Cluster Programs as Present Cluster Financing Instruments

PETER BURGER

Technical University of Košice, Faculty of Economics

Němcovej 32, 040 01 Košice

Slovakia

peter.burger@tuke.sk

Abstract

In many countries of the European Union but also in many other countries around the world, funding clusters through cluster programs *is becoming an important source of support for clusters in the country. The cluster* program *at a national or regional level allocates funding, creates organizational support and defines the rules for drawing support clusters. The cluster* programs *are significantly different based on co-funding, the duration of the cluster program, but also on the amount of the cluster program budget and on maximum amount of support available for the cluster. Similarly the cluster* programs *differ in the focus of their activities and in the objectives the clusters work to fulfill. The contents of this paper include the basic parameters of the optimal cluster* program *in Slovakia, principles on which* programs *should be based on, and which successful programs in the European Union and in the world could influence and help to define them.*

Key words: clusters, cluster programs, financing instruments.

JEL Classification: R12, R58.

1 Introduction

Today, cluster programs belong to the most frequent cluster support tools in the world. For the most part, even in countries with a high level of innovation performance, clusters finance part of their activities through public funds from cluster programs. Slovakia belongs to countries with the lowest cluster support in the European Union. Even though part of the clusters in Slovakia received financial support from public funds in 2013 and 2014, to this day there is not and has never been an independent cluster program designed for cluster support. Cluster support is provided from the state budget in the form of subsidies from the Slovak Republic Ministry of Economic Affairs. Cluster preferences vary based on which parameters an optimal cluster program should have. This paper contains cluster opinions on optimal cluster program settings and definitions of its parameters, such as optimal amount of a single non-refundable subsidy for cluster activities, the optimal duration of the cluster support through cluster programs, the maximum degree of cluster co-funding when receiving funds from a cluster program, and optimal timing of financial support for clusters through cluster programs based on the phase of the cluster's current life cycle.

2 Theoretical Background to Cluster Programs

A cluster program is a program on a national, regional, or local level, which allocates finances, creates organizational surety, and defines the rules of cluster support use. A cluster program is composed of organizational, financial, and human interventions. These

interventions lead to achieving previously set goals in a set period of time. Cluster programs generally have three stages; the first is the draft, the second is the implementation, and the third is the evaluation. Furthermore, cluster programs are realized in the form of projects (activities regarding cluster development), which are always managed by a single authority. Cluster programs are generally divided into prioritized areas, actions, and projects. Cluster programs are generally implemented by agencies. These agencies are created based on the focus of the state cluster politics on a national or regional level. Cluster programs form an important part of state cluster politics. Funding of prioritized areas and actions is determined through cluster programs. Cluster activities in demand of these finances must comply with the actions and goals in the specific prioritized area (Pavelková et al., 2009). In order to determine a cluster program, the focus of politics must be taken into consideration. Some cluster programs may even combine two or three areas of cluster politics, regional politics, research and development, innovation politics, and development and support of industry and business (OECD, 2007).
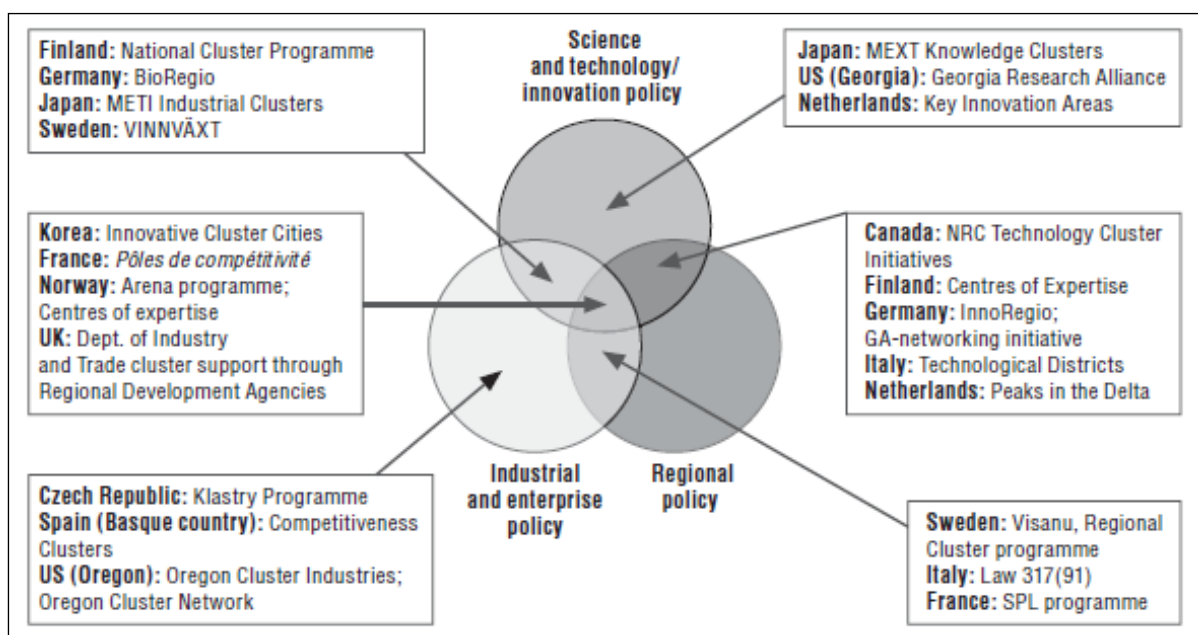

