XXV IASP World Conference 2008

The Role of the Science and Technology Park network in the innovation policy of Madrid Region

Parallel Session 2:
Policies that drive Innovation

Author:
Aurelio Garcia de Sola (infyde@infyde.eu)

Co-Authors:
Alicia Hinojosa, Jaime del Castillo

IMADE (Instituto Madrileño de Desarrollo, Regional Development Agency of Madrid Region Government)
José Abascal, 56; 28003 Madrid; Spain

The role of the Science and Technology Park network in the innovation policy of Madrid Region

Executive Summary

Madrid has experienced significantly higher growth than the average growth observed in surrounding regional economies, with also higher average productivity values.

In order to maintain this position at an international level, the Autonomous Community of Madrid faces numerous challenges posed by the new global economy, where knowledge and innovation are fundamental for competitiveness. In this context, collaboration, cooperation and the establishment of networks are determining elements for promoting innovation and competitiveness.

In this respect, the Parks and Clusters Network of the Autonomous Community of Madrid is proposed as an answer to this international trend, with the aim to coordinate the Parks and Clusters services within the business fabric of Madrid, and its connection with the most advanced regions in the world.

In this sense, with over 1,100 hectares, over 5,500 million euros of total investment and the creation of over 20,000 jobs, the Parks currently in development in Madrid aim to establish the Region as one of the most advanced, creative, and connected locations in the world.

Key Words: Madrid, Science and Technology Parks, clusters, international network

I. Introduction

The 21st century poses many challenges for current economies, with an increasingly intense need to promote knowledge-based competitiveness as the determining and differentiating element among regions.

This new international trend has led the economies to reconsider their position in an increasingly global environment, where the way to compete in international markets focuses on the capacity of each economy to generate and apply knowledge. This leads to a strategic reconsideration of the actions needed for growth, development and even survival in an international environment.

Therefore, following competitiveness between countries and regions, the fundamental deciding factor is currently their capacity to innovate. As highlighted by Schumpeter[1], Freeman and Soete[2], innovation is an important driving force for competitive success, and companies and even regions tend to distinguish themselves and to obtain competitive advantages through it.

In this sense, the Autonomous Community of Madrid[3] is not unaware of this process, also competing in this global environment, where there is only room for the most dynamic and competitive activities.

In the last 10 years, Madrid has undergone a significantly higher growth than that of the average observed in Spanish and European economies. Furthermore, its level of productivity lies among the highest in Spain, also making it the European region that has registered the greatest capacity for the creation of employment.

According to a report made in 2007 by PriceWaterHouseCoopers[4], the Autonomous Community of Madrid is the third most important metropolitan European region in terms of GDP, a position that, in the opinion of the present report, it will keep in the mid/long term. In fact, it is expected that only 3 European regions (London, Île de France and Madrid) will remain among the 30 metropolitan regions with the greatest GDP in the year 2020.

In spite of these positive figures from an exclusively European perspective, according to data from the aforementioned report, on a worldwide level the real expected growth rate of Madrid for the year 2020 would place it in 72nd position, with some Chinese regions with considerably higher values. Consequently, in terms of total production it is expected that the Autonomous Community of Madrid will move from its current world position, 23, to 25 by the year 2020.

Confronted with this situation, and in order to continue progressing instead of losing positions, actions to be carried out in Madrid must favour the appearance of a favourable environment, in the sense that companies could innovate and obtain the highest profits from their R&D+I efforts, maintaining these good results over time to guarantee sustainable growth. In fact, authors such as Romer[5] and Lucas[6] point out that for some time that the need to boost efforts in technological development is a determining factor in growth processes.

[1] Schumpeter, J.A. (1942). "Capitalism, Socialism and Democracy". McGraw-Hill. New York
[2] Freeman, C & Soete, L. (1997) "The Economics of Industrial Innovation". Pinter. London
[3] Comunidad de Madrid is the oficial name for Madrid Region
[4] PriceWaterHouseCoopers (2007) "UK Economic Outlook". March 2007
[5] Romer, P (1986) "Increasing returns and long-run growth". Journal Political Economy, vol. 94, nº5

The competitive environment of each region is, in fact, an element of great importance as it becomes increasingly complicated to reach an international level simply with the individual capacities of individual agents. It is true, as Freeman[7] writes, that knowledge can spring both from internal (indoor) and external (business environment) sources, with an ever- stronger concept of "external innovation" indicated by Chesbrough[8] where the organizations have to use their own knowledge, but also draw from what the environment can offer them to reap the greatest benefit.

