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478

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Approach in German Innovation Policy

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Contests for Cooperation – A New Approach in German Innovation Policy¹

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April, 2005

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Abstract

A new approach in German innovation policy organizes contests of proposals for developing innovation networks. Based on an overview of the different programs, we investigate the advantages, problems and limitations of such an approach. We find that this type of policy may have a relatively large impact and can, therefore, be regarded as a rather efficient instrument of innovation policy. Compared to conventional policies, administration of the program is a much more critical issue. The contest approach may stimulate learning effects on the side of the administration but may also require a high degree of flexibility. The main disadvantage is the additional time that is required for conducting the contest. As a distinct ‘picking the winner’ approach, the contest approach is not suited as a means for achieving a leveling-out of regional welfare levels.

JEL-classification: H32, O18, O38, R11

Keywords: Innovation policy, regional competition, innovation networks

Zusammenfassung

“Wettbewerbe für Kooperation – Ein neuer Ansatz in der deutschen Innovationspolitik”

In einem neuen Ansatz der deutschen Innovationspolitik werden Wettbewerbe für Vorschläge zur Entwicklung von Innovationsnetzwerken organisiert. Ausgehend von einem Überblick über diese Programme diskutieren wir Vorteile, Nachteile und Grenzen dieses Ansatzes. Es zeigt sich, dass diese Art der Innovationsförderung große Wirkungen erzeugen kann und daher vermutlich effizienter ist, als andere Typen von Programmen. Im Vergleich zu konventionellen Formen der Innovationsförderung ist allerdings die Administration des Programms sehr viel anspruchsvoller. Der Wettbewerbs-Ansatz kann Lerneffekte der Administration stimulieren aber auch ein relativ hohes Maß an Flexibilität erfordern. Der wesentliche Nachteil ist die zusätzliche Zeit, die für die Durchführung des Wettbewerbs benötigt wird. Da ein Wettbewerb ein ausgesprochenes ‘Pick the Winner’-Verfahren darstellt, ist dieser Ansatz für eine ausgleichsorientierte Regionalpolitik kaum geeignet.

JEL-Klassifikation: H32, O18, O38, R11

Schlagworte: Innovationspolitik, Wettbewerb zwischen Regionen, Innovationsnetzwerke

1. Introduction

A new approach has emerged in German innovation policy. The main novelty of this approach is that the allocation of public support is based on contests of initiatives for self-organized cooperation in Research and Development (R&D). In programs like BioRegio (Dohse, 2000, 2003; www.bioregio.com), EXIST (Kulicke, 2003; www.exist.de) and InnoRegio (Eickelpasch, Kauffeld and Pfeiffer, 2002; www.innoregio.de), a Federal Ministry invites local groups or 'networks' of actors to submit proposals for cooperative R&D projects with the prospect of attaining support for implementation of the concept. Based on an evaluation of the submitted proposals, the most promising initiatives are selected for public support. In most of the programs, the actors of an initiative are supposed to be located in the same region. In these cases, the approach can be regarded as a form of a regionalized innovation policy.

This paper provides an overview and discussion of the new policy approach with its merits and demerits. Section 2 introduces the basic elements of the new cooperation-contest programs. An overview of the organization of contests and conditions is given in section 3. Section 4 deals with the economic rationale and justification of the new policy. The discussion of potential advantages, problems and limitations of allocating R&D subsidies by contests in section 5 is illustrated with some practical experience with this type of program made so far. Section 6 investigates in more detail what became of the 'losers' of the contest, i.e. those initiatives that were not selected for funding. This issue is of crucial importance for an assessment of this new approach to technology policy (section 7).

2. Competition of concepts for innovative labor division: the basic approach

Since the mid-1990s German innovation policy has increasingly applied competitive elements, particularly for the promotion of cooperative R&D (BMBF, 2002). The common aim of these new programs is to stimulate the division of innovative labor and, thereby, to mobilize potentials for innovation

and creativity. This is done by conducting a contest of concepts for the organization of cooperation within 'networks'. In most of these programs the procedure consists of three stages:

- *Stage I:* Groups of actors are invited to submit a proposal for a concept to organize cooperative innovation activity with the prospect of gaining a assistance for realization. The proposal should include an outline of the expected future development of the respective technology, an estimation of its economic relevance in terms of expected market volume, an assessment of the abilities of the participants in the planned network and the expected chances of success. In those programs which are explicitly focused on a regional level, the strengths of the respective region in the particular technological field have to be explicated. This may include the quality of the labor market, the presence of innovation relevant services (e.g. in the fields of technical support and finance), the extent and nature of already existing private and public R&D in the region as well as the degree of clustering and interaction. Usually, only a rough outline of the concept is required at this first stage.
- *Stage II* is the selection of proposals for further elaboration and assistance. In most of the programs, the evaluation of concepts was mainly carried out by a jury of external experts, and in almost all cases the selection of concepts for final funding was organized in two rounds. In the first round, the outlines of concepts submitted in stage I are reviewed and a selection of these proposals is then invited to participate in a second round of the contest. There is no compensation for the effort of developing the initial first-stage proposal for those initiatives, which are not selected for further assistance. In the second round of the selection procedure, the initial concepts are elaborated further usually supported by advice and public funding. In this second round, the administration may provide 'custom-tailored' support that accounts for the specific requirements of the project and has the opportunity to steer the design of concepts in a certain direction. The applicants can also discuss their ideas with the administration before officially submitting their proposal. The final

selection is then made from the more elaborated concepts that resulted from the second round.