Fig. 1 Cluster programs focused on various areas of cluster politics
Source: OECD (2007).

Many analyses demonstrate that cluster programs are a highly effective instrument in enhancing the innovation capacity of SMEs and promoting research and innovation collaboration projects, because SMEs can benefit directly from the collaboration and knowledge of both large companies and research and education institutions within the cluster (OECD, 2007; OXFORD RESEARCH AS, 2008; Buleca, 2013). Each and every region and/or country with a sufficient industrial or innovative potential should develop their own cluster policy supported by appropriate cluster programs, since clusters are powerful tools in promoting innovation, RD investments, business-research collaboration and internationalization of enterprises. Cluster programs could be developed as a policy instrument for national and regional grand societal challenges, since clusters are the right arenas for regional or national partnerships where all the relevant public and private stakeholders meet, create and develop common strategies in addressing the challenges and in finding solutions (Christensen et al., 2012).

2.1 Degree of cluster programs as tools for financing clusters

The OECD study (2007) confirmed that the current trends of financing clusters from cluster programs dominate in all developed EU countries. This is a true also for some new EU member countries, e.g. Poland, Czech Republic, Bulgaria and Hungary (Charles et al., 2009). In Czech Republic the support of making the cluster initiatives and clusters became one of the activities financed from the structural funds in shortened programming period in the 2004-2006 and later in the following programming period. Also in case of Poland the initiative factor of interest in clusters was the support from the structural funds. Similarly, in Romania, public funds have become more available for the business sector, including cluster members, through the structural funds (Chiţu, 2012; Chiţu and Tecău, 2012) while the EU funding is considered an important tool contributing to the recovery of the Romanian economy (Bogdan, 2011).

The volume and purpose of the funds vary to a great extent depending on the type of cluster and its dominant activities. The OECD study (2007) classifies cluster programs according to the volume of funds into three groups:

1. building partnerships and networks: the annual finance is usually lower than 100,000 EUR, frequently lower than 50,000 EUR and; as a rule the funding does not last longer than 3 years (Local Production Systems in France or Visanu Program in Sweden);

2. cluster programs typical of "light" investments in science and R&D and the provision of common services. The annual budget ranges from 100,000 to 1,000,000 EUR. (The Basque Country's Competitiveness Program in Spain, the German program InnoRegio); and

3. programs with massive investments in science and R&D, the amounts exceeding one million EUR. (The National Cluster Program in Finland, BioRegio Program in Germany, VINNVÄXT in Sweden, or Pôles de compétitivité in France).

The empirical research (Oxford Research AS, 2008) assessed the number and type of cluster programs which differs markedly – 26 were identified in Poland, 23 in Great Britain, 14 in the Netherlands, 12 in Spain, 9 in Austria, and 8 in Germany, whereas only very few (1 or 2) cluster programs have been implemented in most European countries, although the number of cluster programs correlates only moderately with the total volume of allocated funds (Urbančíková and Burger, 2010).

