SOCIOECONOMIC IMPACTS OF PUBLIC UNIVERSITIES AND THE PUBLIC RESEARCH SYSTEM IN CATALONIA
# INDEX

## PRESENTATION

INTRODUCTION ........................................................................................................................................... 127

1. ECONOMIC IMPACT OF THE CATALAN PUBLIC UNIVERSITY SYSTEM (SiCUP) ON THE CATALAN ECONOMY..... 130
   1.1. Impacts of SiCUP: impact generating agents .................................................................................. 132
   1.2. Nature of the effects attributed to SiCUP ...................................................................................... 133
   1.3. Methodology used to estimate the economic impact of SiCUP......................................................... 134
   1.4. Approach to economic effects presenting methodological difficulties ......................................... 136
   1.5. Total economic effect of SiCUP ....................................................................................................... 137
   1.6. Multiplier effects ............................................................................................................................ 140
   1.7. Total impact of SiCUP disaggregated by types of agents .............................................................. 142
   1.8. Geographical distribution of the total impact of SiCUP................................................................. 144
   1.9. Distribution of total impact of SiCUP by sectors of economic activity .......................................... 146
   1.10. Tax revenue generated from from SiCUP and social return on public investment ......................... 148

2. ECONOMIC IMPACT OF THE PUBLIC SYSTEM OF RD&I ON THE CATALAN ECONOMY ......................... 149
   2.1. Effects of RD&I financed by the public sector in Catalonia: impact generating agents ...................... 150
   2.2. Total economic effect originating from the public system of RD&I in Catalonia .............................. 153
   2.3. Total impact of the public system of rd+i in Catalonia disaggregated by types of agents ................. 154

3. TOTAL ECONOMIC IMPACT OF SiCUP AND THE PUBLIC SYSTEM OF RD&I ON THE CATALAN ECONOMY .... 156
   3.1. Total economic effect of SiCUP and the public system of RD&I in Catalonia: main results .............. 157
   3.2. Multiplier effects ............................................................................................................................ 160
   3.3. Distribution of total impact of SiCUP by sectors of economic activity impact of SiCUP and the public system of RD&I ................................................................. 161
   3.4. Revenue originating from SiCUP and the public RD&I system, and social return on public investment ... 164
   3.5. Summary ....................................................................................................................................... 165

ANNEX. Research Institutions included in the analysis in section 2 ......................................................................... 166
   A.1 CERCA centres ................................................................................................................................... 166
   A.2 Research centres of the National Council of Scientific Research (CSIC), in Catalonia ...................... 168
   A.3. Large research-support infrastructures (GISR) ............................................................................... 168
   A.4. Hospital research centres and institutions ........................................................................................ 169
   A.5. Technological centres ....................................................................................................................... 169
   A.6. Science and technology parks .......................................................................................................... 169

4. THE CATALAN UNIVERSITY SYSTEM AS A TOOL FOR REGIONAL SOCIO-ECONOMIC DEVELOPMENT AND TRANSFORMATION: STUDY OF INDICATORS AND KEY DIMENSIONS ................................................. 171
   4.1. Introduction ..................................................................................................................................... 172
   4.2. Universities and the labour market .................................................................................................. 173
   4.3. Knowledge transfer and innovation ................................................................................................. 174
   4.4. Internationalisation ........................................................................................................................... 176
   4.5. Entrepreneurship ................................................................................................................................. 177
   4.6. Impact of corporate social responsibility in universities ................................................................. 179
SOCIOECONOMIC IMPACTS OF PUBLIC UNIVERSITIES AND THE PUBLIC RESEARCH SYSTEM IN CATALONIA
PRESENTATION

The Report “Socio-economic Impacts of Catalan Public Universities and Research, Development and Innovation in Catalonia” uses various quantitative and qualitative indicators to analyse the contribution these institutions and knowledge networks make to the country’s wealth. In keeping with our commitment to transparency and accountability, ACUP strives to provide an analysis of our university and research system in a way that is both accessible and understandable to everyone.

This is merely a first step, and constitutes the foundation stone in a process that aims to build as accurate a picture as possible of the benefits of having a cutting-edge university and public research system. In this study, we focus on the social and economic benefits, but the numerous advantages for society go far beyond this. To ensure future well-being, we need data which highlights university policies in need of improvement and those which need strengthening.

