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Support Policies in Clusters: Prioritization of Support Needs by Cluster Members According to Cluster Life Cycle

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ABSTRACT: Economic development has always been a moving target. Both the national and local governments have been facing the challenge of implementing the effective and efficient economic policy and program in order to best utilize their limited resources. One of the recent approaches in this area is called cluster-based economic analysis and strategy development. This study reviews key literature and some of the cluster based economic policies adopted by different governments. Based on this review, it proposes "the cluster life cycle" as a determining factor to identify the support requirements of clusters. A survey, designed based on literature review of International Cluster support programs, was conducted with 30 participants from 3 clusters with different maturity stage. This paper discusses the results of this study conducted among the cluster members in Eskişehir-Bilecik-Kütahya Region in Turkey on the requirement of the support to foster the development of related clusters.

Keywords: Industrial Clusters; Industrial policy; Government Policy
JEL Classifications: O25; R38

1. Introduction

In recent years, Clusters have attracted the attention of politicians and researchers. As the existence of one or several regional clusters is regarded as a prerequisite of regional prosperity (Porter, 2003), they have become especially popular among policy makers. Since the end of the 1980s, national and local governments in Germany, Brazil, Japan, South Korea, the Spanish Basque country, France, etc have attempted to foster their development. A typical defense of cluster policies is that clusters bring economic gains and shouldtherefore receive public support.

A definition of a cluster is "a geographically proximategroup of interconnected companies and associated institutions in a particular field, linkedby commonalities and complementarities". (Porter, 1998) Clusters rarely conform to standard industrial classification systems which fail to capture many important actors and relationship in competition (Porter, 1998). Cluster based support mechanism should constitute different objectives in comparison to industrial policy.

If clusters are to be effectively fostered through public policy and private sector initiatives, there is a need for a systematic understanding of the factors that contribute to the creation and development of clusters, and the factors that influence the success or failure of clusters and cluster policy. However major part of the literature on clusters is more on definitions and evaluation of the clusters as a static phenomenon than facts that triggers their emergence and perpetuate them. While it is critical to invest in the assets that will permit the emergence of a cluster, there is no magic recipe that works (Bresnahan et al., 2001). There is surprisingly also a little macro or micro empirical analysis of these policies' effect on firms performance. The effectiveness of the cluster oriented policies have not been scientifically proven yet (Martin et al., 2010).

This article targets to identify a basic assumption for support program aiming clusters. Its objective is to contribute to the underlying logic of the programs in order to avoid unfeasible models which are likely to lead failure.

From the existing case studies it can be derived that all clusters follow a kind of life cycle with different phases or stages of emergence, growth and decline that differ in their characteristics (Menzel

et al., 2009**).** The needs and concerns of cluster players will also differ depending on the stage of development of the cluster, and cluster policies must evolve accordingly (Arthurs et al., 2009).

As the cluster members will be critical for the success of "cluster support policies", it is important to uncover their expectations of support to accelarate the process in their clusters. This study tries to show if the prioritization of the actvivites that need public support by cluster members differ according to the stage of development of their cluster.

The paper is structured as follows. We first cover under section "2.A",the general definiton of Clusters. We then lay out in section "B", the cluster support policies. We review Cluster life Cycle Theory under section "2.C" and Cluster support activities under section "2.D". We discussed our research question and explain our methodology under section "3" and "4" respectively. We present our results in section 5. Section 6 concludes and gives some suggestions for future research.

2. Literature Review

A. Clusters

Clusters are geographic concentrations of interconnected companies and institutions in a particular field. They encompass an array of linked industries and other entities important to competition (Porter, 1998). Because of the shared proximity – both in terms of geography and of activities – they enjoy the economic benefits of several types of positive location-specific externalities. These externalities include access to specialized human resources and suppliers, knowledge spillovers, pressure for higher performance in head-to-head competition and learning from the close interaction with specialized customers and suppliers.

Companies in clusters can operate with a higher level of efficiency, drawing on more specialized assets and suppliers with shorter reaction times than they would be able to in isolation. Companies and research institutions can achieve higher levels of innovation. Knowledge spillovers and the close interaction with customers and other companies create more new ideas and provide intense pressure to innovate while the cluster environment lowers the cost of experimenting. And also the level of business formations tends to be higher in clusters. Start-ups are more reliant on external suppliers and partners, all of which they find in a cluster. Clusters also reduce the costs of failure, as entrepreneurs can fall back on local employment opportunities in the many other companies in the same field (Porter, 1998).

