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Cluster as a tool for policy makers

From the theoretical framework to the case of the European Union

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Introduction

When talking about clusters we face a topic that is very current and, at the same time, with a wide historical background. The Cluster is a phenomenon that has attracted great attention from the economic community in recent decades due to its undoubted potential. Well aware of the great successes achieved by clusters in the world, academics have tried to study the dynamism and mechanism that distinguish them, in an attempt to trace a common thread capable of universally explaining their functioning. Many have been the scholars, economists and researchers who have been studying this phenomenon from the end of the nineteenth century till now.

The concept of industrial cluster is always associated with notions such as competitiveness, innovation and growth. Consequently, when addressing this field, we automatically use to refer to the most famous example: the Silicon Valley. The latter is a fabulous place considered to be the best representation of the potential of an industrial cluster and, as a matter of fact, it is widely accepted as the world center in terms of innovation and high technology. However, it is way too simplistic and reductive to associate the latter example to the definition of cluster, with the aim of trying to explain it.

Practical cases at a planetary level demonstrate how clusters – if used effectively – can be a highly useful tool in the hands of the policy makers, to trigger or enhance economic growth and prosperity in a given geographic area. The European context, in fact, is an exhaustive demonstration of how cluster policies have become of central importance over the last few decades. The European Union has identified cluster policies as one of the tools at the heart of the future growth strategy.

At this point, in the light of what just said, and with the aim of deepening the theme of cluster policy, it is natural to ask a series of questions: what are the theoretical bases that support clusters as a cutting-edge and effective tool available to policy makers in the contemporary economic context? And what is the empirical evidence of this? Is it possible to draw a set of common practical rules in order to define a "correct use" of cluster policies?

Difficult questions which correspond to complex answers. In an attempt to shed light on these questions, with this thesis we will try to trace a logical and temporal thread that starts from the notional aspect of the cluster – as a tool in the hands of the political decision-maker – and reaches its practical use.

The thesis will initially focus on a purely theoretical analysis, with the aim of bringing to light different currents of thought on the topic of clusters. These currents of thought affect clusters both at a notional and at a more applicative level.

Afterwards, in order to give a clear interpretation of this, it surely is of high importance to take into consideration practical examples, in addition to theory. In this way it is possible to attribute an exhaustive application, helpful to understand what the theory actually intends to explain. This allows to begin the application-phase of a concept, by really getting a clear understanding of the bigger picture and of the theoretical point of view. To do so, the thesis will be divided into two parts.

The first part (chapters I and II), of a purely theoretical nature, will focus – in the first chapter – on the historical evolution of the concept of cluster from Marshall to the most recent relevant theories. The theoretical analysis will then continue – in the second chapter - with the study of methodologies to support clusters by policy makers.

The second part (chapters III and IV), of a practical nature, will take into consideration – in the third chapter – the cluster policies implemented by the European Union, throughout the years. Finally, the thesis will conclude with an in-depth study of two regional cases of cluster policies: the Basque country case and the Venetian region case.

> "*Clusters are a striking feature of virtually every national, regional, state, and even metropolitan economy, especially in more economically advanced nations"*
> (Michael E. Porter, *Clusters and the New Economics of Competition*, 1998)

I. THE EVOLUTION OF THE CONCEPT AND THE THEORETICAL HISTORY OF CLUSTERS

As well as it uses to happen for every economic theory, it is illuminating to begin an economic analysis from the history. It is interesting, in addition of being severely convenient, to outline how a concept was created and what has been its evolution throughout the years.

The industrial cluster, as it is known nowadays, is not something that has only recently become topical and fashionable. its concept has undergone a long conceptual evolution, which lasted over a century and began with Alfred Marshall at the end of the nineteenth century. During this long period the theory around the industrial district has borne more and more incremental variations, based mainly on empirical observation. However, its great notoriety and attention is attributed to the studies carried out by Michael E. Porter in his "*Competitive Advantage of Nations*".

The modern notion of cluster refers to a “phenomenon of geographical concentration of economic activities”[1] that is considered a crucial element for the development of economy. As for many other concepts, there exist several other definitions. Each of them generally varies depending on the purpose that drives them and on the context to which they are related.

[1] European Commission, *The concept of clusters and cluster policies and their role for competitiveness and innovation: main statistical results and lessons learned*, Luxembourg, Office for Official Publications of the European Communities, 2008, p. 10. Consulted from https://op.europa.eu/en/publication-detail/-/publication/c15445bd-8203-4d15-b907-56ea17a9876e

1. Alfred Marshall: the pioneer of the industrial district

1.1 The origins of the concept

As already mentioned, it was already in the late 1800s that the term "industrial district" appeared for the first time in an economics book, thanks to Alfred Marshall.
Considered as one of the most influential economists of that age, Marshall founded and was the head of the Cambridge School. The British economist started referring directly to this topic in the year 1879, when he wrote "*The Pure Theory of Domestic Values*".
Straight after a discussion on the metal industry, he wrote as follows:

> But in the metal trades in question, and in many others, the advantages which are generally classed under the heads of division of labour and production on a large scale can be attained almost as fully by the aggregation into one district of many establishments of moderate size by the erection of a few huge factories.[2]

As we can see, Marshall spotted the existence of a correlation between the physical aggregation of factories in a circumscribed zone and a series of related advantages. Precisely for this insight, and for the further developments of his theory, he is considered as the discoverer of this phenomenon by several economists of recent times. Moreover, "the Marshallian industrial district is now recognised as an important part of modern industrial economics"[3].
Although Marshall had his first intuition in the year 1879, it was only in the following year that he came up with the first definition of industrial cluster. In his book "*Principles of Economics*", he concentrated on studying a comparison between the economic advantages deriving from the division of labor of a single company on the one hand and the ones deriving from a group of companies on the other hand. The peculiar feature of the second group was that they were small and medium-sized enterprises with a

[2] Vicente J., *Economics of clusters: a brief history of cluster theories and policy*, Paris, Éditions La Découverte, 2016, p. 6.
[3] Belussi F., Caldari K., *At the origin of the industrial district: Alfred Marshall and the Cambridge School*, Padova, Cambridge Journal of Economics, 2009, p. 336. Consulted from https://academic.oup.com/cje/article/33/2/335/1732562

common location. Marshall then decided to take American and English companies as a practical case study, trying to see their differences. After his comparison analysis, he figured out that the advantages related to a system of co-located small-medium firms belonging to one industry are greater than the ones deriving from several activities carried out within only one big firm. More specifically, this intuition came from the observation of some British industries at the end of the 1800s: metallurgy in Birmingham, cutlery in Sheffield and textile in Lancashire.

Regarding his new discoveries Alfred Marshall was so determined to argue that "in a growing international competition, industrial organisation in districts would be better able to restore the supremacy of British industry"[4].

As a matter of fact, geographical proximity is a useful condition for the development and growth of returns for the companies that are part of it. However, this condition alone is not a sufficient reason to explain the resulting advantages. In order to obtain a successful environment within a cluster it is necessary to create a particular type of industrial organisation amid, not just the companies, but more generally all the local players which are part of it. This organisation should be based on the so-called coopetition, a notion which would be later introduced in the academic world and that will be discussed later on.

1.2 The geographical proximity

At this point it is natural to wonder why firms tend to concentrate in a geographical zone, building up an industrial district. In *Principles of Economics* Marshall identified more than one possible reason why this occurs.

The first reason consists in the need of the producers to locate themselves as close as possible to the resources they need for the production process. Producers, in fact, tend to prefer proximity to these resources as it allows to reduce costs and time and it increases the efficiency of the production process.

[4] Vicente J., *Economics of clusters: a brief history of cluster theories and policy*, Paris, Éditions La Découverte, 2016, p. 7.

The second reason is what Marshall literally defined as "the patronage of a court" which produces a "demand for goods of especially high quality"[5].

The third factor is the small towns themselves. Marshall observed how the life of companies can be geographically divided into two phases. At first, companies settle in one or more large cities where they build their factories. In the second phase, which can be defined as expansion, companies need more space to expand their factories. At this point, in the choice between expanding again in cities where land is scarce and the prices are high and moving to towns where these problems do not exist, the companies tend to choose the second alternative. The result is the creation of industrial districts which surround the cities.

Therefore, the geographical proximity of the companies is a phenomenon that does not occur randomly, but is driven by specific factors. However, we are talking about an agglomeration of companies in its primordial form. The industrial districts, in fact, are the result of a process that extends over time. This process requires to connect and amalgamate the companies themselves. Precisely for this reason Marshall argued that only in the case in which this agglomeration of companies persists over time, only then, at a certain point, the advantages begin to be seen.

1.3 Advantages and features of the Marshallian industrial districts

In *Principles of Economics* he essentially identified four advantages deriving from the concentration of several companies in the same area. The first advantage deals with the hereditary skills. The economist argued that "the mysteries of the trade become no mysteries; but are as it where in the air; and children learn many of them unconsciously"[6]. This means that particular skills of the workers are spread from the simple working in contact with each other. Therefore, it is not difficult to imagine that such skills are transmitted from generation to generation precisely because, in a certain sense, they are in the air. And this concept is very dear to Marshall, so much so that it

[5] Marshall A., *Principles of economics*, 8th edn., London, Macmillan, 1920, p. 269.
[6] Ivi, p. 271.

was also discussed in another book published in the previous year, in 1879. In this book, entitled "*The Pure Theory of Foreign Trade: The Pure Theory of Domestic Values"*, Marshall asserted:

> When large masses of men in the same locality are engaged in similar tasks, it is found that, by associating with one another, they educate one another. To use a mode of speaking which workmen themselves use, the skill required for their work is in the air, and children breathe it was they grow up.[7]

He put the hereditary skills in the first place among all the advantages of a cluster, as a theme of central importance. According to him, due to the continuous transfer of knowledge between workers, a fruitful environment is created for the circulation of new ideas and for innovation. And it is precisely this environment that establishes the competitive advantage of the industrial district and that qualifies it. It is the skills and competences that circulate in this environment that determines the qualitative features or, in other words, the added and distinctive value of the cluster.

About the circulation of new ideas Marshall stated:

> […] if the total number of firms engaged in a particular industry is small, there are but few men in a position to make improvements in the process of manufacture, to invent new machines and new methods. But when the total number of men interested in the matter is very large there are to be found among them many who, by their intellect and temper, are fitted to originate new ideas. Each new idea is canvassed and improved upon many minds; each new accidental experience and each deliberate experiment will afford food for reflection and for new suggestion, not to a few persons but to many.[8]

Therefore, it is evident that Marshall had already sensed the enormous potential of industrial districts in innovation. Indeed, as in this particular environment the features of the human factor are the best suited for this purpose.

The second advantage deriving from an industrial district is the growth of subsidiaries trade. The agglomeration of industries in a common area tends to create a second

[7] Marshall A., *The pure theory of domestic values*, London, London School of Economics and Political Science, 1879, p. 9.
[8] Ibid

agglomeration of industries in the surrounding zone. The second group is established in the neighborhood in order to provide resources and materials, by organizing their production as well as their trade. As a result, the firms belonging to the district can exploit a great strategic advantage by relying in subsidiaries and by lightening their workload.

The third advantage is the use of highly specialised machinery. A fundamental characteristic of the industrial district is that it is possible to achieve the use of sophisticated machinery on a large scale despite the fact that there is no single large capital. According to Marshall this occurs mainly because there is a "large aggregate production of the same kind"[9], given by the specialisation of the workforce and the division of labour, main features of the industrial districts.

The fourth and last advantage connected to an industrial district refers to the labor market, or, in other words, to what is called "local market for special skill". With respect to the workers and their mobility, it is easy to deduce that they will tend to move where there is a great demand for labor that requires the same specialization as the one they offer. On the other hand, instead, it is the companies themselves who try to settle down where they can find a high supply of labor with the features that their businesses need. Therefore, a competitive advantage is created both for the companies belonging to an industrial district and for the district itself. Taking the opposite case as an example, it can be seen how a geographically isolated company, despite the fact that it can still count on a large pool of workers to draw on, finds itself in serious difficulty in having the needed specialized workforce.

All the characteristics listed above represent the basic characteristics of the Marshallian industrial district. However, once again, the central role of the time factor in the development of the industrial district should be emphasized. It is the economist himself who affirmed that the advantages connected to an industrial district derive from the common localization that lasts over time. Without this latter factor, therefore, it would be a set of co-located companies which have not matured a sufficient degree of interconnection among them.

[9] Marshall A., *Principles of economics*, 8th edn., London, Macmillan, 1920, p. 271.

The last aspect of the Marshallian industrial district, as abovementioned, is the presence of the so-called "coopetition". The latter is a term which refers to a mix between collaboration and cooperation, that would be used for the first time many years to follow. Nevertheless, Marshall already sensed its existence in his analysis of the internal dynamics of the industrial districts. Within an industrial agglomeration companies are not separate entities, but different components of a single body. A proof of this is that companies, while concentrating on certain phases of the production process, do not consider them as isolated, but as a function of other phases. In this way "the district comes to be not only competitive owing to the presence of many firms but also, and moreover, cooperative where parts interact in an exchange process"[10]. Therefore, it is possible to affirm that, according to Marshall, the industrial district, at an economic level, is the best example of cooperation both in terms of size and efficiency of its inner interrelations. This type of environment is in fact made up of a consolidated and mature network that involves different industrial sectors, which work synchronously, making up a single body. The cooperation which has just been shown can be divided into two different types: conscious and intentional or unconscious and automatic[11]. The economist focused on the automatic cooperation, considered as the most efficient expression of cooperation as well as the main feature of the industrial district.

Marshall's analysis reached its climax when he focused on the comparison with large companies. Relying on the series of competitive advantages that an industrial district guarantees, he affirmed that small and medium enterprises, fundamental components of a cluster, are able to compete even with larger enterprises. Obviously, this can occur if the small and medium enterprises are inserted in a context of a mature industrial district. As he pointed out: "nearly the maximum economy of production can often be attained by a well organised business of moderate size: but (. . .) the task of marketing efficiently over a large area makes demand for almost unlimited capitalistic resources"[12]. Therefore, even if small and medium enterprises, when gathered together in an industrial district, have the potential to challenge the bigger ones, they still have

[10] Belussi F., Caldari K., *At the origin of the industrial district: Alfred Marshall and the Cambridge School*, Padova, Cambridge Journal of Economics, 2009, p. 338.
[11] As discussed in Belussi F., Caldari K., *At the origin of the industrial district: Alfred Marshall and the Cambridge School*, Padova, Cambridge Journal of Economics, 2009, p. 339.
[12] Marshall, A., *Industry and trade*, London, Macmillan, 1919, p. 511.

to face big issues related to marketing. Despite this, Marshall strongly believed that these are surmountable problems as long as firms act together in order to counter them.

1.4 From theory to practice: the British case of study

Marshall used to point out that, for an economist, theory and practice should not be separate, and so he did. According to him both of them are of same importance since, albeit the theory is necessary to explain phenomena that occur in reality, in turn it is direct observation that allows to fully understand the difficult connection between the two aspects. He "visited several factories, making notes of the technological features of productive processes and of the kinds of organisation, interviewing employees and employers, trying to understand the weak and strong points that characterised each firm"[13].

For his purpose, once again, Marshall decided to compare the American and the British industries. During Marshall's time there was a substantial difference between the two most common types of firms in the two countries. In order to have a clear idea of the industrial organisation it is helpful to take a quick look at the historical context of that time. Marshall referred many times to the contrast between these two countries in his book "*Industry and Trade*", written in 1919. The historical period in which the economist's analysis is carried out is contextual to that of the dawn of Fordism, the manufacturing system that would revolutionize the century. Two of the pillars of Fordism are the standardisation of the product and the employment of assembly lines. Thanks to this, the US was experiencing and increasing an expansion of its firms in terms of size. On the other side of the ocean, in the UK, the most common firm is not the large one, but instead the small-medium one belonging to the industrial district. Indeed, the main industries in the country, woollen goods and cotton, were located in the same geographical zone.

[13] Belussi F., Caldari K., *At the origin of the industrial district: Alfred Marshall and the Cambridge School*, Padova, Cambridge Journal of Economics, 2009, pp. 340-341. Consulted from https://academic.oup.com/cje/article/33/2/335/1732562

The contrast between these two types stimulated Marshall's curiosity since he wanted to find out the reason why British firms, predominantly small and medium, were able to compete with the bigger American ones.

It must be said that the British entrepreneurial fabric was not only made of small and medium enterprises but, although still smaller than the American one, there was also the presence of larger industries. And this is exactly what he claimed to be a need for a national industry: to have a heterogenic system of firms, each one with advantages and disadvantages. According to Marshall, however, the districts of manufacturing production had the right potential to raise the British industry by making it internationally competitive.

The most emblematic British industry to be taken into consideration surely was the textile one, since it was treated as the most important and most suitable in the case of an industrial districts analysis. More in particular, Marshall used to recognise the textile industry based in Lancashire as the "best present instance of concentrated organization mainly automatic"[14]. It is considered to be the first British case of a wool industry employing a modern approach to the manufacture process, based on massive production. Besides this, the industry was important for its main features:

- Strategical access to key resources
- Climate quite appropriate
- Character of the population.[15]

The geographical location was a clear advantage for the firms belonging to the industry, since it allowed them to obtain those resources essential for their field (coal, iron and sea) and the climate was adequate for the cotton. The sum of these features made of the Lancashire industry the industrial district he was looking for to conduct his analysis. The demand in the Lancashire textile sector was so variegated about different versions of the same product that "each business can specialize its plant on a narrow range of

[14] Marshall, A., *Industry and Trade*, London, Macmillan, 1919, p. 601.

[15] Taken from Belussi F., Caldari K., *At the Origin of the Industrial District: Alfred Marshall and the Cambridge School*, Padova, Cambridge Journal of Economics, 2009, p. 341. Consulted from https://academic.oup.com/cje/article/33/2/335/1732562

work, and yet keep it running with but little interruption"[16]. As it is easy to guess, this type of demand fostered the specialization and efficiency of the firms which belonged to the industry. Yet this process did not have uniform results among the firms, indeed it had been seen that higher levels of specialization characterized some branches of the industry more than others. According to Marshall, the most specialised were the ones operating in those branches

> which are in the hand of a multitude of independent business of moderate size. As is well known, fine spinning, and weaving are localized separately. Individual firms frequently specialize on a narrow range of counts of spinning. Blackburn, Preston, Nelson and Oldham are centres of four different classes of staple cotton clothes, and so on.[17]

As mentioned before, the massive production of the firms was the main and key strength of the Lancashire industrial district. In fact, it is thanks to this that great results in terms of international competition were achieved, especially in certain branches. Further analysis showed how this superior efficiency led to an undisputed dominance over global rivals and, in certain cases, not having rivals at all. These results can also be found in the Yorkshire industrial district, which specialized in the woollen and worsted sector. Here, however, local businesses had to contend with a strong international competition.

When referring to the great success of the automatic organisation of the British industries, Marshall stated that it was caused by "the fact that their plant is made in their own districts, with constant intercommunication of ideas between machine makers and machine users"[18]. Therefore, once again, the industrial district can lead to competitive advantage. When small businesses enter the international scene and have to compete with large businesses, their disadvantages become evident. Marshall's analysis aims, in fact, at defining the gathering of small businesses as the tool that allows them to reduce or eliminate these disadvantages.

[16] Marshall, A., *Industry and Trade*, London, Macmillan, 1919, p. 601.
[17] Ibid
[18] Ibid

After discussing Marshall's empirical observation and his conclusions, it is possible to make a few remarks. From his reasoning, and as he emphasized over his books, it is clear that the economist had a high level of confidence and positivity towards English industry. Especially in "*Industry and Trade*", while analysing the machinery for various industries, he affirmed that "nearly the whole of it is of British invention, and sought for by rival industries in other countries"[19]. All this certainty in the exaltation of British industry, combined with a continuous search for comparison between it and the industries of the most emerging countries (notably Germany and the United States), actually concealed something negative. As evidenced by his letter sent to Bishop Westcott in 1901, Marshall was frightened by the expansion of the most emerging countries. He also argued that the British industry had become weak and was going through a period of crisis. The resulting scenario is that of a nation, England, which had embarked on a phase of constant and inexorable decline, from the point of view of economic power, in favor of new emerging nations, Germany and the United States above all.

Moreover, Marshall thought he had found the reason of this decline. As he wrote in a letter to E. Caird in the year 1897, "the apathy of many employers and their contentment with inferior methods, until driven out from the field or threatened severely, at least, by more enterprising foreigners"[20].

The economist was not just able to predict what would happen in his country and to understand the reasons, but he also tried to find solutions. And it is not difficult to guess that, because of the studies carried out on the English industrial districts, he had found in them the remedy for the English crisis. Marshall, in fact, saw a lack of vitality and inventiveness in the English industrial fabric. According to him, British companies not only had to be able to keep up with the innovation introduced by other countries, but had to be able to anticipate its moves, by innovating first, through a constant dissemination of knowledge. And it is clear that these are exactly the peculiar features contained in the industrial district model theorized by Marshall, which has been discussed so far.

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[19] Marshall, A., Industry and Trade, London, Macmillan, 1919, p. 603.

[20] Whitaker J. K., *The correspondence of Alfred Marshall*, Economist, 3 vols, Cambridge, Cambridge University Press, 1996, p. 214.

Indeed, in an industrial district

> each man profits by the ideas of his neighbour: he is stimulated by contact with those who are interested in his own pursuit to make new experiments; and each successful invention, whether it be a new machine, a new process, or a new way of organizing the business is likely when once started to spread and to be improved upon[21]

1.5 Pupils and followers of Marhall's thought

Marshall was not the only economist who, during his age, had been dealing with the phenomena of the industrial district. Moreover, it has to be said that not all the ideas and findings that have been discussed and analysed so far come from him.

Among the pupils of Marshall, surely the most brilliant and closest was Sydney Chapman. His main contribution is given by his analysis on the Lancashire Cotton Industry, where the influence of his teacher can be spotted easily. As he wrote in his book, localisation is not a feature of all industries. Some of them are, in fact, characterised by dispersion. According to him, and in line with what Marshall stated, this is not the case of the textile industry, where agglomeration in districts was very common. He recognised geography as the only origin of localisation and he claimed the latter to be the key strength of two particular economies: "specialisation of businesses" and "the proximity of subsidiary industries and their specialisation"[22].

Chapman was in line with the Marshallian idea also as regards the coopetition of companies. Based on his direct observation of the textile field, he stated that competition is the trigger for cooperation between companies. However, he differed from his teacher in the evaluation of the time factor, to which was not given particular importance and which was rather taken for granted.

An economist who gave strong importance to the time within the dynamics of industrial districts was Dennis Holme Robertson. His conception of the causes of localisation is

[21] Marshall A. and Paley Marshall M., *The economics of industry*, London, Macmillan, 1879, p. 53.

[22] Chapman S., *The Lancashire Cotton Industry. A study in economic development*, Manchester, The University Press, 1904, pp. 152-155.

remarkable. According to him, localisation is the result of three blended factors. However, only one of them is really important in practice. Differently from Marshall, Robertson claimed that the vicinity to supply of raw materials was not relevant anymore due to decreased information and transportation costs. Also, the access to sources of power lost its importance, since the latter was no longer based on coal, but rather on oil and electricity, which were easier to be transported. Instead, according to Robertson localisation in industrial districts was given by "obscure reasons of climate or history"[23] and kept up by "force of habit and by the miscellaneous but solid benefits which it confers"[24].

A clear influence of Marshall is spotted in Robertson's view on the industrial atmosphere, which has the same characteristics of Marshall's one. Nevertheless, once again, Robertson differed in one key point: the effect of localisation. He stated that as a consequence of agglomeration of firms in a common geographical area, the firms tend to increase their individual seizes. This is a theory that, he added, is naturally not applicable in all cases, as it admits some exceptions. There are some conditions in which localisation allows the development and survival of small and medium firms.

David Hutchison MacGregor was another economist who dealt with industrial districts and was influenced by Marshall's studies. According to him, the strength of companies within an industrial district is given by centralisation and localisation:

> The forces of industrial revolution have made it profitable for the great industries of a country not only to be centralized – that is to say to work in one district given over specially to the production of certain goods; but also to be localized – that is, to work in certain districts having special advantages for their own forms of production[25].

Therefore, these two forces are the result of the evolution of the industry through time. What makes the difference in the history of an industry is invention. In fact, invention is a factor that allows companies to gain a great advantage. This advantage is due to a

[23] Belussi F., Caldari K., *At the origin of the industrial district: Alfred Marshall and the Cambridge School*, Padova, Cambridge Journal of Economics, 2009, p. 344. Consulted from https://academic.oup.com/cje/article/33/2/335/1732562

[24] Robertson, D. H., *The control of industry*, New York, Harcourt, Brace and Company, 1923.

[25] MacGregor D. H., *The evolution of industry*, London, Thornton Butterworth, 1929, p. 203.

surplus obtainable thanks to a saving in the use of resources in the production process. The industry which invents the most is the one that can obtain the same results while using less resources. Invention needs time and energetic people to be properly activated, and leads to specialisation. In some way, it can be compared to Marshall's atmosphere, but with an important difference: "a local body of people cannot have the full advantage of industrial progress unless they share it with wider bodies of people"[26]. Thus, while according to Marshall the famous atmosphere was the result of proximity and spread within the cluster enhancing it, MacGregor argued that the local dimension itself is not sufficient in order to efficiently and fully exploit the deriving advantages.

The traces of Marshall's thought are still visible even in the middle of the Century when the American economist, Sargant Florence, focused his attention on the industrial district. His contribution is given by having conceived an approach to the study of the phenomenon based on "the location quotient, the coefficient of localisation, and the comparison among different industry rankings"[27].

Through the direct observation of the field he sensed that industrial agglomerations tend to follow the localization with a high rate of urban concentration. Despite this, there are many companies that are neither close to their resources nor to their market. Sargant Florence identified five main advantages linked to the industrial district:

- The creation of a pool of expert labour given by the flow of skilled workers;
- The division of labour among plants which are connected in various aspects (services, products and processes);
- The creation of a reputation connected to the area in which goods or services are produced;
- Reduction in transportation and communication costs.[28]

[26] MacGregor D. H., The evolution of industry, London, Thornton Butterworth, 1929, p. 28.
[27] Belussi F., Caldari K., *At the origin of the industrial district: Alfred Marshall and the Cambridge School*, Padova, Cambridge Journal of Economics, 2009, p. 350. Consulted from https://academic.oup.com/cje/article/33/2/335/1732562
[28] Taken and revised from Belussi F., Caldari K., *At the origin of the industrial district: Alfred Marshall and the Cambridge School*, Padova, Cambridge Journal of Economics, 2009, p. 351. Consulted from https://academic.oup.com/cje/article/33/2/335/1732562

Thus, except for the advantage connected to the reputation which represents something new, the influence of Marshall studies is crystal clear.