2.2 Optimal duration of cluster programs

OECD (2007) declares that the cluster programs, which are focused on the engagement of key actors, building of networks and partnerships, last usually three to five years. Some programs have also so called initial phase which precedes other stages of program. Even though there exists a limited number of assessment methods for the evaluation of the efficiency of these programs, the up to now realized research and proofs signalize that the period of three years is not long enough to fulfil the goals and expectations of the program. The time period of less than three years is usually insufficient for cluster to become independent, too. It appears so that the period of four years is more realistic for the minimum duration of any program for the support of clusters (OECD, 2007). The cluster programs differ from each other a lot, not only by the maximal amount of cluster support, but also by the duration of funding (Lämmer-Gamp et al, 2011).

OECD (2007); Lämmer-Gamp et al (2011); Andersson et al (2010) and Longhi (2008) deal with the implementation of cluster policies and the duration of cluster programs in several countries. The Korean program "Innovative Cluster Cities" was built for the period of five

years. The Swedish program VINNVÄXT offers the possibilities of funding for more than ten years. The Norwegian "Centres of Expertise program" uses also the period of ten years, however this program is divided in three phases with formal milestones, which have to be fulfilled in order to continue in funding of this program. The program BioRegio in Germany functioned for eight years. The Japan cluster programs „MEXT Knowledge Clusters" and „METI Industrial Clusters" were built for the programming period of five years. The French program "Pôles de compétitivité" is trying to invest in the best international clusters with French participation. The programming period for this program is only three years, including the selection phase. Taking into the consideration the scale of these projects, this is an obstacle for the members of the cluster, because it involves large and challenging projects in the area of research and development (Burger, 2012).

For multiple cluster programs (Polish Cluster Support Schemes: Support for the development of Supra-Regional Clusters and Cluster Creation in Eastern Poland; Regional Growth Agreements in Iceland; Cluster Offensive Bayern in Germany and Corallia Cluster Initiative „Semiconductor-Nano/Microelectronics- Embedded Systems in Greece in Greece) does not exist these days a time frame, when the program should be ended (Lämmer-Gamp et al, 2011).

2.3 Support through cluster programs based on cluster life cycle
Cluster programs need to be designed based on the specific context under which they operate. There are immature clusters, matured clusters, or clusters in transition which are at the crossroads of becoming immature again, experiencing a renaissance or developing emerging industries. It is obvious that depending on the development stage of the cluster there should be different opportunities in a program that offer different funding schemes, instruments and approaches to develop further a cluster organization in terms of its cluster management organization, cluster members and the organization itself or the framework conditions (Christensen et al., 2012).

The determination of the timing of cluster financial support through cluster programs belongs to the most important decisions regarding cluster politics implementations. An example of this is "Program Cluster", approved in Czech Republic in 2004. As part of this program in the initial phase of the life cycle, multiple projects concerned with the search for appropriate companies for clusters or regarding cluster establishment and development were supported. In multiple such clusters, their performance decreased and they eventually ceased to exist shortly after the termination of the cluster program. According to Stejskal (2011), in multiple cases in the Czech Republic, the idea of cluster establishment was misunderstood and a cluster was often regarded as a "liberal group of companies" with no emphasis on the effects that needed to occur in the clusters. The goal for these clusters was not development and co-operation, but acquirement of public funds from the "Clusters" cluster program. During the time of the initial boom of clusters in the Czech Republic there were no control mechanisms of sufficient quality for controlling the effectiveness of spent finances, it was therefore too late when the wrong direction of establishing and supporting of clusters was discovered. The first doubts arose after the bankruptcy of first clusters and after having spent large amounts of money through cluster programs. One of the most widespread breakdowns of the cluster life cycle is presented in the so-called "White book of cluster politics" (Biela kniha klastrových politík – Anderson T. et al., 2004). Based on this breakdown, the life cycle is composed of five stages. The first stage is agglomeration. Agglomeration occurs when co-operation of regional subjects happens in a natural way. Subjects start realizing the need of greater co-operation

with others in the region. The second stage is Emerging cluster. Emerging cluster is often called also the cluster embryo stage. Multiple actors increase their activity, build and expand co-operation with each other and create the core of the cluster. The third stage is Developing cluster. Developing cluster creates opportunities in the region attracting corporate investment. Formal and informal ties emerge between the different actors of the cluster. The fourth stage is Mature cluster. Mature cluster happens when the cluster reaches a specific size and number of members, expands its ties and activities beyond the cluster itself, where it creates ties with other clusters and regions. The last and fifth stage is Transformation. Transformation happens when the cluster adapts to changes in the market, technology, and production processes.

