'lack of external coherence' in the words of Chapter 7, is the rule.

   In Italy: 'It seems that there is a lot of overlapping in missions of different institutions working within the Apulia region, with a lack of capability of co-ordination for what concerns the Apulia Region institution' (Garofoli 1999a).

   In Denmark: 'None of the actors have made strategy- and action-oriented links between the forthcoming knowledge-based economy and the attempt to formulate a coherent learning and innovation programme. Most initiatives are of a single programme nature. A stimulating strategy trying to integrate and co-ordinate the diverse innovation schemes is lacking' (Christensen et al. 1999).

3. Few policy instruments are designed and implemented in an user-oriented mode, taking both expressed and latent needs of users into account: the majority of tools are developed in a reactive, top-down fashion and at best consider firms' needs expressed (but not latent). However, in cases where 'voice' of users (i.e. firms' expressed, or even latent, needs) is taken into account, the tools become much more user-oriented.

   In Italy: 'Tecnopolis represents a typical model of technological park based on supply side, starting from the existence (and redundancy) of competences (. . .), always postponing the moment of monitoring the potential needs of local (or external) firms to facilitate interaction between research centre and economic activities' (Garofoli 1999).

   However in Spain: 'Local entrepreneurs belong to the "Consejo Rector", the governing body of the Technological Institutes, so that they participate in the design of activities and policies (. . .) The Institutes' strong points are their nearness to firms, their connections to other international centers of this type and the knowledge transferred to the firms through them (. . .) The Technological Institutes show a high degree of effectiveness in adapting to innovation support needs as expressed by the entrepreneurs of the SMEs in the four sectors studied' (Vázquez-Barquero et al. 1999).

4. Policy learning is still rare and underdeveloped (Nauwelaers 1997). If it occurs at the level of organizations, it takes place in an occasional, not routinized way. Intense policy-learning practices may, however, result in undesirable volatility in the policy system. At the other extreme, it seems unjustified to maintain a range of tools that are virtually not used by firms. The challenge lies in fine-tuning the policy tools without letting firms suffer from the instability of the system. This trade-off between responsiveness and organizational coherence has been discussed at length in Chapter 7.

   In Austria: 'Most support instruments are not evaluated systematically. Of course, there is an ongoing learning process in the institutions about the effects of support activities, about problems and needs of firms regarding their innovation processes. But it is based on personal experience and information exchange, the learning process is not institutionalized or routinely organized' (Kaufmann and Tödtling 1999).

However in the Netherlands: 'National policy-makers have learned from several regional innovation policy initiatives and integrated them into the national innovation policy. The analysed KIM – and KIC – schemes are good examples from Limburg of this bottom-up policy learning process' (Nauwelaers et al. 1999).

However in Norway: 'Policy learning takes place from evaluations in the support system. Thus, TEFT and NT have been changed during their "life", partly as a response to knowledge acquired through evaluations. TEFT also carried out monitoring research, which is implemented in the new REGINN programme too. RUSH, being an experimental programme, in particular, would need procedures for systematic evaluations and learning, however lacking in this case' (Isaksen et al. 1999 chapter 4).

5. There is an emerging new tendency of developing 'overall schemes', gathering into a single programme, instrument, or organization a set of tools that traditionally are proposed separately to companies. This approach is promising in that it fits well with the global perception of innovation within firms: it impinges on all activities of the firm.

In the Netherlands: 'The 18 Syntens organizations are the most important intermediary organizations in the Netherlands (and thus Limburg) for innovation policy addressed at SMEs. The role of the ICs gradually changed from bringing technology to regional SMEs (technology push) to an intermediate role of "broker", and more recently it fulfils the role of "organizer, animator or coach". The "new" organizations are more able to deliver "all-round" service and support to SMEs and they go by the new name of "Syntens: an innovation network for entrepreneurs"' (Nauwelaers et al. 1999).

Example from Norway: 'NT provides also a more all-round support for innovation than the other programmes that concentrate on a single component in the innovation system . . . NT focuses on firm's innovation projects, and tailor-made support to firms' specific needs, both technological and non-technological support' (Isaksen et al. 1999 chapter 4)

6. The majority of instruments aim at improving or facilitating existing innovation projects, rather than inducing new innovation practices. Providing grants for R&D, for example, seems to induce a rather small incremental behavioural effect (in terms of changing strategy, management or culture regarding innovation, co-operation and interactive learning). Therefore, the value-added of such policy instruments, seen from a regional perspective, is questionable. It follows from this that the question of penetration rate of the tools in the business sector is not always addressed in policy settings. For example, where a 'picking-the-winner' approach is taken, a focus on the visibility of results may act to the detriment of the value-added of the scheme.