- *Stage III* is the realization of the selected proposals with public support over a longer period of time. In some of the programs (e.g., EXIST, InnoRegio) some exchange of information about concepts and solutions between program participants had been organized as part of the complementary research.

In most of the contests that have been conducted so far only a rather small share of initial applications has been selected for funding (see section 3 for details). However, in several cases the administration that had organized the initial contest or another public body have launched follow-up programs – some of them again in the form of a contest – that were specifically designed for those initiatives that had not been selected in the initial competition, the ‘losers’. Therefore, one can well identify certain program ‘families’. These follow-up programs may be regarded a *stage IV* of the new approach.

3. The programs under review: a selective overview

The programs under review have two special characteristics. First, they aim at stimulating cooperation or networks in order to strengthen the innovative potential of actors involved. Second, initiatives to be supported are selected by means of a contest. While some of the programs are focused on a certain technological field, others are of a more general character and have no such specific technological orientation. Most of the programs were initiated by the German Federal Ministry of Education and Research (BMBF). Some have also been launched by the Federal Ministry of Economics and Labor (BMWA).

The first program of this type in Germany was *BioRegio* (Cooke, 2002; Dohse, 2000, 2003). Its apparent success paved the way for other programs of this kind. The BioRegio program was launched by the BMBF in the year 1995 with the aim of strengthening German biotechnology industry and, thus, to catch up with the leading nations in this field, the US and the UK in particular. At that time, the development of the German biotechnology industry was

hindered by several obstacles, mainly the legal framework, the lack of sufficiently innovative companies, poor availability of venture capital as well as the low acceptance of innovation in this field by the German society. The BioRegio contest was designed to stimulate cooperation and division of innovative labor between private firms, universities, non-university research institutes, and venture capitalists in certain regions. Proposals for this program were required to outline the strengths of the regional biotechnology sector and to make propositions for its future development, particularly for research projects and cooperation between actors in the region. There were no restrictions with regard to the number of participants or the delineation of the respective region. An independent international jury with representatives from science, industry and labor unions selected four winning initiatives out of 17 proposals submitted according to a detailed list of criteria provided by the ministry.² The selection was completed in November 1996. These winning regions were given funding of about 90 million Euros for realizing their proposed projects.

Although there was no official complementary evaluative research for the BioRegio program, as of yet³, it was soon regarded rather successful in stimulating the biotechnology industry, not only in the supported regions but nationwide (Dohse 2000; Cooke, 2002). The widely acclaimed success of BioRegio paved the way for further programs aiming at stimulating R&D in the biotechnology field like *BioProfile*, *BioChance* and *BioFuture*. In these programs, losers of the *BioRegio* contest received a further chance for attaining public support. With the exception of *BioChance*, the follow-up programs were

² The main criteria by which the regions were selected was the economic and the scientific potential of private firms, universities and other public research facilities in the region, the intensity of intraregional interaction between the different firms and research institutes, availability of supporting services and the strategies for converting research results into new products including the support of innovative start-ups. See BMBF (1995).

³ An official ex-post evaluation of the BioRegio program will start in the year 2005.

also based on a contest.⁴ In the *BioFuture* program, several successive contests have been conducted.

Table 1: Selected contest oriented programs in support of regional R&D cooperation in Germany

| Name | Objective | Support for | Type of support | | | Term of promotion | Budget (Euro)** | Number of submitted applications | Number of granted applications | Share of applications not granted (percent) |
|-------------------|---|---|--------------------------------|-------------------------------|---------------------|-------------------|-----------------|----------------------------------|--------------------------------|---|
| | | | Funding of innovation activity | Funding of network management | Professional advice | | | | | |
| BioRegio | Regional cooperation in biotechnology | Private firms and public research institutes | X | X | | 1995 - 2002 | 90 mill. | 17 | 4 | 76 |
| BioProfile | Regional cooperation in biotechnology | Private firms and public research institutes | X | X | | 1999 - 2006 | 50 mill. | 30 | 3 | 90 |
| BioFuture | Cooperation in biotechnology | National and international scientists at German research institutes | X | | | 1998 - 2010 | 75 mill. | about 1000 | 51 | 95 |
| EXIST | Regional cooperation | At least three partners thereof one university | | X | X | 1997 - 2005 | 50 mill. | 109 | 5 | 95 |
| EXIST Transfer | Regional networks of start-ups | At least three partners thereof one university | | X | X | 2002 - 2005 | 10 mill. | 45 | 10 | 78 |
| InnoRegio | Regional networks of a priori not specified innovations | Private firms, public research institutes, educational institutions | X | X | X | 1999 - 2006 | 253 mill. | 444 | 23 | 95 |
| InnoNet* | Cooperation in R&D | Private SMEs and public research institutes | X | | | 1999 - 2005 | 33 mill. | 404 | 51 | 87 |
| NEMO* | Cooperation in R&D | Private SMEs and public research institutes | | X | X | 2002 - 2006 | 3 mill. | 209 | 55 | 73 |
| Lernende Regionen | Regional networks in innovation | Private firms, schools, public research institutes etc. | X | X | | 2000 - 2006 | 118 mill. | 350 | 72 | 79 |

* Sponsored by the BMWA, all the others by the BMBF. ** Planned spending until end of 2006.