3 Implementation of Own Primary Research

The empirical investigation of clusters is based on a vast primary research. The extensive analysis of assorted sources on cluster organizations resulted in a long list of 834 entries from 32 European countries. The prospective clusters were addressed by the authors during the years 2011 and 2012. In total, 125 properly completed questionnaires from 25 European countries have been collected. The response rate, when calculated from the population of potential clusters, was 14.99 %. Primarily the facilitators of the clusters were addressed.

The majority of responses were received from the cluster representatives in the Czech Republic (17), Germany and Slovakia (14), Hungary (12), Sweden (8), Denmark (7) and Spain (6). Four responses came from the cluster representatives in Austria, Italy, Norway, Poland, Romania, Switzerland and the UK respectively. Three proper responses were sent from each of the countries of the Netherlands and Lithuania. Other European countries delivered only two, one or no response (Urbančíková and Burger, 2014).

Multiple questions within the primary research were oriented towards the identification of optimal parameters for cluster programs based on opinions and recommendations of European clusters including Slovak clusters. This approach shows four key parameters of cluster programs. These parameters are: optimal amount of a single non-refundable subsidy for cluster activities, optimal duration of cluster support through the cluster program, maximum degree of co-funding expressed in percentages and optimal timing of financial support through cluster programs in relation to the current stage of the cluster life cycle. However, not all cluster representatives responded to all questions. The low number of responses of Slovak clusters in the analyzed clusters is not based on unwillingness to participate on the research, but is based on the overall low number of clusters in Slovakia. Even with a more lenient perception of clusters defined by reputable theorists (Porter, Ketels, Sölvell), to this day there are only 16 clusters.

3.1 Results and discussion
The opinions of European and Slovak cluster representatives on the optimal duration of cluster programs are very similar. Only three cluster representatives participating in the research do not consider cluster support through cluster programs as an appropriate solution (namely cluster representatives from Switzerland, Germany, and Poland). Representatives from thirteen European clusters (11.11%), none of which come from Slovakia, believe that the duration of cluster programs should be 2 years minimum. Representatives of the other clusters believe that cluster support from cluster programs should last 3 years minimum. A majority of representatives, of European and Slovak clusters, believe that the optimal duration

of cluster support through cluster programs should last at least 5 years. This opinion was shared by 51.28% of European research participants and by 57.14% Slovak cluster participants.

Tab. 1 Optimal duration of cluster support through cluster programs in Europe and Slovakia

Optimal duration of cluster support through cluster programs	Number of surveyed clusters in Europe	in %	Number of Slovak clusters	in %
I do not consider cluster support through cluster programs as an appropriate solution	3	2,6	0	0
1 year	3	2,6	0	0
2 years	7	6,0	0	0
3 years	29	24,8	4	28,6
4 years	15	12,8	2	14,3
5 years	26	22,2	5	35,7
6 and more years	34	29,1	3	21,4
Total	117	100,0	14	100,0

Source: Author

The key parameters of each cluster programs is also the optimal amount of a single non-refundable subsidy for cluster activites as well as the maximum acceptable amount of co-funding from the part of clusters. The optimal amount of a single non-refundable subsidy according to the majority of Slovak clusters (71.43%) does not have to be high. The amount should be below 100,000 EUR, an amount that is significantly lower in comparison to the preferred amounts of other clusters in other European countries. While 71.43% of Slovak clusters have chosen a sum lower than 100,000 EUR, overall in the survey a subsidy of less than 100,000 EUR was chosen only by 36.84% of surveyed clusters.