In the UK: 'There is a mismatch between the characteristics of entrepreneurs and SMEs in the Lee Valley area . . . and the eligibility criteria for the (SMART) scheme. Its competitive nature, using national assessment criteria, which are weighted towards new to the industry innovations, has meant that relatively few projects from within the Lee Valley have qualified. As a result, the SMART scheme is not making much contribution to raising the level of innovation in SMEs in this area' (Smallbone et al. 1999).

In Austria: 'In general, financial support seems to be actually "over-effective" (. . .) This is especially obvious in the case of the more innovative SMEs. This raises the question if there is a significant share of the applied funds lost to firms and projects, which do not really need them, but take them along as a welcome additional source of funding. A special problem of the direct support programmes seems to be the emergence of long-term stable relations to a special clientele consisting of well-known innovative firms' (Kaufmann and Tödtling 1999).

7. Very often, tools designed at regional level work under a closed vision of the relevant sources of knowledge useful for firms, as the boundaries of the system are defined in administrative terms. If tools would be more user-oriented, there is no need for such a restricted view.

In Belgium: 'Most of the "fringe" initiatives work under irrelevant geographical limits, of an administrative nature, and imposed by the sources of public funding: provincial limits, Objective 1 or 2 zones, (. . .) which do not necessarily correspond with the natural areas of actions of the targeted firms' (Nauwelaers et al. 1999).

In Denmark: 'The national/international client issue tends to overshadow the issue of a regionalized technological service system. Most respondents approached tend to disregard the regional issue as a relevant issue with the argument that the service units will be too small. If every region is going to have a service centre, then the GTS system will lose economies of scale as well as of scope' (Christensen et al. 1999).

8. Overall, there is an uneven degree of policy concern, among the five following innovation-support needs reported by SMEs:

- Finance/risk sharing
- Technology/technical know-how
- Qualifications/personnel
- Market access/information
- Time constraints/Organization/Strategic capabilities.

The lack of 'market orientation' of the policy tools, or their lack of focus on the commercialization aspects of innovation, are particularly evident.

In Belgium: 'There is a need to reinforce further the human skills component of innovation. The take-up of existing human resources schemes is

quantitatively limited, so there is a need to also upgrade externalisation capacities of firms to other sources than universities or knowledge source institutions, to favour better commercial capacities within the firm, and to support strategic capacities for SME managers on a wider scale, introducing more innovation management tools and creative thinking in SMEs (Nauwelaers et al. 1999).

However in the UK: 'The emphasis of BICs is on the commercialisation of innovative ideas. In this respect, BICs aim to provide a comprehensive package of support for innovative new ventures and existing projects. In emphasising the commercial application of innovation, BICs also aim to address the weakness which has been consistently identified in small technology based firms, of an overemphasis on technical development at the expense of marketing and general management skills' (Smallbone et al. 1999).

8.4. STRENGTHS, WEAKNESSES AND WAYS TO IMPROVE INNOVATION POLICY INSTRUMENTS

The preceding section drew horizontal conclusions from the analyses carried out on innovation policy tools in 11 European regions. Broadly speaking, the message was that the general principles for sound innovation policies were not met in most of the cases studied. In this section, we try to go further by asking the following question: how could the tools studied, taken individually, be altered so as to get closer to these principles?

In Chapter 6, the innovation policy instruments have been classified, according to their nature, under five types, reflecting the different goals and targets of these policy instruments. We use this typology for our reflection:

1. Direct support schemes for R&D and innovation projects;
2. Technical personnel introduction schemes;
3. Technology centres and schemes fostering technological diffusion to SMEs;
4. Mobility schemes for researchers;
5. Innovation Brokers and innovation advisers.

For each category, we list the relevant schemes studied in SMEPOL, we propose a summarized view on the main challenges to be met by these schemes, and we indicate possible good-practice lessons to be learned across instruments. The reader is referred to Chapter 5 for a detailed description of each instrument and to Chapter 6 for the results of each instrument's evaluation. The directions proposed below are seen as bases for practice-oriented benchmarking exercises involving policy-makers themselves, and, possibly, beneficiaries.

It should be noted here that such a view on innovation policy instruments is quite restrictive, since a wide range of other types of tools are acting on innovation behaviour: training support, investment support, fiscal and regulatory rules, environment regulations, competition policy etc. We focus here on the type of tools that have been subject to analyses in the SMEPOL study, without pretending that they cover the whole range of relevant policy instruments.

