The Effectiveness of Public Support in the Form of Innovation Vouchers – Czech regional case

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Abstract: - Currently knowledge and innovation play important role in regional economy. We can say that innovations are engines of economic growth. Each region is trying to encourage innovation by certain tools. However, there is no universal approach, how effectively support creating a sustainable environment for creation and spread of innovation from public finance. In this context the tool supporting knowledge transfer from research institutions to private sector was developed. This tool is the innovation vouchers, which have been used for the first time in Czech Republic region - South Moravian Region (NUTS3) - since 2009.
This paper is focused on evaluation of the effectiveness of financial resources spent on innovation voucher program in South Moravian Region. Evaluation will be conducted via descriptive analysis of available and published data. The obtained results will be the basis for deciding whether the public support in the form of innovation vouchers is suitable tool for the support and diffusion of innovation.

Key-Words: - Innovation, innovation vouchers, spill-over effect, knowledge

1 Introduction

Currently knowledge and innovations play important role in regional economy. We can say that innovations are the fundamental driving force of economic growth and key factor in competitiveness. Therefore, there is a huge literature about knowledge and innovations. All authors agree on the idea that innovation can be understood as an interactive learning process performed by a company in given area. [1].

Each region is trying to support innovation process by certain tools. However, there is no universal approach, how effectively create a suitable environment for creation and spread of innovation, at the end of 20. Century M. E. Porter began investigating the influence of innovation. He examined the links between companies and research institutions that underpin the innovation process. His main contribution was the idea, that the best form of above mentioned links might be industrial clusters [8].

The idea of industrial clusters has become a starting point for the creation of innovation systems. The first step was the establishment of National innovation systems (NIS), which have been used since 1980. So far there is no clear definition of National innovation systems, but the most suitable definition is following one: NIS is a network of institutions from public and private sector which joint activities and interactions initiate, import, edit and disseminate new technologies [6]. Lundvall adds that these interactions are within one state [6].

This approach, however, faces the problem of a "size" of the nation state because this national region can be divided into several smaller regions and each of them needs different tool to support innovation process, because each region has a different starting level of innovation production and has different geographic, demographic and economic conditions. Why it cannot use the same tools to support innovation in the national regional policy in all regions of the state.

In response to this problem regional innovation system (RIS) have been developed and regions have become centres of innovation, because innovations arise on the regional level through regional network of innovative companies, or local industrial clusters with significant contributions from academic institutions in the region [2]. Cooke [3] adds to this approach that it is the interaction between companies and other organizations working with innovation play an important role in regional innovation potential.

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In practice of Czech Republic was developed tool for support just regional innovation potential – regional innovation strategy implemented on regional level. These strategies are implemented and supported from public funds. As part of this strategy is also mentioned using of innovation vouchers as a useful tools for the promotion of innovation in the region.

In the first part of presented paper there is theoretical background. In second part there is the Case study about South Bohemian Region. In this part is is performed the descriptive analysis of voucher program, which has not been made in Czech Republic yet.

The aim of this paper is effectiveness evaluation of innovation vouchers like the public support form in case of South Moravian Region (Czech Republic).

2 Innovation vouchers

2.1 Target and Purpose

Innovation vouchers [7] are small lines of credit provided by governments to small and medium-sized enterprises (SMEs) to purchase services from public knowledge providers with a view to introducing innovations in their business operations.

The main purpose of an innovation voucher is to build new relationships between SMEs and public research institutions.

Innovation vouchers are intended as pump-priming funding through which initial industry-university relationships can be established.

The issuing of the voucher has two main impacts, both of which overcome major incentive barriers to usual engagement between SMEs and knowledge providers.

1. The voucher empowers the SME to approach knowledge providers with their innovation-related problems, something that they might not have done in absence of such an incentive,
2. The voucher provides an incentive for the public knowledge provider to work with SMEs when their tendency might either have been to work with larger firms or to have no industry engagement at all.

For the successful implementation of the OECD innovation vouchers were defined some general steps, which are:

1. The availability of vouchers is advertised widely in the press and through the internet,
2. SMEs are requested to submit an application, which should possibly be electronic to keep the application process and the overall management of the program as simple as possible,
3. Vouchers are awarded by the government agency delivering the program. Specific selection criteria should be set out beforehand and in the case that number of applications is higher a simple lottery has been used to determine the winners of voucher,
4. Once the SME has been allocated an innovation voucher, it formulates a completed research question and commissions through the voucher a public knowledge institution to solve the question,
5. There is generally a time limit 6-12 months by which a voucher must be used,
6. Feedback of the implementation of the voucher to providing agency.

