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The Autonomous Region of Catalonia, Spain

SELF-EVALUATION REPORT

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ACRONYMS

ACC10	Public Agency (Business development and external promotion) of the Catalan Ministry of Innovation
ACECU	Catalan Association of University Continuing Education
ACES Network	Curricular Environmentalism of Higher Studies
ACUP	Catalan Association of Public Universities
AFOPA	Association of permanent education classes for elderly people of Catalonia
AGAUR	Agency for Management of University and Research Grants
ANECA	National Agency for Quality Assessment and Accreditation
AQU	Catalan Agency for Quality
AUPA	Andalusian Association of Public Universities
BCU	Barcelona Centre Universitari
CARI	Catalan Agreement for Research and Innovation
CBUC	Consortium of Catalan University Libraries
CCUC	Collective Catalogue of Catalan Universities
CDTI	Centro para el Desarrollo Tecnológico Industrial
CEDEFOP	European Centre for Development for Vocational Training
CELLS	Synchrotron Light Laboratory
CEPIMA	Centre for Processes and Environmental Engineering
CESCA	Supercomputing Centre of Catalonia
CEU	Associate professor
CFGM	Intermediate vocational training degrees
CFGS	Higher vocational training degrees
CGPU	Conferencia General de Política Universitaria
CIC	Interuniversity Council of Catalonia
CIDEM	Regional Agency for Innovation and Business Development
CIDOB	Barcelona Centre for International Studies
CIDUI	International Congress of University Teaching and Innovation
CIRC	International Centre of Research on Coastal Resources
CIRIT	Interdepartmental Commission for Research and Technological Innovation
CNEAI	National Commission of Evaluation of the Research Activities
CREAF	Centre for Ecological Research and Forestry Applications
CREBEC	Bioengineering Reference Centre of Catalonia
CRESIB	Barcelona Centre for International Health Research
CRETESOS	Centre of Research in Technologies for Sustainability
CREUP	Coordinator of Public University Student Representatives
CRUE	Conference of Rectors of Spanish Universities
CRUMA	Conference of Public University Rectors of Madrid
CU	Consejo de Universidades
CVC	Centre de Visió per Computador
CYD Foundation	Fundación Conocimiento y Desarrollo
DIUE	Catalan Ministry of Innovation, Universities and Enterprise
DOGC	Diari Oficial de la Generalitat de Catalunya
ECTS	European Credit Transfer and Accumulation System
EHEA	European Higher Education Area
ENQA	European Association for Quality Assurance in Higher Education
EQUAR	European Quality Assurance Register for Higher Education
ERC	European Research Council
ETSEQ	Technical School of Chemistry Engineering
EU	European Union

EUPMA	Polytechnic University School of the Environment
EUS	Firms-University-Society
FCRI	Catalan Foundation for Research and Innovation
FECYT	Fundación Española para la Ciencia y la Tecnología
forQ	Agency for the Quality of Lifelong Learning
FP	EU Research Framework Programmes
GDP	Gross Domestic Product
GEM	Global Entrepreneurship Monitor
GVA	Gross Value Added
HCB	Hospital Clínic de Barcelona
HEI	Higher education institution
IBEI	Institut Barcelona d'Estudis Internacionals
ICFO	Institute of Photonic Sciences
ICREA	Catalan Institution for Research and Advanced Studies
ICT	Information and communication technologies
ICTA	Institute of Environmental Science and Technology
IDESCAT	Institut d'Estadística de Catalunya
IDIBAPS	Institut d'Investigacions Biomèdiques August Pi i Sunyer
IMA-UdG	University of Girona Environmental Institute (IMA-UdG
INE	Instituto Nacional de Estadística
INTE	Instituto de Ténicas Energéticas
IQS	Chemical Institute of Sarrià
IREC	Catalan Institute for Energy Research
KIC	Knowledge and Innovation Communities
LOGSE	Organic Law on the General Organisation of the Educational System
LOMLOU	Ley Orgánica por la que se modifica la Ley Orgánica
LOU	Ley de Ordenación Universitaria
LRU	Ley Orgánica de Reforma Universitaria
LUC	Catalan Universities' Act
ME	Ministry of Education
MTG	Music Technology Group
OECD	Organisation for Economic Co-operation Development
OTRI	University offices for the transfer of research results
PAS	Administrative and support staff
PCB	Parc Científic de Barcelona
PCT	Patent Cooperation Treaty
PDI	Teaching and research staff
PEMB	Strategic Metropolitan Plan of Barcelona
PROFOR	Programme to Foster Research
R&D	Research and Development
R&D&I	Research, Development and Innovation
REACU	Spanish Network of University Quality Agencies
RUEPEC	University Network of Postgraduate Studies and Continuing Education
SME	Small and Medium sized Enterprise
UAB	Autonomous University of Barcelona
UB	University of Barcelona
UdL	University of Lleida
UIC	International University of Catalonia
UAO	University Abat Oliba
UNED	National Distance University
UOC	Open University of Catalonia
UdG	University of Girona
UPC	Polytechnic Universtiy of Catalonia
UPF	University Pompeu Fabra
URL	University Ramon Llull

URV	University Rovira i Virgili
UVIC	University of Vic
XIT	Xarxa d'Innovació Tecnològica
XTT	Xarxa de Trampolins Tecnològics

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EXECUTIVE SUMMARY

Overview of the region

1. Catalonia, located in the northeast of Spain, is a region of a considerable dimension in Europe. With more than seven million inhabitants, its GDP per capita is higher than the European Union average. It is the main contributor to the Spanish economy with around 19% of the GDP and has 16% of its population.

2. Catalonia is an autonomous community and exercises its self-governance in accordance with the Spanish Constitution and with the Catalan Statute of Autonomy, which is its basic institutional law. It has its own identity, culture and language, as well as a remarkable historical and cultural heritage. It borders on the east with the Mediterranean Sea, on the north with France and Andorra, and on the west and south with the autonomous communities of Aragon and Valencia. This location has favoured an intense relationship with the rest of the Mediterranean countries and with continental Europe. Its capital is Barcelona, a cosmopolitan and multi-cultural city and one of the large cities in the Mediterranean Sea and a major economic driving force in Southern Europe.

3. The total population of Catalonia in 2008 exceeded 7.4 million, over 75% of the Catalan population lives in the province of Barcelona, the rest of the population is distributed between Tarragona (10.7%), Girona (10%) and Lleida (5.8%). In 2008, the foreign immigrants accounted for the 13.3% of the total population of Catalonia.

4. The labor market in Catalonia presented an employment rate of 57.5% in 2008, above the Spanish average (53%) and lower than the EU (65.9%). Moreover, the unemployment rate in Catalonia was 2 p.p. higher than the EU average and 2.3 p.p. lower than the Spanish average.

5. The evolution of GDP per capita in Catalonia during the period 1995 to 2008 has presented a similar behavior to the Spanish GDP, noting that GDP per capita in Catalonia was, on average, 26% higher than the Spanish GDP. Compared to the EU27, over the period 2000 to 2008, GDP per capita in Catalonia was, on average, 28.3% higher.

6. The manufacturing sector in Catalonia represents over 20% of the total VGA in this region. 65% of VGA is produced in the service sector; this is the sector which has experienced a greater increase in the period 1995 to 2008, passing from 48,300 million in 1995 to 125,345 million in 2008 in Catalonia. The share of sectors such as agriculture and the energy sector has remained at around 1.5%.

7. The gross domestic expenditure on R&D as the percentage of the GDP in Catalonia has shown a rising trend since 2001, reaching the 1.6% in 2008. However, this percentage remains below the EU-27 average (1.9%). The structure of R&D expenditure in Catalonia is characterized by a high participation of the private sector, which in 2008 contributed 61.1% of the total R&D expenditure. Although this percentage exceeds the Spanish average it is lower than the private sector share in R&D activities in the EU (64.9%).

Characteristics of the higher education system

8. The Spanish higher education system (mainly a university system, although there are non-university higher education institutions) has seen a number of reforms in the past three

decades, most of which have been concentrated since the year 2000 (mainly the University Acts of: LRU (1983), LOU (2001) and LOMLOU (2007)). The reforms of these national regulatory frameworks have intended to increase university autonomy, transfer competences to the regions, introduce accountability measures (quality evaluation and accreditation mechanisms through the national and regional agencies) and ensure university education as a public service for all those that meet the academic entry requirements. It is a mass higher education system (participation of 43% of the age cohort according to 2006 OECD data) with over 70 universities (most of them public institutions) distributed all over the territory. Funding for (public) universities comes from government subsidies (allocated by the regional governments), tuition fees and national competitive research grants.

9. Spanish higher education is characterised by strong national regulation and national representative bodies (CRUE, CGPU, CU) but also for having specific competences and policy space for the regions to develop particular policies, laws, etc. adjusted to their regional priorities and needs. In this sense, higher education institutions are seen as a driving force for improvement at individual, social and overall economic levels in the region. In Spain, the regionalisation of universities has been a very fast and far-reaching process turning universities into highly valued organisations by politicians due to their social relevance.

10. In the case of Catalonia, the higher education system consists of an important number of higher education institutions (including the private sector and the non-university higher education institutions) that provide different services and/or outcomes to the region such as educational services to the region's population and a stimulation of research activities which have, as of the last decade, increased their local and regional impact. Furthermore, the expansion of the Catalan university system has led to a territorial redistribution of university activities improving the contribution of the Catalan HEIs to the social and economic development of their respective areas.

11. Relations between universities are both based on competition and co-operation. Competition takes place between universities mainly for R&D financial resources and for postgraduate and lifelong learning students. Co-operation, in the Catalan case, especially among the public institutions, takes place under the framework of the Catalan Association of Public Universities (ACUP) by which, among other activities, they work to increase the overall international visibility of the *University of Catalonia* and jointly decide upon common positions regarding key policy issues.

12. There have been some specific policy initiatives that have stimulated the regional role of universities and at the same time have provided a space for collaboration between universities, the industry sector, the government and the civil society. Among these initiatives two can be mentioned as examples. The first one is the *Pacte Nacional per la Recerca i la Innovació* (Catalan Agreement for Research and Innovation, CARI) which fosters research and innovation with the understanding that universities play a crucial role in this area, but also including many other stakeholders from the private sector, the regional authorities and the civil society. The second policy initiative, as mentioned earlier, is the *White Paper of the University of Catalonia* that includes a strong regional dimension in its vision for the Catalan higher education system and calls upon different stakeholders to accomplish its objectives for the benefit of Catalonia.

13. Some policy tensions can be found when the regional role of universities conflicts with the objective of international excellence. However, so far, the regional role is still predominant. There is also a differentiation between teaching and research activities, the first is more oriented to students of the region (especially in undergraduate courses) whereas the second is more oriented towards achieving excellence and national and international recognition (a

policy example is the financial incentive for academics to increase their research productivity).

Contribution of research to regional innovation

14. Higher education institutions and specifically universities play a key role in the Catalan research and innovation system. In recent years they have improved their efforts devoted to R&D and the level of scientific outputs significantly. Currently the HEIs R&D effort is close to the average level of OECD countries. This dynamism of research has been reflected in a very significant increase of the scientific production of Catalonia.

15. Catalan universities are playing an increasing role in "third mission" activities in the field of knowledge transfer and relationships with firms. In addition, Catalan and Spanish R&D innovation policies have evolved devoting more efforts and resources to increase the links and relationships between universities and firms. This has led to the creation of interface structures and instruments to foster these relationships, such as the OTRIs, science parks and networks to facilitate the creation of spin-offs.

16. Although the regional dimension is not explicitly considered in HEIs research policy, all these efforts have allowed an increasing contribution of academic research to regional innovation. In this sense, some figures regarding the different ways of transferring knowledge such as the number of R&D agreements between universities and firms or the applications for patents have experienced a growth in recent years, although in general terms they are still below the most advanced European regions. In addition, some weaknesses are the low mobility of researchers and incorporation of PhDs in firms, and the co-operation between universities and firms, especially SME, is still very rare.

17. To improve the contribution of university research to regional needs and demands there are challenges related with the characteristics of the university system, the interface structures and with the industrial structure that must be dealt with. Firstly, there are still significant barriers to the mobility of researches. In addition, only very recently, the activities related with the third mission are beginning to be taken in account in the university funding system. Secondly, interface structures for knowledge and technology transfer often lack the necessary dimension and critical mass to develop their activities properly. Finally, in comparison with advanced European regions, the technological level of firms is still weak with a low absorptive capacity, although in some activities Catalan firms have achieved a high level of competitiveness.

18. The contribution of academic research to regional innovation is fundamentally done by the public ones and by the URL, a private one. The collaboration between universities in this field is not very frequent although in recent years some joint initiatives are beginning to be more common, as is the example the ACUP, bringing together all the public universities with the purpose to develop joint activities. The collaboration between universities is more frequent when there are other stakeholders involved as the Catalan government. In this case collaboration takes place trough different ways such as the university technology transfer networks or the preparation and drafting of the CARI. Finally, other remarkable examples of collaboration with other stakeholders are the joint research activities with hospitals and with the public research centres created by the Catalan government.

Contribution of teaching and learning to labour market and skills

19. The Catalan University system offers a range of undergraduate and graduate degrees of adequate quality allowing a high percentage of its inhabitants to study in a university in

their own city or region. In parallel, even if mobility of students in Spain is very low, Catalonia is able to attract a relatively large number of foreign students, above the Spanish average. Recently, the university's role as a supplier of services to students and to the rest of society has been reinforced as the range of services it provides has been extended.

20. Despite the significant rise in the number of enrolled students in universities, partly due to the creation of new universities and partly to Catalonia's economic development, the social and economic background of university students is biased towards families with medium to high incomes. There seems to be a relatively low mismatch between supply and demand of graduates in the Catalan labour market as well as between the degree of specialisation in HEIs and regional productive specialisation.

21. A common fact in Catalonia is related to the high number of students that work and study at the same time, indicating low levels of coverage by scholarships and study grants in the country. In Catalonia, as in many other regions or countries, the natural tendency is for the most highly-trained people to receive more training, whereas those who have more deficits in basic skills are generally excluded. Continuing education is relevant as a big share of all postgraduate students in Spain is enrolled in Catalan universities. Besides, in Catalonia, about three quarters of university students continue to improve their education level after graduation.

22. The transition to the European Higher Education Area is meaning that Catalan universities are becoming aware of the importance of student learning and also of strengthening the relationships with the labour market and the society as a whole. Once the Catalan system is fully adapted to the Bologna process, it will facilitate student as well as staff mobility, better learning systems and perhaps some degree of institutional specialisation.

23. Collaboration between regional stakeholders is rather rare in the Catalan university system. However, several examples show a turn in this trend and indicate some strengthening of institutional co-operation. In the context of the "Strategic Agreement of the Catalan Economy", stakeholders collaborate to achieve the objectives envisaged by the plan. The creation of ACUP will have an impact on fostering collaboration among higher education institutions and other social, economic and public agents. Other initiatives such as the Vives network of Catalan speaking universities, or the BCU –*Barcelona Centre Universitari*- are remarkable examples of institutional collaboration.

24. In order to enhance the regional learning system, some negative characteristics of the Catalan higher education system should be tackled. Among the most important are: too many universities offering the same or very similar degree courses and the needs of society and companies that are not adequately met by the universities. For that purpose, the recently published White Paper on the University of Catalonia is intended as a tool to reinforce the strengths as well as to mitigate some of the identified weaknesses.

Contribution to social, cultural and environmental development

25. This chapter focuses on the social responsibility that Catalan HEIs adopt through the educational services and knowledge transfer which they offer following the principles of ethics, environmental respect, social commitment and the promotion of citizens' values. This social responsibility is specified in the role of HEIs in social, cultural and environmental development.

26. Regarding the roles played by HEIs in social development, they have become instruments of social inclusion and cohesion, making and effort to guarantee that everyone can gain access in equal conditions. There are three existing levels at which Catalan HEIs develop a

role in the defence and promotion of social inclusion: 1) internal activity which guarantees access and inclusion of all users, 2) training offered by the HEIs to society as a whole (university extension courses, etc.), 3) participation in society through the study of reality and the development of policies or through the implementation of concrete programmes and actions.

27. HEIs in Catalonia are also promoters of sport, offering sport services and infrastructures and supporting the sports elite. Related to social development it is also important to stress the main role played by HEIs in the development of health and biomedical science policies and, finally, HEIs are, as well, platforms for international co-operation assuming responsibility in the support of other more unfavoured social and economic realities.

28. On the other hand, HEIs are promoters of cultural development in Catalonia. First of all, they are generators of knowledge and excellence among culture professionals through art schools, mainly, and they are also creators of new audiences and generators of their own cultural activity. Besides this, regarding cultural development, it is necessary to stress their commitment to innovation and creativity and the ever greater number of common initiatives between HEIs and other public and private agents. Finally, HEIs are also engaged with Catalan cultural development related to identity and language.

29. Also in line with the third mission of the university (social responsibility), HEIs are becoming more and more aware of waste management and the energy resources they consume, that is why they have become good frameworks to carry out sustainability and environmental development projects. Moreover, HEIs are also generators of knowledge to work on the development of environmental policies and awareness-raising in society through centres of research and innovation and initiatives of curricular environmentalism (incorporation of environmental knowledge and awareness-raising in the academic curriculum).

30. In all previous fields (social, cultural and environmental development), there are co-operative initiatives and joint work between Catalan universities and also with other stakeholders: public entities of the local, regional and state administrations, the service sector and private sector (companies and business groups). It is important to emphasise the fact that the Catalan HEIs system is formed by many institutions and this characteristic means a greater need for global co-operation among them.

Capacity building for regional co-operation

31. Although in Catalonia there is no global strategic plan that covers all the factors for regional growth and welfare, there are different regional and local initiatives where the role of universities is considered fundamental for the development of the region. Among the current agreements and plans, the most important at a regional level are "The Strategic Agreement to Promote Internationalisation of the Catalan Economy, the Strengthening of its Competitiveness and the Quality of Employment 2008-2011", "The Catalan Agreement on Research and Innovation" (2009) and, at a local level, "The Strategic Metropolitan Plan of Barcelona" and "The Strategic Plan of the Camp of Tarragona".

32. The main instrument in promoting communication between universities and regional agents are the Social Councils. The Social Councils are responsible for promoting and assessing the relationships between universities and their cultural, professional, economic and social environment. In public Catalan universities, the Social Councils have 15 members, 6 from the governing bodies of the university and 9 representatives of the society. This composition includes individuals from the cultural, economic and social life and is intended to ensure a representation of the different sectors of the region. Despite the existence of Social Councils

a common criticism is that external stakeholders have a limited role regarding the governance and decision-making in universities and the university management system is mostly academically driven and insufficiently responsive to the needs of the economy and the society. In private Catalan universities their own Foundations act also as Social Councils; their commitment to assist the universities in their relationship with their environment is very high.

33. Within the area of HEIs, the main instrument to coordinate the activities of universities in regional engagement is the ACUP. This association issued, as mentioned above, the "White Paper on the University of Catalonia" in 2008 proposing strategies and projects for the "University of Catalonia". "The White Paper" points out that the interrelation among the eight public universities is very weak and that it is necessary to develop co-operative strategies to improve the excellence of the university system, their internationalisation and their contribution to the economic and social development of Catalonia. For this purpose, the joint brand "University of Catalonia" was suggested, together with strategies and projects on different fields and activities of the universities.

34. In the field of attraction of international talent it is worth mentioning the activity of the "Catalan Institute for Research and Advanced Studies (ICREA)". ICREA is a foundation jointly promoted by the Catalan Government through the DIUE and the Catalan Foundation for Research and Innovation (FCRI) that has been able in its eight years of activity to recruit more than 220 top scientists. ICREA has collaboration agreements with seven Catalan public universities (UB, UAB, UPC, UPF, UdG, UdL and URV) and also with other research centres where the ICREA researchers carry out their work.

35. In Catalonia, there are some experiences of analysis of the regional impact of the universities, both at a global level and at an individual level by some specific universities. Nevertheless, the evaluation of their performance and results with respect to society and regional needs is still insufficiently developed. At a global level, the most relevant analysis is the one carried out by the ACUP, currently in progress, for all the public universities with a comprehensive view on the different impacts of the HEIs. In addition, the CYD Foundation recently complemented its annual analysis on the contribution of Spanish universities to development with a report containing the main figures for each Autonomous Community. At an individual level, four universities have carried out analysis. These are the University of Lleida (UdL), the Rovira i Virgili (URV, in the province of Tarragona), the University of Vic and the University of Girona (UdG).

36. The Catalan university system has experienced substantial changes in the last twenty years with the creation of new universities, both public and private, and with a growing participation in research activities. More recently they have also increased their commitment and activities related with the third mission. This process has led to an increase in their relationships with other stakeholders in the region, both public and private, and has therefore improved their regional engagement.

37. Nevertheless there is room for improvement and to achieve a greater regional engagement does not seem to face significant cultural barriers while other obstacles related with institutional factors and with rigidities in the HEI system appear to be more important. Among the existing barriers the most relevant are the existence of management systems insufficiently responding to society and regional needs, a lack of incentives to increase regional engagement, a lack of institutional autonomy, due to excessive governmental regulation and, in spite of the improvements over the last years, an insufficient accountability of universities to society. To these barriers the insufficient mutual knowledge between universities and industry has to be added.

Conclusions: Moving beyond the self-evaluation

38. Catalonia faces the challenge to advance towards a more knowledge-based society. To achieve this objective, human capital, research and innovation are key elements because they are the main factors for economic and social development and welfare. Other challenges are the increasing internationalisation, the environmental aspects and to guarantee social cohesion. In all these aspects universities have a very important role to play, particularly in the generation of human capital and knowledge, in the activities included in the third mission and participating in policy decision-making processes as experts.

39. In this report the main characteristics, strengths and weaknesses of the Catalan HEI system regarding their contribution to innovation, labour market, social, cultural and environmental development of the region have been presented. In addition, its degree of regional involvement and its role in enhancing capacity building trough cooperation within universities and with other agents, both public and private, have been examined. From this analysis arise some concluding remarks regarding the improvement of regional involvement of the universities and their contribution to society's needs and demands. In particular, three aspects deserve particular consideration.

40. Firstly, universities have increased their relationships with other stakeholders in the region, both public and private, and improved their regional engagement. Nevertheless the participation of external stakeholders in the governance of the universities is still weak and the links with the governments, particularly with local governments, of their territorial areas of activity are not very developed. In this sense, to develop stable platforms, with own legal status, and networks of collaboration with local governments with the participation of other stakeholders as business associations and trade unions, would allow to develop sustained links of cooperation improving the contribution of universities to society's needs and demands.

41. Secondly, the recent experiences of cooperation within public universities (ACUP, International campuses of excellence, etc.) and also the favourable attitude of some private universities to be engaged in these relationships show the convenience to advance in a more cooperative and interrelated university system. This will allow, keeping individual specialisation, to improve the complementarities among the different universities. To achieve a closer cooperation will place universities in a better position to respond to the challenges of increasing the international presence of the Catalan HEI system. To develop also joint strategies will allow then to improve their contribution to economic and social welfare though their different activities of education, research and those included in the third mission.

42. Finally, increasing institutional autonomy is essential to allow universities to define their own strategies and objectives. To enhance autonomy requires introducing new systems of governance of the universities and means that universities have the tools and the capacity to execute their responsibilities and to organise and manage their resources. This increasing autonomy should be complemented with the development of proper ex-post assessment procedures and accountability to society.

CHAPTER 1 OVERVIEW OF THE REGION

43. Catalonia, located in the northeast of Spain, is a region of a considerable dimension in Europe. With more than seven million inhabitants, its GDP per capita is higher than the European Union average. It is the main contributor to the Spanish economy with around 19% of the GDP and has 16% of its population.

44. Catalonia is an autonomous community and exercises its self-governance in accordance with the Spanish Constitution and with the Catalan Statute of Autonomy, which is its basic institutional law. It has its own personality, culture and language, as well as a remarkable historical and cultural heritage. It borders on the east with the Mediterranean Sea, on the north with France and Andorra, and on the west and south with the autonomous communities of Aragon and Valencia. This location has favoured an intense relationship with the rest of the Mediterranean countries and with continental Europe. Its capital is Barcelona, a cosmopolitan and multi-cultural city and one of the large cities in the Mediterranean Sea and a major economic driving force in Southern Europe.

1.1 Governance structure

45. Catalonia is recognized as a nation capable of self-governance in accordance with the Spanish Constitution and its Statute of Autonomy. The Generalitat is the institution that politically organizes the government of Catalonia and its powers arise from the Spanish Constitution and its Statute of Autonomy. The official language of Catalonia is Catalan, as well as Spanish. Currently, 98.3% of the total population in Catalonia understand Catalan, 75.6% speak it, 73% read it and 56.3% write it.

46. Catalonia is one of the 17 regions or autonomous communities of Spain. It is governed by the 2006 Statute of Autonomy that meant a substantial revision of the former autonomy statute (1979). It sets the guidelines for its political, administrative and jurisdictional organization. In Catalonia there are three types of governments: the central administration, regional administration and local administration.

47. The structure of the central government in Catalonia is coordinated by the central government delegation in the region and is composed by four provincial sub-delegations, which assume and manage the tasks assigned in their respective provinces. The central government delegation is responsible for management functions such as ports, airports, train services (RENFE), and justice.

48. The administration of the Catalan community is in charge of the Generalitat de Catalunya; it is responsible for the administration of education, social affairs, transit, economic policies and trade, construction of public facilities such as hospitals, schools, primary and secondary schools, universities and homes for the elderly.

49. The local authority is divided into municipalities and provincial councils. This level of government is responsible for providing services closer to citizens. The powers of local governments depend on the size of the population of each municipality. The provincial councils are responsible for providing joint services to municipalities.

50. In education, the powers are split between regional and local governments. The regional is responsible for regulation, planning, ordering and evaluating the education system, while local governments are responsible for determining the supply and demand for education at the local level as well as of the implementation of programs evaluation and determination of the school calendar.

1.2 The geographical situation

51. The Region of Catalonia is located in the northeast of Spain. It has a land area of 32,113 square kilometers (6.3% of Spain) and is divided into four provinces, Barcelona, Girona, Lleida and Tarragona. This autonomous region, limits to the north with France and Andorra, to the east with the Mediterranean Sea, west and south with the regions of Aragon and Valencia. The Region of Catalonia has a land border of 772 kilometers and a coastline of 699 kilometers, representing 14.3% of the Spanish coast.

52. The interconnection within Catalonia and its connection to the outside consists of a network of integrated transport infrastructure, which combines road and railway networks, airports and seaports of many different sizes.

53. In 2008, Catalonia had a road network of 11,897 km, 49% of them report directly to the regional government, 36% depend on local governments, and the remaining 15% was under the central government. The province of Barcelona has the largest road network in Catalonia, with a total of 3,951 km of roads, followed by Lleida (2,785 Kms) and Tarragona (2,778 km), the Catalan province that had a minor road network was Girona with a total of 2,383 Kms of roads.

54. The rail network in Catalonia mostly depends on the state, through the publicly owned company RENFE. This company offers long distance transport for passengers and goods, as well as local transport for passengers. In addition, Catalonia has its own railway system, which is managed by the public rail company of the Catalan government; this network offers services to transport passengers in metropolitan areas, especially in Barcelona.

55. The Region of Catalonia has four international airports in the vicinity of Barcelona, Reus, Lleida and Girona. In 2008, all airports in Catalonia transported a total of 36.9 million passengers, 18% of total passengers in Spain. El Prat Airport (Barcelona) carried a total of 30.1 million passengers and was the largest airport in the Community, followed by the Girona airport, which carried a little more than 5.4 million passengers and finally, Reus Airport with a total of 1.4 million passengers. Catalan airports mostly transported passengers to international destinations, which accounted for 64.2% of the total. In the case of the Reus and Girona airports this percentage is 96.4% and 92.7% respectively.

Table 1.1 Passenger transportation at Catalan airports

	2007			2008		
	National	International	Total	National	International	Total
Barcelona	15,158	17,544	32,702	12,771	17,398	30,169
Girona	235	4,584	4,819	398	5,088	5,486
Reus	8	1,286	1,294	46	1.222	1,268
Catalonia	15,401	23,414	38,815	13,215	23,708	36,923
Spain	89,051	119,544	208,595	82,142	120,081	202,223

Source: Ministerio de Fomento

56. Catalonia in its 699 kilometers of coastline has a port system that brings together a large number of ports for different uses, sizes and ownership. The most common uses of the Catalan ports are shipping, fishing and leisure. The ports of Barcelona and Tarragona belong to the state-owned port system, these ports in 2008 accounted for 17.4% of the total maritime transport in Spain.

57. The Region of Catalonia has 12 universities. These universities are located in large urban centers. 8 Catalan universities, four public and four private, are located within the

metropolitan area of Barcelona, two universities are located in the province of Girona and the remaining two universities are located in Tarragona and Lleida.

1.3 The demographic situation

58. The Catalan population has grown over the past 10 years with an average annual growth rate of 1.8% from 6.2 million in 1999 to 7.4 million in 2009, representing 16.1% of the total Spanish population. The distribution of population among the provinces is quite unequal. The province of Barcelona brings a greater percentage of the population, accounting for about 75% of the Catalan population, however, this participation has been declining steadily since 1999, while the provinces of Girona and Tarragona have increased their population more actively, and therefore have gained weight in the total population of Catalonia.

Table 1.2 Evolution of the population in Catalonia. Period 1999 - 2009

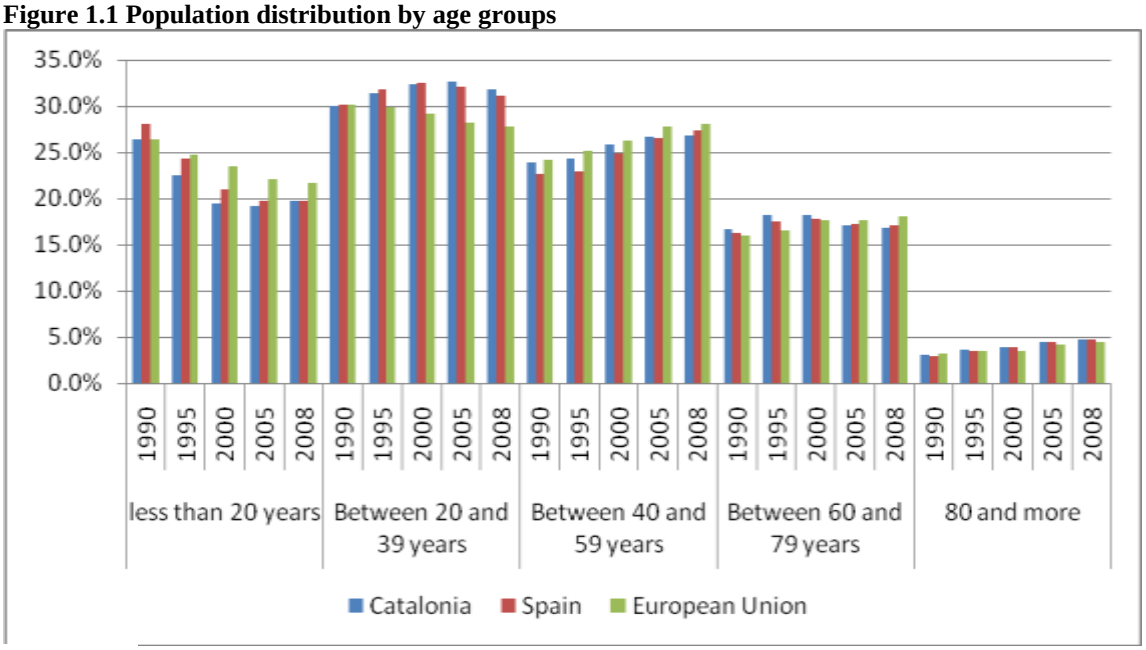
	Barcelona		Girona		Lleida		Tarragona		Catalonia
	Total	%	Total	%	Total	%	Total	%	
2000	4,736,277	75.6%	565,599	9.0%	361,590	5.8%	598,533	9.6%	6,261,999
2005	5,226,354	74.7%	664,506	9.5%	399,439	5.7%	704,907	10.1%	6,995,206
2006	5,309,404	74.4%	687,331	9.6%	407,496	5.7%	730,466	10.2%	7,134,697
2007	5,332,513	74.0%	706,185	9.8%	414,015	5.7%	757,795	10.5%	7,210,508
2008	5,416,447	73.6%	731,864	9.9%	426,872	5.8%	788,895	10.7%	7,364,078
2009	5,487,935	73.4%	747,782	10.0%	436,402	5.8%	803,301	10.7%	7,475,420

Source: IDESCAT

59. Catalonia is made up of 946 municipalities, of which 87.3% have less than ten thousand inhabitants; these municipalities contain 18.6% of the Catalan population, while municipalities with between 10,000 and 50,000 inhabitants represent 10.3% and contain 27.1% of the population. Over 20% of the population is in the city of Barcelona, which is the only one exceeding one million inhabitants. The population distribution according to the size of municipalities in Catalonia is similar to the national distribution, noting that the demographic weight of the large municipalities of the total is higher in Catalonia than in Spain where the Catalan municipalities over 100,000 people contain 42% of the population and account for 1.1% of all municipalities, while in Spain, this group of municipalities contains 39% of the population and represents 0.8% of all municipalities.

60. The demographic distribution by age groups in Catalonia has followed a similar behavior to the average in Spain and the European Union. On the one hand, the percentage of persons under the age of 20 has reduced, this reduction in the total share of population was 6.6 percentage points in Catalonia between 1995 and 2008, in the case of Spain the reduction was 8.3 p.p. and in the European Union the reduction was 4.7 p.p. Moreover, the proportion of people who aged between 40 and 59 years old were those whom most increase their share of the total population, with an increase of 2.9 p.p. in Catalonia, 4.6 pp in Spain and 3.8 p.p. in the EU. The age group that had less variation in the period 1995 - 2008 was that of people between 60 and 80 years old, whose share of the total population was around 16% in Catalonia, 17% in Spain and 18.1% in the EU.

