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Abstract

The paper is an attempt to show the competitiveness clusters policy as a key element of the new French industrial policy using recent evaluation results of this policy. The aim of the paper is threefold. Firstly, objectives of the competitiveness clusters policy as well as their characteristics, spatial distribution across the country, selected statistical data concerning their functioning are overviewed. Secondly, evaluation results of the French competitiveness clusters policy and a comparison of this instrument to similar ones existing in leading EU countries are provided. Thirdly, some crucial challenges resulting from the evaluation and policy orientations are proposed in order to increase the effectiveness of the competitiveness clusters policy in France. The descriptive analysis has been used in the paper as research method.

The competitiveness clusters policy was launched in 2005 to raise the international profile of French technology clusters and promote growth and job-creation in high value-added industries, anchoring these industries in a regional context. Apart from selected positive effects of the competitiveness clusters policy, some not very promising conclusions concerning this policy can therefore be drawn in terms of the number of innovation or patent applications. In order to improve the effectiveness of this industrial policy measure, some structural changes presented in the paper need to be implemented in this field.

Keywords: competitiveness cluster, France, industrial policy, assessment

JEL: L52, F59, O52

Introduction

Nowadays international competition is exacerbated by globalization, economic and financial crisis and developed countries have witnessed a growing trend for their production and their R&D capacities to delocalize towards emerging countries. In this context the success of a number of spontaneously developing clusters, has prompted governments at national and regional levels to support the emergence and development of clusters. In the French case, these arguments are reinforced by the fact that the country's deceiving export performance and the decreasing industrial competitiveness are often explained by the lack of medium size exporters, as well as by the lack of cooperation between universities, research centers and industrial firms [Fontagné, Koenig, Mayneris, Poncet, 2010, p. 7]. The competitiveness clusters policy launched by the French State in 2005 can be understood as a translation of such an attitude of national authorities. The key objective of competitiveness clusters is to increase research excellence and give a new impetus to industrial policy through a better articulation between the innovation, territorial and industrial policies.

The competitiveness cluster policy is a French response to cluster policy promoted by the OECD and the EU. A cluster is defined by its most known propagator M. Porter as "a geographical proximate group of interconnected companies and associated institutions in a particular field, linked by commonalities and externalities" [Porter, 1998, p. 215]. National and regional level initiatives to support clusters originate from one of three main policy families: regional policy, science and technology policy or industrial/enterprise policy. The economic rationale for government to support clusters serves to define the different choices regarding program targets. Those targets may be *places* (leading regions, lagging regions), *sectors* (dynamic, exposed, strategic, of social significance) or *specific actors* or groups of actors (SMEs, multinationals). They could also be a combination of these different target categories. The approach to clusters at national or regional level can be *top-down*, *bottom-up* or a *combination* of these two. The French government and regional authorities use a top-down approach targeting clusters with a critical mass in terms of innovation or industrial base to be competitive internationally [OECD, 2007, pp. 13, 184–186]. This approach differs from the bottom-up approach implemented in most developed economies.

The paper is an attempt to show the competitiveness clusters policy as a key element of the new French industrial policy. The aim of the paper is threefold. Firstly, objectives of the competitiveness clusters policy as well as their characteristics, spatial distribution across the country, and selected statistical data concerning their functioning are overviewed. Secondly, evaluation results of the French competitiveness clusters policy and a comparison of this instrument to similar ones existing in leading EU countries are provided. Thirdly, some crucial challenges resulting from the evaluation and policy orientations are proposed in order to increase the effectiveness of the competitiveness clusters policy in France.