Current specialization means knowledge sources can also be found scattered and largely fragmented, in such a way that organizations increasingly depend on each other. It is in this framework where collaboration and cooperation arise as necessary premises for development, without neglecting the competition which may continue to exist between them.

The case of Madrid reflects this trend, and from the regional Administration the perception exists that a new policy focused on the interrelation between agents can maintain the competitive position of regional companies in the future at an international level. In fact, managing to maintain a competitive environment is especially important in Madrid, whose innovative business fabric lies spread across the whole regional territory. Therefore, the relationships between the agents, but also their close geographical location, lead to improvements in competitiveness. Authors such as Becattini[9] or Audrestsch and Feldman[10] support this idea of how geographical proximity generates positive externalities and allows the development of higher added value activities (Glaeser et al.[11]).

For this reason, the Autonomous Community of Madrid has decided to increase, both in quantity and intensity, support for the development of Science and Technology Parks, while also a network has been created for the coordination of its activities and the generation of synergies that allow the Parks to offer a wide range of services to Madrid businesses.

But this initiative intends to go beyond this, including in its structure the recently constituted clusters that group together the emerging and consolidated sectors of greater potential for regional development. The cluster, as gatherings of economic activity, advantage-generators and positive externalities (Marshall[12], Porter[13], Krugman[14]) will allow, in this context, the favouring of company innovation and the learning process (Lundvall[15]).

Romer, P. (1990). "Endogenous technical change". Journal of Political Economy, nº 98
Romer, P (1994). "The origins of endogenous growth" Journal of Economic Perspectives, nº 8

[6] Lucas, R.E. (1988) "On the mechanics of development planning". Journal Monetary Economics, nº 22
Lucas, R.E. (2000) "Some Macroeconomics for the 21st series". Journal Economic Perspective, vol.14, 1

[7] Freeman, CH. (1994) "The Economics of Technical Change". Cambridge Journal of Economics, 18

[8] Chesbrough, H. (2003) "Open Innovation. The New Imperative for creating and profiting from technology". Harvard Business School Press

[9] Becattini, G (1987) "Mercato e Force Locali: Il Distretto Indutriale, Il Mulino". Bologna.

[10] Audrestsch y Feldman (1996). "R&D Spillovers and the Geography of Innovation". American Economiic Review, 86

[11] Glaeser, E., Kallal, H., Scheinkman, J., y Schleifer, A. (1992) "Growth in cities". Journal of Political Economy" 100

[12] Marshall, A. (1963) "Principios de Economía". Aguilar Madrid

[13] Porter, M (1990) "The Competitive Advantage of Nations". MacMillan. London

[14] Krugman, P (1992) "Geografía y Comercio". Antoni Bosch Editor. Barcelona

[15] Lundvall, B. (1992) "National Systems of Innovation: Towards a Theory of Innovation and Interactive Learning". Pinter Publishers, London

Therefore, the attractive part of the initiative is the grouping, in a single network, both of the clusters and of Science and Technology Parks, allowing the establishment of an even closer relationship between the companies and the support agents for R&D+I[16], and more importantly, the widening of the reach of services and the impact of the Science and Technology Parks to the most strategic business tissue for the economic future of the region.

In addition, the interrelations have focused not only on the intraregional context, but also on the fact that this network, and in particular the Science and Technology Parks in Madrid, will have the chance, through the initiative of an Advanced Regions Network, to maintain direct contact with other Parks and agents of the most developed and advanced economic areas in the world.

In short, this network represents an ambitious project that seeks to fully develop the Parks as entities supporting R&D+I, to make clusters the focuses for business activity of excellence, the establishment of links between both, and the collaboration of these with the most advanced regional centres in the world.