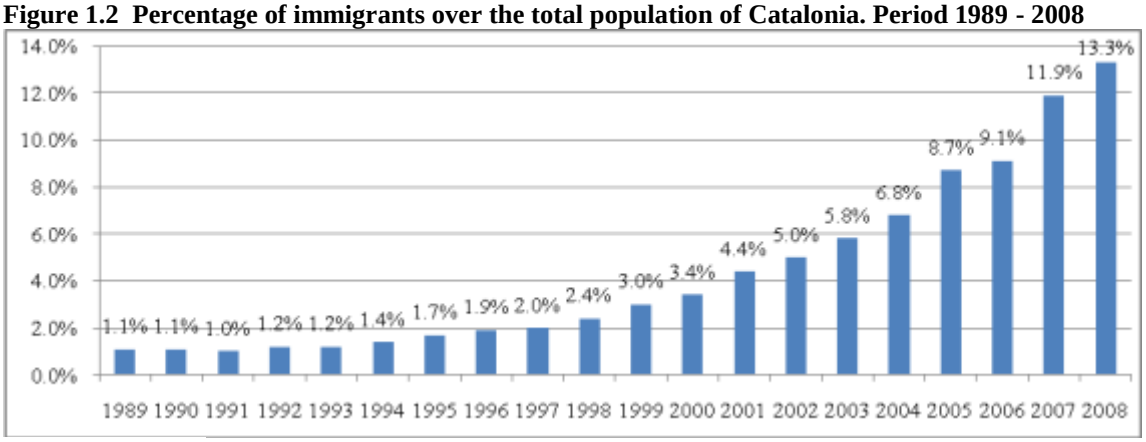
Figure 1.1 Population distribution by age groups



Source: INE

The percentage of immigrants in Catalonia has grown rapidly over the past 10 years, reaching 13.3% of the total population in this region. This increase of the foreign immigrants represented about 85% of the population growth in Catalonia.

Figure 1.2 Percentage of immigrants over the total population of Catalonia. Period 1989 - 2008



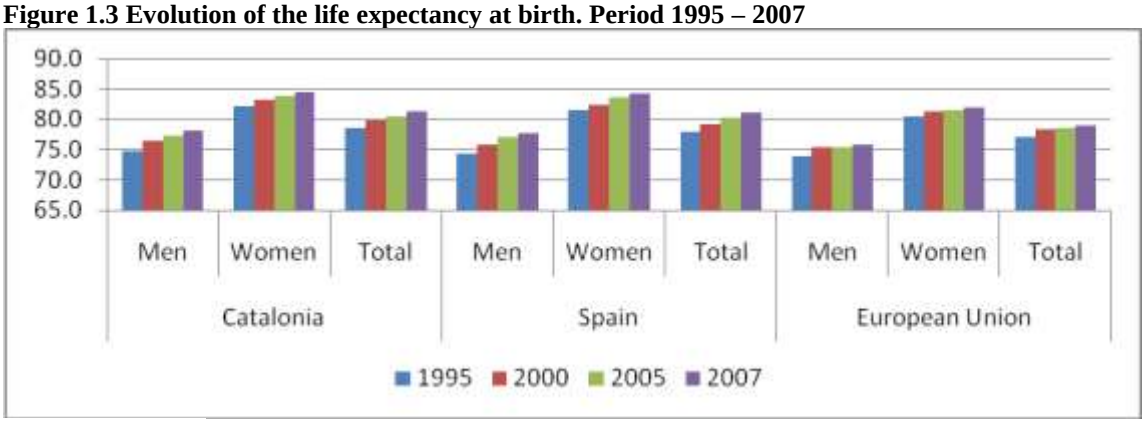
Source: IDESCAT

61. Catalonia is the most important region in terms of migration flows in Spain. In 2008, the total number of immigrants who chose Catalonia as a destination region accounted for about 21% of the total share of immigrants in Spain, this percentage rises if we only take into account foreign immigrants; in this case, Catalonia represents 24.3% of all immigrants from other countries that came to Spain. The total number of emigrants from Catalonia represents the 21.2% of total emigration in Spain. There are notable differences between the internal and external migration. In the case of internal migration, the weight of the share of Catalonia was 19.4%, while external migration from this region accounted for 30.5% of total migration in Spain.

62. Life expectancy at birth in Catalonia in 2007 was 81.42 years, higher than the Spanish average, which was 81.05 and the European Union, which reached 78.96 years. In the period 1995 - 2007 life expectancy of the Catalan population increased by 2.9 years, rising higher than the EU average, where the increase was 1.8 years, but lower than that reported in Spain, where the life expectancy increased by 3.1 years. The evolution of life expectancy

for men has increased more than for women in Catalonia; the life expectancy for men increased by 3.4 years between 1995 and 2007, reaching 78.2 years, whereas in the case of women the increase was of 2.3 years, reaching 84.5 years of life in 2007.

Figure 1.3 Evolution of the life expectancy at birth. Period 1995 – 2007

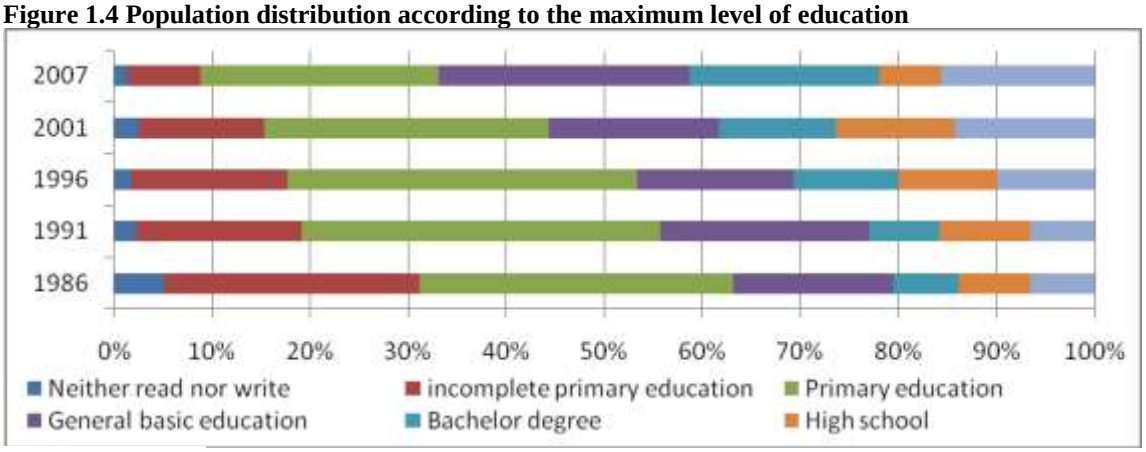


Source: IDESCAT

63. The percentage of people with tertiary education in Catalonia has increased steadily since 1986, from 6.5% to 15.7% in 2007. Compared with Spain, Catalonia has a higher percentage of population with secondary and higher education, which in 2007 accounted for over 41% of the total population in this region, however, the Spanish average stands at 32.3% of the total population.

64. The percentage of illiterate people in Catalonia has reduced significantly, accounting in 2007 for 1.5% of the population of this region, similarly, the percentage of people who have not competed primary education has reduced in 2007 to 7.3% of the population. These percentages are lower than the average Spanish figures, where the percentage of illiterate polulation stood at 2.4% and 12.9% had not completed primary education.

Figure 1.4 Population distribution according to the maximum level of education



Source: IDESCAT

1.4 The economic and social base

65. The evolution of GDP per capita in Catalonia during the period 1995 to 2008 has presented a similar behavior to the Spanish GDP, noting that GDP per capita in Catalonia was, on average, 26% higher than the Spanish GDP; however there is a trend of convergence between Catalonia and Spain in terms of GDP per capita, since the difference between Catalonia and Spain has been gradually reducing since 2000, with the gap in GDP per capita reducing from 29.8% to 23.9% in 2008. Compared to the EU27, over the period 2000 to

2008, the Catalan GDP per capita was, on average, 28.3% higher, and reached its maximum in 2007 (31.2%). In relation to the EU15, the Catalan GDP is 13.1% higher, noting that this percentage has been increasing since 2000 when it was 9.7%, reaching 17.6% in 2007. According to the provisional data from the INE, in 2009 the GDP per capita in Catalonia has shown a negative trend, falling 4.2% over the previous year. This fall was mainly due to the negative behavior of the manufacturing sector, which showed a reduction of 13.4% between 2008 and 2009.

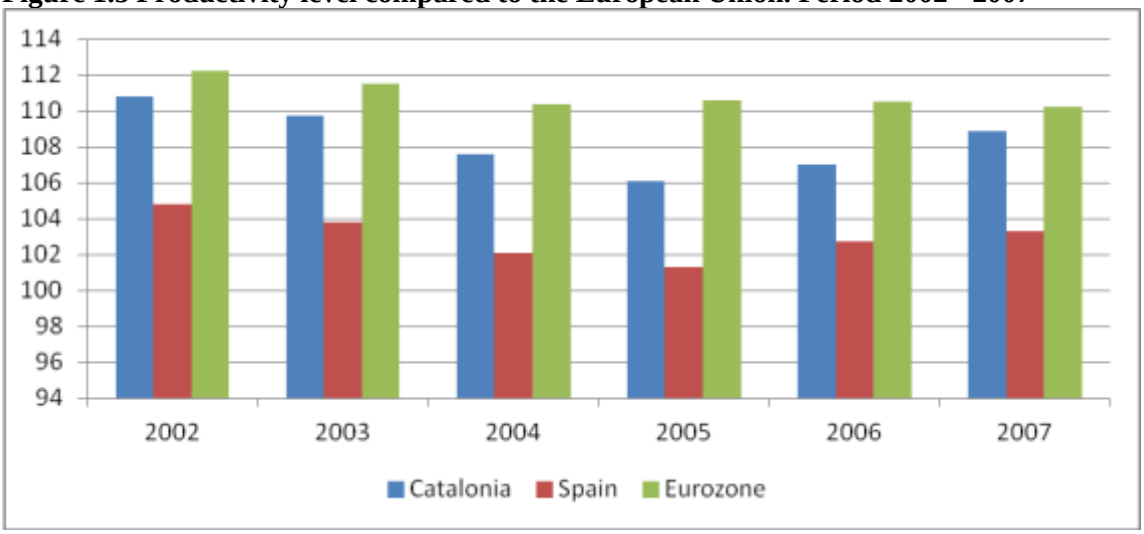
Table 1.3 Evolution of GDP per capita compared to EU and Spain. Period 2000 – 2008

	EU-27 = 100	EU-15 = 100	Spain = 100
2000	126.4	109.7	129.8
2001	126.3	110	128.8
2002	127.9	111.9	127.3
2003	127.7	112.2	126.5
2004	128.1	113.3	126.9
2005	128.1	113.6	125.7
2006	130.2	116	125.2
2007	131.4	117.6	124.7
2008	129.2	116.9	123.9

Source: IDESCAT

66. The productivity in Catalonia measured as the GDP in terms of total employees in the period 2002 – 2007 has been in average a 3% below than the productivity of the Eurozone. This difference has remained constant in the period 2002 – 2007.

Figure 1.5 Productivity level compared to the European Union. Period 2002 - 2007



Note: The euro zone includes the countries that formed part of it in each period: 2002-2006 (12 countries), 2007 (13 countries)
Source: IDESCAT and EUROSTAT

67. The share of GVA of Catalonia on the total GVA of Spain in the period 1995 to 2008 has fluctuated between 18.6% and 19.1% and shows a tendency of convergence towards the average Spanish, as their relative weight has reduced from 1996 until 2008. Despite this reduction, the weight of the Catalan economy still holds a great importance in the Spanish production.

68. The share of the service sector on the total GVA in 2008 reached 67.5%. Traditionally, this is the sector that has had more participation on GVA. On the other hand, the manufacturing sector's share of the total VGA has fallen steadily since 1995, passing from a 26% in 1995 to 19.2% in 2008. The share on VGA of the agriculture, energy and construction sectors has remained relatively constant between 1995 and 2008.

Table 1.4 Relative weight of the economic sector on the total GVA

	1995		2000		2005		2008	
	Catalonia	**Spain**	**Catalonia**	**Spain**	**Catalonia**	**Spain**	**Catalonia**	**Spain**
Agriculture	1.8%	4.5%	1.9%	4.4%	1.6%	3.2%	1.3%	2.6%
Energy	3.4%	3.9%	2.1%	2.8%	2.0%	2.8%	2.0%	2.7%
Manufacturing	26.0%	18.0%	25.6%	18.1%	21.2%	15.4%	19.2%	14.3%
Construction	6.6%	7.5%	7.1%	8.3%	9.8%	11.5%	9.9%	11.4%
Services	62.2%	66.1%	63.4%	66.4%	65.3%	67.1%	67.5%	69.0%

Source: INE

69. Compared to the EU, in Catalonia, the distribution of GVA in the manufacturing sectors shows a greater relevance of the chemical industry, which represents 16% of the total VGA in Catalonia, while the EU average is around 11%. Moreover the share of VGA of the manufacture of machinery and equipment industry is 3.3 p.p. lower in Catalonia than in the EU.

Table 1.5 Distribution of GVA in the manufacturing sector. Comparison between Catalonia and the EU. Year 2005

	Catalonia	**EU27**
Food products, beverages and tobacco	10.9%	12.2%
Textiles; dressing of leather and manufacture of luggage	7.2%	4.0%
Wood and of products of wood and cork	1.4%	2.2%
Pulp, paper and paper products	11.1%	8.0%
Chemicals and chemical products	16.0%	10.9%
Rubber and plastic products	5.1%	4.7%
Other non-metallic mineral products	5.1%	4.5%
Fabricated metal products	13.1%	13.6%
Machinery and equipment n.e.c.	8.3%	11.6%
Electrical machinery and apparatus n.e.c.	7.1%	4.6%
Transport equipment	10.4%	11.1%

Source: INE and EUROSTAT

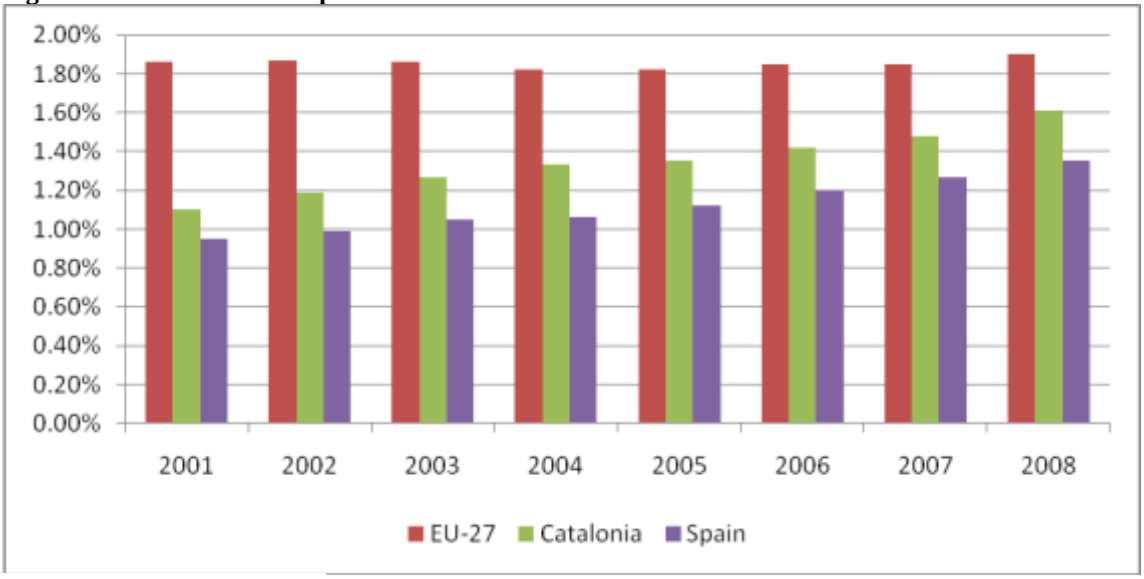
70. The relative weight of sectors of medium and high technology in Catalonia significantly exceeds the Spanish average. While in Catalonia the GVA of the medium and high technology sectors accounted for 7.7% of GVA in 2007 Catalonia, for Spain, this sector represented 4.5%. The difference between Catalonia and Spain in the relative weight of knowledge-intensive sectors increases if we consider only the high technology sectors, which represents 1.8% in Catalonia and 0.8% in Spain.

71. The Business network in Catalonia is characterized by a high percentage of SMEs, These firms represent over 88.5% of the total firms in Catalonia, they employ 20.6% of the workforce and contribute with 21.5% of the GVA. Large firms in Catalonia employ 79.4% of the total workforce and their participation on GVA exceeds 78.6%. The total large firms in Catalonia represent 11.6% of the total enterprises.

72. The Catalan exports have grown steadily during the past 15 years, surpassing 50,000 millions in 2008. High-tech exports in Catalonia represent 13.7% of the total exports, this percentage is lower than the average of the EU, which reached 16.6% in 2006.

73. The gross domestic expenditure on R&D as the percentage of the GDP in Catalonia has shown a rising trend since 2001, reaching 1.61% in 2008. However, this percentage remains below the EU-27 average (1.9%) in the same year.

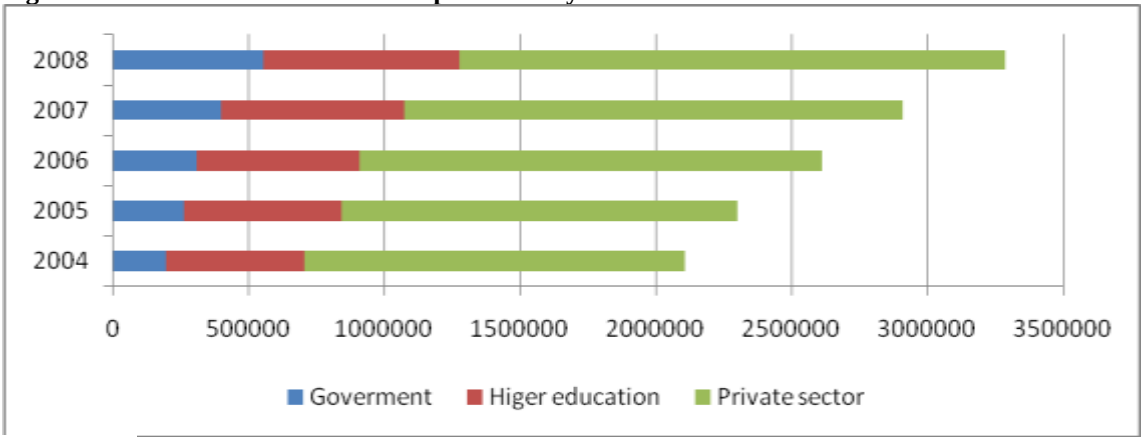
Figure 1.6 Share of R&D expenditures on the GDP. Period 2001 – 2008



Source: INE and EUROSTAT

74. R&D expenditure in Catalonia is a little over 20% of total R&D in Spain. This percentage has remained relatively constant over the past 5 years. The structure of R&D expenditure in Catalonia is characterized by a marked importance of the private sector, which in 2008 contributed with 61.1% of the total R&D expenditure in this region. This percentage exceeds the Spanish average, but is lower than the private sector share of R&D activities in the EU, where in this year the participation of the private sector in the total R&D expenditure reached 64.9%. The higher education sector contributed 22% of the total R&D in the same year, 0.4 p.p. below the UE average.

Figure 1.7 Distribution of the R&D expenditure by sectors in Catalonia



Source: INE

75. Catalonia is characterized by a high entrepreneurial activity, according to the Global Entrepreneurship Monitor (GEM) report, in 2007 the percentage of adult population of Catalonia who was involved in entrepreneurial activities accounted for 8.4% of the total

adult population. This percentage is higher than the Spanish average (7.6%) and the EU average (5.4%). Compared to European Union countries in 2007 Catalonia had the second highest rate of entrepreneurial activity, surpassed only by Portugal, which had an entrepreneurial activity rate of 8.8%

76. According to the CYD Report of 2008, final demand for the university sector in Catalonia in 2006 was 911.7 million Euros, representing 15.8% of the total university demand in Spain. Moreover, the Catalan university sector's impact on the GVA in 2006 was equal to 0.5% and the university sector's impact on total employment was 0.8%, while for Spain the average was of 0.6% for the GVA and 0.8% for employment.

Table 1.6 Labor market indicators. Period 2001 – 2008

	Economically Active population			Employed population			Unemployed population		
	Catalonia	Spain	Ratio*	Catalonia	Spain	Ratio*	Catalonia	Spain	Ratio*
2001	3,092.8	18,050.70	17.1%	2,825.80	16,146.30	17.5%	266.9	1,904.40	14.0%
2005	3,537.1	20,885.70	16.9%	3,291.10	18,973.30	17.3%	245.9	1,912.50	12.9%
2006	3,660.3	21,584.80	17.0%	3,418.70	19,747.70	17.3%	241.6	1,837.10	13.2%
2007	3,756.6	22,189.90	16.9%	3,510.60	20,356.00	17.2%	246	1,833.90	13.4%
2008	3,840.4	22,848.30	16.8%	3,494.60	20,257.60	17.3%	345.8	2,590.60	13.3%

Note: Ratio = Catalonia/Spain
Source: INE

77. The activity rate in Catalonia has shown an increasing trend in the last 10 years, representing in 2008 63.2% of the working age population. Compared to the Spanish average, the activity rate of Catalonia is 3 percentage points above the average of Spain.

78. The working population in Catalonia in 2008 exceeded 3.4 million people and has shown an average annual growth of 2.9% in the period 2001 – 2008. The employment rate has shown an increasing trend in this period, rising from 52.9% in 2001 to 57.5% in 2008. The employment rate in Spain in 2008 was 4.5 percentage points lower than in Catalonia, reaching 53%. Compared to the EU, in 2008 the employment rate in Catalonia was 8.4 p.p. lower than the EU, where the employment rate reached 65.9%

79. The unemployed population of Catalonia in 2008 surpassed 345 thousand unemployed which meant unemployment rate of 9%, 2.5 percentage points higher than that observed in the previous year. The increase in the unemployment rate was also visible in Spain, where it rose from 8.3% in 2007 to 11.3% in 2008. The unemployment rate in the EU in 2008 was 2p.p. lower than in Catalonia. The provisional data from the INE show that the unemployment rate in Catalonia has increased in 5p.p. reaching 16.2% in 2009.

Table 1.7 Evolution of the employment and unemployment rate in Catalonia

	Employment rate			Unemployment rate		
	Catalonia	Spain	EU	Catalonia	Spain	EU
2001	52.9%	47.4%	64.1%	8.6%	10.6%	8.5%
2005	57.0%	52.1%	64.0%	7.0%	9.2%	8.9%
2006	58.1%	53.4%	64.9%	6.6%	8.5%	8.2%
2007	58.4%	54.1%	65.4%	6.5%	8.3%	7.1%
2008	57.5%	53.0%	65.9%	9.0%	11.3%	7.0%

Source: INE and EUROSTAT

80. The distribution of employment between different economic sectors in Catalonia differs slightly from the average Spanish. In Catalonia, the industrial sector employs a little over 20% of the total employed population, and although this percentage has been declining since 2001, it remains well above the Spanish average, which stands at around 17%. The service sector is that which employs most workers in Catalonia, represented 65.4% of total

employment in 2008, while the Spanish average was 68.1%. This sector has presented the greatest increase in the number of workers during period 2001 - 2008, with an average annual growth of 4.8% in Catalonia and in Spain by 4.6%.

81. The weight of employment in the industrial sector in Catalonia over the total employment in this region has dropped by 7.3 percentage points between 2001 and 2008, this reduction is observed in the Spanish average, although in this case, the decline has been of 3.9 percentage points. The weight of employment in agriculture and construction sectors has remained relatively constant during this period. The weight of the agriculture sector has fluctuated between 1.7% and 2.6% in Catalonia and between 4% and 6.5% in Spain, while in the construction sector, the relative weight has remained at around 11.2% in Catalonia and 12.4% in average Spanish.

Table 1.8 Share of occupation by economic sector. Period 2001 – 2008

	Agriculture		Industry		Construction		Services	
	Catalonia	**Spain**	**Catalonia**	**Spain**	**Catalonia**	**Spain**	**Catalonia**	**Spain**
2001	2.6%	6.5%	28.8%	19.7%	10.4%	11.6%	58.2%	62.2%
2005	2.4%	5.3%	23.8%	17.3%	10.6%	12.4%	63.2%	65.0%
2006	2.6%	4.8%	23.1%	16.7%	12.0%	12.9%	62.4%	65.7%
2007	2.2%	4.5%	21.7%	16.0%	12.5%	13.3%	63.6%	66.2%
2008	1.7%	4.0%	21.4%	15.8%	11.4%	12.1%	65.4%	68.1%

Source: IDESCAT

82. In summary, the Catalan economy has a GDP per capita 17% higher than the GDP per capita in the Euro Zone, this percentage has been increasing during the past 10 years. Compared to the EU, the GDP per capita in Catalonia in 2008 was 30% higher than the EU average, however, this gap has narrowed over the past 3 years. The productivity index in Catalonia is 3% below the Euro zone average, this gap has fairly remained constant during the past 5 years. The R&D expenditures in Catalonia in terms of the GDP are 0.3 perceptual points below the EU average. In 2008 the R&D expenditures reached 1.6% of the GDP, while the EU average was over 1.9% in the same year. Nevertheless, the R&D expenditures in Catalonia have shown an increasing trend in the period 2001 – 2008.

CHAPTER 2 CHARACTERISTICS OF THE HIGHER EDUCATION SYSTEM

2.1 The Spanish higher education system

2.1.1 Historical overview

83. Traditionally universities in Spain were under the Napoleonic system in which they were considered as state agencies and totally regulated by state laws and norms. It was not till the 1970s that the Spanish higher education system began to change from an elite system to a mass higher education system (Mora, 2007). The first higher education reform Act (*Ley Orgánica de Reforma Universitaria* hereafter referred to as LRU) was constituted in 1983 after the fall of the dictatorship. Since then the Spanish higher education system has dealt in a relatively short period of time with a variety of issues which other European countries managed in a much longer time frame (Mora, 2000). With the LRU began a profound transformation of the higher education system. The main reforms introduced by this Act were (Mora, 2007):
    - An increase in institutional autonomy implying e.g. that universities were now allowed to establish their own programmes and curricula.
    - Public funds were allocated in lump sums with the freedom to organise the expenditure internally.
    - Professors were no longer part of a national body but were part of the universities they worked for.
    - Responsibility for universities was transferred to the regional governments.

84. The second major university reform Act (*Ley de Ordenación Universitaria*, hereafter LOU) was approved in 2001 and it defined the main function of the Spanish University by declaring that: 'universities carry out the public service of higher education by research, teaching and study activities'. Since then, higher education in Spain is considered a public service that benefits the country socially, politically and economically.

85. The LOU also introduced some major changes such as increasing institutional autonomy, officially incorporating quality assurance mechanisms (establishment of the national quality and accreditation agency) and incorporating an external board in the running of the university (the Social Council) to foster the society-university relationship as an accountability mechanism and to introduce more independence for universities to decide their internal organisation. Regarding quality assurance mechanisms, the law required academic staff to obtain national qualifications before being appointed by the universities and set an obligatory "post-hoc" accreditation of study programmes by the new National Agency for Quality Assessment and Accreditation (ANECA). In addition, the LOU gave more independence to the regions to organise their regional higher education system thus allowing regions to create their own legal frameworks (Catalonia is an example of this as we will see in the next section).

86. The LOU was reformed in 2007 (*Ley Orgánica por la que se modifica la Ley Orgánica*, hereafter LOMLOU) to increase the institutional freedom by allowing universities to design new study programmes thus moving away from the national degrees which had almost identical content in all universities. All new programmes must now undergo an ex-ante quality process by the ANECA.

87. Until March 2009 the Ministry of Innovation and Science (*Ministerio de Innovación y Ciencia*)[1] was the highest governmental agency for higher education. After the latest governmental restructuring in March 2009, higher education is once again under the Ministry of Education[2].

88. The rapid changes over the past three decades have led to some major developments (File, 2006):
    - Rapid increases in access to higher education (mass higher education) with over 40 per cent of the age cohort now entering university.
    - A major expansion in the number of institutions with now 77 universities enrolling more than 1.5 million students.
    - The expansion and diversification of the regulated degree programmes offered and major changes to programme curricula.
    - A significant increase in university scientific production in recent years.
    - The amount allocated for higher education as a proportion of GDP (now within the European average).

2.1.2 Structure of the higher education system

89. Spain's higher education system consists of both university and non-university institutions. In practice, nevertheless, it operates more as a unitary system consisting of universities, rather than a binary system. Non-university higher education consists of: post-secondary higher vocational education (*Formación profesional de grado superior)* and specialised higher education (Art and Design, Sports or Military education). Universities are regulated by specific University Organic Laws while non-university higher education is regulated by the Organic Law on Education, which also regulates pre-school, primary and secondary education and professional certificates for the visual arts and design, advanced art training, languages, sport and adult education. (For further information on the non-university higher education sector see chapter 5, section 3)[3].

90. The university system has doubled the number of institutions in the past two decades, at present it is constituted by 77 universities (50 public and 27 private). According to the Spanish Constitution, universities may be publicly or privately owned. Public universities are established by means of a law passed by the legislative assembly of the concerned autonomous community or through legislation passed in the Spanish Parliament.

91. According to national regulation, a university provides a public service through research, teaching and learning, and its obligations to society are:
    - The creation, development, diffusion and criticism of science, of techniques (technology) and culture;
    - The preparation of students for professional activities which require knowledge, scientific methods and artistic creation;
    - The diffusion, evaluation and distribution of knowledge for culture, the quality of life and economic development;
    - The distribution of knowledge and culture by university extension and lifelong learning.

92. Universities enjoy certain autonomy, from the development of their own statutes to, in the case of private universities, their own organisational rules and functions, as well as other internal rules. University autonomy also includes the creation of specific structures that act

[1] Until March 2008's general elections, known as Ministry of Education and Culture (*Ministerio de Educación y Cultura*).
[2] In a time frame of a few years the higher education sector has been under three different ministries.
[3] The rest of this chapter will focus on university institutions.

as support for research and teaching: the development and approval of study and research plans and specialised teaching for lifelong learning; admission and assessment of students; the issue of official degrees valid throughout the nation, as well as diplomas and own degrees; the management of budgets and administration of assets; and relations with other entities for the promotion and development of institutional goals.

93. The degree structure is undergoing revision to adjust to the requirements of the Bologna Declaration and the formation of the European Higher Education Area (EHEA). Within this framework, university education is to be structured around three cycles:
    - Bachelor (180-240 ECTS)
    - Master (60 ECTS, exceptionally 90 or 120 ECTS)
    - Doctorate (not specified)

94. Universities can offer courses that lead to official degrees valid throughout Spain as well as courses that might not lead to an official title but may be, for example, part of a professional specialisation. To be able to provide official instruction and issue the appropriate titles, the university must have the authorisation of the autonomous community and study plans that are in accordance with the guidelines and conditions set out by the government. This framework reflects recent changes to the LOU (LOMLOU, 2007) that states that "from now on the universities themselves will create and propose […] the teaching and titles they will offer and grant, without being subject to their previous listing in a Government catalogue, as was required until now".

95. Spanish universities are composed by, basically, two staff categories: teaching and research staff and administrative and support staff. Teaching and research staff (or *academic* staff) comprise civil servants in public institutions, and various categories of salaried employee staff (or *non-civil servant* staff). The number of academic staff at public universities was 95 114 in 2006- 07, which reflects an increase of 34% over the previous decade. This increase has been equally strong for civil servants and salaried employees. Civil servant university teachers are regulated by the national government. In 2006-07, some 54.8% persons employed as teaching and research staff at public universities in Spain were civil servants, and 45.2% were employed on a salaried basis. Administrative and support staff (or *non-academic* staff) employed at public universities reached up to 1.557 (OECDb, 2009).

96. Since 2001, non-civil servant staff are also required to undergo an assessment and accreditation evaluation (undertaken by ANECA or the regional quality assurance agency).

97. Private universities have their own staff categories. Accreditation for university professors of private institutions is required since 2002 and undertaken by the national quality and accreditation agency (ANECA).

98. It must be noted that in the last 5 years, student enrolments have dropped approximately 7%, while the number of teachers has increased by 9%. Thus, the student/teacher ratio at public universities has decreased steadily, from 21.6 students per teacher in 1995-96 to 19.9 in 2000-01 and 14.7 in 2006-07 (OECDb, 2009).

2.1.3 Participation in higher education

99. According to OECD data, the overall levels of higher education participation are around the OECD average. In 2006, 43% of a single age cohort could expect to enter a tertiary-type A[4] programme in Spain at some point in their lives, a bit under the OECD average of 56%. For

[4] Tertiary-type A programmes are largely theory-based and are designed to provide sufficient qualifications for entry to advanced research programmes and professions with high skill requirements, they typically last three, four or more years. (OECD, 2002)

the same year, 21% of a single age cohort could expect to enter a tertiary-type B[5] programme at some point in their lives (above the OECD average of 16%).The number of doctoral students has been rising steadily over the past 30 years.

100. The total number of students enrolled in universities dropped 6.4% between 1996-97 and 2006-07, mainly due to a demographic change (Ministry of Science and Innovation, 2007). Enrolment in private universities has, nevertheless, expanded from 4.4% in 1996-97 to 9.6% in 2006-07 of the total number of university students (OECDb, 2009).

101. The total number of students enrolled in Spanish universities in the 2006-2007 academic year was 1 505 100, of whom 93.4% were pursuing a degree in the first and second cycles and 5.5% were doctoral students (5.5%) (OECDb, 2009).

Table 2.1 Enrolment in university according to type of institution and study cycle

	1996 - 1997		2006 - 2007	
Type of programme and university	Enrolment	Percentage	Enrolment	Percentage
Total	1608671	100	1505100	100
Short and long cycle				
Total	1549312	96,3	1405894	93,4
Short cycle	532188	33,1	563468	37,4
Long cycle	999338	62,1	781371	51,9
Only second cycle	17786	1,1	61055	4,1
Public universities	1480881	92,1	1265480	84,1
Short cycle	515709	32,1	511877	34
Long cycle	949698	59	701547	46,6
Only second cycle	15474	1	52056	3,5
Private universities	68431	4,3	140414	9,3
Short cycle	16493	1	51591	3,4
Long cycle	49626	3,1	79824	5,3
Only second cycle	2312	0,1	8999	0,6
Masters programmes			16731	1,1
Doctoral programmes				
Total	59359	3,7	82850	5,5
Public universities	57633	3,6	78758	5,2
Private universities	1726	0,1	4092	0,3

Source: Ministry of Science and Innovation (2007)

2.1.4 System and university governance and regulation

102. Spanish higher education is regulated by an abundant collection of constitutional rules, organic laws and royal decrees. In addition, the governments of autonomous communities can issue complementary legislation within the framework of their own legal powers.