SME: small and medium-sized enterprises.

Source: Own compilation.

⁴ For further information concerning the three programs see URL <http://www.bioregio.com>

The aim of the *EXIST* program introduced in December 1997 was to improve the knowledge transfer between universities and the commercial sector by promoting entrepreneurship and encouraging start-ups of students and academic personnel⁵. In its initial form, the *EXIST* program invited proposals of concepts to stimulate new firm formation out of universities by improving the climate for start-ups at universities and by motivating, training and supporting entrepreneurial personalities. These proposals were supposed to particularly entail cooperation in networks that consist of universities and at least two external partners like public research institutes, private enterprises or chambers of commerce and other business associations. The *EXIST* program provides support for establishing cooperative relationships between these actors and for stimulating entrepreneurship. Each network was funded with about 1 million Euros for three years. The selection of proposals for final funding was made by an independent jury in two rounds. In the initial *EXIST* program only five applications out of 105 were selected. However, the *EXIST* program was followed by the *EXIST-Transfer* program in which proposals that had been rejected in the initial contest could apply for assistance.

The *InnoRegio* program was launched by the BMBF in April 1999. The aim of the program was to strengthen innovative and economic competitiveness in East Germany, that part of the country that had been under a socialistic regime until 1990. The contest invited concepts for regional innovation networks consisting of private firms, universities and other public research institutes. The *InnoRegio* program was limited to East Germany but not to certain industries or technologies. Besides the restriction to East Germany, the spatial delineation of regions participating in the contest was not in any way pre-determined. There have been 444 initial proposals submitted. An independent jury chose those 25 concepts that were to be included into the second round of the selection procedure for further elaboration. Main criteria for this procedure were the relevance of the network for innovation processes

⁵ For further information see Kulicke (2003) and www.exist.de.

and economic development in the respective region, complementarities of participants in the proposed network as well as the novelty and quality of the planned R&D. The initiatives selected for the second round of the contest were awarded up to approximately 153,400 Euro each for preparing a more detailed concept. In this second round, the initiatives were also provided immaterial support from the Ministry in form of moderators who monitored and helped to organize communication as well as with free consultancy on subject areas. The jury selected 23 concepts for final funding in the third stage. Activities eligible for funding are R&D projects as well as qualification measures and the management of the proposed network.⁶ *InnoRegio* may be regarded as a prototype of programs that aimed at improving regional innovative networks such as *InnoNet*, *NEMO* and *Lernende Regionen* (Learning Region).

4. Theoretical foundations and justification of the new program type

Three strands of argument may provide a theoretical foundation and justification for the policies under inspection here. One main element of a theoretical foundation is given by recent approaches to explain innovation behavior, particularly in a regional context (section 4.1). A justification of public measures for promoting R&D cooperation can be based on uncertainty of innovative outcomes and transaction cost that can work as a severe impediment for establishing and maintaining such type of relationship (section 4.2). And finally, the pronounced heterogeneity of innovation processes and regional systems competition provide some rationale for the approach (section 4.3).

4.1 Theories of innovation behavior

Innovation activity is characterized by a division of labor, which tends to be shaped by geography (Fritsch, 2005). One indication for the importance of

⁶ For further information see www.unternehmen-region.de and www.diw.de/innoregio

location is the clustering of innovation activity found in many empirical studies.⁷ Clustering suggests that there are agglomeration advantages at work that stimulate R&D (Enright, 2003; Porter, 1998). Among the most important of these agglomeration advantages are a relatively high potential for face-to-face contacts within clusters, the presence of positive external effects, easy access to research institutions as well as to differentiated input markets such as the labor market and the market for specialized services. All of these factors may facilitate the generation and the transfer (spillover) of knowledge, which constitutes the key element of innovation activity. Another indication for a significant role of location for R&D is the evidence found in many empirical studies that the diffusion of new knowledge tends to be heavily concentrated around its source. Obviously, spatial proximity is of significant importance for such knowledge flows and, therefore, is conducive for a division of innovative labor that necessitates knowledge transfers between the parties involved.

The pronounced regional dimension of innovation processes implies that the quality of regional innovation systems may differ considerably. Recent approaches to a theory of regional innovation⁸ share the common hypothesis that the main factor for explaining the quality of regional innovation activity is not size or endowment⁹ but rather the level and the quality of interaction within and between regional innovation systems. Such interaction constitutes an important vehicle for the diffusion of knowledge that is a necessary precondition for a division of innovative labor. Therefore, stimulating the

⁷ For empirical evidence see Audretsch and Feldman (1996a), Cooke (2002, 130-156) and Baptista and Swann (1998).