These steps can be of course modified according to the local and concrete needs.

2.2 Evaluation of voucher program

The impact of innovation vouchers can be evaluated through ex-post surveys aimed at assessing the short- and long-term behaviour of the voucher's recipients [7]. In particular, two types of additionality are important to measure: *output additionality* and *behavioural additionality*. The first refers to whether or not the assignment for which the voucher was given would have been carried out also without public support. The second refers to whether or not the voucher's recipients have been further contracted public research organizations for follow-up assignments paid through other means (e.g. retained savings or other public funds).

A control-group methodology is best suited for assessing the effectiveness of the tool with regard to its ability to trigger both short- and long-run industry-university collaborations, to have an impact on concrete innovation outputs, and to improve the perception of firms toward university research.

The wide recourse to innovation vouchers demonstrates that, thanks to its simplicity, the measure can be easily adopted by countries and regions worldwide, provided that small firms have a minimum "absorptive capacity" towards university research and that universities and public research institutions are willing to cooperate with industry.

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Innovation vouchers are traditionally used to solve minor technological problems or scope out larger technological issues. As such, they are useful instruments but need to be integrated into wider innovation strategy in which voucher recipients can refer to other policies for further stages of business innovation. Examples include collaborative research programmes, incentives for internal R&D, clusters and networks for innovation, etc.

3 Innovation vouchers in South Moravian region – case study

In South Moravian region was the innovation voucher program introduced in 2009 as a part of the third update of regional innovation strategy. According to the above mentioned fact we can say that this is a very effective way of introducing this instrument, because there is obvious connection to support the development of region's competitiveness. The South Moravian Innovation Centre is responsible for innovation voucher program in South Moravian Region, and also provides the actual implementation of regional innovation strategy and to update it.

Innovation vouchers [4] are defined by South Moravian Innovation Centre as financial instruments to support interaction and cooperation among entrepreneurs, institutions and scientific research capacities (knowledge providers) on smaller joint projects. This tool should motivate entrepreneurs to realize contact with the knowledge provider, which otherwise would not be realised. The aim is to help breaking down mutual barriers and prejudices between companies and research institutions and developing new larger cooperation in the future. On one hand, competitiveness of companies might be strengthened; on the other the commercialization of research result of the knowledge providers might become more effective.

Innovation voucher is a subsidy provided to a company in order to purchase a research service from a knowledge provider. This service is based on knowledge transfer, i.e. transfer of knowledge of scientific of technological nature that is new for the company and is not commonly available. Purchased knowledge must, at the same time, lead to strengthening of companies' competitiveness, mainly through innovating its product, process or service.

The motivation for companies participating in innovation voucher project is particularly opportunity to establish long term cooperation with scientific research department and last but not least, a good experience with an earlier collaboration with scientific research department.

If there are more companies than the size of the volume of funds, are companies, which will be awarded a voucher selected by a lot, which is currently accepted by the companies very well, because it is very simple, fast and most fair and transparent way of decision.

Innovation voucher project is funded from the Brno city budget by financial transfers, which are provided for this purpose to South Moravian Innovation Centre, which has responsibility for this project.

There was a significant increase in number of providers of knowledge during the lasting of project - from the original four institutions to current twelve institutions, which entrepreneurs can establish the cooperation.

There are four universities, mostly technical focus, as well as five institutes of Academy of Sciences focused on physics, analytical chemistry, instrumentation and global change, and then three public research institutions in the fields of transport research, clinical research and veterinary research institute. All these institutions have their headquarters on branch in Brno or in its vicinity.

3.1 Innovation voucher process in practice

Process of innovation voucher project is almost equal to the OECD methodology (sec. 2.1), although there are some extra steps:

- The subsidy is granted by financial guarantor (Brno city) to implementation agency (South Moravian Innovation Centre – JIC),
- Framework agreement between JIC and the provider of knowledge,
- Agreement on mutual cooperation between the provider of knowledge and the entrepreneur,
- Submission of an application for an innovative voucher to JIC,
- Contract for providing innovation voucher between entrepreneur and JIC,
- Contract for work between the entrepreneur and knowledge provider,
- Sending a copy of the contract for work to JIC,

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- Implementation of contract,
- Payment to knowledge provider,
- Submit a request for payment including documentation of the project to JIC,
- Payment for voucher to entrepreneur,
- Sending accounting to financial guarantor,
- Evaluation of program is lasting during the program by JIC, the evaluation is focused on entrepreneur (voucher recipient) and on knowledge provider.