103. The coordination of the university system is performed by two bodies, the General Conference on University Policy (*Conferencia General de Política Universitaria*, CGPU) and the Council of Universities (*Consejo de Universidades*, CU). The General Conference

[5] Tertiary-type B programmes focus on practical, technical or occupational skills for direct entry into the labour market. They have a minimum duration of two years full-time equivalent at the tertiary level. (OECD, 2002)

on University Policy sets out the general directives for university policy; ensures coordination with the EHEA; guarantees links with scientific and research policy; approves evaluation, licensing and accreditation criteria; proposes ways to promote collaboration between universities and the business world; and presents a biannual report on the university system including proposals to improve its quality, efficiency and financial sustainability. The Council of Universities addresses the academic aspects of the Spanish university system. It promotes academic collaboration, co-operation and coordination within the university system; formulates views on university policies which are conveyed to the Ministry of Education, education authorities within autonomous communities and the General Conference on University Policy. Governance of the university system is decentralised. The Minister of Education together with the General Conference on University Policy, establish the national level regulatory framework with general laws and Royal decrees. This role is complemented with additional legislation established by the governments of autonomous communities. The Ministry's role regarding the finance of universities is limited, for it is the autonomous communities that hold this responsibility with the exception of the national system of student scholarships and part of the investment in research and development.

104. Another key player in the development of university policy is the Conference of Rectors of Spanish Universities (*Conferencia de Rectores de las Universidades Españolas*, hereafter CRUE) which was founded as a nationwide non-profit association in December 1994. There is also a University System Board with the representation of all the Spanish Rectors in order to co-ordinate university policy with the central and regional governments. Perhaps its most important role is to give a strong voice to Spanish universities which undoubtedly influence policy developments in the higher education system.

105. The Conference of Social Councils of the Spanish Public Universities (*Conferencia de Consejos Sociales de las Universidades Públicas Españolas*) was constituted in 2004 with the aim to support the activities of the Social Councils, promote the collaboration and Exchange of experiences between the Social Councils, cooperate in the initiatives between universities and society and to promote the role of the Social Council.

106. In a number of autonomous communities the universities of the region have associated to represent their interests. Examples of these initiatives include the Conference of Public University Rectors of Madrid (CRUMA), the Catalan Association of Public Universities (ACUP) and the Andalusian Association of Public Universities (AUPA).

107. Student organisations have not traditionally taken part in educational debates. The Coordinator of Public University Student Representatives (CREUP) is the association with the highest membership (OECDb, 2009).

108. National higher education regulation also determine the establishment of a number of collegial bodies and individual roles:
- Collegial bodies: Social Council, Governing Council, University Senate, School and Faculty Councils and Departmental meetings.
- Individual roles: Rector, Vice-Rector; Secretary General; Manager; Faculty Deans; School, Department and Institute Directors of Research.

109. The Governing Council is the "organ of government of the university". It establishes the programmatic and strategic lines of the university, as well as policies and procedures in the areas of the organisation of teaching, research, economic and human resources and the university budget. The University Senate is the "senior representative organ" of the university community. The Rector presides over it, the General Secretary and the University Manager are members together with a maximum of 300 members elected by academic staff,

administrative staff and students respectively (the three 'sectors') according to regional laws and university statutes but with at least 51% of the members being "civil servant doctors" of the university.

110. The Social Council is the "organ of participation of the society in the university". Its task is the supervision of the economic activities of the university and of the performance of its services, promoting the contribution of the society to the university's funding, and the relations between the university and its social, economic, professional, and cultural environment. The Council also approves the budget and the pluriannual programming of the university, as proposed by the Governing Council. The membership (maximum of 30 members) is regulated by the law of the autonomous region but will be drawn primarily from people from social, labour, economic, professional, and cultural life who are not members of the university community. The Rector, the General Secretary, the University Manager, as well as a professor, a student and a representative of the personnel of administration and services, chosen by the Governing Council from amongst its members will also be members of the Council. The autonomous region will designate the president of the council.

111. The University Senate (*Claustro universitario*) is the "senior representative organ" of the university community (File, 2006). The Rector presides this organ, the General Secretary and the University Manager are members together with a maximum of 300 members elected by academic staff, administrative staff and students respectively (the three 'sectors') according to regional laws and university statutes but with a requirement of at least 51% of the members being "civil servant doctors" of the university. The Senate can revoke the Rector's mandate with one third of the membership and convene an extraordinary assembly to elect a new Rector. The elections of senate representatives to the Governing Council are carried out by and among the members of each one of the eligible sectors. (Article 16, LOU).

112. Faculties elect councils chaired by the Dean. The majority of the members of these councils are teachers or professors with a permanent appointment (civil servants) at the university. In turn, each department is run by a council chaired by the Director and its membership includes holders of doctoral degrees, representatives of the remainder academic personnel, a student representative and a representative of the administrative staff (OECDb, 2009).

113. The Rector is the university's highest authority and representative. His or her office performs the leadership, governance and management of the university; develops guidelines for activities in a range of areas, to be approved by the relevant collegial bodies; and carries out those agreed. He or she is elected by the Senate or directly by the university community as required by the university's statutes (LOMLOU, 2007), which also regulate the election procedures, and the length of his or her mandate. The Rector appoints the Vice-Rectors from the academic staff and the Secretary General from the administrative staff (from those who have an appropriate qualification). The management of administrative and financial services is the responsibility of the Manager. The Rector proposes a candidate with the appropriate qualifications for the Social Council's approval. (OECDb, 2009).

114. Private universities determine their own governance structure and internal rules. However, the representation of the university's different groups needs be assured in each of the internal governing bodies, with a satisfactory gender balance. Bodies with responsibility for academic matters should have a majority of teaching and research staff. Nominations for individual positions also need to consider certain requirements such as, for some positions, holding a doctoral degree.

115. Universities have autonomy within the restrictions imposed by the national and regional regulatory frameworks. A public university is organised in a way that ensures the representativeness of its own communities (*e.g.* academic staff, non-academic staff, students) participate in its governance.

116. In spite of the university autonomy awarded by the different Acts Spanish higher education is still fairly State regulated. The central government, as seen above, holds responsibility of overall coordination of the higher education system, the European and international representation under a unique voice of the Spanish higher education system, and the coordination and control of social policies (scholarships and grants), the rest is under regional regulation, including funding mechanisms and a large part of the quality processes. Due to this there are major differences in the organisation and performance of the different regions, with some regions performing at a higher level than others (Mora, 2007), among these the Catalan higher education system.

2.1.5 Human resource characteristics

117. There are mainly two categories of staff in Spanish universities: teaching and research staff (or academic staff) and administrative and support staff. Teaching and research staff (*Personal Docente e Investigador, PDI*) comprise civil servants in public universities (*funcionarios*), who enjoy nearly unconditional tenure from an early stage in the academic career, and various categories of salaried employee staff (or non-civil servant staff). Civil servant university teachers belong to a nationally regulated category, although they are actually employed and paid by the university they work in (which is under the jurisdiction of its autonomous community). According to OECD data, in 2006-07, some 54.8% of the 93,372 persons employed as teaching and research staff at public universities in Spain were civil servants, and 45.2% were employed on a salaried basis. Civil service academic staff at public universities are divided into the following categories: full professor (*catedrático*), associate professor (*profesor titular* or *catedrático de escuela*, CEU) and college professor (*titular de escuela*, a category designed for teaching in first cycle professional courses)[6]. (OECDb, 2009)

118. Salaried employee academic staff are also divided into several categories, which may vary across autonomous communities. Some have a permanent labour status (a novelty, with specific regulation, since 2002), while others are on fixed-term contracts in the early stages of their academic career. The regulations also provide for some other categories such as associate teachers (who are external professionals hired for specific teaching assignments) and visiting or emeritus professors. Civil servants must by law be more than half the total number of academic staff at each university (in terms of full-time equivalent). (OECDb, 2009)

119. Private universities have their own categories and since 2002 an accreditation for professors at private universities is required.

120. There are 51,557 administrative and support staff (*PAS, Personal de Administración y Servicios*) (or non-academic staff) employed at public universities. Administrative and support staff also have a division between civil servants and salaried employees. Non-academic staff at public universities are carry out administrative and management functions (human resources, administration, financial matters, data processing, record keeping, libraries, laboratory maintenance, information and general services). (OECDb, 2009)

[6] The categories of *catedrático de escuela* and *titular de escuela* have disappeared with the last reform, thus no more positions for these categories are opened.

2.1.6 Funding mechanisms for higher education

121. The funding system of Spanish public universities is based on three main sources:
- Public government subsidies: the autonomous region provides general funding and funding for university investments while the central state provides most grants and scholarships awarded to students.
- Tuition fees paid by students themselves, covering less than 15 per cent of the full cost of university education.
- Funding (public and private) for research activities and other services (knowledge transfer, continuous training, contracts and patents). Public funding subsidies cover the largest part, constituting 85 per cent of total university income. The main public subsidies are: general subsidies usually based on objective input indicators; subsidies of specific nature, dealing with specific characteristics or strategic projects particular to each institution; and finally, subsidies of a competitive nature (which private universities can also apply for), primarily in the area of research funding. Universities also receive public funding for long-term investment plans for infrastructure and equipment.

122. Other recent changes that can be identified in relation to higher education funding are the introduction of formula funding with an emphasis on outputs and targeted national funding as an incentive to foster teaching quality and to promote national and international student mobility.

123. According to OECD data (OECDb, 2009) in 2005, public expenditure on higher education (both on institutions and subsidies to households) was of 0.9% of GDP, the 23rd highest percentage among the 28 OECD countries for which data are available. This level of spending amounted to 2.5% of total public expenditure (the 17th such figure among the 25 OECD countries for which data are available, OECDb, 2009). For the same year, total expenditure on higher education institutions (including private sources) reached 1.1% of GDP, the 23rd highest percentage among 28 OECD countries, an increase from the 1.0% of GDP in 1995. Total spending on higher education institutions grew 14% in real terms between 2000 and 2005 (21st highest growth among the 28 countries for which data are available). More notably, given the slight decline of 7% in student enrolments, total spending on institutions per higher student grew by 23% during that period (the 6th largest growth in the OECD area, OECDb, 2009).

124. In 2005, 91.8% of public spending on higher education was allocated as direct subsidies to institutions, with only 8.2% going to student financial aid. In 2005, the proportion of spending on higher education coming from private households was 18.7% (11th highest share for the 23 OECD countries for which data are available, OECDb 2009).

125. Public funding of higher education is a responsibility of autonomous communities, which leads to differences across communities over approaches to the public funding of higher education institutions. There is a general trend in the different autonomous communities to go from the traditional incremental allocation system to more transparent formula-based models. For the funding of research activities, research staff are required to apply to the wide range of competitive funding programmes available from national, regional and European institutions.

126. Each public university receives from its autonomous community public funds as a lump sum and its budget must be approved by its Social Council which is responsible to oversee its financial activities. In addition, there is a separate provision of funds for infrastructure and for improving facilities by means of multi-year investment plans.

127. Private universities are not eligible for the public subsidy for teaching activities but do have access to some public funding. They can apply to competitive research funds and their students have access to the national scholarship system. Private institutions derive their income almost exclusively from tuition revenues with some exceptions in which students fees cover less than 80 % of its budget.

128. University funding specifically for R&D&I activities relies on three main sources (OECDb, 2009):

- The National Research Plan, designed around a broad set of national priorities. Between 2000 and 2003 the National Research Plan funded 23,859 research projects for a total amount of EUR 4,100 million.
- The 17 Regional Plans for R&D&I, through which regional authorities finance the research and innovation activities performed by universities and technology parks under their jurisdiction.
- The European Union, via participation in the Research and Development Framework Programme calls and specific funding from the Structural Funds and the special European Technology Fund 2007-2013. For the period 2007-2013, Spain is expected to receive around EUR 10 billion to invest in R&D&I activities.

129. Students can apply to three major sources to finance their studies: assistance from their families; scholarships; and part-time and vacation employment. The student financial aid system is relatively modest in Spain. No publicly subsidised or guaranteed loan schemes are available to undergraduate students. At the national level, a single public scholarship scheme is regulated by the central Ministry of Education (ME). Despite the fact that the Constitutional Court awarded full competences to the Generalitat de Catalunya on scholarship policies and management, the competences have, as of yet, to be transferred from the Ministry of Education.

130. The national scholarship system is a scheme of means-tested grants with an academic performance minimum requirement. The conditions, regulations and administration of the scholarship system are the responsibility of public authorities. At a regional level there are specific scholarship schemes which are considered as complimentary to the national one. Despite these schemes, students rely mainly on family financial assistance to cover their study expenses. (OECDb, 2009)

2.1.7 Quality assurance and evaluation in Spanish higher education

131. External quality assurance began with the first evaluation programmes initiated, like many countries, in the early 1990s by the Ministry of Education and Culture.

132. In 2001 with the LOU and amidst the implementation of the Bologna Process, ANECA was established. ANECA was created as a Trust governed by a board of Trustees. The Ministry in charge of universities is by law the state authority above the Agency. The Agency was to continue the activities already in place by the Ministry and to introduce new elements such as accreditation of programmes, service certification and quality assessment of institutions, services and programmes. Apart from the accreditation of the university degrees which can only be performed by ANECA and is done by an *ex-post* process (Vidal, 2003), all other activities can be executed as well by regional agencies (Mora and Vidal, 2000) although no all regions have quality agencies established.

133. ANECA's mission statement declares that,

'the ultimate goal of the Trust is to contribute to the quality improvement of the higher education system through the assessment, certification and accreditation of university degrees, programmes, teaching staff and institutions' (ANECA 2001).

134. The Agency also stresses the need for transparency of public administration; that institutions must be accountable for achieving their aims and must provide feedback to society by publishing reports with evaluation results. The ANECA considers international co-operation as fundamental for the improvement of higher education quality and has actively joined the ENQA[7] and participated in numerous European quality projects.

2.2 Overview of the Catalan higher education system

2.2.1 The regional dimension in the Spanish higher education system

135. Higher education in Spain has strong regional characteristics and sometimes even major differences between Autonomous Communities (Amorós et al., 2001) to an extent that it is often considered that Spain has 17 higher education systems (Mora, 2007). Adapting universities to regional needs may be a positive action but can also bring forth problems. In Spain, the regionalisation of universities has been a very fast and far-reaching process. All 17 Autonomous Communities have their own universities traditionally to cover the needs of the region. This regionalisation process has also brought forth some challenges (Mora, 2007):

- High political influence from governments to universities (and vice versa).
- Increased political value of universities but weakened governmental capacity to steer higher education.
- Little differentiation because of the fact that each region is considered a higher education system (irrespective of the size and number of higher education institutions).

136. Within the university sector, autonomous regions have broad responsibilities for higher education including the creation of public universities and the recognition of private ones; planning and co-ordinating the supply of university study programmes; funding the system of public higher education; and science and technology policies. However, the issuing and standardising of professional and academic degrees; the determination of basic university staff legal regulations (as civil servants); the specification of the internal governance arrangements for public universities; and the general coordination and promotion of scientific and technical research are the responsibility of central government. University autonomy in Spain needs to be understood within this framework.

2.2.2 Overview of Catalonia

137. Catalonia is an Autonomous Community in Spain; it borders France and Andorra to the north, and the Valencia Community to the south and Aragon in the west. It has a population of little over seven million people. In 1986, Spain joined the European Union, where Catalonia proposed the recognition of the role of the regions as a driving force for economic development and social welfare. Today the role of the regions is crucial for the development of the Spanish higher education system as shown in the previous section.

[7] European Association for Quality Assurance in Higher Education.

138. In spite of the strong state regulation, regions, as seen above, have an important amount of autonomy in designing their higher education systems. The central government holds responsibility of overall coordination of the higher education system, the European and international representation under a unique voice of the Spanish higher education system and the coordination and control of social policies (scholarships and grants), while the rest is under regional regulation, including funding mechanisms and a large part of the quality processes. This has conditioned the performance of the different regions, with some performing at a higher level than others (Mora, 2007), among these the Catalan higher education system. Each region has the ability to decide in which areas of public policy it wants to prioritise. In Catalonia higher education and research have become a regional priority in recent years. A number of important initiatives have differentiated the Catalan higher education system from other regions in Spain.

2.2.3 Structure of the Catalan higher education system

139. The university system in Catalonia has grown and developed significantly in recent years, both in terms of quality and size. From three highly consolidated public universities, it has grown to a system of twelve universities. The number of university students has increased (see tabled below) steadily over the past few decades and activity in the areas of research, technology transfer and innovation have substantially gained prominence despite being in a country with little research tradition (Vilalta, 2001).

140. Currently, Catalonia has eight public institutions, four of them located in Barcelona (University of Barcelona - *Universitat de Barcelona (UB),* Autonomous University of Barcelona - *Universitat Autònoma de Barcelona (UAB),* University Pompeu Fabra - *Universitat Pompeu Fabra (UPF),* Polytechnic Universtiy of Catalonia - *Universitat Politènica de Catalunya (UPC)*); one per each of the three remaining provinces (University of Girona - *Universitat de Girona (UdG),* University of Lleida - *Universitat de Lleida (UdL),* University Rovira i Virgili - *Universitat Rovira i Virgili (URV)*) and one distance learning institution (Open University of Catalonia - *Universitat Oberta de Catalunya (UOC)*). Additionally there are four private institutions: University Ramon Llull - *Universitat Ramon Llull (URL),* University of Vic - *Universitat de Vic (UVIC),* International University of Catalonia - *Universitat Internacional de Catalunya (UIC),* University Abat Oliba - *Universitat Abat Oliba (UAO).*

141.

Table 2.2 The Catalan university system

University	***Ownership***	***Region***
University of Barcelona	Public	Barcelona
Autonomous University of Barcelona	Public	Barcelona
Polytechnic University of Catalonia	Public	Barcelona
University Pompeu Fabra	Public	Barcelona
University of Girona	Public	Girona
University of Lleida	Public	Lleida
University Rovira i Virgili	Public	Tarragona
University Ramón Lull	Private	Barcelona
Open University of Catalonia	Public[8]	Headquarters in Barcelona
University of Vic	Private	Barcelona
International University of Catalonia	Private	Barcelona

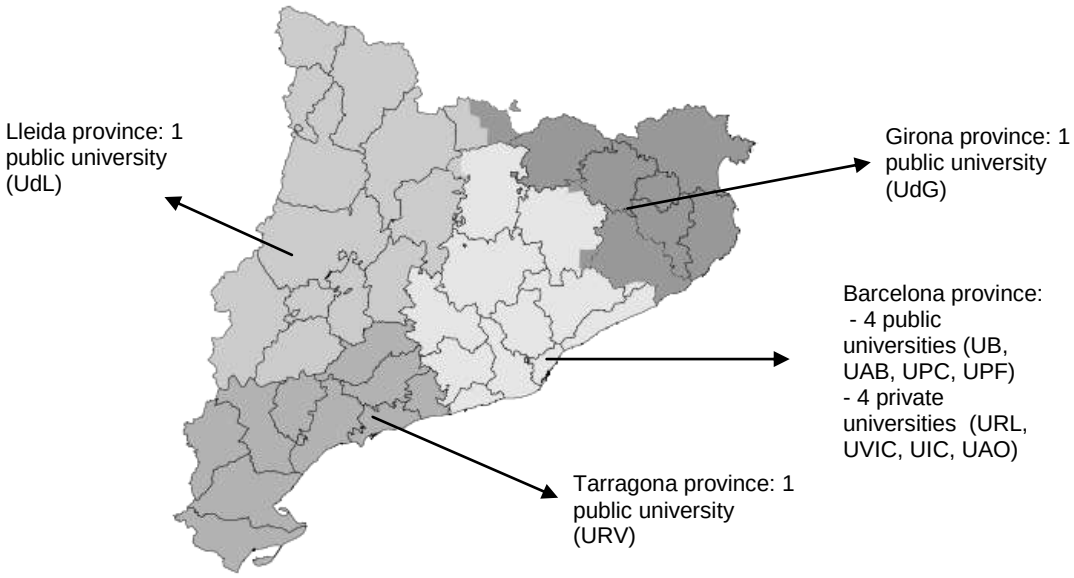
[8] The UOC offers a public service but it is organised and managed as a private institution.

University Abat Oliba	Private	Barcelona

Source: Generalitat de Catalunya

142. Most of the universities are situated in the province of Barcelona, and more specifically either in the city or its surroundings (see figure 2.1. below).

Figure 2.1 Map of Catalonia with universities by province



143. The origins of the current university system in Catalonia date back to the end of the thirteenth century with the University of Lleida (then a "centre for study") founded by King James II. From 1539 to 1620, centres of study or universities were established in Barcelona, Girona, Tarragona, Tortosa, Vic and Solsona. Together with the University of Lleida, these kept operating until the defeat of Catalonia in 1714. Philip V suppressed them all. In 1837 the University of Barcelona was re-established, which incorporated the universities of Cervera and the City of Majorca in 1842, and in 1968 the Autonomous University of Barcelona was founded as an on campus university outside the city centre.

144. In 1851, the Chamber of Commerce schools were integrated into the *Escola Industrial Barcelonesa* (Barcelona School of Industry), which was established by Royal Decree to provide teaching in industry and trade. This and other technical schools that were founded in Barcelona and other cities in the second half of the nineteenth century (Terrassa, Vilanova i la Geltrú, Canet de Mar), came together in 1971 to form the Technical University of Barcelona, which was given its current name of Polytechnic University of Catalonia in 1984.

145. However, it was with the transfer to the Government of Catalonia of jurisdiction for universities in 1985 that the outline of Catalonia's current university system appeared and was extended throughout Catalonia.

146. In 1990, the Parliament of Catalonia established the Pompeu Fabra University in Barcelona. The following year saw the establishment of the University of Lleida, the University of Girona, and the Rovira i Virgili University in Tarragona, successors of the respective centres of study of Girona, Lleida and Tarragona, which had been suppressed in 1714.

147. In 1995, the Open University of Catalonia, was also established upon the initiative of the Government of Catalonia. This is a distance-learning university that provides an innovative approach in higher education through the use of multimedia and interactive technology.

148. In addition to the legislation of the Parliament of Catalonia, different private and public initiatives have led to the creation of other universities that have been recognised by Parliament: Ramon Llull University, in 1991, the University of Vic and the International University of Catalonia in 1997, and the Abat Oliba CEU University in 2003.

149. In total the Catalan universities have approximately 183,000 undergraduate students and over 37,000 postgraduate students. Student enrolment in public universities was 89,6% in the academic year 2008-2009, while student enrolment in private universities was 10,4%, a number that has been increasing in the last years.

Table 2.3 Total number of students enrolled per academic course in Catalan universities

Year	UB	UAB	UPC	UPF	UdG	UdL	URV	UOC	URL	UVIC	UIC	UAO	Total
00-01	60,377	38,250	35,518	8,962	12,836	11,257	12,751	14,837	13,007	3,671	2,324	0	**213,790**
01-02	59,121	37,757	34,724	9,175	12,669	10,487	12,395	21,374	12,657	3,678	2,262	0	**216,299**
02-03	57,582	37,285	33,744	9,370	12,656	9,788	12,404	25,783	12,413	3,643	2,258	0	**216,926**
03-04	55,648	37,157	33,938	9,465	12,416	9,192	12,300	29,988	11,984	3,964	2,291	317	**218,660**
04-05	54,074	36,908	32,627	9,405	12,260	8,766	11,676	33,307	11,909	4,180	2,253	564	**217,929**
05-06	53,230	36,446	32,091	9,557	11,903	8,033	11,673	36,217	12,211	4,438	2,331	762	**218,892**
06-07	53,152	35,773	31,681	9,960	11,870	7,929	11,976	39,398	12,124	4,575	2,732	1,038	**222,208**
07-08	52,327	35,275	30,997	10,305	11,716	8,067	11,855	41,222	12,655	4,498	3,100	1,403	**223,420**
08-09	51,843	35,695	30,288	11,430	11,552	7,880	12,065	42,653	13,647	4,592	3,413	1,729	**226,787**

Source: Departament d'Innovació, Universitats i Empresa

150. The number of academic (teaching and research) staff in public universities has increased steadily and totalled a number of 15,027 employed academic in the academic year of 2008-2009 (see table 2.4. below). Administrative and supporting staff employed by the public universities reached over 8,000 in the academic year of 2008-2009 (see table 2.5. below).

Table 2.4 Total number of academic staff per academic course in public universities

Academic year / University	00-01	01-02	02-03	03-04	04-05	05-06	06-07	07-08	08-09
University of Barcelona	4,057	4,126	4,311	4,267	4,230	4,265	4,302	4,431	4,518
Autonomous University of Barcelona	2,581	2,776	2,791	2,822	2,908	3,082	3,203	3,251	3,345
Polytechnic University of Catalonia	2,258	2,422	2,507	2,611	2,526	2,500	2,483	2,523	2,585
Pompeu Fabra University	842	755	812	836	841	885	949	982	1,076

Rovira i Virgili University	833	955	1,002	1,077	1,098	1,250	1,387	1,447	1,503
University of Girona	801	823	940	936	959	973	1,049	1,090	1,152
University of Lleida	681	674	694	707	732	743	775	829	848
Total	**12,053**	**12,531**	**13,057**	**13,256**	**13,294**	**13,698**	**14,148**	**14,553**	**15,027**

Source: Departament d'Innovació, Universitats i Empresa

151. The UOC, being a distance learning institution, has some special characteristics in their teaching methodology, therefore, the academic staff is comprised presently by 187 teachers and 2043 tutors.

152. The largest private university, the *Universitat Ramon Llull*, had 1,216 academic staff (2009), while the smaller private universities ranged from 200 to 500 per university.

Table 2.5 Total number of administrative staff per academic year in public universities

Academic year / University	**00-01**	**01-02**	**02-03**	**03-04**	**04-05**	**05-06**	**06-07**	**07-08**	**08-09**
University of Barcelona	1,902	2,057	2,072	2,032	2,025	2,066	2,124	2,177	2,294
Autonomous University of Barcelona	1,309	1,352	1,437	1,457	1,522	1,554	1,649	1,699	1,769
Polytechnic University of Catalonia	1,171	1,210	1,333	1,289	1,294	1,363	1,393	1,452	1,584
University Pompeu Fabra	512	556	549	554	560	565	580	635	691
University of Girona	403	414	425	495	513	512	540	547	570
University of Lleida	305	295	292	332	351	409	435	501	473
University Rovira i Virgili	336	412	434	443	491	549	577	637	688
Total	**5,938**	**6,296**	**6,542**	**6,602**	**6,756**	**7,018**	**7,298**	**7,648**	**8,069**

Source: Departament d'Innovació, Universitats i Empresa

153. The student-academic staff ratio has improved in the past years and was 10 to one in the public universities in the academic year of 2007-2008, below the Spanish average of 14.

Table 2.6 Student-academic staff ratio in public universities

Academic year / University	**00-01**	**01-02**	**02-03**	**03-04**	**04-05**	**05-06**	**06-07**	**07-08**
University of Barcelona	12.8	12.1	12.2	11.9	11.3	11.2	11	10.6
Autonomous University of Barcelona	14.2	12.9	13.9	14	12.9	12.2	11.3	10.6
Polytechnic University of Catalonia	10.2	9.3	9.8	9.3	9.6	9.5	9.2	8.8
University Pompeu Fabra	10.2	12.8	13.8	13.6	13.4	13.3	12.4	12
University of Girona	13.1	12.8	11.8	11.3	10.6	10.3	9.6	9.3
University of Lleida	12.3	11.8	11	10.5	9.7	8.9	8.6	7.8
University Rovira i Virgili	14.9	12.8	12.9	12.2	11.8	10.8	9.9	9.5

Total	**12.5**	**11.8**	**12.1**	**11.7**	**11.3**	**10.9**	**10.4**	**10**

Source: Departament d'Innovació, Universitats i Empresa

154. In Catalonia, the research production of scientific articles has increased nearly 70% in the past decade and now represents 2.5% of the total production of the EU-15. In 2006 the Catalan contribution to the overall scientific production for Spain was over a fourth. In this sense, the creation of the Research Centres in the year 2000, which are legally and financially independent from universities allowing for greater flexibility and dynamism, have been very successful in attracting internationally recognised talent and in increasing research outputs (more information on the Research Centres in Chapter 3 and 6).

2.2.4 System governance and regulatory framework

155. As a consequence of the 2001 LOU, in 2003 the Catalan Universities' Act (*Llei d'Universitats de Catalunya*, hereafter LUC) was passed. The LUC regulates the important aspects of the Catalan university system such as the academic staff policies, quality assurance policies, social participation, funding, research and the relations between university and the private sector. It is important to mention that one of the measures to be adopted included a revision of the total budget to increase it gradually up to 30%. This budget increase was a direct response to the need for additional funds for the implementation of the Bologna Process and the shifts of priorities now focused more on research and innovation in line with the Lisbon goals. These funding improvements were to impulse the development of an improvement plan for the academic mission, the research and knowledge transfer mission and the third mission (the relation between the university and society) which should be articulated as a continuation, discussed and improved, of the previous strategic plans convened with the department in competency of universities (Vilalta and Gavaldà, 2007). These improvements also included a plan to develop the administration, efficiency and effectiveness of the universities to be developed in four phases (diagnosis of the actual situation, planning, implementation and revision) (Vilalta and Gavaldà, 2007).

156. The department in charge of higher education issues in the Catalan government which acts like a Ministry but at the regional level. Since 2006 it is the Department for Innovation, Universities and Enterprises (*Departament d'Innovació, Universitats i Empresa*). Inside this department, there is a specific Commission for Universities and Research (*Commissionat per a Universitat i Recerca*). This Commission represents the Department in university and research issues. It is in charge of directing, planning and executing policies in these areas.

2.2.5 Funding mechanisms in the Catalan higher education system

157. Since the Catalan government was delegated, among other competences, the control of allocating funding to the universities in the autonomous community of Catalonia, there has only been one University Act, the LUC, passed in 2003. Title V of this the LUC describes the basic instruments for organising the Catalan university system, namely, the Catalan University Plan and the University Funding Programme. Three kinds of funding mechanisms are envisaged: general, complementary (by means of contract programmes) and open competition.

158. The basic principles behind higher education funding are those of equity, sufficiency, efficiency and effectiveness. The LUC came with a commitment to significantly increase public funds for the higher education system; from 2003 to 2010 the amount of funding for higher education and research destined to universities up to 30%. During the period of

2003-2006 the Catalan government improved this prevision to stimulate university research and created a specific programme to this effect, Programme to Foster Research (PROFOR).

159. The Ministry of Education and Universities, the Ministry of Economy and Finances and the public universities of Catalonia (except the UOC who has a differentiated system) signed a new funding plan on October 10th, 2006 (see table 2.7. below). This funding plan anticipated that in 2010 universities would almost double their ordinary public funding in comparison to the situation in 2003. This would provide more funds for research, with the aims of integrating university staff in research programs and securing higher levels of external resources.

160. Furthermore the Generalitat, as a response to the EU objective to dedicate 3% of GDP to R&D activities and to impulse the implementation of the EHEA in Catalan universities approved an additional allocation for the period 2007-2010 conditioned to the accomplishment of strategic objectives. According to this agreement, between 2007 and 2010, the public funding of the universities would grow from €523 million in 2003 to €1,032 million in 2010 - a growth in real terms of 56% in 8 years, practically double that predicted in the 2003 Catalan Universities Law. However, a major part of this additional funding has as of yet not been transferred to the universities creating uneasiness among the public universities and some financial problems.

Table 2.7 Funding resources for Catalan public universities

(millions €)	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**
Prevision LUC	522.9	559.5	604.3	652.6	698.3	747.1	799.4	855.4
Special research agreements	7.3	7.7	8.3	8.7	9.1	9.3	9.8	10.3
Ordinary improvements (2004-2006)		19.2	2.4	21.0				
Additional improvement (2007-2010)					57.0	90.9	130.4	176.2
Not conditioned					40.0	40.0	40.0	40.0
Conditioned to objectives					17.0	50.9	90.4	136.2
Total	**530.2**	**586.4**	**615.0**	**682.3**	**764.4**	**847.3**	**939.6**	**1041.9**

Source: Departament d'Innovació, Universitats i Empresa

161. Additionally there has been an increase in targeted national funding for increasing teaching quality and for national and international student mobility as well as a rising importance of competitive research grants at regional, national and European levels.

162. Since 1997 a portion of university public funding is objective-based through a contract – programme mechanism. This has meant a substantial modification of the approach to co-ordination and funding of the university system more than the magnitude of the measure itself. The Catalan Autonomous Government agreed to study, in conjunction with the universities, a new system to complement the one already in place, based on the setting of objectives for the universities, assessment of the results obtained and result based funding. It was conceived as an additional mechanism to the existing basic funding system. In fact, the percentage of overall funding for universities provided through programme contracts

began very low (about 2% of total funding at present) but it has since increased yearly. Subsequently in 2000 and 2002 the objective-based funding mechanisms were reformed with the aim to improve the previous ones by systematising the use of the contract programmes and introducing competition for funding that would in theory increase competition and therefore efficiency and quality in some priority areas such as research and new teaching methodologies (Vilalta, 2001).

Box 2.1 Programme-contracts – an objective-based university funding mechanism

In 1997 four-year programme-contracts were introduced; a funding rationale based on set objectives. This meant a substantial modification to the approach of co-ordination and funding of the public university system more than the magnitude of the measure itself. The Catalan Autonomous Government agreed to study, in conjunction with the universities (starting with the Polytechnic University of Catalonia), a complementary system based on the setting of objectives for the universities, assessment of the results obtained and result-based funding. It was conceived as an additional mechanism to the existing basic system of funding (the percentage of overall funding for universities provided through programme-contracts began very low, about 2% of total funding at present, but has increased yearly to 13% in 2010). In 2002 some changes were introduced to increase competition and therefore efficiency and quality (Vilalta, 2001). The funding allocation was then divided into:

- Fixed funding, equal for all universities, covering the minimum structural expenses necessary for their operation.
- Basic funding, which provides resources for their ordinary academic activity and related operating expenses. Based on common objective parameters.
- Derived funding, for expenses stemming from employment of teaching and research staff.
- Strategic funding linked to quality objectives in relation to university strategy.
- Competitive funding, for certain measures, particularly research.

The programme-contracts (File, 2006) establish specific objectives in four common strategic areas: teaching (education and the learning process); research and technology-knowledge transfer; university-society relations (the third mission of the university) and internal university organisation and management to improve quality and accountabilty (with pluriannual time scales enabling definition of mid-term policies and plans spanning more than a single academic year). They evaluate the extent to which the objectives are achieved by means of pre-established indicators, mainly quantitative in nature. In addition they determine specific public funding according to the degree to which the objectives are achieved. Finally, they include provision for annual revision of the objectives, in accordance with an evaluation of the results of the contract, the development of the government's higher education policy and the priorities of the universities themselves (File, 2006).