⁸ These recent approaches are the notion of regional innovation systems (cf. Cooke, Uranga and Etxebarria, 1997; Cooke, 2004; Edquist, 1997), the concept of industrial districts (cf. Porter 1998 and the contributions in Pyke, Beccatini and Sengenberger, 1990), the network approach (cf. Camagni, 1991; Grabher, 1993), and the concept of “innovative milieux” (Crevoisier and Maillat, 1991; Ratti, Bramanti and Gordon, 1997). See Cooke (2005) for a review of recent developments.

⁹ There are numerous empirical examples of highly effective clusters in remote, sparsely populated areas which have fewer employees than there are inhabitants in a small town (Porter, 1998; van der Linde, 2003). This suggests that only a fraction of the differences in the efficiency and the success of R&D can be attributed to the sheer size of an agglomeration or cluster.

division of innovative labor could be a promising starting point for a policy that aims at promoting regional R&D activity.

4.2 Specific problems of labor division in R&D

The recognition that differences in the performance of innovation systems may well be explained by the intensity of R&D cooperation and division of innovative labor is only a first step in justifying the cooperation-contest type of program. In the second step, it should be shown that interaction for a mutually beneficial division of innovative labor may be difficult to establish. There are, indeed, a number of hurdles for the establishment and maintenance of interaction in the field of R&D (see Fritsch 2001 for an overview).

One of these special problems is that relationships in R&D processes can not be completely specified since the outcome of an innovation process is unknown in advance. Because such incomplete contracts include the danger of the exchange partners behaving in an opportunistic way, establishing such relationships requires some trust. This implies that actors must be 'linked' (Kranton and Minehart, 2001), i.e. they have to spend some actor-specific transaction cost. This cost may be incurred while identifying a suitable transaction partner, when establishing an appropriate interface for the exchange relationship or by building up some reputation and trust in order to reduce the danger of opportunistic behavior to a reasonable level. Another reason why a division of innovative labor may necessitate investment in actor-specific transaction cost is that the required inputs are often highly specialized and not commonly traded on large markets. Indeed, markets for skills and resources that are important for innovation activity may well be rather 'thin' with only very few suppliers available and transactions taking place rather infrequently. For this reason, an immense amount of search costs might be necessary for

identifying a suitable transaction partner and negotiations about the conditions of an exchange may be rather costly.¹⁰

Because for these reasons, mutually beneficial modes of labor division in the field of R&D do not emerge more or less automatically, a policy that stimulates such relationship may achieve considerable improvements of innovative capacity and the efficiency of innovation systems. This pertains to formalized relationship as well as to rather informal types of interaction.

4.3 Variety and systems competition

Innovation processes in different technological fields, industries and regions can have rather specialized characteristics that require specific solutions (see Tödting and Tripl, 2005). For this reason, policy programs should be designed in a way that they provide sufficient room for different solutions to emerge. Variety of approaches allows for learning from experience with different ways of problem solving and to identify superior solutions. It is also a basic precondition for competition because if all submitted concepts were identical a contest would not make sense. Competition between alternative approaches of organizing a division of innovative labor may be regarded an effective means of stimulating the search for better solutions and their diffusion. This is a key argument in the theory of federalism or, more generally, systems competition (Frey and Eichenberger, 1999; Vanberg and Kerber, 1994).

By inviting propositions for organizing the division of innovative labor according to the needs of the respective project, the cooperation-contest

¹⁰ If such a cooperative relationship comes about, it may involve even more advantages than intensified division of innovative labor and increased efficiency of R&D processes. One such further advantage of R&D cooperation is that the relationships could involve relatively 'open' exchange of information that may be stimulating for R&D activity (Axelsson, 1992; Lundvall, 1993; Powell, 1990). Therefore, cooperative relationships in R&D may work as an important medium for knowledge spillovers. Not only formalized cooperative relationships like joint ventures or contract research, but also informal relationships like 'information trading' are often important for such knowledge spillovers to emerge and may play a significant role for stimulating innovation activity (e.g., von Hippel, 1987).

approach allows for a high degree of variety and systems competition. Because the concepts are developed ‘bottom-up’ by the potential participants of the proposed innovation network, it is in the very nature of this type of program that solutions can be custom-tailored and innovative. Moreover, competition for public assistance creates incentives for developing concepts that are of high quality. Hence, the competition-contest approach can work as a laboratory for discovering and diffusing superior ways to organize a division of innovative labor. For these reasons, innovation policy programs, which allow for a variety of solutions and allocate assistance by means of competition are probably more appropriate and efficient than a completely centralized one-size-fits-all approach (Tödting and Trippel, 2005) that provides only one type of assistance.

In summarizing the arguments that were briefly reviewed in this section, there are good grounds to suggest a decentralized approach to innovation policy that tries to stimulate the diverse kinds of innovative labor division. Such policy measures may be particularly justified because mutual beneficial cooperation in the field of R&D may not emerge automatically. There are strong reasons to expect that competition between different solutions will help to find a superior alternative. Competition may also stimulate diffusion of such superior solutions.