However, despite the several connections between the two economists, it is in the concept itself that the widest difference can be seen. Florence's definition of industrial district is strictly connected to the colocation parameter. Besides, as his studies showed, "a precise demarcation of distinct districts is of course impossible, as many of the districts are contiguous and basic industries of contiguous districts most frequently overlap in their location near the margin of the areas"[29].

His researches confirmed that industries with strong agglomeration features are typically made up of small and medium-sized enterprises - as it was already amply illustrated in Marshall's studies. Florence identified the strength of industrial districts in this peculiarity. The environment of small-seized firms tends to favor the creation and growth of new companies. As a direct consequence, taking for example the workers, it is natural that in this context they are more inclined to pursue their aspirations trying to become entrepreneurs.

This is likely to happen in environments where the employees are not working just for the interest of the shareowners themselves, as it occurs in big firms.

As Florence stated:

> It is easy where there is a pool of skilled labour for foremen or any others with ambitions to break away from the old firm and set up on their own with hired labour. Few firms survive, but this ease of entry into the trade does enable many to try […]. Those who survive among the small men are presumably the more 'fit' and they are presumably also trained at least by experience"[30].

In conclusion, a final note deserves to be added about the comparison between Marshall and Florence. The famous Marshallian atmosphere seems to be outmoded by the American economist, shifting from a specialised to a diversified industrial district.

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[29] Belussi F., Caldari K., *At the origin of the industrial district: Alfred Marshall and the Cambridge School*, Padova, Cambridge Journal of Economics, 2009, p. 351. Consulted from https://academic.oup.com/cje/article/33/2/335/1732562

[30] Florence, P. S., *Investment, location, and size of plant*, Cambridge, Cambridge University Press, 1948, p. 80.

In other words, in a context where economies were getting more and more dynamic, "highly localised industries for Sargant Florence are not necessarily specific individual districts"[31].

2. The rise of the Italian industrial district in the 1980s

2.1 A century later: the recall of Marshall

Marshall's intuition on industrial districts is now widely recognised as being illuminating and pioneering. His works shall clearly be identified because they have a modern key, both at the conceptual level and at the practical level, although they were written more than a hundred years ago. This is to be considered outstanding, especially if we think that these theories can still be treated as current, after a long time. For these reasons Alfred Marshall can be considered a full-fledged forerunner.

Nevertheless, the attention on this topic has been lost over the course of the century until the beginning of the 1980s. As a matter of fact, his works have remained unnoticed for several decades, with the only exception of few cases, as already discussed.

The most accredited cause for this is the parallel rising of the Fordist idea of industry. This explains why for so many decades the attention was almost entirely captured by large firms instead of small and medium ones. Therefore, during this period of time, "most growth and productivity gains were associated with the development of the large firm and therefore the search for internal economies of scale"[32].

The economic context in which the countries found themselves between the end of the seventies and the beginning of the eighties, however, was perfect for the resurgence of Marshall's theories. Western economies, in different periods, went through a phase of

[31] Belussi F., Caldari K., *At the origin of the industrial district: Alfred Marshall and the Cambridge School*, Padova, Cambridge Journal of Economics, 2009, p. 351. Consulted from https://academic.oup.com/cje/article/33/2/335/1732562

[32] Vicente J., *Economics of clusters: a brief history of cluster theories and policy*, Paris, Éditions La Découverte, 2016, p. 9.

slow or no economic growth, rising inflation and rampant unemployment, which impacted the decline of the Fordist industry.

2.2 Becattini and the case of the north and north-east Italian districts

It is in Italy where the rediscovered attention towards the industrial districts founds its origin. During the 1970s, despite the ongoing economic crises, firms belonging to several cities and regions located in the north and north-east of Italy kept on performing with high growth rates. In those years a set of phenomena were taking place, including the oil crisis, the decline of the Fordist idea and the rapid change in the demand for products and services, which put industries in crisis. In this difficult context, some small and medium enterprises were unexpectedly able to face these changes and to overcome them. As a consequence, economists began to investigate the reasons for this "anomaly".

The most remarkable studies were carried out by the School of Florence, considered to be the link between the Marshallian industrial district and its modern concept.

The main father and contributor of this school was Giacomo Becattini, an Italian economist who "contributed the reorganization of Marshall's fundamental insights in an interpretive organic framework applied to the analysis of industrial districts in Italy"[33]. He published an article named "*Dal "settore" industriale al "distretto" industriale: alcune considerazioni sull'unità d'indagine dell'economia industriale*", which is widely recognised as the landmark for the contemporary conception of district.

According to Becattini the failure of the Fordist production model can be found in its dearth of flexibility, typical of the large companies, incompatible with the growing differentiation and specialisation of the demand of goods and services, going on during the 1970s. The Italian small and medium firms belonging to industrial districts, instead, were not short of flexibility and even adapted to the new situation through the use of

[33] Schilirò D., *Italian industrial districts: theories, profiles and competitiveness*, Messina, Article in Management and Organizational Studies, 2017, p. 2. Consulted from https://www.researchgate.net/publication/320694885_Italian_Industrial_Districts_Theories_Profiles_and_Competitiveness

collaboration. They "exchanged knowledge and expertise with other firms in the same sector and firms in their immediate surroundings, thereby enabling several complementarities"[34].

With the precise purpose of finding the cause, the School of Florence conducted a careful investigation on the phenomenon underway in northern Italy, trying to outline its key points:

- High specialisation in a particular traditional industry
- Overall viability of the territorialized mode of production
- Central role of the territorial division of labor
- Cooperative and competitive relationships between the companies
- Flexible and responsive production process.[35]

Thus, it is logical to conclude that the excellent performance of these micro-regions is not linked to the mere consequences of agglomeration, but to "the result of the ability of district actors to simultaneously use their productive autonomy and their complementarity according to market opportunities"[36].

In his studies, Becattini shifted the focus from the single company to the district made up of interconnected companies belonging to the same geographical area. This is considered a great difference between Marshall's thought and the new vision introduced by the Italian economist. Firms were then defined as "agglomerations, which are characterized by social relations and inter-firm cooperation and competition"[37].

As a natural consequence of competition, a strong division of labor is created which occurs within the districts themselves, as the companies that are part of it tend to specialise in different sectors of the value chain.

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[34] Ortega-Colomer F. J., Molina-Morales F. X., Fernández de Lucio I., *Discussing the concepts of cluster and industrial district*, Journal of Technology Management & Innovation, Innov. 2016. Volume 11, Issue 2, Santiago, p. 140. Consulted from https://scielo.conicyt.cl/scielo.php?script=sci_arttext&pid=S0718-27242016000200014

[35] Taken and revised from Vicente J., *Economics of clusters: a brief history of cluster theories and policy*, Paris, Éditions La Découverte, 2016, p. 11.

[36] Vicente J, *Economics of clusters: a brief history of cluster theories and policy*, Paris, Éditions La Découverte, 2016, p. 11.

[37] Dahl M. S., *Knowledge diffusion and regional clusters: lessons from the Danish ICT industry*, Aalborg, Department of Business Studies, Aalborg University, 2003.

Becattini gave his own concept of industrial district

> A socio-territorial entity which is characterized by the active presence of both a community of people and a population of firms in one naturally and historically bounded area. In the district, unlike in other environments, such as manufacturing towns, community and firms tend to merge.[38]

The novelty introduced lies in analyzing the district no longer from a merely productive or technological point of view, but rather from the one that takes into account a social component. In order to follow this path, more and different perspectives were taken into account, such as history and sociology, besides economics.

This social dimension was spotted and studied even by the scholars belonging to the School of Florence, particularly in the case studies on the Italian micro-regions.

Therefore, while for Marshall the district is based on an aggregation of co-located activities working in the same field, for Becattini it is characterised by "the presence of a community" which he considered to be as " a set of history, unwritten rules, and shared values, which directly affects the productivity and structure of the district"[39].

Moreover, the aforementioned connection and interaction among firms, also extends to other actors: more specifically it involves the market and the institutions.

In conclusion, it is meaningful to mention a statement that Becattini himself reported in connection with the conglomeration of companies. In the discussion on the relationship between companies belonging to an industrial district and the environmental context in which they are inserted, he said:

> in order for the industrial district to develop, it is necessary that such a population of small firms merge with the people who live in the same territory,

[38] Pyke f., Becattini g., Sengenberger W., *Los distritos industriales y las pequeñas empresas. Distritos industriales y cooperación interempresarial en Italia*, Madrid, Ministerio de Trabajo y Seguridad Social, 1992. Consulted from https://www.sciencedirect.com/science/article/pii/S1135252312600136

[39] Schilirò D., *Italian industrial districts: theories, profiles and competitiveness*, Messina, Article in Management and Organizational Studies, 2017, p. 2. Consulted from https://www.researchgate.net/publication/320694885_Italian_Industrial_Districts_Theories_Profiles_and_Competitiveness

and who, in turn possess the social and cultural features (social values and institutions) appropriate for a bottom-up industrialization process.[40]

3. Michael Porter and the beginning of the modern industrial cluster

As it has been seen in the first chapter, the concept of industrial district was debated by many economists and scholars in an intermittent development. Its shape was modified a few times during the years, mainly according to the contextual economic period. However, it is only in 1989 that the economists first started referring to the term "cluster", thanks to the book "*The Competitive Advantage of Nations*" written by Porter. Michael Eugene Porter is the Bishop William Lawrence University Professor at Harvard Business School. Nowadays, the academic community agrees in attributing the origin of the industrial cluster to him. Beyond this, Porter gave the cluster a renewed interest and popularity worldwide.

3.1 Porter's industrial cluster

The American economist, as above mentioned, started dealing with the concept of industrial cluster in "*The Competitive Advantage of Nations*", and he made further analysis and implementations in two articles in 1998 and 2000[41]. The latter two will later be considered as the points of reference to which any article of this field would refer.
Porter had no doubts about the central and increasing importance of clusters, as he was stating back in 1990: "the cluster is becoming a new way of thinking about economies and organizing economic development efforts"[42].

[40] Benko g., Dunford M., *Industrial change and regional development: The transformation of new industrial spaces*, London, Belhaven Press, 1991, p. 4.
[41] Harvard Business Review, https://hbr.org/1998/11/clusters-and-the-new-economics-of-competition and Porter M., *Location, Competition, and Economic Development: Local Clusters in a Global Economy*, Economic Development Quarterly, 2000. Consulted from https://journals.sagepub.com/doi/10.1177/089124240001400105
[42] Porter M., *The Competitive Advantage of Nations*, The Free Press, New York, 1998.

According to Porter "a cluster is defined as a geographical concentration of firms and institutions connected to each other and operating in a particular field"[43].

First of all, if compared with his predecessors, the turning point is represented by an inclusion of different types of actors with different types of interests, of which mention should be made: "suppliers, customers and also governmental and other public institutions such as universities, colleges, standard-setting agencies, think tanks, vocational training providers and trade associations and missions"[44].

Moreover, the cluster environment comprises not just those companies related to that market or similar ones, but also a wide variety of other companies which work indirectly in the same fields, the so-called "related and supporting firms"[45].

Therefore, Porter broadened "geographically" the cluster's environment by including more actors, if compared with Marshall and Becattini. In Porter's ideas the environment surrounding the company is its source of competitiveness and, consequently, its source of success. This can be seen as proof of the central role given to the environment in the industrial cluster dynamics.

His work represents a turning point compared to the past even with respect to the focus of his conception of cluster. Porter's cluster in fact, differently from Becattini's, does not consider the social dimension as a relevant element in its development. Instead, "with the introduction of the Michael Porter school of clustering, the focus is moved from the social relations that keep clusters together and toward the traded relations of clusters"[46].

Porter's goal was to create a concept capable of applicability on a global as well as universal scale. It was "shaped" with the clear intention of finding an explanation for the fact that some companies were located and co-located in particular countries able to achieve a competitive advantage that was sustainable. On the contrary, those kinds of

[43] Harvard Business Review, https://hbr.org/1998/11/clusters-and-the-new-economics-of-competition

[44] Ibid

[45] Term introduced by Porter in *The Competitive Advantage of Nations*, The Free Press, New York, 1998.

[46] Ingstrup M. B., Freytag P. V., Damgaard T., *Cluster initiation and development: A critical view from a network perspective!* In Proceedings of the 25th annual IMP Conference, Marseille, 2009. Consulted from https://portal.findresearcher.sdu.dk/en/publications/cluster-initiation-and-development-a-critical-view-from-a-network

advantages were difficult (or even impossible) to be achieved by companies situated in countries with opposite features.

The cluster designed by Porter, in addition to some differences, has also a great similarity with the industrial district of Marshall. A contact point with the famous industrial atmosphere can be spotted when Porter claimed that "the proximity of different firms and institutions and the repetition of their exchanges generate higher level of trust and coordination than a context of market transactions between actors from different locations"[47]. Moreover, through his studies Porter confirmed what the Italian economists had already discovered a few years earlier. Indeed, industrial clusters enjoy the benefits of not relying on vertical integration. This fact, according to Porter, leads to a greater potential for performance not only if compared to the previous Fordist model, but also, more generally, if compared with isolated companies. If compared to the latter, in fact, clusters can count on a greater production flexibility and are much more prone to innovation.

3.2 The central role of competitive advantage in the modern industrial clusters: A brief analysis

According to Porter at the basis of the incredible success of the industrial clusters there is one main element: the competitive advantage. Thus, trying to go under the surface of the concept of cluster, with the intention of explaining its functioning, it is very useful to analyze the competitive advantage. The question that arises spontaneously and of which it is needed to find an answer is: how are clusters able to develop and exploit this competitive advantage?

Michael Porter addressed the topic in his main book, "*The Competitive Advantage of Nations*", in which he initially focused on a national scale. Indeed, despite the success attributed to his book, Porter's ideas have substantially changed through the years before becoming the successful ones we know now. More precisely, while discussing

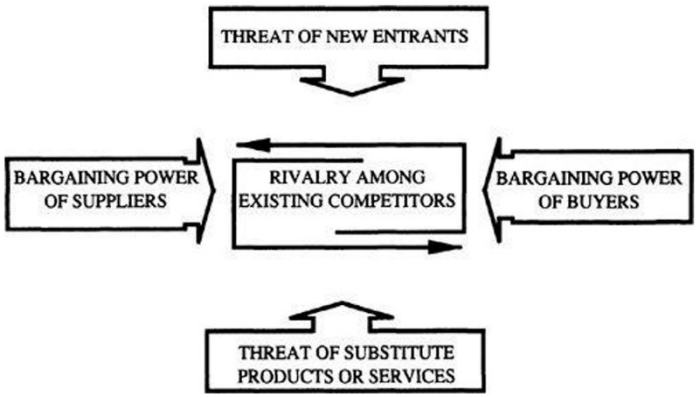
[47] Vicente J., *Economics of Clusters: A Brief History of Cluster Theories and Policy*, Paris, Éditions La Découverte, 2016, p. 17.

the competitive advantage, he shifted the emphasis from a national to a regional scale since the cluster theory was catching the attention of the academic world. As he also said, while referring to "*The Competitive Advantage of Nations*": "while the book is set at the level of the nation, the same framework can and has been readily applied at the regional, state, and city level"[48].

According to Porter every industry has a particular nature of competition which is given by five competitive elements:

1. The threat of new entrants
2. The threat of substitute products or services
3. The bargaining power of suppliers
4. The bargaining power of buyers
5. The rivalry among the existing competitors

Figure 1. The five competitive forces that determine industry competition.



Source: Porter M., *The Competitive Advantage of Nations*, The Free Press, New York, 1998.

[48] Swords J., *Michael Porter's Cluster Theory as a Local and Regional Development Tool: The Rise and Fall of Cluster Policy in the UK*, Local Economy, 2013, p. 373. Consulted from https://journals.sagepub.com/doi/10.1177/0269094213475855

Although these five forces may be applied to any industries, they manifest themselves heterogeneously among industries. Consequently, their strength differs depending on which industry is taken into account.

A nation's business fabric is made up of a range of different industries. Each of them has different properties and structures that make it unique and inimitable. According to Porter "the strength of each of the five competitive forces is a function of industry structure, or the underlying economic and technical characteristics of an industry"[49].

In addition, Porter argued that the five forces make it possible to assess the long term profitability of the industries. His studies have highlighted how the five forces "shape the prices firms can charge, the costs they have to bear, and the investment required to compete in the industry"[50], by determining they profitability.

3.3 The diamond model

As seen before, the main goal of Porter and his team of researchers was to identify the nature of competitiveness of the industrial clusters. According to him the competitiveness of a firm as well as of a cluster is the result of its surrounding environment. Consequently, the success or failure of a cluster depends on factors that lie outside the cluster itself, this proving how the local environment plays a central role in Porter's ideas. Indeed, it is this environment, and its interaction with the cluster, which shapes the competitiveness and the deriving success of the cluster in the course of time.

Porter, well aware of all this, created a model which could identify and evaluate these external sources of competitive advantage for the cluster. The diamond model[51], as he named it, is made up of four elements, each of which, with different intensity, affects the competitive performance of the cluster at an international level.

The elements are:

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[49] Porter M., *The Competitive Advantage of Nations*, The Free Press, New York, 1998, part 1, ch. 2.

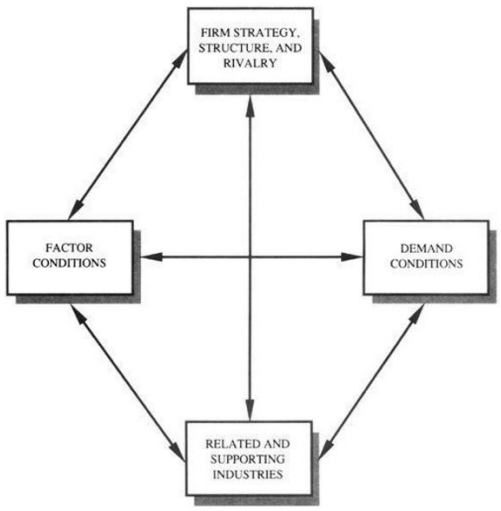
[50] Ibid

[51] which, after further studies and developments by Porter, will become the "cluster framework".

- Factor conditions
- Demand conditions
- Related and supporting industries
- Firm strategy, structure, and rivalry.[52]

These four elements, which can act together or separately, create the environment in which the cluster is born and develops. According to Porter, the diamond model embodies the answer to the key question he asked himself at the beginning of his book: why do some clusters achieve international competitive success while others do not? The answer lies in the four elements, since they "shape the environment in which local firms compete that promote or impede the creation of competitive advantage"[53].

Figure 2. The determinants of the diamond model.



Source: Porter M., *The Competitive Advantage of Nations*, The Free Press, New York, 1998.

It was highlighted how a greater proximity of the companies belonging to the same cluster determines a greater intensity in the interactions of the model, which

[52] Porter M., *The Competitive Advantage of Nations*, The Free Press, New York, 1998, part 1, ch. 3.
[53] Ibid

consequently becomes more effective. A further peculiarity of the diamond model is its reciprocity in the reinforcement of its elements, since "the effect of one determinant is contingent on the state of others"[54].

Factor Conditions are seen as "the inputs necessary to compete in industry, such as labor, arable land, natural resources, capital and infrastructures"[55]. Each industry has certain factors that are considered as a key from a competitive point of view. If among these key factors, the cluster holds the ones with low cost or high quality, then it gains competitive advantage.

Demand conditions are the circumstances related to the home demand for products and services. Three elements are relevant for home demand: "the composition of home demand, the size and pattern of growth of home demand, and the mechanism by which every nation's domestic preferences are transmitted to foreigner markets"[56].

Related and supporting industries are the ones that cooperate in terms of vertical integration. There is competitive advantage in a cluster where "the suppliers as well as the final producers optimize the production process and improve the products"[57], due to costs reduction and other direct advantages related to co-location.

Firm strategy, structure, and rivalry are considered by Porter as "the way in which firms are created, organized and managed as well as the nature of the domestic rivalry"[58]. The competitive advantage lies in finding the good balance amid these factors, which vary a lot from industry to industry.

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[54] Porter M., *The Competitive Advantage of Nations*, The Free Press, New York, 1998, part 1, ch. 3.

[55] Ibid

[56] Ibid

[57] Zumbach K. U., *The role of cluster theory for economic development: Does Porter's competitive diamond fail to explain Dubai's financial cluster?,* Bowling Green State University, 2010, p. 10. Consulted from https://etd.ohiolink.edu/apexprod/rws_olink/r/1501/10?clear=10&p10_accession_num=bgsu1274974773

[58] Porter M., *The Competitive Advantage of Nations*, The Free Press, New York, 1998, part 1, ch. 3.

3.4 The role of the government

So far it has been seen how the various economists who studied the industrial district, despite having dealt with many facets of phenomenon, have paid little or no attention to the intervention of institutions. Unlike them, Porter not only argued that the government plays a central role in cluster development, but he tried to push them to be more active and enterprising.

The government policy is actually a double-edged sword for the industrial cluster. Its role is to influence the four elements of the diamond model, but this can have either positive or negative consequences on the environment. Indeed, its policies must always pay particular attention not to limit competitiveness. The correct way for the government to support clusters is by "establishing and upgrading factor conditions by politically paving the way and eliminating and removing inefficiencies that hamper cluster innovation and productivity" [59] . Besides, empirical studies showed that government policies can even be influenced in turn by the diamond's forces.

In support of its argument, Porter took all the elements of the diamond model as examples. For instance, while referring to factor conditions, he stated that they "are affected through subsidies, policies toward the capital markets, policies toward education, and the like"[60].

3.5 The relevance of Porter's studies and criticism

At this point of the analysis a natural question should be: why did Porter's work become so important and influential? There are likely to be two answers to this question.

First, Porter's work seems to have been very successful due to its break with the past. He argued that cluster dynamics analysis can no longer be considered and developed

[59] Dahl M. S., *Knowledge Diffusion and Regional Clusters: Lessons from the Danish ICT industry*, Aalborg, Department of Business Studies, Aalborg University, 2003.

[60] Porter M., *The Competitive Advantage of Nations*, The Free Press, New York, 1998, part 1, ch. 3.

from an internal point of view. Instead, the attention has to be oriented towards the environment. As he claimed:

> Cluster thinking suggests that companies have a tangible and important stake in the business environments where they are located in ways that go beyond taxes, electricity costs, and wages rates. The health of the cluster is important to the health of the company.[61]

Second, Porter paid particular attention in the attempt to transform his work into practical tools for public institutions. In other words, he literally applied his own theory. In fact, to Porter is attributed what is considered the first and most famous case of cluster policy. He founded and led a consultancy company, named Monitor, which got an assignment from the Spanish Basque Country in the beginning of the 1990s. A cluster development programme was launched, which "was based on industrial diagnosis of the region, and the concrete recommendations followed the guidance of Porter's diamond"[62]. Subsequently many other similar initiatives were started, inspired by the case of the Spanish Basque Country.

Although Porter's work is considered extremely revolutionary by the academic community as well as by politics, it has also been the subject of criticism.

In particular, he was accused of distortion around the study of the industrial district, since he focused on a concept which was purely "a mere geographic concentration of industries"[63]. His focus should have been in line with Becattini's idea of industrial district, i.e. underlying "that the industrial district is a socio-economic construct"[64].

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[61] Porter M., *Location, competition, and economic development: Local clusters in a global economy*, Economic Development Quarterly, 2000. Consulted from https://journals.sagepub.com/doi/10.1177/089124240001400105

[62] Vicente J., *Economics of Clusters: A Brief History of Cluster Theories and Policy*, Paris, Éditions La Découverte, 2016, p. 18.

[63] Sforzi F., *Rethinking the industrial district: 35 years later*, Journal of Regional Research, 2015, p. 20. Consulted from https://www.researchgate.net/publication/283711036_Rethinking_the_industrial_district_35_years_later

[64] Dei Ottati G., *L'effetto distretto: alcuni aspetti concettuali*, Economia Marche, 2006 And Sforzi F., Rethinking the industrial district: 35 years later, Journal of Regional Research, 2015. Consulted from https://www.researchgate.net/publication/283711036_Rethinking_the_industrial_district_35_years_later

A further criticism related to its theoretical construction accused his work of "lack of depth of the very definition of a cluster" and of generating "confusion by the multiple parameters of clusters and their complex interactions"[65]

4. Clusters in the knowledge economy

4.1 A new economic paradigm

The fourth phase of the theoretical life of clusters coincides with the most recent economic context. Although it has become highly topical only in recent economic debates, the concept of the knowledge economy takes root more than twenty years ago.

Its definition has been discussed by various authors over the years and, inevitably, it has evolved leading to the existence of more than one. According to the OECD, when talking about knowledge economy we refer to: "trends in advanced economies towards greater dependence on knowledge, information and high skill levels, and the increasing need for ready access to all of these by the business and public sectors"[66].

Although knowledge has clearly always been a fundamental factor in production, it has now become a very central element; this has also happened by virtue of an increased globalization and freedom of movement of capital. As a consequence of this, the modern economy has reached a point where

> the key strategic element, the real competitive factor, the real raw material is not so much the endowment of resources but the ability to use them […], capacity that we can summarily define with the term knowledge.[67]

[65] Martin R., Sunley, P.*, Deconstructing clusters: Chaotic concept or policy panacea?*, London, Journal of Economic Geography, 2003. Consulted from https://www.researchgate.net/publication/5213250_Deconstructing_Clusters_Chaotic_Concept_or_Policy_Panacea and Duranton G., California dreamin': The feeble case for cluster policies, Review of Economic Analysis, 2011. Consulted from https://core.ac.uk/

[66] Organisation for Economic Co-operation and Development, https://stats.oecd.org/glossary/detail.asp?ID=6864

[67] Tronti L., *Economia della conoscenza, apprendimento e democrazia*, In "FOR – Tendenze Strumenti Strategie", Franco Angeli, Milano, n. 98, 2014, pp. 12-17. Consulted from

Moreover, according to this current of thought – in those countries where it is widely recognized – knowledge becomes an essential and central element for progress in both the economic and social fields. The most advanced economies, in fact, have reached the point that the vast majority of their development objectives have been included in the field of the knowledge economy. It is now a well-established and widely shared concept – by both regional and national governments – that this type of strategic vision is fundamental for achieving competitiveness.