These programme-contracts set very ambitious objectives which are challenging and entail the following negative aspects and/or possible dangers (Vilalta, 2001) such as: annual revision can lead to no-win negotiation by attrition in a context of crisis or inter-institutional mistrust; it may develop into a mechanism for extreme competition between universities; the determination of the proportion of basic funding to objective-based funding (programme-contract); problem of budget restrictions under conditions of austerity; problems in defining (common) indicators; and it does not take into account equity factors as it is institutionally focused.

In this sense, the contract-programmes have proven to be a very interesting experience for the funding of universities (Vilalta & Gavaldà, 2007) and the levels of achievement of the set objectives have been between 85% and 95%. This mechanism also provides for the appropriate penalties (no funding or partial funding) in the event that the university fails to achieve, or only partially achieves, the agreed objectives (Vilalta, 2001). These output-based mechanisms were the first step towards institutional competition and efficient planning by the universities. It obliged them to design the objectives, the budget necessary for achieving them always with the risk of a penalization. Since the contract programmes where established in all the universities they have become a strategic instrument for management and quality improvement in the Catalan universities.

2.2.6 Quality assurance and evaluation in Catalonia

163. As for quality, the Catalan Agency for Quality (AQU) was constituted in 1996, years before the ANECA[9], with the aim of promoting the improvement of quality in the Catalan university system (File, 2006). It was legally conformed as a consortium which included the Rectors and the Presidents of the Social Councils of the public universities and the Generalitat. Like ANECA they are independent bodies. In the succeeding years AQU Catalunya developed rapidly and has achieved European and international recognition (File 2006:48). It is also a founding member of the ENQA (and together with ANECA the only two Spanish agencies that have been granted membership of ENQA) and REACU[10] and was accepted in the EQAR[11] in the first round. Under the Catalan University Law of 2003 AQU Catalunya is considered as the main mechanism for the enhancement and evaluation of quality. It has created three commissions: evaluation of candidates for professional posts, quality evaluation and research evaluation.

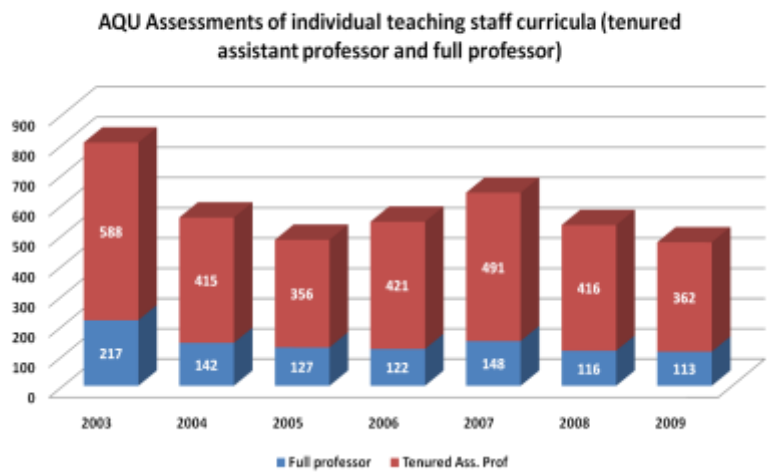
Box 2.2 Agència per la Qualitat del Sistema Universitari de Catalunya (AQU) – the regional quality agency

The regional quality agency of Catalonia (AQU Catalunya) was established in 1996 to promote the quality and continuous enhancement of the university system in Catalonia, and as such, was the first quality assurance agency to be set up in Spain. It was legally conformed as a consortium which included the Rectors and the Presidents of the Social Councils of the public universities and the Generalitat. Its activities focused on the design of review methodologies and evaluation management, mainly within the scope of university degree programmes.

The passing of the Catalan Universities Act (LUC), in 2003, extended its scope of action to the certification and accreditation of institutions and university teaching staff. It was conformed as a public-law entity of the Generalitat de Catalunya which adjusts its activity to private law. Thus the agency has its own legal personality, full capacity to act, and its own assets for the performance of the functions that are attributed to it. Under the Catalan University Law of 2003 AQU is considered as the main mechanism for the enhancement and evaluation of quality. It has created three commissions: evaluation of candidates for professional posts, quality evaluation and research evaluation.

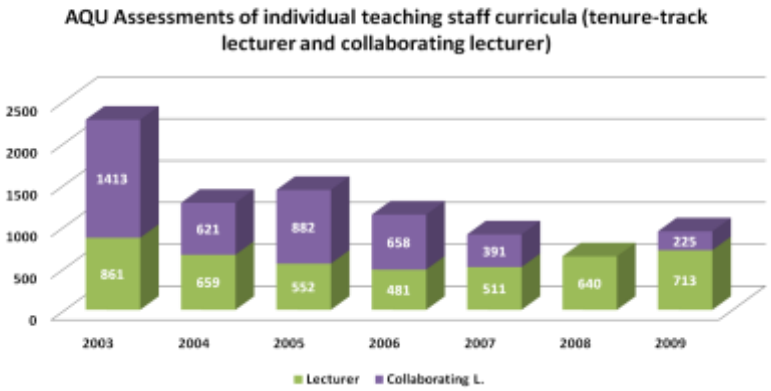
Figure 2.2 Individual and teaching staff curricula assessments from 2003 to 2009

[9] But after the National Commission for Quality established in 1995.
[10] The Spanish Network of University Quality Agencies the purpose of which is to promote inter-agency collaboration to contribute to establishing the conditions for the mutual recognition of their evaluation processes.
[11] European Quality Assurance Register for Higher Education.



Source: AQU Catalunya

Figure 2.3 Individual teaching staff curricula assessments from 2003-2009



Source: AQU Catalunya

In the succeeding years AQU Catalunya developed rapidly and has achieved European and international recognition (File 2006:48). It is also a founding member of the European Association for Quality Assurance in Higher Education (ENQA) and REACU[12] and was accepted in the European Quality Assurance Register for Higher Education (EQAR) in the first round.

The Catalan University Quality Assurance Agency, AQU Catalunya, is the main instrument for the promotion and the evaluation of quality in the Catalan higher education system.

2.2.7 Recent regional higher education initiatives

164. A recent interesting bottom-up initiative in relation to the Catalan public higher education system is the publication of *The White Paper of the University of Catalonia.* The *White Paper of the University of Catalonia* is a bottom-up project stemming from the

[12] The Spanish Network of University Quality Agencies the purpose of which is to promote inter-agency collaboration to contribute to establishing the conditions for the mutual recognition of their evaluation processes.

eight[13] public universities in Catalonia. In 1997 these eight public universities of Catalonia joined forces and created the Catalan Association of Public Universities (ACUP) and with it a common brand: *University of Catalonia*. This university co-operation arises as a response to the massification of higher education in the last two decades and the increasing international competition of the higher education sector. In June 2008, the ACUP presented the *White Paper* to all the actors in the Catalan and Spanish higher education system. This *White Paper* expresses the vision that the Catalan public universities have on their role in and for the Catalan society and is meant to be an objective in itself. The White paper consists of eleven chapters, 64 strategies and 73 projects to achieve the goals outlined.

165. The rationale behind the *White Paper for the University of Catalonia* is, according to the ACUP, the call upon universities to play a pivotal strategic role in the changing of society and the knowledge economy through three main channels: university education, scientific research and social progress, and last but not least, collective welfare and competitiveness (ACUP, 2008).

Box 2.3 The University of Catalonia – The White Paper

The public university system in Catalonia has undergone significant changes in the past decade. A major development has been the association of the Catalan public universities under a common brand - *University of Catalonia* - and with a strong and challenging proposal to improve the university system - the *White Paper of the University of Catalonia* (2008).
In 2004 the eight public universities of Catalonia (UB, UAB, UPC, UPF, UdG, UdL, URV, UOC) joined forces and created the *Associació Catalana d'Universitats Públiques* (ACUP) and later in 2008 a joint brand - *University of Catalonia*. This university cooperation arises as a response to the massification of higher education in the last 10-15 years and the increasing international competition of the higher education sector. The *University of Catalonia* is, therefore, a reaction to the need for a joint approach in ensuring the continuation of the country's progress and development and an increased role in the European society of knowledge.

Catalan public universities are highly committed to the social, cultural and economic development of Catalonia. Their will and aim is to provide quality university training and research, the base of a knowledge economy and society.

In June 2008, the ACUP presented the *White Paper of the University of Catalonia* to all the actors in the Catalan and Spanish higher education system. This *White Paper* expresses the vision that the Catalan public universities have on their role in and for the Catalan society and is meant to be an objective in itself. The *White paper* consists of eleven chapters focusing on aspects such as institutional autonomy, quality assurance and accountability; integration into the EHEA: research production and knowledge transfer; the role of the university for regional development and innovation; generation of equity and progress; good governance and efficient management and objective based funding mechanisms. In addition the *White Paper* identifies 64 strategies and 73 projects to achieve the goals outlined. Presently, the ACUP is developing and working on 14 projects of the *White Paper*.

2.3 Concluding comments

166. As seen all along this chapter, Spanish higher education is characterised by strong national regulation but also for having specific competences and policy space for the regions to develop particular policies, laws, etc. adjusted to their regional priorities and needs. In this sense, higher education institutions are seen as a driving force for improvement at individual, social and overall economics levels in the region.

[13] UAB, UB, UPC, UOC, UPF, UdG, UdL and URV

167. In Spain, the regionalisation of universities has been very fast and far-reaching process (Mora, 2007) turning universities into highly valued organisations by politicians due to their social relevance.

168. In the case of Catalonia, the higher education system consists of an important number of higher education institutions (including the private sector and the non-university higher education institutions) that provide different services and/or outcomes to the region. Such as educational services to the region's population, a stimulation of research activities and have, as of the last decade, augmented their local and regional impact through (as one illustrative example) the Scientific and Research Parks that link the activities of the universities with those of the private sector.

169. Relations between universities are both based on competition and co-operation. Competition takes place between universities principally for financial resources and students. Co-operation, in the Catalan case, especially among the public institutions, takes place under the framework of the Catalan Association of Public Universities (ACUP) by which, among other activities, they work to increase the overall international visibility of the *University of Catalonia* and jointly decide upon common positions regarding key policy issues.

170. There have been some specific policy initiatives that have stimulated the regional role of universities and at the same time have provided a space for collaboration between universities, the industry sector, the government and the civil society. Among these initiatives two can be mentioned as examples. The first one is the *Pacte Nacional per la Recerca i la Innovació* (Catalan Agreement for Research and Innovation, CARI) which fosters research and innovation understanding that universities have a crucial role in this area, but also including many other stakeholders from the private sector, the regional authorities and the civil society. The second policy initiative, as mentioned earlier, is the *White Paper of the University of Catalonia* that includes a strong regional dimension in its vision for the Catalan higher education system and calls upon different stakeholders to accomplish its objectives for the benefit of Catalonia. Some policy tensions can be found when the regional role of universities conflicts with the objective of international excellence. However so far, the regional role is still predominant. There is also a differentiation between teaching and research activities, the first more oriented to students of the region (especially in undergraduate courses) and the second more oriented towards achieving excellence and national and international recognition (a policy example is the financial incentive for academics to increase their research productivity).

CHAPTER 3 CONTRIBUTION OF RESEARCH TO REGIONAL INNOVATION

3.1 Introduction: main features of HEIs research in Catalonia

171. Higher education institutions and specifically universities play a key role in the Catalan research and innovation system. In recent years they have improved their efforts devoted to R&D and the level of scientific outputs significantly. Furthermore, universities have taken actions to improve transfer of knowledge and their relationships with firms. Nevertheless, the figures show that there is still room for improvement in the development of the "third mission". In addition, in a context of increasing competition among universities in the world to attract researchers and students it would be convenient for Catalan universities to improve their performance and get better positions in the different university world rankings.

172. The increase in university R&D expenditure has been significant in recent years and they contribute to 23.3% of the total Catalan expenditure in R&D (INE, 2008). Currently the R&D effort is close to the average level of OECD countries (0.34% of the GDP compared to 0.38% in the OECD, in 2007). Over 90% of this expenditure is carried out by public universities, and among the private universities, the most remarkable in research is the URL. HEIs also concentrate a high proportion of the researchers with 42% of the total number of researches in Catalonia, slightly higher than the 41% corresponding to the private sector. Nevertheless, other figures show a less positive picture; for instance the number of technicians is quite low and the amount of R&D expenditure per university researcher is significantly below the advanced European countries.

173. This dynamism of research in HEIs has been reflected in a very significant increase of the number of publications. The scientific production of Catalonia has been growing continuously in recent years and currently stands at approximately 1% of the total world scientific production. HEIs are the main institutional sector publishing more than 60% of all publications. Catalonia produces more than the 25% of total Spanish publications, a percentage clearly above the proportion of the total population. This dynamism has also allowed the participation in the European R&D Framework Programmes to be improved. Particularly, the figures of the returns obtained in the 7th Framework Programme and in the European Research Council grants are very positive, which shows the ability of Catalan universities to capture funds from competitive calls.

174. In some specific areas, university research has been able to achieve international excellence. These are the cases of some fields of knowledge such as biomedical research and clinical research that contribute with more than the 50% of the whole scientific documents. This research is carried out in close relationships with the main hospitals in Catalonia. Currently, the first three hospitals more active in research in Spain are located in Barcelona. Furthermore, Catalan universities and research centres have been able, with the support of public policy as the ICREA Programme, to attract high level qualified scientists. Nevertheless, in general the position of Catalan universities, although better than most Spanish universities, in the world university rankings is quite low. Although rankings should be considered with care, in the well-known Shangai ranking, the University of Barcelona is the Spanish university best positioned in 2009 despite that it is located among the 152-200 top universities. Two other Catalan universities, the UAB and the UPF, are also among the top 500 world universities.

175. Catalan universities are playing an increasing role in "third mission" activities in the field of knowledge transfer and relationships with firms. All public universities and the URL, a private one, have a Technological Transfer Office so-called *Oficina de Transferencia de Resultados de la Investigación (OTRI)*. The industry funding of university

R&D expenditures is above the OECD average and the R&D contracts between universities and firms have increased. Furthermore, the number of spin-offs and of university patent applications have also increased being the Polytechnic University of Catalonia the first university in Spain in the number of patent applications. Nevertheless, some weaknesses are the low mobility of researchers and the incorporation of PhDs in firms, the co-operation between universities and firms, especially SME, is still not very frequent and that the technological level of the agreements between universities and firms is quite low. In addition, other indicators, such as the incomes by licenses of patents are very far from advanced countries.

3.2 Responding to regional needs and demands

176. HEIs research policy in Catalonia does not have an explicit regional dimension and it is more oriented to achieve international excellence. In this sense there are no specific incentives for researchers to reward regionally-based research. The main individual incentives for researches, established at a national and a regional level, are the so-called *sexenios*. The *sexenios* are a complement of the salary that is given, after an evaluation by a national Agency (CNEAI, National Commission of Evaluation of the Research Activities), to researchers that have published in highly-cited journals. Furthermore, in competitive calls for research projects, both at a national and a regional level, one of the main criteria to evaluate the applications are the number and the quality publications of the research coordinator and the rest of the team.

177. Although the regional dimension is not explicitly considered, some facts and policies show the relationships and the commitment of the HEIs with regional needs and demands. Firstly, as have been presented in the chapter two, in the late 1980s and 1990s a considerable expansion of the Catalan university system took place with the creation of new universities such as the URV (Tarragona), UdL (Lleida) and UdG (Girona). This expansion has led, from a territorial point of view, to a redistribution of university research activities and has favoured the innovative capacity of the territory in which the universities are located. This process, nevertheless, is not exempt of criticisms mainly related with the fragmentation and lack of specialisation of Catalan HEIs.

178. Secondly, as it is described in more detail below, there are an important number of mechanisms to transfer knowledge and to foster relationships between universities and firms. Examples of these mechanisms are the technological transfer offices (OTRI), the science and technology parks, the network for technological innovation support (XIT) or the network to facilitate the creation of spin-offs (XTT) among others. In addition and although the lack of data limits a comprehensive analysis for all Catalan HEIs, the available information (CRUE, 2008) shows that university contracts in R&D consulting and services with regional agents, represent a significant percentage of the total contracts. For instance, in the URV it reaches an 86% and in the UdL a 71%. Another remarkable example is the influence of IQS (Chemical Institute of Sarrià, URL) in the development of the chemical industry, one of the most important in the Catalan industry added value.

179. Thirdly, some recent initiatives of collaboration among HEIs show the purpose of increasing commitment with the "third mission". The ACUP (Association of Catalan Public Universities) issued a White Paper in 2008 defining new strategies and explore a new model for Catalan universities proposing a joint brand "University of Catalonia" (ACUP, 2008). In this model, the activities related with the third mission play a significant role. In relation with the contribution of research to regional innovation the main strategies proposed are to promote stronger research management skills, developing a model based on the third mission and promoting it among staff and in university funding target and promoting innovation through science and technology parks.

180. Fourthly, the new Catalan Strategic Agreement to Promote International visibility of the Catalan Economy, the Strengthening of its Competitiveness and the Quality of Employment for the period 2008-2011 (Generalitat de Catalunya, 2008), which is described in the VI chapter of this report, states as one of its main lines of action the objective of moving towards an entrepreneurial university that fosters the transfers of technology and knowledge. To fulfil this objective it is planned to establish a system of incentives to promote the third mission of the universities, linking a percentage of public funding of the universities to the results of the transfer of technology and knowledge to business.

181. Finally, the Catalan Agreement on Research and Innovation (CARI) achieved in 2008 is a remarkable example of the collaboration between the regional Government and Catalan universities. The CARI is an agreement between the Government of Catalonia, the political parties with parliamentary representation, the Catalan universities, the business associations and trade unions and it is the main framework for the definition of research and innovation policies in Catalonia (Generalitat de Catalunya, Ministry of Innovation, Universities and Enterprise, 2009).

182. The CARI has a broad-based vision of innovation and envisages Catalonia becoming an international reference area for research and innovation in 2020. The CARI defines as one of the eight challenges for research and innovation policy to have an own strategy for Catalonia and to focus on and prioritise research and innovation in its socio-economic and scientific-technical needs, challenges and opportunities. To achieve this challenge several objectives are proposed; among them there is the objective to design and develop a regional strategy for specialisation in science, technology and innovation that will be developed in the specific Research and Innovation Plans. This may lead to a more oriented regional dimension of HEIs research policy, although the main objectives of the CARI continue to be more related with international excellence.

183. HEIs have research links and collaborations with regional agents and firms trough different ways and systems. The main procedure are the OTRIs and trough the networks and programmes supported by the regional government and specifically by ACC10. ACC10 is the public Agency (Business development and external promotion) of the Catalan Ministry of Innovation, Universities and Enterprise (DIUE) responsible, among other policies, for the implementation of innovation policy. ACC10 supports and coordinates two university technology transfer networks (XIT and XTT) to foster the links between universities and firms, the main features of which are presented further on.

184. In addition, ACC10 gives support to other agents more closely related with the industry as the Technological centres. These centres are mainly oriented to the transfer of technology and to give advice and solve technological problems of small and medium enterprises. The regulation of these centres states that although they are managed by representatives of business associations, universities have to participate in the management board of the centre. With the participation of the university, the Catalan government pursue to increase the technological level of these centres and to facilitate the relationships between universities and industry.

185. ACC10 has also developed other actions to foster the relationships between universities and firms. The main current R&D subsidy programme of ACC10 is oriented to the creation of partnerships between firms but with the participation of public research centres and universities to develop R&D projects of some dimension and at least with a budget higher than 600,000 euro. In the last call of 2008 more than 30 partnerships were approved with a subsidy percentage around 40%. Another action, although in a very preliminary stage, is the development of territorial innovation systems. In this case the main objective is to foster the

design and implementation of innovation plans for some small territories increasing the coordination and links among the different agents, including the universities.

186. The universities have also links with other research agents of the region. For instance they are involved in large scientific infrastructures, in the research centres sponsored by the Catalan government and with the Catalan Institution for Research and Advanced Studies (ICREA).

187. Catalonia has large scientific facilities created principally with the support of the national and regional government. With these infrastructures, the objective is to increase the scientific and technological capabilities of Catalonia and the possibility for the scientific community to use these facilities to develop excellent research projects. Some remarkable examples of these facilities are the Barcelona Supercomputing Centre with the participation of the UPC, the CESCA (Centre of Supercomputing of Catalonia) where all the public universities and the URL participate and the CELLS (Synchrotron Light Laboratory), with the UAB.

188. The Catalan government has been very active in sponsoring the creation of research centres with the aim to increase the research capabilities. Currently there are 39 centres, under the programme CERCA, that employ more than 3,000 people (researchers, administrative staff and PhD students). There are centres in most of the scientific fields (a detailed list is available in the webpage of the DIUE, in the programme CERCA) and have an independent status, with a private management model and external scientific committees. Nevertheless, they are independent from the universities, and in all cases one or more university is involved which facilitates cooperation between both agents but also some tensions (see boxes 3.1 and 3.2 with two examples of research centres).

189. Finally, as is presented in chapter 6, the Catalan government and the Catalan Foundation for Research and Innovation promoted the creation of ICREA, a programme aimed to attract top scientists. This programme started in the year 2000 and has been very successful. The researchers carry out their work in universities and in research centres, with which ICREA has collaboration agreements.

Box 3.1 Institute of Photonic Sciences (Institut de Ciències Fotòniques, ICFO) (Polytechnic University of Catalonia, UPC)

The **Institute of Photonic Sciences** (ICFO) is an independent, non-profit, permanent research centre established by the **Generalitat de Catalunya,** the **Department of Universities and Research**, and by the Polytechnic University of Catalonia **(UPC)**. ICFO was launched in March 2002, with the mission to conduct wide-scope, basic and applied research in several branches of the Sciences and Technologies of Light, at the highest international level. The centre has three main missions: education, research and the generation of economic development and wealth.

- In research: The centre aims to concentrate a critical mass of research members and associated staff to conduct cutting-edge, wide-scoped research ranging from telecommunications and information technologies to biotechnology, and including remote sensing, quantum information, and industrial photonics.
- In education: One of ICFO's main missions is to train PhD students through courses, seminars, accessibility to cutting-edge experimental infrastructures, and the tutorage of researchers that are among the best in the world in their field. This training addressed to talented students will equip them with unique capabilities that will help them become future leaders, either in the academic or in the industrial world.
- In economic development and wealth generation: The centre is highly proactive in establishing working partnerships with industrial corporations, and fostering spin-off creation by research members. The centre participates in incubator activities and seeks to attract investment venture capital.

ICFO is supported financially by the founding institutions, and by competitive projects from national and international funding agencies and private institutions and enterprises. The centre collaborates with over a dozen hospitals, local health centres, biomedical research centres and private companies acting as a hub for the biomedical community and putting at their disposal the *know-how* and the most advanced technologies.

Box 3.2 Computer Vision Centre (Centre de Visió per Computador, CVC)

The Computer Vision Centre is a non-profit institution and leading research and development centre in the Computer Vision field. It was established in 1995 by the Generalitat de Catalunya and the Autonomous University of Barcelona with the purpose of generating quality knowledge in the field and transferring added-value technology to the industry and to society.
Since its foundation it was created with an R&D model where research and development collaborate to facilitate knowledge transfer generated in the private sector. Its aim is to foster knowledge transfer between universities and the private sector by providing computer vision and engineering solutions where needed for their activities. These activities have had an important impact seen in their research results and their contribution to the economy and development of the region and Spain. CVC has worked with more than 100 Catalan and international companies located in Catalonia and it has created seven spin-offs and a high number of patents. On account of its good practices, the CVC has positioned itself as an authority in the Computer Vision field and is regarded as a reference of knowledge generation for society.

3.3 Framework conditions for promoting research and innovation

190. The framework conditions for promoting research and innovation are established both at a national level and a regional level. In addition, European Union policies for promoting R&D and innovation have to be taken in account.

3.3.1 Spanish R&D and innovation policies

191. At a national level, there are two main and complementary plans, the initiative INGENIO 2010 and the current National Plan for Scientific Research, Development and Technological Innovation 2008-2011. The INGENIO 2010 initiative is part of the National Reform Plan (*Ministerio de la Presidencia*, 2005) that was launched in 2005 with the objective to increase the competitiveness of Spain. Among their measures, the main policy instrument to improve the research and technological level of Spain is INGENIO 2010 that contains a number of instruments, the CENIT, CONSOLIDER and AVANZ@.

192. The main one to encourage the relationships between firms and universities is the CENIT strategic programme aimed at promoting public-private partnerships for R&D projects. This programme is managed by the CDTI (*Centro para el Desarrollo Tecnológico Industrial*) and has meant a very significant increase to the public funds devoted to R&D. It is considered a successful programme fulfilling the objective to build critical mass and foster networking although there is room to improve the participation of small and medium enterprises (OECD and FECYT, 2007). Within the CENIT Programme, the NEOTEC Venture Capital Fund was also launched. Although this action is oriented to increase early-stage investment in all types of technology companies, university spin-offs are one of the main beneficiaries of this venture capital instrument.

193. The current National Plan for Scientific Research, Development and Technological Innovation 2008-2011 was approved in 2007 (*Comisión Interministerial de Ciencia y Tecnología*, 2007). The Plan is the basic programming mechanism of the Spanish system of R&D and innovation and establishes policy objectives and priorities, and designs the instruments to achieve them. The Plan has six objectives that are to put Spain in the vanguard of knowledge, to promote a firm's competitiveness, to integrate the regional level into the national S&T system, to strength the international dimension of the S&T system, to provide a favourable climate for R&D investment and to provide favourable conditions to promote scientific culture and the diffusion of S&T advances in society. Within these objectives the Plan emphasizes the need to increase the public-private co-operation, to enhance transfer of technology and to foster the creation of technology-based firms with a specific programme designed to fulfil these objectives.

194. In relation to national framework conditions, other aspects related to mobility of researchers and the incorporation of highly qualified human capital in firms deserve a particular consideration. The low innovative capacities, in terms of human resources devoted to R&D activities of Spanish firms and the barriers that hamper the mobility of researchers are two important weaknesses of the Spanish and also of the Catalan research and innovation system.

195. In this sense, two measures pursue the objective of improving mobility between the public and private research sectors. The first one is the programme Torres Quevedo that provides financial support for the incorporation of R&D personnel (PhDs and technology management experts) into the firms. This programme was launched in 2001, has achieved a positive impact (Cruz-Castro and Sanz-Menéndez, 2005) and has been boosted under the initiative INGENIO 2010. Secondly, the mobility of researchers between public and private organisations is quite low and it is restricted by the rigidities that affect particularly to the researchers with civil servant status and permanent positions in universities. In the case that a university professor takes a voluntary leave to work for the business sector he needs to pass a competitive exam to get back to the public sector, risking then to lose his position. The reform of the University Law introduced in 2007 pretends to alleviate this problem and foster mobility, guaranteeing the position for a maximum of five years for university professors taking a voluntary leave of absence to create spin-offs related to their research.

196. Finally, it must be pointed out that although Spanish policy has evolved devoting more resources to research and innovation policies, with the current economic crisis, the government has cut the budget devoted to these policies. This has generated substantial criticisms by the scientific community and has introduced an important uncertainty on the R&D policy and on the amount of the public support available for the next years.

3.3.2 Catalan research and innovation policies: The Catalan Agreement on Research and Innovation (CARI)

197. At a regional level, the main framework of research and innovation policy is, as has been mentioned above, the CARI. The research and innovation policy of Catalonia has evolved from the first Research Plan (1993-1996) to the current agreement which establishes the main bases for the next Research and Innovation Plans. The first two Research Plans (1993-1996, 1997-2000) had a supply-side driven approach and were mainly devoted to strengthen the research capabilities of Catalonia although in the 2nd plan there were some initiatives to support business R&D and innovation activities and to foster linkages and collaboration between academia and industry. After these two Plans, in the period 2001-2004, two separate plans were implemented, one Research Plan managed by the CIRIT and the Innovation Plan managed by the CIDEM, the former public Agency of the Ministry of Industry, that currently belongs to ACC10.

198. Finally, in the period 2005-2008, the Research and Innovation Plan 2005-2008 attempted to develop a more integrated approach between the support of supply and demand factors and devoted more efforts to technology transfer programmes. At the end of this period the Catalan government, with the purpose to show the increasing importance of innovation and research in its policies, decided to foster a socio-political consensus on the diagnosis and actions for the Catalan research and innovation system that leads to the signature of the CARI in 2008.

199. The CARI provides a roadmap for the design and implementation of research and innovation policy and considers universities a core agent for the implementation of these polices. The CARI also emphasizes the importance of the third mission of the universities with commitments devoted to the research and knowledge valorisation, the promotion of knowledge-transfer activities and the creation of knowledge intensive activities. Furthermore, it aims to take into account this third mission in the new system of funding of the universities. The CARI is an ambitious proposal although its translation to a concrete research and innovation plan with specific measures and resources is not exempt of difficulties due the large number of commitments and some lacks in the establishment of priorities. Nevertheless these difficulties, it shows the aim of achieving a close relationship between the agents of the system, to reinforce the capacity of research agents to value knowledge and to consider the transfer of knowledge as a priority.

3.3.3 The European Union programmes

200. Finally, research and innovation in Catalonia have also received the support of the European Union. The two main funding sources are the EU regional policy and the EU research policy implemented in the different framework programmes. The incorporation of new countries in the European Union and the growth, in terms of GDP per capita, of Catalonia has led to a decrease in the funds received by Catalonia from the EU structural policy. In a contrary sense, Catalonia has increased its participation and the funds received in the calls of the EU Research Framework Programmes (FP), particularly in the current FP7 and in other funds such as the grants awarded by the European Research Council (ERC). Specifically, in the 2008, Catalonia is the Spanish region that has received more

funds from the FP7 with an amount of more than 100 millions of euro and in the case of the Starting Grants from the ERC, more than 60% of the grants received by Spain have been awarded to Catalonia. The increasing participation in the Framework Programmes has also favoured the internationalisation of research and innovation by Catalan agents fostering their participation in networks. Finally, Barcelona, with the participation of the UPC and ESADE (URL) has been chosen as one of the location centres of the KIC InnoEnergy, one of the three "Knowledge and Innovation Communities" promoted by the European Institute of Innovation and Technology.

201. In synthesis, both Spanish and Catalan research and innovation policy have evolved towards a more integrated approach devoting more efforts and instruments to the transfer of knowledge and to encourage co-operation between HEIs and industry. Nevertheless fruitful relationships between universities and firms require that universities develop quality research and that firms consider innovation as a key element of its strategy and have the necessary absorptive capacity. Although, in both aspects there have been substantial advances, there are still weaknesses particularly in relation with the absorptive capacity of small and medium enterprises. Furthermore, a recent analysis of the Spanish research and innovation policy states that there is room to improve science-industry linkages enhancing networking of existing transfer organisations and removing barriers to the mobility of researchers (OECD and FECYT, 2007). In addition the development of cluster policies and to prioritise R&D projects between universities and firms in areas where Catalonia already has o may develop a competitive advantage could increase the effectiveness and the economic impact of the science-industry linkages.

3.4 Interfaces facilitating knowledge exploitation and exchange

202. Relationships between universities and industry take place through different ways and mechanisms such as the agreements for R&D projects, the applications for patents and its exploitation and the creation of spin-offs from academic research. In recent years Catalan universities have made considerable efforts and improved their activities related with knowledge exchange. The main mechanisms and interfaces, with the available data and information, are described below. Despite the efforts of different institutions such as the CRUE or the OTRI network, the information is still not enough comprehensive and homogenous among universities.

3.4.1 University offices for the transfer of research results (OTRI).

203. All the public universities and the URL (a private institution), have a technology transfer office. The OTRIs were created at the end of 1988 with the support of innovation policy as a structure to promote co-operation between research and firms. In 1996, they acquired an official character with the creation of an official registry. The OTRIs are organised in the OTRI network of universities and have undergone very significant growth in the last few years.

204. Catalan OTRIs are quite big compared with the Spanish average and have between 9 and 30 technicians. The management of contracts continues to be one of the main tasks although in recent years, some OTRIs are playing a more active role in other and more sophisticated ways of transferring technology, such as the creation of spin-offs and licensing patents. With the last available data they applied for 97 national patents, with 40 PCT extensions and created 17 spinoffs. Nevertheless, the Spanish R&D Plan 2008-2011 states that they are overloaded with work and much focused on administrative functions when they should behave as strategic bodies.

Table 3.1 Catalan OTRIs. Main figures 2008

University	Faculty (FTE)	Technicians OTRI (FTE)	R&D contracts (thousands of euro)	Services (thousands of euro)	National Patents	PCT Extensions	Licences (thousands of euro)	Spin-off
UAB	2.836	26,0	14.200,0	4.745	26	9	100,0	5
UdL	589	9,0	2.276,2	452	2	3	2,5	1
UdG	838	15,0	3.531,0	610	3	0	2,0	0
UPC	1.889	29,0	39.863,0	3.473	35	12	133,0	9
UPF	470	11,0	6.475,0	0	4	2	165,9	1
URL	567	28,5	7.816,0	750	6	2	0,0	1
UB	3.758	22,0	15.621,0	1.816	20	11	118,0	0
URV	249	17,0	6.701,9	901	8	1	0,0	2
Total	11.196	157,5	96.484,1	12.747	104	40	521,4	19

Source: Report of the Survey RedOTRI 2008 (*RedOTRI de Universidades*) and URL

205. Some criticisms that the OTRIs have received are that they lack the necessary critical mass to face up to the complex tasks that they have to develop (OECD and FECYT, 2007) and the low scientific and technological level of an important proportion of the R&D agreements between universities and firms. In the same sense their activities, as for instance the licensing of patents, requires to have highly specialised personnel which is difficult to achieve in organisations of small and medium size.

206. The Catalan Government attempted to enhance networking with the creation of the Knowledge Transfer Consortia in 2005. Nevertheless, its orientation was very supply-side driven with insufficient participation of the firms and after some years, in 2009, it was decided to dissolve it. Currently, the DIUE is looking for other approaches to try to improve the co-operation among the OTRIs and it has the commitment to create a public-private instrument for the exploitation of technology, as the revision of the Catalan Strategic Agreement to Promote Internationalisation of the Catalan Economy, the Strengthening of its Competitiveness and the Quality of Employment for the period 2008-2001 states (Generalitat de Catalunya, 2008). This instrument will be at the disposal of every university and research centre and will complement the research exploitation and markets units of the universities and research centres.

3.4.2 The Network of Support Centres for Technological Innovation (XIT)

207. The XIT was created in 1999 with 9 centres by the Regional Agency for Innovation and Business Development (CIDEM), the Interdepartmental Commission for Research and Technological Innovation (CIRIT) and nine universities. With the creation of the XIT, the Catalan Government got involved as active player in a new structure of interface among universities and firms (Defazio and Garcia-Quevedo, 2006). The XIT is formed by units and groups of researchers with the capacity to offer innovation services to Catalan companies.