II. Economic context of Madrid: facing the future solidly

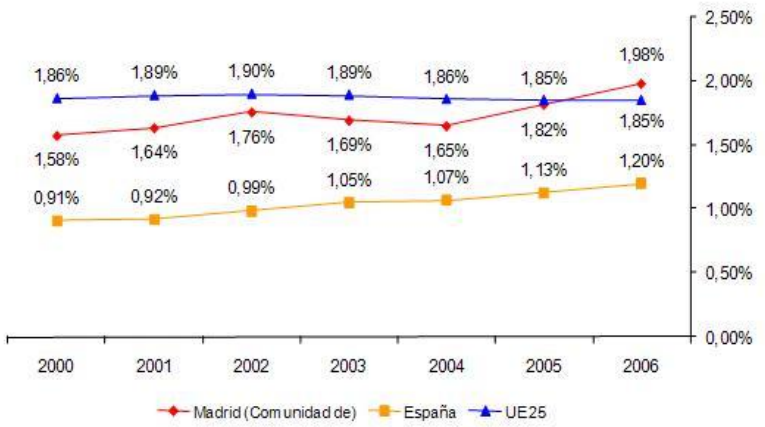
The Autonomous Community of Madrid presents a series of factors that historically have allowed it to experience high competitiveness and more attraction of economic activity than other locations. Among them we can highlight the high stock of productive capital (sectorial concentration and specialization, internationalization, innovation etc.), human capital (highly qualified workers and the availability of manpower) and the development of public capital (infrastructures, both basic and Technological and also knowledge-based).

This relative advantage has allowed the appearance of sectorial agglomerations of very important activity compared with the rest of the Spain. According to data from the Instituto Nacional de Estadística (INE) for the year 2006, the Autonomous Community of Madrid encompasses more than 13% of the Spanish population, has a weight in the national GDP of around 18%, and a per capita income of almost 30.000€. Madrid also has the position of one of the most dynamic regions, with an annual economic growth in the year 2001 of around 4%.

Together with its weight in terms of population and of wealth creation, the Madrid Region also concentrates 16.14% of total Spanish employment and 15.06% of all companies. In terms of R&D the concentration is greater still, with 28.91% of total State expenses and 25.4% of the staff, with approximately 30% of all Spanish documents published in Science and Technology.

[16] R&D+I= Research, Technological Development and Innovation

Figure 1, R&D expenses



Source: Eusrostat and INE

Madrid also has important R&D+I infrastructures, both public and private. Notable examples include its universities, with a total of fifteen (six public, the Universidad Nacional de Educación a Distancia, and eight private), the research centres and institutes (Centro Superior de Investigaciones Científicas and another 22 public research bodies) and company R&D departaments.

To these research infrastructures must be added a new initiative launched from the regional Administration, the Institutos Madrileños de Estudios Avanzados, IMDEA, institutes of recent creation that aim to be references of excellence at an international level in areas of interest for the business fabric of Madrid. These institutes of excellence will coordinate the research capacity of the universities of the region to provide a series of common services to the Parks and Clusters Network.

The 6 Science and Technology Parks in Madrid, though at an early stage of development in several cases, represent an important R&D+I promotion tool: Leganés tecnológico, Móstoles tecnológico, Parque Científico de Madrid, Parque Científico Tecnológico de Alcalá, Área Tecnologógico del Sur de Getafe and the Ciudad of Knowledge, the new project in Colmenar. All of these represent altogether over 1,160 hectares of surface area (11 million m^2) and a total investment (both public and private) of around 6 billions euros.

Table 1, Science and Technology Parks of the Network

NAME OF THE PARK	SURFACE (HECTARES)	PUBLIC INVESTMENT (M€)
TecnoAlcalá	37.06	29.6
Móstoles Tecnológico	67.05	36.2
Leganés Tecnológico	280.49	189.4
Technological Área del Sur	57.7	34.3
Parque Científico de Madrid	20	-
Ciudad de Conocimiento de Colmenar	700	700
Total Network of Parks	1,162.3	989.5

Source: Madrid Institute of Development IMADE (2007)

For its part, together with the Science and Technology Parks, the Network also encompasses nine clusters of recent creation that aim to coordinate, from the side of demand, the R&D+I and competitiveness needs the most important companies of the sectors at a regional level.

In this way, the Clusters will be responsible for articulating the collective needs of the business fabric within the economic sectors identified as priorities for the future of the region. Its role is connected with that of the activity of the Science and Technology Parks as, with a few exceptions, cluster management structures do not generally provide an answer to all company needs. In this sense, the Network is the instrument that allows the efficient coordination of all the agents, and which allows the advanced services and the Technology Transfer activities carried out from the Parks, reaches all the companies in Madrid and responds to the needs of the different sectors.