Competitiveness clusters in the new French industrial policy

According to an official definition “A competitiveness cluster brings together large and small firms, research laboratories and educational establishments, all working together in a specific region to develop synergies and cooperative efforts. Other partners may be brought in, such as public authorities, either local or national, as well as firms providing business services. The goal of competitiveness clusters is to build on synergies and innovative, collaborative projects in order to give partner firms the chance to become the first in their fields, both in France and abroad” [Competitiveness clusters in France, p. 2]. Each competitiveness cluster is specialized in scientific and technological fields; some competitiveness clusters cover the same field. The competitiveness clusters are ranked nationally according to the perimeter they are able to compete (there are global competitiveness clusters, globally-oriented competitiveness clusters and national competitiveness clusters) [Czyżewska 2013, pp. 74–75].

The key objectives of the competitiveness clusters are to boost the competitiveness of the French economy and to help to develop growth and jobs in key markets by:

- Accelerating innovation efforts
- Providing support for high-tech and creative activities, primarily industrial activities, in the French regions
- Improving the attractiveness of the French economy via greater international visibility.

The priorities and status of each cluster are defined in individual contracts between the different parties involved (State, local authorities, universities, research laboratories, training centers and enterprises). Each competitiveness cluster implements a five-year strategic plan based on the shared vision of various participants. This allows the competitiveness cluster to:

- Establish partnerships between participants;
- Set up collaborative R&D projects, as well as structuring projects such as innovation platforms that can benefit from public subsidies;
- Promote an overall environment, that enhances both innovation and growth among the competitiveness cluster’s members [Competitiveness clusters in France, p. 2].

France is committed to creating a conducive environment for firms and innovation. In this respect it offers assistance for cluster-based research and development, particularly via the Single Inter-ministerial Fund (FUI), which provides support for cluster policy and for the forward-looking investments that are part of France’s National Loan Program.

The support provided by the State for cluster development, at both national and regional levels, is the following:

- Allocation of financial aid to the best R&D projects and innovation platforms¹, through calls for projects from the Single Inter-ministerial Fund and the Investments for the Future Program²,

- Partial financing of cluster governance structures,
- Provision of financial aid for theme-based collective actions, through the intermediary of decentralized government departments,
- Help for competitiveness clusters and their member firms in finding the best international partners and in setting up technological partnerships with them focused on value creation [Competitiveness clusters in France, p. 3].

The competitiveness clusters policy being part of the new French industrial policy was launched by the French Prime Minister in 2004 as a call for proposals entitled “growth ecosystems”. In this context it was decided to implement structures to reinforce innovation, particularly in relation to research units. As a result of the call for projects, the authorities in the regions received 105 competitiveness clusters applications [Czyżewska, 2012]. This was an unexpected high number of applications that forced the government to double the available funding from €750m to €1,5b for the 2006–2008 period (of which 55% from the Single Inter-ministerial Fund (FUI); 35% from Agencies; 11% in tax breaks).

What is a statistical portrait of the competitiveness clusters performance? According to the data from 2012, 71 competitiveness clusters have comprised more than 7,500 firms and 1,186 innovation projects have been financed by the Single Inter-ministerial Fund (FUI) between 2005 and 2012 [DGCIS 2013, p. 1]. With regard to R&D statistics, in the period 2008–2011 R&D projects have generated 2,500 innovations (more than 1,800 being product or process innovations). R&D projects have also generated more than 1,000 patent applications particularly in the field of ICT, biotechnology and energy and 6,349 scientific publications (including 2,504 peer reviewed publications). Moreover, 93 start-ups have been set up by competitiveness clusters members [Erdyn, Technopolis France, BearingPoint, 2012, pp. 118–123].

Empirical assessment of the competitiveness clusters policy

Since Marshall [1920] it has been apparent that geographical concentrations of firms and economic actors, known as districts or clusters, can generate positive effects on economic growth in specific territories. Numerous studies confirm positive effects generated by such structures. In the 1990s, national and regional authorities in many countries were prompted by the proven success of the clusters. They decided to introduce cluster policies designed to encourage the creation of synergies observed in such spontaneously evolving clusters and to generate sources of competitiveness in their territories [Saublens, 2007, quoted by: Gallié, Glaser, Pallez, 2010, p. 3]. Cluster policy need to be evaluated regularly in order to assess its economic effects. In this paragraph selected evaluation results of the French competitiveness clusters policy are highlighted.

