The effects of Structural Funds on the stimulation of innovation: Empirical results from the mid-term evaluation of the Objective 1-programme of the Austrian province Burgenland

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Regionalization of innovation policy - options and experiences

4-5/6/2004, Berlin

Abstract: In recent years regional policy has become more and more concerned with the improvement of the innovation capacity and performance of firms. Many regional development strategies have as key elements the support of their regional innovation systems or innovative clusters. It has been recognized that increasing the technological level, the value added and the competitiveness of a regional economy relies to a large extent on the innovation capacity of regional firms and clusters. Regional development is an important policy issue also for the European Union. The EU Structural Funds aim at supporting regions lagging behind in their development or facing structural problems. In this paper we are going to analyse the relation between EU regional policy – more precisely, the European Regional Development Funds (ERDF) – and the regional innovation system in the Austrian province Burgenland. In the context of the recent mid-term evaluation of the Objective 1-programme Burgenland, we have been concerned with the effects of the ERDF on the innovation capacity of regional firms. For this purpose we have conducted a survey of the innovation activities of firms. The survey provides us with information on innovation projects, the resources employed in the process of innovation, the firms' innovation networks and the problems impeding innovation. This set of data is the basis for assessing the innovation-related effects of the ERDF. In this paper we (1) deal with the structural change of the regional economy since the beginning of EU structural funding in Burgenland. Then we (2) give an overview of the innovation activities and patterns of regional firms, their most serious problems and needs regarding innovation. Finally, we (3) analyse the effects of the instruments co-funded by the ERDF on reducing barriers to innovation or improving the innovation potential of firms and give some preliminary conclusions regarding the effectiveness of Structural Funds in stimulating innovation.

Keywords: European Union, Structural Funds, regional policy, innovation

1 Introduction

In this paper we are investigating the role of regional policy of the European Union for increasing the innovation potential of a regional economy. We are interested in this question because fostering the development of regions confronted with structural deficiencies needs to target the innovation potential of the regional economy. Possible ways to change the structure of an economy are a) setting up new firms, either endogenously or by foreign direct investment or b) entering new markets and diversifying established firms. Both ways are closely linked with innovation. The term 'innovation' comprises simple product modifications, the introduction of products which are new in a firm's product range as well as products which are really new to the market. With this meaning, start-ups are by definition innovative and entering new markets usually requires innovation. As a consequence, regional policy in general and Structural Funds in particular should aim at improving the innovation capacity of firms in regions with lagging development.

Research findings on the effects of EU regional policy on the economic structure of poorer regions are ambiguous. In a recent paper Midelfart-Knarvik and Overman (2002) have argued that structural spending by the EU does attract R&D-intensive industries but often contrary to the comparative advantages of these regions. Such isolated "sucesses" do not lead to an improvement of the performance of the overall regional economy. Two thirds of the Objective 1-regions could not increase their share in the total value-added of the EU. Most of those which could, became more specialized according to their comparative advantages. They conclude that EU aid should be focussed more on changing the endowments (the skills of labour force) of regions and enabling the specialization according to the resulting advantages. But this argument assumes that EU Structural Funds do have effects on changing crucial factors of competitiveness. In this paper we will present evidence that it is exactly the lack of such effects, on innovation in particular, that is characterizing EU regional aid.

In the course of the recent mid-term evaluation of the Objective 1-programme of the Austrian province of Burgenland, we have investigated whether Structural Funds (more precisely the ERDF) have positive effects on the innovation performance and capacity of the regional economy. Burgenland is the least developed province of Austria. It has for decades suffered from its peripheral location not only within Austria but also from locational disadvantages as a border region to the former Eastern block (the so-called "iron curtain" to Hungary and Slovakia). Accordingly it was granted Objective 1-status with Austria's accession to the European Union in 1995. EU regional policy in general and the Structural Funds in particular were regarded to stimulate the structural change of Burgenland from a peripheral rural area to a modern central European region, particularly in view of the accession of the neighbours Hungary and Slovakia in 2004.

2 Structural changes in Burgenland in the 1990s

The Burgenland has historically been a peripheral rural area characterized by an unfavourable industrial structure, a slow economic development, a negative demographic trend, high unemployment and consequently a high share of out-commuters. Economic performance was weak, the traditional locational advantage was that of a typical low-wage region. Since the 1990s, however, economic policy framework conditions have been changing quite drastically. With the opening of the borders to East Europe, Austria's accession to the European Union, and the stronger interationalization of economies worldwide, also the Burgenland had to adjust its economic policy.

The first EU co-financed Objective 1-programme 1995-1999 had a broad framework, encompassing agriculture and forestry; industrial and technological change and tourism, as well as the development of human resources. The European Regional Development Fund (ERDF) aimed at stimulating structural change through investment in infrastructure and corporate modernisation. Accordingly, modernising the existing company stock and attracting new businesses that provide high-qualification jobs were considered of strategic importance for Burgenland. Technology-related measures such as technology centres and technology transfer complemented the ERDF-programme. The current Objective 1-programme 2000-2006 is very similar, as far as the range of objectives is concerned, but has a stronger strategic focus on reducing the North-South disparities and a stronger thematic focus on innovation (ERDF) and qualification of human resources. ERDF interventions still target companies but the measures are aiming more at strengthening their innovation capacity (R&D, networks, etc.).

2.1 Structural change of the regional economy since the beginning of EU structural funding in Burgenland

The largest part of Burgenland's territory can be characterized as peripheral. Whereas the northern part with the capital Eisenstadt has quite significant socio-economic linkages with the near urban region of Vienna, Austria's capital, the southern part even classifies as extremely peripheral. Intraregional disparities are strong. Whereas the territory is quite accessible via motorways, public transport is a major mobility bottleneck. With the exception of the northern parts, the traffic network is not only badly connected with neighbouring agglomerations in the rest of Austria (particularly the Vienna region) but also with the neighbouring countries (Hungary, Slovakia).