Tab. 2 Optimal amount of a single non-refundable subsidy for cluster activities based on opinions from European an Slovak clusters

Optimal amount of a single non-refundable subsidy	Number of European clusters	in %	Number of Slovak clusters	in %
under 10,000 EUR	2	1,8	0	0
10,000 - 25,000 EUR	4	3,5	0	0
25,000 - 50,000 EUR	15	13,2	4	28,6
50,000 - 100,000 EUR	21	18,4	6	42,9
100,000 - 250,000 EUR	33	28,9	1	7,1
250,000 - 500,000 EUR	18	15,8	1	7,1
500,000 - 1,000,000 EUR	11	9,6	2	14,3
1,000,000 - 5,000,000 EUR	9	7,9	0	0
over 5,000,000 EUR	1	0,9	0	0
Total	114	100,0	14	100,0

Source: Author

Similarly as in the previous case, Slovak cluster representative replied to the question of maximum co-funding which they considered acceptable. While thirteen out of fourteen Slovak clusters (92.86%) clusters state that the maximum acceptable amount of co-funding is 25%, the overall survey indicates that only 51.79% of clusters replied the same and 42.86% of surveyed clusters in Europe considers an acceptable cluster program co-funding from own funds at 26-50%.

Tab. 3 Maximum amount of co-funding in %, which cluster representatives consider acceptable in Europe and Slovakia

Maximum amount of co-funding in %	Number of European clusters	in %	Number of Slovak clusters	in %
0	1	0,9	0	0
1-10%	21	18,8	6	42,9
11-25%	36	32,1	7	50,0
26-50%	48	42,9	1	7,1
51-75%	4	3,6	0	0
More than 76%	2	1,8	0	0
Total	112	100,0	14	100,0

Source: Author

In the question of proper timing of cluster support through cluster programs, European and Slovak cluster representatives alike consider cluster program support inappropriate in life cycle stages 4 and 5, thus in stages of Mature cluster and Transformation. The first stage of the cluster life cycle called Agglomeration is according to the opinions of Slovak cluster representatives also inappropriate for cluster financial support through cluster programs. European cluster representatives have a more positive stance than Slovak representatives towards cluster support in this stage of the life cycle, but the majority of European clusters are still not inclined towards cluster support in this stage. Representatives of European clusters consider the most appropriate to support clusters in the second and third stage of the life cycle, thus in the stage of cluster establishment and development. Slovak cluster representatives, probably because the majority of Slovak clusters are in the third stage of a developing cluster, have a much more reserved opinion towards cluster support in the second stage. On the contrary, twelve out of fourteen Slovak clusters expressed themselves in favor of supporting clusters in the third stage, Developing cluster, during which no Slovak clusters consider support as contra-productive.

Tab. 4 Opinions of cluster representatives on financial support through cluster programs in different stages of the cluster life cycle

Stages of cluster life cycle	Number of cluster representatives who consider cluster support as appropriate		Number of cluster representatives who consider cluster support as appropriate in %		Number of cluster representatives who consider cluster support as contra-productive		Number of cluster representatives who consider cluster support as contra-productive in %	
	Europe	Slovakia	Europe	Slovakia	Europe	Slovakia	Europe	Slovakia
Stage 1: Agglomeration	43	0	35,2	0	25	6	20,5	42,9
Stage 2: Emerging cluster	87	7	71,3	50,0	8	2	6,6	14,3
Stage 3: Developing cluster	98	12	80,3	85,7	6	0	4,9	0
Stage 4: Mature cluster	23	3	18,9	21,4	65	8	53,3	57,1
Stage 5: Transformation	22	2	18,0	14,3	37	3	30,3	21,4

Source: Author

4 Conclusion

Opinions of Slovak and European cluster representatives obtained in the research of optimal parameters for cluster programs partially coincide, even though certain differences were recorded. In the question of optimal duration of cluster programs, a majority of European and Slovak clusters agree that the optimal duration of cluster support through cluster programs should be at least 5 years. In relation to the fact that a significant part of European cluster programs lasts 3 years is this response quite surprising. From researching the opinions of cluster representatives on the optimal amount of a single non-refundable subsidy for cluster activities and the maximal accepted amount of co-funding from cluster, the following conclusions can be made: in the most cases, Slovak clusters do not require such a high single non-refundable subsidy as European clusters. For the majority of Slovak clusters, a single non-refundable subsidy in the amount of 25,000 – 100,000 EUR is sufficient, what is regarded as less than optimal for European clusters. At the same time, Slovak clusters consider important that the amount of co-funding from their part not exceed 25%. Otherwise, a big part of them could have difficulties in engaging in appeals or programs, which could potentially be interesting at a lower degree of co-funding. If there were to be an independent cluster program in Slovakia, it would be appropriate to consider allowing participation especially of clusters that are in the third stage of their life cycle. These clusters, the majority of which was created before 2009, despite a significant indifference from the national level, have shown a certain viability and it is assumed that if these clusters were supported by a cluster program, they would not cease to exist after its expiration.