The first phase of the competitiveness clusters policy ran from 2005 to 2008. The policy was renewed in 2008 for 3 years, after the evaluation of all the individual clusters. The general conclusion of the evaluation was that the “organization of competitiveness clusters seems to be sufficiently promising to warrant a continuation of the general outlines of the policy” [Gallié, Glaser, Pallez, 2010, p. 11]. In terms of the evaluation of the individual clusters, the evaluation from 2008 recommended a three-tier classification based on three key areas (strategy, governance, and the capacity to develop R&D projects). From the total number of 71 competitiveness clusters:

- 39 competitiveness clusters had “attained the objectives of the cluster policy”;
- 19 competitiveness clusters “had partially attained the objectives of the cluster policy, and which must focus on making improvements in certain areas”;
- 13 competitiveness clusters “could benefit from making thoroughgoing changes” [Gallié, Glaser, Pallez, 2010, p. 11].

The competitiveness cluster 2.0 for the period 2009–2011 meant to widen the scope of competitiveness clusters activities. The evaluation report of the French competitiveness clusters policy, conducted in consortium of BearingPoint, Erdyn and Technopolis France, was published on 19 June 2012. The study was contracted by the Directorate General for Competitiveness Industry and Services (DGCIS) and Directorate for Territorial Cohesion and Regional Competitiveness (DATAR). The evaluation addressed the 2009–2012 implementation period, i.e. the second phase of this major innovation support policy in France (2,7b of public expenditures over the period). Its aim was to assess the relevance, coherence, efficiency and impact of the national policy as well as each of the 71 competitiveness clusters. The study concluded that the policy should be continued over the 2014–2020 period and recommended to increase the lead of regions in the governance of the cluster policy, as well as to reinforce the role of clusters and their impact on the SMEs innovation development.

In April 2013 the DGCIS in conjunction with the French statistical office INSEE has published the results of an econometric evaluation concerning the economic impact of the competitiveness clusters policy on the participating companies (Table 1). The study has two components: firstly, it concerns all 1,520 SMEs and mid-sized companies³ being competitiveness clusters members, independent of multinational companies and that are not very specialized in R&D; secondly, it concerns SMEs and mid-sized companies (approximately 500 entities) that have been provided funds for collaborative R&D projects from the FUI⁴. The second component of the evaluation is therefore comprised in the first component of the study. These companies are the main beneficiaries of the innovation support measures proposed by the French government because of their higher sensitivity to the R&D market failure. The evaluation gives the possibility to assess the impact of the competitiveness clusters policy on participating companies in terms of R&D expenditure, R&D employment and turnover. Estimated impacts are average annual for companies in the period 2006–2009 in comparison with companies operating outside the competitiveness clusters.

TABLE 1. Economic impact of the competitiveness clusters policy

Average annual effect between 2006 and 2009	SMEs and mid-sized companies in the competitiveness clusters		SMEs and mid-sized companies in the competitiveness clusters, with collaborative R&D projects financed by the FUI	
	Average annual effect by company	Relative effect compared with 2005	Average annual effect by company	Relative effect compared with 2005
Total R&D expenditure (EUR thousands)	76.1	4.3%	100.4	3.3%
Direct R&D public funds (EUR thousands)	29.6	22.1%	44.5	14.7%
R&D private funds (EUR thousands)	47.6	2.9%	57.1	2.1%
Research tax credit (EUR thousands)	32.6	4.7%	41.5	5.5%
Use of research tax credit (percentage points)	10.9	4.6%	5	6.2%
HRST (annual, in FTE)	0.7	237%	1.3	21.7%
Researchers in FTE	0.4	19.1%	0.9	7.7%
Net turnover (EUR thousands)	287.7	0.7%	963.9	2%
Number of patent applications	0.1	4.5%	0.2	8%

Source: DGCIS 2013, p. 3.