5. Possible advantages of the cooperation-contest approach, critical issues and limitations

The cooperation-contest type programs, which are under review, can have a number of important advantages compared to a conventional innovation assistance program that provides the same type of solution to all applicants. These possible merits of the new approach are explicated in section 5.1. The following two sections then deal with critical issues (section 5.2) and limitations (section 5.3). In this discussion we bring in some available empirical evidence from the new types of program.¹¹ Our point of reference for

¹¹ The available evidence on the effects of the programs is still rather limited, mainly, because most of the programs are still in operation.

assessing the merits and demerits of the new approach is the common practice of a policy operated at the central state level that allocates only one kind of assistance. If such one-size-fits-all programs (Toedtling and Trippel, 2005) include discretionary decisions about public assistance, these decisions are typically made successively case-by-case and are based on a common set of criteria. In contrast, decisions in a contest are based on a simultaneous comparison and ranking of all submitted applications at a certain point of time.

5.1 Possible advantages

Compared to the standard procedure of allocating identical forms of R&D support successively on a case-by-case basis, the cooperation-contest type of program provides a number of advantages. While some of these advantages result from the contest mode of allocation, other advantages are a consequence of the self-organization and the variety of solutions that is allowed.

Quality of submitted concepts: The general expectation that competition generates incentives for a high level of performance may also hold for the quality of concepts submitted in a contest for public assistance. Not only the competition between concepts, but also interaction with the administration and the support that firms experience when they elaborate their concept during the selection process may lead to significant quality improvements. Generally, the selection procedure can produce learning effects for applicants that can be relatively pronounced if the feedback that they receive is rich and profound. Such learning effects may be relevant for all kinds of applicants, for the winners which are selected for assistance and for the losers whose applications are rejected. The intensity and the quality of the feedback depend critically on the administrative implementation and management of the contest.

Quality of project selection: The contest mode of selection is to decide about assistance at a time when all alternative applications are known and can be simultaneously taken into consideration. Therefore, selection decisions can be based on more relevant information and be of higher quality than in the conventional approach that is characterized by successive case-by-case

decisions. In the conventional approach, the administration decides whether to provide assistance or not when an application has been submitted. At the time when such a decision is made, the administration does not know if later applications will be of higher or lower quality than the one which has to be decided on. Incomplete information about the relevant alternatives, hence, limits the possibilities of selecting the most promising projects considerably. If decisions are made by an independent jury of experts, as it has been the case in nearly all of the programs under review, the quality of the selection may also be higher as compared to decisions that are made by a public administration. Moreover, since contests may be addressed to a wider group of potential applicants than conventional programs they may gain more attention, publicity and public awareness than conventional programs. Hence, the pressure for justification of decisions is higher and may induce a more transparent design of the decision procedure. However, this publicity may also be regarded as a disadvantage and induce attempts to conceal details of the decision process (see section 5.3).

Self-organizing the division of innovative labor: It can be regarded as a great advantage of the approach that applicants have considerable degrees of freedom in choosing the organizational form of innovative labor division that corresponds to their specific problems and needs. Because solutions are developed bottom-up by the potential participants of the proposed innovation network, they can be expected to be more suitable than in a program that provides a uniform type of assistance to all applicants. Moreover, policy makers largely avoid the pretence of knowledge-problem, i.e. to a priori assume a certain type of assistance or project design appropriate. By designing the relevant network, applicants also give a definition of its extent, e.g. the relevant regional scope. Therefore, no predetermined delineation according to administrative criteria is necessary, as would be the case in a program in which the availability of funds is limited to certain assisted areas that may be too small to include all relevant actors or sources of knowledge spillovers. Hence,

artificial discrimination against certain potential members of the network due to administrative criteria can be avoided.¹²