Acknowledgements

References

ANDERSSON, G., LARSEN, K., SANDSTRÖM, A. 2010. VINNVÄXT at the halfway mark - Experiences and lessons learned. ISBN: 978-91-86517-06-9.

ANDERSSON, T., SCHWAAG-SERGER, S., SÖRVIK, J., WISE HANSSON, E. 2004. The Cluster Policies Whitebook. IKED - International Organization for Knowledge Economy and Enterprise Development, ISBN 91-85281-03-4.

BOGDAN, A. M. 2011. European Union funds - a solution for the Romanian economic recovery. In: *Journal of Applied Economic Science*, Vol. 6, No. 2, pp. 115-120.

BULECA, J. 2013. Podpora inovácií a podnikania v Košickom samosprávnom kraji. In: *Acta Oeconomica Universitatis Selye. pp.47-54.* ISSN 1338-6581.

BURGER, P. 2012. Comparison of the Optimal Duration of Clusters Support in European Countries with Different Levels of Innovation. In: *Region Direct číslo 1/2012. pp. 48-67.* ISSN 1337-8473.

CHARLES, D., DAMIANOVA, Z., MAROULIS, N. 2009. *Contribution of policies at the regional level to the realisation of the European Research Area*, pp. 26-27.

CHIȚU, I. B. 2012. The Real Impact of Projects Financed Through European Social Fund – Sectoral Operational Program for Human Resources Development- over Target Audience. In: *Journal of Applied Economic Science*, 7,(4): 366-372.

CHIȚU, I. B., TECĂU A. S. 2012. Consultancy Services in Marketing and Management – Growth Factor of Competitiveness for Small and Medium Enterprises. In: *Journal of Applied Economic Science*, 7(4): 373-379.

CHRISTENSEN, T.A., LÄMMER-GAMP, T., MEIER ZU KÖCKER, G. 2012. Let's Make a Perfect Cluster Policy and Cluster Program - Smart Recommendations for Policy Makers. Danish Ministry of Science, Technology and Innovation/Competence Networks Germany, Copenhagen/Berlin, ISBN: 978-87-92776-53-2.

LÄMMER-GAMP, T., MEIER ZU KÖCKER, G., CHRISTENSEN, T.A. 2011. Clusters Are Individuals - Creating Economic Growth through Cluster Policies for Cluster Management Excellence, Danish Ministry of Science, Technology and Innovation/Competence Networks Germany, Copenhagen/Berlin, pp. 22-23.

LONGHI, C. 2008. The French Regional Policy in the 21st Century: Old Wine in New Bottles? In: International Experiences of Regional Policy and Policy Implications for Korea.

OECD, Competitive Regional Clusters - National Policy approaches. 2007. ISBN 978-92-64-03182-1, pp. 88-91.

OXFORD RESEARCH AS. 2008. *Cluster Policy in Europe - A brief summary of cluster policies in 31 European countries.* Norway, pp. 20-23.

PAVELKOVÁ, D. et al. 2009. Klastry a jejich vlyv na výkonnost firem, Prague. ISBN 978-80-247-2689-2, pp. 111-112.

STEJSKAL, J. 2011.Průmyslové klastry a jejich vznik v regionech. LINDE PRAHA, a.s., Praha 1, ISBN 978-80-7201-840-6.

URBANČÍKOVÁ N., BURGER, P. 2010. Miera regionalizácie inovačných politík a jej vplyv na inovačnú výkonnosť regiónov. In: *E+M Ekonomie a Management,* 13(1). *pp. 34-35.*

URBANČÍKOVÁ N., BURGER, P. 2014. Financing clusters from public funds in the European countries, In: *Journal of Applied Economic Sciences, 9 (1), pp. 148-157.* ISSN: 1843-6110.