According to the results of the study, total annual R&D expenditure of the SMEs and mid-sized companies being competitiveness clusters members is in average 76,000 EUR higher than the expenditure of companies operating outside the competitiveness clusters in the period 2006–2009. It represents an annual expenditure of 4.3 percent higher than the total R&D expenditure in 2005. When it comes to SMEs and mid-sized companies in the competitiveness clusters, with collaborative R&D projects financed by the FUI, their total annual R&D expenditure is in average 100,000 EUR higher than the expenditure of companies operating outside the competitiveness clusters in the period 2006–2009. It accounts for an annual expenditure of 3.3 percent higher than the total R&D expenditure in 2005. The total R&D expenditure of the analyzed companies would account for 410m EUR, including 160m EUR resulting from the collaborative R&D projects funded by the FUI. The increase of the total R&D expenditure corresponds to the direct public funds of 29,600 EUR for the SMEs and mid-sized companies being competitiveness clusters members.

ters members and of 44,500 EUR for the SMEs and mid-sized companies in the competitiveness clusters, with collaborative R&D projects financed by the FUI. Regarding R&D private funds, they account for 47,600 EUR for the SMEs and mid-sized companies being competitiveness clusters members and for 57,100 EUR for the SMEs and mid-sized companies in the competitiveness clusters, with collaborative R&D projects financed by the FUI. It means that a leverage effect of the R&D expenditure is greater than 2:1 for the SMEs and mid-sized companies in the competitiveness clusters, with collaborative R&D projects financed by the FUI which seems to be a particularly positive result.

The SMEs and mid-sized companies being competitiveness clusters members have employed in average 0.7 more personnel in R&D, including 0.4 more researchers per year as compared to the companies operating outside the competitiveness clusters. For the SMEs and mid-sized companies in the competitiveness clusters, with collaborative R&D projects financed by the FUI the data are respectively 1.3 and 0.9. In total, approximately 1,000 HRST have been employed in the companies operating in the competitiveness clusters. Moreover, the net turnover of the SMEs and mid-sized companies in the competitiveness clusters, with collaborative R&D projects financed by the FUI has increased of 963,900 EUR per year in comparison with the companies operating outside the competitiveness clusters. For all 1,520 analyzed companies the net annual turnover has increased of 287,700 EUR in the period 2006–2009 in comparison with the companies operating outside the competitiveness clusters. The last indicator taken into account in the study is the number of patent applications which has not increased significantly in the SMEs and mid-sized companies in the competitiveness clusters (annual growth of 0.1 higher in comparison with the companies operating outside the competitiveness clusters in the period 2006–2009). One of the probable explanations of this situation is a short period of analysis taken into account. Summing up, it is worth highlighting an important increase of the private R&D expenditures observed in the SMEs and mid-sized companies operating in the competitiveness clusters. However the results of patent applications as an example of innovation output are rather deceiving in the companies taken into account in the evaluation.

Crucial challenges and future orientations of the competitiveness cluster policy

The competitiveness clusters policy was launched in 2005 to raise the international profile of French technology clusters and promote growth and job-creation in high value-added industries, anchoring these industries in a regional context. The vision of the French initiative is in keeping with that of the Europe 2020 strategy, which calls for, among other things, an increase in investment in research and development (R&D) by industry and the lifting of barriers obstructing public-private partnerships.