ACUP already has a distinguished track record of published studies with a finger on the pulse of the Catalan public university system. These include Indicators of Research and Innovation in Catalan Public Universities and Indicators of Training and Teaching. This report, as in the case of previous studies, is a work in progress. Each new edition means improving how indicators are adjusted and implemented, as well as looking for the best way to draw conclusions.

Our aim is to improve how indicators are collected and analysed in order to draw up an even better next edition. A lot of work still lies ahead, particularly in expanding the area of evaluation involving universities, as well as innovation and research agents. Therefore, the various authors of the report propose indicators for both the quantitative and the qualitative data which need to be assessed for inclusion.

In this first approach, at a summary level the Report finds that Catalan public universities contribute 1.4% of GDP to the Catalan economy, and generate close to 45,000 full-time jobs. If we incorporate data from the public research system, the contribution to Catalan GDP rises to 1.7%, with over 60,000 jobs generated. This balance is noteworthy, but only a fraction of what universities and research centres return to society.

Year by year, image by image, we can carefully build up a picture of the entire knowledge system in our country. Then we will be able to see that the demands for better university funding, and the response to this, are small in comparison to the enormous positive impact the university system has on the economy and on society. In this regard, any ideas for improvement are warmly welcomed.

Jaume Casals
President of the Catalan Association of Public Universities
INTRODUCTION

The aim of this report is to raise awareness of both the importance of universities and research centres as basic pillars of a country’s development and the return received from public investment in them. It assesses the socio-economic impact of the Catalan public university system (SICUP), together with the Catalan public research development and innovation (RD&I) system on the Catalan economy for the year 2015.

It measures the effect Catalan public university activities and other public RD&I entities have on key variables in the Catalan economy, e.g. the level of revenue/output, Gross Domestic Product (GDP), associated wage and taxable incomes, and full-time employment. We wish to point out that the monetary quantifications estimated in this report does not cover all the effects generated. It is evident that the impacts go beyond a strictly economic dimension, and other dimensions (e.g. cultural or social) should be taken into consideration. There are a range of intangible impacts, which cannot be quantified in monetary terms and are not taken into consideration in this study. Impact studies should be analysed from demand and supply perspectives, but in this study only the demand perspective is considered. A new source of underestimation is thus added.

Assuming that this report presents an estimation centred on the tangible effects, focused on demand, an interesting first estimation allows us to check the economic relevance and importance of the public university system in Catalonia and the public RD&I for the Catalan economy. The figures and reflections in the following pages show, confirm and explain the importance of public universities and other research entities as generators of profit, growth and economic and social development in Catalonia.

The report is structured in four parts. Part one calculates the amount invested by the Catalan Public University System (SICUP), which encompasses all types of activities stemming from Catalan public universities (University of Barcelona, Autonomous University of Barcelona, Polytechnic University of Catalonia (BarcelonaTech), Pompeu Fabra University, University of Girona, University of Lleida, Rovira i Virgili University and the Open University of Catalonia). Part two analyses the economic impact of the rest of the Catalan public RD&I. To avoid overlaps, SICUP investment is not included in the calculations as this is already done in part one. In part two the RD&I activity of other non-university institutions such as CERCA centres, CSIC, hospital research centres, large research-support infrastructures, etc. are calculated. Part three combines the impact generated by SICUP and other public RD&I entities in Catalonia, bringing together parts one and two, which have already been analysed separately. In this way, a wider vision of the quantitative impact of public expenditure in higher education and research is provided; whether university or non-university. Finally, part four gives a qualitative analysis of five key dimensions of Catalan public universities of strategic importance and potential for the country’s economy and society: the labour market, innovation and knowledge transfer, internationalisation, entrepreneurship and social responsibility.

This report is an executive summary. The full report (available in Catalan), as well as all the information on the methodology, other details and the results obtained are available in on the following link: wwwindicadorsuniversitats.cat.
This study could not have been conducted without the collaboration of various organisations and institutions in the field. We would like to thank the team from the Laboratory of Applied Economics (AQR-Lab) at the University of Barcelona: Jordi Suriñach, the director; and Joaquim Murillo and Esther Vaya, authors of parts 1-3. Furthermore, we would like to thank the team at University Rovira i Virgili who wrote the fourth part of the report, coordinated by Antonio Duro, and under the supervision of Agustí Segarra and Mercedes Teruel from the Department of Economics, and Pere Segarra and Ma Dolors Setó from the Department of Business Studies.