8.4.1 Direct-Support Schemes for R&D and Innovation Projects

Relevant instruments:

- FFF, ERP, ITF and RIP in Austria
- Development companies and Growth Fund in Denmark
- SMART in UK
- Recoverable advances in Wallonia
- Equipment loans in Italy
- National and regional grants or loans
- Tax deductions for private R&D investments.

Main challenges:

- Lower fragmentation of support according to various aspects of innovation process, take a longer-term view on support (ensure complementarity with awareness-raising, market-oriented, innovation management, commercialization, . . . support);
- Increase additionality (broaden and renew client base to pick up less obvious clients) without losing focus on innovation;
- Introduce more policy learning in these traditional policy tools;
- Work in complementarity with risk capital.

Good-practice lessons:

- NT has several good practice elements to offer to other schemes, combining high responsiveness and high co-ordination, and using an interactive mode of delivery of the support: high degree of policy learning, witnessed by incorporation of lessons from evaluations in subsequent programming periods, focus on learning on how to innovate in companies; all-round support covering financial, technical, commercial, managerial and organizational needs; long-term coaching of firms; policy implementers act as partners to the firms (presence on the board of companies); attention paid to foster linkages between firms and other agents etc.
- SMART could evolve towards incorporating more consideration on

marketing issues, notably by developing better co-ordination with Business Links;
- BIC takes equity in order to secure long-term support to companies (and payback);
- The Network of SMART winners introduce an inter-firm dimension in an otherwise very 'introverted' tool;
- Development Corporations in Denmark ensure a sparring partner function for supported firms, in addition to providing funds;
- More policy learning could be introduced in the recoverable advances scheme in Wallonia, though external evaluations, focusing on the analysis of reasons for success and failures in the supported projects.

8.4.2 Technical Personnel Introduction Schemes

Relevant instruments:
- KIM in Limburg
- RIT in Wallonia.

Main challenges:
- Increase penetration rate of the schemes;
- Increase additionality of the schemes, i.e. their role in changing behaviour in SMEs, rather than responding mainly to financial considerations;
- Upgrade flexibility of the schemes, to adapt them to firms' characteristics (nature of innovation process, level of formalization achieved etc.).

Good-practice lessons:
- The RIT scheme can usefully take lessons from the neighbouring KIM scheme and be transformed to: focus the selection criteria in order to ensure the introduction of a new function and new profile in the firm; extend the RIT support to marketing competences, and combine this scheme with the support of 'mentors' who 'sell' the scheme (helping firms expressing their needs) in order to ensure its success.

8.4.3 Technology Centres and Schemes Fostering Technological Diffusion to SMEs

Relevant instruments:
- GTS and TIC in Denmark
- Austrian Technology Centres
- Spanish Technology Centres
- RTC in UK
- Tecnopolis in Apulia and Service Centres in Lombardy
- TEFT and RUSH/REGINN in Norway.

Main challenges:
- Reconcile self-sufficiency on financial side with public service mission (awareness-raising in SMEs etc.);
- Combine role of developing supply side and respond to demands;
- Make the technology advisers evolve from a 'consultant' mode (transferring existing knowledge from their shelves to the firm) towards a 'process consultant' mode (working together with the firm on its transformation process, bringing in relevant knowledge – taken from anywhere – when necessary and adapting it to the particular situation). That is, developing a demand-led approach in these centres;
- Reconcile openness with context sensitivity: while proximity might help, it should not mean that support need necessarily be delivered from sources in proximity; a key role of a technology centre is to help firms find ways to relevant sources worldwide.

Good-practice lessons:
- TEFT's attachés perform a firm analyst function, which helps them evolve towards a more demand-oriented mission than if they were only in charge of transferring knowledge available in their centre to the firms;
- The Austrian centre Software Park, Hagenberg succeeds in performing a mix of the following functions: R&D, industrial development, teaching, incubation etc., which in the end favours interactive learning between researchers from the private and public sectors, enterprises managers, engineers and students;
- The Spanish Technology Centres are well embedded within the local industrial fabric, with entrepreneurs being present at conception and implementation of the services to be delivered by the centres (they have 'voice' in the policy). This could be an example to follow for the Tecnopolis centre in Apulia, for example, which suffers from a lack of linkages to business needs;
- The UK Lee Valley Centre works in co-operation with the Business Links, in order be able to offer a more complete support to firms involved in an innovation project, beyond their technological needs. This helps the former to evolve from a technology-led support towards more client-centred support;

- REGINN's approach is to support firm clusters rather than individual firms, which adds the 'interactive learning' dimension to the support.