Table 2, Clusters of the Network

TYPE OF CLUSTER	NAME
Strategic	Madrid Plataforma Aeronáutica y del Espacio (Aerospace)
	Cluster de la Seguridad y Confianza (TIC)(ITC)
	Madrid Plataforma de la Biotecnología (Biotecnology)
	Madrid Plataforma Audiovisual (ITG related to Multimedia)
Emerging	Madrid Plataforma de la Salud y el Bienestar (Health and Welfare)
Natural	Madrid Centro Financiero Internacional (Finance)
	Madrid Plataforma Logística (Logistics)
Other	Madrid Plataforma de la Automoción (Automotive Industry)
	Madrid Plataforma de las Artes Gráficas (Print)

Source: Madrid Institute of Development IMADE (2007)

III. The Parks and Clusters Network of the Autonomous Community of Madrid: building future synergies

If the growth and economic dynamism of the Autonomous Community of Madrid in the Spanish framework has mainly been due to its central position as the capital of Spain, a good positioning of the region in an international context will only be possible if the right conditions are created for it. That is to say that its positioning in the global sphere as one of the most advanced centres at a worldwide level will necessarily happen as a result of the collective action of all the social and economic actors.

The Science and Technology Parks play a central role in this strategy. It has been demonstrated over time that these instruments are ideal when it comes to interconnecting the agents of innovation systems, the needs of companies with the potential contributions of research agents, and to spread the promotion of innovative culture to all society. In short, in the words of Felipe Romera[17], "*the Parks are perhaps the best available business support infrastructures for innovation*".

[17] Romera, F (2000). "Los Parques Ciéntíficos y Tecnológicos. Los Parques en España". Encuentros Empresariales. Cotec

But to achieve success in such an ambitious vision as that aimed for by the Autonomous Community of Madrid[18], it is necessary to go beyond simple support for the development of Science and Technology Park initiatives and extend its profits to the whole of the regional business environment.

The Parks and Clusters Network has been born with this in mind, with the mission to support the whole existing R&D+I supply at a regional level and place it at the service of all its agents, promote the transference of knowledge, a culture based on innovation for society as a whole, and raise the economy of Madrid to one of the most innovative positions in the world.

The goals of the Network are as follows:

- To create and boost the common image of a distinguished and modern brand for Madrid as a Society of Knowledge
- Creation of an articulated series of knowledge clusters and a space for collaboration between these and the Science and Technology Parks
- To increase the international presence of the companies and Research Centres of Madrid
- Attraction of knowledge-intensive resources
- Interrelate the Science and Technology Parks in Madrid with the Regional Science and Technology System, and turn them into a privileged interrelation between researchers and innovative companies
- To combine and unite resources to obtain synergies and externalities in the whole of society, and in particular among companies

The formation of Science and Technology Park networks represents a most advanced state in the articulation of agents of the regional innovation system, currently as a pioneer experience owing to the virtual inexistence of similar cases.

In the United States, Route 128 in Massachusetts or Silicon Valley are “natural networks”, which have emerged spontaneously from the very interaction between different regional agents.

It is also true that there exist networks which have emerged from the initiative of the agents themselves, such as the Silicon Joint Venture, a forum in which the main representatives of the administrative, university and business fields participate to tackle the challenges they face together. But in Madrid, Regional Administration plays an important role as the facilitator and coordinator of the whole process. The Administration also acts so that the scope and ambition of the project is greater than what is expected from a “spontaneous” initiative. The Parks and Clusters Network aims to be more than a simple forum or informal network to become a tool to coordinate relations among the different elements of the Regional System and position Madrid globally as one of the 10 most advanced regional economies in the world.

[18] The aim of the regional Administration is to situate Madrid among the 10 most important economies in the world

Therefore, unlike in North American cases, support from regional Administration is crucial, as an added guarantee for securing such ambitious objectives, acting as the manager of the whole process in stages or areas where private initiative, though potentially capable, does not initially carry out actions of the aforementioned magnitude.

As we can see, in the case of Madrid the networks are the ultimate way to materialize the concept of Etzkowitz's "triple helix[19]," where the efforts of Administration, the universities and research institutes, and companies are united to achieve synergies through cooperation and attain greater heights of competitiveness.