What has just been said is confirmed by the action of the European Union itself. Referring to the presidency conclusions of the Lisbon European Council of 2000, it is stated that the Union has the goal "to become the most competitive and dynamic knowledge-based economy in the world capable of sustainable economic growth with more and better jobs and greater social cohesion"[68].

Eventually, the central issue which accompanies the topic of the knowledge economy is related to the methods to evaluate its intensity level from a national or a regional perspective. About this, Raspe and van Oort tried to address the problem to the elaboration of the following variables:

1. 'knowledge workers' with indicators: ICT sensitivity, educational level, creative class and communicative skills;
2. 'R&D' with indicators: the density of high- and medium-tech firms and the share of R&D employees;
3. 'innovativeness' with indicators: technical and non-technical innovations.[69]

https://www.researchgate.net/publication/277971891_Economia_della_conoscenza_apprendimento_e_democrazia

[68] The European Parliament, https://www.europarl.europa.eu/summits/lis1_en.htm

[69] Knut Ingar Westeren, *Foundations of the Knowledge Economy - Innovation, Learning and Clusters*, Nord-Trøndelag University College, Norway, Edward Elgar Publishing Limited, 2012, pp. 1-2.

4.2 The regional innovation systems

In the new economic context just described, clusters also have changed their structure. The most recent theoretical schools on clusters, aligned with the knowledge economy, are mainly related to the study of the regional innovation systems.

This theoretical school provides a "unifying framework for a large corpus of related research on regional innovation"[70] [71]. The concept of regional innovation system is rooted in the antecedent concept of national innovation system, of which it represents an evolution and adaptation. Despite not having a universally recognized definition, the regional innovation system can be defined as:

> A set of interacting private and public interests, formal institutions and other organizations that function according to organizational and institutional arrangements and relationships conducive to the generation, use and dissemination of knowledge.[72]

The general idea behind this concept is that the presence and interaction of a large number of subjects within a specific region generates a series of positive, systemic and pervasive effects. These last ones, in turn, stimulate the companies present in the region itself to "develop specific forms of capital that is derived from social relations, norms, values and interaction within the community in order to reinforce regional innovative capability and competitiveness"[73]. Therefore, through investments aimed at sustaining and developing regional innovation systems, innovation and competitiveness are promoted in favour of the economic development of the geographical area in which they are located.

The aspect of this school of thought that deserves the most attention is linked to the relationship between the different players, which represents a pivotal point around

[70] Asheim B.T., Lawton Smith H., Oughton C., *Regional innovation systems: theory, empirics and policy*, Routledge, 2011, 45:7, 875-891, p. 878. Consulted from https://www.tandfonline.com/doi/abs/10.1080/00343404.2011.596701

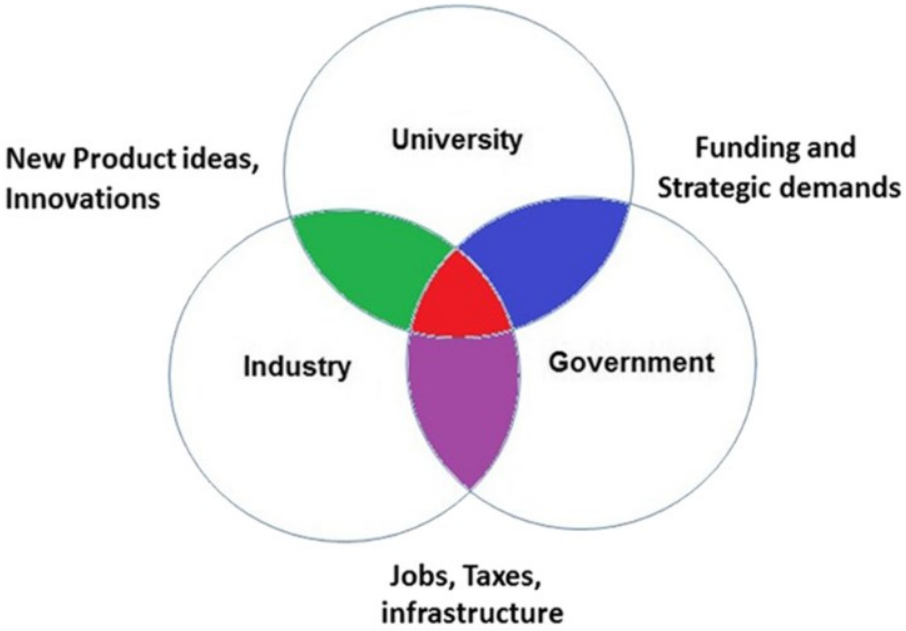
[71] Related theories are, i.e., the learning regions, the innovative milieux and the Triple Helix Model.

[72] Doloreux D., Parto S., *Regional innovation systems: a critical review*, journal article, 2004. Consulted from https://www.urenio.org/

[73] Ivi p. 3.

which the theory revolves. The success of the regional innovation system is closely linked to the "Triple Helix" concept (see *Figure 3*). According to this concept the aforementioned generation of knowledge, an indispensable factor in modern economies, is driven by the interaction of three main worlds: the academic world, the business world and the institutional world.

Figure 3. The triple helix approach.



Source: Evolution of strategic interactions from the triple to quad helix innovation models for sustainable development in the era of globalization, 2016.

As part of the partnerships, "Consultants and advisory organizations are often included"[74] among the key players. Therefore, the simultaneous presence in a country of the pillars of the Triple Helix, taken alone, is not sufficient to guarantee innovative and sustainable economic development. The essential condition is a strong interaction between these factors, which can give "rise to science parks, technopolis, and at more advanced stages to innopolis"[75]

[74] Westeren K.I., *Foundations of the Knowledge Economy - Innovation, Learning and Clusters*, Edward Elgar Publishing Limited, Nord-Trøndelag University College, 2012.
[75] Kimatu J. N., *Evolution of strategic interactions from the triple to quad helix innovation models for sustainable development in the era of globalization*, Journal of Innovation and

4.3 A comparison between clusters and regional innovation systems

Although the concepts of cluster and regional innovations systems present many points of contact, it is necessary – on a notional level – to make a distinction between the two phenomena. The theory on clusters, for example, like that of regional innovation systems, deepens and focuses on issues related to "social capital, networking and learning within an evolutionary framework" [76]. However, the main features which distinguish them are related to their conception of space and the type of connections they build.

First of all, clusters are grounded in space, and the geographic location delineates the cluster itself", by making them highly "based on physical proximity" [77]. Regional innovations systems, instead, can be defined as a-spatial, since they transcend the traditional geographic borders. Second, the type of connections intended in the cluster theory is based on trade between the firms, rather than networking relationships. Therefore, with the regional innovation system, much more attention is now given to networking, as "social and institutional interactions and associated collective learning is analysed within an evolutionary framework in contrast to Porter's more comparative static approach"[78].

It is also important to note that in recent years the literature on regional innovation systems has grown at a higher pace than that on clusters, leading to greater interest from the academic world. This is certainly attributable to its policy impact. Indeed, this approach "with its more complete theoretical and policy analysis, offers a broader

Entrepreneurship, 2016. Consulted from https://www.researchgate.net/publication/299541004_Evolution_of_strategic_interactions_from_the_triple_to_quad_helix_innovation_models_for_sustainable_development_in_the_era_of_globalization

[76] Asheim B.T., Lawton Smith H., Oughton C., *Regional innovation systems: theory, empirics and policy*, Routledge, 2011, 45:7, 875-891, p. 878. Consulted from https://www.tandfonline.com/doi/abs/10.1080/00343404.2011.596701

[77] Westeren K.I., *Foundations of the Knowledge Economy - Innovation, Learning and Clusters*, Edward Elgar Publishing Limited, Nord-Trøndelag University College, 2012.

[78] Asheim B.T., Lawton Smith H., Oughton C., *Regional innovation systems: theory, empirics and policy*, Routledge, 2011, 45:7, 875-891, p. 879. Consulted from https://www.tandfonline.com/doi/abs/10.1080/00343404.2011.596701

framework for regional innovation theory and policy"[79]. A clear example is the fact that the European Union has shifted its attention to this phenomenon, through the activation and funding of the RIS programme. And this trend has been followed by parallel initiatives, also at the level of regional institutions.

[79] Asheim B.T., Lawton Smith H., Oughton C., *Regional innovation systems: theory, empirics and policy*, Routledge, 2011, 45:7, 875-891, p. 879. Consulted from https://www.tandfonline.com/doi/abs/10.1080/00343404.2011.596701

II. CLUSTER POLICY AND THE THEORETICAL FRAMEWORK: HOW TO SUPPORT CLUSTERS

Porter's insights on cluster's potential literally opened a new era in politics. As the awareness of its functioning and importance grew, an increasing number of regional development plans began to consider policies aimed at supporting clusters. As a direct consequence, a wide and variegated range of theories and data rose as well.
Therefore, it is convenient to examine this constantly growing set of information that has gradually been created. In this way it will be possible to outline a sort of "guide" to be followed, in the attempt to create or support clusters through public intervention.

1. The spreading innovation performance in the current economic dimension

1.1 Some statistics: clusters matter

"38% of all European employees work in industries that concentrate regionally – in clusters"[80], as of 2010; "Europe is home to some 2 900 specialised clusters, (…) the effect of cluster specialisation is equal to approximately a 13.5% increase in average wage"[81], as of 2019. These are just two introductory statistics that try to provide two main information: the importance and the trend of clusters.
The phenomenon of clusters has by now assumed a role of primary importance within the economic context, not only in Europe but in the whole world. The advantages of this "modern tool" do not go unnoticed, and statistics provide a great deal of evidence to

[80] European Cluster Policy Group, *Final recommendations: A call for policy action*, 2010. Consulted from https://wbc-rti.info/object/document/7861
[81] Naumanen M., *European panorama of clusters and industrial change*, Luxembourg, Publications Office of the European Union, 2019, p. 5. Consulted from https://ec.europa.eu/growth/industry/policy/cluster/observatory_en

support them. Instead, if we consider their tendencies, they only reinforce what has been stated up to now: the cluster trend is continuously growing.
It can be validly stated that the relevance of something is strictly connected to its results. According to recent studies carried out for the European Commission, it has been found that, in a comparison between clusters and other locations, the first ones perform:

- 13.5% higher average wage
- +0.7% higher annual wage growth rate
- +0.5% higher annual employment growth rate
- 143% more global frontier firms
- 77% more high-growth firms
- 141% more rapidly growing start-ups.[82]

Therefore, investing in clusters, whether it is in its development or in its creation, means investing in growth. Instead, the decision of cutting funds and leaving a particular region will bring to an opposite effect. It has been found how this scenario would "push the cluster towards decline, and other sources will slowly emerge with other areas of the economy or become idle"[83].

1.2 Cluster as a means of creating and disseminating innovation: why we should talk about innovation drivers

As Michael Porter made it clear with his studies, investing in clusters also means investing in competitiveness. Statistics show how the economic benefits deriving from this type of industrial agglomeration are sensitive and multiple. However, what makes

[82] Naumanen M., *European panorama of clusters and industrial change*, Luxembourg, Publications Office of the European Union, 2019, p. 5. Consulted from https://ec.europa.eu/growth/industry/policy/cluster/observatory_en
[83] Sölvell Ö., Ketels C., Lindqvist G., *The European Cluster Observatory: EU cluster mapping and strengthening clusters in Europe*, Europe INNOVA Paper n°12, Luxembourg, Publications Office of the European Union, 2009, p. 10. Consulted from https://op.europa.eu/en/home

the cluster such a successful phenomenon is perhaps its ability to create and spread innovation.

In order to understand the process of "creation of innovation" within clusters, the first step has to be the analysis of its participants, i.e. its players. The latter can essentially be broken down into five macro categories:

- Firms
- Research organisations
- Education organisation
- Capital providers
- Government and public bodies.[84]

Each of the elements listed above has a different role, but they all contribute to the creation of cluster innovation. Surely, the most relevant player is the firm, together with its entrepreneur who is responsible for bringing the internal innovation from the inner environment to the market. In this way innovation ends up facing the market in sort of a test.

It is precisely in the cluster's actors that the answer to the question is found: why are clusters so important for innovation?

> The reason clusters are relevant for innovation is that when there is a critical mass in a location of a sector or industry, the different actors can support each other, and new ideas are formed in both planned and unplanned meetings and interactions. Through interaction within the cluster, conditions are more likely to emerge that are adapted to the needs of the firms, and that are conducive to innovation.[85]

Therefore, a sort of cross-pollination of ideas is established among the actors belonging to the cluster, and brings it towards success. In this regard, geographic proximity plays a vital role, since it "facilitates the flows of tacit knowledge, the presence of a skilled

[84] Sölvell Ö., Ketels C., Lindqvist G., *The cluster initiative greenbook 2.0*, Stockholm, Ivory Tower Publishers, 2013. Consulted from https://www.hhs.se/

[85] Ibid

labour as well as unplanned interactions that are critical parts of the innovation process"[86]. And the closer the players are, the more frequent the interactions between them.

Nevertheless, in such an environment, collaborations and connections that lead to failures are inevitably a common and recurring factor.

This interaction between players and clusters shows some commonalities with the concept of "triple helix" belonging to the model of innovation. The latter, however, considers only three actors, unlike the innovation triggered by clusters which has just been discussed. Indeed, innovation is the result of the interaction among government, universities and, more generally, industries.

Case studies suggest that clusters are perfectly lined up with the modern conception of "open innovation", according to which innovation does not generate from isolation, but rather from "dynamic environments" where there is abundance of "competent organisations and skilled labour" which "interact in a constructive and complementary way to assimilate existing knowledge and generate new ideas and products"[87].

1.3 Statistical findings about clusters' innovation performance

It must be said that the statistical demonstration of such thing as the impact of clusters from an economical point of view is complicated and convoluted. However, the great majority of the findings tends to converge on the extremely positive implications on the innovation field, driven by clusters.

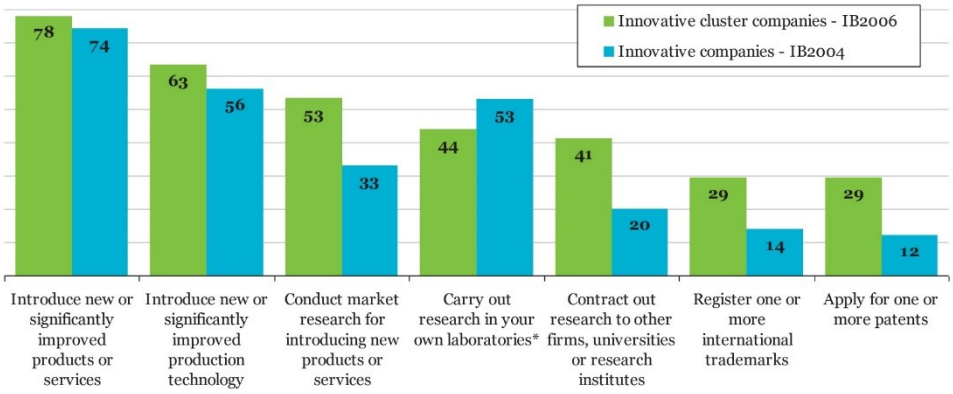
If we compare the Innobarometer survey of 2004 with the one of 2006 (see *Figure 3*), which reports on the one hand the innovative firms and on the other hand the firms that work in a cluster-like environment, it is clear how the second category innovates more[88].

[86] Directorate-General For Enterprise And Industry (European Commission), *The concept of clusters and cluster policies and their role for competitiveness and innovation: Main statistical results and lessons learned*, Europe INNOVA Paper n°9, Luxembourg, Office for Official Publications of the European Communities, 2008, pp. 21-22. Consulted from https://op.europa.eu/en/publication-detail/-/publication/c15445bd-8203-4d15-b907-56ea17a9876e

[87] Ivi, p. 21.

[88] Ivi, p. 22.

Figure 4. Comparison between clustered and non-clustered firms.



Source: European Commission (2006d) 2006 *Innobarometer on cluster's role in facilitating innovation in Europe.*

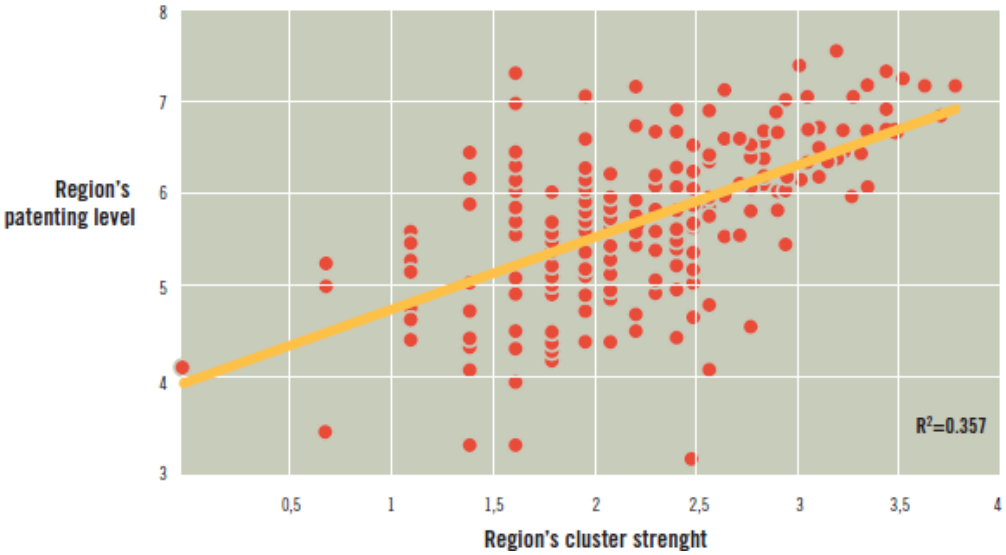
Figure 4 highlights three digits above all, which represent the major differences. The outsourcing of research to external bodies and the number of innovations that are patent or trademarked. For these three we see values that are more than double higher in cluster firms than in non-clustered firms.

Instead, if we analyze the regions specifically, it becomes more complex to determine the correlations between the data. The European Cluster Observatory provides data which compare the degree of clustering, i.e. cluster's strength, with the general level of patenting within a region (see *Figure 5*). Thanks to this, it has been found not only that "regions in Europe without clusters are all performing badly", but even that "all regions in Europe with many ranked clusters are all top performers"[89].

The positive relation connecting the cluster strength and its regional level of patents leads to two main conclusions. First, firms that are part of a cluster are generally more prone to innovation compared to those that do not belong to any cluster. Second, within the cluster itself, the innovation performance increases as the clustering degree (i.e. level of specialisation) increases.

[89] Sölvell Ö., Ketels C., Lindqvist G., *The European Cluster Observatory: EU cluster mapping and strengthening clusters in Europe*, Europe INNOVA Paper n°12, Luxembourg, Publications Office of the European Union, 2009, p. 13. Consulted from https://op.europa.eu/en/home

Figure 5. Cluster strength and patenting level in European regions.



Source: European Cluster Observatory. ISC/CSC cluster codes 1.0, dataset 20070613

2. Cluster policy

2.1 What is a cluster policy

Up to twenty years ago, undertaking active policies in support of clusters meant entering an uncertain and little-known path. In doing so, one could inevitably encounter problems of various kinds: from the lack of theory on which to base the development of strategies, to the simpler absence of case studies from which to take inspiration and example. However, over the last twenty years, there has been a decisive turnaround regarding cluster policies. Clusters have gained such an extraordinary relevance up to a point where they are literally defined as "world-wide fad":

> From the OECD and the World Bank, to national governments […], to regional development agencies […], to local and city governments […], policy makers at all levels have become eager to promote local business clusters.
> Nor has this policy interest been confined to the advanced economies: cluster policies are also being adopted enthusiastically in an expanding array of developing countries […]. Clusters, it seems, have become a world

wide fad, a sort of academic and policy fashion item.[90]

Porter himself sees the cluster as a naturally suitable environment for cluster policies. He claims that "the multi-industry range of the cluster concept makes it particularly suitable as a framework for economic policy"[91].

When talking about cluster policy it is necessary to outline the different concepts which are always used in this field, in order to avoid possible confusion.

Cluster policy is identified as a "wider set of specific governmental policy interventions aiming at strengthening existing clusters or facilitating the creation of new ones"[92]. Cluster policy tends not to carry out a precise and targeted action towards single companies, but rather focus on how these companies work and interact with each other. In other words, the goal of the cluster policy is to create or strengthen a network between companies based on collaboration and interaction. Moreover, the cluster policy can take on many facets depending on the specific activity of interest, which is intended to be enhanced.

The policy maker usually resorts to the creation and development of cluster organisations and cluster initiatives, with the aim of maximizing the effectiveness and efficiency of cluster policies. In fact, these tools allow to support and implement cluster policies, especially if used complementarily. In particular, cluster initiatives can be defined as "organised efforts to increase growth and competitiveness of clusters within a region, involving cluster firms, government and/or the research community"[93].

Cluster organisations fit into this context due to their relevant function of cluster-supporters through the provision of various services. In this sense, cluster organisation can be understood as "the legal entity engineering, steering and managing the clusters,

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[90] Martin R., Sunley, P., *Deconstructing clusters: Chaotic concept or policy panacea?*, London, Journal of Economic Geography, 2003. Consulted from https://www.researchgate.net/publication/5213250_Deconstructing_Clusters_Chaotic_Concept_or_Policy_Panacea

[91] Lindqvist G., *Disentangling clusters: Agglomeration and proximity effects*, Elanders, Vällingby, 2009, p. 16. Consulted from http://www.clusterobservatory.eu/csc

[92] Directorate-General For Enterprise And Industry (European Commission), *The concept of clusters and cluster policies and their role for competitiveness and innovation: Main statistical results and lessons learned*, Europe INNOVA Paper n°9, Luxembourg, Office for Official Publications of the European Communities, 2008, p. 9. Consulted from https://op.europa.eu/en/publication-detail/-/publication/c15445bd-8203-4d15-b907-

[93] Ivi, p. 10.

including usually the participation and access to cluster's premises, facilities and activities"[94].

The list of different ways to categorise the cluster policy types is very long. However, a brief statement of the two most important is a must. Thus, it is emblematic to take into consideration the approach and the initiator of the cluster policy.

One of the most important differentiation is based on two different approaches of cluster policies: cluster creation versus cluster leveraging. Following the first approach the policies should "impact on economic geography and the emergence of clusters directly" through the creation of incentives which would push firms to "co-locate in order to create more externalities"[95]. On the other hand, cluster policies can focus on clusters already present in the area and act in an attempt to leverage them. In this case, the intention would be to "internalize the externalities that exist and thus drive activities that make better use of the potential from co-location"[96].

The second distinction deals with the subject which initiates the cluster initiative: government versus business. In practice, the difference concerns the priority for action of the two subjects, which consequently brings to two different focuses. On one side, a cluster initiative triggered by the private sector "focuses on issues most relevant for the competitiveness of the firms"; whereas, on the other side, the public sector would have an active role in "promoting collaboration to build trust where otherwise only competition would occur"[97].

In conclusion, if the relationship between cluster and cluster policies through empirical observation is examined, another relevant distinction may be reached: in economics there are basically three types of combinations. Specifically:

[94] Directorate-General For Enterprise And Industry (European Commission), *The concept of clusters and cluster policies and their role for competitiveness and innovation: Main statistical results and lessons learned*, Europe INNOVA Paper n°9, Luxembourg, Office for Official Publications of the European Communities, 2008, p. 10. Consulted from https://op.europa.eu/en/publication-detail/-/publication/c15445bd-8203-4d15-b907-

[95] Sölvell Ö., Ketels C., Lindqvist G., *The cluster initiative greenbook 2.0*, Stockholm, Ivory Tower Publishers, 2013, p. 44. Consulted from https://www.hhs.se/

[96] Ivi, p. 45.

[97] Ivi, p. 19.

- Clusters which originated and grew casually and automatically, without any kind of support;
- Clusters which are the result of specific and successful cluster policies;
- Cluster policies which failed in the attempt of creation of clusters.

2.2 Cluster policy matters

A survey based on thirty-one European countries, carried out in 2008, reveals how cluster policy at national level is of central importance for most of the countries. Despite a great variety of views, approximately 70% of the interviewed countries commonly agree that national cluster policy has a medium or high degree of relevance[98].

In the same way, the importance of cluster policies over time tends to increase or to remain stable, rather than decreasing. Indeed, the same survey found out how, on the one hand, for 54% of the countries the relevance of this kind of policies has increased over time and for 41% of the countries has remained the same. On the other hand, only 5% of the interviewed nations declare a decreased importance[99].

Then a question arises: what makes cluster policies so attractive and important for the policy makers? Logically the answer is strictly connected to the benefits deriving from this type of policies. As it has already been discussed in this chapter, clusters are considered as drivers of competitiveness, innovation and growth. However, it is useful to point out how cluster policies bring advantages even from another perspective: when compared with those common policies which support the economy. For example, in the case of a cluster policy aimed at supporting companies individually, the firms would benefit both because of a greater leverage and because of a better accuracy of the policy itself. Likewise, a cluster policy which has a broader target such as an industry would "avoid many of the distortions relating to suppliers along the value chain that otherwise often emerge"[100]. In the same way, if the whole economy is considered, initiatives at a

[98] Oxford Research AS, *Cluster Policy in Europe: A brief summary of cluster policies in 31 European countries*, Europe Innova Cluster Mapping Project, Kristiansand, 2008, p. 14.
[99] Ivi, p. 18.
[100] Izsak K., Meier Zu Köcker G., Ketels C., Lämmer-Gamp T., *Smart guide to cluster policy*, Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs (European

cluster level would be more effective than those which don't consider the clusters. And, once again, this occurs thanks to a great accuracy of the interventions, which are able to address the companies' problems quite directly.

As the cluster policies are increasing their importance throughout the years, policy makers are in parallel relying more and more on the evaluation of cluster programmes. This approach makes it possible to improve the efficiency and efficacy of the measures implemented to support clusters.