8.4.4 Mobility Schemes for Researchers

Relevant instruments:
- FIRST-Enterprise in Wallonia
- FFF scheme for student stays in firms in Austria
- Mobility scheme in Denmark.

Main challenges:
- Focusing schemes on companies' needs rather than providing opportunities for financing research in the education sector;
- Ensuring a sufficient take-up of the scheme;
- Ensuring additionality of the scheme;
- Upgrading behavioural impact of the scheme in the longer-term, in terms of developing lasting collaborative patterns between research and industry.

Good-practice lessons:
- For the First-Enterprise scheme, extend the scheme to collaboration with other firms (rather than restricting it to public research laboratories) and to non-technological matters (managerial, strategic, marketing). Supplement this scheme with a new scheme for access to laboratories' equipment by SMEs.

8.4.5 Innovation Brokers and Innovation Advisers

Relevant instruments:
- Business Links and BICs in UK
- TIC in Denmark
- Syntens and KIC in Limburg
- TEFT in Norway.

Main challenges:
- Ensure a user-oriented mission while broker has a vested interest in the system;
- Professionalize such a job, often loosely defined; develop the skills of brokers in making tacit needs apparent;
- Improve the value-added to a 'pure' brokerage service;
- Maintain an innovation focus and avoid downgrading to 'basic' business development support;

- Reach micro-enterprises and less obvious clients;
- Achieve good linkages with other actors in the system;
- Demonstrate effectiveness of services with a long-term and rather uncertain impact.

Good-practice lessons:
- The 'fringe' tools in Wallonia (and other schemes) may learn from Business Links: they succeed in maintaining a holistic view on innovation and in carrying out a signposting function. The function of 'Personal Business Adviser' might be used as a basis to define more precisely the mentoring function developed on an ad hoc basis by several actors;
- Syntens evolved from pure brokers towards pro-active advisers, and added to their initial technological concern, competences in human resources development and strategic management. They also have been charged with a mission to reach new clients for their services;
- The quite innovative KIC scheme could provide lessons (on the positive and negative sides) to the numerous policy-makers interested in developing cluster policies in their region.

Although the above suggestions for schemes' improvement are presented per category of tools, one of the most promising approaches in the design of innovation policy lies in the development of tools that cross the boundaries of this typology: technology centres that also perform broker and innovation coach functions, direct financial support schemes that go along with support to human resources of innovation management, mobility schemes embedded in wider support to innovation projects etc. A move towards a more interactive, responsive and flexible innovation policy entails the development of multi-faceted instruments, or of strong linkages between traditionally distinct tools.

8.5. A SYNTHESIZED VIEW ON POLICIES DIRECTED AT INNOVATION IN SMEs IN A REGIONAL CONTEXT

The SMEPOL study has revealed a high degree of heterogeneity in policy instruments aiming at fostering innovation in SMEs. The instruments have various goals, such as linking SMEs with R&D-producing institutions or strengthening human resources within companies. The support also comes in various forms, like direct financial support, or services from technological centres or brokers, or under the name of cluster policy. Some policies

clearly have a national origin while others may be classified as regional. Moreover, and perhaps of more fundamental importance, the policy instruments touch on different points of intervention in individual firms' innovation processes, or even different phases of the (collective) innovation path of the regional system these firms may belong to. For instance, the abilities and attitudes vis-à-vis innovation of firms targeted by awareness-raising instruments differ from the abilities and attitudes addressed by 'linear' instruments. Some tools might help to create the necessary awareness and capabilities in firms, so they can afterwards be supported with more standardized schemes when they have moved further up their learning curve. A proper sequence of instruments is then more appropriate than a search for universally and permanently adequate tools.

The evidenced diversity, of course, is not a surprise considering the variety among SMEs, their regional contexts and, most of all, the innovation processes. Notwithstanding this multilayered diversity, we can construct a simple two-dimensional classification of the policy instruments, which presents a synthesized view along two key issues concerning a shift or change in policy paradigm (see Table 8.1). We have classified the SMEPOL instruments according to the two following key fundamental characteristics:

1. Target level of support: firm-oriented or (regional) system-oriented.

With the term 'system', we explicitly refer to regional systems. This does not imply that national or global systems or networks are irrelevant bases for economic co-ordination, but it expresses the claimed importance of the regional environment for innovation in SMEs. Some tools focus on innovation and learning within firms while others focus on crossing firm boundaries, aiming for externalities or synergies stemming from complementarity within the region as an innovation system. The logic behind (regional) system-oriented support is based on the idea that the innovation capacity and performance of a regional system may be larger than the 'sum' of the internal innovation capacity and performance of the individual 'members' of the system.