A survey reports that in the many empirical studies on agglomeration, the doubling of the size of a cluster (generally measured as employment of a given sector in a given region or as local density of employment) leads to a productivity gain between 3% and 8% (Rosenthal et al., 2004).

In fact, the 2006 Innobarometer carried out by The European Commission is primarily dealing with the specific characteristics of companies existing in a cluster-like environment. 3.528 companies working in a clusterlike environment were interviewed in the 25 member states and the results have been compared with the general data from the 2004 Innobarometer.

- 63 % of the cluster companies introduced innovative production technology, compared to 56 % in the 2004 Innobarometer.
- 53 % of the cluster companies are likely to conduct market research compared to 33 % in the 2004 Innobarometer.
- The innovative companies in clusters are more than twice as likely to source out research to other companies, universities, or public labs as the average in the 2004 Innobarometer.
- 29 % of the cluster companies are likely to trademark and patent their innovation compared to 12 % in the 2004 Innobarometer.

B. Cluster Support Policies

As a response to increased globalization, all these tangible benefits made the concept of clusters very popular and led to many developments in various countries in the 1990s and 2000s. Although the process of clustering occurs naturally, through many individual decision makers across companies, organizations, research institutions, and public bodies making independent decisions, the experience of many countries and regions assumes that public cluster policies can be an effective tool to steer and improve the outcomes of this process.

Cluster policies are most often a tool of regional development policy used by national and regional authorities, aiming at fostering regional strength and creating new or better jobs in the region.

National programs for cluster support established through open competitions, such as in France, Germany or Sweden provide effective incentives for rising the profile and excellence of regional cluster policies, thus also contributing to the creation of globally competitive clusters.

Although there is a rich literature about clusters and their importance, there is still a lack of proven model to support or initiate clusters. While it is critical to invest in the assets that will permit the emergence of a cluster, there is no magic recipe (take one great university, 47 venture capitalists, and …) that works. Instead a number of different routes exist to building the backdrop-technology opportunity, educated labor, flow of entrepreneurial talent, etc. Sometimes these long-term investments in national or regional capabilities can grow for a long time in what seems like a low return mode before the take off into cluster growth (Bresnahan et al., 2001).

That's why it's widely agreed that governments should reinforce and build on emerging clusters aiming to upgrade them rather than attempt to create new ones. The process of cluster upgrading involves recognition that a cluster is present and then removing obstacles, relaxing constraints and eliminating inefficiencies that impede productivity and innovation in the cluster (Porter, 2010).

We briefly mention three cluster related policy examples from Latin America, South Korea and Finland in this study. Three types of clusters were proposed when it comes to formulating cluster-oriented policies in Latin America. Survival clusters of micro- and small-scale enterprises owe their existence more too unfavorable macroeconomic conditions and less to entrepreneurial competence and dynamism. Their competitive potential is limited. Support measures mainly aim at improving the conditions for survival since these clusters are important in creating employment opportunities. The impetus should be to break through the low skills/low investment vicious circle. More advanced and differentiated mass producers have been flourishing in the import-substitution era but are coming under enormous pressure with the transition to open economies. In these clusters the main challenge is to create an environment that stimulates and supports learning, innovation, and constant upgrading. Clusters of transnational corporations are typically dominated by foreign firms not only at the final assembly stage but also in parts production. These clusters often are showcases of best-practice manufacturing; this can be used to stimulate the upgrading of domestic firms, notably by involving them in the supply-chain of transnationals (Meyer-Stamer et al., 1999).

The current cluster policy in Korea is primarily implemented based on physical boundaries such as municipal and provincial administrative zones. However, since corporate activities extend beyond administrative zones, there are cases in which the physical scope of government support and of corporate activities does not correspond to each other. Therefore, it is necessary to provide government support according to economic zones, factoring in connections among different companies. Through this approach, issues such as excessive competition among regional clusters and overlapping scope within similar industries can be resolved, while cooperative projects among cities and provinces can help increase the efficiency of budget support (Yim, 2005).