An example of evaluation of a national cluster programme is given by the one which analyses the French programme "*Competitiveness clusters*", carried out in 2012. This study was based on the observation of the national initiatives between the years 2006 and 2009[101]. It was found out that not only clusters are beneficial for the economy, but even that "investment from cluster policy and public support for clusters pays off"[102]. The "*Competitiveness clusters*" programme triggered a waterfall effect on various aspects:

> […] gave a significant boost to R&D investment (EUR 2.5 billion of public support saw almost 1 500 projects launched and generated more than EUR 6.5 billion of R&D expenditure), increased collaboration between industry and research considerably and benefited SMEs (as 80% of the 9 700 firms covered by the initiative were SMEs, which also received over 50 % of the funding allocated by the Competitiveness Cluster Fund).[103]

Commission), Belgium, 2016, p. 17. Consulted from https://s3platform.jrc.ec.europa.eu/-/smart-guide-to-cluster-policy?inheritRedirect=true

[101] Etude portant sur l'évaluation des Pôles de compétitivité, http://competitivite.gouv.fr/documents/commun/Politique_des_poles/2eme_phase_2009-2011/evaluation/rapport-evaluation-2012-%20complet.pdf

[102] Izsak K., Meier Zu Köcker G., Ketels C., Lämmer-Gamp T., *Smart guide to cluster policy*, Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs (European Commission), Belgium, 2016, p. 18. Consulted from https://s3platform.jrc.ec.europa.eu/-/smart-guide-to-cluster-policy?inheritRedirect=true

[103] Ibidem

2.3 Cluster initiatives' main activities

In the attempt of pursuing their goals, cluster initiatives tend to focus on some activities. The latter can be summarised as follows:

- General cluster networking
- Human resources upgrading
- Cluster expansion
- Business development
- Innovation and technology
- Business environment.[104]

These six main categories can be found in cluster initiatives in different combinations: there are cluster initiatives which embrace all of them, whereas some others embrace only a few.

The *general cluster networking* was found to be the most sought-after activity according to the data collected. Its aim is to bring together different parties belonging to the cluster. This approach makes it possible to study together the strengths and weaknesses inherent in the environment and to find a common strategy to address them. Typical tools for chasing this target are "information gathering, publishing cluster reports, sharing information through seminars, inviting speakers, creating websites, etc."[105].

Human resources upgrading targets both workforce and management. The idea is to train and educate these actors in order to implement a pool of skilled and capable workers. Moreover, the process can include students as well, by attracting them in the environment. In this way the cluster implements a long-term vision guaranteeing a skilled workforce for its future.

[104] Sölvell Ö., Ketels C., Lindqvist G., *The cluster initiative greenbook 2.0*, Stockholm, Ivory Tower Publishers, 2013, pp. 4-5. Consulted from https://www.hhs.se/

[105] Sölvell Ö., Lindqvist G., Ketels C. H. M., *The cluster initiative greenbook*, Ivory Tower AB, Stockholm, Sweden, August 2003, p. 27. Consulted from https://www.hbs.edu/faculty/Pages/item.aspx?num=15469

Cluster expansion is simply based on the attempt of enlarging the cluster by increasing the number of companies which are part of it. This can mainly be achieved in two ways. The first approach is to make the cluster more attractive, by enhancing its image, so as to attract more investments. The second way "involves incubator services and the promotion of spin-off firms"[106].

Business development puts together several firms by stimulating them in sharing common operations. This implies, for instance, the creation of "joint export promotion, joint purchasing, or sharing of services to reduce costs"[107]. This kind of operations usually picks out small-medium enterprises as objective.

Innovation and technology, as "cluster initiatives can be set up to facilitate improved innovation processes and enhance technology"[108]. Primarily there are two types of cluster initiatives for the promotion of innovation and technology. The first way focuses its action on the relationship amid companies, and tries to stimulate cooperation in order to foster innovation. On the contrary, innovation can also be stimulated by bringing the world of research closer to the world of companies. Nevertheless, it is not uncommon to find cases in which the two approaches are used in a complementary manner.

Cluster initiatives that focus on *business environment* try to "enhance the microeconomic conditions for business, through improving the legal and institutional setting or improving the physical infrastructure"[109]. The most suitable subject, and therefore the one indicated for the improvement of these conditions, are the institutions. This is explained by the fact that these conditions are external; therefore, they are beyond the possibilities of intervention of the companies themselves.

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[106] Sölvell Ö., Lindqvist G., Ketels C. H. M., *The cluster initiative greenbook*, Ivory Tower AB, Stockholm, Sweden, August 2003, p. 28. Consulted from https://www.hbs.edu/faculty/Pages/item.aspx?num=15469

[107] Sölvell Ö., Ketels C., Lindqvist G., *The cluster initiative greenbook 2.0*, Stockholm, Ivory Tower Publishers, 2013, p. 5. Consulted from https://www.hhs.se/

[108] Sölvell Ö., Lindqvist G., Ketels C. H. M., *The cluster initiative greenbook*, Ivory Tower AB, Stockholm, Sweden, August 2003, p. 28. Consulted from https://www.hbs.edu/faculty/Pages/item.aspx?num=15469

[109] Sölvell Ö., Ketels C., Lindqvist G., *The cluster initiative greenbook 2.0*, Stockholm, Ivory Tower Publishers, 2013, p. 5. Consulted from https://www.hhs.se/

2.4 Frequent traps for cluster initiatives

As already stated, the growing amount of information is a direct consequence of the growing interest towards clusters. However, the large amount of data allowed to develop a key comparison between different cluster policies. The studies carried out over the years and in different contexts, if considered as a whole, have made it possible to identify a series of contact points useful for formulating common indications. More precisely, thanks to the shared experience it is now possible to recognise several traps that the cluster initiatives and cluster organisations should strive to avoid.

The first common mistake is about the central organisation of the cluster initiatives. It can easily happen that, without being aware of this, some programmes that should be orchestrated in a complementary way, instead move independently and without coordination. In some cases, it may even happen that few programs with common objectives work in parallel and then inevitably end up overlapping. In some other cases, the initiatives may end up orienting themselves towards conflicting, rather than complementary, objectives. A common reason why this occurs is the fact that the initiatives are driven by "the priorities and operational requirements of different funders"[110].

Given the key role of incrementing cooperation and connections among the various players within the cluster, sometimes this may evolve and lead to a kind of distortion. When too much importance is attributed to the networking goal, there is a tendency to give a "blind" stimulus to the cluster, as it overshadows other activities that require equal attention (and in some cases even higher). For instance, instead of giving precise directions towards activities to be undertaken, cluster initiatives end up focusing "on providing opportunities to meet without a transparent and funded structure to then pursue specific activities"[111].

[110] Izsak K., Meier Zu Köcker G., Ketels C., Lämmer-Gamp T., *Smart guide to cluster policy*, Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs (European Commission), Belgium, 2016, p. 20. Consulted from https://s3platform.jrc.ec.europa.eu/-/smart-guide-to-cluster-policy?inheritRedirect=true

[111] Ibid

Another issue occurs when "cluster programmes […] spread support too thinly, with critical mass lacking in both the cluster and the activities" [112] . The correct implementation of a cluster initiative is guaranteed by a process of careful evaluation of the most appropriate geographical areas and activities in which to intervene, before undertaking the initiative. However, it may happen that once the fund has been disbursed, it is not followed by a periodic monitoring and reassessment of the results of cluster policies. As consequence, it is not rare to see that for those initiatives which do not produce satisfactory results, the funds are not interrupted. This inevitably leads to an avoidable waste of resources.

Cluster programmes can have a problem of shortage, or sometimes even absences, of "entrepreneurial discovery aspect" needed for "encouraging growth in related fields", as a "key aspect of the smart specialisation"[113]. On the one hand, some clusters may avoid expanding into new fields, preferring to "bet everything" on already well-known strengths and potentialities. However, this produces negative repercussions in terms of slowing down cluster growth itself, as well as changes necessary for the growth. On the other hand, some clusters may try to undertake expansion programs and initiatives in new fields, but not in the right ones. In fact, the risk is that of concentrating in sectors in which the possibility of being competitive is practically nil, implementing initiatives that are ineffective and ending up wasting resources.

A final issue is related to ignoring or giving little importance to the relevant peculiarities inherent in the environment, which are instead variables of utmost importance in designing a cluster program. And about this, policy makers are asked to pay particular attention with respect to those areas which are experiencing difficulties in the economic development. These regions "lacked the institutional capacity (both in government and in the private sector) required by programmes copied from more advanced regions"[114].

[112] Izsak K., Meier Zu Köcker G., Ketels C., Lämmer-Gamp T., *Smart guide to cluster policy*, Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs (European Commission), Belgium, 2016, p. 20. Consulted from https://s3platform.jrc.ec.europa.eu/-/smart-guide-to-cluster-policy?inheritRedirect=true

[113] Ivi, p. 21.

[114] Ibid

3. Three steps to be followed in order to use cluster policy efficiently and effectively

3.1 Some necessary premises and recommendations

In reality, cluster policies are conducted by the policy makers with the aim of creating or strengthening growth in a particular region. However, in order to efficiently and effectively implement these policies, each policy maker should rely heavily on theory. Obviously, this does not mean that knowing the theory leads automatically to operating in the best way. On the contrary, because there exist many different ways of approaching clusters, as well as there exist many different forms of clusters themselves, it is not possible to talk about the "unique and most appropriate" approach. In other words, the one-size-fits-all type of cluster policy does not exist. Instead, each policy maker has to deal with the basic issue of identifying the specific features of the targeted cluster, as well as the ones of the region in which he operates. Thus, implementing a cluster policy properly is synonym with choosing the alternative which better suits the peculiarities of the environment as a whole.

A consideration must be made regarding a factor that probably is not sufficiently deepened and discussed in the theory books on cluster policies: the time factor. Too often it happens that this key variable fades in the background or is taken for granted. Instead, time is relevant for policy makers' evaluations and considerations since clusters have a different need depending on which stage it is going through among birth, growth, maturity and decline or renaissance. Policy makers should also be aware of the fact that it takes time to see the effects of their initiatives.

> Even if these ingredients are present and the policy is well targeted, successful transformation through cluster policy cannot be achieved overnight. There needs to be recognition that it can take time – sometimes five or ten years – before good cluster policy shows its full effects, and it is usually after the end of an electoral period.[115]

[115] Izsak K., Meier Zu Köcker G., Ketels C., Lämmer-Gamp T., *Smart guide to cluster policy*, Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs (European

Therefore, it is explanatory to state that cluster policies are not able to provide neither the best solution, because of different shapes of the environments, nor a quick solution, because of the time factor.

Any step in the implementation of a cluster policy should be made with the interests and personal gain aside. In fact, it is necessary that the initiatives in support of clusters are based on evidence. The ideal cluster policy is characterised by "strategic, consistent and concentrated efforts"[116] which do not have to be driven by self-interest, but rather by objective evidence.

Despite the wide variety of different shades that cluster initiative can take, the policy makers which create and develop it should always consider three main aspects: objective, location and linkages.

The objective of cluster initiatives should be a constant pursue for increasing competitiveness, considered as those values of a particular region which "enable firm to succeed in national and global markets while supporting a high standard of living for local communities" [117]. This goal can be achieved through a decisive stimulus to innovation and productivity. The latter are therefore to be considered as the driving factors, which must be implemented in the medium-long term.

As already mentioned above, an efficient and effective policy in support of clusters cannot disregard the consideration of the peculiarities inherent in the region to which it is directed. It is clear that each region has its own specificities which are evidently unique and, precisely for this reason, cluster initiatives must necessarily be aligned with these specificities. And undoubtedly it is useful and correct to take inspiration from other regions, but it is much more important to ensure that the initiatives have a selective and specific effect on the area of interest.

Commission), Belgium, 2016, pp. 20-21. Consulted from https://s3platform.jrc.ec.europa.eu/-/smart-guide-to-cluster-policy?inheritRedirect=true

[116] Izsak K., Meier Zu Köcker G., Ketels C., Lämmer-Gamp T., *Smart guide to cluster policy*, Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs (European Commission), Belgium, 2016, p. 20. Consulted from https://s3platform.jrc.ec.europa.eu/-/smart-guide-to-cluster-policy?inheritRedirect=true

[117] Ivi, p 25.

The current economy is "characterised by multiple linkages across economic activities"[118]. For this, the cluster policy must first recognise the presence of these linkages and then take advantage of them.

In conclusion, it has to be stressed once again that the approach that will be analysed in this chapter is just one possible choice among many. Because of this, even if the following discussion will be based on comprehensive tools, the latter are not to be considered exhaustive.

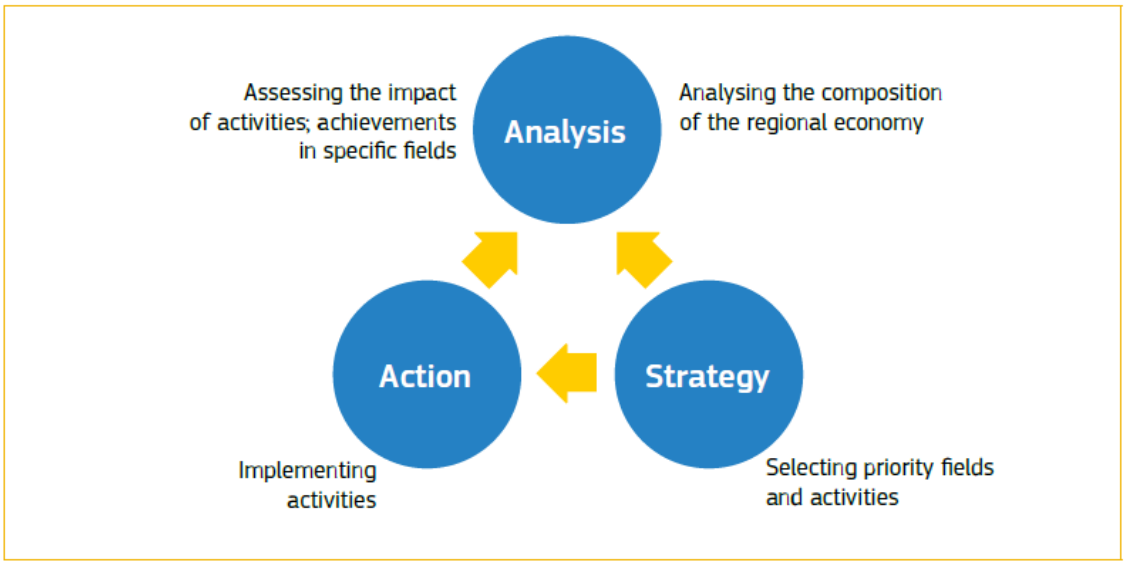
3.1 First step: analysis

A cluster policy-making process can be seen as a cycle because there are three different phases which rotate in turn seamlessly, just like a gear. In each of these steps, the use of data has to be involved. As it can be seen from *Figure 6*, the stages are analysis, strategy and action.

The first stage of the cluster-initiative process is based on the analysis of the most suitable locations, e.g. the ones with the greatest potential, where to invest time and resources for the development of the cluster. Every decision taken in this phase must give primary importance to the peculiar characteristics of the location being evaluated. Furthermore, this assessment must follow a logic based on facts and evidence. The correct execution of this phase of the process lays the foundations for a correct preparation and design of the following strategy.

[118] Izsak K., Meier Zu Köcker G., Ketels C., Lämmer-Gamp T., *Smart guide to cluster policy*, Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs (European Commission), Belgium, 2016, p. 26. Consulted from https://s3platform.jrc.ec.europa.eu/-/smart-guide-to-cluster-policy?inheritRedirect=true

Figure 6. Steps involved in the cluster policy cycle.



Source: Izsak K., Meier zu Köcker G., Ketels C., Lämmer-Gamp T., *Smart Guide to Cluster Policy*, Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs (European Commission), Belgium, 2016, p 26.

Therefore, it is clear that, although data are relevant in the perspective of the whole process, in this stage they are of vital importance and have a very central role. In fact, data is a useful tool which allows to have an "insight into the relative composition of the local economy, differentiating groups of activities that are exposed to different sets of business environment conditions"[119]. And because of the cluster nature of the analysis, cluster mapping is the most suitable instrument to pursue the goal. Indeed, it provides a broad perspective on the comparison between areas of the same region, by highlighting the different level of competitive advantage achieved by each area.
Cluster mapping is made up of two sections:

- cluster codes are developed with the aim of identifying and quantifying the level of agglomeration inherent in a given region;

[119] Izsak K., Meier Zu Köcker G., Ketels C., Lämmer-Gamp T., *Smart guide to cluster policy*, Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs (European Commission), Belgium, 2016, p. 27. Consulted from https://s3platform.jrc.ec.europa.eu/-/smart-guide-to-cluster-policy?inheritRedirect=true

- performance measures are developed, in order to quantify the degree of competitiveness and dynamism of the clusters in question.[120]

The strength of cluster mapping is that it does not provide information in an absolute sense, for instance the simple dimensions of an industrial area, which could lead to misleading conclusions. On the contrary, data are developed in relation to the surrounding environment, or in other words, the strength of an industry is relative to the other clusters located in that area.

From a broader point of view, data provided by cluster mapping are useful for separating traded industries and local industries. In this way, cluster policies can be oriented to the best, since "these two parts of a location's economy are exposed to structurally different competitive dynamics and offering different types of economic returns"[121].

Instead, if we analyse cluster mapping's data at a restricted level, it is possible to gain information about the specialisation model of an area. For instance, it can be distinguished and measured the share for the local market and the one for the traded market. The comparison is a key tool of cluster mapping as well. On the one hand, it is possible to investigate and identify some key players as competitors and candidate partners, thanks to the assessment of the level of intensity and strength of relations with certain related traded industries. On the other hand, through the comparison between similar industries, it is possible to obtain information on the economic development of the industry in question. For example, if it is found that the target industry is encountering remarkable difficulties in its trading activity with respect to its peers, this could be an indicator of the presence of a trade barrier.

The utility of data in this particular stage of the process is also linked to the capacity to provide insights on the area's competitiveness. In this case, information is obtained thanks to the overall strength of the cluster portfolio value, "measured by the

[120] Ketels C., Lindqvist G., Sölvell Ö., *Strengthening clusters and competitiveness in Europe: The role of cluster organisations*, The Cluster Observatory, Stockholm, 2012, p. 6. Consulted from https://s3platform.jrc.ec.europa.eu/cluster-organisations

[121] Izsak K., Meier Zu Köcker G., Ketels C., Lämmer-Gamp T., *Smart guide to cluster policy*, Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs (European Commission), Belgium, 2016, p. 27. Consulted from https://s3platform.jrc.ec.europa.eu/-/smart-guide-to-cluster-policy?inheritRedirect=true

proportion of the local wage bill generated by employment in clusters that qualify as strong"[122].

Given the outmost relevance of data and cluster mapping, some recommendation and considerations have to be taken into account. First of all, the cluster mapping's location in the policy maker's agenda is at the very first place: even before considering a particular cluster initiative, the task is to "engage cluster and policy leaders to produce an economy-wide map that shows cluster locations and their link ages with the wider economy"[123]. The following step would be a long and broad analysis based on dialogue among the various actors, in order to select the clusters to work with. The big problem is that data are quite often difficult to obtain – especially in the developing countries – causing a misleading analysis which inevitably leads to fails in developing cluster initiatives. However, this issue has been partially solved through the so-called "self-selection": clusters themselves are required "to prove their worthiness for engagement by demonstrating their commitment through the investment of time, ideas, and most importantly, through their willingness to bear the initial costs of developing an initiative"[124].

3.2 Second step: diagnostics and strategy formulation

At this point of the process the targeted cluster has been chosen: it will be the resources recipient. The first problem to be faced is to formulate a "smart specialisation" strategy. This has become binding since the European Union has established it as a necessary requirement to access EU funds, the so-called "EU Structural Funds". In order to be aligned with these requirements, regions have to develop and set vertical priorities, considered as:

[122] Izsak K., Meier Zu Köcker G., Ketels C., Lämmer-Gamp T., *Smart guide to cluster policy*, Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs (European Commission), Belgium, 2016, p. 28. Consulted from https://s3platform.jrc.ec.europa.eu/-/smart-guide-to-cluster-policy?inheritRedirect=true

[123] SHAKYA M., *Clusters for competitiveness: A practical guide and policy implications for developing cluster initiatives*, The World Bank, 2009, p. 52. Consulted from http://dx.doi.org/10.2139/ssrn.1392479

[124] Ivi p. 53.

> Identifying specific 'domains' or areas of activity in which a location has a specific strength or potential and which are likely to transform the existing economic structures through R&D and innovation, and on which the region has therefore decided to focus its economic development activities.[125]

The reason why this process of attribution has been implemented is the result of the recognition of three factors which affect the policy-makers analyses.

First, the scarcity of resources. The development of an agenda which sets priorities becomes inevitably needed when the access to resources and resources themselves are finite. And this goes beyond the simple funds. For example, the availability of skilled and competent leadership capable of successfully driving cluster initiatives is also understood as a resource. Second, the competition is created by different areas that try to win over the traded industries. In this context, it is necessary that the locations, after an appropriate analysis, focus only on specific activities.

Third, in many cases cluster policies are strictly intertwined with other policies relate to other fields. Thus, taking decisions related to cluster initiatives has also repercussions on other types of policies, and vice versa. For this reason, the choices of policy makers must be taken on the basis of a broader and overall view, which includes all the possible fields that are affected.

The core of the second stage of the development of a cluster initiative "involves a strong analytical and process agenda"[126]. The policy maker has a long list of tools that he can use for this purpose. There is no precise and unambiguous method of using these tools. However, it is extremely appropriate that these instruments follow a logical order. This means that those specializing in team-building – "such as Product and Market Segmentation, SWOT (Strengths, Weaknesses, Opportunities, Threats), GAP Analysis, Porter's Five Forces Analysis"[127] – should be considered as the first ones. Subsequently, when more in-depth analysis is required, tools more in line with the objective should

[125] Izsak K., Meier Zu Köcker G., Ketels C., Lämmer-Gamp T., *Smart guide to cluster policy*, Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs (European Commission), Belgium, 2016, p. 29. Consulted from https://s3platform.jrc.ec.europa.eu/-/smart-guide-to-cluster-policy?inheritRedirect=true

[126] SHAKYA M., *Clusters for competitiveness: A practical guide and policy implications for developing cluster initiatives*, The World Bank, 2009, p. 56. Consulted from http://dx.doi.org/10.2139/ssrn.1392479

[127] Ivi, p. 13.

instead be considered – "such as Value Chain Analysis, Market Trends Analysis, Competitive Positioning Analysis"[128].

The key question that arises at this stage of the process is naturally the following: what competitive strategy underlying the cluster initiative should be undertaken by the cluster? This question is as important as it is complex. In fact, as it is easy to imagine, there is no instruction manual that allows the policy maker to make the right decision. What is certain is that the chosen strategy should be the result of the discussion and analysis process conducted by the players.

However, despite the impossibility of formulating a precise guide, it is still possible to identify three main phases that make up a sort of strategy implementation process. The latter is therefore considered in a broader perspective.

The first phase is the analytical agenda, as the "industry and policy analyses as well as the formulation of technical assistance and strategic actions"[129]. This is the phase in which the abovementioned instruments find their natural application. Although at this point the cluster facilitator plays a key role, this stage is characterised by cooperation and, precisely for this, each player has a relevant part. The correct way to implement the analytical agenda is through the creation of working groups focused on dialogue that bring both cluster members and policy makers to work together.

After the sign of a memorandum of understanding agreed by the players, "the facilitator will apply the diagnostic tools" while being side to side with a "leading global expert from the industry in question" who "will provide technical assistance"[130]. The growing success of clusters over the years has led to an increment in the efficiency of the cluster policy implementation process. Diagnostics is one example. If at the beginning it took several months to complete this phase, in the most recent cluster initiatives only few consultation sessions (5-6) are needed. At these consultations, policy makers and cluster experts come to meet and discuss. At the end of this, the results and conclusions are summarized and presented to the various stakeholders.

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[128] Shakya M., *Clusters for competitiveness: A practical guide and policy implications for developing cluster initiatives*, The World Bank, 2009, p. 13. Consulted from http://dx.doi.org/10.2139/ssrn.1392479

[129] Ivi p. 56.

[130] Ivi p. 57.

Moreover, while the industry diagnostics phase is in progress, the players of the cluster tend to undertake a series of study and evaluation trips in the areas of interest. The latter typically are "markets or countries where centers of excellence are located and which represent leading clusters in their industries"[131].

The entire process finishes with the last phase: strategy formulation. In fact, the development of a strategy for the improvement of a cluster's competitiveness has already started, since it begins to take shape and to be visible already when the diagnostic tools are applied. The result is a clear and accurate plan resulting from the careful study and cooperation of different players gathered together with a common goal. The strategy consists of several parts:

> It begins with an articulation of a vision for the cluster, elaboration of challenging and quantifiable goals, the identification of strategic initiatives to reach those goals, and the pinpointing of policy and institutional constraints that impede the strategy's implementation.[132]

3.3 Third step: Implementation and action

The third and last phase consists in the practical application of the information and strategies studied and organised in the two previous phases. Also in this case there is no single and perfect method of action. On the contrary, there are various measures that can be applied in different quantities and ways. It can be validly stated that, despite the growing database of data and experiences from clusters developed in recent years, the third phase of the process is undoubtedly the most complex to theorise. The practical implementation of a cluster policy in fact depends and, above all, must reflect on a myriad of factors and conditions that are highly specific and related to the location of interest. In simple terms, even though a cluster policy performs very well in a particular region, it does not mean that the same will happen if this policy is applied in another

[131] Shakya M., *Clusters for competitiveness: A practical guide and policy implications for developing cluster initiatives*, The World Bank, 2009, p. 58. Consulted from http://dx.doi.org/10.2139/ssrn.1392479

[132] Ivi pp. 58-59.

region. In addition, it must be clear in the action phase that its specificity is not only related to the characteristics of the environment in which it is directed. The maturity of the cluster should also be considered. Depending on whether the latter is more or less mature, the approach towards it will be significantly different.

> In mature clusters, policies can achieve and demand more. There is a greater benefit to be gained from stable longer-term commitment and an opportunity to make larger investments that pay off. This is the logic behind some of the longer-term programmes such as Vinnvaxt in Sweden. In emerging clusters, there is more of a need to experiment, which requires greater openness to different and incomplete structures, shorter evaluation cycles with clear exits, and less funding for any one single initiative. [133]

A first crossroads facing the policy maker concerns the choice between two different approaches. It is in fact necessary to establish in which respective quantities the mix of measures between specific and broader ones should be formed. On the one hand there are the so-called cross-cutting initiatives, aimed at "improving the overall business environment"[134]. On the opposite side, the policy maker can implement initiatives which are narrower and more precise, aimed at focussing "on competitiveness of a specific set of related industries"[135].