2. Form and focus of support: focused on allocation of resources as inputs for innovation or focused on learning aiming for behavioural value-added.

At one extreme the policy approach is to raise the endowment, the stock of given resources (in firms and regions) as inputs for innovation. In a reactive mode of intervention, the policy instruments aim at increasing innovation capacity by making the necessary resource inputs available. The principal idea in the latter approach is that the window of opportunities and problems towards innovation and support are clear and that, given the lack (and need) of certain resource inputs, policy-makers increase the innovation output by allocating resources, that is, providing the innovation inputs or increasing their availability (again internally within the firm or externally, within the region). At the other extreme are the instruments which focus on learning, trying to change behavioural aspects like the organizational culture, innovation strategy, management, mentality or the level of awareness. They focus on creating or changing the windows of opportunities and problems concerning innovation and innovation policies. Accordingly, the mode of intervention is a proactive and interactive one. The principal idea is that the involved agents (private and public, individually or collectively) learn by doing, by using and by interacting. During innovation, using resources and interacting with others improves the awareness, the behavioural routines and the rationality towards innovation (and innovation policy).

Each of the four quadrants of Table 8.1 can be traced back to its own theoretical background or tradition ranging from atomistic to holistic approaches, and solutions from neo-classical and evolutionary traditions. The typology incorporates them all, and, in fact, it is suggested that in practice none of them is irrelevant in aiming for a change in innovative performance. 'Linear' tools directly aim for more innovation performance, while 'interactive' tools address innovation behaviour, but addressing behaviour is only meaningful if, in the end, it results in better performance.

Every policy in principle aims at changing behaviour. Policy-makers can affect the innovative behaviour of firms directly via subsidies and individual projects or indirectly via the provision of 'hard' or 'soft' public infrastructure and institutions like universities or a technology centre. In a neo-classical reasoning, providing subsidies as an input to the innovation process is an intervention method to affect the innovative behaviour of firms directly by influencing the choices based on the cost/benefit calculations of the agents. An input subsidy for R&D, or for hiring an expensive highly-educated employee for instance, affects the decisions regarding resource allocation immediately.

A more evolutionary approach to policy incorporates learning. In this respect subsidies for R&D can provide a learning experience. Within a 'learning-to-innovate' framework, policy support can get an innovation process started and support a change in the innovative behaviour in firms or regions. The support may also result in the static effect of more innovation output, but more importantly it aims for dynamic effects, effects which go on after the support stops. The argument for policy then becomes temporal.

Table 8.1 Classification of policy instruments studied in SMEPOL along mode and target of support

	Mode of innovation support	
Target level of support	Input resources (reactive tools allocating inputs for innovation)	Behavioural value-added (proactive tools focusing on learning to innovate)
Firm-oriented	**A** • *Traditional firms' R&D subsidies & loans* • *Risk capital* • *Training subsidies* • *Incubators with 'hard' support* • *Research centres* • *Traditional 'reactive' technology centres* • *Transfer units in universities*	**B** • *Subsidy for hiring innovation managers in SMEs* • *Loans for competence development* • *Incubators with 'soft' support* • *Business Innovation Centres* • *'Proactive' technology centres* • *Audits, monitoring needs* • *Innovation Coach* • *Innovation management training & advice*
(regional) System- oriented	**C** • *Mobility schemes research industry* • *Co-operative schemes HEI industry* • *Subsidy for co-operative R&D projects* • *Subsidy to promote use of business services* • *Collective, User-oriented Technology or Innovation centres*	**D** • *Proactive Brokers, match-makers* • *Cluster policies* • *Support for firm networking* • *Umbrella schemes* • *Local strategic plans* • *Schemes acting on the culture of innovation* • *RTP and RIS/RITTS kind of programmes* *(fostering strategic capabilities of policy-makers)*

Timing and the ex-ante conditions become important. The reasoning behind policy becomes proactive rather than re-active. The difficulty with reactive policy is to know exactly what the firm or the region needs. Some expressed needs may be 'over-supported' while others may be latent, neglected, tacit and not supported. The articulation of the need then has to become part of the policy process, albeit in an interactive way. Merely providing the resource inputs that the policy-makers think are relevant may not be enough to induce a real change in future behaviour.