The Research Institute of the Finnish Economy (ETLA) and the Finnish National Fund for Research and Development (SITRA) launched an extensive research project, based on Porter's (1990) cluster approach, on Finnish industries' competitive advantage. The result of this study was a mega cluster mapping which was published in 1995. The study identified nine clusters based on approximately 60 smaller studies. These analyses provided a significant base for decisions to launch special measures for the development of a national industrial cluster. Eventually eight clusters were supported in the National Cluster Programme (European Commission Enterprise Directorate-General, 2007).

Although cluster policies have become popular in many countries, they have not been extensively evaluated, either. Large amounts of money are often spent on clusters initiatives (1.5 billion euros for the French Competitiveness Clusters" from 2006 to 2008 and from 2009 to 2011, 45 billion euros for the Northwest Regional Economic Strategy" from 2006 to 2026 in UK for example). There is however surprisingly little macro or micro empirical analysis of their effect on firms performance. The effectiveness of the cluster oriented policies have not been scientifically proven,yet (Martin et al., 2010).

It is critical that cluster based support programs are designed and executed in a way that answers the real needs of the regions so that limited state resources are used in most effective and efficient way as well as the cluster initiatives develop at a pace to catch up the global competition.

C. Cluster Life Cycle

Since there are so many variables underlying the development of cluster initiatives, what would be one of the common denominators to design a model that fits all or at least constitute the logic of the cluster support programs? From the existing case studies it can be derived that all clusters follow a kind of life cycle with different phases or stages of emergence, growth and decline that differ in their characteristics (Menzel et al., 2009).

A four-stage cluster life cycle is defined as follows:

- Latent. A region has a number of firms and other actors that begin to cooperate around a core activity and realise common opportunities through their linkages. Indicators for a latent cluster will include a small number of firms, low internal awareness and external recognition of cluster activities, and few linkages among stakeholders.
- Developing. As new actors in the same or related activities emerge or are attracted to the region, new linkages develop. Formal or informal institutes for collaboration may appear, as may a 'label' (such as 'Silicon Valley') and common promotional activities for the region. Indicators for a developing cluster will include developing linkages, internal awareness of regional strengths and other actors, and high innovation.
- Established. A critical mass is reached. Relations outside of the cluster are strengthened. There is an internal dynamic of new firm creation through start-ups, joint ventures, and spin-offs. Indicators for an established cluster will include a large number of firms (many of which will be 'spin-offs' of other cluster organisations), external recognition of the cluster's advantages, active linkages, and high innovation.
- Transformational. Clusters change with their markets, technologies, and processes. In order to survive, the cluster must avoid stagnation and decay. Transformation may be through changes in the products and methods, or into new clusters focused on other activities. Depending on the state of transformation, indicators may be mixed (Andersson, 2004).

It can be difficult to assign a cluster to a specific stage if it is in transition. A cluster consists of many diverse protagonists that develop differently. Parts of the cluster can stay at an earlier stage while others advance along the trajectory. Focal points of activity, where most synergies exist between the actors, are supposed to move more quickly through the cycle while the actors at the edge of the cluster lag behind. Therefore, the assignment of the cluster to one of the phases depends on the development of the focal points of the cluster, even though they may change as the cluster moves through the cycle (Menzel et al., 2009).

Emerging clusters only contain a few, often quite small companies with few employees that are scattered over wide areas technologically. The emerging cluster either becomes a growing cluster when it is able to reach a critical mass and the growth rate of the companies exceeds the growth rate of non-clustered companies. The crucial factor for this is to first create synergies around a focal point (Arthur, 1994; Feldman., 2005; Klepper, 2007).

The forces underlying the emergence of a cluster differ from those needed to ensure its continued growth. While increasing returns and external effects can keep a cluster going, the initial spark is more difficult to obtain and more risky to pursue. The research suggests that these include the importance of being linked to a sizable and growing demand as well as the availability of a proper supply of key factors like skilled labour. Other critical factors are firm and market building capabilities. These require significant and systematic efforts by the pioneers of the cluster to promote organizational and technological capabilities of various sorts (Bresnahan et al., 2001).