In this phase the government plays a fundamental role. According to the technical choices of implementation of cluster policies, together with the decisions relating to the contextual creation and development of cluster organization, the government has the necessary powers to trigger a decisive push to the cluster. Policy makers have several methods available to strengthen clusters. They can focus on investments for "improving a cluster-specific dimension of the business environment", or they can focus on the cluster image in order to "attract specific companies or activities to a cluster", or they can even establish access requirements for "funding in existing programmes subject to

[133] Izsak K., Meier Zu Köcker G., Ketels C., Lämmer-Gamp T., *Smart guide to cluster policy*, Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs (European Commission), Belgium, 2016, p. 32. Consulted from https://s3platform.jrc.ec.europa.eu/-/smart-guide-to-cluster-policy?inheritRedirect=true

[134] Ivi p. 29.

[135] Ibid

companies and academic institutions being part of specific industries or cluster"[136]. Whatever course of action the government chooses, it must necessarily be in line with the strategy already agreed and approved in the previous phase.

During his action, the policy maker must pay particular attention on how his cluster policy fits into a wider context, namely that of all other policy initiatives. In fact, cluster policy is nothing more than a part of a set of similar programmes and tools that have similar objectives. As a result, a particularly strenuous integration problem arises. A possible solution to overcome this last problem could be to put together all the policies that have a meaningful impact on clusters. A single strategy would thus be created, made up of a set of related initiatives and programs, which would bring different public departments and private organizations to come together and collaborate.

Among the tools used in their action, policy makers rely heavily on cluster organisations. According to the "*European Cluster Collaboration Platform*", cluster organisations

> are the legal entities that support the strengthening of collaboration, networking and learning in innovation clusters and act as innovation support providers by providing or channelling specialised and customised business support services to stimulate innovation activities, especially in SME.[137]

Because of their ability to foster collaboration, they represent a key instrument in the creation of partnerships across the clusters. Moreover, they can be seen as the access door to the tools that the government puts at disposal for strengthening clusters.

The different structures of cluster organisations can be resumed through three main categories. Some can be set as quasi-private organisations. In this case, all the programmes provided by the government for the companies belonging to the cluster are accessible in a one-stop solution. These programmes also depend on the private sector for the collection of the needed funding. On the contrary, other nations "support

[136] Izsak K., Meier Zu Köcker G., Ketels C., Lämmer-Gamp T., *Smart guide to cluster policy*, Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs (European Commission), Belgium, 2016, p. 29. Consulted from https://s3platform.jrc.ec.europa.eu/-/smart-guide-to-cluster-policy?inheritRedirect=true

[137] The European Cluster Collaboration Platform, https://www.clustercollaboration.eu/cluster-definitions

cluster initiatives in the private sector directly through financial support for a cluster secretariat"[138]. The third alternative is based on funding directly precise activities "contingent on the existence of an organisational structure for collaboration in the cluster"[139] . Once again, in the comparison amid these three categories, there is no better one. Instead, each of them has its own positive and negative sides.

In conclusion, the implementation of cluster policies may be more efficient for the policy makers by relying on a "knowledge-based support infrastructure including the programme agency and specialized partners such as universities and consultants"[140]

[138] Izsak K., Meier Zu Köcker G., Ketels C., Lämmer-Gamp T., *Smart guide to cluster policy*, Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs (European Commission), Belgium, 2016, p. 33. Consulted from https://s3platform.jrc.ec.europa.eu/-/smart-guide-to-cluster-policy?inheritRedirect=true

[139] Ibid

[140] Christensen T.A., Lämmer-Gamp T., Zu Köcker G.M.*, Let's make a perfect cluster policy and cluster programme: smart recommendations for policy makers*, Berlin/Copenhagen, The Danish Ministry of Science Innovation and Higher Education, 2012, p. 32. Consulted from https://www.cluster-analysis.org

III. CLUSTER POLICIES AND ORGANISATIONS IN EUROPE: THE ROLE OF EU IN CLUSTERS IMPLEMENTATION

The commitment carried out by the European Union to support clusters has undoubtedly been increasingly active. Considering also the "young age" of this type of industrial policy, it is natural to see that it has changed over the years. In fact, the approach of the European Union towards cluster policies has been modeled according to the feedbacks deriving from the application in the field. However, especially in the first years, ineffective actions were not rare, due both to inexperience and, indeed, to the scarce availability of data and theoretical basis. To retrace the cluster policies and their impact, it is convenient to divide the path taken by the European Union into different phases, according to the time period in which they have been designed.

> Clusters are of growing importance in the new global environment in which Europe 2020 strategy has to succeed; European policymakers cannot afford to ignore their role and should actively explore their potential to modernise and improve economic policies.[141]

1. EU's efforts in supporting clusters

1.1 EU's first phase of cluster policies (1989-2000)

Although the first decade of the 2000s represents the dawn of the cluster policies of the European Union, already in the nineties some experimentation began to take hold. It is precisely in these years that clusters started to arouse interest and attention for the achievement of certain economic objectives. This impulse at the European level was

[141] European Cluster Policy Group, *Final recommendations: A call for policy action*, 2010. Consulted from https://wbc-rti.info/object/document/7861

largely driven by the desire to follow the initiatives previously carried out at the regional level.

The first evidence of efforts aimed at supporting clusters by the European Commission dates back in 1989 with the PHARE Program, together with the first initiatives aimed at collecting data on European clusters and cluster policies.

The PHARE Programme – Poland and Hungary Assistance for the Restructuring of the Economy – was initially ideated as the main tool for providing economic support to the emerging Poland and Hungary in their path of trade and commercial and economic cooperation with the European Union. However, through the years it was extended to more than ten other emerging economies, all belonging to the east of Europe.

Mainly based on grant funding, the PHARE programme targeted specific sectors of candidate countries for the entry into the European Union. In particular, the target of the funds was the development and support of SMEs. This was guaranteed thanks to a process of facilitation for the access of the SMEs to various key factors, for instance the access to credit and information technology. Among the various factors of interest, there was also the experimental one of clustering.

The impact of the programme was undoubtedly positive, as proved the by ex-post evaluations conducted by the European Union. In particular, it fostered an economic growth through an increased modernisation. Moreover, the program also succeeded as it helped "the candidate countries to bring their industries and basic infrastructure up to Community standards by mobilising the investment required"[142].

In 1990 the European Union initiated a new economic policy which, after several renewals, is still in force nowadays: The European Territorial Cooperation (ETC), or INTERREG. The latter is "the instrument of cohesion policy that aims to solve problems across borders and to jointly develop the potential of diverse territories"[143], and is currently funded by the European Regional Development Fund. The program finds in the cooperation among countries, both across Europe and beyond its borders, its central scope. Indeed, it claimed to be "built around three strands of cooperation", namely

[142] The European Union, *Evaluation of PHARE [EU pre-accession] financial assistance to Bulgaria, Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Romania, Slovakia, Slovenia: Final Report*, 2015, p. 123. Consulted from https://ec.europa.eu/

[143] The European Parliament, https://www.europarl.europa.eu/factsheets/en/sheet/98/european-territorial-cooperation

"cross-border (Interreg A), transnational (Interreg B) and interregional (Interreg C)"[144]. In pursuing this goal, the ETC tries to identify and develop the potential of different regions. In particular, with the ETC for the 2007-2013, EUR 2 million have been earmarked in "innovation in the EU-27 and inter-cluster activities that gather several regions"[145].

The first decade of European policies in support of clusters, albeit still enormously limited and experimental, ends with a new long-term initiative, launched in 1999: the PAXIS initiative. The acronym stands for "pilot action of excellence for innovative start-ups" and refers to the European initiative with the ambitious goal of contributing "through a practical approach, to the identification, analysis, validation and dissemination of local conditions of excellence for the creation of innovative firms"[146]. Within the PAXIS initiatives a series of pilot projects was developed in the context of the implementation and enhancement of mutual policy learning. Among these projects, some aimed at identifying "good practice examples and developing tool boxes for establishing cluster initiatives"[147]. The resources invested in this initiative have allowed, over the years, to create a series of effective and common directives. The latter, concerning strategic areas including innovation, development and entrepreneurship, were then transferred to other key regions. In this way, a sort of handbook was created, namely the "PAXIS Manual", which was able to provide and explain "these practices in details" and to supply "useful guidance for the set-up and management of clusters"[148].

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[144] The European Commission, https://ec.europa.eu/regional_policy/en/policy/cooperation/european-territorial/

[145] Directorate-General For Enterprise And Industry (European Commission), *The concept of clusters and cluster policies and their role for competitiveness and innovation: Main statistical results and lessons learned*, Europe INNOVA Paper n°9, Luxembourg, Office for Official Publications of the European Communities, 2008, p.38. Consulted from https://op.europa.eu/en/publication-detail/-/publication/c15445bd-8203-4d15-b907-56ea17a9876e

[146] The European Commission, https://cordis.europa.eu/article/id/20897-evaluation-of-paxis-initiative-points-to-importance-of-long-term-projects

[147] Directorate-General For Enterprise And Industry (European Commission), *The concept of clusters and cluster policies and their role for competitiveness and innovation: Main statistical results and lessons learned*, Europe INNOVA Paper n°9, Luxembourg, Office for Official Publications of the European Communities, 2008, p.38. Consulted from https://op.europa.eu/en/publication-detail/-/publication/c15445bd-8203-4d15-b907-56ea17a9876e

[148] Ibid

It can be noted that the policies adopted by the European Union in the nineties were mainly focused on promoting cooperation between players, and that the cluster theme still represented only a fraction of the objectives of the initiatives. In addition to being too limited, these initiatives suffered from a lack of a solid empirical background from which to draw. However, as it naturally happens, already in the following decade evident improvements were made on how to best design and implement the cluster policy.

1.2 The dawn of European cluster policies: the second decade

It is with the 2000s that the interest in clusters grows to the point of creating initiatives focused exclusively on supporting clusters or defining "guides" relating to cluster policy. In 2003 the European Commission becomes the protagonist, through its direct support, in the creation of the European Foundation for Cluster Excellence, with the aim of "providing objective reviews of cluster performance" and of "creating a permanent reference platform comparison"[149]. The EFCE is a non-profit organisation which fosters the excellence of clusters at each stage and from every point of view of their development. In pursuing its goal, the foundation makes use of an online platform. The latter allows to bring together the best knowledge and experiences at a European level, in a continuous flow and exchange of information useful for cluster development. The set of knowledge deriving from this process is applied in trainings. In fact, there are several management training programmes that provide cluster players with adequate preparation for the support and development of their clusters. There are mainly three training programmes developed in accordance with the European Commission:

- *Competitive school*;
- *Essence of Cluster Excellence Management;*
- *Cluster Excellence Gold Manager.*[150]

[149] The European Foundation for Cluster Excellence, http://www.clusterexcellence.org/background

[150] Izsak K., Meier Zu Köcker G., Ketels C., Lämmer-Gamp T., *Smart guide to cluster policy*, Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs (European

Between the three, the last one is certainly the most relevant and comprehensive, as it is "aimed specifically at cluster-based economic development professionals"[151].

A great turning point for the conception of European bodies towards clusters is linked to the Lisbon Agenda. It is precisely after having acquired the awareness of the failure of the relaunch of the Agenda that clusters are finally identified among those economic policy instruments "of the future" on which to focus decisively. In 2005 the president of the European Commission, José Manuel Barroso, decided to renew the already existing Strategy and set two main goals: cohesion policy and enterprise policies. However, the European approach towards cluster policies has been lacking a concrete unique and coherent plan, although manifesting a clear interest and importance. The European Commission itself decided "against formulating a specific cluster policy" and, instead, used cluster as "policy tools to pursue a range of different policy objectives"[152]. This led to a controversial situation,

> the limit of this approach is that the 'territorial' dimension of EU Cohesion policy and the Lisbon Strategy is often captured by initiatives that are at best regional (and in some cases, even national), horizontal and sectoral, without real systemic and integrated support that brings together socio-institutional-economic activities.[153]

In 2006 the European Union started the CLUNET project, which puts together some sixteen different actors across Europe with the aim of "sharing and exchanging experiences regarding their cluster innovation and development policies"[154]. Taken together, the various actors participating in the project constitute the elite in the field of innovation policies, as well as representing more than 62 clusters. The CLUNET has

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Commission), Belgium, 2016, p. 37. Consulted from https://s3platform.jrc.ec.europa.eu/-/smart-guide-to-cluster-policy?inheritRedirect=true

[151] Izsak K., Meier Zu Köcker G., Ketels C., Lämmer-Gamp T., *Smart guide to cluster policy*, Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs (European Commission), Belgium, 2016, p. 37. Consulted from https://s3platform.jrc.ec.europa.eu/-/smart-guide-to-cluster-policy?inheritRedirect=true

[152] De Propris L., *Reconciling cohesion and competitiveness through eu cluster policies?*, Routledge, 2007. 28:4, 327-345. Consulted from https://www.tandfonline.com/doi/abs/10.1080/01442870701640690

[153] Ibid

[154] The European Commission, https://cordis.europa.eu/project/id/38847/it

been able to "design a number of concrete pilot cross-border cooperation initiatives which support growth and innovation"[155]. The project lasted for three years with a total budget of EUR 2,022,000.00[156].

The goal of pursuing cooperation among players is also followed by the EUROPE INNOVA Initiative, also launched in 2006. Indeed, the initiative "has strongly supported trans-national cooperation between clusters at operational level and provided a true learning experience for cluster-related organisations" [157]. The initiative is also focused on fostering and expediting innovation of products and services in order to ease their trade in the market.

In July 2007, following Porter's experience with the US mapping of clusters, the European Cluster Observatory (ECO) and its website were launched under the initiative of the European Commission's Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs. The ECO is "an online, free and user-friendly platform that provides a single access point to data and analysis of clusters" and gives " a cluster library, and a classroom for cluster education"[158]. The mapping considers all the nations part of the European Union, 27, and Iceland. The Observatory is widely recognised as a fundamental and unique source of information, which are extremely helpful in the hands of the policy makers. The central role it has gained throughout the years is not merely related to competitiveness around cluster policies, but it is related to many more economic policy's areas of interests as well. Moreover, the Observatory was not designed to be a static service; on the contrary, its database is constantly updated and expanded, by making sensitive accurate and current data available to the policy maker.

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[155] Directorate-General For Enterprise And Industry (European Commission), The concept of clusters and cluster policies and their role for competitiveness and innovation: Main statistical results and lessons learned, Europe INNOVA Paper n°9, Luxembourg, Office for Official Publications of the European Communities, 2008, p.40. Consulted from https://op.europa.eu/en/publication-detail/-/publication/c15445bd-8203-4d15-b907-56ea17a9876e

[156] The European Commission, https://cordis.europa.eu/project/id/38847/it

[157] Directorate-General For Enterprise And Industry (European Commission), The concept of clusters and cluster policies and their role for competitiveness and innovation: Main statistical results and lessons learned, Europe INNOVA Paper n°9, Luxembourg, Office for Official Publications of the European Communities, 2008, p.53. Consulted from https://op.europa.eu/en/publication-detail/-/publication/c15445bd-8203-4d15-b907-56ea17a9876e

[158] The European Cluster Observatory, http://www.clusterobservatory.eu/

To give an idea of this, suffice is to say that on a monthly basis around 1.500 books and papers and 2.000 maps are first created and uploaded on the website[159].

Following the year 2012, the "Cluster Observatory was separated from the European Cluster Observatory and is run by the Center for Strategy and Competitiveness at the Stockholm School of Economics"[160].

The commitment of the European Union in encouraging collaboration among clusters was also renewed in 2007, with the development and start-up of the CLUSTRAT project. The latter, which was intended to last until 2014, has the objective of developing "new cluster concepts that promote cross-fertilisation between industries, technologies and services and support the implementation of key enabling technologies"[161]. In doing so, partners from different countries belonging to the Central European area are enabled to "join forces to develop and test new policy approaches to upgrade the innovation capacity of clusters"[162].

Cooperation at an interregional level is also the central theme of a third initiative of 2007, namely Regions for Economic Change, under the Cohesion Policy.

The data and findings provided by the European Cluster Observatory make it possible for the High Level Advisory Group on Cluster to elaborate the European Cluster Memorandum, "signed by a large number of countries across Europe and presented to the European Commission in early 2008"[163]. The Memorandum tries to delineate the use and the potential of clusters, by giving specific hints to both the regions and the European Commission on how to develop the most suitable environment for European clusters. More specifically, the Memorandum gives for instance practical suggestions on

[159]Data taken from Ketels C., Lindqvist G., Sölvell Ö., *Strengthening clusters and competitiveness in Europe: The role of cluster organisations*, The Cluster Observatory, Stockholm, 2012. Consulted from https://s3platform.jrc.ec.europa.eu/cluster-organisations

[160] The European Cluster Observatory, http://www.clusterobservatory.eu/

[161] Izsak K., Meier Zu Köcker G., Ketels C., Lämmer-Gamp T., *Smart guide to cluster policy*, Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs (European Commission), Belgium, 2016, p. 38. Consulted from https://s3platform.jrc.ec.europa.eu/-/smart-guide-to-cluster-policy?inheritRedirect=true

[162] The Clustrat, http://www.clustrat.eu/clustrat.eu/index.html

[163] Sölvell Ö., Ketels C., Lindqvist G., *The European Cluster Observatory: EU cluster mapping and strengthening clusters in Europe*, Europe INNOVA Paper n°12, Luxembourg, Publications Office of the European Union, 2009, p. 8. Consulted from https://op.europa.eu/en/home

"why we need stronger clusters based on innovation and excellence" or "fostering excellence through strong innovation clusters"[164].

Besides the High Level Advisory Group on Clusters, founded in 2006, another key European policy group was founded in 2008: The European Cluster Policy Group (ECPG). Created by the European Commission, the Group's task is to "advise the Commission and Member States on how to better support the development of more world-class clusters in EU"[165]. After the selection and settlement of its members, the ECPG published its main document: The ECPG Final Recommendations - A Call for Policy Action. The document consists of three principles which "explain the role of cluster programmes in the overall policy mix and the nature of cluster programmes" and eight action proposals which "translate these general principles into more concrete suggestions for specific new policy actions"[166].

In 2009 the European Commission switched its focus to increasing the quality and the efficiency of cluster policies across Europe. In this direction goes the European Cluster Excellence Initiative (ECEI), aimed at "identifying and setting up a meaningful set of training, quality indicators and peer-assessment procedures for cluster management" by putting together "he most experienced people and organisations in Europe"[167]. The ECEI creates a benchmarking tool, with the purpose of comparing clusters within the European Union, which is called European cluster excellence labels. This mechanism simply categorizes clusters in three different ways, according to their quality grade: gold, silver or bronze. The initiative ended in 2012.

After the conclusion of the ECEI, the cluster labelling is managed by an independent organism: the European Secretariat for Cluster Analysis (ESCA). The analysis and rating

[164] The High Level Advisory Group On Clusters, *The European cluster memorandum, promoting European Innovation through Clusters: An agenda for policy action*, Center for Strategy and Competitiveness, Stockholm, 2008, pp. 1-3.

[165] Ketels C., Lindqvist G., Sölvell Ö., *Strengthening clusters and competitiveness in Europe: The role of cluster organisations*, The Cluster Observatory, Stockholm, 2012, p. 39. Consulted from https://s3platform.jrc.ec.europa.eu/cluster-organisations

[166] European Cluster Policy Group, *Final recommendations: A call for policy action*, 2010. Consulted from https://wbc-rti.info/object/document/7861

[167] The European Foundation for Cluster Excellence, http://www.clusterexcellence.org/background

of clusters is conducted by "independent cluster experts who have attended special trainings"[168].

1.3 Focus on clusters' quality: the third decade

The third decade of policy clusters in Europe sees a shift of interest from the European Union. It is clear that until now – with some exceptions such as the ECEI – the focus was essentially centered on encouraging the use of clusters, as well as on creating a stable and lasting network between players. Now, however, attention is significantly oriented towards the very quality of the European clusters.

The impulse comes from the European Cluster Policy Group. The body of experts, thanks to the ever-growing availability of data, is able to establish what are the main characteristics that an efficient cluster program should have. This information, after being implemented by the European Commission, is then transformed into precise directives, aimed at increasing the quality and efficiency of clusters at the European level. A new generation of projects is therefore launched, which identifies benchmarking and training as its strengths.

In 2012 a second group of cluster experts was created. The European Forum of Clusters in Emerging Industries is made up of 15 experts in the fields of "cluster policy, cluster management and cluster business" who target "the role of clusters as accelerators and drivers of emerging industries in Europe"[169].

The year 2014 opened up with a new programme orientated towards supporting SMEs: the COSME. Through the programme for Competitiveness of Enterprises and Small and Medium-sized Enterprises, the European Commission aims to "promote entrepreneurship and improve the business environment for SMEs, to allow them to

[168] Izsak K., Meier Zu Köcker G., Ketels C., Lämmer-Gamp T., *Smart guide to cluster policy*, Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs (European Commission), Belgium, 2016, p. 37. Consulted from https://s3platform.jrc.ec.europa.eu/-/smart-guide-to-cluster-policy?inheritRedirect=true

[169] Ketels C., Lindqvist G., Sölvell Ö., *Strengthening clusters and competitiveness in Europe: The role of cluster organisations*, The Cluster Observatory, Stockholm, 2012, p. 40. Consulted from https://s3platform.jrc.ec.europa.eu/cluster-organisations

realise their full potential in today's global economy"[170]. COSME also aims to support clusters through its various initiatives, with particular regard to the fostering of cluster excellence. This, as a consequence, creates a beneficial effect to those SMEs which are related to clusters themselves. As reported in its original leaflet, while listing how the programme addresses its objectives, related to how to improve the conditions for a framework oriented towards competitiveness:

> COSME promotes the development of worldclass clusters in the EU, fostering cluster excellence and internationalisation with an emphasis on cross-sectoral cooperation, notably in support of emerging industries.[171]

The European Commission, which claims for the importance of the SMEs in Europe, considered as the "backbone of Europe's economy, providing 85% of all new jobs", funded the programme for the period from 2014 to 2020 with a total of EUR 2.3 billion[172].

Under the COSME the European Cluster Excellence Programme was started in 2014, followed by two more implementations in 2015 and 2018. Also this case is a further effort on the part of the European Commission to promote excellence in the world of European clusters. In addition to "strengthening cluster management excellence", the programme "facilitates exchanges and strategic partnering between clusters and specialised eco-systems and cities across Europe"[173]. The programme sees essential factors in the level of quality of cluster management and in the specific connections between the clusters themselves. In fact, these are considered as key elements for obtaining clusters that enjoy success at both European and world level. In addition, it is recognised how the support of clusters must necessarily pass through the support of SMEs seeking to emerge in the international market.

The second main project carried out by the European Commission under COSME is the European Strategic Cluster Partnership, launched in 2014. Its aim is that of promoting

[170] The European Commission, https://ec.europa.eu/docsroom/documents/9783
[171] Ibid
[172] The European Commission, https://ec.europa.eu/growth/smes/cosme/
[173] The European Commission, https://ec.europa.eu/easme/en/section/cosme/cos-cluster-2020-3-03-european-cluster-excellence-programme-clusterxchange-scheme

the strengthening of networks, through "encouraging clusters from Europe to intensify collaboration across regions and sectors"[174]. This project also extends its area of interest to those sectors characterized by new and growing industries. The work carried out with the interest of bringing together and comparing different players belonging to the world of clusters makes sure that partnerships are created. The latter "encourage clusters from Europe to work together to exploit synergies and develop a joint 'European' strategic vision with a global perspective and common goals with respect to specific non-EU markets"[175]. Furthermore, as it is logical to deduce, these more specific objectives fit together and form part of a more general picture. The ultimate goal of the European Commission, through this but also other initiatives, is certainly that of "boosting economic growth and competitiveness in Europe"[176].

2015 is notable for the start of the INNOSUP initiative, which "addresses the challenge to develop new cross-sectoral industrial value chains across the EU, by building upon the innovation potential of SMEs"[177]. INNOSUP, currently destined to last for five years until 2020, has so far launched a total of 179 projects aimed at different target regions within and beyond European borders [178]. This project provides a demonstration of the farsighted view of the European Commission, as it decides to support emerging industries in order to guarantee future economic growth and incremental employment. The analysis and selection of industries pay particular attention, in addition to the duration over time, to those able to provide products or services that guarantee an adequate level of competitiveness, including international, as well as European. A total of EUR 130 million has been allocated for the INNOSUP project[179].

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[174] The European Cluster Collaboration Platform, https://www.clustercollaboration.eu/eu-cluster-partnerships

[175] Izsak K., Meier Zu Köcker G., Ketels C., Lämmer-Gamp T., *Smart guide to cluster policy*, Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs (European Commission), Belgium, 2016, pp. 39-40. Consulted from https://s3platform.jrc.ec.europa.eu/-/smart-guide-to-cluster-policy?inheritRedirect=true.

[176] The European Cluster Collaboration Platform, https://www.clustercollaboration.eu/eu-cluster-partnerships

[177] The European Cluster Collaboration Platform, https://www.clustercollaboration.eu/eu-initiative/innosup-calls

[178] Data taken from the Horizon 2020 INNOSUP data hub, https://innosup.easme-web.eu/#

[179] Data taken from Izsak K., Meier Zu Köcker G., Ketels C., Lämmer-Gamp T., *Smart guide to cluster policy*, Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs (European Commission), Belgium, 2016, p. 40. Consulted from https://s3platform.jrc.ec.europa.eu/-/smart-guide-to-cluster-policy?inheritRedirect=true.

In 2016, under the COSME project, the European Commission launched the European Cluster Collaboration Platform (ECCP), considered as the meeting point and a great reference point of the European cluster system. The ECCP has the key role of supporting clusters and clusters' players through the provision of information and the incentive to networking, with the aim of "improving their performance and increasing their competitiveness through trans-national and international cooperation"[180]. If a cluster decides to register on the ECCP website, it can take advantage of unique and strategic opportunities. In fact, through the site it is possible for the clusters and cluster organisations to introduce themselves to the other players and to get their attention. In this way, not only the collective knowledge is increased through a continuous exchange of experiences, but it is also possible to seek (and be sought) by potential international partners. Therefore, the process of selecting the partners themselves is simplified, which must satisfy cluster-specific requirements. Everything to the advantage and benefit of transnational cooperation and access to the international markets. Despite having been designed for cluster managements in the first place, the ECCP is also "useful for both the SME cluster members and for the cluster policy makers at regional, national or international level"[181].