An example of the difference between reactive and proactive tools can be provided by two instruments studied in SMEPOL, similar at first sight but serving different purposes, because one is more reactive and the other more proactive. Both the RIT scheme in Wallonia and the KIM scheme in Dutch Limburg, are subsidies to hire personnel in SMEs for the conduct of innovative projects, and have the objective of targeting firms that are not yet innovative. In the Walloon case, the firm itself has to write a formal technological development project and submit the proposal to the administration, who will decide on the subsidy according to the quality of the proposal and the results of an audit in the firm. The person employed needs to be a technician. In the Limburg case, an intermediary (Syntens, the innovation centre) helps the firm identify when such a scheme would be useful, helps find the candidate as needed, and does not require a formal project as a condition for the allocation of the subsidy. The type of personnel employed is not restricted to people possessing technological competences, but can also cover commercial or managerial weaknesses in the firm. It is clear that the RIT is mainly responding to the financial need of the company. Many SMEs do not use the RIT, because the formal requirement to codify a technological development project constitutes a barrier, and also because other financial sources are more easily accessible. In the case of KIM, the focus is more on the change of behaviour of the firm and there is an interaction between the firm and the support provider, within a more open view on the innovation project.

Table 8.1 can be used to examine under which paradigm issues (neo-classical or more evolutionary) the 40 SMEPOL policy instruments are developed and implemented. The A type of instruments may be classified as more 'traditional' while D type of instruments seem more 'innovative', but this does not mean that instruments in one of the four quadrants are intrinsically better than instruments in any of the other quadrants. There are still sound arguments for each and every type of tool. The question turns more into one of the choice of the appropriate policy portfolio, anticipating the needs of the region (see section 8.6 below). Concerning the resource-oriented tools A and C, the national policy level may in many cases be more relevant than the regional policy level, especially if the

support is needed at firm level and the lack of (internal or external) resources for innovation is not region-specific.

The relevance of A, B, C as well as D types of tools not only relates to different regional conditions, like the intensity of existing co-operation practices, for instance, it also relates to the various identified distinctive characteristics of SMEs. The size-related characteristics affect the needs for support as well as the way the support can be delivered effectively. SMEs' limited resource base, for instance, finds a response in A or C types of tools. The A types focus on raising endowment within firms, and the C types of tools raise endowments of the innovation system the SME is part of, or is 'invited' to be part of. SMEs' distinctive organizational culture and management practices receive a better response in B types of tools, which try to influence certain attitudinal and behavioural aspects within the SMEs. The lesser ability of SMEs to shape their environment, compared to larger firms, might be addressed by D types of tools. These tools have to tackle the external uncertainties smaller firms are typically faced with, by enhancing the capacity of the firm to understand its environment and to become part of it (e.g. by forming clusters) – that is to become pro- and interactive members of a regional innovation system rather than staying passive, unaware and incapable of adapting or influencing others towards adaptation. This calls for external awareness, and tools which teach SMEs how to identify, value, use and develop regional resources and interact with resource owners.

The correspondence between the distinctive characteristics of SMEs regarding innovation and the various policy approaches shows, first of all, that each of the four types of policy instruments is relevant and, secondly, that the instruments have to be designed to address SMEs' needs, expressed as well as latent.

The main outcome of the SMEPOL study is that the policy tools are too concentrated in category A (e.g. in the form of firms' subsidies), and that there are few instruments in category D (e.g. support to cluster-forming). All types of instruments are relevant to different types of firms and different types of environments (and at different points in time), but the main gaps in the support systems in the SMEPOL cases are found in category D. In order to conduct a change in perspective, it seems necessary, however, in most cases to first develop instruments of the B and C types, before the system and agents are ready to implement and absorb D-type instruments.

As stated before, in any specific regional situation, there will probably be a need for a mix of A, B, C and D types of instruments. For example, A- and C-type instruments will be particularly relevant for New Technology-Based Firms and spin-offs. B-type instruments could be used for less innovation-aware firms. Building internal capabilities is a necessary step in most cases before being able to participate in a D-type instrument, promoting interaction with other innovating agents.

If a region does not have a lot of innovative SMEs, providing ever more resources to the same group of firms seems less appropriate than extending the number of innovators by approaching non-innovating SMEs with B-type of tools. Enhancing their learning process and preparing them for more interactive behaviour can subsequently be supported by C or D types of tools. If there is no lack of innovators but they seem to innovate in relative isolation, C types of tools might create more openness and stimulate the use of external resources in the region.