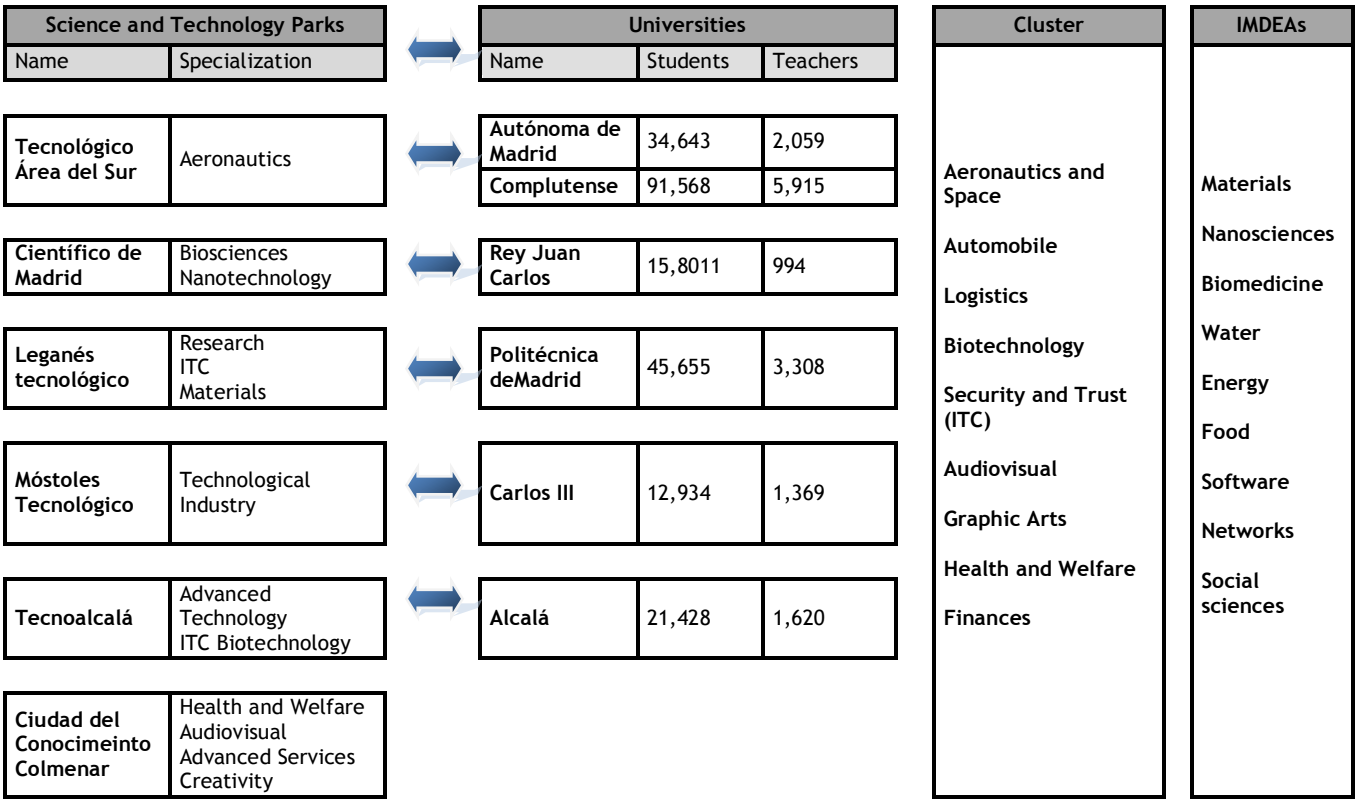
In the case of Madrid, the concept introduced by Etzkowitz is reflected in the design of the Network, integrating the 6 existing or planned Parks (Parque Científico de Madrid, Móstoles Tecnológico, Technological Área del Sur, Leganés Tecnológico, Tecnolalcalá and la Ciudad de Conocimiento de Colmenar), 6 universities with a direct link to those Parks and their IMDEA centres of excellence, the regional business fabric together with the 9 clusters and the Public Administration through the Madrid Institute of Development – IMADE.

As we can see in Figure 2, the Parks and the universities, the clusters and the new IMDEAs form an infrastructure whose collective action can generate in important synergies and positive externalities, not only looking towards an improvement in regional competitiveness, but also towards wealth creation, welfare and the total transformation of Madrid into a first-class knowledge-based society at a worldwide level.

The Parks in Madrid each have one particular sectorial specialization that can be seen supported by each university and from the IMDEA centres of excellence, each within a specific area. This specialization usually coincides with the existing one through the cluster. In short, the network will allow the Parks to channel the regional supply of knowledge towards the business fabric, whose demands and needs, coordinated sectorially, can be treated with greater efficiency.