We are also grateful for the collaboration of those who provided the necessary information to carry out the study. Firstly, the vice chancellors and managers of the Catalan public universities, for their trust and support in sending data. Secondly, Josep Maria Vilalta, Josep Alías and the team at ACUP. Thirdly, those who provided statistical data at all the universities: Mireia Cendrós at UAB; M. Dolors Baena, Maria Mar Bohorquez and Milagros Pérez at UB; Josep M. Gómez from UdG; Carme Sala from UdL; Maria Taulats, Lidia Lepiani and Sara Martínez at the UOC; Santiago Roca and Núria Martínez-Rovira at UPC; Jordi Campos and Lluís Coma at UPF; David Basora from URV. We are also grateful to the many other institutions who provided data: Francesc Josep Abad, Carina Álvarez and the rest of the team at the Office of Planning, Analysis & Evaluation (Àrea de Suport a la Planificació, Anàlisi i Avaluació de la Secretaria d’Universitats i Recerca); Lluís Rovira from CERCA; Antoni Dedeu and Paula Adam at AQUAS; Mariano Sazatornil from Synchrotron Light Source; Alex Puerto at Barcelona Supercomputing Center; Lluís Calvo from the CISC delegation in Catalonia; and finally, Jordi Garza and Xavier López at Eurecat.
1. IMPACT OF THE CATALAN PUBLIC UNIVERSITY SYSTEM ON THE CATALAN ECONOMY
1. IMPACT OF THE CATALAN PUBLIC UNIVERSITY SYSTEM ON THE CATALAN ECONOMY

Teaching, research, and transfer of knowledge are the three traditional functions of universities. To these, a fourth function of social responsibility can be added. This is understood as a search for the maximum wellbeing of actors associated with universities.

Catalan public universities have far reaching effects through their various functions (economic, social, cultural, and environmental), which foster growth in their local regions. At first universities have an immediate effect on a region’s growth, in that they contribute to GDP by generating expenditure. Universities and their students, and even delegates at conferences organised by them use goods and services from their regions (office materials, laboratory materials, transport services, restaurant and hotel services, etc.) This demand brings additional income, employment and GDP.

Apart from this immediate demand, universities also contribute to the long-term economic development of their local region, in that they affect the endowment of factors of production. So, using a production function of an exonomy, the triple function mentioned above of teaching, research and knowledge transfer undertaken by universities augments the technological capital (technological progress) and the endowment of human capital in the region, thus fostering growth.

---

1 Simplified, these actors are, on one hand, students receiving tuition, and on the other hand, the future society, which will benefit from the development of research and knowledge transfer.

2 This concept shows how the output of a company depends on the endowment of its production factors, among which we can find human capital and technological capital, in addition to physical capital and labour factors.
1.1. IMPACTS OF THE CATALAN PUBLIC UNIVERSITY SYSTEM (SICUP): IMPACT GENERATING AGENTS

To analyse the effects of SICUP, we have to point out that the initial boost to the economy is not only confined to SICUP, but includes students, friends and family who visit, foreign academic staff, and those attending events organised by the university (conferences, day seminars, workshops etc.). Apart from the traditional agents (students), this report identifies and calculates, to a larger or smaller extent, the effect of other agents linked to Catalan universities. Activities carried out by entities directly linked to SICUP universities, but operating with an independent tax identification number, are looked at (for example, science and technology parks driven by SICUP or other institutions/businesses with links to SICUP such as foundations or consortium). Businesses in science and technology parks originating from SICUP, SICUP start-ups and spin-offs, administrative concessions, businesses that take students on placement, and/or voluntary students/staff are also considered part of the impact.

Figure 1. Impact generating agents related to SICUP

Source: AQR-Lab.

---

3 The impact or activity is considered attributable to the existence of the university or Parks, whether the part analysed is in the Park because of its location or part of the start-ups or spin-offs stemming from SICUP.
1.2. NATURE OF THE EFFECTS ATTRIBUTED TO THE CATALAN PUBLIC UNIVERSITY SYSTEM (SICUP)

From a methodological perspective, the impact of universities can be divided into three categories:

**Effects stemming from demand** are short-term and can be evaluated monetarily. This would be the case of universities and other associated agents consuming goods and services, for example.