In 2018 the ClusterXchange (CXC) programme was created, giving more support to clusters and their members.

> The general objective of ClusterXchange is to encourage and facilitate transnational, cross-regional, sectoral and cross-sectoral cooperation between industrial clusters and their members to boost their learning and innovation-oriented activities with the view to generate more growth opportunities and to increase the competitiveness of European SMEs so they can successfully access global markets.[182]

[180] The European Cluster Collaboration Platform, https://www.clustercollaboration.eu/vibrant-platform-service-cluster-organisations

[181] Ibid

[182] The European Cluster Collaboration Platform, file:///C:/Users/gio/AppData/Local/Temp/2020_cxc_qm.pdf

The way in which the programme operates is through an actual exchange of the subjects that join it. It is therefore about making a stay abroad by visiting the organization of another country. The exchange has a multipurpose function, as it can be used to:

- Learn from actors in another cluster and/or other country
- Explore growth opportunities in new markets
- Foster the adoption of new technologies, digitalisation and green low-carbon solutions
- Invest in strategic interregional collaboration.[183]

In 2019 the European Union proceeded to the creation of a new group of cluster policy experts: the European Cluster Expert Group. The group, which is temporary and with a limited scope, has the goal of supporting not only the Member States and regions part of the European Union, but also the European Commission itself, by providing recommendations, hints and by sharing their own experience. Through this process the Group intends to advise the subjects of interest "on how to better use clusters as a strategic tool of industrial policy, interregional collaboration and for integrating SMEs into EU and global value chains"[184] .

In Warsaw in 2019 the foundations were laid for the European Cluster Alliance (ECA), a new approach towards cluster European policies, which is

> dedicated to creating synergies between the various activities of clusters in various countries and speak with one strong voice for the development of further framework conditions for clusters to support the competitiveness and innovation capacity of their SMEs in Europe.[185]

[183] The European Cluster Collaboration Platform, https://www.clustercollaboration.eu/clusterxchange

[184] The European Commission, https://ec.europa.eu/transparency/regexpert/index.cfm?do=groupDetail.groupDetail&groupID=3636

[185] The European Cluster Collaboration Platform, https://www.clustercollaboration.eu/news/green-light-establishment-european-clusters-alliance

The ECA has a vast network of relationships in the world of European clusters. In fact, the program works with a total of 800 cluster organizations, inserted in the context of 15 different national cluster associations, and involves more than 123,000 businesses and about 10,000 universities and other related research institutes[186].

In conclusion, the intervention of the European Union in support of clusters and their quality was not limited only to the creation and implementation of initiatives, programs and groups of experts. Especially in recent years, the European Commission has generated, with an increasingly growing trend, a fair number of cluster and cluster policy events, conferences and forums. Some examples are "*the European Cluster Policy Forum*", "*the European Strategic Cluster Partnerships Events*" and "*the EU Cluster Weeks*" in 2018, or "*the European Cluster Conference*" in 2019[187].

2. Considerations on the impact of EU's cluster policies

2.1 A difficult assessment

At this point of the analysis, it is natural to try to take a closer look at the initiatives undertaken by the European Union in support of clusters. The goal is to discuss and analyze the data relating to the impact and effects that these policies have produced. This phase is normally considered as the most complex and articulated, and it is even more so in the case of cluster policies, for various reasons.

The main problem is related to the use of the data themselves. As it is easy to guess, it is far from simple to establish a cause-effect relationship between the policies of the European Union and the data collected in reference to the effects that these policies have had. Specifically, cluster policies are by their nature aimed at producing cross-sectoral and cross-regional effects, which makes the data interpretation process even

[186] The European Cluster Collaboration Platform, https://www.clustercollaboration.eu/cluster-networks/european-clusters-alliance-eca?page=0%2C0%2C0%2C1

[187] Taken from The European Commission, https://ec.europa.eu/growth/industry/policy/cluster/observatory_en

more controversial and articulated. A proof of the difficulty of the analysis is provided by the CLUNET project report:

> Most of the partners have involved their regional cluster organizations and experts in order to complete the CPFS(cluster policy fact sheet) and obtain the range of data. However, even with a common framework, most of the partners have faced difficulties during the phase of collection of data, and especially within the last section dedicated to the impact analysis.[188]

Secondly, the timing problem should not be underestimated. On the one hand, if the so-called "first generation" of initiatives undertaken by the European Union are taken as a reference, one can count on a large amount of data – a substantial advantage; on the other hand, however, the data would suffer from problems related to the maturity of the European clusters themselves, causing possible misleading results. An example is given by the case of the CLUNET report, in which a great difficulty for the partners in providing detailed information on the results of the project was connected to the "lack of maturity of the cluster projects"[189]. On the other hand, in the event that the evaluation is made by referring to more recent programmes and initiatives, such as those starting from 2010, there would still be advantages and disadvantages. It would certainly be about more mature clusters and cluster policies, thus allowing to avoid the problems discussed above. A direct consequence would be the constant flow of useful and updated data. However, in most of the cases one would have to deal with unfinished policies. And this would heavily affect the objective assessment of the impact that the cluster policy has had.

2.2 General overview and consideration of the impact

It is clear that the European Union has increasingly focused on clusters, through policies aimed at their development and support. In the previous chapter it was seen how the

[188] Pro Inno Europe, *Clunet Cluster Policy Guidelines Report*. Consulted from http://docplayer.net/153907343-Clunet-cluster-policy-guidelines-report.html
[189] Ibid

measures implemented have been many and different from each other. Nevertheless, it is possible to derive general points of contact, which allow to summarize what has been a journey of over thirty years. The goal of the European Union on this matter, although slightly changed over time, has always been that of proving the tools necessary to improve the quality of clusters, their policies and their networks. In this sense, the impact of European policies is largely due to:

- Data provision, through a continuous seek for increasing their quantity and quality
- Propensity and dissemination of knowledge of excellence
- Encouragement to meet and exchange
- Funding.

The European Union's efforts in the field of cluster policies have shown positive results in most cases, but with some exceptions. Arguably the most emblematic ineffective policy has been the Lisbon Strategy of 2005 (with the sole reference to the objectives on clusters).

However, to get a general idea of the efficiency level of cluster policies, it is useful and emblematic to resort to surveys. The latter allow to have the point of view of the key players, by understanding what has or has not worked in an initiative with respect to the objectives set. In order to do this, the European Observatory of Clusters and Industrial Change (EOCIC) gives a great help. The EOCIC provides an analysis carried out on an online survey, in which the subjects responsible for the organization and implementation of cluster policies – both at national and regional level – are interviewed (see *Figure 7*). On the whole, the data collected refer to 29 nations and 49 regions belonging to the European Union[190].

The data provided show that, despite the great variety of effects produced by the cluster policies, 16 of the 19 triggered effects are deemed of medium or high importance by the

[190] Sirtori E., Caputo A., Colnot L., Ardizzon F., Scalera D., *European cluster and industrial transformation report*, Publication Office for The European Union, Luxembourg, 2019. Consulted from https://ec.europa.eu/growth/content/trends-european-clusters-results-2019-european-panorama-trends-and-priority-sectors-reports_en

players involved. This suggests a great impact of the cluster policies in terms of strategic utility and relevance for the interested parties. In particular, it is essential to underline how the support for collaboration, and therefore for the creation of networks, both at a cross-sectoral and international level, has obtained the most convincing results. And collaboration represents one of the main objectives of the European Union in the field of cluster policies.

Figure 7. Average importance of support measures provided by national and regional cluster programmes.

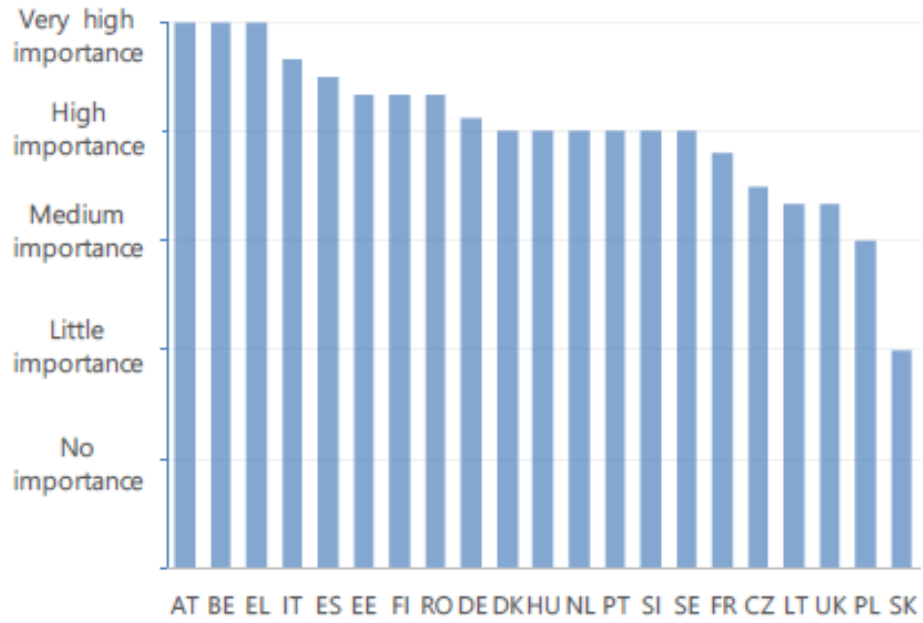
Source: EOCIC.

The positive impact of cluster policies from the point of view of the network they generate is also confirmed by further research. The EOCIC provides a more specific survey in which the focus is precisely on the importance that countries themselves –

rather than the different players as seen above – attribute to cross-sectoral linkages effects triggered by policies (see *Figure 8*)[191].

Also in this case the results are almost univocal and show that for most of the countries of the European Union the cluster policies undertaken are extremely important for their impact generated on cross-sectoral linkages, making the latter a fundamental variable.

Figure 8. Average importance of measures supporting cross-sectoral collaboration, by country.



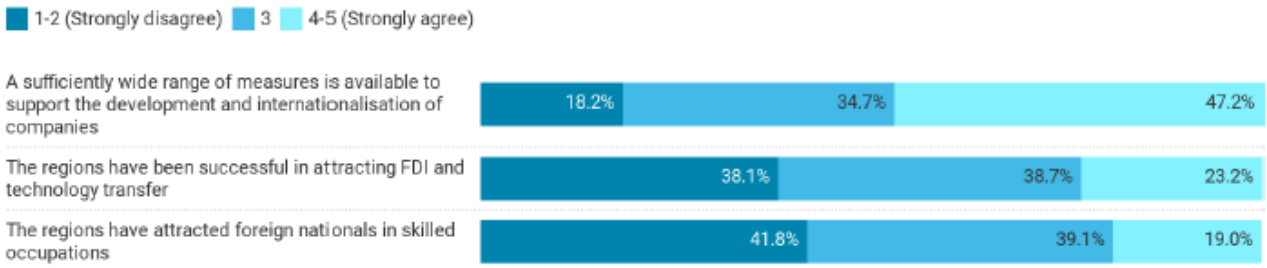
Source: EOCIC.

However, the EOCIC provides data which tend to be diametrically opposed to what has been stated so far, or at least it provides a "less-positive" perspective. As it is logical to expect, over the years non-positive feedbacks on the effects of cluster policies in Europe have also been collected. Among these it certainly arouses interest the "*Summary Report on lessons learnt from fostering modern Cluster Policy in regions in industrial transition*", elaborated and published by the EOCIC. In this report 10 selected regions of the European Union are called to share their views and opinions on modern cluster

[191] Sirtori E., Caputo A., Colnot L., Ardizzon F., Scalera D., *European cluster and industrial transformation report*, Publication Office for The European Union, Luxembourg, 2019. Consulted from https://ec.europa.eu/growth/content/trends-european-clusters-results-2019-european-panorama-trends-and-priority-sectors-reports_en

policies. For instance, it was reported how, with respect to the internationalisation of SMEs, the stakeholders are not satisfied about the measures provided by the European Union (see *Figure 9*). In particular, "less than half of the stakeholders consider that there is a sufficiently wide range of measures available to support the development and internationalisation of companies"[192].

Figure 9. Stakeholders views regarding SME internationalisation in the pilot regions.



Source: EOCIC.

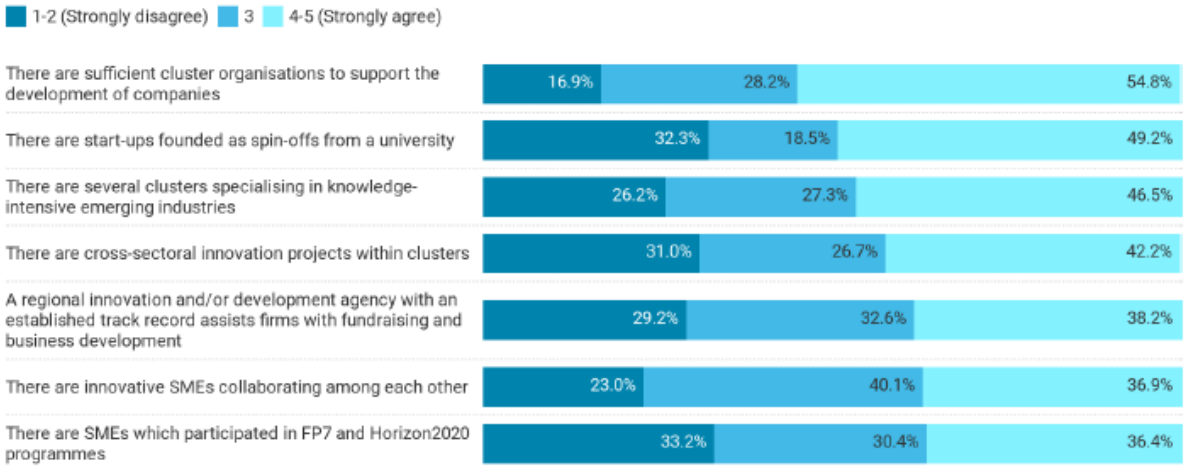
Nevertheless, it is not easy to find the reasons for such negative opinions. The same research, however, provides a point of view on the collaboration of European clusters, by imputing it among the possible causes (see *Figure 10*). In the data provided by the EOCIC we can see several items relating to the collaboration and, despite generally negative values for other items, there is one that is definitely emblematic: Only about half of the stakeholders consider the number of cluster organisations enough for providing support for the development of companies. This indicates clear clues about a discrepancy between the objectives set by the European Union in the key field which is the collaboration of SMEs to support their development, and the results obtained. Moreover, negative results are found even if innovation is taken as a reference value. In fact, it turns out how only "one in three of the pilot regions thought that regional

[192] Hausemer P., Porsch L., Nunu M., Rodriguez A. E., *Summary Report on lessons learnt from fostering modern Cluster Policy in regions in industrial transition*, Publication Office of the European Union, Luxembourg, 2019, p. 9. Consulted from https://clustercollaboration.eu/news/summary-report-cluster-policy-regions

innovative SMEs collaborate with one another"[193]: A value which is undoubtedly too low.

Notwithstanding, on the whole, there is no doubt that the impact of the policies implemented by the European Union has been positive, guaranteeing a development of the clusters (and their organizations) both in quality and in number over the years. However, in order to have a more precise and practical idea of the impact it is necessary to take some initiatives as references and study them individually. For this reason, in the following paragraphs, three programmes will be investigated and evaluated in detail.

Figure 10. Stakeholders views regarding collaboration in the pilot regions.



Source: EOCIC.

2.3 The Clustrat Project

The first example of industrial policy is the Clustrat project, completed in 2014 and which involved different types of players from Austria, the Czech Republic, Germany, Hungary, Italy, Poland, Slovenia, Slovakia and Ukraine.

[193] Hausemer P., Porsch L., Nunu M., Rodriguez A. E., *Summary Report on lessons learnt from fostering modern Cluster Policy in regions in industrial transition*, Publication Office of the European Union, Luxembourg, 2019, p. 9. Consulted from https://clustercollaboration.eu/news/summary-report-cluster-policy-regions

The project achieved the excellent result of bringing together Central European countries for an exchange of ideas and knowledge, in order to formulate a common strategy within the action of emerging clusters. It is certainly considered a positive and unique output the fact of having been able to bring together the forces of different countries under the roof of a common goal.

Specifically, the Clustrat managed to develop a "joint strategy on new cluster concepts, with a view to supporting emerging industries and promoting cross-cutting themes in central Europe"[194]. In fact, throughout the seven years of the initiative, the 18 partners member of the transnational consortium implemented "pilot actions, manuals for the implementation of pilot actions and individual reports for the participating countries that summarise the most important project experiences and results for each country"[195].

Beyond the fact of having produced excellent results, the project has provided a source of inspiration for the cluster policy-makers, but also for the different players who, for various reasons, are involved in the development of clusters.

When analyzing in detail the actual impact of the initiative, it is useful to refer to a report drawn up directly by the stakeholders. Take as an example the activity carried out by Italy: Veneto, Piedmont and Friuli Venezia Giulia regions took part in the project together with the German Baden Württemberg in the development of a pilot action. The latter was exploited specifically to observe the practical application of the new cluster concepts. The pilot action was evaluated as

> a precious opportunity to analyze the economic fabric and local production, recording strengths and weaknesses in each region and, above all, for identify, together with the actors involved, new development assets and opportunities to deal with upcoming global challenges.[196]

[194] Izsak K., Meier Zu Köcker G., Ketels C., Lämmer-Gamp T., *Smart guide to cluster policy*, Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs (European Commission), Belgium, 2016, p. 38. Consulted from https://s3platform.jrc.ec.europa.eu/-/smart-guide-to-cluster-policy?inheritRedirect=true.

[195] Ibid

[196] Regione Veneto - Sezione Ricerca e Innovazione, con la collaborazione della Regione Piemonte - Direzione Innovazione, Ricerca, Università e Sviluppo energetico sostenibile e di Friuli Innovazione – Centro di Ricerca e Trasferimento Tecnologico, *Nuove politiche a sostegno dei cluster, industrie emergenti e tematiche intersettoriali – Report Nazionale*, p. 9.

In addition, among the feedbacks of the players involved, it is worth mentioning one that has been evaluated as very positive: the participatory method proposed by the project and the possibility of open discussion at various levels on the policies – both already underway and in the start-up – of the regions involved in terms of clusters and their future.

According to the Veneto Region, the Clustrat has been a great occasion to involve different subjects belonging to different fields, in "the reflection on new opportunities of growth and intersectoral collaboration"[197].

The positive impact of the Clustrat also concerns the policies on clusters prior to the project in question. In fact, the three Italian regions involved have used the project to evaluate the work of previous initiatives: Thanks to the exchange of information and comparison with other regions and countries, it was possible to obtain a more adequate evaluation of the effectiveness of the policies, supporting the clusters already undertaken.

In conclusion, it can be validly stated that the Clustrat project has a positive rating. This statement is based on its results, which are fully in line with the objectives set for its launch, and on the strong evidence provided by the subjects involved themselves.

2.4 Europe's programme for small and medium-sized enterprises (COSME)

The second example is COSME, the program that the EU has developed with the aim of increasing the competitiveness of small and medium-sized enterprises (SMEs). The six-year project ended in 2020 with a total budget of EUR 2.3 billion.

The analysis of the impact of this project will take into consideration three variables: the relevance, the effectiveness and the efficiency of Cosme.

First of all, it is necessary to state that Cosme is essentially based on two financial instruments: The Loan Guarantee Facility (LGF) and the Equity Facility for Growth (EFG).

[197] Regione Veneto - Sezione Ricerca e Innovazione, con la collaborazione della Regione Piemonte - Direzione Innovazione, Ricerca, Università e Sviluppo energetico sostenibile e di Friuli Innovazione – Centro di Ricerca e Trasferimento Tecnologico, *Nuove politiche a sostegno dei cluster, industrie emergenti e tematiche intersettoriali – Report Nazionale*, p. 10.

The LGF is used to "fund guarantees and counter-guarantees for financial intermediaries to help them provide more loan and lease finance to SMEs", whereas the EFG "is dedicated to investments in risk-capital funds that provide venture capital and mezzanine finance to expansion and growth-stage SMEs"[198]. In other words, if on the one hand the LGF focuses on financial support to those SMEs that struggle to obtain financing through the traditional banking method, on the other hand the EFG tries to cover the needs of start-ups and SMEs specifically in their phases of growth and expansion.

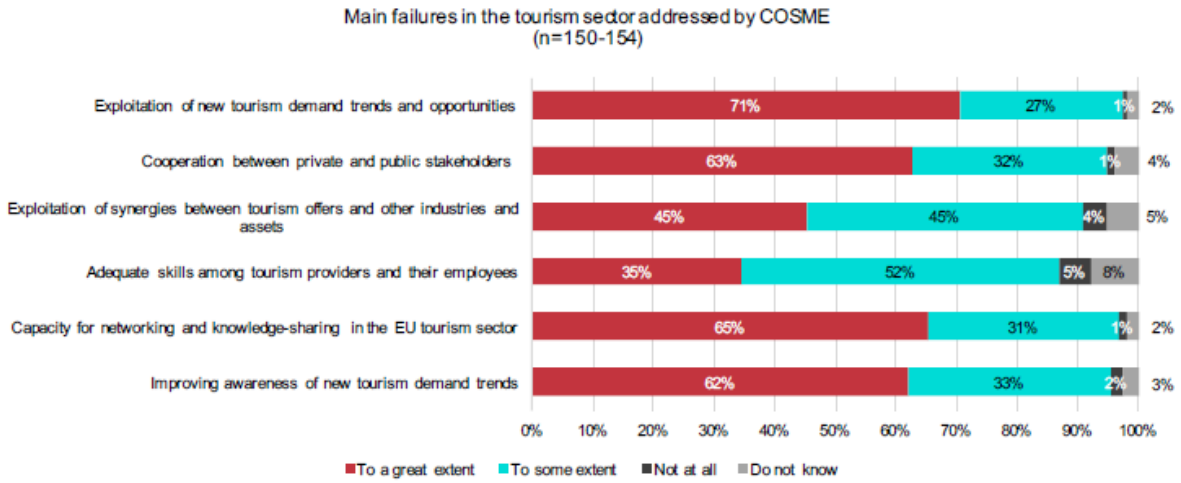
As for the relevance of Cosme, according to the report commissioned by the European Commission, the results of the project are considered satisfactory overall. In fact, it was found that both the recipients of the funds, the SMEs, and the intermediaries themselves consider the measures implemented positively. It is the same subjects mentioned above who share the opinion according to which "the financial instruments in COSME are relevant and corresponding to their needs, both in terms of the conditions set and the size of the financing offered"[199]. However, the tourism field, which is also the recipient of the project's financial aid, is a case which deserves particular attention. In contrast with what has been said so far, data shows that the tourism sector seems to be the only drawback (see *Figure 11*). Among the inefficiencies of this sector connected to the initiative, according to its participants, the most problematic one derives from the lack of exploitation of new tourism demand trends and opportunities. Failures were also encountered by the managers of the clusters employed in the Cluster Internationalization Programme. The accusation is that of a lack of attention and focus on the long term, regarding international relations as well as business planning (93% partially or totally agreed with this issue[200]).

[198] The European Commission, https://ec.europa.eu/growth/access-to-finance/cosme-financial-instruments_en

[199] Mahieu B., Brown N., Jan Fikkers D., Rosemberg C., Roman L., Sadeski F., Zegel S., *Interim evaluation of the COSME Programme – Final report*, Publications Office of the European Union, Luxembourg, 2017, p. 29. Consulted from https://ec.europa.eu/docsroom/documents/27383?locale=it

[200] Technopolis Group, Survey data (2017).

Figure 11. Main failures in the tourism sector addressed by Cosme.



Source: Technopolis Group, based on survey data (2017).

Even from the point of view of the effectiveness, Cosme seems to achieve satisfactory results overall. Investments from the EFG last for 5 years on average, making it difficult to evaluate the output. However, the EFG "allowed for an average volume of 'ticket' received by the eligible SMEs of €5m, which is about three times the average European risk capital ticket"[201]. As of the end of 2016, the LFG completed a total of 67 transactions, corresponding to an amount of EUR 611.7 million. These results can also be broken down, by providing the following data: over 60 financial intermediaries are involved in 25 countries and a total of 140 thousand SMEs received financial support (half of which are start-ups)[202].

The good effectiveness of Cosme is also evidenced by its own projects (EYE, EEN, Clusters Go International, etc.). For instance, the Enterprise Europe Network (EEN) demonstrates excellent results from this point of view. Its participants claim to "to have increased their expertise as well as their ability to provide high level services to their client SMEs by

[201] Mahieu B., Brown N., Jan Fikkers D., Rosemberg C., Roman L., Sadeski F., Zegel S., *Interim evaluation of the COSME Programme – Final report*, Publications Office of the European Union, Luxembourg, 2017, p. 40. Consulted from https://ec.europa.eu/docsroom/documents/27383?locale=it

[202] Technopolis Group, based on EIF monitoring data at end of 2016 (EIF Quarterly Report Q4/2016).

participating in the Network"[203]. This positive trend is also confirmed by the Clusters Go International project, where the level of participation of the clusters was so high that some participants joined voluntarily. Moreover, according to the subjects participating in the project, the positive effects linked to the internationalization of their clusters are numerous (see *Figure 12*).

Figure 12. Outcomes of the Clusters Go International project.

Source: Technopolis Group (2017); Notes: the survey targeted both funded and voluntary/non-funded projects.

The greatest achievement, even with non-existent negative reviews, is the access to new international partners.

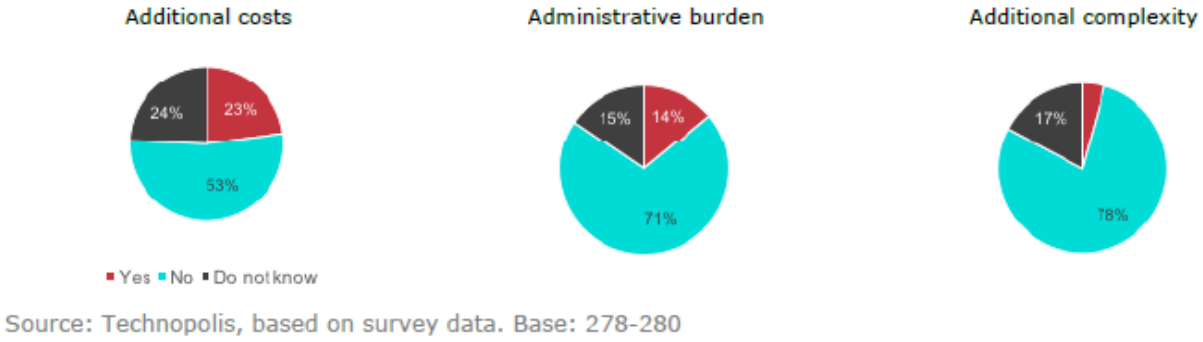
Despite having helped more than 140,000 SMEs in total, Cosme has also been the subject of some criticism due to its not very selective action. In other words, Cosme's two major actions LGF and EEN, "accounting for about 80% of the total budget committed"[204], act towards all SMEs without implementing particular focuses in certain categories. Instead, they target all the SMEs regardless of criteria.