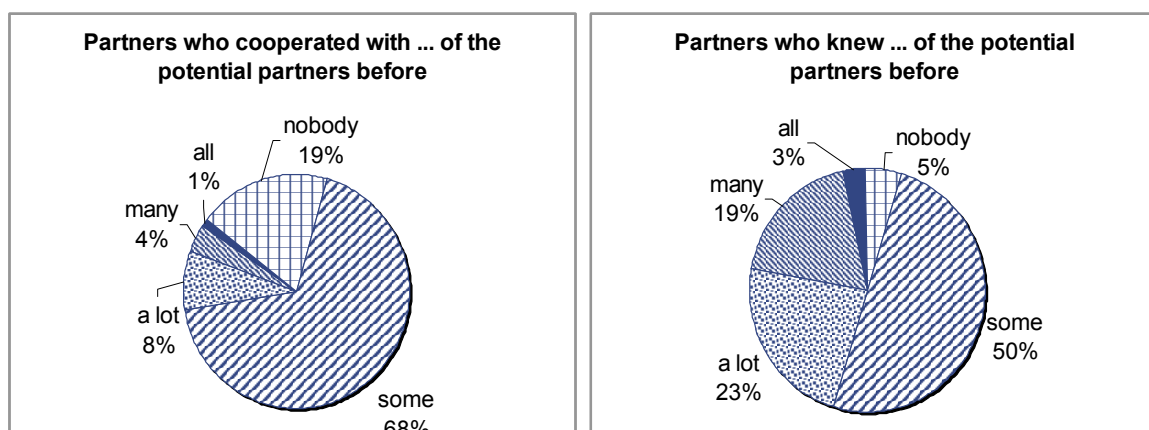
Mobilization of innovative activity: A further important advantage of the cooperation-contest approach is that it provides incentives for self-organization. When initiatives submit their proposal to the administration they have already made the first important step towards self-organizing their future division of labor and building an innovation network. Therefore, this type of program can generate relatively strong mobilization effects for innovative activity by stimulating the division of innovative labor. It can induce actors to establish new contacts, deepen existing relationships and create new innovation networks that have not existed, yet. The competition approach, therefore, is more likely to fuel creativity, the generation of new ideas and the division of innovative labor than conventional assistance policy. This is particularly relevant in regions with a low level of innovation activity where conventional R&D promotion programs find few occasions for funding and, therefore, can have only a limited effect.

Information about the incentives for self-organization of innovation activity is available from the complementary research for the InnoRegio program (see Eickelpasch, Pfeiffer and Pfirrmann, 2004). Members of those InnoRegio initiatives that have been selected for funding in the final stage of the program have been asked by a postal inquiry whether they knew their InnoRegio partners previous to participating in the contest, and whether they maintained cooperative relationship with these actors before the application procedure. About half of the respondents acknowledged that they knew only some of their future partners before the initiation of the InnoRegio project and five percent stated that they knew none of them. Only three percent of respondents were acquainted with all their InnoRegio partners before they began. With regard to cooperative relationship with their InnoRegio partners, it

¹² However, some spatial restrictions may apply. In most of these programs partners located far away from the network-‘core’ were not eligible for funding. In the InnoRegio program, for example, funding was limited to actors located in East Germany. And as a general restriction of German innovation policy, financial support is not granted to actors located abroad.

was found that only one percent of the participants had cooperative relationship with all of the partners before the contest and four percent had cooperative relationship with “many” of them (figure 1). Nearly one fifth of the respondents (19 percent) did not cooperate with any of their InnoRegio partners before (category “nobody”) and 68 percent already had cooperative relationship with only “some” of them. According to these figures, there can be no doubt that the InnoRegio contest had a considerable mobilizing effect for the self-organization of innovative networks.

Figure 1: Relationship of InnoRegio partners before participation in the contest (percentages)



Source: DIW Berlin, Survey in 2000, N=727.

Benefits of losers, mobilization surplus, and the impact of public funds:

The mobilization of innovative potential that is induced by the cooperation-contest-type programs is closely connected with benefits of the losers, i.e. those firms that did not succeed to be selected for funding in the contest. One important benefit for losers can be that in developing their concept they have established contact to other actors that may be helpful later on. In particular, they still have their concept for a certain form of innovative labor division and may at least partly realize this concept without public support or in the framework of other programs. These benefits of losers constitute a main difference between the cooperation-contest type of program and conventional R&D subsidies. Moreover, support that was received in developing the concept and feedback on the submitted concept by the public administration may prove

to be of considerable future value. The benefits of the loser may result in a ‘mobilization surplus’ that manifests in those rejected applications, which are further pursued (see section 6). Hence, programs of the cooperation-contest type may have a considerably higher impact than conventional programs of comparable budget size and may spend public resources more effectively.

The review of contest programs (section 3, table 1) showed that in most of these programs the share of non-selected applications was well above eighty percent. This rejection rate is much higher than what can be found for many of the conventional R&D promotion programs.

Learning effects for policy makers and public administration: It is the very nature of a contest approach, that applicants have considerable degrees of freedom for expressing their specific needs and desires in the design of a proposal. Policy makers and the public administrators have, therefore, the opportunity to learn from the proposals as from evaluation of realized concepts for a more appropriate design of future programs. Such learning effects of the administration are well reflected in the follow-up programs of BioRegio, EXIST and InnoRegio (cf. section 3 and table 1) that benefited from the experiences that have been made with earlier programs of the cooperation-contest type.

As a discovery procedure, a cooperation-contest for assistance may stimulate the division of innovative labor, the knowledge of how to organize and manage an innovative network as well as the ability of policy of dealing with cooperative R&D.

5.2 Critical issues

One problematic issue of the contest approach as compared to conventional policy measures is the *relatively large organizational effort for the administration of the program*: Conducting a contest may well require more time and resources on the side of the public administration than is needed for a conventional program, especially if a jury of experts is involved in the selection procedure. Not only the public administration, but also *applicants*

may have higher effort of participating in a contest as compared to a program with successive case-by-case selection. The above mentioned quality enhancing effect of competition may require more resources for preparing a promising application than in case of a conventional R&D subsidy. This may particularly hold if the application has to include not only the design of a certain R&D project but also a concept for organizing the division of innovative labor in a network of actors, as is the case in many of the contest-type programs (see section 5). Developing a concept for joint R&D requires identification and selection of potential partners as well as the ex-ante coordination of the project. If, however, only a rough outline is necessary for the first round of the selection procedure, the effort of application may be even less than that in a conventional program.