The needs and concerns of cluster players will differ depending on the stage of development of the cluster, and cluster policies must evolve accordingly. For example, in early stage clusters, salient issues include the development of specialised R&D infrastructure, the fostering of linkages, the development of firm capabilities, access to talent, and the elaboration of a shared vision. In growing clusters, the emergence of new firms may alter the strategic alliances driving the cluster's R&D activities, or may require new strategies to meet the increased demand for skilled labour and risk capital. As the cluster firms expand their reach into national or continental markets, the availability of managerial talent with the skills needed to direct an enterprise of this increasing geographic scope can become a critical factor contributing to, or limiting, their growth potential. The emergence of foreign competitors or competing technologies may also require an internal restructuring to increase

efficiencies or a new investment in R&D capabilities. This dynamism causes the cluster's structure to change over time (Arthurs et al., 2009).

D. Activities requiring support in upgrading Clusters

It is crucial to define the areas cluster initiatives need to be or should be supported. Cluster theory suggests that competitive advantage derives not just from firm-based resources and capabilities, but also from the resources and capabilities located in the firm's geographically proximate business environment. Some empirical research has shown that clustering can produce significant positive effects on rates of new firm formation and firm productivity, innovation, profitability, and growth (Gordon et al., 2005).

Direct top down policies to support clusters are most likely to fail. Particularly worrisome are policies that would direct at a level of detail such as picking the specific industries or technologies to be sponsored. The right policies have elements of a `benign neglect` and they allow for a significant decentralization in the choice of the initiatives. They would focus instead on the enabling conditions like the creation of suitable demand and markets including formation of standards/ openness, skilled people along with policies focused on key supply side factors and institutions and on education in the first place (Bresnahan et al., 2001).

Finding the source of demand that may spark off the growth of the cluster can be critical for its rise and in many respects and in many respects it should be one of the policy focuses in this arena. (Bresnahan et al., 2001)

Public policies favouring pre-competitive research and cooperative R&D have played a decisive role in the emergence and development of technology centres and technological infrastructures all over the world (Tassey, 1991). These technological infrastructures have been defined "as a set of collectively supplied, specific, industry-relevant capabilities, intended for applications in two or more user organisations" (Justman et al., 1995).

Clustering facilitates the rapid diffusion of the knowledge thus acquired. Local industrial policy has an important role to play in expanding infrastructure and strengthening training, testing and certification facilities. (Humphrey et al., 2000)

3. Research Question

Our research question is: "Would it be effective and efficient to design a cluster support program according to cluster life cycle theory?"

In order to answer this question, it is critical to identify the clusters' support requirements and if these requirements change according to the clusters' life cycle. As the needs of Cluster initiatives are very diversed, we generate our hypotheses for each specific activity of the clusters.

Cluster initiatives are not a panacea and they are not a substitute for efforts to remove weaknesses in the general business environment or the overall context. But examples suggest that if they are part of an integrated strategy for competitiveness upgrading, they can be effective tools to achieve an impact that cross-cutting policies alone will be unable to match. In addition they can provide a powerful bottom up input to refine cross-cutting horizontal polices at the regional, national level. In this spirit, cluster policies are an integral part of innovation policy and the Growth and Jobs Strategy. Based on these facts and specifications of clusters under Porter's diamond model, we generate our 44 hypotheses under 4 major headings (Appendix 1).

4. Methodology

Survey techniques have often been applied in cluster analysis to generate a set of customised data about key cluster dynamics. The use of survey methods, as opposed to the use of the official statistics, means that the data collected are usually not comprehensive, i.e. they are from a sample, rather than from a full population. Also, lack of standardisation in survey design means that results cannot be easily compared with studies conducted by other researchers. However, the custom design of the survey means that the cluster analysis is not dependent on existing generic statistical data sources or categories – stakeholders can be specifically targeted and the data gathered can be tailored to the specific issues of interest in the cluster analysis (Arthurs et al., 2009).

To test our hypotheses, a non-parametric test has been conducted. Sampling region was identified as Eskisehir-Bileck and Kutahya since there are 3 cluster initiatives available in the region with a different maturity stage in cluster life cycle.

1. Ceramic Cluster –Established
2. Railways -Developing
3. Aviation –Latent

30 participants from 3 different cluster initiatives were briefly updated about the study and participated in a one day workshop. They were asked to use a likert scale from 0 to 5 to evaluate a survey of 44 questions under 4 components (see appendix 1). Each participant prioritized the support need for each 44 activity for their own cluster.If they thought there was a missing activity, they were also asked to add this on their survey. In order to validate the survey, it was initially conducted in a small controlled group of the representatives of different clusters and experts.