208. The main objective of the XIT is to have a more effective way to transfer technology from the universities to the firms, introducing a new model of organisation based on a system of external accreditation to provide some quality guarantees to both enterprises and research groups. The units that form part of the XIT have to maintain a research of high quality but they receive incentives to engage in knowledge transfer. To facilitate this relationship these units receive public support to hire a manager responsible for enhancing and coordinating the co-operation with firms. The number of accredited Centres grew

rapidly to 24 in 2000 and to more than 70 currently, most of them belonging to universities. Currently, as the other technological centres, they are under the new brand TECNIO promoted by ACC10 with the objective to consolidate the model of technological transfer of Catalonia (see box 3.3).

Box 3.3 Network of Support Centres for Technological Innovation (Xarxa d'Innovació Tecnològica, Xarxa IT) in the region of Catalonia

This initiative aims to encourage a trend which began some years ago when Catalan universities started progressively to target their R&D activities towards meeting the current and future needs of the productive sector. The initiative is funded mainly by ACC1Ó (Department of Universities, Innovation and Enterprise of the Generalitat de Catalunya – regional government) and the universities.

The main rationale behind this initiative comprises the promotion and stimulation of research groups and units to provide innovative technological services to Catalan firms, and aims to strengthen the R&D subcontracting market in Catalonia and increase companies' capacity for innovation. The objective is to improve, based on supply, the access of companies to the stock of *know-how* which exists at universities, technological centres and engineering firms. Furthermore, the presence in Catalonia of a network of technology centres which speak the same language as companies and that are run according to business parameters provides a source of competition for small and medium-sized firms. The challenge is to constitute a virtual community composed of companies which are active in R&D and is backed by nearly a hundred technological centres and other complementary agents (private engineering companies, legal advisors…).

The *Xarxa IT* has had numerous results translated into the number of patents and spin-offs generated, the amount of European funds awarded and the number of R&D projects with companies. See figure below for detailed results.

Presently the *Xarxa IT* is under the TECNIO brand.

Table 3.2 Xarxa IT results 2006-2008

	2005	2006	2007	2008
Total Number of centres	73	73	80	77
New centres	9	6	7	7
Excluded centres	3	6	0	10
Total invoicing (million euros)	58.15	58.38	59	65.48
R&D contracts w/ companies	43.32 (74%)	35.63 (61.03%)	33.48 (62%)	42.03 (64%)
R&D public funding	11.74 (20%)	19.77 (33.86%)	17.48 (32%)	20.14 (31%)
Training	3.10 (5%)	2.88 (4.93%)	3.38 (6%)	3.3 (5%)
Number of R&D project contracts	578	508	551	680
Number of company clients R&D projects	496	-	460	542
Number of patents applied	52	35	37	31

for				
Number of created spin-offs	6	7	9	3
Total number of clients	3,182	3,050	3,638	
Number of new clients	934 (RD and services)	488	470	
Personnel	1,720	1,788	1,786	1,605
Civil servants	403	-		
Scholarship holders	715	-		
Contracted staff for projects	602	568	540	993

3.4.3 Patents and licenses

209. In Spain and Catalonia, both the university and the academic researchers have incentives to patent the results of their research; although the universities are the owners of the inventions generated by university researchers, the latter have the right to a share of the royalties derived from their patented discoveries The Spanish Law of Patents (Law 11/1986 of Patents of Inventions and Utility Models), in Article 20, states that "the university possesses the ownership of the inventions made by university staff as a consequence of their research function in the university". The same article states also that "staff will have, in any case, the right to participate in the benefits obtained by the University for the licensing or cession of their rights over the inventions". Although Catalonia as other regions develops their own innovation and university policy, the regulations on patents are the same for the whole country.

210. The universities have established internal rules for distributing possible royalties. These rules are freely decided by each university and have to be approved by their management bodies. In these regulations, the percentages for the distribution of possible profits between the university and the researcher, and when applicable the department or research group to which the researcher belongs as well, are permanently established and to vary the royalty shares a change in the regulations is required. In general terms, the greater part of the profits accrues to the researcher, an average of 40-50%, while the university itself obtains around 30-35%%. The rest is allocated to the department to which the researcher belongs, while the share of the research group is marginal.

Table 3.3 University applications for national patents. 2000-2008 (*)

University	2000	2001	2002	2003	2004	2005	2006	2007	2008
UAB	10	5	4	8	6	10	14	7	16
UdL	0	1	0	1	0	0	1	1	4
UdG	0	3	0	1	1	1	1	0	3
UPC	29	20	23	34	25	36	35	37	32
UPF	0	1	0	1	1	0	1	2	1
UB	6	9	6	13	8	10	11	12	19
URV	0	1	1	5	3	0	2	1	8
Total	**45**	**40**	**34**	**63**	**44**	**57**	**65**	**60**	**83**

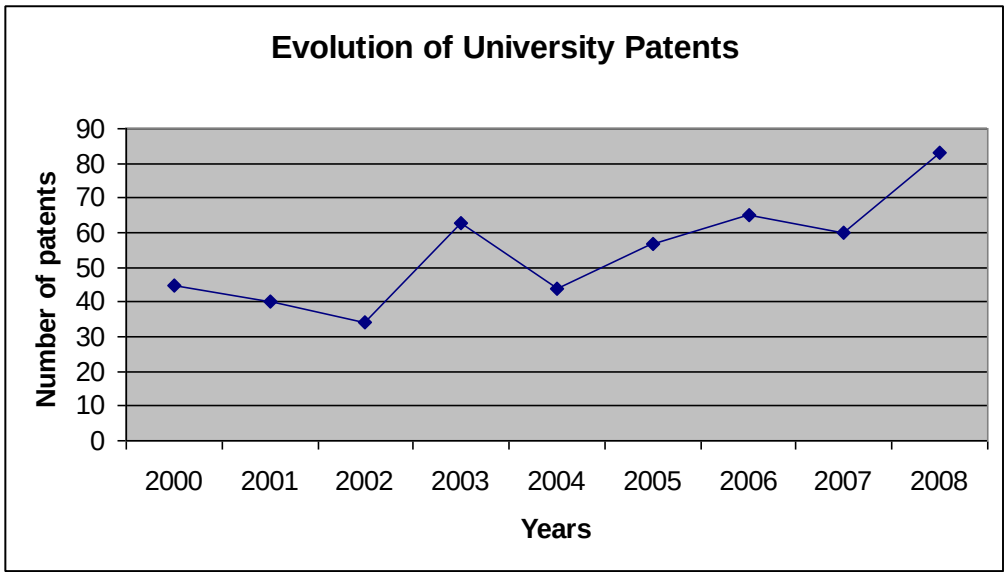
(*) Patents which a university is one of the applicants. Two or more universities can share the ownership of a patent.

Source: Spanish Office of Patents and Marks

211. The number of university-owned patents has growth in recent years and the Polytechnic University of Catalonia is the Spanish university with the highest number of applications for patents. Among the private universities, the URL has applied also for 6 patents in 2008. It should be pointed out that the figures of university-owned patents underestimates university involvement in patenting because it does not take into account the non-university owned patents that have a university inventor. Nevertheless, the available information to examine this question is very scarce.

212. Some universities such as the University of Barcelona have some tradition in the management of patents and it created a specific centre of patents in 1987, devoted to the research in the field of property rights and providing services to the researchers. In general terms, Catalan OTRIs are devoting more efforts to the management of patents with the aim to increase not only their number but also their quality and internationalisation, but the number of technicians involved in this task continues to be quite low. Furthermore, the incomes for licenses are quite low, around 500,000 euros, substantially below the most advanced countries.

Figure 3.1 Evolution of the number of Catalan university patents



Source: Spanish Office of Patents and Marks

3.4.4 Promotion of spin-offs

213. The creation of spin-off from the results of academic research has deserved an increasing attention by Catalan universities and in 2008 16 spin-offs where created with the support of the OTRIs. Among the public universities, the UPC is particularly active in the creation of firms. In 1999 the UPC set up the programme INNOVA (see box 3.4) with the objective to foster innovative culture and entrepreneurship in the university and favouring the creation of new firms. Since its creation, this programme has facilitated the creation of more than 150 technology-based firms. Among the private universities, the most active is the URL that has created 21 technology-based firms.

Box 3.4 The INNOVA programme (Polytechnic University of Catalonia)

The Innova programme has as its main objective the promotion of universities as an actor for economic development and to contribute to increase the entrepreneurial competitiveness of

Catalonia. This programme contributes to the valuation of research carried out in the Polytechnic University of Catalonia (UPC) for the benefit of society so it can benefit from the services and products generated. The Innova programme promotes a culture of innovation and entrepreneurship in the university community, this contributing to increase the innovative potential of its groups and units, fostering the creation of new companies and the valuation tools for knowledge.

More specifically, the Innova programme offers several services such as providing solutions for structuring and defining valuation policies for technology and innovation; identifying technological opportunities; assessment for intellectual property rights and research in general; assessment for the creation and expansion of enterprises and training in the field of research management, technology transfer and the creation and expansion of enterprises.

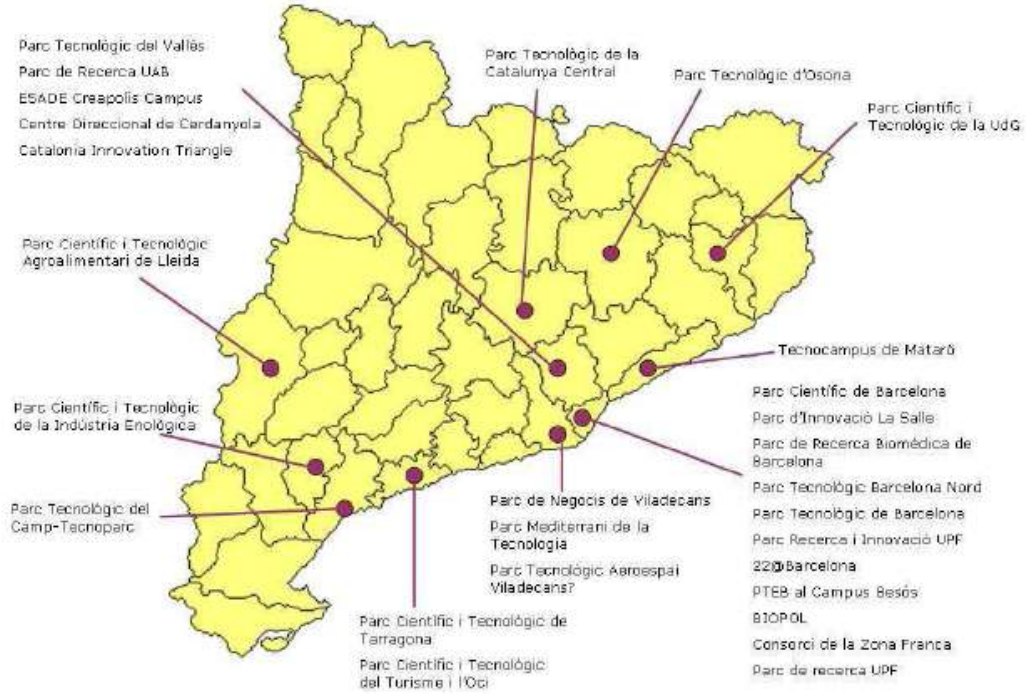
Over the last 3 years (2006/2007/2008) over 430 projects were offered assessment and 66 technological enterprises were created. Since 1999 over 1,700 new jobs were created, from which 96% required high qualifications (80% of entrepreneurs hold a university degree, 10% hold a doctoral degree and 6% are university professors). The investment of these enterprises in R&D is over 70% for 54% of them and between 35 and 70% for 23% of them.

214. The creation of firms receives also the support of the Catalan Government. In 2000, with the objective to develop an entrepreneurial activity of transfer of knowledge the network *Xarxa de Trampolins Tecnològics* (Technology springboards) was created. It was the result of the agreement among the Centre for Innovation and Business Development (CIDEM), the Interdepartmental Commission for Research and Technological Innovation (CIRIT), nine Catalan Universities and the IESE Business School. The technological springboard are entrepreneurial centres belonging to an academic or scientific institution whose main objective is to foster enterprise to develop projects in the fields of new technologies supporting them trough different services: helping them to define a model of enterprise, to develop the market strategy and offering legal and commercial support for the activity (Defazio and Garcia-Quevedo, 2006). With the support of this network, nearly 70 technology-based firms were created in 2006 (Nicolini et al., 2009). Despite these good results in terms of creation of firms, the growth of these new firms seems to be quite weak.

3.4.5 Science and Technology Parks

215. The creation of science parks is a relatively new phenomenon in Catalonia with some exceptions such as the scientific park of the UB, created in 1997 (see box 3.4). Since 2000 there has been a very important expansion of the number of science and technology parks that have received an important public support, mainly from the Spanish government. Currently, there are 25 parks in Catalonia, most of them university-linked (17), while the other ones are related with region or cities initiatives. These parks are distributed in the whole Catalan territory and most of the new ones have been created in locations different from Barcelona (see box 3.**5** for the case of the science park of Lleida). Although some figures show a positive evolution in the number of firms or R&D personnel located in these parks, more time is needed to evaluate properly these actions because an important proportion of these parks are currently in the phase of construction or of project (Bellavista, 2005). Most of these parks (19) belong to the Catalan Network of Science and Technology Parks and are quite active participating in international networks and associations.

Figure 3.2 Science and Technology Parks in Catalonia



Source:CARI

Box 3.4 Barcelona Science Park (Parc Científic de Barcelona) (University of Barcelona, UB)

Since its foundation in 1999 the Barcelona Science Park of the University of Barcelona has as targets:

1. To foster quality research with the support of a wide range of technologies
2. To revitalise the relation between university and business
3. To promote the creation of new companies and institutions
4. To further the science-society dialogue and encourage careers in science

At present the park is home to 4 research institutes, 75 companies, an incubator for biotechnology companies, more than 70 research groups and a wide range of research support technology. In addition, it organises more than 120 activities for the promotion of scientific culture and new careers in science, in which close to 6,000 people participate each year.

The research carried out at the Barcelona Science Park is multidisciplinary and covers a wide range of areas in the experimental, human and social sciences. However special attention should be paid to the work performed at the Institute of Biomedical Research of the PCB (IRB-PCB), the Nanobioengineering Laboratory, and by companies and spin-offs from the pharmaceutical and fine chemistry sectors. Occupying an area of 5,000 m2, the technological facilities available at the Barcelona Science Park include powerful infrastructure and specialized services which provide support to researchers in the centre. In addition, these facilities are also available to external institutions and companies.

Through the Barcelona Science Park, among other institutions, Barcelona, the capital of Catalonia, forms part of one of the four bioclusters in Europe. Similarly, this city has been considered by the Nano2life Network of Excellence as one of the five European clusters in nanobioengineering, thanks to the Nanotechnology Platform and Nanobioengineering Laboratory at the PCB, and at regional level through the opening in December 2003 of the Bioengineering Reference Centre of Catalonia (CREBEC), which belongs to the Generalitat.

Box 3.5 Agro-food Technological and Science Park of Lleida

The City Council of Lleida, in conjunction with the University of Lleida decided to create the Agro-food Technological and Science Park of Lleida in 2005 with the aim of rendering the economic activity in the area dynamic and also offering the opportunity to increase competitiveness in the entrepreneurial tissue through innovation and knowledge transfer with the academia and science world. The Agro-food Technological and Science Park of Lleida is a strategic and ambitious project for Lleida, based on innovation, quality, specialization, dynamism, scientific and academic prestige and a clear vocation of leadership. At present the park has 18 companies, 1 incubator with 21 companies and 3 spin-offs and 750 graduates and researchers that work there.

The competitive advantage of this Park is that it offers an opportunity for high specialization in the agro-food industry, based on the importance of this sector in the local economy and intends to become a recognized technological and science park that can become a reference-point in the agro-food industry in Catalonia, Spain and southern Europe.

The University of Lleida and the City Council of Lleida are the founding members and share an equal stake in the park's Consortium. The park has received vital contributions from the European Regional Development Fund and the Spanish Ministry of Science and Innovation and is located in what was the former military compound in the Turó de Gardeny, in the city of Lleida. This allows the city to recover and integrate into the city an emblematic site that was far from citizen's daily life, precisely due to its military history.

The Agro-food Technological and Science Park of Lleida was created with the intention to become one of the main science and technology platforms in the field of agro-food in Spain and also to become an innovation centre that is able to attract technology-based companies. Innopan, Fruitcentre, Maqcentre, ITL, Incafust, IRB Lleida, Agroaltic are high profile technological centres linked to the Agro-food Technological and Science Park of Lleida Besides it is a good tool to strengthen the research groups at the University of Lleida, interaction between these groups and attracting new researchers as well as strengthening competitiveness within the entrepreneurial tissue in the area of influence of Lleida by promoting innovation, offering R&D&i services on demand and disseminating the results of this innovation to companies.

3.5 Conclusions

216. The Catalan universities are improving their resources devoted to R&D activities and their capacity to generate knowledge. They are also increasingly involved in the transfer of knowledge and technology and in activities related to the third mission. In addition, Catalan and Spanish R&D and innovation policy have evolved devoting more efforts and resources to increase the links and relationships between universities and firms. This has led to the creation of interface structures and instruments to foster these relationships, such as the OTRIs, science parks and networks to facilitate the creation of spin-offs, among others.

217. Although the regional dimension is not explicitly considered in HEIs research policy, all these efforts have allowed an increasing contribution of academic research to regional innovation. In this sense, some figures related with the different ways of transfer knowledge such as the number of R&D agreements between universities and firms, the applications for patents have experienced a growth in recent years, although in general terms they are still below the most advanced European regions.

218. To improve the contribution of university research to regional needs and demands faces also other difficulties related with the characteristics of the university system, the interface structures and with the industrial structure. Firstly, in relation with the university characteristics there are still significant barriers to the mobility of researches which is one of the main sources of academic knowledge transfers. In addition, only very recently, the

activities related with the third mission are beginning to be taken into account in the university funding system, although they still play a limited role. Secondly, interface structures for knowledge and technology transfer frequently lack the necessary dimension and critical mass to develop properly their activities which require in most cases a high level of specialisation. In the same sense, the co-operation and networking between the different structures and mechanisms is still insufficient. Finally, in comparison with advanced European regions, the technological level of firms is still lower with a low absorptive capacity, although in some activities Catalan firms have achieved a high level of competitiveness.

3.5.1 Collaboration between regional stakeholders

219. The Catalan university system is, as has been presented in chapter 2, quite complex with 12 universities. The contribution of academic research to regional innovation is made fundamentally by the public ones and by the URL, a private one. The collaboration between universities in this field is not very frequent although in recent years some joint initiatives are beginning to be more common. In this sense, a remarkable example is the ACUP that have brought together all the public universities with the purpose to develop joint activities and creating the brand "University of Catalonia". In addition, the collaboration between universities is more frequent when there are others stakeholders involved as the Catalan government or the City Council. In the case of the Catalan government, as has been described in this chapter, this collaboration takes place trough different ways such as the university technology transfer networks or the preparation and design of the CARI. Finally, other remarkable examples of collaboration with other stakeholders are the joint research activities with hospitals and with the public research centres created by the Catalan government.

3.5.2 SWOT related to contribution of university research to regional innovation

Strengths	**Weaknesses**
▪ Significant improvement in the creation of knowledge ▪ High level of scientific research in some specific areas ▪ Experience in international relationships ▪ Increasing involvement in knowledge transfer ▪ Existence of developed interface infrastructures and networks ▪ High political commitment (CARI and Strategic Agreement) ▪ Experiences of collaboration among universities (ACUP) ▪ Successful programmes for attracting scientists (ICREA) ▪ Attractiveness of Barcelona (researchers, PhD students)	▪ Rigidities (barriers to mobility of researchers between public and private sectors; barriers to recruit highly-qualified international researchers) ▪ Few incentives for researchers to be engaged in knowledge transfer activities ▪ University funding very weakly related with research and transfer of knowledge ▪ Lack of qualified technical staff to support research ▪ Lack of technical capabilities and professional management of R&D structures and bodies ▪ Low technological absorptive capacity of a high proportion of firms ▪ Insufficient co-operation and networking among technology transfer intermediaries ▪ Insufficient co-operation among universities ▪ Lack of homogenous statistics and data to analyse knowledge transfer
Opportunities	**Threats**

▪ Increasing EU funds for research ▪ Implementation of a regional strategy in the framework of the CARI ▪ Development of a knowledge economy with an increasing importance of research ▪ Growing importance of knowledge intensive services ▪ Growing importance of private-public partnerships in R&D projects	▪ Increasing financial uncertainty and reduction of the support of Spanish government in R&D and innovation policy ▪ Growing global competition to attract talent ▪ Increasing competition for EU R&D funds

CHAPTER 4 CONTRIBUTION OF TEACHING AND LEARNING TO LABOUR MARKET AND SKILLS

4.1 Localising the learning process

220. With some 175,000 people enrolled in the academic year 2007-2008, Catalan universities represent 12.5% of the Spanish university system in terms of students. Of these, 55% are women, 23% are over 25 years old and 2.5% are foreign students. Moreover, some 30,000 individuals received a degree from Catalan universities in that year, representing 15.4% of all undergraduate degrees in Spain. Additionally, some 11,650 individuals were pursuing PhD programmes while 4,281 received their research degrees, representing 16% and 17% of the Spanish university system, respectively.

221. Around 365 undergraduate courses were offered in the academic year 2007-2008 by the 12 public and private universities, representing 12% of the overall course supply in the Spanish higher education system. Besides, with 3,736 and 54,615 students representing 25% and 43% of total enrolment in Spain in official and unofficial master's programs, respectively, the Catalan university system represents an important share of the whole Spanish system. Thus, a great deal of resources and infrastructure devoted to higher education is located in Catalonia.

Table 4.1 Territorial distribution of universities, students and population in Catalonia, academic year 2007-2008

	Universities		Students		Population*	
	Number	%	Number	%	Number	%
Barcelona	9**	75.0	144,427	82.9	5 332,513	74.0
Girona	1	8.3	11,083	6.4	706,185	9.8
Tarragona	1	8.3	11,051	6.3	757,795	10.5
Lleida	1	8.3	7,620	4.4	414,015	5.7

* Data refers to 2007.

** Includes UOC, the Catalan Open University whose headquarters are located in Barcelona.

Source: CRUE and Idescat.

222. Higher education in Catalonia has been a key element in generating knowledge and transferring qualified people, knowledge and new technologies to its territory as well as to its productive system. The responsibility for higher education is distributed between the central government and the Catalan government. In Spain, the process of higher education policy decentralisation to the autonomous regions began in 1985 and finished in 1997. Catalonia was one of the first regions to receive these responsibilities and hence is one of the regions that have accumulated more experience in the governance of its higher education system. This approach meets different regional needs and gives greater importance to employment. The process of decentralisation has led to an important increase in the number of universities since the 1990s. In Catalonia, nine new higher education institutions (private and public) have been created since then, some of them in provinces that previously had no higher education institutions.

223. Likewise, the vocational training offer has undergone a decentralization process started in 1981 (and finished in 2000) whereby the Central Administration has gradually transferred functions, services and resources to Catalonia. In this case, the Central Government establishes the Catalogue of Vocational Qualifications and the Ministry of Education and Science regulates the curricular aspects that constitute the basic learning, adjusting to the demands of the National Qualifications and Vocational Training system and respecting the regional government jurisdiction.

224. In the last decades, the regional government in Catalonia along with many local governments and regional councils has made a considerable effort to construct university facilities and infrastructures. A large part of current university facilities are relatively new and are spread all over the territory. This policy of regionalising higher education has played an essential role in generating and maintaining localized capabilities.

225. In addition, the range of services has been extended. This has reinforced the university's role as a supplier of services to students and to the rest of society in the region. Universities no longer only provide traditional services, such as residence halls, career services and university extension services. They now offer high value-added services that are adapted to the new demands required of them, such as alumni services, bodies devoted to promoting innovation and boosting the creation of university-based companies, technology parks and so on, which have important impacts in the region.

4.2 Student recruitment and regional employment

226. In the Catalan higher education system there is not an explicit recruitment policy according to regional needs. In fact, this process depends largely on centralised decision making. The Spanish University Coordination Council determines the number of students admitted in public universities, basing its decision largely on the proposals put forward by the Catalan government, student demand, and the cost of each course. Labour market demand has not been a major factor in decisions on the number of students admitted for most university courses. Traditionally, first and second cycle courses are designed for particular professions and normally postgraduate and continuing education courses are designed to tackle the needs of the labour market. Private universities follow independent recruitment policies, not subject to the same rules as public ones.

227. Since the approval of the Organic Law on the General Organisation of the Educational System (LOGSE) in 1990, the number of students that could be admitted in higher vocational education has no longer been linked to student demand, but has instead been adapted to the requirements of industry. Currently, in Catalonia the number of students that can be admitted for each vocational course and the consequent budgetary allocations are determined with a view to meeting the requirements of the regional labour market. This partly explains the fact that the unemployment rate among students with higher vocational education qualifications is among the lowest, although the fact that vocational education is more closely adapted to the labour market and that students can make contacts during work placements also contributes to higher employment rates.

228. To enrol in higher education, students are required to have successfully completed the final, non-compulsory stage of secondary education. Students have to pass an entrance examination to get onto long cycle courses and the (most popular) short cycle courses. An average mark is obtained by combining the results of the examination with the marks obtained by students in the final, non-compulsory stage of secondary education. Admission to specific degree courses depends on the resulting average mark.

229. People aged over 25 who wish to take university courses can gain access to university without having successfully completed the final, non-compulsory stage of secondary education or equivalent by following a special procedure that values the academic courses they have completed and, especially, their work experience.

230. The Catalan government, as in other regions in Spain, must reserve a certain percentage of admissions in all courses leading to official university degrees for the following student groups:

- Students over 25 years of age: 1% to 3% of admissions in all courses to obtain official university qualifications.
- Students from non-EU countries who meet the requirements for university access in their country of origin: 1% to 3% of admissions provided that the students' respective governments reciprocate in this area.
- Students who have completed a higher vocational education course: 7% to 30% of admissions, depending on the degree course.
- Outstanding sportspersons: 1% to 3% of possible admissions, plus an additional 5% on the Physical Activity and Sport Science degree course.

231. Universities should reserve 3% of possible admissions for students with disabilities. Access for disabled students to official university courses should be based on the principles of equal opportunity, non-discrimination and positive discrimination. The student admission procedures established by Catalan universities should include all the necessary measures for adapting to the special needs of disabled people.

232. Access to higher vocational education can be gained directly or by taking a special test designed to demonstrate that the candidate has sufficient knowledge and skills to benefit from a higher vocational course, without prior qualifications. Additionally, students are allowed to enrol in professional modules linked to occupational units of competence provided they show proof of the access requirements before finishing their studies. The academic requirements for direct access are either the certificate received on successfully completing the final, non-compulsory stage of secondary education, or one of the following academic qualifications or credentials: specialised technician, advanced technician or equivalent, university qualification or equivalent. The distribution of university enrolment by institution is showed in Table 4.2 for university education and table 4.3 for vocational training.

Table 4.2 Enrolment in undergraduate and graduate degrees in Catalonia, academic year 2007-2008

	Undergraduate			**PhD**	
	Students	**%**	**% change 1997-2007**	**Students**	**%**
Autonomous University of Barcelona	33,619	19.30	-0.7	4,067	34.91
University Barcelona	50,922	29.24	-2.8	2,927	25.12
University of Girona	11,083	6.36	0.1	430	3.69
University of Lleida	7,620	4.37	-4.2	428	3.67
Polytechnic University of Catalonia	28,966	16.63	-2.0	2,122	18.21
University Pompeu Fabra	9,531	5.47	1.6	555	4.76
University Rovira i Virgili	11,051	6.34	-0.6	423	3.63
University Abat Oliba CEU	1,376	0.79	44.3	40	0.34
International University of Catalonia	2,953	1.70	9.9	191	1.64
University Ramón Llull	12,537	7.20	0.5	443	3.80
University of Vic	4,523	2.60	7.3	24	0.21
CATALONIA	**174,181**	**100.00**	**-1.2**	**11,650**	**100.00**

Source: Consejo de Coordinación Universitaria and INE

233. Over the last quarter of the twentieth century, there was a significant rise in the number of university entrants, due partly to an increase in university capacity and the creation of new universities, and partly to Catalonia's economic development. In spite of the progress made in widening university access, data on the socioeconomic origin of university students

show a marked orientation towards families with medium to high incomes, indicating that there is much room for improvement in the area of equity. For students from low-income family backgrounds, one of the main obstacles to tertiary education, if not the main one, is the opportunity cost of the time spent on it. In this respect, the role of AGAUR, the regional Agency for Management of University and Research Grants, created in 2001 as an instrument to carry out the policies of the Catalan Government, should be highlighted. The agency manages scholarships for university students based on several criteria, as well as funding for pre and post doctoral students, administration and services staff and many more. The scholarships granted by AGAUR complement those conceded by the central government and hence constitute an important tool in widening educational opportunities for residents in Catalonia.

Table 4.3 Students enrolled in vocational training, by type. Academic year 2007-2008

	CFGM*		CFGS**	
	Students	%	Students	%
Socio-cultural services	1,483	3.91	5,802	15.51
Management	5,763	15.21	5,415	14.48
Health	4,797	12.66	4,189	11.20
Computing	3,980	10.50	3,549	9.49
Electricity and electronics	4,684	12.36	3,231	8.64
Marketing	1,520	4.01	2,090	5.59
Communication, image and sound	275	0.73	1,896	5.07
Building	223	0.59	1,630	4.36
Sports	977	2.58	1,604	4.29
Hotels and tourism	2,251	5.94	1,402	3.75
Chemical	576	1.52	1,381	3.69
Production	2,033	5.37	1,131	3.02
Mechanical	1,197	3.16	1,046	2.80
Vehicles	3,608	9.52	1,045	2.79
Personal image	2,435	6.43	693	1.85
Primary activities	701	1.85	464	1.24
Graphic arts	545	1.44	334	0.89
Food	143	0.38	191	0.51
Fishing and maritime activities	174	0.46	187	0.50
Furniture	465	1.23	68	0.18
Textile	60	0.16	56	0.15
TOTAL	37,890	100.00	37,404	100.00

* Intermediate vocational training degrees

** Higher vocational training degrees

Source: Department of Education, Gencat.

234. Although university access began to expand in the last quarter of the twentieth century, the various socio-economic levels are still not equally represented at Catalan universities. The chances of a young male entering university increase considerably according to the education level of his parents. A recent report (*Ministerio de Educación y Ciencia*, 2003), although the results can be extrapolated, compared the completed education level of students' parents with the distribution of completed education among the overall male population aged 45-59. The report concluded that the proportion of young people taking a university course when their parents had no schooling was 9%, whereas this proportion was 65% (seven times greater) for young people whose parents had completed a long cycle university course.

235. Mobility is very low in Spain. Most students do not move to another region to study (or to another city if they can study their desired choice of degree in their own city). According to data for 2005-2006, 84% of students registered in Catalan universities come from

Catalonia and only 2% of residents go to another region to pursue university studies. In this sense, Catalan universities have a strong regional dimension. The same situation can be applied to vocational education and training, as these studies are strongly linked to the place of residence. In recent years, mobility appears as one of the main topics to be dealt with in the Catalan university system, driven both by the adaptation to the EHEA and by the need to take advantage of internationalisation of higher education. In this respect, almost every university in Catalonia offers, trough their internationalisation offices, several mobility programs beyond the traditional Erasmus scholarships. Moreover, joint initiatives as the DRAC program, with the objective of promoting mobility of students and staff between member institutions of the Vives network of Catalan speaking institutions, act as complements. Although mobility is rather low, the attractiveness of Catalan public universities is evidenced by the share of foreign students enrolled both in undergraduate and graduate studies, as 4 out of 7 Catalan public universities are among the top 10 Spanish universities in terms of the share of foreign students in both cycles. Table 4.4 shows the shares of foreign students in undergraduate and graduate studies per institution. Almost half of the PhD students at the UPC are foreigners, and a high 40% at the UPF. For example, the proportion of international doctoral students at URL is very significant: international doctoral candidates at ESADE account for 74% of the total. Upon completing their programmes, 83% of these PhDs are hired by universities, 17% by companies and only 10% remain in Spain, the rest work abroad (60% in the EU).

Table 4.4 Share of foreign students in Catalan universities, academic year 2008-2009

	Undergraduate	Graduate*
Autonomous University of Barcelona	3.9	43.1
University of Barcelona	4.6	32.2
University of Girona	4.6	23.1
University of Lleida	2.5	25.1
Polytechnic University of Catalonia	3.7	37.3
University Pompeu Fabra	4.3	37.4
University Rovira i Virgili	2.1	21.2
University Abat Oliba	3.3	-
International University of Catalonia	3.8	24.4
University Ramon Llull	2.8	31.5
University of Vic	3.5	14.3
UOC	1.9	11.4

* Refers only to official Masters

Source: Ministry of Education ("Avance de la estadística de estudiantes universitarios. Curso 2008-2009)

236. Almost all Catalan universities have centres that provide career guidance and information to graduates and final year students who are looking for work or wish to know more about educational and professional opportunities. These centres facilitate access to work placements in companies and vocational education and labour market insertion courses, the organisation of forums to promote contact between students and local businesses, and offer companies a free pre-selection service for certain posts. Every year, the Catalan universities and other regional HEIs participate in the Education Show (*Saló de l'Ensenyament*) a fair organised by the Catalan government. In the last edition (2009), more than 70,000 individuals and 166 educational centres (some of them from overseas) participated. The objective of the fair is to provide information and guidance for people looking to embark in further education. Another important vehicle between students and the labour market are ex-alumni associations, which play an important role in disseminating job offers and recruiting university-fellows. For example, URL has strong associations (ESADE ex-alumni, A-IQS, AAA-La Salle) which are in close relation with the University.

237. In recent years, there has been an increase in agreements between universities and companies intended to facilitate student access to work placements as part of the

curriculum. Although there is not enough statistical information available to carry out an exhaustive study of the extent of this practice across Catalan universities, the Conference of Rectors of Spanish Universities (CRUE) estimated that, during the 2000-2001 academic year, 8% of the student population participated in work placement programs in companies. Significantly, just two years before, this percentage was only 5%, which reveals how these programmes have grown in the last few years. In some universities or centres these figures are quite higher because work placements are part of the degree course. To this respect, the EUS (Firms-University-Society) program at the University of Barcelona, which is running its 23rd edition in the academic year 2009-2010, is a joint initiative of several private companies and some public institutions with the university in order to select distinguished students to pursue their last years of their degrees in Business and Economics in parallel with work placements at participating firms or institutions. Moreover, a more recent proposal to be highlighted is the EnginyCat initiative, a scheme by means of which all public universities and some private, with the lead of the Catalan government, promote engineering among the young, with actions taken in primary and secondary schools and universities, and even taking students into the labour market.