There are also arguments to develop linkages between tools of the various categories. In general, however, the proactive provision of internal and external learning experiences with B and D types of instruments respectively will create new clients, and new resource needs which may subsequently be effectively addressed with the reactive provision of internal or external resources. The other logical sequential link refers to the fact that a certain level of internal resources and learning experiences are needed before system-oriented tools can be effective. This calls for excellent co-ordination and the development of synergies between all tools at work in the environment.

This discussion also links with the question of the relevance of different levels of authorities for the various policy activities like design, adaptation, learning, implementation and evaluation. Proactive tools imply more freedom of action and closeness to beneficiaries more likely to be found at regional level, while reactive, standard tools are more adapted to higher levels of authorities.

8.6. CUSTOMIZING A POLICY PORTFOLIO TO REGIONAL SPECIFICITIES

An argued in several chapters of this book, regional differences in innovation capabilities call for a tailored mix of policy instruments. This section, therefore, reflects on the question of the appropriate policy portfolio to be developed in a regional context. For targeting of policy, characteristics of the region as a whole and SME-specific challenges for innovation are taken as the point of departure. To achieve the objective of identification of policy portfolios, Table 8.2 proposes a picture of the situation which combines the results of the analyses gathered in the SMEPOL study, i.e. the analysis of the main potential deficits of regional innovation systems (see Chapter 3), and the analysis of the main firms' barriers with regard to innovation (see Chapters 1 and 2).

Table 8.2 Policy responses to regions' and SMEs' problems with innovation: an illustration of possible policy objectives and tools

	Regional innovation system problems		
SMEs' needs	Organizational thinness	Fragmentation	Lock-in
Financial	*Attract and retain innovating firms* *Foster firms to go global, link them to international partners and external financial resources*	*Coach firms in linking to finance sources* *Foster specialization by combining technological support and finance* *Support the formation of sector-specific* venture-capital funds	*Ensure long-term finance for 'overall' innovation project* *Support new firm creation* *Address succession problems* *Restructure mature industries by attracting FDI and promoting international partnerships*
Technological	*Link firms with technological resources outside the region* *Promote collective sourcing and investments in collective resources* Technology centres *Use private R&D centres as technology resources for other firms*	*Provide bridge between firms and technological resources,* brokers *Provide 'accessible' technology:* co-operative schemes HEI-SMEs *Finance firms to access technology centres*	*Push firms to seek new technology options* *Foster access to resources outside the region, international partnerships* *Restructure the technology support infrastructure towards new technologies and sectors*
Human resources	*Attract/retain highly-skilled workers* *Support collective training programmes*	*Foster exchange of codified and tacit knowledge* *Foster intra-firm nodes for co-operation:* hiring of researchers in SMEs	*Develop creative capacities of workers* Subsidy to hire personnel for innovation
Openness and learning attitude	*Promotion of networking between firms, and clusters at every geographical scale*	*Foster a more collaborative spirit and more strategic orientation in the regions,* Regional Development Agencies *Combine funding with interaction stimulation,* Umbrella schemes	*Help SMEs evolve towards more creativity and autonomy in production* Supply-chain learning, Demonstration projects
Strategy & Organization	*Support firms in linking to international input and output markets* *Develop systemic character of innovation support:* network brokers	*Help firms identify, articulate and 'de-bundle' their needs:* innovation coach *Invite firms collectively to help in formulating a regional innovation strategy*: RIS/RITTS	*Open windows of opportunities for SMEs: techno-economic intelligence schemes* Innovation management training

The combination of regional and firms' deficits should form the basis for the design of policy intervention. The aim of Table 8.2 is to enlighten possible policy responses to certain innovation barriers, deficits or challenges at regional and firm level. Such a table shows clearly that there is no 'one-size-fits-all' policy system: it depends on the problems and opportunities to be addressed in the existing context. It also shows the need for policy to provide longer term and holistic support to innovation in all its aspects. But it is nevertheless possible to develop recommendations per category of firms' problems (horizontal lines in the table), per regional context (vertical lines in the table), and per type of policy tool (within each cell, every tool can be benchmarked against the broad guidelines for policy and against similar tools of the same type). In light of such a table of possible instruments, it becomes clear that the main role of the policy-maker becomes setting priorities according to the perceived problems in the region, to align with the main orientation of the economic development policy of the region.