5. Results

Survey results have been analysed through SPSS, with non parametric test of Kruskal-Wallis (see appendix). The results for each hypotheses have been stated under Appendix 1. According to results, hypethoses with (*) showed a p value less than 0.05 and states that prioritization of these activities by cluster members depends on the maturity stage in cluster life cycle where as remaining hypethoses have a p value higher than 0.05 leading the rejection of Ho's. The prioritization of these activities do not show a significant difference according to the cluster maturity stage. Please see Appendix 1 for details.

Hypotheses:

A. Development of Cluster Awareness and Effectiveness

1. The priority of "Establishing a legal entity representing the Cluster" changes acc to cluster life cycle.*
2. The priority of "capacity building of the legal entity of the Cluster"changes acc to cluster life cycle.
3. The priority of" Coordination of cluster initiation" changes acc to cluster life cycle *
4. The priority of "building the awareness of cluster members" changes acc to cluster life cycle *
5. The priority of " get together organization for cluster members" changes acc to cluster life cycle *
6. The priority of "Organizing sectoral events for cluster members particicpation" changes acc to cluster life cycle.
7. The priority of "Development and promotion of a common brand" changes acc to cluster life cycle *
8. The priority of "Lobbying and promotion activities" changes acc to cluster life cycle *
9. The priority of "Investment promotion" changes acc to cluster life cycle *
10. The priority of "Local market development" changes acc to cluster life cycle *
11. The priority of "Access to International business Networks and cooperation with other clusters" changes acc to cluster life cycle *
12. The priority of "Basic analyses regarding the cluster" changes acc to cluster life cycle *
13. The priority of "Advanced analyses regarding the cluster" changes acc to cluster life cycle
14. The priority of "Identfying the cluster strategy and road map" changes acc to cluster life cycle *
15. The priority of "Support programs to apply financial aid programs" changes acc to cluster life cycle *

B. Improvement of Factor Conditions

1. The priority of "Development of Basic labour markets" changes acc to cluster life cycle *
2. The priority of "Development of qualified labour markets" changes acc to cluster life cycle.
3. The priority of "Develoment of high tech labour markets" changes acc to cluster life cycle.
4. The priority of "Studies to upgrade the raw materials and inputs quality"changes acc to cluster life cycle.*
5. The priority of "Studies to decrease the cost of ram materials and inputs" changes acc to cluster life cycle. *
6. The priority of "Investments to upgrade the common infrastructure" changes acc to cluster life cycle. *

7. The priority of "University- Industry cooperation programs" changes acc to cluster life cycle. *
8. The priority of "Establishing units to provide continous market information" changes acc to cluster life cycle.
9. The priority of "Access to strategic info sources" changes acc to cluster life cycle .*

C. Productivity

1. The priority of "Supply development programs" changes acc to cluster life cycle
2. The priority of "Shared production units" changes acc to cluster life cycle *
3. The priority of "Shared warehousing utilities" changes acc to cluster life cycle *
4. The priority of "Organizations regarding to collective purchases" changes acc to cluster life cycle *
5. The priority of "University Industry cooperation programs" changes acc to cluster life cycle *
6. The priority of "Energy efficieny programs" changes acc to cluster life cycle
7. The priority of "Renewable energy programs" changes acc to cluster life cycle *
8. The priority of "Establishment of Test-Analyse facilities" changes acc to cluster life cycle *
9. The priority of "Dissemination of Best practises" changes acc to cluster life cycle. *
10. The priority of "Industrial collective life" changes acc to cluster life cycle .*
11. The priority of "Collective transportation, shift planning" changes acc to cluster life cycle. *
12. The priority of "Product certification and accreditation" changes acc to cluster life cycle.

D. Innovation

1. The priority of "Establishment of Research Development facilities" changes acc to cluster life cycle. *
2. The priority of "Innovation development support program" changes acc to cluster life cycle .*
3. The priority of "Establishment of shared sampling production lines" changes acc to cluster life cycle. *
4. The priority of "Establishment of shared test/ simulation facilities" changes acc to cluster life cycle .*
5. The priority of "Promotion, transfer and technology tracking units" changes acc to cluster life cycle. *
6. The priority of "University- Industry cooperation programs" changes acc to cluster life cycle *.
7. The priority of "Support programs to apply financial aid programs" changes acc to cluster life cycle *.
8. The priority of "Programs to increase capacity in design and creativity" changes acc to cluster life cycle.