**Effects stemming from supply** are long-term and need time to mature. These effects come from output generated by universities: mainly research results, and knowledge and technology transfer. A more complex methodology is required to evaluate them in monetary terms. Some supply effects impact on the endowment of production resources within the university system: the stock of human capital; contributions to business (business capital); through transfer of knowledge and creation of knowledge-producing infrastructures; and lastly, contributions towards technological capital resulting from the spread of technological innovation achieved through university research.

**Effects in which the difficulties in attributing economic value render them impossible to calculate**, for example, having a higher level of education has a series of impacts (social, well-being and cultural) on people, their families and society as a whole.

Figure 2. Nature of effects attributed to SICUP

Source: Author’s own.

---

4 These inputs are very diverse, covering for example, office material, laboratory material, electricity, gas and water, leasing of property, IT equipment and networks, catering, hotel accommodation, transport, building maintenance etc.
“The study calculates the monetary effects stemming from demand for the year 2015”

“Incalculable and other long-term effects stemming from supply are not included. Therefore, the magnitude of the real effect will most certainly be larger”

1.3. METODOLOGY USED TO ESTIMATE THE ECONOMIC IMPACT OF SICUP

The following steps were taken to measure the impact of SICUP on the demand side, i.e. the impact resulting from every day SICUP activities and other impact generating agents. This is without taking into consideration the long-term effects (via supply) derived from the increase in endowment of human and technological capital delivered by SICUP:

Figure 3. General methodology used for estimating the economic impact of SICUP

<table>
<thead>
<tr>
<th>Stage 1. Identify the impact generating agents.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stage 2. Determine the direct economic effect. This stage requires basic information for each agent. For example, budget settlements, profit and loss accounts, activity reports, audit reports etc.</td>
</tr>
<tr>
<td>Stage 3. Identify the demand for goods and services from agents in order to carry out their activity. Once known, expenditure can be categorised by sectors of economic activity.</td>
</tr>
<tr>
<td>Stage 4. Use the information in the previous stage and input-output methodology (MIOC-11), to calculate the cross-sector effects making up the indirect impact.</td>
</tr>
<tr>
<td>Stage 5. Determine the induced effect, or, the effect from increased production from employment income directly and indirectly generated from SICUP, intended for consuming goods and services.</td>
</tr>
<tr>
<td>Stage 6. Calculate the total effect as a sum of the direct, indirect and induced effects.</td>
</tr>
<tr>
<td>Stage 7. Estimate the impact on tax collection, applying, the effective types corresponding to corporation tax, VAT and personal income tax, gross operating surplus, the gross added value and employee remuneration, respectively.</td>
</tr>
</tbody>
</table>

Source: AQR-Lab.
"Focusing on input-output methodology, the agents mentioned above generate three types of economic impact: direct, indirect, and induced effects, which end up affecting the various sectors of the Catalan economy on the whole."

The **direct effects** stem from the everyday activities of the five economic agents identified. All of these - SICUP and other entities with ties with SICUP, the business attributable to SICUP, students who travel from their hometown to study at SICUP centres, and those visiting SICUP regions in connection with SICUP – carry out ‘kick-start’ activities that directly affect the Catalan economy.

The **indirect effects**, come from the aggregated demand introduced by economic agents when spending on the goods and services needed to carry out their activities. For example, leasing of property, acquisition of expendable office material, expendable laboratory material, etc. All this expenditure brings about increased output from the productive sectors, which act as suppliers, in turn creating employment and increasing the Gross Value Added (GVA) generated. As a consequence, the indirect effect is not exhausted by the initial impact, in that the suppliers have also consumed other goods and services in order to carry out their production activity. In this way, the initial increase in demand from economic agents in the supply sector has a multiplier effect on the other sectors of the Catalan economy.

Finally, the **induced effects** capture the economic impact of goods and services purchased with income from jobs created directly and indirectly by the universities. The methodology used to calculate the indirect and induced effects was the Input-Output Framework for Catalonia (MIOC-2011).