238. Two initiatives are currently underway involving work placement programs in European companies: the Argo and Faro projects. The Argo project is intended for university graduates from any Spanish university and provides work placement programmes in European companies, with an average duration of six months. The Faro project consists of 500 grants to enable students in the final years of their university courses in Spain to do a period of work placements in European companies, with an average length of six months per grant. Both initiatives are part of the European Union‘s Leonardo da Vinci programme, and are coordinated by the Spanish Ministry of Education and Science.

239. In Catalonia, vocational education has excellent direct links with the working world. All vocational education courses include a specific module carried out in the workplace, which constitutes an ideal way for students to become familiar with work situations and establish direct contact with the working world. However, students are never directly employed by the company. Training modules established in the workplace have become one of the most effective means of obtaining employment. Students who have carried out work placement schemes in a company are often employed by the same company when they graduate. Students who successfully complete higher vocational education studies obtain an Advanced Technician degree.

240. The qualifications obtained after following special vocational courses are professional qualifications that enable students to enter the labour market. Vocational education courses in Visual Arts and Design contain a phase of practical training in companies, studios and workshops, which has become a key tool for labour market insertion. In Sports Education, all students take a professional development module, which guides and facilitates their insertion in the labour market. It contains information on the labour market, professional associations, and legal requirements for exercising the profession of advanced sports specialist. Students who successfully complete these studies obtain a university diploma.

241. The growth of the tertiary education system in Catalonia over the past few decades took place within the context of a marked mismatch between supply and demand in employment. Nevertheless, the average number of years the working population has spent in education has doubled, and the population with higher education qualifications has grown almost seven-fold. Today about a third of the total working population has received some form of higher education. This reflects a sustained increase in the educational level of the Catalan workforce over the last decades. Over recent years, the Catalan economy has become increasingly geared towards the international market, especially Europe, and this has brought with it changes in the tertiary education system. These changes have been boosted by European unity, foreign language learning, the international mobility of students and

academic staff, and the development of joint courses with other European educational establishments to facilitate the mobility and competitiveness of graduates.

242. Training and education are factors that have highly significant repercussions on individual employment levels. In 2008, the unemployment rate for the population with tertiary education qualifications was less than 5% and 2% considering only workers with PhDs, whereas it was 14% for the population with primary education and 27% for the population without education. These figures show that students with recognised tertiary education qualifications had the lowest rates of unemployment.

Table 4.5 Employment and unemployment of recent graduates* by area of knowledge, 2008

	Employment	Unemployment	Inactive
Humanities	89.4	5.8	4.8
Social Sciences	94.2	2.9	2.9
Experimental Sciences	90.4	3.0	6.6
Health	95.3	2.1	2.6
Technical studies	95.0	3.4	2.6
Total	**93.5**	**3.1**	**3.4**

* Data refers to students graduated in 2004.
Source: AQU

243. AQU and many universities carry out studies on labour market insertion of young graduates. The last report on the insertion of Catalan graduates in the labour market was done in the year 2008, with data for graduates in the academic year 2003-2004. Data from this study (AQU, 2008) indicates that 93.5% of graduates had a job three years after graduation, while 3% remained unemployed (6% in humanities and 2% in health and technical studies). The unemployment rate of Catalan graduates has decreased significantly, being 8% in 2001 and 5% in 2005. The employment rate was 3 points higher than the one reported in the 2005 study.

244. Even if these figures picture a somehow optimistic situation, when analysing the adequacy of students' degrees to the functions they perform in their jobs, the results of the last AQU survey show that only 63% of the students graduated in 2004 were required a specific degree in their current jobs and the tasks to be performed corresponded to that degree. However, this figure is greater than the one obtained in the previous survey (in 2005), where only 59% of students were performing specific tasks in line with their degrees. In contrast, 15% of graduates are under-employed, performing tasks for which no degree was originally required or different from their specific degrees.

245. As regards quality of employment, 88% of Catalan graduates in 2004 were employed with full time contracts, being especially notorious in the cases of technical studies and health, with a high 95%. Even if in the overall assessment 60% of graduates had an open-end contract, this situation is particularly stable for those working full time (65% against 35% of open-end contracts for those working part-time). The adequacy of tasks of the job to the level of studies of the graduate indicates some sort of skills matching between supply and demand. In this case, 62.5% of graduates were asked for a specific degree when applying for the job and, moreover, their functions are directly associated to the degree. Only 4% of graduates were asked for a university degree but the tasks to be performed are not related to that level of education.

Table 4.6 Average satisfaction* of current jobs, 2008

	Satisfaction with				
	Tasks to be performed	Professional trajectory	Wage	Usefulness of knowledge	General
Humanities	5.59	4.66	4.57	4.11	5.36

Social Sciences	5.76	5.11	4.81	4.53	5.57
Experimental Sciences	5.57	4.81	4.55	4.43	5.36
Health	5.77	5.01	4.63	4.97	5.55
Technical studies	5.55	5.04	4.74	4.50	5.34
Total	**5.68**	**5.00**	**4.73**	**4.51**	**5.47**

Note: The scale is from 1(lowest satisfaction) to 7 (highest satisfaction)
Data refers to students graduated in 2004
Source: AQU

246. Besides the quality of employment and skills mismatch, satisfaction with the job is crucial to properly value university education. The Catalan class of 2004 assesses with an overall 5.47 (on a scale from 1 to 7) their general satisfaction with their current job. The item with the highest score is satisfaction with the tasks to be performed with a score of 5.68 whereas the least valued item was the usefulness of the knowledge acquired at university (4.51).

247. In the survey, graduates identified as the five major skills to develop in order to be able to perform the tasks demanded on their jobs to be, in decreasing order of importance: problem solving, team work, decision making, critical thinking and computing. These skills appear to be the most important independently of the tasks performed by the graduates (university level or not). Skills where the greatest deficit was identified were: languages, computing, decision making, problem solving and leadership (Serra-Ramoneda, 2003).

248. Universities not only contribute to the provision of education and skills to a considerable share of the working population. Other activities related to the universities may impact regional employment as well. Many universities have science and technology parks in association with private and/or public foundations and city councils. Moreover, spin-offs are useful and dynamic mechanisms for technology transfer and they boost the national and regional economy. In addition, they create localised employment for highly qualified people, helping to improve the overall stock of qualifications of employees at the regional level. These two contribute to high quality regional employment creation.

Table 4.7 Skills deficit of the graduates of Catalan universities, 2008

	Humanities	**Social Sciences**	**Experimental Sciences**	**Health**	**Technical studies**	**Total**
Theoretical education	0.52	0.31	0.59	0.22	0.44	0.38
Practical education	-0.43	-0.41	0.08	-0.26	-0.34	-0.34
Written communication	-0.19	-0.46	-0.84	-0.50	-0.85	-0.56
Oral communication	-0.68	-0.78	-1.07	-0.90	-1.04	-0.87
Team work	-0.79	-0.55	-0.80	-0.74	-0.69	-0.65
Leadership	-0.91	-0.84	-1.10	-0.81	-1.38	-0.99
Problem solving	-1.19	-1.06	-0.94	-1.09	-0.91	-1.03
Decision making	-1.22	-1.11	-1.29	-1.25	-1.42	-1.23
Critical thinking	-0.11	-0.49	-0.68	-0.80	-0.79	-0.57
Creativity	-0.67	-0.83	-1.04	-0.76	-0.77	-0.80
Management	-1.01	-0.80	-1.14	-0.93	-1.21	-0.97
Documentation	-0.28	-0.49	-0.75	-0.75	-0.57	-0.54
Languages	-1.02	-1.17	-2.17	-1.45	-1.90	-1.45
Computing	-1.79	-1.37	-1.30	-1.49	-0.95	-1.32

Data refers to students graduated in 2004
Source: AQU

4.3 Promoting lifelong learning, continuing professional development and training

249. Following the last AQU survey, three quarters of the students interviewed declared to have continued to improve their education level after graduation. In this respect, 26% declared to have been enrolled in master's degrees whereas another 21% pursued specialised or diploma courses. An additional 13% begins another university degree and 6.5% goes into PhD. However, taking into account the number of persons enrolled in unofficial masters and post graduate degrees in Spain, Catalonia represents around 40% both in terms of students and in terms of programs. Looking at the figures for official master programs in the whole Spanish higher education system, Catalonia represents 25% of students and 21% of programs, indicating the magnitude of postgraduate programs designed by regional universities beyond those accredited by the central government.

250. Globalisation and the advent of the knowledge-based economy mean that people need to upgrade their skills throughout their lives to cope with modern life, not just in the area of work but also in their private lives. From the labour market perspective, continuing education is important for the individual to maintain employability and improve career prospects, since employers need workers with an ever-expanding skills base to keep up with the latest developments. Hence, lifelong learning is seen as a necessary condition for individual success in the labour market and for general social well-being. It is also believed that the competitiveness of national and regional economies depends heavily on societies' capacity to encourage and facilitate lifelong learning.

251. Lifelong learning is a clear synergy mechanism between universities and companies. However, in general terms, these activities have been considered by the universities as secondary with respect to other academic activities. At the moment, at the political level it is clear that the universities cannot stay away from this important social function. According to the analysis carried out by the European Center for Development for Vocational Training (CEDEFOP, 2008), the progress in the topics related with lifelong learning is weak and the role of universities is not the one that corresponds to its capacity and potential.

252. Spain has been one of the last countries of the European Union in implementing the "Bologna Process" in its official formative structure. The "duality" caused by the coexistence of official Masters with those already existent -more than two decades of Own Masters- has provoked that, almost simultaneously, lifelong learning is transforming into the new format. Also in this sense, Catalan universities, via the ACECU (Catalan Association of University Continuing Education) coordinated with the RUEPEC network (University Network of Postgraduate Studies and Continuing Education); have been leading this whole process of adaptation.

253. Universities have been carrying out for years an enlarged, consolidated and recognised offer of high quality courses (see Box 4.1). But it is necessary to foster their participation in the most flexible lifelong learning, adapting it to social necessities and demands, supplementing this open education with corporate and occupational instruction. Lifelong learning is governed by operations and conditions closer to the market and, therefore, it is competitive. In public universities, also, it has a self-funding approach. Universities must adapt their government structures to the new functions, and they should also pursue further flexibility in their management processes. If all this is accomplished, lifelong learning promoted by the universities can have an added value given that, maintaining all its rigor and quality, it will be professionally and academically validated.

254. Catalan universities are under conditions of continuing their leadership in this process. Activities as lifelong learning and the transfer of technology are more and more common, moving away from their traditional secondary role to be part of the institutional mission.

255. Lifelong learning defined broadly refers to any form of deliberately chosen learning activity by a person outside the conventional campus-based school or college system. Lifelong learning may be for pleasure, intrinsic interest or for career development. In Catalonia, universities coexist and compete with other public and private organisations in the provision of lifelong learning and continuing education, both by distance (mainly on-line) and place-based. Almost every university has its own lifelong learning institute, sometimes integrated institutionally in the university and sometimes as independent organisations. In this area, on-line education is especially relevant and the Open University of Catalonia (UOC) is a leader in the Spanish market and very well placed at the Spanish-speaking world market (see Box 4.2). In this context, forQ is the Agency for the Quality of Lifelong Learning.

Box 4.1 Consolidating Lifelong Learning in Catalan universities

In 1983 the Organic Law to Reform Universities (LRU 11/1983) made it possible, for the first time, for universities to enter into agreements with public or private entities, or with individuals, in order to develop specialization courses, among other activities. This was a turning-point within the legal system, since it allowed universities to organize non-official activities, that is, activities that are specific to each university that enable them to reach out to student profiles that are different from the ones usually found in classrooms.

Catalan universities were one of the first in organizing and regulating activities falling under article 11 of the LRU. Since then, especially during the 90's, universities moved towards the creation of management units, internally or through foundations, to support their research and more specialised training activities. In Catalonia, in August 1988, the Official Journal of the Catalan Government (DOGC 1026 of 3rd August) published the directives from the Catalan Interuniversity Council on the characteristics of postgraduate courses and degrees. In the rest of Spain, it wasn't until 1991 that a group of universities, in collaboration with the *Consejo de Universidades* signed an interuniversitary agreement with the same purposes.

These new studies were warmly welcomed and rose in demand. This was reflected in the Decree 406/1996, of 24 December, regulating the accreditation of diplomas and specific degrees offered by universities, thus reflecting the interest in promoting collaboration among both national and foreign universities. This framework lead to the further development of lifelong learning, from universities to students with a more professional profile and, to a certain extent, to the belief and understanding that this kind of activities could be the driving force behind the development of both universities and society as a whole.

In 1999, with the Bologna Declaration, there was a strong commitment to progress in the establishment of a European Higher Education Area (EHEA), and it was at a meeting of the European Commission in 2001 where "lifelong learning" was defined as a set of learning activities carried out at any stage in life, in order to increase knowledge, skills and competencies from a personal and civic approach and/or linked to employment. In Spain, the LOMLOU, Organic Law 4/2007 of 12 April stated in its preamble that "*Society also demands for permanent training throughout one's life, not only on the macro-economic and structural sphere, but also as a model for personal self-fulfilment"*. Article 1 of this law deals with the spreading of knowledge and culture through university extensions and life-long learning. Article 2 deals with the drafting of curricula, research plans and specific training plans for life-long learning; and, Article 36 deals with the validation of professional or work experience. Life-long learning is the main goal of Higher Education for the decade beginning in 2010, according to the statement issued by the Conference of European Ministers held in Leuven in April 2009.

Within this European framework, in Spain, the "2015 University Strategy" is an initiative that was coordinated between the national government, autonomous regions and the universities themselves. Its basic objectives are the modernization of universities through the promotion of excellence in training and research; internationalization and participation in the economic change based on knowledge and improving innovation. Lifelong learning is an essential branch of this strategy. In this sense, the Spanish Ministry of Education, from its Secretariat for Universities is committed to draft a set of national regulations on Permanent Training and, for this purpose, has created a specific commission with the following objectives:

1) Clarify the present mapping of Life-long learning at universities
2) Unify terminology and classifications
3) Study the co-existence of official and non-official Master degrees
4) Establish the requirements, conditions, protocols and deadlines to register in the Spanish Register of Universities, Centres and Degrees
5) Establish mechanisms for the recognition of credits for non-official study programmes
6) Gain an internal and external visualization of Life-long learning
7) Recognize these study programmes in public calls for funding
8) Recognize representative associations at a State level
9) Find mechanisms to recognize formal, non-formal and informal training
10) Define the role of public universities regarding Life-long training

256. The non-university supply of continuing (professional) education is carried out by a much atomised set of small private centres, usually associated with unions or business associations. In 2004 the Consortium for Continuing Education of Catalonia was created, in charge of the management and execution of continuing professional education in order to reach the objective of guaranteeing lifelong learning, workers adjustment to the knowledge-based society as well as enhancing the workers' adaptation to changes in the different productive processes. As far as the role that universities play in on-going training given by companies, there is very little information to approach what is really going on. However, universities tend to collaborate with companies in certain aspects (courses, projects, etc…), but not on a regular basis. As an example, the URL has several units for in company training in Social Projects and in Management with the so called corporative universities with many national and international firms.

Table 4.8 Students and programmes in official and unofficial postgraduate courses, academic year 2006-2007

	Unofficial				**Official**			
	Students	**%**	**Programmes**	**%**	**Students**	**%**	**Programmes**	**%**
Autonomous University of Barcelona	8,752	16.02	557	27.00	615	14.53	29	17.16
University of Barcelona	27,823	50.94	248	12.02	960	22.67	40	23.67
University of Girona	Nd	Nd	Nd	Nd	256	6.05	15	8.88
University of Lleida	909	1.66	52	2.52	232	5.48	7	4.14
Polytechnic University of Catalonia	6,428	11.77	711	34.46	1,074	25.37	32	18.93
University Pompeu Fabra	3,193	5.85	155	7.51	257	6.07	13	7.69
University Rovira i Virgili	1,440	2.64	44	2.13	611	14.43	24	142
University Abat Oliba CEU	0	0.00	0	0.00	Nd	Nd	Nd	Nd
International University of Catalonia	1,268	2.32	79	3.83	68	1.61	2	1.18
University Ramon Llull	4,400	8.06	199	9.65	161	3.8	7	4.14
University of Vic	402	0.74	18	0.87	Nd	Nd	Nd	Nd
CATALONIA	54,615	100.00	2,063	100.00	4,234	100.0	169	100.0

Source: CRUE

257. The average age of the students enrolled on tertiary education courses has gradually increased in recent years. Even if student performance has improved over the last few years, there are still significant delays, especially in the completion of engineering courses. The age increase among university students does not therefore appear to be due to greater educational failure. On the contrary, longer periods spent at university reflect changes both in the demand for courses and in the background of university students.

258. The following hypotheses have been put forward to explain the greater proportion of older students at universities: first, difficulties in finding a suitable first job may boost demand for accredited postgraduate courses and second degrees, as students wish to have a broader curriculum to give them an advantage when competing in the labour market.

Secondly, there may be a demand for continuing education that has benefited from the creation of only second cycle courses. Thirdly, some of the adult students combine work and study.

259. A significant element to be considered is the high number of students that work and study at the same time. This circumstance can indicate low levels of coverage by scholarships and study grants in the region, and may have an effect on student academic performance. This phenomenon is common in Catalonia. Nevertheless, part-time students do not have any special status in the higher education system.

Box 4.2 Open University of Catalonia (UOC)

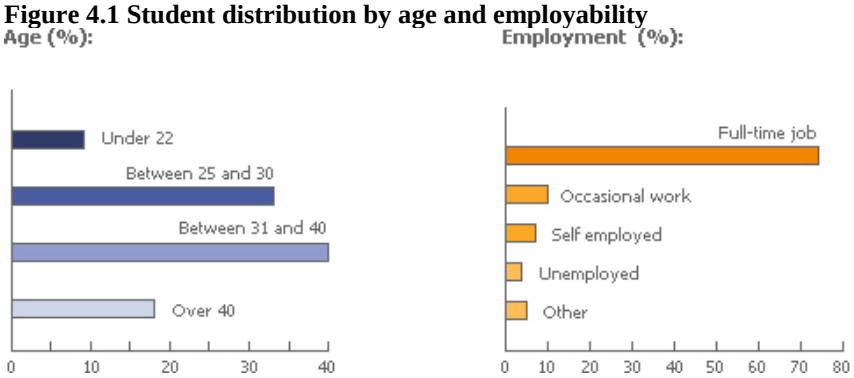
The Foundation for the Open University of Catalonia was created on 6 October 1994 as an initiative of the Catalan government to provide access to lifelong learning through the use of information technologies and a personalised educational model. On 6 April 1995, the Law recognising the Open University of Catalonia (UOC) was officially approved by the Catalan parliament. Since, it has become an internationally-renowned online university, offering student-centred learning with the benefits of personalized studies, flexibility, accessibility and collaboration. The University offers a public service (the Foundation) and is organized in private management. The UOC is a leader and innovator in education and technology, and is a benchmark for quality in its academic work and research in e-learning based on Information and Communication Technologies (ICT). It is also sensitive to the diversity of its environment and committed to the capacity of education and culture to effect social change. The UOC has currently over 33,000 students from Catalonia enrolled (2008-2009) in undergraduate, masters and PhD programmes ranging from Humanities, Psychology and Tourism to Telecommunication studies and Business and Management Administration.

Table 4.9 Students enrolled by origin

	Students enrolled	Residing in Spain	Residing in Catalonia	Residing outside Spain
LRU Recognized degrees	38,311	37,454	28,246	857
Undergraduate programmes	3,398	3,314	2,611	84
Master programmes	1,486	1,285	774	201
Postgraduate programmes	3,257	2,796	2,186	461
TOTAL ENROLLED:	**46,452**			

Source: UOC

Figure 4.1 Student distribution by age and employability



Source: UOC

In the past few years the number of students under 22 years old enrolling at the UOC has been steadily increasing introducing a new dimension to the university since it is becoming a first option for quite a number of students commencing university studies, and not only those with special needs (i.e. full-time workers, students with family obligations, professionals in need of lifelong learning education, etc.). The UOC contributes to the labour market's need for higher qualified workers by providing higher education opportunities and a wide choice of lifelong learning programmes with a specially designed teaching methodology student-centered and with constant support and supervision.

260. This brings to the discussion the issue of adult education. Today's Catalan population has lived and been trained in very different educational contexts and have had very unequal training opportunities. Until the end of the 70s, there was no modern and generalist educational system guaranteeing real compulsory schooling for all. The generations born at

the end of the 60s have an educational level which, with the peculiarities that are specific to each country, can be compared to that of the other countries of the European Union. However, the generations born between 1940 and 1970 only had an old-fashioned and minority educational system available, with rates of schooling that were very different from those of the other countries of the EU for the same generations (*Ministerio de Educación y Ciencia*, 2006). Until the 1970s, labour training was developed through experience. In the Catalan adult population, therefore, we find different levels of educational attainment based on characteristics such as age and sex.

261. In addition, the increasingly long initial training period, and dizzying changes in social and work life not only affect younger adults but adults in general. To maintain their basic skills, they must participate in training programmes throughout their lives. This fact increases those challenges arising from the previous training deficits of older generations. The Catalan education system has provided most people born at the end of the 1960s and after with the basic skills corresponding to longer and modern compulsory education, which has increased from four years prior to 1970 to eight years with the introduction of the General Education Law. Reducing the high level of school failure continues to be one of the main challenges, with notorious effects on universities and lifelong learning activities.

262. Related to this, another initiative to be highlighted in the Catalan university system is the upsurge of Universities for Older People (*Universitats de la Gent Gran*) promoted by the National Distance University (UNED). At present, there are two campuses, one in Cornellà, a joint initiative with the city council, and another one in Terrassa, a joint initiative with the Polytechnic University (UPC). These institutions complement a more than 25 years old tradition in Catalan universities to offer, as a part of their cultural activities, what is called Classes for Older People (*Aules de la Gent Gran*). The newest universities also offer these services.

263. With regard to access to ongoing training, we see that in Catalonia as elsewhere, the natural tendency is for the most highly-trained people to receive more training, whereas those who have more deficits in basic skills are generally excluded. In the case of young people, the high rates of school failure recorded in Spain also represent a major problem, primarily in relation to the barrier it represents in access to lifelong training. This is especially serious for the young who have many years of social and work life ahead of them. However, the training deficits of young adults are not the same as those of older adults: whereas illiteracy in older adults relates to basic knowledge due to the lack of access to schooling, illiteracy in young adults is due to school failure. Despite the fact that the latter is a subject that is far from the aims of this report, we should not ignore it as an eventual source of problems, and a barrier to the development of lifelong learning for the whole population.

4.4 Changing forms of educational provision

264. Catalan higher education policy aimed at integration into the EHEA, which will involve creating courses that can be more easily compared at a European level and greater focus on student learning, will also entail new relations with the labour market. The European Diploma Supplement will facilitate student mobility and integration into the European labour market, as it is an easier, more transparent mechanism for transmitting information on the knowledge acquired by students to other universities and European institutions. It should be mentioned that URL got the ECTS label award in 2006 before the Bologna reform was regulated by the Spanish Law in 2007.

265. Introducing the European credit as the unit of educational attainment involves evaluating all the work carried out by students on their courses and not just the hours spent

in class. This will make it easier to insert in-company work placements into students' academic records, thus promoting greater contact with the labour market at an earlier stage. Higher vocational education, whose curricula are currently under revision, is going to be credit-counted in order to facilitate further university studies, since, using a different counting measure would make such progression difficult to fulfil. Nevertheless, there are some initiatives that tend towards more learning-based methodologies, as described in Box 4.3.

Box 4.3 Teaching methodology of the Technical School of Chemistry Engineering (Escola Tècnica Superior d'Enginyeria Química, ETSEQ) (Rovira i Virgili University, URV)

The teaching methodology that the Technical School of Chemistry Engineering (ETSEQ) uses is based mainly on an active learning student-centred. This methodology, implemented at ETSEQ over a decade ago, seeks to train and prepare engineers for a changing world where learning to learn is more important than memorising knowledge; able to work in multidisciplinary teams, to develop skills (leadership and communication) and to provide traineeships in the industry sector with a strong international inclination (50% of the students at ETSEQ have an international study or trainee experience).
In the ten years that this methodology has been in place there have been important improvements: lower failure degree among first year students, a higher practical experience and training in project organisation and management, a rapid adaptation to different working environments and facility to apply the knowledge acquired to real situations.

The centre has between 150 and 200 training agreements annually with the industry sector (in Catalonia and with international firms). These agreements allow students to enter the industrial world well before finishing their degree under supervision.
After over ten years of experience this methodology has proved to be crucial to foster professional attitudes without a backdrop in the technical training and knowledge transmission.

266. Another consequence of the integration of the Spanish tertiary education into the EHEA with consequences for Catalonia is the definition of the Spanish Qualification Framework. This framework, which is currently under development, will allow learning processes to be defined in relation to the competencies required by the labour market. This framework will help to transform the design of degree courses at university level thus bringing them closer to real social and economic demands.

267. In 2005, the Catalan government and the principal economic and social agents in Catalonia signed the Strategic Agreement around three main objectives: to promote the internationalisation of the Catalan economy, the strengthening of its competitiveness and the quality of employment. The agreement aimed to be the road map to competitiveness, orientating economic policy on the road towards the improvement of productivity and, at the same time, guaranteeing the combination of economic growth with quality of employment and social cohesion.

268. The educational and training measures envisaged in the Agreement included a strategic agreement for vocational education and training in Catalonia with the objective of increasing the number of people trained though vocational education, in line with the objective of the 2nd Vocational Training Plan to increase by 40% the number of vocational training service users by 2010. Similarly, the aim is to guarantee retention in the system, above all of young people in the compulsory education stage, as well as to increase and extend the number of people who opt for vocational education and training as a formula for personal development. In addition, the Agreement considers as strategic actions promoting inclusion and educational achievement, and reducing early drop-out by students; strengthening the teaching of information and communication technologies (ICT) in schools

and higher education institutions; strengthening the reception and integration of immigrant students; developing a university model that opts for excellence and internationalisation; revising qualifications and teaching methods to adapt them to the needs of the labour market; improving university-industry relations and, finally, attracting and retaining talent.

269. As in other orbits of human activity, ICT brings a number of advantages and capabilities that are also present at universities: large treatment and storage of information, interactivity and automating tasks, flexible access to information and easy transport data, channels of communication, integration of media and codes, reduction of cost, time and effort in carrying out the work, among others. In addition, the impact of ICTs in the University is greater than in other environments because many of the basic functions of this institution are precisely based on location, production, storage, criticism and transmission of information, operations that are provided and certainly changed with the use of new technologies.

270. In Catalonia, as in other regions, ICT has become a standard for teaching and learning activities (CRUE, 2004). All universities have virtual campuses at different levels of interactivity with both students and staff. These have been mainly used for postgraduate programs (masters and diplomas) but are being increasingly used also for undergraduate education. In this last dimension, webs for courses where students can find materials and links to information and resources as well as virtual tutorial activities are the main uses of ICT. The initiative Estudia.cat, the information channel for higher education in Catalonia, is a clear example of the relevance of ICT as an information tool.

271. Nevertheless, these technologies can also be used for learning activities. For example, ICT constitute a transversal content that passes through all areas of knowledge and is one of the factors, though not the only, which makes necessary a constant program renewal of courses and subjects. In addition, new methodologies can be implemented by using ICT as faculty has ceased to be the main source of information; it is now geared to students on how to access better information in each case and how to process it into useful knowledge.

272. Thus, taking advantage of the possibilities of ICT, classic universities become bimodal, and new distance universities appear (UOC in the case of Catalonia) equipped with powerful virtual campus. Another formula that begins to set is the "tailor-made degree" composed of credits of different universities. In Catalonia, the Intercampus initiative (www.catcampus.org) a joint project of eight Catalan universities allow students of any of these institutions to enrol in courses offered by any of them, with full recognition of the credits passed.

4.5 Enhancing the regional learning system

273. Some characteristics of the Catalan higher education system, for instance too many universities offering the same or very similar degree courses, the territorial distribution of the universities, the needs of companies and of society that are not adequately met by the universities, etc., represent some of the difficulties faced in order to gain competitiveness and improve efficiency and need to be solved in order to enhance the regional learning system. On the positive side, however, it should be highlighted that cooperation among universities is increasing, in particular in offering joint degrees (see, for an example, Box 4.4).

274. A clear understanding of these problems will aid to predict and prevent some of the problems and unwillingness of university lecturers to adapt to the new demands of society regarding the educational needs of the students. The current situation in Catalan universities is complex due to the following issues: i) the large number of Catalan universities makes it

necessary to readjust and rethink the role of universities in the Catalan society; ii) new students are entering university with different kinds of knowledge, they are demanding different types of courses (undergraduate and postgraduate) and display different abilities and values; iii) university staff must change their culture and way of thinking if they wish to keep abreast of these changes and it is essential to help them to modify their beliefs and ideas concerning the university and its functions; iv) new information technologies provide a large number of new ways of processing information more effectively and factors such as the role of university teaching staff, ways of teaching, methodologies and research, etc. must be rethought.

Box 4.4 Interuniversity Master in Public Management (Màster Interuniversitari en Gestió Publica) (University of Barcelona, UB – Autonomous University of Barcelona, UAB – University Pompeu Fabra, UPF)

Interuniversity Master in Public Management coordinated by the Autonomous University of Barcelona, and with the participation of the University of Barcelona (co-director), University Pompeu Fabra (co-director) and the Catalonia Public Administration School.
The origin of this master can be found in the academic year of 1988-1989 when it was first delivered at the Autonomous University of Barcelona under the initiative of Dr. Subirats. It was, and still is, an innovative programme for its content as well as its multidisciplinary orientation and its teaching methodology.
During the 21 editions of this master programme more than 300 professionals have been trained with the goal to prepare them for thorough analytical reflection and professional practice in the areas of public management. These professionals work in the public, semi-public and private (consultancy) fields. The founders of the Catalan Association for the Improvement of Public Management (1992) are former students of the Interuniversity Master in Public Management. This association has organised two conferences with over 400 participants that indicate the interest and relevance of public management.

275. In public universities, the Social Councils have representatives from employers' organisations, chambers of commerce and professional associations, as long as it is regulated by the regional government. The role of the Social Councils as far as academic issues are concerned is very limited, resulting in a very minor real implication in educational policies.

276. A comparative analysis of recent graduates and employer opinions show that, in evaluating the training received, both groups generally coincide in giving the theoretical component a positive evaluation and, the practical component, a negative evaluation.

277. The recent White Paper on the University of Catalonia developed by the ACUP establishes a set of strategies and measures to foster the regional learning system in a context of strong co-operation among (public) institutions:

- An integrated offer of degrees in the context of the European Higher Education Area
- To foster undergraduate studies having in mind social needs and demands
- Learning as a process requires a more general entry profile and a more specialised exit profile
- To offer masters that can become international reference in key areas
- Strengthening teaching along with acquiring competences for the labour market
- To promote lifelong learning with a supply of quality and flexible programs

4.6 Conclusions

278. The Catalan University system offers varied undergraduate and graduate degrees of sufficient quality in order to allow a high percentage of residents to study in a university in their own city or region. At the same time, even if mobility of students in Spain is very low it attracts a modest number of foreign students, above the Spanish average. Recently, the range of services has been extended, reinforcing the university's role as a supplier of services to students and to the rest of society in the region.

279. According to the Times Higher Education 2009 ranking of World universities, a more teaching-oriented ranking than the Shangai one, the University of Barcelona is again the best placed Spanish university, although in the 186th position. However, this ranking is composed by six different indicators, and analyzing each of these separately, we can see for example the UB at the 97th place in the academic peer review indicator and, more interestingly, the URL (a result mainly driven by ESADE Business School) at the 68th position in employer review and the UPF in position 48th in the international faculty indicator.

280. Despite the significant rise in the number of enrolled students in universities due partly to the creation of new universities and partly to Catalonia's economic development, the socio-economic origin of university students is biased towards families with medium to high incomes. There seems to be a relatively low mismatch between supply and demand of graduates in the Catalan labour market as well as between HEIs' degree's specialisation and regional productive specialisation.

281. About three quarters of university students continue to improve their education level after graduation. Continuing education is relevant as a big share of all postgraduate students in Spain is enrolled in Catalan universities. A common phenomenon in Catalonia is related to the high number of students that work and study at the same time, indicating low levels of coverage by scholarships and study grants in the country. In Catalonia as in many other regions or countries, the natural tendency is for the most highly-trained people to receive more training, whereas those who have more deficits in basic skills are generally excluded.

282. The transition to the European Higher Education Area is meaning that Catalan universities are becoming aware of the importance of student learning and also of strengthening the relationships with the labour market and the society as a whole. Once the Catalan system is fully adapted to the Bologna process, it will facilitate student as well as staff mobility, better learning systems and perhaps some degree of institutional specialisation.

283. In order to enhance the regional learning system, some negative characteristics of the Catalan higher education system should be tackled. Among the most important are: too many universities offering the same or very similar degree courses and the needs of society and companies that are not adequately met by the universities. For that purpose, the recently published White Paper on Catalan University (ACUP, 2008) is intended as a tool to reinforce the strengths as well as to mitigate some of the identified weaknesses.

4.6.1 Collaboration between regional stakeholders

284. Collaboration between regional stakeholders in order to enhance the contribution of teaching and learning to labour market and skills takes place at several dimensions, although co-operation in this field is still rather rare in the Catalan university system. In the first place, in the context of the Strategic Agreement, the main economic and social actors proceed together in order to achieve the objectives oriented to education and training

envisaged by the defined actions within the overall plan. Secondly, the creation of ACUP grouping all public universities in order to develop the idea of the "University of Catalonia" as a single entity will certainly have an impact on fostering collaboration among higher education institutions and other social, economic and public agents. In third place, other initiatives such as the Vives network of Catalan speaking universities, grouping together institutions from Catalonia, Valencia and the south of France (*Catalunya nord*) whose aim is to create a university network that makes possible the coordination of teaching, research and cultural activities, as well as the promotion and normalisation of the Catalan language. Finally, initiatives such as the International Congress of University Teaching and Innovation (CIDUI), whose 6th edition will be held in 2010 in Barcelona and is normally organized jointly by the public Catalan universities and the UOC, or the BCU –*Barcelona Centre Universitari*– a joint effort of four public and four private universities along with the regional government and the city council to assist foreign students with accommodation, travel and living in the city and in the region, are remarkable examples of institutional collaboration.