Need of time for the contest: Conducting a contest may take more time between the initial application and the final funding decision than what is required for a conventional program. This may slow down innovation processes considerably and endanger the benefits such as first-mover advantages. One possible reason for the additional time that is required might be the larger administrative effort that is necessary for carrying out such a contest. Second, decisions cannot be made immediately upon receipt of a proposal but only when a certain deadline has been reached, after which no further application is considered in the selection process. It is, therefore, important that the bid-time for submitting proposals is short, and that selection decisions are made promptly. In the BioRegio and the EXIST program, for example, the time between the start of the contest until final selection was about one year. In EXIST Transfer about five months were required. In InnoRegio the time for the whole contest amounted to 20 months. In an inquiry of the winners and loser of the BioRegio contest, the respondents qualified the interregional competition as an appropriate selection mode but criticized the amount of time needed (Dohse 2000). Also participants of the InnoRegio contest complained about the complex and long lasting decision procedure (Eickelpasch, Kauffeld and Pfeiffer 2002). Especially those participants who planned to realize high-tech projects were afraid to lose important first-mover advantages due to the long-lasting selection process.

Discouragement and discrimination of losers: We have already emphasized (section 4.1) that even the losers of a cooperation-contest may gain considerable benefits from participating in terms of contacts, concepts and feedback to their ideas. They could, however, also feel as if they were being ‘punished’ for three reasons. First, although they may have learned something from the application process, at least a part of their effort for the application procedure was in vain. Second, losers in the contest may suffer from a bad reputation of not being selected. And third, because the ‘winners’ in the contest get public support for their R&D, those firms that are not rewarded have a competitive disadvantage (Dohse, 2000). This effect, that is also relevant for conventional assistance schemes, would be particularly discriminating if the difference in the quality of concepts was not very significant. If there are promising concepts among those applications that have not been selected in the initial contest, it may be reasonable for policy to provide some assistance also for these proposals. Such a support for losers of the contest is, however, a rather sensitive issue. Aftercare should provide considerably less assistance than is given to the winners of the initial contest because otherwise it would distort the incentive to compete.

Relatively high administrative flexibility required: It constitutes a basic requirement of any contest that the participants have some degree of freedom in the design of their concepts. The search for concepts constitutes a discovery procedure from which results can not be predicted. As already mentioned, this may lead to learning processes on the side of the administration (section 4.1), but implementation of a winning concept may also require new modes of support or administrative innovation and flexibility. Another disadvantage in the view of the administration can be a *relatively high public and political pressure*. It is, for example, quite likely that political representatives of regions participate in a contest campaign in favor of their clientele. Such political pressure may distort the selection process. Dealing with public and political pressure, therefore, is an important issue for designing and administrating this type of program.

There can be no doubt that the *quality of the selection decisions* is of critical importance for the effectiveness of this program-type. The decision procedure should identify and select the most promising projects with a high degree of reliability. Trust in an unbiased quality oriented selection procedure is decisive for the motivation of applicants to develop and submit a proposal. So far, there have been no serious complaints with regards to the quality of the selection procedure. Complementary research showed that participants in contest-type programs, winners as well as losers, evaluated the selection as fair (Dohse, 2000; Belitz, Pfirmann and Eschenbach, 2002). At least, there is no indication at all that the quality of decision is lower than in conventional case-by-case decision programs.

All these issues may constitute severe problems or disadvantages of the contest approach. They can, however, be lowered or even eliminated by an appropriate implementation and administration of the policy. We can conclude from the mentioned problems that

- effort for applicants should be limited to a plausible level,
- bid-times should be short and decisions made rather quickly,
- feedback on proposals should be helpful and encouraging even for the losers of the contest,
- administrating the program may require a relatively high degree of flexibility, and that
- ways should be found to deal with public and political pressure induced by the contest.

Moreover, it may be desirable to devote some care to the losers of the contest in order to not discourage but stimulate their innovative potentials. In Germany, this has been quite often done by means of follow-up programs in which those initiatives could apply for assistance that have not been selected in the initial contest (see section 3).

5.3 Limitations of the approach

The contest approach is, by its very nature, a ‘picking the winner’ procedure and is, therefore, not well suited for policies aiming at leveling-out regional welfare levels. The competition is organized in order to select the most promising concepts and not those alternatives that have been submitted by the poorest or most needy applicants. Any attempt to account for distributional ‘justice’ in the selection procedure would endanger the quality of the selection.

Limiting the competition to certain types of applicants or to part of the country which are economically backwards (like the InnoRegio program that was limited to East Germany) does in no way change this bias towards supporting the most promising initiatives. With a quality-oriented selection mechanism, nothing favors proposals that come from the most needy applicant or most lagging region. For the support of the less favored initiatives or regions, other measures of a more enabling character should be applied.