With 64% of the Austrian average GDP per capita in 1995, Burgenland's economic performance was lagging significantly behind the other Austrian provinces. Since then the GPD per capita has risen from 64% of the Austrian average to 68%. Correspondingly, Burgenland's contribution to Austria's total value-added has steadily risen form 2.0% in 1995 to 2.2% (1997) and 2.3% in 2001. Within Burgenland itself, a clear North-South divide can be observed. Whereas the North reaches 74% of Austrian average GDP per capita, the Middle

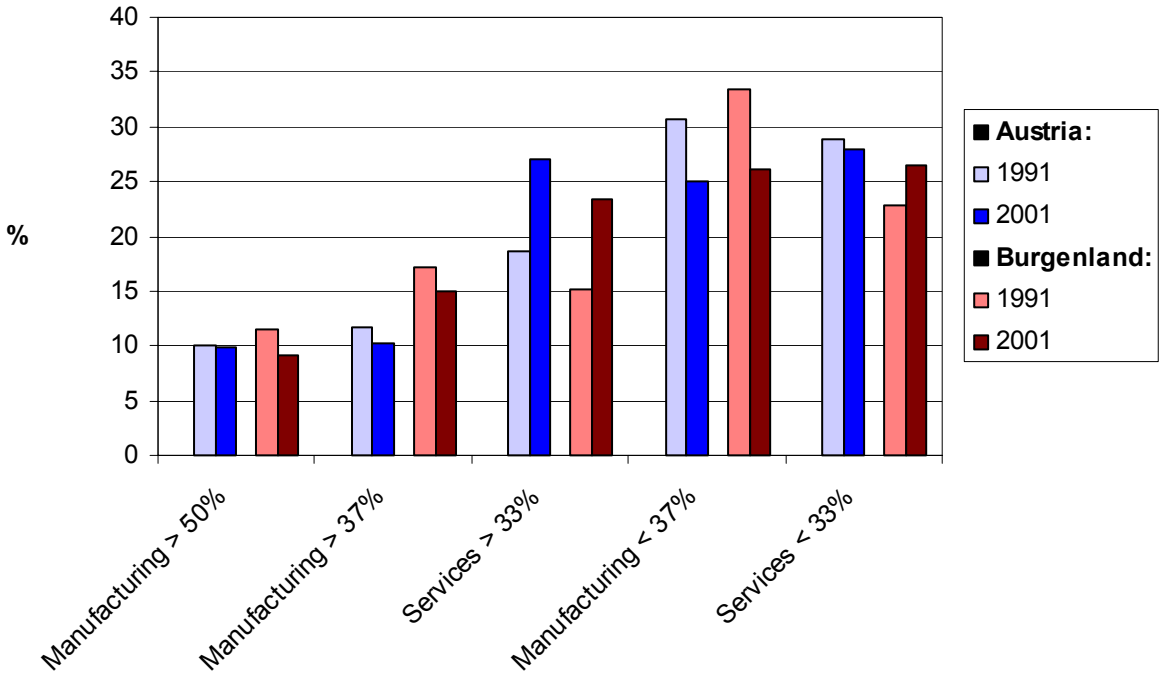
and Southern parts only gain 54% (1995 figures). Average annual growth rates of 6% between 1995 and 1999, however, are among the highest in Austria and underline the recent positive economic development compared with the the rest of Austria (5.5% on average). In addition, there has been a strong sectoral shift, as the GDP per capita in the primary sector has been shrinking (-7.5%) while those of the secondary and tertiary sectors have been expanding (8.2% and 7.0%, respectively).

Regarding research and development, Burgenland is the weakest region in Austria. In 1998 it had a share of only 0.3% of R&D personnel and 0.2% of total R&D expenditure. This can largely be explained by the lack of universities and research organizations as well as the unfavourable industrial structure. Burgenland's economy is heavily dominated by small and micro firms. 83% of the firms are micro-enterprises (i.e less than 10 employees). Overall, they employ 25% of the total labour force. By contrast, only 2.4% of firms employ between 51 and 250 people, only 0.3% more than 250. The sectoral composition is quite diverse, most important (in terms of employment) are food, electrical and instrument engineering as well as wood, paper and printing. 9% of Burgenland's employees are in agriculture and forestry which is 4 %-points above the Austrian average). The share of services is 61% which is 3 %-points below the Austrian average. The manufacturing sector too is smaller than in other parts of Austria. Its share in employment reaches only 18% compared with the Austrian average of 22%. The only strong concentration of the tertiary sector can be found in the regional capital of Burgenland, Eisenstadt. However, over the last years tourism and health services have been expanding in Burgenland, especially in the middle and southern parts of the province.

2.2 Structural changes in Burgenland with a special focus on innovation

The relative innovation performance of Burgenland's economy can be assessed by comparing the sectoral shift of innovation classes based on data from the recent Community Innovation Survey (CIS 3) in Austria. For this purpose we have defined five innovation classes which are distinguished by the percentage of firms with product innovations in any industry. We have then compared the share of these classes in total employment and their growth between 1991 and 2001. Based on CIS 3 the most innovative industries in manufacturing (i.e. those with more than 50% product innovators) are the chemical, electronics and automotive industries, with up to 95% in the case of chemicals. Less innovative but still above the average of the manufacturing sector (37%) are the food, plastics and glass industries. In services the more innovative industries (more than the sector-average of 33% product innovators) are banking and insurance as well as data processing, research and development and engineering. All other manufacturing and service industries which are below these thresholds belong to the less innovative classes. Certain industries like mining, energy, construction, retail trade, tourism and a few other service industries are not covered by CIS 3.