4.6.2 SWOT related to the contribution of teaching and learning to labour market and skills

Strengths	**Weaknesses**
▪ Open, extended and accesible higher education system ▪ Expanding range of services to society ▪ Widespread development of continuing education ▪ Attracts a big share of Spain's postgraduate students ▪ Increasing number of adults enrolling in Higher Education ▪ Very close relationship between vocational training and the labour market ▪ Attractiveness of Barcelona for undergraduate and graduate students as well as for professors and researchers	▪ Universities do not have control over main expenditures (wages) nor revenues (tuition) ▪ Scarce student and staff mobility ▪ Unequal access possibilities in terms of economic position ▪ Incomplete financial aid system ▪ Decision making mechanisms rather slow and ruled by academics ▪ Learning model not yet adapted to the needs of students and society ▪ Enrolment in vocational education is lower than in other European countries ▪ Insufficient collaboration among stakeholders ▪ Insufficient institutional specialisation ▪ Lack of homogenous data to analyse the insertion of graduates in the labour market
▪ **Opportunities**	▪ **Threats**
▪ The Bologna process will change the learning system and adapt it to regional needs ▪ Adaptation to EHEA can detonate major institutional and organisational changes ▪ Development of knowledge-based economy places universities at the core ▪ Increasing economic importance of high-technology and knowledge intensive activities ▪ Increasing globalisation of higher education	▪ Increasing global institutional competition to attract talented students ▪ Restrictive national and EU wide immigration policies deter foreign students inflow

CHAPTER 5 CONTRIBUTION TO SOCIAL, CULTURAL AND ENVIRONMENTAL DEVELOPMENT

5.1 Introduction

285. This chapter focuses on the social responsibility that Catalan HEIs adopt through the educational services and knowledge transfer which they offer following the principles of ethics, environmental respect, social commitment and the promotion of citizens' values. All of this is framed in the so called third mission of universities which refers to the adoption of a new role on the part of HEIs which moves beyond the traditional functions of Higher Education and research.

286. Before beginning the analysis of the role which Catalan HEIs play in social, cultural and environmental development, their double function must be defined: on the one hand, they act as active agents and on determining occasions adopt social, cultural and environmental responsibilities, and, on the other hand, they act as shapers of socially responsible citizens who will adopt their own active role in the development of society in these social, cultural and environmental aspects.

5.2 HEI and social development

287. As a forward note to the diverse roles played by HEIs in social development it is necessary to emphasise their role in guaranteeing social mobility. The commitment to a quality public university and universal access provide equality of opportunity that for decades has been a determining element in making social mobility possible.

288. On the other hand, there is a Catalan scholarship system (complementary to the state scholarship system) formed by the scholarships, grants and loans given by the Department of Innovation, University and Business of the Catalan Regional Government via the Agency for Management of University and Research Grants (AGAUR). These scholarships and grants are for undergraduates, graduates, PhD students and postdoctorates to make tertiary education more equitable in Catalonia. In addition, most of the Catalan universities also award grants and have their own scholarships, through some of them ("collaboration grants") students can collaborate with various bodies of the university or external entities that have signed collaboration agreements with the university and, in exchange, they receive financial assistance (UB, UAB, UPF, UPC, UdL, etc.). However, it is worth to remark that Spain, and in extension Catalonia, are at the tail-end of EU-countries in relation with scholarship resources. It is also necessary to emphasize the challenge that higher education institutions are going to face in the coming years: the rise of students from immigrant backgrounds who are now in secondary schools. However, this change will take place in higher education if the Catalan and Spanish education systems overcome the problem of school failure, which is especially high among immigrant students.

289. However, beyond this general consideration about universal access, the Catalan HEIs assume, today, an active role in the promotion of values such as gender equality, the culture of peace, human rights, respect, tolerance or social policy.

5.2.1 HEIs, instruments of social inclusion and cohesion

290. Certainly, inclusion goes far beyond open access without economic restrictions. Therefore, in order to take on social responsibility in terms of inclusion, HEIs make an effort to guarantee that everyone can gain access in equal conditions. To realize this objective they develop active policies that facilitate the entry of groups with access difficulties of any kind.

291. There are three existing levels on which Catalan HEIs develop a role in the defense and promotion of social inclusion.

292. The first level exists in the development of their internal activity through all of those actions, programmes and policies which guarantee the access and inclusion of all users (students, faculty, technical teams, researchers, various personnel…) that form part of the traditional activity of the university. Some examples of these types of actions and programmes are related to the access for people with reduced mobility, disabilities or special needs (such as the UPC Chair of Accessibility, the UdL programme for the elimination of architectural barriers, the URL Personal Orientation Service, created by its Blanquerna's faculties, or the UAB programme that facilitates the access to higher university studies for the non-EU immigrants).

293. The second level can be seen in the opportunity of formation offered by the HEIs to society as a whole, which is forever growing in intensity. This relates to the openness of the university world towards society as a whole and its needs. One example is the university extension courses for the general population or specifically for older people that almost all Catalan universities offer (see box 5.1, with the case of the UdG). Another example is the role that university libraries are playing as open places that permit society access to a wide range of information and knowledge.

Box 5.1 Adult education (University of Girona, UdG)

In the present process of consolidation and social awareness of all that affects elderly people and lifelong learning as a vital argumentation for the development of the individual and society, the university has an important role to play. The University of Girona (UdG) since its foundation in 1991 has been active in these areas. Specifically through the following programmes:

- *Aules d'Extensió Universitària per a la Gent Gran* that organise workshops and seminars for elderly people, some of them together with the AFOPA (*Agrupació d'Aules de Formació Permanent per a la Gent Gran de Catalunya*, the association of permanent education classes for elderly people of Catalonia).
- *Programa de Formació per a Majors de 50 anys*, a programme that since 2005 offers the possibility for people over 50 to take undergraduate degree subjects at the university (sharing the class with undergraduate students).

The characteristics of the people that participate in these programmes is very diverse; age can range from 50 to over 80, personal interests vary enormously as well as the motivation. However they share some common traits such as continuity, high level of participation and performance and adaptation to new environments.

294. Finally, HEIs adopt a role as active agents within society intervening in it through the study of reality and the development of policies or through putting concrete programmes and actions into place. It is worth highlighting the existence of many initiatives dedicated to analysing and developing concrete policies for social cohesion and integration: the Interuniversity Institute of Women and Gender Studies (UPC, UAB, UB, UdG, UVic,

URV), the Interdisciplinary Immigration Research Group (UPF), the Institute of Government and Public Policy (UAB), the UNESCO Chair of Women, Development and Cultures (UB), among others.

295. Catalonia is the country with the most UNESCO Chairs of the world. Presently, it has 21 UNESCO Chairs in the main universities such as the UNESCO Chair in Peace and Human Rights (UAB), UNESCO Chair for Education, Technology and Development (URL), UNESCO Chair of Intercultural Studies (UPF) or the UNESCO Chair of Technology, Sustainable Development and Imbalance and Global Change (UPC) or the UNESCO Chair for Middle-Sized Towns, Urbanism and Development (UdL).

296. Apart from general policies and plans, HEIs are responsible for develop concrete programmes and actions for the promotion of social cohesion. All these actions are leaded for Solidarity Foundations (UAB, UB) or services like the Volunteer Service of URL.

5.2.2 HEIs as promoters of sport

297. Catalan HEIs are engaged in the promotion of sport and physical education in all of its aspects aimed at the all-embracing education of its people. In this way, the universities promote physical activity and health, education in sport management and research in this area.

298. In this sense, the majority of Catalan HEIs offer sports services and infrastructures, they form diverse sports clubs and organize and participate in university competitions in different sports (football, basketball, athletics, waterpolo, badminton, tennis, etc.).

299. The commitment to sport can also be seen in the support for the sports elite, in that some universities develop support programmes for these people through financial aids, the validation of credits and academic guidance to reconcile studies with a high-level sporting life. Sports Elite programmes can be found in the main universities (UB, URL, UPC, UAB, UPF, UAO).

5.2.3 HEIs in the development of Health and biomedical science policies

300. Catalonia boasts, as has been presented in chapter 3, international prestige in biomedical research, an area in which HEIs assume a fundamental role. Of the ten most productive hospitals in the Spanish State in clinical investigation, the first three are Catalan: *Hospital Clínic i Provincial de Barcelona* (linked to the University of Barcelona), *Hospital de la Vall d'Hebron* (linked to the Autonomous University of Barcelona), and *Hospital de la Santa Creu i Sant Pau* (linked to the Autonomous University of Barcelona).

301. Likewise, beyond research, it is worth emphasizing part of the third level educational offer in relation to health policies. Here the Masters in Public Health (UPF – UAB) may be stressed; this is one of the most valued at state-level and has international prestige.

5.2.4 HEIs, platforms for international co-operation and development

302. The majority of HEIs in Catalonia offer programmes in international co-operation, assuming responsibility in the support of other more unfavoured socio-economic realities, thus working in defense of democratic values, liberty and justice for people in many places around the world. These programmes are carried out through direct action or through the study of realities and the development of concrete policies.

303. On one hand, the direct action is leaded by organisms such as the Centre for Co-operation and Development (UPC), that carries out voluntary initiatives, the Campus for Peace (UOC) that develops education and research programmes with social application, the Offices of Co-operation for Development in UdG, UdL, URL and URV, for example. Another remarkable example is the CRESIB (Barcelona Centre for International Health Research), a research centre in global health (see box 5.2)

Box 5.2 Barcelona Centre for International Health Research (Centre de Recerca en Salut Internacional de Barcelona, CRESIB) (University of Barcelona)

The **Barcelona Centre for International Health Research, CRESIB** is a new global health research institute developed from some of the leading academic and biomedical research institutions in Barcelona (University of Barcelona, *Hospital Clínic de Barcelona*, *Institut d'Investigacions Biomèdiques August Pi i Sunyer* (IDIBAPS)) together with the Catalan Government as a response to the new international health challenges of the 21st century.
CRESIB was founded in July 2006 by the Generalitat de Catalunya, the University of Barcelona (UB), *Hospital Clínic de Barcelona* (HCB) and the *Institut d'Investigacions Biomèdiques August Pi i Sunyer* (IDIBAPS). CRESIB's scientific agenda includes the study of the poverty-related diseases, emerging, re-emerging and immuno-preventable diseases, health and migration, and health and climate. CRESIB promotes multidisciplinarity and excellence in research, and also collaborates with other research centres from developed and less-developed countries. Research on malaria is the main research focus for CRESIB and where most of its developments and innovations can be found (tools to control malaria and work on a vaccine). Through its research activities the CRESIB has consolidated collaborations with more than 60 research centres in over 30 different countries.

304. On the other hand, there are programmes and organisms more focused on the analysis of reality and later development of concrete policies. It is worth highlighting the work of CIDOB Foundation (Barcelona Centre of International Studies), a reference point in that field, or the Barcelona Institute of International Studies, formed by the UB, UAB, UPC, UPF, UOC and the CIDOB Foundation.

5.3 HEI and cultural development

5.3.1 HEIs as generators of knowledge and excellence among culture professionals.

305. The network of HEIs in Catalonia is formed by universities and art schools, both types of institutions having the same legal status. The role of these art schools is really remarkable now that they have made possible the development of a high-quality and professionalized culture in Catalonia. However, at present, there is not enough information nor data on the role of these art schools, their connections with universities and the effects of this education system on the professionalization of these sectors in Catalonia.

306. Thus, the art schools are the maximum expression of the commitment adopted by the HEIs to the professionalization of the artistic sectors, generating quality professionals for all of them. On this point, we must emphasise the new legal framework in which artistic education in Catalonia will develop now that the new law in education (12/2009, July 10th) specifies that "the educational Administration will exercise the functions specifically related to the teachings of higher artistic education[14] (…) through the ***Institut Superior de les Arts***".

[14] Artistic teachings: music, dance, plastic arts and design, dramatic art, conservation and restoration of cultural goods and other artistic manifestations determined by the Government.

Thus, this new autonomous organism will manage the art schools, providing them with more autonomy and presence in the whole Catalan university system.

Table 5.1 Art Schools Catalonia

Field	Name of Centre	Qualifications	Specialty	Linked University
Theatre	Institute of Theatre (Superior School of Dramatic Art)	Direction and Dramaturgy qualification	Stage direction	
			Dramaturgy	
		Scenography qualification		
		Interpretation qualification (options; theatre in text, expressive theatre, puppetry and theatre of objects and musical theatre)	Theatre in text	
			Expressive Theatre	
			Puppetry and Theatre of objects	
			Musical theatre	
Dance	Institute of Theatre (Superior School of Dance)	Pedagogy of Dance		
		Choreography and techniques of interpretation of dance		
Design	Bau School of Design	Higher qualification in design	Audiovisual design	UVic
			Fashion design	
			Interior design	
			Graphic design and visual communication	
	Lai School of Design	Higher qualification in design	Interior design	UIC
			Graphic design	
	Eina School of Design	Higher qualification in design	Interior design	UAB
			Product design	
			Graphic design	
	Elisava Superior School of Design	Higher qualification in design	Industrial design	UPF
			Design	
			Multidisciplinary design	
			Audiovisual design	

	ESDI Superior School of Design	Higher qualification in design	Textile Design	URL
			Product design	
			Fashion design	
			Graphic design	
Music	Liceu School of Music	Higher qualification in music	Jazz and Modern Music	
			Classic and contemporary music	
	Superior Music School of Catalonia (ESMUC)	Higher qualification in music	Jazz and modern music	
			Classic and contemporary music	
			Ancient music	
			Traditional music	
			Theory and composition	
			Direction	
			Musicology	
			Pedagogy	
			Sonology	
			Promotion and management	
	School Workshop for Musicians	Higher qualification in music	Traditional music	
			Jazz modern music	
Cinema	School of Film and Audiovisual Presentation of Catalonia	Higher qualification in cinema and audiovisuals	Direction	UB
			Production	
			Script	
			Direction of photography	
			Set	
			Sound	
			Artistic direction	
			Documentary	

5.3.2 HEIs in the development of the culture of creativity and innovation

307. Knowledge, and its transfer, creativity and innovation are elements which differentiate one region from another, which make a region more attractive and competitive as they are sources of wellbeing, development and wealth. It is for this reason that there is a forever greater number of common initiatives between HEIs and other public (governments) and private (companies) agents whose objective is to generate synergies and to increase business opportunities through knowledge transmission. Some highlighted examples of stable projects of the promotion of knowledge transference, creativity and innovation, in the field of cultural development, are:

- Barcelona Media: technological centre dedicated to applied research in the field of communication or media, and to knowledge and technology transference in this sector. Its activity is based on the integration of R&D&i groups and service laboratories in collaborative projects with businesses and institutions (UPF)
- Social Sciences and Humanities Research Park: organized to promote, develop and manage large research and development initiatives in the field of the social sciences and humanities, its principal mission being to promote social commitment favouring research, innovation and the transference of results and technological progress thus making itself a revitalising socioeconomic agent acting between the university, the administrations and firms. (UPF)
- ESADE Creapolis: International centre of innovation where "Open Innovation" is practiced. It combines an academic (ESADE Business School) and business zone which presently brings together more than 70 firms resident in the park, and is part of the Research and Transfer Office which includes PEINUSA and La Salle Innovation Park, (URL) (see box 5.3)
- Music Technology Group (Department of Information and Communication Technology, UPF): specialized in the digital technologies related to sound and music. (see box 5.4).
- IN3 (UOC): The Interdisciplinary Internet Institute is a research institute of the Open University of Catalonia (UOC) specialised in research on the network society and the knowledge economy, such as the study of network technologies and specific areas of software. The IN3 offers a doctorate programme on the Information and Knowledge Society.
- Television Innovation and Quality Master (UPF and TV3): It is a joint initiative between the UPF and the public Catalan TV channel and an important example of cooperation for transfer and innovation.

Box 5.3 ESADECreapolis - Open & Cross Innovation (Ramon Llull University, URL)

The mission of ESADECreapolis, created by ESADE a co-founding centre of the Ramon Llull University, is to foster Open & Cross innovation. Speeding-up innovation, proposing spaces (physical and of knowledge) that stimulate interaction among the business school, the entrepreneurial world and other networks of knowledge and innovation, to detect new market opportunities, to promote its development and commercialization with success.

At present and less than a year after opening, ESADECreapolis has more than 45 companies established on a year-round basis. Nearly 70 of which have shown an interest in being established at ESADECreapolis.

The type of companies working in ESADECreapolis are as diverse as:

Companies with an innovative scope and/or with innovative projects in different sectors of the market that have projects or that want to become innovative in their business.

Departments of innovation of large enterprises.

Newly created companies with innovative projects.

But, all of them went to ESADECreapolis to develop their new ideas or to find new opportunities, new projects and highly stressing new networking with other enterprises and institutions, which very often come from very different business areas.

Box 5.4 Music Technology Group (Pompeu Fabra University, UPF)

The Music Technology Group (MTG) of the University Pompeu Fabra in Barcelona, part of its Department of Information and Communication Technologies and of its Audiovisual Institute, is specialized in sound and music computing. With more than 40 researchers coming from different and complementary disciplines, the MTG carries out research on topics such as sound processing and synthesis; music content description; interactive music systems; computational models of perceptual and music cognition; and the technologies related with music social networks.

The MTG contributes to the improvement of the technologies related to sound and music communication, carrying out competitive research at the international level and at the same time transferring its results to society. To that goal, the MTG aims at finding a balance between basic and applied research while promoting interdisciplinary approaches that incorporate knowledge from both scientific/technological and humanistic/artistic disciplines.

The commercial launching of product based on MTG technology (Vocaloid – YAMAHA, LoopMash – Steinberg, etc.) a financial turnover is over 5 million euros in the enterpises of the sector. In addition the MTG, through its different projects and research activities was been awarded numerous regional, national and international recognitions.

5.3.3 HEIs, creators of new publics and generators of cultural activity

308. Some Catalan HEIs have become cultural managers and rejuvenators through their own culture supply, one of their main objectives being the promotion and generation of cultural consumption habits. Some outstanding initiatives are the wide range of artistic courses and workshops (theatre, dance, poetry…) that all HEIs organise, the UAB cultural promotion service, the Univers programme that brings together all of the cultural offers promoted in UPC or the UOC Art, Science and Technology Magazine.

5.3.4 HEIs engaged with Catalan identity, culture and language

309. The cultural reality of Catalonia impacts upon the functions and roles that the HEIs have been assuming throughout their history. In this way, Catalan universities have defended the Catalan language and identity, always from respect for freedom of individual expression. In this sense, all HEIs in the region offer courses in the Catalan language, as well as in history and culture, for all of those interested in learning it, whether they are foreigners or from other regions of the state.

310. In this context it is worth emphasizing the example of the *Xarxa Vives Universitats*, an association of universities that fosters relations between university institutions of Catalonia, the Valencian Community, the Balearic Islands, North Catalonia and Andorra and also other territories with common geographical, historical, cultural and linguistic links. Its intention is to create a university space which allows for the coordination of teaching, research and cultural activities, thus fostering the use and normalization of the local language.

5.3.5 Joint working between universities

311. There is a common agreement between Catalan HEIs on the creation and transference of knowledge and a good example of this philosophy of co-operation is the creation of the Consortium of Catalan University Libraries (CBUC), formed in 1996 by the UB, the UAB, the UPC, UPF, UdG, UdL, URV, UOC, and at present with the URL also, the Library of Catalonia and the Department of Innovation, Universities and Business of the Catalan Regional Government (Generalitat de Catalunya). The first activity of the CBUC was the creation of the Collective Catalogue of Catalan Universities (CCUC) and afterwards it organized an inter-library loan programme. The positive results of these two initial programmes led to the creation and putting into place of new activities (joint buying of equipment, education, benchmarking…), and to the elaboration the Catalan digital library project.

5.4 HEI and environmental development

312. In terms of the social responsibility of the HEIs, and also in accordance with the third mission of the university, they should be, on one hand, conscious of waste management as well as the energy resources they consume and, on the other hand, they should generate knowledge to work on the development of environmental policies and awareness-raising in society in general.

313. In response to these principles it is important to stress a tendency which has been establishing itself in Catalonia, not only at a university level but also at a scholarly level, and which consists of curricular environmentalism, which is to say, the incorporation of environmental knowledge and awareness-raising in the academic curriculum in general. To achieve this, concrete structures have been created, for example, the ACES Network (Curricular Environmentalism of Higher Studies), formed by UPC, UB, UdG, UAB, ESADE, URV, URL and Elisava.

5.4.1 HEIs, centres of research and innovation

314. Catalonia has an important network of research centres whose activity focuses on environmental development and sustainability. Among all these centres stand out the following:

- EUPMA (Polytechnic University School of the Environment) (UAB)
- ICTA – Institute of Environmental Science and Technology: its mission is to promote and carry out research, and to train researchers who can contribute to our understanding of the environment and meet the challenges posed by the interaction between society and the environment (UAB)
- INTE – *Instituto de Ténicas Energéticas*: Its research activities, knowledge transfer, services and training are chiefly concerned with the use and risks of ionizing radiation and the environmental impact that it may cause. (UPC)
- CEPIMA – Centre for Processes and Environmental Engineering: This centre carries out research, development and innovation and integrates the study, simulation and

optimization of chemical processes and sustainability. Its work is therefore aimed at achieving improvements in the design and management of production systems that lead to the rationalization of the use of resources, improves efficiency in processes and the minimization of environmental impact. (UPC)

- IREC – Catalan Institute for Energy Research: Its mission is to contribute to the sustainable development of society and increase corporate competitiveness via innovation and development of new technological products, medium and long-term research, and development of scientific and technological knowledge in the field of energy. (URV)
- CREAF – Centre for Ecological Research and Forestry Applications: CREAF's main objective is to generate knowledge and create new methodological tools in the field of terrestrial ecology, with special emphasis on forest ecology, in order to improve environmental planning and management in rural and urban areas. (UAB)
- Centre for Sustainability (Cities): this is an internal university project with the objective of maximizing opportunities in R&D&i and introducing sustainability in technological education (UPC)
- The University of Girona Environmental Institute (IMA-UdG): technical research oriented toward environmental protection, the promotion of economic activity and the defense of social and territorial justice. (UdG)
- Centre of Research in Technologies for Sustainability (CRETESOS): carries out research in energy saving, the use of renewable energies and the interaction between people and computers. (UdL)

5.4.2 HEIs as prescribers of public policy

315. HEIs participate in policy decision-making processes as experts on the environmental situation, however, the weight they assume in the configuration of policies goes beyond that of expert advice and, on occasion, they become a driving force in said policies.

316. However, we must bear in mind that the role of Catalan HEIs as centres of environmental research and innovation is at the same time related to the role they assume as prescribers of public policies and these are, in many cases, inseparable. It is worthwhile highlighting the task of the Landscape Observatory, an entity of advice for the Catalan government and awareness-raising in society, in whose steering committee are represented many universities (UdG, UAB, UB, UPC, UdL, URV and UOC); the Catalan Government Action Plan for the Mitigation of Climatic Change 2008 – 2012 that has counted with de collaboration of many universities; the CIRC (International Centre of Research on Coastal Resources (UPC); and the TecnATox, a research centre specialized in environmental protection and providing services to public institutions form URV.

5.4.3 HEIs, spaces of good practice in environmental issues

317. Catalan HEIs have become a good framework for the carrying out of sustainability and environmental development projects, putting into practice pilot programmes that become useful experiences for the whole of society. Some examples are the UPC and the URL Sustainable Plans, UAB Agenda 21 or the Green Office of the UdG.

5.5 Conclusions

318. The role of Catalan HEIs in social, cultural and environmental development is outstanding because they have become active agents which maintain a relationship more and more strengthen with society. Gradually HEIs assume the importance of a real and operative interaction between knowledge generated in HEIs and their social environment.

319. So, HEIs take part, they are opened, they come into contact with nearby society (solidarity activities) and far-off society (platforms for international co-operation and development), through action and through research and study, getting the commitment with innovation and creativity and professionalizing and specializing (art schools) citizenship.

5.5.1 Collaboration between regional stakeholders

320. The Catalan HEIs system has a special characteristic: there is a large amount of them. In this context, the collaboration between HEIs becomes important in order to promote initiatives and projects that are more consistent and global. The collaboration that takes place among the HEIs, as well as with other social agents in social, cultural and environmental development, may be synthesized in the following way:

<u>In social development:</u>

- In many of the open education initiatives developed by Catalan HEIs (extension classes, classes for older people, further education…) collaborative agreements are established between each of the universities that offer the training and cultural and socio-cultural entities of support or formed by concrete collectives which transmit the educational supply.
- When HEIs adopt an active role in society intervening in it to promote social cohesion, as well as to develop international co-operation initiatives, they are normally in collaboration with other agents, primarily through concrete programmes. These are:
- Public organisms of the local, regional and state administrations (City Councils, Institutes, Ministries…)
- The tertiary sector and diverse entities
- The collaboration between the sanitary and biomedical research sectors and the Catalan HEIs is fundamental. Thus, the main Catalan hospitals are university ones and also some medical research centres are as well linked or attached to the HEIs.

<u>In cultural development:</u>

- There are cooperative initiatives and joined-up work between Catalan universities: The Consortium of Catalan University Libraries (CBUC), Collective Catalogue of Catalan Universities (CCUC) and the inter-library loans service.
- The design art schools are connected to the universities.
- In promotion of innovation the Catalan HEIs collaborate and create joint projects with agents from the private sector, primarily companies and business groups, and with public organisms whose objective is the promotion of creativity and innovation, creating knowledge transfer programmes, research and business parks, innovation centres, etc…
- In the generation of cultural activity some collaboration is established between the HEIs and the public administration, although it is not very usual.

<u>In environmental development:</u>

- There are joint programmes among HEIs with the objective of promoting environmental conscience and awareness-raising. For example: Network ACES (Curricular Environmentalisation of Higher Studies)

- Research and innovation centres in environmental development realize projects with and for public administrations and organisms, companies and non-profit entities. Some

of these centres are considered as consortiums with there own juridical personality in which HEIs as much as public organisms and private entities participate.

- When the HEIs put into action pilot programmes in sustainability and environmental development they count, on some occasions, on the collaboration of other HEIs, public organisms and entities.

5.5.2 SWOT analysis of the role of HEIs in social, cultural and environmental development

Strengths	**Weaknesses**
▪ HEIs commitment to ensure universal access to make social mobility possible. ▪ Adoption of the agreement in social responsibility of the universities in the ensemble of the Catalan HEIs. ▪ HEIs are one step forward of the other stakeholders. ▪ Large presence in medical research. ▪ Principal actors in the development of environmental policies and awareness-raising in society. ▪ Important network of art schools which facilitate excellence among professionals. ▪ Wide educational supply which goes beyond the university (university extension classes…).	▪ Lack of collaboration between HEIs and the Business sector in the development of programmes for the promotion of social cohesion. ▪ Lack of collaboration between HEIs and the Business sector in the generation of cultural activity. ▪ Insufficient link between HEIs and culture (understood from the point of view of cultural policy). Presently Catalan HEIs do not hold specific weight in cultural activity or in the definition of cultural policies. ▪ Certain distance between the elaboration of discourse realised by HEIs and the operational capacity of those discourses. ▪ Lack of relation between the Business sector and the HEIs in fields that go beyond those of technology alone. ▪ Complexity of Catalan HEIs system makes co-operation and common politics difficult. ▪ Few scholarship resources, at the tail-end of EU countries.
Opportunities	**Threats**
▪ Capacity to establish links with a multiplicity of sectors and collectives in society. ▪ Possibility of the creation of transversal programmes, initiatives and policies making use of the diversity of the educational supply and the research areas on which the HEIs count. ▪ Existence of interuniversity structures created in order to put in place more joint initiatives and programmes for social, cultural and environmental development. ▪ Favourable spaces for innovation in projects and programmes centred on the promotion of social cohesion and the generation of cultural activity, in the same way it occurs in the environmental field. ▪ There are no framework conditions to	▪ Progressive proliferation of programmes in social, cultural and environmental development without clear objectives or lines of action. ▪ Too inflexibility in most of the HEIS to adapt itself to social changes.

encourage HEIs' contribution to social, cultural and environmental development. ▪ Adaptation to new habits in cultural consumption derived, primarily, from new technologies.	

CHAPTER 6 CAPACITY BUILDING FOR REGIONAL CO-OPERATION

6.1 Mechanisms to promote regional involvement of HEIs

321. HEIs are a key element in different regional agreements and strategic plans. Although in Catalonia there is not a whole strategic plan that covers all the factors for regional growth and welfare, there are different regional and local initiatives where the role of the universities is considered fundamental for the development of the region. Among the current agreements and plans, the most important at a regional level are "The Strategic Agreement to Promote the Internationalisation of the Catalan Economy, the Strengthening of its Competitiveness and the Quality of Employment 2008-2011" and "The Catalan Agreement on Research and Innovation" (2009) and, at a local level, "The Strategic Metropolitan Plan of Barcelona" and "The Strategic Plan of the Camp of Tarragona".

322. The first one, the "Strategic Agreement of the Catalan Economy" for the period 2008-2011 is the continuation of a first agreement promoted by the Catalan Government that achieved a high degree of socio-economic consensus and was signed in 2005 by the government, business associations and the trade unions (see box 6.1). The main objective of this agreement is to foster a change in the economic model of Catalonia. Although it can not be considered a real regional strategic plan it presents a list of detailed and concrete measures to promote competitiveness and to guarantee social cohesion.

323. The universities collaborated in the preparation of the agreement and are also one of the main target agents of the measures proposed in it. Despite this, their participation in the follow up mechanisms of the Agreement are very scarce. In the agreement for the period 2008-2011 the main objectives regarding universities and their role in regional development are:

- Developing and strengthening the transfer networks in Catalonia, as has been presented in the third chapter.
- Moving towards an entrepreneurial university that fosters the transfer of technology and knowledge. Some concrete measures to achieve this objective are to link a percentage of public funding of universities to the results of the transfer of knowledge to business or to rationalise and specialise the science and technology parks.
- Evaluating and marketing the research produced in Catalonia and incorporating the functions of prospecting and technological vigilance into the system. The main commitment of the Government to fulfil this objective is, as has been described in the third chapter, to develop a public-private instrument for the exploitation of technology that will be available for every university and research centre.
- Developing a university model that opts for excellence and internationalisation.
- Revising qualifications and teaching methods to adapt them to the need of the labour market
- Improving university-industry relations with a reformulation of the universities' social councils as it is described further on.

Box 6.1 The Strategic Agreement to Promote the Internationalisation of the Catalan Economy, the Strengthening of its Competitiveness and the Quality of Employment

The strategic agreement for the internationalization, employment quality and competitiveness of the Catalan economy arises from the joint vision of the Catalan government, employer's associations and trade unions of the need to take action facing the globalization of markets and the rapid technological advances by changing the Catalan model of competition, among others. This agreement, reached in 2004, finds its grounds in the consensus among the signing agents regarding the necessary measures, and is a result of the proposals presented by several working groups made up by senior officials, experts and where universities, given their importance, have been a key factor. The relevance of this agreement can be seen in the decision adopted by all signing agents to renew it in 2007.

Beyond the set of measures enshrined in this strategic agreement, it is worth mentioning its participatory and dynamic nature. It is participatory since the process to review and approve the new agreement was done by 165 people, 73 of whom were senior officials and 56 were representatives from the different agents engaged in the working groups. It is dynamic since there is a permanent and systematic follow up of the measures which enable assessment and adopting the relevant corrective measures.

The governance and follow up mechanisms for these agreements are organized in commissions. On the one hand there is the Institutions' Council, the top entity in charge of the follow up of this agreement and made up of representatives from the entities signing this strategic agreement. On the one hand, there are the Follow up Commissions that monitor the implementation of measures and their results. They deal with the progress made and actions carried out. For example, at the last meeting they valued positively the creation of an administrative mechanism allowing university academics to participate in technology and science centres through a linking agreement between universities and research or technology centres for professors or researchers.

There are also reporting commissions and territorial monitoring commissions with on-site representatives from the signatories as well as from economic and social institutions – universities, local entities, chambers of commerce, etc. – Each territorial commission meets at least once a year to assess and report on the development of the agreement in that territory. "Ad-hoc" monographic commissions have also been established such as the Commission on University Policy held in September 2009, and a specific commission to study measures to counter the economic crisis, given the current context. Finally, there is a liaising Committee with the Catalan Parliament in order to guarantee that the actions included in the strategic agreement are carried out transparently.

324. The second one, the CARI, has been described in detail in the third chapter. The most relevant aspect regarding the identification of regional needs and to increasing regional engagement of HEIs is the purpose of defining an own strategy for Catalonia and to focus on and prioritise research and innovation in its socio-economic and scientific-technical needs, challenges and opportunities. This may lead to a more oriented regional dimension of HEIs research policy, although, as has been pointed out in the third chapter, the main objectives of the CARI are more oriented to international excellence.

325. Thirdly, the Strategic Metropolitan Plan of Barcelona (PEMB) has the aim of identifying and promoting support strategies for the economic and social development of the metropolitan area of Barcelona which comprises 36 municipalities. The current PEMB was based on the previous experience of strategic plans of Barcelona initiated in 1990. In the PEMB the most important economic and social bodies participate and in its General Council there are more than 300 institutions, bodies and persons that represent the civil society of the metropolitan area of Barcelona. Nearly all the universities of the area of Barcelona (UB, UAB, UPC, UPF and URL) are in this General council and have an active participation in the definition of the strategies and in the execution of the PEMB (see box 6.2).

Box 6.2 Barcelona Strategic Metropolitan Plan (Pla Estratègic Metropolità de Barcelona)

The Barcelona Strategic Metropolitan Plan was established more than two decades ago. It is a non-profit institution promoted by the Barcelona City Hall, which has among its objectives to elaborate and identify and prepare strategic proposals for the economic and social development of the metropolitan area of Barcelona. In its Executive Committee representatives of the private, social, public and university sector participate. The Executive Committee acts through complicity and consensus between the actors with major decision capacity in the metropolitan territory.

In its process of formalisation of the strategic models, one of its most present and constant aims has been the need to introduce new factors of competitiveness and innovation in the production sectors of the Barcelona metropolitan area economy. This transversal strategy has, from its beginning, had an active and direct intervention of the University as a key element to the economic model restructuring and the contribution of new identity factors such as the excellent research centres, the university – industry sector platforms and the establishment of new and highly valued research infrastructures and equipments.

This contribution of the University to the economic and social development of the metropolitan area of Barcelona, also has a dimension as a reference centre, as seen by the concentration of top Business Schools, the international excellence economy schools, the high quality and internationally recognised offer of master degrees and the attraction of international students (represented by the *Barcelona Centre Universitari*). All this contributes to a better local and international position for Barcelona as a reference pool in university issues.