The main condition however for the usefulness of the proposed approach, as a guide to re-designing innovation policies targeting SMEs, is that on the policy side too, learning processes are at stake, and adequate strategic capabilities are present. In trying to create learning firms within learning regions there is a need for learning governments. This implies four things in particular:

1. That the regional situation, that is the particular needs and opportunities (for innovation support) of SMEs and the regional innovation system as a whole, are well mapped, communicated and understood by policy designers;
2. That the objectives set for policy instruments are clearly expressed ex-ante in a global coherent framework and that the expected results are measurable;
3. That the results and impacts of the instruments are monitored properly and then evaluated by an independent third party in conjunction with peers' and clients' views;
4. That lessons from the evaluation are acknowledged and diffused and that they are compared with the policy aims, in order to adjust the policy approach in a continuous manner, and its instruments accordingly.

In most of the regions studied in SMEPOL, deficiencies have been noted in all the aspects listed above: a detailed knowledge of the specificities of the regional innovation system is often absent, not properly diffused in a language understandable by policy-makers, or not updated with sufficient regularity; effects of policies are often measured in a 'funds-consumption' approach only; evaluation is rarely built into the design of the programmes; no real independent evaluation of results and impacts are undertaken in most cases; pilot, bottom-up experiments are not really assessed, and there is thus a failure to capture lessons from these experiments; and policy learning is, in general, underdeveloped.

8.7 CONCLUSION

Drawing on the SMEPOL findings we have questioned in this chapter how policy directed at innovation in SMEs can be improved. After discussing several rationales for policy we came up with a main question, i.e. did we witness an actual shift in the policy paradigm or did we find arguments which call for a new policy paradigm? Our conclusion is that we have witnessed some shifts in practice, and that we have found sound arguments which support our claim that a shift in rationale is needed to improve the policy directed at innovation in SMEs.

More precisely, we used Table 8.1 to discuss the way to combine tools that are reactive or proactive and target internal processes in SMEs, and tools that are proactive and target the externalization of SMEs or the functioning of the regional innovation system.

We also proposed a reflection on policy mixes, using Table 8.2, showing that similar SME problems need to be tackled differently according to the regional context, but also that there is scope for importing elements of good practices from one context into another. A key challenge for innovation policy lies in the development of appropriate complementarities between instruments, in order to address the diversity of modes of innovation among SMEs and of innovation barriers in regions. This is an area where much progress is still to be achieved.

With this discussion, we can conclude that such an analysis, with the three key features of:

- Matching the context and SME needs' pictures with the policy tools in each region
- Confronting the policy tools with the lessons of theory
- Comparing results achieved with a range of policy instruments in different environments

is suitable for improving SME innovation-support policies in the EU regions.

The best way to evolve in such a direction, however, would be to undertake such a strategic benchmarking exercise with the active participation of policy-makers and policy implementers themselves. Theoretically sensible ideas could then be confronted with reality.

Notes

1. Camagni (1991) offers a related perspective to explain how firms translate external information into a language that the firm can understand via a 'transcoding function'. According to Camagni: 'These functions are perhaps the most critical, though widely overlooked by economic theory, in that they control the process of interfirm know-how transfer and information appropriation. Utilizing codified information, both freely available or costly, and merging it with chaotic and unordered "information" results in a firm-specific "knowledge" and possibly into potential business ideas at the disposal of the managerial decision-making' (Camagni, 1991, p.127).
2. A third type of coordinated economies (not further discussed in the chapter) is the keiretsu- or chaebol-type coordination among groups of companies in industries in Japan and Korea.
3. Part of this chapter was first published in Musyck, B. and G. Garofoli (2001), 'Innovation policies for SMEs in Europe: towards an interactive model?', *Regional Studies*, 35(9), pp. 869–72. Reprinted with kind permission of the Taylor and Francis Group (www.tandf.co.uk).
4. The additionality of the policy tools is related to the changes that would not have occurred without its implementation.
5. LVBIC from the United Kingdom could also be included in this section.
6. BI, LVCs and LVBIC from the United Kingdom could also be included in this section.
7. As an example the UK team found that some technological centres are catering for the needs of large firms as well as SMEs in their study of Regional Technology Initiatives (RTIs) in the English regions (Smallbone et al. 1999).
8. The LVCs from the United Kingdom could also be included in this section.
9. A previous version of this chapter has been published in the *Technology Analysis and Strategic Management Journal* (Nauwelaers and Wintjes 2002). The authors wish to thank their colleague Viki Sonntag for her valuable comments on an earlier draft of this paper.
10. Even there, in most cases, the problem is not so much the existence of risk capital funds but the accessibility of these for SMEs engaged in risky, and sometimes weakly formalized projects.

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