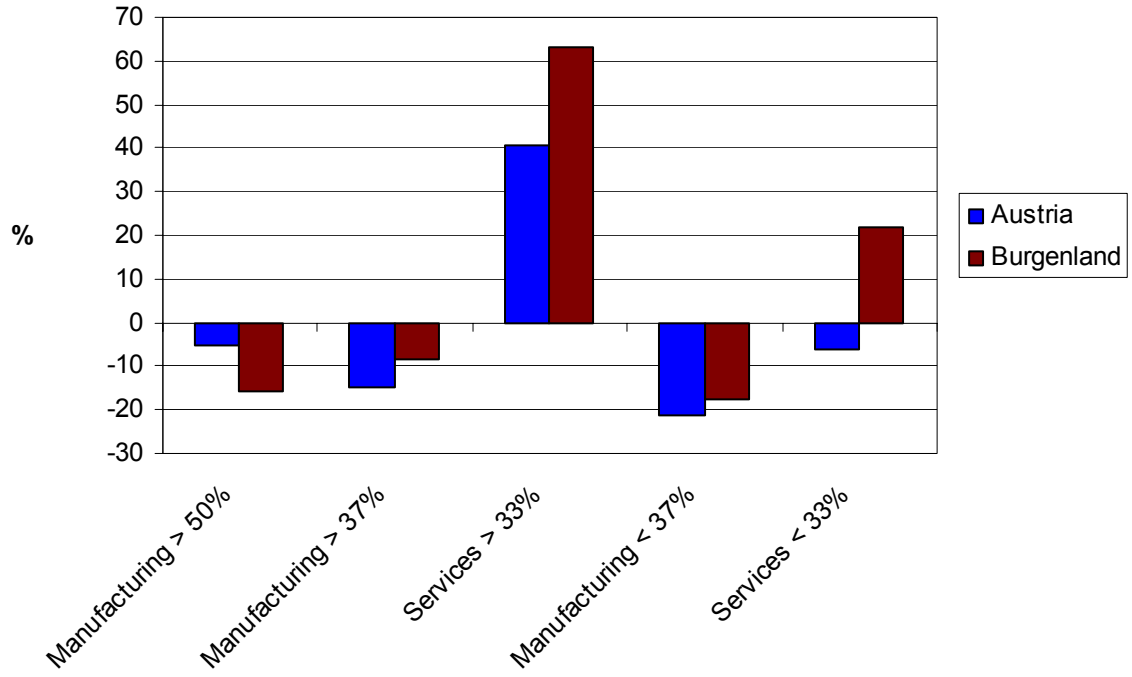
Figure 1: Share of classes of innovative performance* in total employment 1991 and 2001



* Industries with a share of firms with product innovations above or below certain thresholds. In manufacturing the overall share of product innovators is 37%, in services it is 33%. Innovation data are for 1998 - 2000.
Source: Statistik Austria: 3. Europäische Innovationserhebung (CIS 3) 2002, Arbeitsstättenzählungen 1991 and 2001.

Corresponding to the general trend of decreasing employment in the manufacturing sector, in almost all innovation classes of this sector, employment in relative terms has been reduced between 1991 and 2001. Only the most innovative industries in Austria could keep their share in employment at the same level. This, however, is not true of Burgenland. Here also the share of the most innovative industries is lower today than in 1991. In general, the importance of services has grown. But it is interesting that while the share of the less innovative service industries in Austria has decreased slightly, in Burgenland their share has increased. As the next figure shows, this is due to the fact that the whole service sector in Burgenland has grown more in Burgenland than in Austria.

Figure 2: Growth in employment in classes of innovative performance* 2001 against 1991



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We see that the structural changes in Burgenland are only partly in favour of more innovative industries. Innovative services have grown stronger in Burgenland than in Austria, but their share is still lower in this region than in Austria. A precarious development is the much stronger decline in the most innovative manufacturing industries in Burgenland than in Austria.

3 Innovation in Burgenland's economy

The findings in this chapter are based on a survey of innovative firms in Burgenland, which covered exclusively firms with at least one product innovation in the recent past, even if it was only a minor one. There are no firms without any innovation activity in this survey. The innovation survey was conducted within the framework of the mid-term evaluation of the Objective 1-programme Burgenland at the end of 2003. The survey was based on a questionnaire sent by mail. All firms were reminded twice by telephone. Eventually, we arrived at a number of 64 respondents of which 54 were fully usable for analysis. The response seems weak but it has to be considered that the number of firms actually engaged in innovation is much smaller. Information from a regional technology centre leads us to the assumption that only about 500 firms in Burgenland are actually innovative. This is also supported by the CIS 3-data for Austria that show that only about one third of Austrian firms

are innovative. 34.6 % of all Austrian firms (covered by CIS 3) have had product innovations in the time period between 1998 and 2000, 36.9 % in the manufacturing and 32.8 % in the service sector. If it is assumed that this ratio does not differ too much between Burgenland and the rest of Austria, about two thirds of Burgenland's economy is not innovative at all. Therefore due to the fact that our innovation survey aimed only at innovative firms excluding firms without innovation, we estimate that the relevant response rate is about 10%.