The present vision of the territory contributes to a high amount of realities as a result of the collaboration of the University with the development of the territory. These realities can be related to three basic lines:

a) **Creation of the research centres and the science parks:** Barcelona Science Park (University of Barcelona), Biomedical Research Park (University Pompeu Fabra), Biomedical Research Centre IDIBAPS, Science and Business Park Biopol, Research Park (Autonomous University of Barcelona) and Barcelona Media Park;

b) Projects that have an impact on urban improvement: Consolidation of a university campus in the centre of the city (University of Barcelona), the University Pompeu Fabra campus in two urban spaces in the city, the new university campus in the Besòs area specialised in energy issues; and

c) **Scientific and technologic infrastructures:** Supercomputer Marenostrum and Marincógnito, Alba particle accelerator, photonics centre and/or the tissue bank.

All the above mentioned leads to the evidence of the importance of the University for the present and future development of the metropolitan area of Barcelona as a competitive economic innovation and production centre of goods and services.

326. Finally, the "The Strategic Plan of the Camp of Tarragona" is a recent initiative and has designed a roadmap and a future scenario for the year 2015 for the economic and social development and welfare for the area of Tarragona, one of the most dynamic in Catalonia (URV and Generalitat de Catalunya, 2008). The strategic plan has been carried out as an open and participative process with a significant involvement of the University Rovira i Virgili in its design and preparation. Furthermore, the URV is one of the key actors together with the main stakeholders of the region (Business associations, trade unions and chamber of commerce among others) for implementing the Plan. The Plan emphasizes the sustainability, the economic and social cohesion and the creativity as key elements for the progress and social welfare.

327. In the preparation of the CARI, the regional government undertook an analysis of the research and innovation system of Catalonia and on the knowledge resources of the region.

This analysis is presented in the framework document for the agreement and includes quantitative and qualitative information from the opinions of an international expert panel, individual interviews of key actors of the research and innovation system of Catalonia and from 22 debate meetings with institutions and experts.

328. Other institutions have also carried out analyses and compiled information on the knowledge resources of the region. For instance, the *Pacte Industrial de la Regió Metropolitana de Barcelona* (Industrial Pact for the Metropolitan Area of Barcelona), in collaboration with the Catalan Government, undertook a study of the innovative potential of the metropolitan area of Barcelona including a detailed presentation of the existing research and innovation infrastructures and services (*Pacte Industrial de la Regió Metropolitana de Barcelona*, 2006). In addition, the City Council of Barcelona has developed a web page called the "Barcelona Research and Innovation Map" with information on the centres, institutions, companies and financial institutions at the forefront of research and innovation within the city and in the metropolitan area. The "Institut of Catalan Studies" has also developed the webpage called "Meridia" (Measurement of the research, development and innovation), which offers information on the resources and outputs of the research and innovation activities of Catalonia. ACC10 also offers in its publications information on the whole research and innovation system of Catalonia and on the activities and performance of some key agents and instruments. Finally, the Catalan Government asked the OECD to make a diagnosis and an evaluation of its research and innovation policy that was carried out in 2009 and will be published in a few months.

329. Although there are no formal mechanisms to identify regional needs and to support explicitly regional engagement of HEIs, the plans mentioned above have the aim to promote regional involvement of the universities and have defined instruments for this purpose. In addition, other specific instruments promote the engagement of the universities with regional needs and demands. Apart from the mechanisms described in the previous chapters, as for instance the technological transfer network of ACC10, four relevant examples are Biocat, the programme "Barcelona, research and innovation" (see box 6.3), the Institut d'Estudis Territorials (see box 6.4) and the 22@ Barcelona project.

330. Biocat was created in 2006 and it is a body that promotes the development of a cluster in the fields of biotechnology, biomedicine and medical technologies in Catalonia. Biocat with a staff of nearly 20 people is supported by the Catalan Government and the Barcelona City Council and promotes the co-operation between firms, research centres, hospitals and universities. It also fosters the competitiveness and internationalisation of the firms and plays a role as a strategic advisor to the government and other decision-makers. The universities are key agents in Biocat and the UB, UAB, UPC, UPF, UdL and URV have representatives in its governing bodies.

Box 6.3 Programme "Barcelona, Research & Innovation"

The main goal of "Barcelona, Research & Innovation" Programme is to increase the international projection of the city's potential and outcomes in both, the research and innovation fields. Barcelona would like to become an important player in the construction of the knowledge-based economy. Thus, the Programme aims to promote the dissemination of the strengths of the Barcelona's research and innovation capabilities and results. The framework of the Programme is an agreement, signed on January 2009, among five universities, four publics (UB, UAB, UPC and UPC) and one private (URL), the Barcelona Chamber of Commerce and the Barcelona City Council.

One of the main outputs of the Programme is the "Research and Innovation Map" of Barcelona and its metropolitan area. The map could be reached at www.bcn.cat/innovacio and have been designed as a friendly tool to allow an easy access to research and innovation capabilities of the region. The Map is presenting more than 300 agents, as research units and institutes, research infrastructures (as scientific parks and technological centres), entities that support innovation (including seed/venture capital firms) and also innovation success cases, especially from spin-off, start-ups and other technology-intensive and innovative firms.

Beside the Map, the Programme is also promoting a wide range of initiative to facilitate talent attraction to Barcelona, as the increase of the accommodation offer for post-graduate students and young researchers, the support to legal arrangements for his/her arrival and welcome services. The accommodation service is offered through a consortium, the BCU ("Barcelona Centre Universitari") a jointly initiative of 9 universities (public and private), the "Generalitat de Catalunya" and the Barcelona City Council.

The Programme is also offering to the participating universities the use of the "Consulats de Mar" ("Sea Consulates") network to develop local specific initiatives to attract postgraduate students, researchers and entrepreneurs to Barcelona. The "Consulats de Mar" are offices devoted to the Barcelona promotion as a business city as well as the commercial exchanges, and the network include 14 offices in the most develop areas of the world (New York, London, Paris, Copenhagen, …), in the emerging economies (Hog Kong, Singapore, Shangai, New Delhi, Dubai,…), South and Central America (Buenos Aires, Mexico) and the Mediterranean area (El Cairo).

The Barcelona, Research and Innovations Programme represent the join commitment of universities, the economic tissue, represented by the Chamber of Commerce, and the Barcelona Municipality to become a Knowledge City.

331. In 2000, the Barcelona City Council approved the 22@ Barcelona project with the aim to transform two hundred hectares of industrial land of Barcelona (Poble Nou), near the waterfront, into an innovative district offering spaces for the location of intensive knowledge-based activities. This initiative is an urban renewal project but also an economic and a social project. The district aims to integrate the different agents of the system of innovation such as companies, universities and training centres and centres of research and transfer of technology and also promotes the creation of networks of formal and informal relationships between these agents. Currently there are more than 1,400 firms established with a significant presence of universities such as the Communication campus of the UPF, the centre of continuing education of the UB and the new headquarters of the UOC. Together with this project another recent initiative in Barcelona is the Business and Technological Campus of Llevant with the presence of the UPC but that aims also to be a location for firms.

332. Finally, the BZ Barcelona Innovation Zone is an ambitious project seeking to respond to industrial and business needs. In 2004, the Consortium of Zona Franca reached an agreement with the carmaker SEAT to buy back 50 hectares of land in the Zona Franca Industrial Estate, located in Barcelona, which it had been leasing until then. Three different business uses have been identified for this land: industrial technology, the food industry and

cultural activities. These all require an approach to business planning and urban development that will convert the area into a place where economic activity and technology can meet.

Box 6.4 Institute for Territorial Studies (Institut d'Estudis Territorials (Universitat Pompeu Fabra, UPF))

The Institute for Territorial Studies (IET) was created as a consortium with its own legal identity integrated in the Generalitat de Catalunya (Departament de Política Territorial i Obres Públiques – Ministry of Town and Country Planning and Public Works) and the Pompeu Fabra University (UPF).

The research activities of the IET focus on the resolution of territorial and urban planning problems. The centre undertakes these activities aside from its support functions to the Administration in its everyday activities, both by participating in the territorial planning of Catalunya and in international and transnational projects.

The IET's research activities are divided in three areas of action:

- Territorial information: gathering and analysis of social, economic, urban, infrastructural and environmental data that has an impact on the territory and territorial planning with the aim to become a reference centre in this field.
- Territorial planning: definition of territorial balance objectives of general interest with the aim to contribute directly to the development of studies to be included in the Territorial Planning Programme of the Departament de Política Territorial i Obres Públiques of the Generalitat de Catalunya and to other institutions with competencies in territorial planning.
- Territorial strategy: formulation of proposals and strategies to reflect upon the present reality, the territorial trends and challenges that affect Catalunya and beyond.

IET not only studies the infrastructures and the activities related to the territory, but also takes into consideration their ways of management and regulation which provides a multidisciplinary perspective that has special importance for Catalunya.

6.2 Promoting regional dialogue & joint marketing initiatives

333. The main instrument in promoting communication between universities and regional agents are the Social Councils. Every university has a Social Council that is the mean by which society participates in universities. As stated in the Spanish Law 4/2007 of 12th of April reforming the previous Law 6/2001 of 21st of December on Universities "the Social Council is the body of participation of the society in the university and should act as an instrument of interrelation between society and the university". The Social Councils are responsible for promoting and assessing the relationships between the universities and their cultural, professional, economic and social environment.

334. In Catalan universities, according to the Catalan Law of Universities (Law 1/2003 of 19th of February) the Social Councils have 15 members, 6 from the governing bodies of the university and 9 representatives of the society. This composition includes individuals from the cultural, economic and social life and is intended to ensure a representation of the different sectors of the region. The chairs of the Social Councils are named by the Generalitat de Catalunya but they have to be chosen among the 9 representatives of the society. The Social Council has to approve the multi-year budget and supervises the university's financial activity. Furthermore, they have other responsibilities such as to approve additional incentives for the faculty and to approve the job list of the administrative staff. They also have to foster the participation of the society in the university, to promote

relationships with the social entities and to stimulate co-operation between firms and universities in research activities.

335. Despite the existence of Social Councils, a common criticism is that external stakeholders have a limited role on the governance and decision making of universities and the university management system is mostly academically driven and insufficiently responsive to the needs of the economy and the society (OECD, 2009). In this sense, one of the objectives of the "The Strategic Agreement to Promote Internationalisation of the Catalan Economy, the Strengthening of its Competitiveness and the Quality of Employment 2008-2011" is to improve university and society relationships reformulating the composition of the Social Councils, increasing the role of universities as interlocutor with the economic and social agents.

336. Within the HE sector, the main instrument to coordinate the activities of universities in regional engagement is the ACUP. This association is composed of all the public universities of Catalonia and issued the "White Paper on the University of Catalonia" in 2008 proposing strategies and projects for the "University of Catalonia". "The White Paper" points out that the interrelation among the eight public universities is very weak and that is necessary to develop cooperative strategies to improve the excellence of the university system, international presence and their contribution to the economic and social development of Catalonia. For this is proposed the joint brand "University of Catalonia" together with strategies and projects on different fields and activities of the universities such as their commitment with the society, higher education, research, third mission or internationalisation among others. It proposes also joint strategies to increase the relationships among universities.

337. In the concrete field of regional engagement of universities, the "White Paper" states that the "University of Catalonia" aims to be a true motor of development, innovation and welfare. To achieve this, it proposes strategies and projects to promote the knowledge transfer improving the flow of university graduates and PhDs to the industry, developing incentives among the teaching and research staff related with the third mission and incorporating the function of the third mission by targets in university funding. The "White Paper" proposes also joint strategies for the internationalisation of the "University of Catalonia", to increase the capacity to attract and retain talent and to project Catalonia and Barcelona as ideal places to pursue internationally recognised postgraduate and doctoral education.

338. Specifically, in the field of internationalisation, the ACUP has developed the *Plan for the International Projection of the Catalan Public Universities 2010-2015* that is a joint initiative stemming from the eight public universities grouped in this association. This *International Projection Plan* is based on a vision that is bold and ambitious but also possible. The main purpose of the International Projection Plan is to make the *University of Catalonia* a cohesive system, with the individual and complementary profiles of the universities which form it, and internationally recognised for its quality, innovation and social responsibility. The International Projection Plan contemplates a timescale of six years (2010-2015) and establishes six priority lines of action (international projection, international Catalan society - internationalisation at home-, quality research and global talent, Catalan culture in the world, knowledge for development and the University of Catalonia).

339. Apart from the ACUP there is also a body of coordination among the universities, the "Interuniversity Council of Catalonia (CIC)" with representatives of all the universities, public and private. Its main objective is to facilitate the coordination between the Government and the university system and its functions are quite limited and mainly focused on educational activities.

340. Other activities more linked with regional engagement of the HEIs that are worth mentioning are the Graduate School of Economics and the *Institut Barcelona d'Estudis Internacionals* (IBEI, see box 6.3), the "Barcelona Knowledge Campus" and particularly ICREA. The Graduate School of Economics is a joint initiative of the UPF, the UAB and two research centres to develop PhD programmes of high quality to attract international students.

Box 6.5 Institut Barcelona d'Estudis Internacionals (IBEI)

The will to create an interuniversity institute for international studies in Barcelona for the education of high profile professions in politics and international relations became a reality in 2004. The *Institut Barcelona d'Estudis Internacionals* (IBEI) was established as a private foundation and as an initiative of the five public universities of Barcelona and the CIDOB Foundation. Later on, the Generalitat de Catalunya, the Barcelona City Hall, the Barcelona Provincial Council, the association of Barcelona metropolitan area municipalities and the Ministry of External Affaires and Cooperation joined the steering committee.
The IBEI has, in a short period of time, gained international prestige. One of its major higher education programmes, the master course in International Relations has increased the student number to around 100 per academic year (2009-2010). One of the highlights of the IBEI is the high employability rate of the graduates. 86.8% of the graduates find a job on finishing the master programme. 25.3% of the graduates work in the private sector and 22.8% work for public administration entities. In addition to the higher education programme, during these years the IBEI has concentrated on creating a strong academic group that are linked to the institute and that undertake research on three main areas: international security, global governance and political economy.

341. The "Barcelona Knowledge Campus" is a joint project of the UB and the UPC and intends to be a motor of the scientific, social and economic development of Barcelona and to improve international attractiveness of these two universities. This project was recently selected in a competitive call of the Ministry of Education and the Ministry of Science and Innovation as one of the five international campuses of excellence of Spain. Together with this project, the UAB was also selected as an international campus of excellence. The international campuses of excellence were approved at the end of 2009 and it is an ambitious public programme of the Spanish government that aims to improve the world position of some universities with innovative projects and competing internationally.

342. Finally, the "Catalan Institute for Research and Advanced Studies (ICREA)" is a foundation jointly promoted by the Catalan Government through the DIUE and the Catalan Foundation for Research and Innovation (FCRI). ICREA has been able in its eight years of activity to recruit more than 220 top scientists and it is considered a successful programme. ICREA has collaboration agreements with seven Catalan public universities (UB, UAB, UPC, UPF, UdG, UdL and URV) and also with other research centres where the ICREA researchers carry out their work. In 2008, ICREA launched ICREA Academia aiming to reward research excellence specifically for the faculty of the public universities of Catalonia. The programme is addressed to very active researchers as a means of retaining talent.

6.3 Evaluating and mapping the impact of the regional HEI system

343. In Catalonia, some experiences of analysis of the regional impact of universities an be found , both at a global level and at individual level for some specific universities. Nevertheless, evaluation of their performance and results with respect to society and

regional needs are still insufficiently developed. At a global level, the most relevant analysis is the one carried out by the ACUP, currently in progress, for all the public universities with a comprehensive view of the different impacts of the higher education sector. In addition, the CYD Foundation has complemented recently its annual analysis of the contribution of Spanish universities to development with a report with the main figures for each Autonomous Community. At an individual level, four universities have carried out analysis. These are the University of Lleida (UdL), the Rovira i Virgili (URV) in the province of Tarragona, the University of Vic, created in 1997 and the University of Girona.

344. The ACUP is undertaking an analysis of the impact of the Catalan public universities. This is the first global analysis for the whole public university system. Although it does not include the private universities, in the higher education system of Catalonia public universities represent the most important part, as has been presented in the previous chapters. This analysis covers different kinds of effects and examines the contribution of the universities not only in economic terms but also their social and cultural impacts. The study also takes in account the effects of the universities on the labour market and on the research and innovation activities. Therefore, it pretends to be a comprehensive analysis of the contribution of the universities to the economic and social welfare of Catalonia and its presentation is planned for the first semester of 2010.

345. Since 2004 the CYD Foundation (www.fundacioncyd.org) carries out yearly a report on the contribution of the Spanish universities to development. In this report the main effects of the universities, such as their economic impact, the effects on the labour market or the results of technological and knowledge transfer activities are analysed. Recently, in 2009, the CYD Foundation has complemented this report with a specific analysis for the Spanish regions called "The contribution of the universities to development in the Autonomous Communities". In this report, the main figures and information, both for the inputs and outputs, of the universities for each region are presented.

346. At an individual level for specific universities, the first analysis was carried out for the University of Lleida (Enciso et al., 2001). This study is focused in the economic impact of the university on the local economy, in the area of Lleida, and uses an input-output methodology, analysing mainly the effects of the expenditures on the demand of goods and services and on the production, income and employment. A second analysis corresponds to the URV created in 1991 (Segarra et al, 2002). In this case, the study is focused in the local economy of Tarragona but together with the analysis of the economic impact using an input-output methodology other effects were also examined. Concretely three aspects deserved particular attention: the urban changes that the creation of the URV generated; the effects on the level of education of the population, and the impacts related with the research and transfer of knowledge. A third analysis was carried out for a private university of recent creation located in Vic, in the area of Osona (Parellada and Duch, 2005). This analysis uses an input-output methodology and examines the economic impact of the university on the local area and on the whole Catalonia (see box 6.4). Finally, the most recent analysis corresponds to the University of Girona. This study is based also in an input-output methodology and includes some indicators regarding education, research and transfer of knowledge activities (Carreras and Rigall, 2008).

Box 6.6 The economic impact of the University of Vic on its territory

Vic is a medium-sized city of 40,000 inhabitants, capital of the county of Osona, in the province of Barcelona, located some 70 km north from the city of Barcelona. The origins of the University of Vic go back to 1977 when the Spanish Ministry of Education and Science set up the *Escola Universitària Balmes*, a non-state primary education teacher training school affiliated with the University of Barcelona. Twenty years later, the Catalan Parliament passed a law to convert it into the University of Vic. Nowadays, this private institution is governed by the *Fundació Universitària Balmes* (Balmes University Foundation) whose board is presided by the city Council and composed by representatives of the Catalan government, the city's government, academics and civil society representatives. In this context, there is a clear interest to analyze the economic impact of such an institution on its territory of influence.

Various different methodologies exist to analyse the impact of a university on a region. In this case, the input-output methodology was used. As no input-output table was available for the Osona region, the estimation of the impact of the University of Vic on its territory was carried out by regionalising spending by students, academic and administrative staff by means of the available data on their place of residence. On the contrary, it was assumed that all spending by the University of Vic on material, equipment and services occurred in the Osona region. The results of the economic impact show that, during the 2002-2003 academic year, 24 million euros worth of production were required to satisfy the final demand induced by the University of Vic. The presence of the university in the region generated an additional (indirect) production of more than 7 million euros of this total. The results for added value show that spending by the University of Vic during the 2002-2003 academic year generated an added value for the Osona economy of more than 13 million euros, which represented 0.8% of the region's GDP in 2002. The results show that the impact was more important in the services activities than in manufacturing. The impact on all tertiary activities was 55%, whereas the added value of manufacturing activities represented approximately 20%. The impact on employment in the Osona region shows that the activity of the University of Vic during the 2002-2003 academic year generated 502 jobs, of which 336 were created directly. A comparison of this figure with the data on employment in the region indicates that this represented 1.2% of total employment
in Osona in 2002.

6.4 Institutional capacity building for regional involvement

347. Most Catalan universities consider in their strategic plans or main institutional documents the engagement with the region as an important aspect along with excellence in teaching and research and an international vocation (see box 6.5, with the example of the URL). Nevertheless, the emphasis put in their relationships with the regional community presents some differences generally related with the location of the university. In this sense, the universities located outside Barcelona like the UdG, the UdL and the URV stress their purpose to contribute to the social and economic development of their respective areas while the universities located in the area of Barcelona such as the UB or the UPF put more emphasis in their international vocation.

348. In general terms, university's academic leadership and central management have not been altered to engage specifically with regional needs and there is not a specific person responsible for regional decisions in the institutions, although all the universities have specific Vice-rectorates devoted to the management of institutional relationships or to the transfer of knowledge and technology. In addition, as has been pointed above, the Social Councils are the bodies intended to establish the relationships and communication between the universities and the society although it can be said that the university governance systems and processes are in general more related with the internal aspects of the institutions than with society needs (OECD, 2009).

349. Apart from the Social Councils, there are other channels that allow the communication with the regional agents. These channels are for instance the Offices for the Transfer of Research Results, the units in charge of continuing education or the offices devoted to facilitate the job placement of the graduates. In addition, universities also participate in policy decision-making processes as experts on the diagnosis and policies regarding economic and social regional development and welfare.

Box 6.7 URL – Ramon Llull University Project

The very essence of URL is the concept of strategic aggregation. After years in which the different institutions which founded our university were working together from a starting point based on an "implicit strategy", the sum of each federated institution's specialisations and characteristics ends to a "common global strategy of excellence" based on a coordinated, unique and shared project.

Under this new concept, URL works to be known and strives for excellent in three large areas of specialisation. These areas combine teaching activities (already a reference) and research groups which compete in the international arena. These strategic areas are:

a) Technology: Biosciences, Engineering and ICT (IQS, La Salle).

b) Management, with special emphasis on internationalisation and business innovation, entrepreneurship, Corporate Social Responsibility and technology management (ESADE).

c) Social Sciences and Humanities, especially in areas analysing the players, structures and processes linked to people and society (Psychology, Pedagogy, Education and Social Work, Law, Philosophy, Communications, Media and Advertising) (Blanquerna).

In addition URL is pioneer in the concept on transferring scientific, technological and social knowledge to the industries, enterprises and the society in general. The first unit created specifically for that purpose was created in 1963. The normal evolution of such structures has a unique and common objective: to bring to the society the maximum innovation capacity.

6.5 Human & financial resources management

350. In Catalan universities, the regional dimension does not play any specific role in their human resources policy. The recruitment of human resources follows the regulations established both at a national level and a regional level. The regional responsibilities are not assigned to specific members of the staff because the organisation of the staff and the management positions are defined by subjects. Therefore, there are not concrete rewards to the staff for regional engagement although it is planned to take in account the transfer of knowledge in the salary complements of the faculty.

351. As has been presented in chapter two, the Catalan government has the responsibility for funding universities. Together with the existing basic funding system a small portion of university public funding is target-based through a contract-programme mechanism. Although in quantitative terms this does not represent a very significant proportion it meant a remarkable modification of the approach of funding introducing some competition and made universities define objectives and the means to achieve them. These objectives are related with education, research and management but also with the third mission and regional engagement. Specifically, in the field of improving education, one objective is to improve the employment level of the graduates while in the field of improving research, promoting the transfer of knowledge is considered a key issue.

352. Finally, and although there is not a specific source of funding to pay for the regional role of the universities, they obtain funds from different sources, both public and private, that have positive effects in their engagement with the region. From public administrations,

there are competitive calls both at national and at regional levels. Some relevant examples in this case are, as have been presented in this report, the calls for "campuses of excellence", the funds for science and technology parks or the instruments to improve the transfer of knowledge and technology and the private-public partnerships, among others. In addition, universities get resources through agreements and contacts with firms for continuing education, research or provision of services.

6.6 Creating a new organisation culture

353. The Catalan university system has experienced substantial changes in the last twenty years with the creation of new universities, both public and private, and with a growing participation in research activities. More recently they are also increasing their commitment and activities related with the third mission in the different fields of education, transfer of knowledge or social and cultural aspects.

354. This process has led to an increase in their relationships with other stakeholders of the region, both public and private, and therefore improving their regional engagement. In addition and very recently they are initiating some experiences of coordination of their activities within the HEI sector, with the remarkable example of the "White Paper" issued by the ACUP. The university system in Catalonia comprises twelve institutions very weakly interrelated without a joint vision that only very recently seems to be experiencing some changes. In this sense, the "University of Catalonia" is a relevant step for promoting collaboration where all the public universities have agreed to define some joint strategies and projects.

355. Adopting a greater regional engagement does not seem to face significant cultural barriers while other obstacles related with institutional factors and with rigidities in the HEI system appear to be more important. Among the existing barriers the more relevant are the existence of management systems more academically driven and insufficiently responding to society and regional needs, the lack of incentives, both at an institutional level and at an individual level, to increase regional engagement, the lack of institutional autonomy, due to excessive governmental regulation and, in spite of the improvements of the last years, an insufficient accountability of universities to society. To these barriers should be added the still insufficient mutual knowledge between universities and industry.

CHAPTER 7 CONCLUSIONS: MOVING BEYOND THE SELF-EVALUATION

7.1 Lessons to be learned from the self-evaluation process

356. As has been presented in this report, the Catalan HEI system has experienced an important expansion in the last twenty years, with the creation of new universities, both public and private. In addition they are increasingly adopting a greater regional engagement. Among the practices that seem to be most promising for strengthening regional capacity building, the most remarkable are the following ones:

357. Firstly, universities are increasingly committed with the third mission and the activities regarding this mission in the different fields of education, research or social and cultural aspects are, in general, in the agenda of their plans for future development. In addition, the recent initiatives of cooperation among HEIs in a system characterised by a weak interrelation show a changing trend and the purpose to define joint projects acting as a key agent for the development of the region and to achieve critical mass to compete with other regions. This collaboration is currently mainly among public universities, through the ACUP, but private universities like the URL have also shown their interest in increasing the degree of collaboration within the HEI system.

358. Secondly, the participation of the universities with the regional government in the main strategic plans as the "Strategic Agreement to Promote the Internationalisation of the Catalan Economy, the Strengthening of its Competitiveness and the Quality of Employment" and the CARI have facilitated also the involvement with regional demands and needs. Furthermore, both national and regional policies have evolved devoting more efforts to improve the relationships between universities and industry. This has led also to a development of interface bodies that have a key role in fostering these relationships.

359. Nevertheless, as it is presented in the last section of this chapter, to achieve a greater involvement of HEIs with the region and strengthen the regional capacity building requires improving significantly the degree of institutional autonomy of universities, particularly in the case of the public ones, and their accountability to society. Furthermore, it is convenient to advance in the creation of a more cooperative HEI system that fosters complementarities among universities but also improving the degree of differentiation among them and their specialisation. In addition, more sustained links between universities and regional and local stakeholders should be sought.

360. The synergy between the aims and objectives of institutions and the region is showed by the increasing cooperation between the regional government and universities, particularly in the fields of research and technology transfer, and in the participation in the plans presented above but also in other strategic local plans such as the "The Strategic Metropolitan Plan of Barcelona" or the "Strategic Plan of the Camp of Tarragona". Universities also participate in policy decision-making processes as experts on the mains factors regarding regional development and welfare.

361. Nevertheless these synergies are not always positive and there are conflicts of interest. Firstly, the regulatory framework, both national and regional, of the university system makes it difficult for universities to define their own strategies restricting their autonomy and their degree of differentiation. Secondly, the governance of the institutions is academically driven with a low participation of external stakeholders in the management processes and therefore insufficiently responding to society's demands. In addition some

tensions can be found when the regional role of universities conflicts with the objective of international excellence, particularly in the field of research.

362. As has been presented along this report the existing incentives, both at an institutional and individual level, are not particularly involved with regional engagement. At the institutional level the main incentives for regional involvement are related with some changes in the funding system, the competitive calls that take into account the regional dimension and the mechanisms and funding devoted to foster the transfer of knowledge and the relationships between universities and industry.

363. The university funding system has been presented in the second chapter and the main change related with regional involvement is the definition of a part of university public funding that is objective-based through a contract-programme mechanism. Nevertheless, in quantitative terms it is still a small part of the whole funding system. At an individual level the incentives policies are oriented to reward, with small salary increases, educational and particularly research activities without having specific incentives that take into account regional issues. Nevertheless there is the purpose to consider also transfer of knowledge in the incentives for the teaching and research staff.

364. Finally, some challenges facing the different sets of decisions-makers are related both with the characteristics of the HEI system and with some regional aspects. Firstly, the Catalan HEI system consists of an important number of higher education institutions with 12 universities that are hardly interrelated, and other non-university higher education institutions, although of less importance and which operate under a different regulatory framework. This dimension entails some advantages but also introduces complexity in the management of the system. In addition, there is also an important number of other bodies such as Foundations, interface infrastructures or research centres related with the HEI system that also entail some difficulties in achieving an efficient management and coordination of the system.

365. Secondly and although the regional plans, as the "Strategic Agreement for the Catalan Economy" and the CARI have allowed a more accurate definition of regional challenges and needs, there are some lacks in defining priorities for the region in higher education and research policies. In this sense and although these plans show a greater commitment of the regional government with research and universities, in Spanish and Catalan public policies, in comparison with other European countries and regions, universities are frequently not placed at the top of the political agendas

366. Finally, another challenge is related with the characteristics of the economic system. Fruitful collaboration between universities and industry requires, apart from high quality academic research and efficient interface infrastructures, that firms consider innovation as a key aspect of their strategy. Although Catalan firms have significantly improved their efforts devoted to R&D activities, their technological level and absorptive capacity is still below the most advanced European regions.

7.2 Potentialities and problems, opportunities and threats for increasing the contribution that HEIs make to the region (SWOT)

Strengths	Weaknesses
▪ Significant improvement in the creation of knowledge ▪ High level of scientific research in some specific areas	▪ Excessive governmental regulation (national and regional) and lack of institutional autonomy ▪ University governance and management

▪ Experience in international relationships ▪ Increasing involvement in knowledge transfer ▪ Existence of developed interface infrastructures and networks ▪ High political commitment (CARI and Strategic Agreement) ▪ Successful instruments to attract researchers (ICREA) ▪ Open, extended and accessible higher education system ▪ Expanding range of services to society ▪ Widespread development of continuing education ▪ Attracts a big share of Spain's postgraduate students ▪ Increasing number of adults enrolling in Higher Education ▪ Very close relationship between vocational training and the labour market ▪ Principal actors in the development of environmental policies and awareness-raising in society. ▪ Important network of art schools which facilitate excellence among professionals ▪ Experiences of collaboration among universities (ACUP) ▪ Attractiveness of Barcelona (researchers, PhD students)	systems academically driven, insufficiently responding to regional needs ▪ Insufficient institutional differentiation and specialisation ▪ Insufficient accountability of universities to society ▪ Rigidities (barriers to mobility) ▪ Few incentives for researchers to be engaged in knowledge transfer activities ▪ University basic funding very weakly related with research and transfer of knowledge ▪ Lack of technical capabilities and professional management of R&D structures and bodies ▪ Low technological absorptive capacity of a high proportion of firms ▪ Insufficient cooperation and networking among technology transfer intermediaries ▪ Insufficient cooperation among universities ▪ Universities do not have control over main expenditures (wages) nor revenues (tuition) ▪ Scarce student and staff mobility ▪ Unequal access possibilities in terms of economic position ▪ Incomplete financial aid system ▪ Learning model not yet adapted to the needs of students and society ▪ Enrolment in vocational education is lower than in other European countries ▪ Lack of collaboration between HEIs and the Business sector in the generation of cultural activity. ▪ Insufficient link between HEIs and culture (understood from the point of view of cultural policy)
Opportunities	**Threats**
▪ Increasing EU funds for research ▪ Implementation of a regional strategy in the framework of the CARI ▪ The Bologna process will change the learning system and adapt it to regional needs ▪ Adaptation to EHEA can detonate major institutional and organisational changes ▪ Development of knowledge-based economy places universities at the core ▪ Increasing economic importance of high-technology and knowledge intensive activities ▪ Increasing globalisation of higher education	▪ Increasing financial uncertainty of the support of Spanish government in R&D and innovation policy ▪ Growing global competition to attract talent ▪ Increasing competition for EU R&D funds ▪ Restrictive national and EU wide immigration policies deter foreign students inflow ▪ Progressive proliferation of programmes in social, cultural and environmental development without clear objectives or lines of action

7.3 The way forward: the discussion of the region's vision for future policy

367. Catalonia faces the challenge to advance towards a more knowledge-based society. To achieve this objective, human capital, research and innovation, are key elements because they are the main factors for economic and social development and welfare. Other challenges are the increasing internationalisation, the environmental aspects and to guarantee social cohesion. In all these aspects universities have a very important role to play, particularly in the generation of human capital and knowledge, in the activities included in the third mission and participating in policy decision-making processes as experts.

368. In this report the main characteristics, strengths and weaknesses of the Catalan HEI system regarding their contribution to innovation, labour market, social, cultural and environmental development of the region have been presented. In addition, its degree of regional involvement and its role in enhancing capacity building trough cooperation within universities and with other agents, both public and private, have been examined.

369. From this analysis arise some concluding remarks regarding the improvement of regional involvement of the universities and their contribution to society's needs and demands. In particular, three aspects deserve particular consideration.

370. Firstly, universities have increased their relationships with other stakeholders in the region, both public and private, and improved their regional engagement. Nevertheless the participation of external stakeholders in the governance of the universities is still weak and the links with the governments, particularly with local governments, of their territorial areas of activity are not very developed. In this sense, to develop stable platforms, with own legal status, and networks of collaboration with local governments with the participation of other stakeholders as business associations and trade unions, would allow to develop sustained links of cooperation improving the contribution of universities to society's needs and demands.

371. Secondly, the recent experiences of cooperation within public universities (ACUP, International campuses of excellence, etc.) and also the favourable attitude of some private universities to be engaged in these relationships show the convenience to advance in a more cooperative and interrelated university system. This will allow, keeping individual specialisation, to improve the complementarities among the different universities. To achieve a closer cooperation will place universities in a better position to respond to the challenge of the internationalisation of the Catalan university system. To develop also joint strategies will allow then to improve their contribution to economic and social welfare though their different activities of education, research and those included in the third mission.

372. Finally, increasing institutional autonomy is essential to allow universities to define their own strategies and objectives. To enhance autonomy requires introducing new models of governance of the universities and means that universities have the tools and the capacity to execute their responsibilities and to organise and manage their resources. This increasing autonomy should be complemented with the development of proper ex-post assessment procedures and accountability to society.

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