Basic information about the challenges which was still held and current challenge for 2012 are listed in table 1.

Table 1 Calls to the innovation vouchers

Year	No. Apps.	No. Win.	No. Lose	Total amount of funds (thousand EUR)
2009	199	38	37	228
2010	136	57	27	288
2011	210	52	29	288
2012				160

Source: own processing

There were some modifications of voucher program during the implementation of the each call. The first change took place in 2010, when it was established compulsory participation of entrepreneurs in 25 %, i.e. the subsidy covers 75 % of the amount of contract, but its maximum is 6 000 EUR. In 2011, companies in the whole European Economic Area can participate in the project for the first time. This possibility was used by five companies from Germany, Austria and Slovakia. The last change was in 2012 due to the reduction of the total amount of funds. Maximum amount was reduced from 6 000 to 4 000 EUR per voucher and since 2012 can apply for a voucher entrepreneurs around the world.

The above table shows that interest in innovation vouchers in South Moravian region during the lasting of the project increases. This is obviously due to the fact that companies from around the world not just from the Czech Republic can log into the new project. Another important change, which supports both the increasing number of applications for vouchers and the number of paid vouchers, is to establish at least 25 % participation of enterprises in the implementation of projects.

An important benefit for the South Moravian Region resulting from the implementation of innovation vouchers is moving branches of individual firms in the vicinity of three universities in South Moravia Region, because technological incubators usually take place near the universities. The implementation phase of the project, are usually located in above mention technological centres.

The above table also shows that there are a relatively large number of companies that were not granted a voucher. These companies have the opportunity to re-subscribe to these challenges. The survey [9] conducted by South Moravian Innovation Centre, however, shows that the number of repeated applications is approximately 24 % of all discarded. Another important conclusion of the above survey is that companies with prior experience with research institutions are more often reported in the challenges.

South Moravian Innovation Centre also monitors the behavior of unsuccessful applicants. In this context, there are an increasing number of failed companies who have successfully cooperated without granting the voucher. From the all unsuccessful applicants it is about 28 %. The total value of this realized cooperation is 455 354 EUR, i.e. the average value of individual investments of the company is 6 900 EUR.

The following Table, which is in appendix shows the overview of the collaboration undertaken among 2009 - 2011.

The data in this table are derived from case studies, which are processed by the South Moravian Innovation Centre, and data about value paid vouchers are provided from a representative of the South Moravian Region.

3.2 Results from the analysis

The table in appendix shows that most cooperation is implemented with a VUT Brno. This is mainly because most of the completed projects are a technical nature. In addition, this table also shows that since 2010 the mandatory participation of enterprises on the realized project in the extent of at least 25 % of its value. The maximum paid voucher is 6 000 EUR. The highest value of the implemented project is 10 326 EUR, which means that there is business involved more than the prescribed 25 %. From the case studies can be further observed that companies participate in the cooperation only a maximum amount that is 25 % of the cost. When the entrepreneur was not obliged to participate in the costs, any of the companies give finance beyond the voucher. It is important to note that nearly half of these companies would not

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cooperate without payment voucher; some would have made implementation in lesser extent and others only probably. We can suggest that innovation vouchers greatly encourage cooperation and transfer of knowledge between scientific research institutions and enterprises.

For enterprises that without innovation voucher did not realize cooperation, the majority are small and micro, rarely medium-sized enterprises. You can then draw another conclusion, namely that the small firms without public support could not engage in research and development. For this reason it is also for these companies very difficult to maintain its competitiveness and therefore vouchers should be directed primarily to group of small and little businesses.

4 Conclusions

Innovation vouchers are definitely modern incentive instruments, which can help increase interest particular local businesses to start research activities, like investment incentives. The aim of this work is to obtain a patent or innovation that will help gain market position, or just reduce production costs, which affect the final selling price and the company, can increase its competitiveness in the markets.

Due the economic situation is not common that companies in the CR have their R & D department. They rely more on innovation in the form of improvements or production proposals for implementation of small product innovation. The South Moravian region was in this situation, before the introduction of innovative R & D incentives.