Before we present the results of the survey, let us characterize the responding firms. In total, 37 firms belong to the manufacturing sector, 17 to services. The manufacturing sector is rather well represented in the survey, more or less matching the size in Burgenland's economy. There is only one exception - electrical and optical equipment - which is strongly overrepresented in the survey (2% of firms in Burgenland belong to this industry, but 30% of the firms in the survey). Two sectors are underrepresented in the survey - services (39% in Burgenland, 20% in the survey) and construction (29% in Burgenland, 13% in the survey). Regarding size most responding firms are small: 25 firms have less than 10 employees, 19 less than 50, 9 less than 250 and only a single firm is large (with 392 employees). As far as the firms' age is concerned, most firms are relatively young. Only 3 firms have been founded between 1900 and 1945, 10 after the war until 1979, 5 in the eighties, 19 in the nineties and 17 since 2000.

3.1 Innovation output

By definition, all firms responding to our survey are innovative. They were asked to describe the most important innovation project in the past three years. If they had none, they were not considered. Firms could refer to finished as well as ongoing projects. Furthermore, they were asked to indicate whether the described project was a minor or major innovation. In the questionnaire, three categories were offered: 1) modification of an already established product (e.g. redesign, improved usability), 2) introduction of a new product in the firm's product range without being new to the market, 3) introduction of a product which is new to the market (i.e. without facing a directly competing product). Table 1 shows the relative frequency of each type of innovation:

Table 1: Scope of innovation (% of firms)

	Total	Manufacturing	Services
Product modification	18.5	21.6	11.8
Product new for the firm	33.3	29.7	41.2
Product new to the market	42.6	43.2	41.2

Source: Midterm-evaluation survey

According to the self-assessment of the responding firms most of their innovation activity is rather far-reaching, leading to some kind of temporary monopoly at least on their regional markets. This applies to both manufacturing and services. Simple product modification is more usual in manufacturing whereas adding a new item to the product range is more frequent

in the case of services. The fact that the information from the survey is based on one innovation project per firm does not incur a serious problem. Most responding firms have only one (20 firms) or two (12 firms) ongoing innovation projects anyway. Only 9 firms indicated more than two projects. So the results are quite typical for the firms and not exceptional.

What is the position of Burgenland regarding some key innovation indicators in Austria? Are there remarkable differences?

Table 2: Key innovation indicators of Burgenland[1] compared with Austria[2]

	Burgenland	Austria
Share of firms with products new to the market		
(% of all innovative firms)	42.6	39.9
- in manufacturing	43.2	52.8
- in services	41.2	35.1 [3]
Turnover based on innovative products	26.9	13.2
(% of total turnover)		
- in manufacturing	27.2	20.5
- in services	26.2	30.5 [4]

Source: [1] Midterm-evaluation survey, [2] Statistik Austria: 3. Europäische Innovationserhebung (CIS 3) 2002
[3] Data processing and R&D only, [4] Data processing only

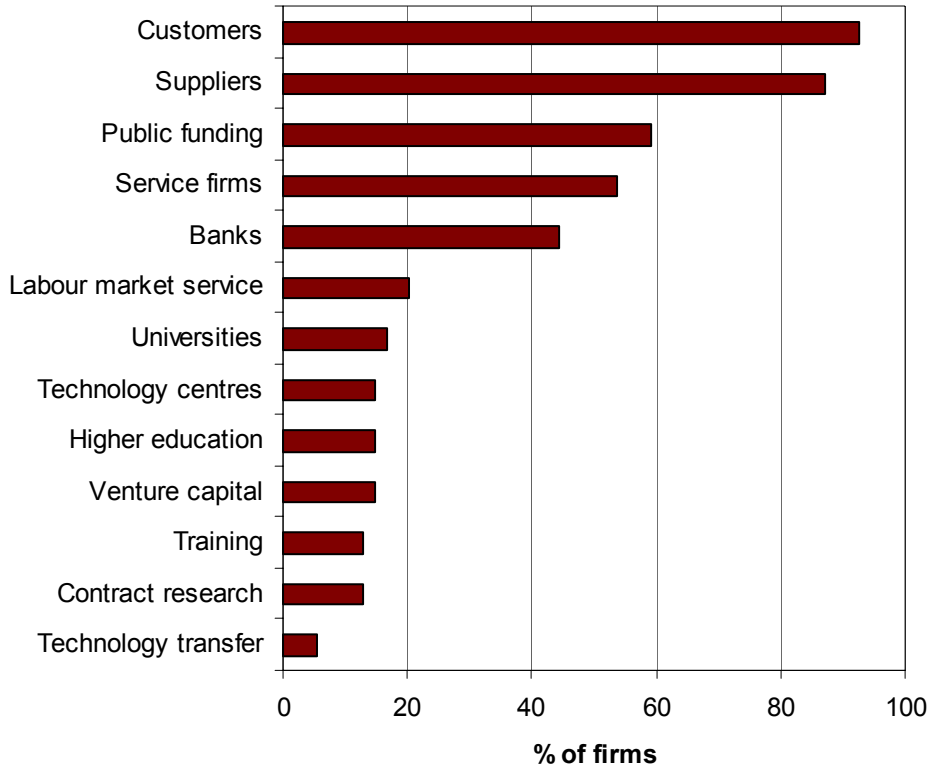
As far as the relative importance of products new to the market is concerned, Burgenland seems to be rather similar to Austria in general. Services and manufacturing differ significantly, however. Service firms in Burgenland seem to be more innovative than this sector in Austria whereas manufacturing seems to be lagging. But this result has to be interpreted with caution because the composition of the samples in our survey and in CIS 3 differ considerably regarding services. In order to make the results more comparable, we show the Austrian CIS 3-data only for two industries which are similar to the selection in our survey - data processing and R&D. Nevertheless our data lead to the conclusion that the service sector in Burgenland is comparatively more innovative than the manufacturing sector.