[19] Etzkowitz, H & Loet Leydesdorf (1997) "Universities in the global economy: a triple hélix of university-industry-government realtions". London: Cassell Academic

Figure 2, Potential synergies among the network agents



Source: IMADE (2005) and own elaboration

But the Parks and Clusters Network is not only an initiative that aims to join the efforts of the regional agents in R&D+I material. Due to the fact that the economy of Madrid can only be conceived from a global perspective, in parallel with its development, contact is beginning with the most advanced regions at an international level for the creation of an "Advanced Regions Network."

The aim of this initiative is to transform Madrid into the Centre of an International Network of regional cooperation. The reason for this is that the only way to be competitive in a global economy is to keep a productive fabric open to globalization and willing to take advantage of the advantages that come from it. Most emerging knowledge technologies are produced in a global framework, and many of these flow within collaboration networks. For this reason the Administration of Madrid has considered it vital that companies in Madrid are inserted in international networks in which the most advanced Centres participate, and this is to improve its capacity for technological innovation.

Therefore, this International Network will allow the Parks and Clusters Network to be inserted at the global level, collaborate with notable international institutes and offer the companies and the region as a whole the advantages of that global level. Furthermore, the potential cooperation of the Parks Network with its equivalents in the Regions Network will help improve the image of the Autonomous Community of Madrid as an open place, attractive for the localization of technological companies, and make it possible to attract international Resources Centres (training, higher education and research). Among the regions that the International Network will make available to the Parks and Clusters Network and with which contact has been initiated are the following:

- **Helsinki.** This region is characterized by its specialization in ITC and mobility, with a large capacity for the generation of highly qualified human resources.

- **Stockholm**. There exists a very prominent specialization in ITC, audiovisual, biotechnology and finance activities.

- **Île de France**. This is the most important region in France, with centres of competitiveness in biotechnology, finance, aerospace, audiovisual communication and ITC.

- **Baveria.** This is the most advanced region in Germany, specialized in aeroespace, automobile, ITC, biotechnology and finance.

- **Silicon Valley**. The Silicon Valley region in California is known as the most innovative region in the world.

- **Hong Kong.** This is currently the most developed gateway and with a more western mentality than China, as well as a Technology-generating Centre that aspires to become Asia's "Technological market place."