6. Conclusion

Based on our research, it is clear that the support requirements of clusters in Eskisehir-Bilecik-Kutahya region change according to their maturity level in the cluster life cycle. However based on this study it is not possible to identify the specific distinction among the support types according to cluster maturity level. So there is a need for a further study to classify the supports needed by cluster life cyle.

This study helps for directions for further research in the cluster-support genre. As indicated in our methodology, it has been conducted in a specific and limited region, we chose a regional context characterized by, presumably, with cluster initiatives in different maturity level. Most likely, members of other cluster initiatives who dwell in other territorial settings will approach cluster supports differently. In order to get a richer understanding of how cluster support requirements shape from the perspective of cluster members, different settings must be investigated. An obvious choice would be a another region such as less economically developed part of Turkey with some cluster initiatives.

A fundamental challenge is that the design of regional cluster policies is motivated by diverse interests and aspirations. Clearly, one size does not fit all. This raises the question of who can best learn what from whom, calling for different configurations in cluster policies. So it is very important to identify the support requirements of the clusters as they will be the active role players and they are the critical success factors for these support programs.

Then maybe based on these requirements, a further study could be done to identify the underlying factors for cluster policies and how to provide them to clusters.

As the cluster initiatives and other cluster-based economic policies becoming increasingly common, there will also be a demand for a systematic assessment of their impact; there will be a need for a study to evaluate the success of the different programs and initiatives. It will be also critical to consider the perception of cluster members in this process, so this study can also provide a rough base for this process.

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Appendix

APPENDIX: Kruskal-Wallis Test

		Ranks			Test Statistics[a,b]	
A	**Strengthening the Coordination, Increasing awareness and /or Efficiency of the Cluster**	**Cluster type**	**N**	**Mean Rank**		
1	Establishment of a legal institution (union, foundation, cooperative… etc) to represent the cluster.	**1.00**	**8**	**23,50**	**Chi-square**	**12,587**
		2.00	**9**	**9,17**	**df**	**2**
		3.00	**13**	**14,96**	**Asymp.Sig**	**,002**
2	Building institutional capacity of the legal institution (union ...etc) to represent the cluster	**1.00**	**8**	**16,50**	**Chi-square**	**0,421**
		2.00	**9**	**14,11**	**df**	**2**
		3.00	**13**	**15,85**	**Asymp.Sig**	**,810**
3	Coordination of the cluster initiative (for example forming a team of professional staff)	**1.00**	**8**	**21,38**	**Chi-square**	**8,004**
		2.00	**9**	**10,39**	**df**	**2**
		3.00	**13**	**15,42**	**Asymp.Sig**	**,018**
4	Raising awareness of the cluster actors on clustering	**1.00**	**8**	**25,94**	**Chi-square**	**23,192**
		2.00	**9**	**17,61**	**df**	**2**
		3.00	**13**	**7,62**	**Asymp.Sig**	**,000**
5	Organizations to encourage the cluster actors to be familiar each other	**1.00**	**8**	**23,56**	**Chi-square**	**19,613**
		2.00	**9**	**6,11**	**df**	**2**
		3.00	**13**	**17,04**	**Asymp.Sig**	**,000**
6	Making sectoral organizations for participation of the cluster actors or participation in these kinds of organizations	**1.00**	**8**	**19,94**	**Chi-square**	**3,470**
		2.00	**9**	**13,89**	**df**	**2**
		3.00	**13**	**13,88**	**Asymp.Sig**	**,176**
7	Strengthening the common cluster brand and advertising (especially aiming at marketing)	**1.00**	**8**	**24,19**	**Chi-square**	**20,608**
		2.00	**9**	**5,94**	**df**	**2**
		3.00	**13**	**16,77**	**Asymp.Sig**	**0,000**
8	Lobbying and advertising activities (rather for looking after the cluster's benefits)	**1.00**	**8**	**22,38**	**Chi-square**	**16,304**
		2.00	**9**	**6,78**	**df**	**2**
		3.00	**13**	**17,31**	**Asymp.Sig**	**,000**
9	Investment promotion	**1.00**	**8**	**22,31**	**Chi-square**	**7,999**
		2.00	**9**	**13,11**	**df**	**2**
		3.00	**13**	**12,96**	**Asymp.Sig**	**,018**
10	Market (including the local markets) growth activities	**1.00**	**8**	**26,13**	**Chi-square**	**18,794**
		2.00	**9**	**14,22**	**df**	**2**
		3.00	**13**	**9,85**	**Asymp.Sig**	**,000**
11	Access to the international business networks and collaboration with the other clusters…etc	**1.00**	**8**	**23,56**	**Chi-square**	**12,572**
		2.00	**9**	**9,50**	**df**	**2**
		3.00	**13**	**14,69**	**Asymp.Sig**	**,002**
12	Conducting the basic analyses (competitiveness…etc) related to the cluster	**1.00**	**8**	**22,19**	**Chi-square**	**20,160**
		2.00	**9**	**20,94**	**df**	**2**
		3.00	**13**	**7,62**	**Asymp.Sig**	**,000**