Figure 4. Categories of effects taken into account in order to determine the total economic impact

---

Source: AQR-Lab.
“The total economic effect is obtained by adding together the direct, indirect and induced effects”

1.4. APPROACH TO ECONOMIC EFFECTS PRESENTING METHODOLOGICAL DIFFICULTIES

As already mentioned, effects stemming from the contribution to society of advanced university knowledge and “know how” are too methodologically complex to be evaluated in monetary terms. Furthermore, it is difficult to establish the casual relationship between university activities and the socio-economic relationships surrounding them. Among the quantifiable effects we can find the following types:

a) Increase in business productivity originating from the transfer of RD&I generated from SICUP.

b) Increase of productivity due to the increased human capital in businesses benefiting from corporate training courses.

c) Increase of productivity attributed to the use of patents granted to SICUP institutions.

Independently and separate from the rest of the study, a first estimation, in monetary terms, is made of the effects generated by supply, and derived mainly from fluxes of knowledge transfer from SICUP to society. These calculations are included to highlight the fact that the impacts of SICUP go further than those calculated in the rest of the study. However, given that the calculations are based on assumptions (to reach a rigorous comparison with the rest of the study, it would need to be contrasted with a specific analysis for SICUP), they are presented informatively and separately.

“Improvements in business productivity originating from knowledge transfer projects, ad hoc corporate training and use of university patents, lead to a contribution of between €328m and €348m to the GVA in Catalonia”.

Figure 5. Origin of effects (via supply) more difficult to calculate in monetary terms

Source: AQR-Lab.
1.5. TOTAL ECONOMIC EFFECT OF SICUP

Taking the demand perspective proposed in the study, and breaking down the total impact of the three effects (direct, indirect and induced), for 2015, an output of €2,468m and a contribution to the Catalan GDP of €1,804m was derived from SICUP. It contributed to €1.163m in direct wage income and the creation/maintenance of 27,804 full-time jobs.

Likewise, the indirect and induced effects stemming from the activity of the eight Catalan universities analysed, entities and businesses with links to SICUP, and the expenditure from students and visitors, represent an output of €2,077m, a contribution to the Catalan GNP of €1,151m (of which €502m was wage income) and 16,972 additional full-time jobs.

“SICUP contributed €2,955m to GDP, (€1,804m directly, and €1,151m indirectly and induced), accounting for 1.4% of the GDP in Catalonia.”

“Total output in Catalonia resulting from the existence of SICUP was €4,545m, implying a daily output of €12.4m”
Figure 7. Economic effects originating from SICUP

Source: AQR-Lab.

To put these figures into proportion, Figure 8 shows a daily output of €12.4m resulting from SICUP activities.

Figure 8. Daily output in Catalonia originating from SICUP

Source: AQR-Lab.
Figure 9. Total impact attributable to SICUP broken down by type of effect

**DIRECT IMPACT**

- **OUTPUT**: €2,468m
- **CONTRIBUTION TO GDP**: €1,804m
- **WAGE INCOME**: €1,163m
- **JOBS**: 27,804 FTE

**INDIRECT AND INDUCED IMPACT**

- **OUTPUT**: €2,077m
- **CONTRIBUTION TO GDP**: €1,151m
- **WAGE INCOME**: €502m
- **JOBS**: 16,972 FTE

**TOTAL IMPACT**

- **OUTPUT**: €4,545m
- **CONTRIBUTION TO GDP**: €2,955m
- **WAGE INCOME**: €1,665m
- **JOBS**: 44,776 FTE

Source: AQR-Lab. Note: ETC (Equivalent to full-time). Monetary amounts expressed in millions of euros (€m)

“Each job directly created by SICUP has a total output of €163,480, a GDP of €106,266, a wage income of €59,894, and a tax revenue of €40,250.”
1.6. MULTIPLIER EFFECTS
Comparing the results of direct impact with indirect and induced impact in order of magnitude, it can be concluded that:

“For every €100 directly invoiced from SICUP, an additional €84 of output is generated and invoiced in an indirectly and induced”.

Figure 10. Multiplier effect on output

Source: AQR-Lab.

“For every €100 of GVA corresponding to direct effect, €64 additional of GVA correspond to indirect and induced effects”

Figure 11. Multiplier effect on GVA

Source: AQR-Lab.