3.2 Innovation networks

A part of the questionnaire focused on the external relations in the innovation process of the firms (see figure 3). Most important are partners within the value chain - customers and suppliers. In this respect our survey confirms an already well established fact. More remarkable is the strong role of public institutions providing financial suport for innovation projects. They are even more frequent partners than producer service firms. In general, we find a rather traditional approach to the funding of innovation activities: Banks are by far more often involved in innovation projects than institutional providers of risk capital like venture capital funds. Concerning the diversity of the innovation networks, most firms in

Burgenland have only few types of partners. It is, in particular, partners from research, training and education as well as technology transfer that are often missing. Comparing this result with CIS 3-data it has to be concluded that firms in Burgenland are less willing or able to co-operate with such partners than firms in other parts of Austria.

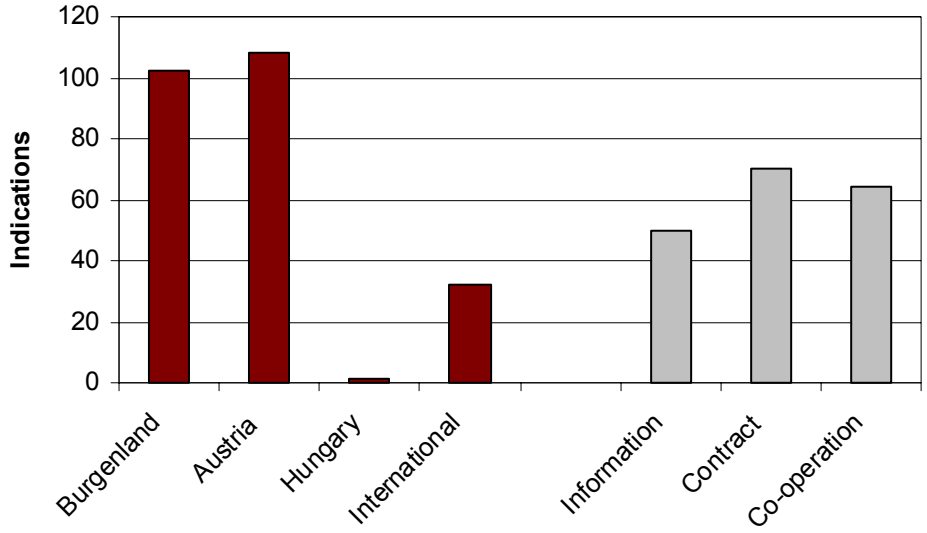
Figure 3: Innovation partners of firms in Burgenland



Source: Midterm-evaluation survey

Looking at the spatial dimension of the innovation networks, the next figure shows that most firms have partners only in the region or in Austria. International relations are comparatively rare. We were especially interested in cross-border partnerships with firms or other organizations in Hungary. Our survey is unambiguous and disappointing in this respect. Only a single firm has an innovation partner - a supplier - from Hungary. The potential of cross-border innovation projects has not yet been explored at all.

Figure 4: Location of innovation partners and nature of relations with them



Source: Midterm-evaluation survey

Figure 4 shows not only where innovation partners are located but also what the nature of these relations is. Contract relations - e.g. provision of components for an innovation project by a supplier, innovation-related consultancy by a service firm or development of a component by a research organization - are most frequent. But there are also many co-operations where partners pool resources to achieve a shared objective. Simple information relations without further interaction are less frequent.

One remarkable finding of our survey is the strong role of public support for innovating firms in Burgenland. As the following table shows, co-funding by public institutions is far more frequent in Burgenland than in the rest of Austria. But this is due to national and regional institutions. Our survey also shows that there is hardly any difference between Burgenland and the rest of Austria when we consider co-funding by the European Union (structural and framework funds).

Table 3: Public support of innovation projects in Burgenland[1] and Austria[2]

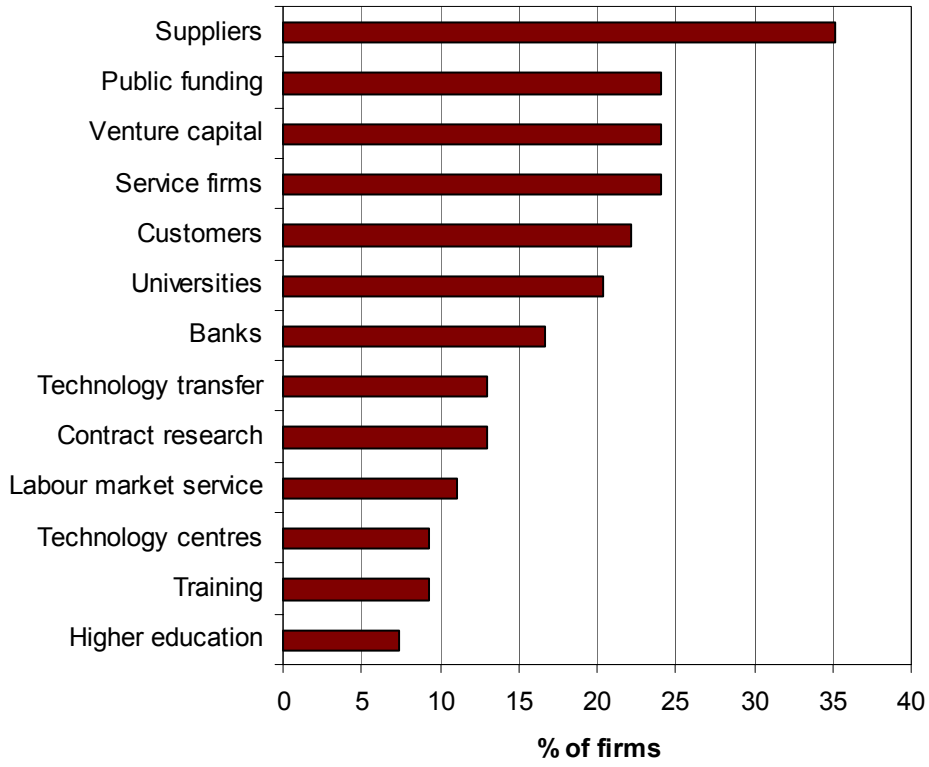
	Burgenland	Austria
Share of innovative firms with public co-funding (%)	61.1	38.3
- in manufacturing	64.9	49.1
- in services	52.9	25.2
Share of innovative firms with EU co-funding (%)	11.1	11.5
- in manufacturing	13.5	15.5
- in services	5.9	7.0