6. A closer look at the mobilization surplus: what have the losers done?

We have argued that programs of the cooperation-contest type may create considerable benefits even for the losers of the contest that are not selected for funding. This effect may be quite relevant given the large share of rejected applications that in many of the programs amount to more than 80 percent (table 1). This advantage of the programs under review may, however, be contradicted if the losers are discouraged by not being selected. It is, therefore, of special interest what those applicants do, which were not selected in the program.

In order to shed some light on this issue, postal questionnaires were sent out to the 419 rejected applicants of the InnoRegio contest (see DIW, 2005). The inquiry was carried out in early 2005, more than five years after the selection of projects in the contest and resulted in usable information from

about 178 of the rejected initiatives.¹³ In 42 percent of these cases (74 applicants) the project idea had been abandoned immediately after the rejection in the InnoRegio contest. In 18 percent of the cases (32 applicants) the project was pursued for a while but then given up. About 40 percent of the respondents (72 cases) realized their idea despite the rejection in the InnoRegio program and in most of these cases this process is still under way. Among those cases in which the project idea was not abandoned, 61 percent received some public funding in the framework of other programs (44 out of 72 projects), whereas 39 percent of these projects (28 cases) were set up without any significant public assistance. At that point of time, 22 winners of the InnoRegio contest were still active¹⁴ realizing their project with assistance of the program. This means that for each initiative funded in the InnoRegio program there were more than three rejected initiatives of which we know for sure that they are or have been realized in one or another way. About 1.7 projects per assisted InnoRegio case have been put into practice without public funding in the framework of other programs. It should be noted that these figures give the lower limit of the mobilization effect since there may be some more projects that have been implemented among those initiative which did not respond to our inquiry. We can conclude that the overall mobilization of innovative potential that resulted from the InnoRegio program has considerably exceeded the amount of activity that is funded by the program.

This conclusion is confirmed in a study by Krantz, Lilischkis and Wessels (2000) who investigated the development of 47 out of the 104 rejected concepts that have been submitted to the initial EXIST contest.¹⁵ The inquiry was carried out three years after the selection for funding was made. In 37 cases, the contest-losers that had been included in the study were realizing their project, often in a reduced form. In 67 percent of these cases, the realization of

¹³ 94 of the questionnaires could not be delivered and 147 applicants did not react, refused to answer or were for other reasons unable to provide the required information.

¹⁴ One initiative selected for funding in the InnoRegio program was abandoned.

¹⁵ See section 2 for a brief description of this program. The selection of these cases is not entirely clear and it can not be completely excluded that particularly the relatively promising initiatives have been included in the sample.

the project was based on the universities' own funds or by the respective Federal State (Land). In 44 percent of the cases private resources were raised. Given that only five initiatives had been selected for funding in this contest, the relation of realized projects over projects selected is much higher than in the case of InnoRegio. In both cases one may well presume that the mobilization surplus is at least as important as the funding of the winners.

7. Conclusions

The cooperation-contest approach to R&D incentives has a number of important advantages over conventional programs that allocate support on the basis of successive case-by-case decisions. One main advantage of this program type is that applicants have a high degree of freedom in the design of their project so that assistance can be custom-tailored and much better suited than in a one-size-fits-all approach. Hence, pretence-of-knowledge problems are largely avoided. Not only, that it is well suited for stimulating the division of innovative labor, which is a critical issue for the efficiency of innovation systems. The programs can also generate relatively strong mobilization effects and, in so doing, achieve a high impact of public funds. Moreover, this type of policy can be a valuable means for the administration to learn about demands and bottlenecks of innovative actors helping to design appropriate policy measures. However, the cooperation-context programs are rather demanding with regards to implementation and administration. Proper implementation of the policy is a crucial issue for the advantages of the approach to become effective and to keep the problems of the approach within reasonable limits. As a 'picking the winner'-approach, contests are not suited as a means of a leveling-out policy that is aiming at economic cohesion.

A number of important questions remain unanswered and should be subject of further research. It is not clear from a conceptual point of view as to how far the policy should care for the losers of the contest. We have argued that even the losers may benefit from participating in the contest because they may receive valuable feedback on their concept during the selection procedure, and that they could try to implement their ideas without further assistance.

Supporting the loser could be particularly regarded an option if the quality of the winning and the losing proposals is very close so that funding of winners could result in a considerable distortion of competition on the output market.

In the future, contests will probably be of growing importance for German innovation policy, as official statements indicate (Blum 2001, BMBF 2002). Further research will be needed to investigate thoroughly the effectiveness of contests for innovation policy. A main focus of this research should be on the implementation of the programs because this issue appears to be of crucial importance for the advantages of the approach to become effective. In addition, special attention should be paid to the quality and the development of the cooperative networks, particularly their persistence over time. Are networks that have been stimulated by policy of about the same effectiveness as cooperative relationship that emerged without public intervention and are they as robust? Last but not least, the involvement of different administrative levels could be an interesting issue. To what extent is it appropriate to involve local political bodies in the selection and finance of such a cooperation-contest?

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