13	Conducting the sophisticated analyses (comparing, market analysis, technology survey) related to the cluster	**1.00**	**8**	**15,50**	**Chi-square**	**,545**
		2.00	**9**	**14,11**	**df**	**2**
		3.00	**13**	**16,46**	**Asymp.Sig**	**,761**
14	Identifying the cluster strategy and preparing a roadmap	**1.00**	**8**	**26,00**	**Chi-square**	**26,544**
		2.00	**9**	**18,44**	**df**	**2**
		3.00	**13**	**7,00**	**Asymp.Sig**	**,000**
15	Preparing applications for various financial support programmes.	**1.00**	**8**	**12,44**	**Chi-square**	**13,606**
		2.00	**9**	**9,39**	**df**	**2**
		3.00	**13**	**21,62**	**Asymp.Sig**	**,001**
B	**Strengthening the Factor Conditions and / or Markets**	**Cluster type**	**N**	**Mean Rank**		
1	Strengthening the main (low or half qualified) labour market (worker, master … etc)	**1.00**	**8**	**6,56**	**Chi-square**	**12,813**
		2.00	**9**	**18,28**	**df**	**2**
		3.00	**13**	**19,08**	**Asymp.Sig**	**,002**
2	Strengthening the qualified labour market (technician, basic engineering)	**1.00**	**8**	**15,50**	**Chi-square**	**2.726**
		2.00	**9**	**12,61**	**df**	**2**
		3.00	**13**	**17,50**	**Asymp.Sig**	**,256**
3	Strengthening the high - qualified labour market (R & D engineering, designer …etc)	**1.00**	**8**	**19,19**	**Chi-square**	**5,421**
		2.00	**9**	**10,78**	**df**	**2**
		3.00	**13**	**16,50**	**Asymp.Sig**	**,066**
4	Activities for increasing the quality of raw materials and /or intermediate goods.	**1.00**	**8**	**8,00**	**Chi-square**	**18,257**
		2.00	**9**	**11,67**	**df**	**2**
		3.00	**13**	**22,77**	**Asymp.Sig**	**,000**
5	Activities for reducing the cost of the raw materials and / or intermediate goods.	**1.00**	**8**	**8,81**	**Chi-square**	**19,547**
		2.00	**9**	**10,39**	**df**	**2**
		3.00	**13**	**23,15**	**Asymp.Sig**	**,000**
6	Activities to strengthen the common physical Infrastructure (incubation, purifying, energy, transport…etc)	**1.00**	**8**	**6,63**	**Chi-square**	**21,315**
		2.00	**9**	**12,17**	**df**	**2**
		3.00	**13**	**23,27**	**Asymp.Sig**	**,000**
7	University – Industry Collaboration Programmes	**1.00**	**8**	**12,44**	**Chi-square**	**6,533**
		2.00	**9**	**21,00**	**df**	**2**
		3.00	**13**	**13,58**	**Asymp.Sig**	**,038**
8	Establishing the units to provide information about the market continuously	**1.00**	**8**	**19,00**	**Chi-square**	**5,732**
		2.00	**9**	**18,17**	**df**	**2**
		3.00	**13**	**11,50**	**Asymp.Sig**	**,057**
9	Access to strategic information sources (settling the tenders, raw material prices, other news about the market)	**1.00**	**8**	**24,94**	**Chi-square**	**15,884**
		2.00	**9**	**15,00**	**df**	**2**
		3.00	**13**	**10,04**	**Asymp.Sig**	**,000**