Source: [1] Midterm-evaluation survey, [2] Statistik Austria: 3. Europäische Innovationserhebung (CIS 3) 2002

3.3 Problems constraining innovation

The most serious barriers - problems actually preventing or having prevented some innovation projects of the responding firms - are financial: lack of public and private funds (indicated as "preventing" by 15% and 13% of the firms, respectively) and too high taxes (11%). Less important negative factors - problems which delay innovation projects but do not prevent them - are, in addition to the financial barriers, deteriorating market conditions (indicated as "impeding" by 33% of the firms), lack of distribution partners (28%), lack of adequately qualified labour force (26%) and missing access to international markets (22%). A lot of potentially important barriers came out to be negligible. About or more than 80% of the firms stated to have no problems regarding research (like missing research partners and inadequate access to international research programmes), consulting (insufficient law and marketing services), infrastructure (inadequate IT-networks and transport links) and legal restrictions (rigid environmental and work standards). Unfortunately, it is hardly possible to decide whether this reflects the true situation or is caused by unawareness of latent deficiencies.

Figure 5: Innovation partners not sufficiently available in the region



Source: Midterm-evaluation survey

3.4 Changes in innovation activites and organization of firms

Let us start with the intended change in innovation activities: 46% of the responding firms are planning to increase their innovation efforts, 37% want to hold the level, 11% will probably reduce them and only 4% will not start any new innovation project in the future.

Regarding types of new innovation partners the survey shows that customers (48 indications) and suppliers (45) are by far the most frequently targeted. Banks follow with a distance (24). New partners from the service sector are less often mentioned (19) which is similar for public support and private risk capital (18 each). Partners from research are obviously hardly appreciated: Universities were mentioned 8 times, contract research 10 times and universities of applied sciences (*Fachhochschulen*) 11 times. We find that if there is any relevance for research partners then they have to be as applied as possible. Therefore there could be a more important role for higher education, i.e. *Fachhochschulen*, a rather young type of education in Austria, in this context.

Most firms expressed their intention to find new partners within the region (83 indications) or in Austria (87). To access new partners abroad is, in general, far less popular (39), but as far as Hungary is concerned, interest in new partners in this neighbouring country is comparatively quite strong (25).

Only 8 firms have changed their field of business in the recent past, but 34 plan to enter new sales markets in the near future. From those firms who have changed business, most have switched only recently, 6 since 2001. As far as sales markets are concerned we find a tendency towards more internationalization: 20 indications referred to Austria, but 25 to Europe excluding Hungary, 17 to Hungary and 15 to countries outside Europe. This does not apply to purchasing. Here Austria was mentioned 10 times, only 9 indications referred to Europe as well as Hungary and only 3 to countries beyond Europe.

39% of the firms said that they are going to introduce a new technology. Almost all of them stated that the new technology was necessary for their product innovation activities. All other reasons for adopting a new technology, like reducing labour costs and inputs, substituting for cheaper inputs or protecting the environment, are negligible in comparison.

Finally, most firms (52%) intend to increase employment, 44% do not plan to change the number of employees and only very few (2%) will probably reduce employment.

4 Effects of Structural Funds on innovation in the regional economy

4.1 Do firms supported by the EU differ from those who are not with regard to innovativeness and propensity to change?

In the following table the scope of innovation and organizational as well as business changes are compared between firms with and firms without co-funding by EU Structural Funds. Of course, this does not imply that EU-funding was necessary in a particular case for the realization of an innovation, the setting up of a new firm, the change of business activity or the entering of new sales markets. The data only show whether EU-supported firms are more innovative, younger or more ready to change its business orientation than those without support from the EU.

Table 4: Differences between firms supported or not supported by EU-funds with regard to innovation and change (% of firms)

	with EU support (n = 6)	without EU funds (n = 44)
Scope of innovation:		
- Product modification	16.7	20.5
- Product new for the firm	33.3	36.4
- Product new to the market	50.0	43.2
Start-up since beginning of recent programme:		
- Firm founded since 2000	50.0	30.4
- Firm founded before 2000	50.0	69.6
Change of the core business in recent years:		
- Change of business	0.0	18.2
- Same business	100.0	81.8
Entering new sales markets in recent years:		
- New sales markets	66.7	63.0
- Same sales markets	33.3	37.0

Source: Midterm-evaluation survey

Regarding innovation, the fact to be supported by the EU does not make any significant difference. The frequency of the three innovation categories are rather similar for both types of firms. We have to conclude from our survey that firms which have received co-funding from the EU are not more innovative than those without support. This is also true of new sales markets. For both types of firms, a similar majority has entered new markets in the recent past.