[203] Mahieu B., Brown N., Jan Fikkers D., Rosemberg C., Roman L., Sadeski F., Zegel S., *Interim evaluation of the COSME Programme – Final report*, Publications Office of the European Union, Luxembourg, 2017, p. 40. Consulted from https://ec.europa.eu/docsroom/documents/27383?locale=it

[204] Ivi, p. 95.

The last Cosme's factor to be evaluated is its efficiency, intended as the results obtained by the programme in relation to the resources used. An overall positive feedback is obtained from the analysis of cost efficiency, from the point of view of the financial intermediaries and the beneficiaries. Apart from some particular exceptions – i.e. the case of administrative burden considered excessive – the parties directly concerned agree in affirming that the benefits outweigh the costs. Moreover, the recipients of the LGF loans state that they have not encountered concrete additional costs (53%), administrative burdens (71%) or additional complexity (78%) (see *Figure 13*).

Figure 13. LGF beneficiary companies that incurred additional costs, administrative burden or additional complexity related to their EU-COSME guarantee.



Source: Technopolis, based on survey data. Base: 278-280.

The programmes financed by Cosme, like EYE and EEN, are also satisfied with the relationship between costs and benefits of the program, positively evaluating the balance between the two items[205].

The overall assessment is clearly satisfactory and identifies its key strength in the "clarity of its work programme descriptions, leading to a relatively small share of ineligible proposals responding to the calls for grants"[206].

[205] Mahieu B., Brown N., Jan Fikkers D., Rosemberg C., Roman L., Sadeski F., Zegel S., *Interim evaluation of the COSME Programme – Final report*, Publications Office of the European Union, Luxembourg, 2017, pp. 63-64. Consulted from https://ec.europa.eu/docsroom/documents/27383?locale=it

[206] Ivi, p. 96.

However, also the programme's efficiency has a weak point: The way the funds are distributed within the program is not a little perplexing. There is a clear inequality as only the two most important actions (LGF and EEN) are assigned 4/5 of the entire resources available for Cosme. Consequently, the remaining small portion of the funds is divided among a considerable number of projects. The downside to this lies in the negative "influences (on) the potential for cost-efficiency in the programme implementation and accentuates the limits in strategic steering and coordination of the programme"[207].

2.5 The INNOSUP initiative

The last impact of a cluster programme to be analysed is that of the INNOSUP programme, ideated and launched by the European Union with the aim of "supporting SMEs to develop new value chains that cross business sectors"[208].

The impact report drawn up in 2019 by the Executive Agency for Small and Medium-sized Enterprises (EASME), entitled "*Horizon 2020 – INNOSUP-1 Cluster facilitated projects for new industrial value chains"*, provides a clear overall view of the impact that this programme has had on the various countries of the European Union that have joined it.

The INNOSUP boasts excellent results from the point of view of the geographical coverage achieved. To date, in fact, the programme includes 489 participants and 179 projects belonging to 36 different countries spread within the European Union and beyond[209].

As of May 2019, the INNOSUP initiative has reached out some 3,232 SMEs, even tough data are not comprehensive considering the absence of one project's data. Despite an

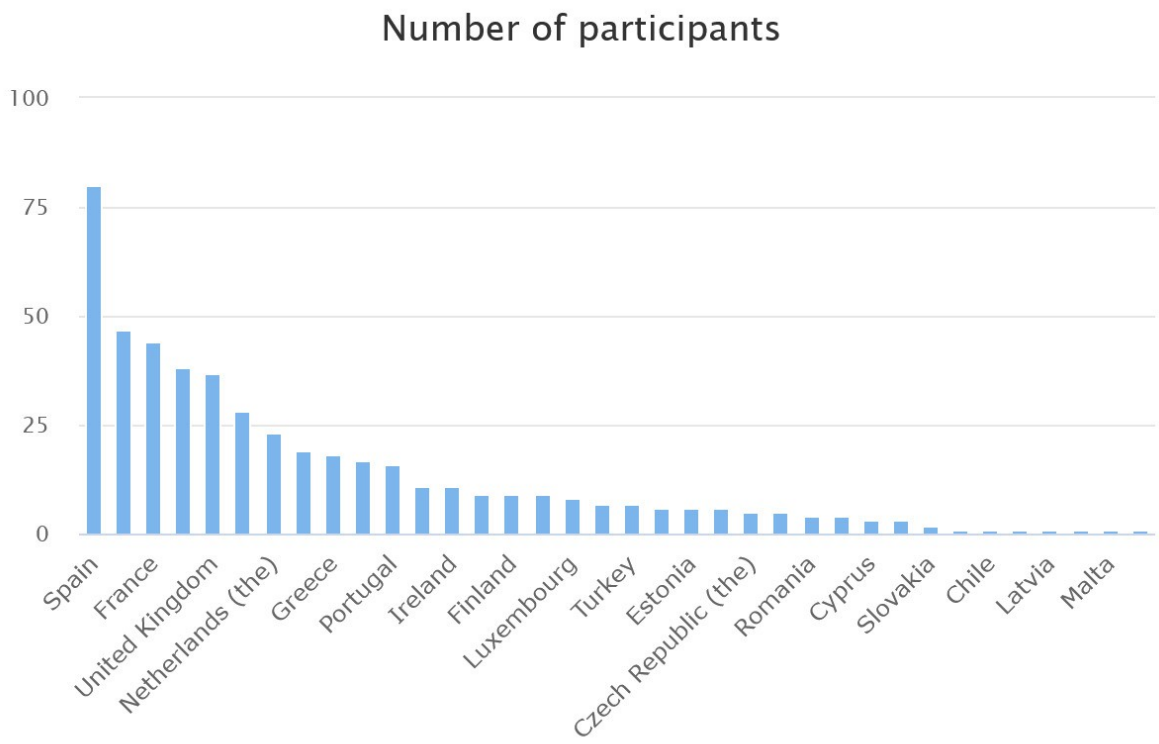
[207] Mahieu B., Brown N., Jan Fikkers D., Rosemberg C., Roman L., Sadeski F., Zegel S., *Interim evaluation of the COSME Programme – Final report*, Publications Office of the European Union, Luxembourg, 2017, p. 97. Consulted from https://ec.europa.eu/docsroom/documents/27383?locale=it

[208] The European Commission, https://ec.europa.eu/easme/en/news/innosup-1-providing-innovation-support-smes-develop-cross-sectoral-value-chains

[209] Data taken from the Horizon 2020 INNOSUP data hub, https://innosup.easme-web.eu/#

already large number of companies reached, if we consider only the SME's registered as adherents to the project, then the number increases further. The latter are estimated to be at least 6,492. Yet the figure is probably way higher since "only 37 of the 53 INNOSUP-1 clusters provided data on their SME members"[210].

Figure 14. Geographical distribution of the INNOSUP-1's participants based on country.



Source: Horizon 2020 INNOSUP data hub.

As regards the subjects directly beneficiaries of the initiative, the estimate is 1,662 SMEs spread out 36 nations. Although, even in this case, the figures seem to be much higher, because "further countries are possibly represented by SMEs receiving innovation support within an additional 149 SME-led consortia that also received innovation support"[211].

[210] Executive Agency For Small And Medium-Sized Enterprises (EASME), *Horizon 2020 – INNOSUP-1 Cluster facilitated projects for new industrial value chains*, Publications Office of the European Union, Luxembourg, 2019, p. 5. Consulted from https://op.europa.eu/en/publication-detail/-/publication/f3d69a67-9ece-11e9-9d01-01aa75ed71a1/language-en

[211] Ibid

Parallel to these excellent results, there is equally excellent funding. The loan disbursed to date amounts to EUR 129.95 million[212]. These funds are disbursed to varying degrees between countries, but, more importantly, all to varying degrees depending on the objectives. The data provided by the Horizon 2020 INNOSUP data hub tells us that clusters are by far the most funded topic (see *Figure 15*). Clusters are such an important goal that alone they attract 64.7% of the funds disbursed so far on a total of 12 topics.

A key strength lies in the regulations linked to the disbursement of funds. It is in fact made a constraint for the projects receiving the funds to "allocate at least 75% of their total budgets to support for innovation in SMEs"[213]. As a result, data updated to May 2019 indicate that a total of EUR 26.2 million went to SMEs in funding and services[214].

At the time of writing, ten projects are completed while thirteen are still in progress. The totality of the completed projects shows an adequate achievement of the specific objectives of the project[215].

[212] Data taken from the Horizon 2020 INNOSUP data hub, https://innosup.easme-web.eu/#

[213] Executive Agency For Small And Medium-Sized Enterprises (EASME), *Horizon 2020 – INNOSUP-1 Cluster facilitated projects for new industrial value chains*, Publications Office of the European Union, Luxembourg, 2019, p. 2. Consulted from https://op.europa.eu/en/publication-detail/-/publication/f3d69a67-9ece-11e9-9d01-01aa75ed71a1/language-en

[214] Ivi, p. 10.

[215] A report of each single completed project is given by *Horizon 2020 – INNOSUP-1 Cluster facilitated projects for new industrial value chains*.

Figure 15. Geographical distribution of the INNOSUP-1's funds based on topic.

Source: Horizon 2020 INNOSUP data hub.

A specific example of the effectiveness of INNOSUP can be provided by the KATANA project, operating in the agro-food sector, which started in July 2016 and concluded in December 2018. In less than three years and through a fund of EUR 4.6 million, the project has managed to involve eight European countries (Denmark, Germany, Greece, Spain, Italy, Netherlands, Serbia, United Kingdom) and to support 97 SMEs[216]. A total of EUR 3.9 million was invested for supporting the SMEs, corresponding to three-quarters of the funds KATANA[217]. Thanks to the financial aid through grants given to 10 consortia of SMEs for boosting innovation, "54 innovative cross-sectoral projects were

[216] The KATANA project, https://katanaproject.eu/

[217] Executive Agency For Small And Medium-Sized Enterprises (EASME), *Horizon 2020 – INNOSUP-1 Cluster facilitated projects for new industrial value chains*, Publications Office of the European Union, Luxembourg, 2019, p. 11. Consulted from https://op.europa.eu/en/publication-detail/-/publication/f3d69a67-9ece-11e9-9d01-01aa75ed71a1/language-en

developed”[218]. In conclusion, the KATANA experienced the direct involvement of more than 400 people belonging to the SMEs’ world, who participated to the various activities provided by the project.

[218] Executive Agency For Small And Medium-Sized Enterprises (EASME), *Horizon 2020 – INNOSUP-1 Cluster facilitated projects for new industrial value chains*, Publications Office of the European Union, Luxembourg, 2019, p. 11. Consulted from https://op.europa.eu/en/publication-detail/-/publication/f3d69a67-9ece-11e9-9d01-01aa75ed71a1/language-en

IV. REGIONAL IMPLEMENTATION OF CLUSTER POLICIES: CASE STUDIES

In this last chapter, two different regional case studies of cluster policies belonging to countries of the European Union context will be analyzed. In fact, once the theoretical knowledge relating to this object of study has been acquired, it is extremely important to deepen and compare this with practice and direct experience in the field.

The first cluster policy to be analyzed is that of the Basque Country, taken into consideration for its undoubted relevance: This is not only the first practical case of theory application of the father of modern cluster theory, Porter, but also one of the oldest cluster policies of its kind, globally.[219]

The second regional case is that of Veneto. It is a region with a high district vocation, which in terms of history and socio-economic characteristics is significantly opposed to the Basque case. It is an extremely relevant cluster system also due to the so-called "Made in Italy", a sought-after quality tag created over the last decades.

1. The Basque Country's case: the pioneer region

1.1 Region overview

Dating back to 1990, the case of the Spanish Basque Country is considered as a pioneer among the cluster policies, since it was one of the first regions in the world to develop and implement such a policy. But the Spanish example is the best-known cluster policy also thanks to another reason: its methodology. As already discussed in the first chapter,

[219] The case of the Basque cluster policy is a world reference and is studied at Harvard for its good results.

the Basque cluster has been developed sticking to Porter's theory. In fact, the region's government asked for consultancy by the Monitor Company, owned by Porter himself.
The Basque Country is a relatively small region located in the north of Spain, recognized as an autonomous community. The geographical position of the country – the proximity to France, other autonomous communities and the Bay of Biscay – has always been a stimulus for its economic development. The population in relation to the nation is relatively small: as of 2019, with a total of 2,188,017 inhabitants, it represents only less than 5% of the entire Spanish population[220]. Due to its autonomy, the Basque Country enjoys particular rights relating to political decisions and taxes. In fact, the regional government has the authority in some specific areas, including: "Treasury and Tax Collection, Industry and Economic Promotion, Transport and Public work, Research and Innovation, Agriculture and Tourism, Law and Order, Labour and Insurance"[221].

1.2 Economic profile

The region's economy has always been based on the industrial sector, since the dawn of the last century. It is this long manufacturing tradition that has constituted the real and main strength of the region. The evidence for this is the fact that in 2017 this sector has come to represent approximately a quarter of the region's GDP, or EUR 18,366 million[222]. This positive trend was inevitably impacted by the Great Recession which changed its values downwards.
The Basque Country's regional Gross Domestic Product (GDP) is estimated to be of EUR 72,170 million, as of 2018, and it has always had a growing trend since the early 2000s, with the sole exception of a deflection during the 2008 crisis[223].

[220] Worldometer, https://www.worldometers.info/world-population/spain-population/
[221] Konstantynova A., *Regional cluster policy and economic development: case study of the Basque Country and Upper Austria*, Ingolstadt, 2016, p. 106. Consulted from https://opus4.kobv.de/opus4-ku-eichstaett/frontdoor/index/index/year/2016/docId/326
[222] The European Commission, https://ec.europa.eu/growth/tools-databases/regional-innovation-monitor/base-profile/basque-country
[223] Regional Competitiveness Observatory, https://www.orkestra.deusto.es/competitiveness-observatory/en/ES21/indicator-detail/1

According to the studies conducted by Eurostat, the Basque Country is today one of the economically healthiest regions in Spain, as well as representing one of the main industrial centers of the whole country. Its industry is well developed, stable and particularly prosperous in the "automotive industry, aeronautics, energy, the environment, industrial design, machinery and engineering"[224]. However, the industrial sector is constantly growing and changing, mirroring a region with dynamic characteristics. Precisely for this reason, other sectors such as R&D and new technologies are also gradually gaining ground. The firms of the regions "manufacture a wide variety of capital goods, durable goods and other intermediate products"[225].
Despite its current reputation as a highly industrialized region, there was a significant economic contraction in the early 1990s. One of the tools chosen by the government of the Basque Country to overcome the negative moment and to give new impetus to competitiveness was the cluster policy.

1.3 Cluster Policy's timeline and evolution

As just mentioned, the cluster policy was introduced in the Basque region due to the consistent economic decline of the early nineties. It was in fact conceived with the specific purpose of reversing the economic trend of those years.
As already mentioned, the Basque region cluster policy finds in Porter its reference figure in the start-up phase. Porter and his company, the Monitor Company, supported the region in "developing the core pillars of the first Basque cluster competitiveness programme"[226] in 1991.
The development and implementation of cluster policies in the Spanish region can be divided into four main phases (see *Figure 16*).

[224] The European Commission, https://ec.europa.eu/growth/tools-databases/regional-innovation-monitor/base-profile/basque-country
[225] Ibid
[226] Konstantynova A., *Basque Country cluster policy: the road of 25 years*, Routledge, 2017, 4:1, p. 111. Consulted from https://www.researchgate.net/publication/317079695_Basque_Country_cluster_policy_the_road_of_25_years

Figure 16. Evolution phases of the cluster policy in the Basque region.

Source: Basque Country cluster policy: the road of 25 years.

The first phase was based on importing and spreading the cluster concept in the region. Moreover, the first allocations of funds by the Basque government began, in order to complete the first mapping of the clusters in the region, together with the formation of the first cluster groups.

In the second phase, an action of "improving and polishing review of the policy "[227] is undertaken. The change did not affect the cluster policy itself, but it affected the organizational structure of the associations in charge of cluster development. A more strategic vision is introduced, also in order to justify the funds requested from the government.

The third phase focuses on "giving new opportunities support of cluster policy"[228] by moving the attention to some specific activities. An emblematic example is the one around the creation of new clusters. In fact, particular attention is paid to the issue of the so-called "pre-clusters": an attempt is made to give a decisive boost to the growth of new industrial sectors. A lock-in effect of the already existing clusters is thus prevented, and an excellent level of dynamism within the region is maintained.

The last phase is about "re-management boost renewed the assessment of cluster policy"[229]. There is a shift in management and organization, from the national – the Basque country – to a more local level – the agencies. In line with the vision and the

[227] Konstantynova A., *Basque Country cluster policy: the road of 25 years*, Routledge, 2017, 4:1, p. 112. Consulted from https://www.researchgate.net/publication/317079695_Basque_Country_cluster_policy_the_road_of_25_years

[228] Ibid

[229] Ibid

European cluster support plan, the coordination of initiatives in the Basque region passes to regional business development bodies.

Throughout all these four phases, the Basque Cluster has been subject to a sensible evolution which affected the cluster policy as well. The latter has been particularly strategic in developing and strengthening the initial clusters, and supporting and fostering the new ones at the same time.

Another clearly noticeable event has been the slowing but relentless changing in the management structure, from a national set to a sectoral set. If at the beginning of the cluster's life the head of the initiatives was the government of the region, then the same role was taken by the SPRI, or Basque Business Development Agency. In fact, the SPRI was already created by the Spanish government as early as 1981, but became paramount only later. The agency gained the key role of coordinating the various cluster organizations involved in the region by, inter alia, "facilitating the communication flow and monitoring the cluster organisations' annual action plans and their strategic plans"[230].

1.4 Cluster policy's analysis

As of 2020, in the Basque Country some 22 clusters, equally split between the priority ones and the new ones, have been supported and developed by the Spanish cluster organizations. The currently recognized clusters are present in the following sectors: papermaking, maritime, machine tool, energy, electronics and ICT and aeronautics[231]. As mentioned before, the organizations – coordinated by the SPRI – have represented the head of the cluster policy body in the Basque region. Their key relevance and strength lie in being "considered a valuable instrument for the industrial policy due to

[230] European Observatory For Clusters And Industrial Change*, Smart Guide to cluster policy monitoring and evaluation*, Publication Office of the European Union, Luxembourg, 2020, p. 53. Consulted from https://ec.europa.eu/growth/content/smart-guide-cluster-policy-monitoring-and-evaluation-published_en

[231] Elola A., Valdaliso J.M., Franco S., López S.M., *Public policies and cluster life cycles: insights from the Basque Country experience*, Routledge, European Planning Studies, 25:3, pp. 539-556, 2017. Consulted from https://www.tandfonline.com/doi/abs/10.1080/09654313.2016.1248375

its capability to generate added-value for the region by aligning their actions with the strategic policies"[232].

According to a series of regional studies that analyzed the economic growth indices of the Basque Country, it emerged that one of the most determining forces of the cluster is linked to having abandoned path dependency. To have facilitated this line of action was certainly the "persistent leadership of the initial clusters and a rising importance of pre-clusters"[233]. The dynamism of the Basque cluster has stimulated a continuous transformation of it in a consistent evolutionary process, flanked by an equally continuous transformation of the management processes. It deserves to be remarked the constant creation of knowledge that has characterized the cluster, with a management of the cluster policy able to learn and to know how to adapt according to the changes of the economic environment.

> The Basque Country cluster policy demonstrated a mix of persistence and agility: persistence provided the necessary pressure to avoid lock-ins and address the cluster life cycle-specific needs. Agility ensured staying embedded and tailored into the local context, such as by identifying and supporting the entry of 'newcomers', such as the pre-cluster associations.[234]

Cluster theory has outlined innovation as a cornerstone for cluster development. Indeed, in the case of the Basque cluster, the practice just confirms the theory discussed in the previous chapters, which identifies innovation as an affective focus for cluster initiatives. Several studies carried out around the Basque cluster have attributed to innovation the role of overriding factor in cluster development: it is thanks to "the industrial and general competitiveness programme based on clusters and innovation" that the Basque region "has improved its economic and industrial strengths in the last

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[232] European Observatory For Clusters And Industrial Change*, Smart Guide to cluster policy monitoring and evaluation*, Publication Office of the European Union, Luxembourg, 2020, p. 53. Consulted from https://ec.europa.eu/growth/content/smart-guide-cluster-policy-monitoring-and-evaluation-published_en

[233] Konstantynova A., *Basque Country cluster policy: the road of 25 years*, Routledge, 2017, 4:1, p. 113. Consulted from https://www.researchgate.net/publication/317079695_Basque_Country_cluster_policy_the_road_of_25_years

[234] Ivi, p. 114.

20 years”[235]. Many initiatives have been undertaken in support of the R&D sectors, with the aim of strengthening them – in the first phase of the cluster's life – and renewing them – in recent years. A tangible clue to what has just been said is provided by the studies of the European Union itself, according to which R&D expenditure in relation to GDP in the Basque region is above the national average[236]. In 2017, these values for the Basque Country and Spain were respectively 1.94% and 1.21% of the GDP.

The peculiarities of the Basque cluster policy must also be identified in the four phases set up for the natural cycle of implementation of the policy. The discussion phase of the cluster policy by the players, aimed at initiating the implementation process, is undeniably based on communication. There is in fact a direct and constant line between the institutional bodies in charge and the business sector. During the second phase, the analysis, “targeted studies led to the exploration of market and business trends”[237]. In this way the process of identifying clusters present on the territory is made easier, for both those already existing and those new. The implementation phase of the cluster policy, instead, took place on two parallel tracks: on the one hand, an action to support collaborative projects and on the other, the creation of associations. The advantages of these tools are their high responsiveness and flexibility, as they can “be adjusted in time and, therefore, (they) better respond to changing territorial needs”[238]. Lastly, in the last phase of review of the cluster policy and its possible improvement, the Basque cluster used a mix of different tools. However, all of them moved in a coordinated manner towards objectives capable of “ensuring learning, and modification of routines and institutional settings”[239].

In conclusion, it should be noted that the institutional support to the Basque cluster has been chameleonic in adapting to the impending mutations of the Spanish economic system, undertaking new and different initiatives and bearing the resulting risks. The

[235] Faíña J.A., López-Rodríguez J., Montes-Solla P., *Case study - Basque Country*, Work Package 4 "Structural change and Globalisation", 2010. Consulted from https://ec.europa.eu/

[236] The European Commission, https://ec.europa.eu/growth/tools-databases/regional-innovation-monitor/base-profile/basque-country

[237] Konstantynova A., *Basque Country cluster policy: the road of 25 years*, Routledge, 2017, 4:1, p. 114. Consulted from https://www.researchgate.net/publication/317079695_Basque_Country_cluster_policy_the_road_of_25_years

[238] Ibid

[239] Ibid

political initiatives undertaken over the years, while changing, can however be summarized on the basis of three main features: ingrained in the territorial context, prone to risk and open to change.

1.5 Results and conclusions

Taken together, the results brought about by the efforts in developing the Basque cluster are undoubtedly positive. The number of cluster organizations supporting the initiatives has increased significantly, going from only two existing to eleven in the period from 1992 to 2014.

From an economic point of view, however, the steps forward made by the region since the beginning of the cluster policy are nothing short of extraordinary. In fact, if the value of GDP per capita in the year 1990 is taken into consideration, it can be seen how the Basque region ranks seventh in the country. However, in the sixteen years from 1995 to 2011, the highest growth rate among the Spanish regions is recorded, with a rate of 43%. To confirm this thesis are the same neighboring countries of the Basque region. If at the beginning of the reference period all of them performed better, the GDP per capita in 2011 stands at levels quite similar to the Basque one. This contrast – between the beginning of cluster policies and more than twenty years later – highlights the excellent economic impact triggered by this type of industrial policy[240].

In identifying and quantifying the economic impact that cluster policies have produced, it is useful to compare the results concerning innovation with those of Spain and, more generally, of the European Union. In this sense, the most recent statistics are provided by the Regional Innovation Scoreboard 2019 (RIS, 2020): "the Regional Innovation Index (RII) in 2019 was 0.388 (normalised score), 121.6 relative to Spain (100) and 79.8 relative to the EU (EU average set equal to 100)"[241]. The performance of the Basque Country in

[240] Data on GDP is taken from Konstantynova A., *Regional cluster policy and economic development: case study of the Basque Country and Upper Austria*, Ingolstadt, 2016. Consulted from https://opus4.kobv.de/opus4-ku-eichstaett/frontdoor/index/index/year/2016/docId/326

[241] The European Commission, https://ec.europa.eu/growth/tools-databases/regional-innovation-monitor/base-profile/basque-country.

the field of innovation is therefore highly positive compared to the Spanish average, and in any case competitive at European level.

Excellent results, especially when compared with the rest of the nation, are found in various indicators. For example, in terms of competitiveness (RCI index) [242] and efficiency[243], values above the national average are highlighted – with the sole exception of Madrid – and in line with the first-tier European regions.

Therefore, in summary, it is possible to state that the level of economic development achieved by the Basque Country – and supported by various indicators – has been extremely effective, bringing the region to levels on average higher than the rest of the country and in line with the most competitive regions of the European Union. These results can be attributed to several factors. However, the use of cluster policies certainly played a predominant role.

In conclusion, the case of the Basque cluster probably returns a series of key indications useful for the implementation of a cluster policy: the support provided by the competent bodies – whether private or public – must be constant, capable of evolving and adapting and with a focus also on embryonic "pre-clusters".

2. The Veneto's region case

2.1 Region overview and economic profile

> Veneto is a striking example of what in the sixties was called "Italian economic miracle". Until the mid-fifties Veneto was a land of peasants, poverty and migration, plagued by constant floods, while later on it became one of the leading Italian industrial regional economies.[244]

[242] The European Commission, ec.europa.eu/regional_policy/sources/docgener/studies/pdf/6th_report/rci_2013_report_final.pdf

[243] Based on RCI 2013 index the efficiency groups is composed of indicators referring to: market size, labour market efficiency, high education, training & lifelong learning.