C	Productivity (Synergy,scale economies …etc)	Cluster type	N	Mean Rank		
1	Implementing programmes for strengthening the suppliers.	1.00	8	11,00	Chi-square	4,170
		2.00	9	15,83	df	2
		3.00	13	18,04	Asymp.Sig	,124
2	Establishing workshops (ORTKA) for common use.	1.00	8	23,50	Chi-square	13,590
		2.00	9	16,44	df	2
		3.00	13	9,92	Asymp.Sig	,001
3	Establishing depots for common use.	1.00	8	11,00	Chi-square	22,389
		2.00	9	7,56	df	2
		3.00	13	23,77	Asymp.Sig	,000
4	Organizations for procurement of the common raw materials or intermediate goods	1.00	8	5,50	Chi-square	17,383
		2.00	9	17,17	df	2
		3.00	13	20,50	Asymp.Sig	,000
5	University – Industry Collaboration Programmes	1.00	8	9,75	Chi-square	6,554
		2.00	9	15,61	df	2
		3.00	13	18,96	Asymp.Sig	,038
6	Energy efficiency programmes	1.00	8	13,25	Chi-square	5,340
		2.00	9	20,56	df	2
		3.00	13	13,38	Asymp.Sig	,069
7	Renewable energy programmes	1.00	8	5,44	Chi-square	16,595
		2.00	9	17,44	df	2
		3.00	13	20,35	Asymp.Sig	,000
8	Establishing test / analysis laboratories	1.00	8	23,75	Chi-square	25,319
		2.00	9	20,44	df	2
		3.00	13	7,00	Asymp.Sig	,000
9	Expanding the best practices among the cluster actors (including the companies)	1.00	8	11,50	Chi-square	16,105
		2.00	9	24,67	df	2
		3.00	13	11,62	Asymp.Sig	,000
10	Industrial shared services	1.00	8	19,25	Chi-square	6,182
		2.00	9	18,22	df	2
		3.00	13	11,31	Asymp.Sig	,045
11	Shared transportation, planning of job rotations.	1.00	8	24,75	Chi-square	25,775
		2.00	9	19,56	df	2
		3.00	13	7,00	Asymp.Sig	,000
12	Certification and accreditation	1.00	8	18,19	Chi-square	2,604
		2.00	9	12,39	df	2
		3.00	13	16,00	Asymp.Sig	,272

D	Innovation	Cluster type	N	Mean Rank		
1	Establishing an applied R&D laboratory	1.00	8	20,13	Chi-square	24,736
		2.00	9	23,67	df	2
		3.00	13	7,00	Asymp.Sig	,000
2	Support programme for strengthening the innovation (Product, process, market)	1.00	8	9,38	Chi-square	8,175
		2.00	9	15,17	df	2
		3.00	13	19,50	Asymp.Sig	,017
3	Establishing sampling line for common use.	1.00	8	19,25	Chi-square	6,182
		2.00	9	18,22	df	2
		3.00	13	11,31	Asymp.Sig	,045
4	Establishing platforms for common use (test, simulation …etc)	1.00	8	16,94	Chi-square	13,867
		2.00	9	22,83	df	2
		3.00	13	9,54	Asymp.Sig	,001
5	Establishing units to follow up, to introduce and to transfer new technologies	1.00	8	11,56	Chi-square	12,145
		2.00	9	10,56	df	2
		3.00	13	21,35	Asymp.Sig	,002
6	University – Industry Collaboration Programmes	1.00	8	9,56	Chi-square	7,626
		2.00	9	15,50	df	2
		3.00	13	19,15	Asymp.Sig	,022
7	Preparing applications for various financial assistance programmes.	1.00	8	12,31	Chi-square	16,369
		2.00	9	8,67	df	2
		3.00	13	22,19	Asymp.Sig	,000
8	Programmes for building the capacity of design and creativity	1.00	8	17,06	Chi-square	1,874
		2.00	9	12,72	df	2
		3.00	13	16,46	Asymp.Sig	,392