“For every €100 of wage income generated directly, another €43 are generated from wage income resulting from indirect and induced effects”
Figure 12. Multiplier effect on wage income

"For every 100 people employed directly, another 61 additional workers stem from indirect and induced effects"

Figure 13. Multiplier effect on employment

Source: AQR-Lab.
1.7. TOTAL IMPACT OF SICUP DISAGGREGATED BY TYPES OF AGENTS

The economic impacts of SICUP are presented below, disaggregated by types of agents (universities, entities linked to SICUP, businesses with ties to SICUP, students and visitors), as outlined in section 1.1.

Table 1. Distribution of total impact (direct + indirect + induced) by type of agent

<table>
<thead>
<tr>
<th>Economic agents</th>
<th>Output</th>
<th>Contribution to GDP</th>
<th>Wage Income</th>
<th>Jobs</th>
</tr>
</thead>
<tbody>
<tr>
<td>SICUP (Universities)</td>
<td>€2,752m</td>
<td>€1,975m</td>
<td>€1,139m</td>
<td>28,321</td>
</tr>
<tr>
<td>ENTITIES linked to SICUP</td>
<td>€430m</td>
<td>€224m</td>
<td>€132m</td>
<td>3,330</td>
</tr>
<tr>
<td>BUSINESSES with ties to SICUP</td>
<td>€587m</td>
<td>€324m</td>
<td>€170m</td>
<td>5,220</td>
</tr>
<tr>
<td>STUDENTS</td>
<td>€625m</td>
<td>€348m</td>
<td>€184m</td>
<td>6,477</td>
</tr>
<tr>
<td>VISITORS</td>
<td>€151m</td>
<td>€83m</td>
<td>€40m</td>
<td>1,429</td>
</tr>
<tr>
<td>TOTAL</td>
<td>€4,545m</td>
<td>€2,955m</td>
<td>€1,665m</td>
<td>44,776</td>
</tr>
</tbody>
</table>

Source: AQR-Lab.

Graph 1. Distribution of total impact on output by type of agent

Source: AQR-Lab.
Graph 2. Distribution of total contribution to GDP by type of agent

Source: AQR-Lab.

Graph 3. Distribution of total impact on employment by type of agent

Source: AQR-Lab.
1.8. GEOGRAPHICAL DISTRIBUTION OF THE TOTAL IMPACT OF SICUP

Two types of regional analyses were carried out: the first analyses the geographic distribution of the impact in function of the location of the universities, and the second calculates the impact in each region affected. Results of the analysis show a certain regional redistribution, as the impact on the region of Barcelona is smaller than the impact the region makes to the whole.\(^5\)

“Public universities in Barcelona province generated a total output of €3,712m in 2015 (counting direct, indirect and induced impacts), €2,410m in GDP, €1,349m in wage income and 35,902 jobs. This accounts for approximately 81.5% of the total effect. The public universities in Girona, Lleida and Tarragona generated an output of €883m, €545m in GDP, €316m in wage income and 8,874 jobs (accounting for 18.5% of the total impact).

Figure 14. Distribution of impact according to the geographic area of the universities generating the effect

Source: AQR-Lab. Note: FTE (full-time equivalent)

\(^5\) In order to obtain this regional distribution, the following steps were taken: for direct impact, this was restricted to the region where each university is located; for the regional distribution of the indirect and induced impacts, the distribution was done on the basis of the relative weight each economic sector in the Barcelona region has over the total in Catalonia, in terms of number of employees registered with the social security system.
“The province of Barcelona has an impact of €3,563m (78.4%) in terms of total output, €2,356m (79.7%) in GDP, €1,328m (78.5%) of wage income. The rest of Catalonia has an impact of €982m (21.6%). Regarding the volume of output, GDP is €599m (20.3%) and wage income €337m (21.5%)”

“Regional distribution of economic activity throughout Catalonia benefiting other areas outside those where the universities in the study are located”

“In the Barcelona region, 78.5% (35,154 FTE jobs) of employees are employed directly, indirectly or induced by SICUP, compared to 21.5% (9,622 FTE jobs) in the rest of Catalonia”
1.9. DISTRIBUTION OF TOTAL IMPACT OF SICUP BY SECTORS OF ECONOMIC ACTIVITY

The direct economic impact affects various sectors in the Catalan economy, beyond those directly related to university activity, namely the Higher Education and Research and Development sectors.