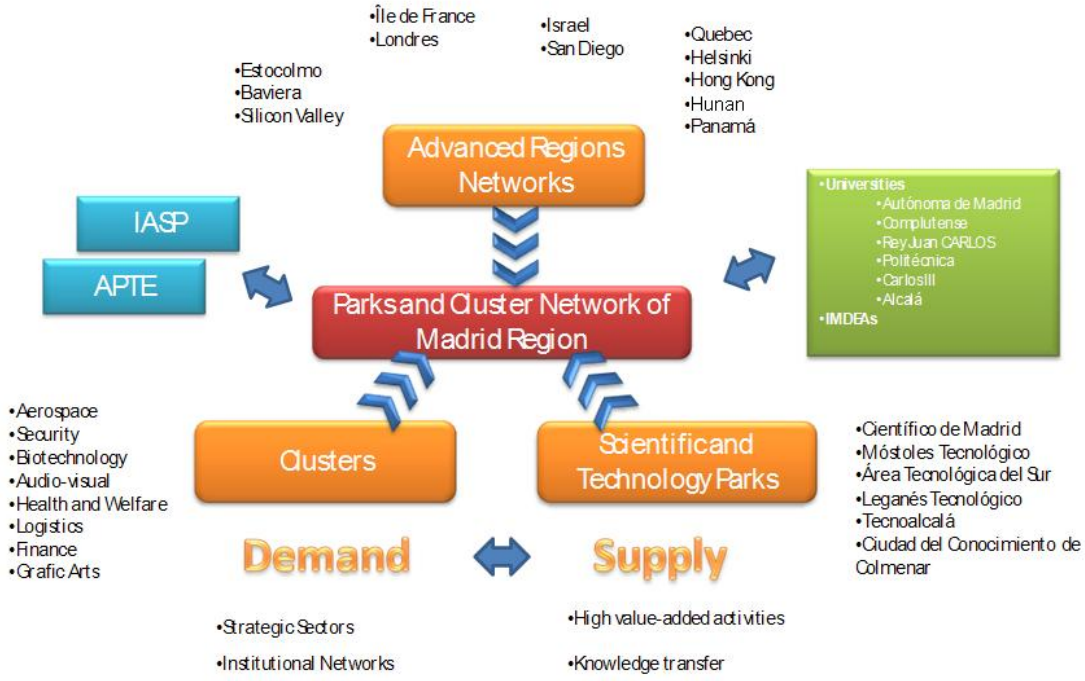
Table 3, Advanced Regions Data network

	Silicon Valley	Baveria	Stockholm	Helsinki	Île de France	Hong Kong	Madrid	Spain	UE15
Average per capita income (2005) €	37,042 €	32,041	45,407	34,670	42,167	15,949 (2004)	27,219	20,932	26,652
Employment in sectors of high Technology (% total 2006)	7,6% (1)	6,34	9,28	7,92	8,85	-	7,15	3,43	-
R&D expense (% GDP 2003)	3,74% (2001)	2,95	4,31	3,55	3,2	0,79 (2005)	1,98 (3)	1,2 (3)	1,95
EPO patents (per million inhab. 2003)	256 (2)	232,5	183	171,4	157,94	-	17,16	14,32	-

Source: Eurostat, INE, US Census Bureau, Technology Office

1. (no. high Technology companies over total 2001)
2. (Patents US per 1000 establishments)
3. INE Data 2006

Figure 3, The Parks and Clusters Network of the Autonomous Community of Madrid



Source: Own elaboration

IV. The Parks and Clusters Network in the future of the Autonomous Community of Madrid

In Madrid's bid to become, in the mid and long term, one of the most advanced regions in the world, the Science and Technology Parks will play a very important strategic role.

Although, currently, most Parks in Madrid are in an embryonic state or in their initial development, their potential is enormous. Using APTE methodology in its study "*Socioeconomic Impact of the Spanish Science and Technology Parks*"[20], when the Parks in Madrid work similarly to the APTE Parks, the Parks Network of the Autonomous Community of Madrid could represent a future weight in regional GDP greater than 2% and 1.7% in employment. If with the same projection the impact were calculated, comparing its working to that of the 7 most consolidated Spanish Parks indicated in the study, the impact would almost reach 4% and 3.5% of GDP and regional employment respectively.

[20] APTE (2006) "Impacto Socieconómico de los Parques Científicos y Tecnológicos Españoles"

Table 4 Potential Impacts of the Science and Technology Parks in Madrid

YEAR 2005	IMPACT GDP REGIONAL (M€)	REGIONAL GDP IMPACT (%)	REGIONAL EMPLOYMENT IMPACT	REGIONAL EMPLOYMENT IMPACT (%)
Average turnover/ surface ratio of the APTE (2005)	3,177	2,14	50.832	1,76
Turnover/ surface ratio 7 most consolidated parks of the APTE	5,986	3,74	95,776	3,3

Source: IMADE data and the methodology for socioeconomic impact analysis of the APTE (2007)

Within the development of the Parks, the Ciudad of Knowledge at Colmenar Viejo, with a total of 700 hectares (7 million metres squared) and a public investment that exceeds 700 million euros, is the banner project of the Network and of the economy of the region.

The Colmenar project intends to turn the idea of a city based on knowledge into a reality where young people can reside, studying, researching and working in university centres and in Technological companies. This city will be built upon three basic values: an opening to the world, the meeting of minds, and cooperation as the fundamental base of greater competitiveness.

It is a very ambitious project that intends to become an international reference for places where the Knowledge is created, where teaching and research centres and high-technological companies can live together, alongside leisure activities, sports areas and green and residential spaces. It will also be provided with high-level infrastructures and will have emblematic buildings designed by architects of international prestige.

The unison of all these elements will produce an environment favorable to creativity and innovation that will also promote high-level opportunities for younger generations, the return of talent from outside and the attraction of international companies and institutes of excellence.

In short, the City of Knowledge at Colmenar Viejo, with around 70% of the total projected investment for the whole Parks Network and more than 60% of its surface area, will be established as the basic strategic instrument of the Autonomous Community of Madrid. In particular Colmenar will be a key piece to situate the region in the global context of knowledge, to create a suitable space for young creativity and become an international urban reference for attractive living and working environments.

In short, then, the Parks and Clusters Network as a whole is expected to create a critical mass of agents that will favour the appearance of synergies, and which the knowledge transference processes created in it reach every company in the region.

The Network, with the planned Parks infrastructure, thus becomes the instrument that the Autonomous Community of Madrid will use to achieve its aim of situating itself in 2020 as one of the 10 most advanced regions in the world.