[244] The European Commission, https://ec.europa.eu/growth/tools-databases/regional-innovation-monitor/base-profile/veneto

Located in the north-east of Italy, Veneto covers an area equal to about 6% of the national territory and is recognized for its consistent morphological variety. In fact, within the region alone, four different geographical areas can be identified: the northern alpine zone, the hill zone, the lower plain and the coastal territory[245].

As of 2020, with its 4.9 million inhabitants, Veneto ranks fifth among the most populous regions of the nation[246]. The region is well known globally for its capital city Venice, one of the most attractive tourist destinations in the world, and for its wine and art. However, Veneto is much more than this: behind the most visited region of Italy there is in fact an industrial and economic structure that has achieved extraordinary and first-rate results at both national and European level. A first demonstration of this is provided by regional GDP which, with an as of 2018 value of EUR 163.303 million, contributes 9.1% to the total national wealth - in third place after Lombardy and Lazio[247].

At the entrepreneurial level, however, the data updated to 2020 show that there are 427,517 companies in the area: once again this is one of the highest numbers in the nation[248]. Despite a significant decline, due to the ongoing economic crisis, the Veneto entrepreneurial fabric represents 8.1% of the national one[249]. Regarding its nature, the Veneto entrepreneurial fabric is made up for the vast majority of SMEs. It is precisely this characteristic that makes the region

> economically dynamic and interconnected, in which the district vocation of manufacturing type assumes an important role in the main production areas. In fact, the "Made in Veneto" represents a recognized excellence also at international level.[250]

[245] Veneto inside, https://www.venetoinside.com/discover-veneto/geography/
[246] Eurostat, https://ec.europa.eu/eurostat/cache/digpub/regions/
[247] The European Commission, https://ec.europa.eu/growth/tools-databases/regional-innovation-monitor/base-profile/veneto
[248] Sistema Statistico Regionale, http://statistica.regione.veneto.it/banche_dati_economia_imprese.jsp
[249] Ibid
[250] Regione Del Veneto - Assessorato all'Economia e Sviluppo, Ricerca e Innovazione - Dipartimento Sviluppo Economico, Sezione Ricerca e Innovazione, *Smart specialisation strategy della regione del Veneto*, 2016 p. 8. Consulted from https://www.venetoclusters.it/content/ris-3-veneto

The distribution of companies between sectors is divided between 12% in industry, 14% in construction and 56% in the service sector[251]. In addition to the above, agriculture is also a leading sector for the region. This sector is characterized by a high specialization and mechanization that guarantee the Venetian companies an excellent competitiveness.

Particular attention deserves the tourism sector, which is counted as one of the major sources of GDP. Veneto is the region with the highest influx of foreign tourists on an annual basis, with a share of 16.1% of the overall presences in Italian accommodation establishments [252]. The Venetian tourist accommodation system has evolved and strengthened over the years, especially in its promotion, reaching an annual average of 20 million arrivals[253].

However, Veneto is best known also thanks to its export to foreign countries. Exportation is the real strength of the region, which ranks second in the national ranking of exporting regions, with a share of foreign sales of 13.5%, second only to Lombardy[254]. An evidence of the extreme importance of the sector is the fact that despite the constant and persistent economic crisis that has hit the region over the last decade, exports have marked a growing trend. It is therefore a counter-trend value that certifies its benefits in terms of driving the Venetian economy. An example above all is given by the agricultural industry. In 2018 there was an increase in exports in this sector, compared to 2013 equal to 37%[255]. This data is in line with the fact that that Veneto is the first region in Italy for exports in the agri-food sector.

[251] The European Commission, https://ec.europa.eu/growth/tools-databases/regional-innovation-monitor/base-profile/veneto

[252] Conferenza delle regioni e delle province autonome, http://www.regioni.it/newsletter/n-3733/del-28-11-2019/istat-dati-sul-turismo-nel-2018-20516/

[253] Sistema Statistico Regionale, http://statistica.regione.veneto.it/banche_dati_economia_turismo.jsp

[254] Data taken from Regione Del Veneto - Assessorato all'Economia e Sviluppo, Ricerca e Innovazione - Dipartimento Sviluppo Economico, Sezione Ricerca e Innovazione, *Smart specialisation strategy della regione del Veneto*, 2016 p. 9. Consulted from https://www.venetoclusters.it/content/ris-3-veneto

[255] Data taken from The European Commission, https://ec.europa.eu/growth/tools-databases/regional-innovation-monitor/base-profile/veneto

2.2 Historical evolution of Venetian clusters

The industrial sector of Veneto is made up of local clusters, the so-called "distretti industriali". The peculiarity of this entrepreneurial fabric is that it is formed by the vast majority of SMEs.

The Veneto district system has undergone an enormous transformation over the decades and, to fully understand it, a short digression into history is necessary.

Taking as reference the historical period that goes from the second post-war period up to the 1970s, we are in the presence of a Veneto industrial system based largely on local businesses and markets. In this context, the first SMEs strongly rooted in the territory are created, due to various factors - including raw materials.

The Venetian clusters were thus created, which found their strength in the presence of a community of entrepreneurs "typically endowed with great initiative, entrepreneurial sense and an emulative spirit"[256]. However, the way the Veneto clusters were formed is also a source of weakness. The large number of small businesses, in fact, originated through a process of emulation, to the detriment of differentiation: employees of already existing companies broke away and set up on their own using the knowledge previously acquired. In this way, a high volume of companies specialized in the same products has been created, strong in prosperous economic times, but with obvious negative effects in periods of contraction in demand.

The success of the Venetian clusters, however, has prospered along with an economic system limited to a regional and national horizon. With the advent of the European single market and globalization, the cluster system had to face the worst crisis since its birth. The SMES of Veneto had to face the harsh reality of a competition that from internal and efficient has become global and uneven, to the clear advantage of the large multinationals.

During the 1990s and 2000s, globalization began to show its effects on the Venetian clusters. The first effect was certainly that of relocation. The opening of international markets has induced significant competition on costs which has forced the leading

[256] Esposito M., *Distretti e Reti d'Imprese*, Eurosportello del Veneto, p. 4. Consulted from http://eurosportelloveneto.it/EicHome.asp

Venetian companies - the largest ones - to move phases or entire production cycles to more convenient locations. Smaller district companies, on the other hand, have had to choose between "developing sustainable niche strategies in a global market"[257] or succumbing and closing. In other words, it was found that in Veneto "the value network of leading companies [...] has grown and in its configuration the district fraction has been greatly reduced to the advantage of the extra-district one"[258].

Furthermore, globalization has had a substantial negative effect – together with other factors including a lack of generational change – in the very population of the industrial clusters. In fact, according to a study conducted on three of the main industrial clusters in Veneto[259] – jewelery in Vicenza, eyewear in Belluno and footwear on the Brenta Riviera – starting from the first decade of 2000, there was a significant demographic contraction in the number of cluster enterprises present in the manufacturing sector. Furthermore, this study tends to underline what has been stated above, namely the ability of the more structured companies to better withstand the new global competitive challenges to the detriment of SMEs. The result is an increase in the incidence of joint-stock companies on the total number of cluster companies, especially in those districts most affected by demographic declines.

However, it is the same study that also indicates positive signs in the Veneto district context, in parallel with the demographic decline. On the one hand, there has been a strong increase in KIBS in recent years, i.e. services and business operations heavily reliant on professional knowledge. So much so that "as in all the territories analyzed, their number now exceeds that of companies specialized in cluster production"[260].

On the other hand, the study illustrates how there has been a general increase in the turnover of companies belonging to the Venetian clusters. Two cases, above all, are quite emblematic. Instead of marking a contraction due to the economic crisis, the footwear district of the Riviera del Brenta recorded a higher increase in turnover in 2010,

[257] Grandinetti R., De Marchi V., *Crisi e trasformazione dei distretti industriali veneti – Gioielli, occhiali e calzature a confronto*, Treviso, Unioncamere Veneto, 2012, p. 11. Consulted from http://www.ven.camcom.it/

[258] Ibid

[259] All the following data are taken from this research: GRANDINETTI R., DE MARCHI V., *Crisi e trasformazione dei distretti industriali veneti – Gioielli, occhiali e calzature a confronto*, Treviso, Unioncamere Veneto, 2012. Consulted from http://www.ven.camcom.it/

[260] Ivi, p. 15.

if compared with the pre-crisis values of 2006, with a positive delta of 9.6%. Even more significant is the case of the Belluno eyewear district. Despite being the district most affected by the demographic decline – even losing about half of its businesses in the period between 2002 and 2011 –, the highest increase in turnover among the various districts is recorded, with an increasing value by 18.6% between 2006 and 2010.

2.3 Current Geographic framework

The current mapping of the Venetian clusters was studied and established in 2014. On 15th September, a meeting took place between the trade associations and the trade unions, with the aim of acquiring the necessary data and knowledge.

It was decided to opt for a recognition system for clusters based on two categories: A and B. Category A identifies "the areas of manufacturing specialization that meet all the parameters defined to be qualified as a "clusters"" [261], among which we find the following districts: Riviera del Brenta footwear, Tanning of Arzignano, Mechanics of Alto Vicentino, Furniture of Livenza, Eyewear Bellunese, Jewellery Vicentino, Technical footwear and sporting goods (Sportsystem) of Asolo and Montebelluna[262]. The group B, instead, covers all areas of manufacturing specialisation which, in order to be categorized as "clusters" "manifest some difficulty in satisfying all parameters or the historical requirement is partially met in view of a limited bibliography in support"[263]. The following Venetian clusters are in the second category: Artistic ceramics of Nove and Bassano del Grappa, Household appliances and stainless steel from Conegliano and Treviso, Air conditioning and refrigeration from Padua, Carousel of Polesine, Fish of Polesine and of the Lower Venetian, Marble and stone of Veronese, Classic furniture

[261] Regione Del Veneto - Assessorato all'Economia e Sviluppo, Ricerca e Innovazione - Dipartimento Sviluppo Economico, Sezione Ricerca e Innovazione, *Smart specialisation strategy della regione del Veneto*, 2016 p. 86. Consulted from https://www.venetoclusters.it/content/ris-3-veneto

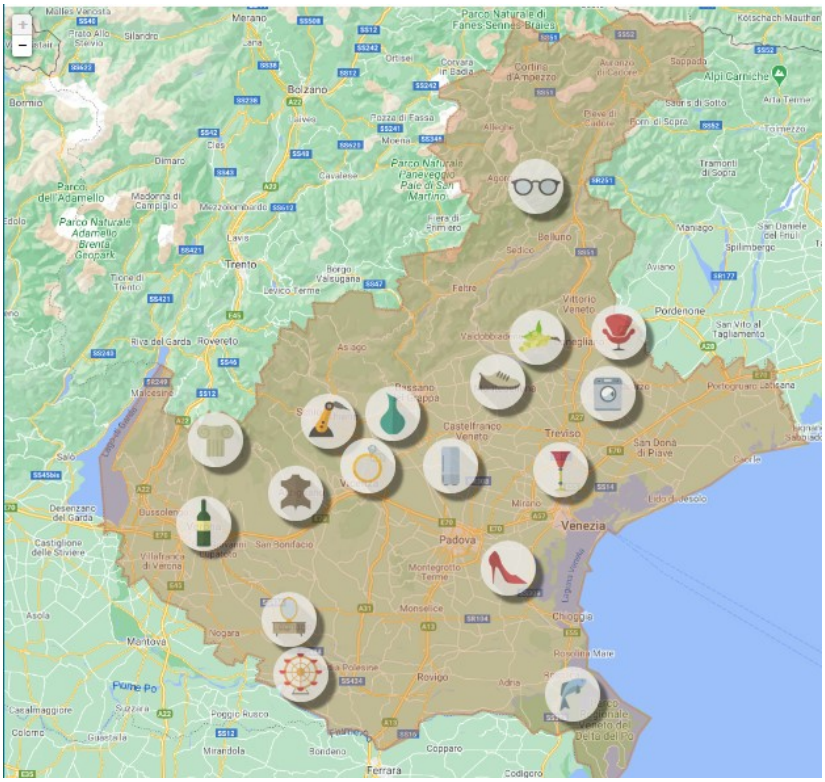
[262] Ibid

[263] Ibid

from the Lower Veronese area, Prosecco of Conegliano and Valdobbiadene, Murano artistic glass and Venetian glass[264].

Subsequently, the wine cluster of Valpolicella and Soave was also recognized, thus reaching 17 clusters distributed in the region (see *figure 17*). Finally, the clusters can be summarized in four macro categories, pertaining to the field of specialization: Smart Agrifood, Smart Manufacturing, Sustainable living and Creative industries.

Figure 17. Geographical distribution of Venetian clusters.



Source: venetoclusters website.

[264] Regione Del Veneto - Assessorato all'Economia e Sviluppo, Ricerca e Innovazione - Dipartimento Sviluppo Economico, Sezione Ricerca e Innovazione, *Smart specialisation strategy della regione del Veneto*, 2016 p. 86. Consulted from https://www.venetoclusters.it/content/ris-3-veneto

2.4 Regional cluster policy in Veneto and its regulation

Veneto can be considered a region where the process of applying industrial policies is complex, due to its socio-administrative structure, "characterized by strong localisms and a weak regionality"[265].

The Venetian cluster policy implemented at the regional level is relatively recent and, yet, has already encountered the first difficulties. The region introduces the first real regulation on clusters with the L.r. 8/2003. The general objective is to favor the development of the Venetian industrial clusters. Inter alia, cluster representatives are introduced – appointed by the cluster companies to propose development agreements for the region –, the methods of disbursement and distribution of outright grants are defined, and the "actuating companies" and the "sole underwriters" are distinguished[266]. The law had the virtue of capturing the true essence of the cluster, underlining the decisive factor of spontaneity in the aggregation of companies.

Nevertheless, the law has aroused overall negative opinions, mainly due to its excessively dispersed application logic[267]. The dissatisfaction generated by the poor results achieved, however, was valuable for the improvement of subsequent cluster policies. Precisely, with Regional Law No 13 of 30 May 2014, the Venetian region launches a new industrial policy that

> arises from dissatisfaction with the results achieved in the first experience and adopts consistently a selective logic, thinking of projects of a certain extent capable to increase the evolutionary chances of the "real" industrial districts present in regional territory (whose number is much lower than that which has been codified under the under the previous legislation.[268]

[265] CRIAPI, Università di Padova e Venezia, *Innovazione, distretti industriali e filiere globali: il caso Veneto*, quaderno Criapi, 2007, p. 18. Consulted from https://www.dse.univr.it/?lang=en
[266] Esposito M., *Distretti e Reti d'Imprese*, Eurosportello del Veneto, pp. 6-7. Consulted from http://eurosportelloveneto.it/EicHome.asp
[267] Grandinetti R., De Marchi V., *Crisi e trasformazione dei distretti industriali veneti – Gioielli, occhiali e calzature a confronto*, Treviso, Unioncamere Veneto, 2012, p. 11. Consulted from http://www.ven.camcom.it/
[268] Ibid

In other words, the disbursement of funds in a uniform manner of the clusters is stopped. On the contrary, flexible productive and industrial development policies are developed, which take into account the global strategic context.

The new regulation achieved the objective of identifying "in an organic way the main reference targets of regional interventions, such as real expressions of specific productive areas"[269]. Moreover, thanks to this new regulation, the guidelines for the definition of an industrial cluster are clearly defined, used in the identification of the 17 Venetian clusters set out in the previous paragraph.

Thanks to this cluster policy, excellent results have been obtained in terms of cooperation between district companies. In fact, there are numerous cases of joint actions initiated for the "development of common projects on research, development and technology transfer"[270]. Perhaps one of the most emblematic examples is that relating to cooperation between Venetian enterprises in the textile industry with companies belonging to the goldsmith sector. This collaboration led to a restoration and reorganization of the entire production-line, through the combination of old tradition and new innovative production methods. The result is a new vitality to this market, guaranteed by the provision of high-quality materials produced under the "Made in Italy" tag. This can be considered as a successful example of how "smart specialisation strategies can promote, through clusters, the efficient and effective use of public investment in R&I whilst delivering breakthrough products"[271].

[269] Regione Del Veneto - Assessorato all'Economia e Sviluppo, Ricerca e Innovazione - Dipartimento Sviluppo Economico, Sezione Ricerca e Innovazione, *Smart specialisation strategy della regione del Veneto*, 2016 p. 126. Consulted from https://www.venetoclusters.it/content/ris-3-veneto

[270] Izsak K., Meier Zu Köcker G., Ketels C., Lämmer-Gamp T., *Smart guide to cluster policy*, Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs (European Commission), Belgium, 2016, p. 47. Consulted from https://s3platform.jrc.ec.europa.eu/-/smart-guide-to-cluster-policy?inheritRedirect=true

[271] Ibid

2.5 The S3 and other main projects

The network and cooperation system between companies and other entities just mentioned was developed in parallel with another important project: the smart specialization strategy (s3). The latter is considered as "the most important document that defines the regional innovation trajectories"[272].

The aim of this plan is to develop a new mode of action in support of innovation, which is based on flexibility and dynamism. Furthermore, Veneto seeks to unify its innovation policies, in order to have a common framework and to avoid the fragmentation already experienced in the past years. By examining the document, it is clear how the regional cluster policies go in the precise direction of "enhancing, qualifying and making the regional innovation system more effective" [273]. The intention is to pursue the achievement of these objectives through an activity of promoting interactions both between companies and between the knowledge that they generate, "increasing research and innovation in businesses and increasing the innovative production through coordination of enterprises and innovative regional clusters"[274].

A prerequisite for the development of the policies defined in the smart specialization strategy was to identify four macro-areas of intervention. It is a question of identifying those areas of regional specialization, which are "the result of the expression of the productive fabric, of scientific and technological excellence (KETs), of the innovative potential and of the outlet in local and global markets"[275]. The identified areas are:

- Smart Agrifood
- Smart Manufacturing
- Creative industries
- Sustainable Living.

[272] The European Commission, https://ec.europa.eu/growth/tools-databases/regional-innovation-monitor/base-profile/veneto

[273] The European Commission, https://ec.europa.eu/growth/tools-databases/regional-innovation-monitor/base-profile/veneto

[274] Ibid

[275] Veneto Clusters, https://www.venetoclusters.it/content/ris-3-veneto

The activity of the region in support of clusters is manifested in further projects, including for example the candidacy for 4 National Technological Clusters, the goal of supporting 550 enterprises for the innovation of industrial clusters by 2023, and above all the Plan of Regional Programming – whose pillars are research and innovation, digital agenda and competitiveness of production systems[276].

Furthermore, the purely regional cluster policy acts in parallel, but in harmony of intentions and ideas, with the projects organized by the European Union. The European projects implemented at the regional level focus on support for small and medium-sized enterprises, and make use of international collaboration with bodies and institutions belonging to other European countries. In total, the funds allocated for the implementation of the initiatives amount to EUR 769.783,00[277].

At the moment the Venetian region is involved in five territorial cooperation projects, created and funded by the European Commission through the Interreg programmes. These are:

- S3-4Alp Clusters (Interreg Alpine Space);
- Smart Space (Interreg Alpine Space);
- MONITORIS 3 (Interreg Europe);
- Co-Create (Interreg Mediterranean - MED);
- THINGS+ (Interreg Central Europe)[278].

Even in this case, as well as in the case of regional industrial policies, special attention is paid to initiatives as a whole. In fact, the objectives of these projects have been elaborated intentionally in a coherent and harmonious way, through a strategic framework in line with the regional strategy of development of the territory.

[276] Regione Del Veneto - Assessorato all'Economia e Sviluppo, Ricerca e Innovazione - Dipartimento Sviluppo Economico, Sezione Ricerca e Innovazione, *Smart specialisation strategy della regione del Veneto*, 2016. Consulted from https://www.venetoclusters.it/content/ris-3-veneto

[277] Veneto Clusters, https://www.venetoclusters.it/progetti-europei

[278] Ibid

2.6 Conclusions

As previously mentioned, the Veneto cluster system is a particularly emblematic case under various aspects, above all for its high cluster vocation with low-tech specialization and for its high propensity to export.

The attempt to provide a clear and pragmatic analysis of the cluster is certainly hampered by a shortage of data, especially in the field of cluster policies. The latter have rarely been evaluated over the years. This is certainly due to the "Italian political-administrative tradition", in which it is particularly widespread the idea that such an evaluation "is a function that belongs exclusively to political actors […] or to technical-bureaucrats, through a formal control of the procedure"[279].

Furthermore, the fact that the Venetian cluster policy is relatively young should not be overlooked[280].

That said, it is evident that the Venetian cluster system has already had to face a devastating crisis that has seen its structure change substantially. Despite these serious difficulties, and due to a scarce presence – at least in the early years – at the political level, the Venetian clusters have been able to adapt and evolve. In fact, over the years the immense value of the globally known and so-called "made in Veneto", a strong point of the Region's business system, has remained unchanged.

After a period of initial settlement and experimentation and not without failures – the L.r. 8/2003 above all – the regional initiative in support of clusters has moved in the right direction. Great strides have been made to promote greater cluster coordination, both through regional and European policies, thus overcoming the initial political fragmentation.

Clearly the region is still struggling to recover from the economic crisis, but clusters can be an important resource for regional economic growth, especially if used efficiently by the relevant bodies. Indeed, "the future of a cluster, as of an enterprise, is first of all in

[279] CRIAPI, Università di Padova e Venezia, *Innovazione, distretti industriali e filiere globali: il caso Veneto*, quaderno Criapi, 2007, p. 18. Consulted from https://www.dse.univr.it/?lang=en

[280] Especially if this case study is compared with the longest-lived Basque case.

the hands of entrepreneurs and other human resources operating in local businesses and institutions”[281].

[281] Grandinetti R., De Marchi V., *Crisi e trasformazione dei distretti industriali veneti – Gioielli, occhiali e calzature a confronto*, Treviso, Unioncamere Veneto, 2012, p. 18. Consulted from http://www.ven.camcom.it/

Conclusions

In the evolution of the theory of industrial aggregation, there has been an increasing attention and analysis of the political aspect.

As seen in the first chapter, the genesis of the concept of industrial aggregation is attributable to Marshall, the "father" of the industrial district. Marshall, more than a century ago, already had the incredible and avant-garde intuition – subsequently taken up and deepened by his pupils – of resorting to industrial aggregation in districts as an instrument of economic policy. The study of the Lancashire textile sector, which he conducted, led in fact to the idea of countering the decadence of the English industry at the turn of the nineteenth century precisely through the industrial districts, capable of disseminating knowledge and guaranteeing vitality.

The Marshallian theories are then enriched thanks to the contribution of Becattini and the Florentine school, which shift the attention from the single company to the interconnection between many companies and introduce the social component. At the basis of this current of thought is the evaluation of the excellent performance of the Italian micro-regions, attributed to the consequences of agglomeration and, more precisely, to the ability of district actors.

The centrality of institutions in the process of support and development of clusters becomes – for the first time – strongly supported by the father of the concept of cluster itself, Porter. According to the latter, the cluster policy should be oriented towards establishing and implementing the factor conditions and towards the detection and elimination of the efficiencies which hinder cluster's innovation and productivity.

With the emergence of regional innovation systems, cluster policies are now an integral part of the current macroeconomic context. Government action is in fact one of the three pillars of the triple helix approach.

The theoretical and statistical analysis conducted in this thesis has provided a great deal of evidence to support clusters as tools for policy makers. From a statistical point of view, in particular, it was highlighted how investing resources in this type of industrial

aggregates guarantees a positive return under various profiles, such as wages, employment and, more generally, economic growth and competitiveness.

However, the most interesting aspect of clusters is certainly linked to their ability to create and disseminate innovation. Through the interaction of different players, a very high number of new ideas is generated, in a sort of cross-pollination process. This is supported by the data, which show that the tendency to innovate is higher in cluster firms than in others.

At the theoretical level it was also possible to outline a series of "common rules" to be followed in the implementation of a cluster policy. It was highlighted that the ideal focus should not be on the companies themselves, but on the relationships between them. It is necessary that the programmes devised are orchestrated in a coordinated way, so as to avoid their overlap or, worse, conflict. Regular monitoring and evaluation of the cluster policy results should not be neglected once the funds have been disbursed. However, the most important indication to follow is certainly to pay extreme attention to the peculiarities and characteristics inherent in the geographical area of intervention of the policy. In particular, it was chosen to analyze an approach – among the many possible – based on three steps. The latter has suggested, in addition to what has been said above, to encourage the inclusion of cluster representatives in the decision-making process and to make wide use of data – especially in the definition of cluster mapping.

From the practical point of view, the study on the cluster policies implemented by the European Union has highlighted positive results – albeit with some defects – arising from the initiatives conducted in the last thirty years. All in all, the practice seems to largely confirm the theory. At the European level, in fact, and in line with the above, the cluster policy has focused a lot on the use of data, on the stimulus to the exchange and diffusion of innovation and on networking. Furthermore, it is the same surveys conducted on the players involved that highlight the excellent impacts of cluster policies. On the other hand, margins for improvement emerged as regards to the number of existing organizations and the support for the internationalization of cluster companies.

The analysis of the regional case studies has led to highlighting extraordinary economic results deriving from the cluster policy in the Basque country, while the results are less evident in the Venetian region. While the analysis of the Venetian cluster policy – in addition to being weaker and more fragmented – has suffered from a shortage of data

related to a number of factors, the Basque case, on the contrary, clearly demonstrates how cluster policies, used in a continuous, efficient and targeted manner, have the potential necessary to increase, or even revive, the economy of a region. Furthermore, the Basque case gives us one last piece in the puzzle of the rules to follow for a correct cluster policy: a cluster's management able to change and adapt in accordance with the economic context.

Finally, it is extremely important to underline the fact that although it has been possible to identify a generic set of common rules, the one-size-fits-all type of cluster policy does not exist. On the contrary, the correct implementation of the cluster policy must follow a single universal criterion, namely the choice of the alternative which better suits the peculiarities of the environment as a whole.

In conclusion, the current global macroeconomic environment is the result of decades of growing openness, and the same trend appears to be expected in the future. In this context, it is extremely rewarding for countries to resort to the using of cluster policies. Modern economies, by investing part of their "knowledge generation" resources in the industrial cluster sectors, have greater opportunities to reap benefits in terms of market growth, innovation and productivity, than by investing in "non clustered" industrial sectors.

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