After three years of vouchers duration we can see a slight improvement, respectively achieve some goals of vouchers. The controlled-group after the exhaustion of the innovation voucher continues in cooperation with scientific-research center. Measurable output is increase of added value of the enterprise. As the negative seems finding that voucher holders did not turn public financial support for major innovation, which would cause an increase in production capacity, creating new jobs and an enormous increase in revenue, which would affect the payment of taxes. The effectiveness of this innovative stimulus element is not quantified.

As the problem also appears lack of monitoring by the implementer of innovation support. This may be the goal of the project, which is not to ensure maximum efficiency, but the initiation of innovative capabilities of enterprises and research institutes in the region. Experience from the case study is transferable to other regions in the form of benchmarking. In implementing this form of support for innovative activities is recommended to proceed as follows:

- There should be an agency that will be responsible for the implementation of the voucher program and where will be trained workers who at every stage of implementation will assist both the entrepreneurs and the research institutions,
- The emphasis on minimizing administrative costs for companies during submitting applications - everything should preferably be electronically,
- During the various phases of the program to perform a monitoring of partial results,
- At the end of the project to check the innovation result based of submitted documentation,
- Ensure the establishment of subsequent long-term cooperation - select a suitable way of additional funding (to re-log into the program, but with higher participation of companies),
- Links to regional innovation strategy,
- The ex-post evaluation for example using questionnaires or interviews with representatives of the controlled companies and research institutions.

This case study can be further developed and used as a methodological basis for evaluation of public support.

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Appendix: Implemented cooperation through innovation voucher program in years 2009-2011

Company	**University knowledge provider**	**Value of project (EUR)**	**Value of voucher (EUR)**	**Year of impleme ntation**	**Implementa tion without voucher**	**Size of company *****
Tenza, JSC.	VUT Brno	4 160	3 120	2010-11	YES	Medium
A.W., Ltd.	Mend.U. Brno	5 800	4 350	2010-11	YES	Medium
Kaláb	VUT Brno	8 000	6 000	2010-11	NO	Medium
Gina Software, Ltd.	VUT Brno	7 200	n/a	2011	YES*	Micro
Mesing, Ltd.	ASCR v. v. i.**	7 560	5 670	2010-11	YES	Medium
OMICRON, Ltd.	VUT Brno	8 000	6 000	2010-11	NO	Medium
ELLA – CS, Ltd.	VFU Brno	10 326	6 000	2010-11	YES	Large
BENDER, Ltd.	VUT Brno	8 000	6 000	2011	NO	Small
ROMEX, Ltd.	VUT Brno	5 960	4 470	2010-11	NO	Small
MARAT, Ltd.	VUT Brno	7 960	5 970	2010	NO	Small
HOXTER, JSC.	VUT Brno	8 000	6 000	2010-11	YES	Micro
Filmochod, Ltd.	VUT Brno	5 042	n/a	2010	YES*	Micro
I. K. V., Ltd.	VUT Brno	6 000	4 500	2010-11	NO	Micro
ACEMCEE, Ltd.	MU Brno	8 000	6 000	2010-11	NO	Micro
REKUPER, Ltd.	VUT Brno	6 000	4 500	2010	YES*	Small
STROM PRAHA JSC.	Mend.U. Brno	10 000	6 000	2010	NO	Medium
Natural Energy E., Ltd.	VUT Brno	8 000	6 000	2010	NO	Small
It2b, Ltd.	Mend.U. Brno	6 000	5 042	2010	YES*	Small
Baktoma, Ltd.	Mend.U. Brno	6 000	4 500	2010-11	YES	Small
HYDROSYSTEM JSC.	VUT Brno	6 000	6000	2009-10	YES	Small
R. D. S. – CZ, Ltd.	VUT Brno	5 840	5 840	2009-10	YES*	Micro
Taurid Ostrava, Ltd.	VUT Brno	6 000	6 000	2010	NO	Small
Fortemix, Ltd.	VUT Brno	6 000	6 000	2009-10	YES	Micro
DAPE, Ltd.	VUT Brno	6 000	6 000	2010	YES*	Micro
BERNARD, JSC.	VUT Brno	6 000	6 000	2009-10	NO	Small
ENJOY Ltd.	MU Brno	5 678	5 678	2010	YES	Micro
ENERG-SERVIS JSC.	VUT Brno	4 269	4 269	2009-10	NO	Medium
INVEA-TECH	VUT Brno	6 000	6 000	n/a	n/a	Spin off

Source: own processing; * probably; ** public research institution; *** according to typology in [5]

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