Apart from selected positive effects of the competitiveness clusters policy highlighted particularly in the aforementioned evaluation reports and the evaluation study conducted by the DGCIS and the INSEE, some not very promising conclusions concerning the competitiveness clusters policy can be drawn. As pointed out by Cordoba and Lucazeau [2012, pp. 23–24], although competitiveness clusters have received EUR 1.5b from the State for their functioning in the period 2006–2008, their performance indicators are rather discouraging: only 25 percent of competitiveness clusters' projects generate an innovation, the number of patent applications from competitiveness clusters is about 1.5 percent and R&D expenditure of 4.5 percent (France = 100 percent). When comparing French competitiveness clusters to similar cluster structures functioning in leading EU countries, some crucial differences between them are visible (Table 2). Firstly, the most important of them concerns the financing structure of the cluster. In Germany, United Kingdom and Finland private sources are much more important than public ones. Secondly, French competitiveness clusters are much more numerous than the compared ones. Consequently, they are not concentrated on key industries but operate in a wide range of industries. As pointed out by Cordoba and Lucazeau, lack of competitiveness clusters performance in comparison with clusters in other EU countries results from three principal weaknesses of the competitiveness clusters model:

1. Too large number of competitiveness clusters which are not aligned with the key technologies of the future.
2. An excessive orientation of competitiveness clusters on R&D (innovation input) and a weak capability to support and commercialize innovation (innovation output).
3. Domination of the public sector in the financing structure and in competitiveness clusters governance [Cordoba, Lucazeau, 2012, p. 24].

TABLE 2. French competitiveness clusters vs. similar measures in leading EU countries

Specification	France	Germany	United Kingdom	Finland
Name of the measure	Pôle de compétitivité	Spitzencluster	TIC	SHOK
Financing structure of the cluster	Public, regional	Private, regional, public	Private, public	Public, private
Number of clusters	71	15	7	6

S o u r c e: own elaboration based on: Cordoba, Lucazeau 2012.

In order to face the enumerated challenges, some structural orientations are necessary. The most important step is to reduce the number of competitiveness clusters by

merging them into bigger structures and by concentrating their activity on the technologies of the future. It is crucial to point out that 62 out of 71 competitiveness clusters receive 50% of public funds devoted to this measure, which means that the public funds dedicated to competitiveness clusters are concentrated on global competitiveness clusters.

The next orientation to be taken is to make the competitiveness clusters more independent of the state policy and to concentrate their activity not only on R&D but on innovation outputs, as innovation commercialization, design, new business models – key aspects that seem to be a French weakness in comparison with leading EU countries.

An important step is also to continue the evaluation efforts to assess the impact of the competitiveness clusters policy. The implementation of evaluation results is of crucial importance taking into account that the third phase of the competitiveness clusters policy has been launched by the French government on 9 January 2013 for the period 2013–2018. According to the main objectives of this policy the competitiveness clusters should become “factories for the products of the future” (fr. *usines à produits d’avenir*). As the competitiveness clusters are treated as decisive tools for the competitiveness of French industry, a great ambition is assigned to them by the Government, announced as part of the National pact for growth, competitiveness and employment.

Notes

¹ An innovation platform provides an open structure to various innovative stakeholders, particularly competitiveness cluster members, in which participants have access to high-quality facilities and services. The goal of the innovation platform is to facilitate R&D projects, testing, and the development of pre-series and prototypes. A platform can even serve as a “living lab” [Competitiveness clusters in France, p. 3].

² The Investments for the Future Program contains two competitiveness clusters specific measures: development of structuring R&D projects (€300 million) and pooled innovation platforms (€200 million). Other competitiveness cluster-related measures include the future technology research institutes and excellence centers for low-carbon energy sources, both created to enhance cluster established ecosystems [Competitiveness clusters in France, p. 3].

³ According to the INSEE definitions, a SME is an enterprise that has fewer than 250 employees and has either an annual turnover not exceeding €50m or an annual balance sheet total not exceeding €43m. A mid-sized company (fr. *entreprise de taille intermédiaire*) is an enterprise that has between 250 employees and 4999 employees and has either an annual turnover not exceeding €1,50b or an annual balance sheet total not exceeding €2b.

⁴ The Single Inter-Ministerial Fund (FUI) funds projects whose total budget is at least 75,000 EUR, and that associate at least two companies and one research laboratory or educational establishment.

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