The goal could be ambitious, but if the development of the Park infrastructure is mantained, following the projections and the impact presented above, and the Network allows the successful interconnection of all the agents indicated, a development path similar to that of the most advanced regions can be created.

That is, based on previous cases of rapid innovation-based development, it would not be such an incredible hypothesis to state that, with the full development of the Network supported in its complete insertion in the Advanced Regions Network and with a high exploitation of its capacities, Madrid will reach the same growth rates as regions such as Silicon Valley, San Diego or Boston.

Table 5 Potential growth at a similar level of activity to the advanced regions in North America

	MADRID						
	GROWTH POTENCIAL ACCORDING TO AREA CONSIDERADA						
	YEAR INICIAL	YEAR FINAL	SILLICON VALEY	RUTA 128	SAN DIEGO	DENVER	DALLAS
Population	2006	2021	13.45%	6.35%	17.43%	19.31%	24.43%
Population with higher qualifications %	2005	2015	24.23%	22.06%	16.60%	18.97%	2.66%
No. workers (thousands)	2006	2021	-3.77%	4.24%	23.38%	20.98%	9.58%
Unemployment rate (%)	2005	2019	0.00%	-46.67%	-29.51%	11.11%	-6.56%
No. of companies	2006	2020	11.90%	11.12%	23.02%	12.04%	7.92%
GDP ($ million)	2006	2020	111.59%	94.72%	112.72%	132.41%	109.42%
GDP per capita ($)	2006	2020	140.57%	144.87%	134.06%	194.79%	137.68%

Source: OR.S Census Bureau 2007, State and County statistics / INE 2007 / EUROSTAT 2007 and own elaboration.

That is, that if we project growth rates of this kind on the economy of Madrid, using these growth ratios, and if in the future the Autonomous Community of Madrid grows in a similar way, its average GDP would increase by 105% and the per capita income by 142%, the unemployment rate would be reduced by 17% and employment would increase by 10%. Furthermore, productivity, understood as the relation between the work factor and the generated added value would increase by around 86.91%, situating the region as one of the most competitive at an international level.

V. Conclusions

The 21st century poses many challenges for current economies, with an increasingly intense need to promote knowledge-based competitiveness as the determining and differentiating element among regions.

In this context, Madrid has undergone a significantly higher growth than that of the average observed in the economies surrounding it, both in terms of added value and employment and in productivity. If the growth and dynamism experienced is mainly due to its being the countries capital in the context of Spain, in an international context these factors do not play the same role.

To maintain its position in the mid and long term and be situated in the global sphere as one of the most advanced centres at a worldwide level, the Autonomous Community of Madrid must organize all the resources at its disposal in a coordinated way and boost the collective activity of all its social and economic actors.

In order to fulfill the objective suggested by the regional Administration of positioning Madrid as one of the 10 most advanced economies in the world by the year 2020, the Parks and Clusters Network of the Autonomous Community of Madrid has been created, which together with the Advanced Regions Network, will allow the establishment of a closer relationship between all the aforementioned resources, and more importantly, to situate and identify the business fabric, and the region as a whole, as a Centre of Knowledge, and of first-class competitiveness at a worldwide level.

The Parks Network will encompass over 1,100 hectares, over 6,000 million euros in total investment and will be able to generate around 50,000 jobs.

In the future it is foreseen that, when this Network is functioning fully, the economic impact in the region will lie at around 2.5-3.5% of GDP and generate 1.7-3.3% of all jobs. Furthermore these results would be underestimate, as they would not include the positive externalities resulting from the growing collaboration among the various R&D+I support agents, Administration and the companies, nor the institutes and regions of the International Network that are being created.

In short, the development of the Science and Technology Parks of the Autonomous Community of Madrid and their inclusion in the Parks and Clusters Network and the Advanced Regions Network, without a doubt represents an unprecedented initiative both in its concept as in its scope, that will set the basis for a new way to understand the regions in the framework of the global knowledge economy.

Statistical sources

- **Instituto Nacional de Estadística**
  - Demografía y Población
  - Cuentas Económicas – Contabilidad Nacional y Regional
  - Estadísticas de Ciencia y Tecnología

- **Eurostat**
  - General & Regional Statistics
  - Economic Accounts
  - Science and technology Statistics
  - Structural Business Statistics

- **US Census Bureau**
  - People and Households
  - Business and Industry Statistics

- **US Office of Technology Policy**