But there are two features where we find significant differences: Firms with financial support from the EU are younger. Obviously, EU-funds have a positive effect on start-ups. However, we cannot conclude from these data that EU-support has actually raised the rate of start-ups. It has certainly been helpful, but hardly in all cases necessary. Furthermore, we find that not a single firm supported by the EU has changed its core business activity in the past years. But

this result might be less remarkable than it seems considering the facts that the change of business is generally rare and that supported firms are younger which makes such a strategic change less likely.

The general impression from these results is ambiguous. Of course, there are no easy interpretations regarding causal relations. Furthermore, even if there were a relation it would often be hidden by a long time lag between support and effect. Overall however, the effects of Structural Funds on innovation and structural change seem to be rather limited. Maybe this is due to the inappropriate targeting of innovation at all. In the next chapter we will investigate this question.

4.2 Does Burgenland's Objective 1-programme target innovation appropriately?

After having discussed innovation activities, networks and problems in Burgenland as well as differences - or the lack of differences - between firms with or without EU-support regarding innovation and change, we will investigate now the possible effects of the Objective 1-programme by looking at their measures in detail. By confronting the instruments applied with the needs deduced from our survey, we are going to assess whether the most important needs are adequately addressed or whether they are missed.

The Objective 1-programme of Burgenland comprises 6 priorities: manufacturing, research-technology-innovation, tourism-culture, agriculture-forestry-environmental protection, human resources and technical support. In total the programme provides 270 m € of EU-funds (ERDF, ESF, EAGGF). Only the first two priorities comprise measures that concern innovation. Priority 1 has an EU-budget of 88 m €, priority 2's is 29 m €. Together they account for 44% of the Objective 1-programme. According to the objectives as laid down in the programme documents (EPPD, EzP) all nine measures of these two priorities are aiming explicitly or implicitly at innovation. But as we will see in the following, the effects of many measures on innovation in Burgenland's economy are actually far weaker than intended.

Table 5 gives a brief overview of objectives and actual effects on problems or needs of regional firms regarding their innovation activities.

Table 5: Objectives and actual performance of innovation-related measures of the Objective 1-programme Burgenland (2000 - June 2003)

Measure	Tied[1]	Objective	Effects
1 Manufacturing			
1.1 Strengthening economic development	63%	Supporting material and immaterial investments that increase the competitiveness of firms, the value added of its products and that help to enter new markets. Projects should also have positive effects on the environment.	Well accessed - 16 from targeted 20 projects already realized. Mostly extension and upgrading projects, only few start-ups. Only one environmental project (biomass), few effects of other projects on environment.
1.2 Support of SMEs in structural change	18%	Supporting SMEs' capability concerning co-operation, marketing, diversification and internationalization.	Small projects than expected, mainly concerning setting up, extending or modernizing a plant and consultancy. Few co-operations.
1.3 Priority-supporting infrastructure	104%	Improving locations to attract new firms (transport, communication and other infrastructure, business parks and fairs).	Too many objectives regarding the available budget. Only four projects for which already all funds have been required (extension of a business park, a new fair building, two water projects).
1.4 Information technology, telecommunication	38%	Improving the access to data networks and the use of the Internet. Stimulating ICT R&D-projects.	No infrastructure projects so far (because they are usually incompatible with the regional boundaries). 8 ICT-related R&D-projects, mostly without co-operation.
1.5 Venture capital	100%	Establishing a venture capital fund to provide risk capital to SMEs.	The fund is insufficiently endowed with capital. The fund is already used up but has only four investment projects.
2 Research, technology, innovation			
2.1 Clusters, competence centres	20%	Stimulating the emergence of clusters. Establishing competence centres (which comprise firms and research organizations).	There are many cluster initiatives (11), but they are lacking substantial activities, no building-up of competence. Only a small part of the budget has been used so far.
2.2 Technology and incubation centres	63%	Establishing or extending technology and incubation centres and a university of applied sciences (Fachhochschule).	The budget has been already used up with the extension of one and the establishment of two new technology centres.
2.3 Innovative services	7%	Supporting the introduction of innovative services.	Only very few (4) R&D-projects so far (all concerning software).
2.4 R&D-projects	47%	Supporting research and development projects, especially in co-operation with research organizations.	There are less projects (13) than expected, but they are more expensive (software and electronics). Only two projects are in co-operation with science.

[1] ERDF-funds committed

Source: ERDF monitoring, EzP

In addition to these objectives the programme is intended to stimulate start-ups. The target of 500 new firms during the programming period has been clearly missed so far. In the first two priorities only 4 start-ups have been recorded until June 2003.

Overall, the objectives are too ambitious considering the available funds. Actually, what is primarily supported in priority 1 are investments of firms aiming at modernization or extension of plants. R&D-projects, start-ups and co-operations, especially with research organizations, are far less frequent. The effects of the priority 1-measures on innovation are therefore rather weak. Priority 2 is closer to innovation but only successful as far as R&D-projects, mainly in software and electronics, are concerned. Network effects are weak. Clusters are numerous but lack substantial activities regarding building up of competence and joint learning. Joint R&D-projects with research organizations are rare as well.

Infrastructure (primarily supported in the second priority) concerns more or less the extending or setting up of technology centres. The aim of the measures is to provide facilities, but not to offer innovation-related and -supporting services like technology transfer, network-building, or innovation management consultancy. The establishment of a regional venture capital fund does certainly match an important need of many firms. The fund, however, is far too small to have wider effects on the regional economy's endowment with risk capital.

Table 5 suggests that the Objective 1-programme does not sufficiently target the really important needs and problems of firms regarding innovation. Table 6 shows that the relative importance of innovation-related projects in the total Objective 1-programme is very small.

Table 6: Needs of firms for innovation support targeted by the Objective 1-programme

Needs	Stated / Latent [1]	Projects targeting this need	Project volume (m €) [2]	Share in pro-gramme (%) [2]
Co-operation with research organizations	L	3	2.0	0.4
Development co-operation with firms	S	2	2.0	0.4
Technology transfer	L	1	1.4	0.3
Technology centres, applied sciences (higher education)	L	5	39.4	7.5
Suppliers nearby	S	11	0.6	0.1
Venture capital	S	1	30.0	5.7
Distribution partners	S	0	-	-
International partners	S	0	-	-
Cross-border partnerships	L	0	-	-
New sales markets	S	?	-	-
New technology for product innovation	S	2	6.2	1.2
Qualified personnel	S	? [3]	< 14.0	< 2.7

[1] Stated: explicitly mentioned by at least a quarter of the firms. Latent: important factors contributing to successful innovation (deduced from research), but not mentioned by 25% or more of the firms.

[2] Total project volume comprising EU-funds as well as national, regional and private funds (2000 - June 2003).

[3] Three measures of priority 5 (Human resources), funded by ESF, aim at improving qualification. Due to the fact that these measures do not only support this objective, the effective amount is less than presented in the table, but we lack more detailed data.

In total, only 25 projects (disregarding qualification measures supported by ESF) have been targeting the most important problems or needs of firms' innovation activities until June 2003. Their total amount of committed investment (public and private) of 95.6 m € accounts for only 18 % of the Objective 1-programme. Furthermore, most funds are used up for improving the regional technology infrastructure in Burgenland (but not their range of services) and for providing risk capital. But also these projects do not perfectly meet the firms' needs. The establishment and extension of technology and incubation centres concerns only the material investment in facilities, but not the range of services of these centres for SMEs that need specific innovation support. Our survey shows that many firms did not indicate any interest in relations with technology centres. This is no surprise considering the limited range of services of these centres today. Of course, many problems are latent, firms are not aware of certain deficiencies. As a consequence, it is not enough to add new services to the centres' activities, they have to be offered proactively. As far as venture capital is concerned, the available funds are still far too small to have any significant effect on endowment of the regional economy with risk capital.

Table 6 shows also that many important needs of firms in order to improve their innovation performance are hardly represented or not targeted at all. This applies in particular to network-oriented projects like research co-operations with science and truly innovative clusters of firms. The number of such projects is comparatively negligible. Support for international and cross-border co-operations with Hungarian partners regarding innovation and marketing is missing completely. It is particularly this kind of support that would very likely raise the innovation performance of firms in Burgenland. This conjecture is confirmed by many findings of recent innovation research. The importance of networks for the success, even the emergence, of innovation projects of firms is a well established result in the literature. Innovation is almost always of a systemic nature (Kline and Rosenberg, 1986), comprising networks on the international, national (Lundvall, 1992; Nelson, 1993) and regional levels (Braczyk et al., 1998). Intensive direct personal communication is frequently precondition for successful innovation co-operations (Nonaka and Takeuchi, 1995). It enables the emergence of trust which is necessary for such relations (Malecki and Oinas, 1999). And it helps to overcome the difficulties to exchange tacit knowledge (Cowan et al., 2000). Networks can involve a broad variety of organizations, private and public, business and science, manufacturing and services. Often more radical innovations require contributions from partners who follow rather incompatible rationalities like firms and university departments (Kaufmann and Tödtling, 2001). However, they are usually very difficult to be established, to be managed and, what is our concern here, to be initiated by public support. So far, at least in the case of the Objective 1-region Burgenland, EU structural funding has not been successful in this respect.

5 Conclusions

Analysing the data from our innovation survey as well as from the programme monitoring, we conclude that, overall, the Objective 1-programme Burgenland is too small, covers too broad a range of tasks and negelects too many crucial needs and problems to be really effective in stimulating innovation and, eventually, transforming in this way Burgenland's economy to become more competitive and dynamic.

We think that one important reason for the inability of Structural Funds to stimulate innovation is the ambition to follow two rationales in one programme. One strategic focus is convergence, closing the gap between poorly and strongly performing regional economies. The other strategic focus is competitiveness, raising the innovative performance of firms. The second rationale implicitly accepts that regional differences may emerge or become stronger. Both rationales tend to be in conflict. They are not necessarily contradictory, because in theory it is possible to increase the potential for innovation equally in all regions. But in reality, such a spatially equal development is extremely unlikely. In other words, when aiming at raising competitiveness, the emergence or increase of core-periphery patterns have to be taken in account as an unavoidable consequence. From a regional policy perspective, this is acceptable if (and only if) both regions - the centre as well as the periphery, are better off afterwards (see also the discussion in the so-called "new economic geography", e.g. Krugman, 1991).

Focussing on what is actually done and not what is stated in the Objective 1-programme Burgenland, we find that convergence is the primary rationale. Accordingly, low-risk single-firm investment projects are predominant. The operating principles of most Objective 1-measures are basically risk-averse. Institutions in charge of administrating these measures have no incentive to select more innovative and, as a consequence, more risky projects.

A second problem resulting from the design of Structural Funds is the restriction of support on eligible and often very small regions. This applies clearly to our case, the region of Burgenland, which is small even for Austrian standards. Many network-oriented projects of innovation support (e.g. clusters, ICT-infrastructure) cannot be supported within these restricted boundaries.

In order to be truly effective, innovation-oriented regional development has to accept that some kind of core-periphery imbalance might emerge or be reinforced. This is a strategic policy decision and it requires appropriate consideration in the Objective 1- or 2-programmes. Each approach - innovation or convergence - needs a different set of instruments. To try to achieve both objectives within one programme with a relatively small budget is bound to miss one of them; at present, this applies to the stimulation of innovation.

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