"The total impact cannot be ascribed to a small number within the sector, but to intersectional multiplier effects that spread to other sectors which are not directly related to education and research. So, for example, 6.2% of the total impact on output corresponds to the real estate sector, 5.1% to retail trade, 4.3% to accommodation services etc."

Graph 4. Main economic sectors benefiting from the distribution of the total economic impact: output (€m)

<table>
<thead>
<tr>
<th>Sector</th>
<th>Impact (€m)</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Education</td>
<td>1,572</td>
<td>34.6%</td>
</tr>
<tr>
<td>Real Estate</td>
<td>281.4</td>
<td>6.2%</td>
</tr>
<tr>
<td>Research and development</td>
<td>236.9</td>
<td>5.2%</td>
</tr>
<tr>
<td>Retail trade</td>
<td>232.9</td>
<td>5.1%</td>
</tr>
<tr>
<td>Accommodation services</td>
<td>196.9</td>
<td>4.3%</td>
</tr>
<tr>
<td>Food and Beverage services</td>
<td>190.3</td>
<td>4.2%</td>
</tr>
<tr>
<td>Wholesale trade and intermediaries</td>
<td>154.2</td>
<td>3.4%</td>
</tr>
<tr>
<td>Construction industry</td>
<td>149.9</td>
<td>3.3%</td>
</tr>
<tr>
<td>Other professional and technical...</td>
<td>115.5</td>
<td>2.5%</td>
</tr>
</tbody>
</table>

Source: AQR-Lab.

Graph 5 and Figure 16 are clear examples of how the impact of university activity is distributed by sectors. For example, 55.4% of jobs created do not correspond to either Higher Education or Research and Development sectors.

"Regarding the contribution to the labour market, SICUP and agents linked to it contributed to the creation/maintenance of 44,776 FTE jobs: 27,804 FTE direct jobs, and 16,972 FTE indirect or induced jobs. 55.4% of the total number of jobs created do not correspond to Higher Education or R+D"
Graph 5. Main sectors benefiting from the distribution of the total economic impact: jobs (FTE)

<table>
<thead>
<tr>
<th>Sector</th>
<th>Jobs</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Education</td>
<td>18,827</td>
<td>(42%)</td>
</tr>
<tr>
<td>Retail trade</td>
<td>3,846</td>
<td>(8.6%)</td>
</tr>
<tr>
<td>Accommodation services</td>
<td>2,029</td>
<td>(4.5%)</td>
</tr>
<tr>
<td>Food and Beverage services</td>
<td>1,996</td>
<td>(4.5%)</td>
</tr>
<tr>
<td>Other types of road transport</td>
<td>1,289</td>
<td>(2.9%)</td>
</tr>
<tr>
<td>Research and development</td>
<td>1,184</td>
<td>(2.6%)</td>
</tr>
<tr>
<td>Other professional and technical services</td>
<td>1,164</td>
<td>(2.6%)</td>
</tr>
<tr>
<td>Domestic services</td>
<td>1,143</td>
<td>(2.6%)</td>
</tr>
<tr>
<td>Wholesale trade and intermediaries</td>
<td>1,047</td>
<td>(2.3%)</td>
</tr>
<tr>
<td>Medical and dental services</td>
<td>1,039</td>
<td>(2.3%)</td>
</tr>
</tbody>
</table>

Figure 16. Comparison by sectors of total economic impact: jobs (FTE)

Source: AQR-Lab.
1.10. TAX REVENUE GENERATED FROM SICUP AND SOCIAL RETURN ON PUBLIC INVESTMENT

The fiscal effect generated from SICUP in 2015 amounted to **1,119 €M** of tax revenue from state and regional taxes (**€620m** in VAT, **€254m** in income tax and **€245m** in corporation tax).

“In 2015 the tax revenue generated from SICUP was higher than the public contribution by the Regional Government of Catalonia (€735m)”

“Government spending on Catalan public universities can be considered a profitable economic investment. Apart from the other economic and social benefits set out and calculated in this study, looking at the tax revenue from the universities themselves in 2015, for every €100 that the Government spends on public universities, €152 is generated in tax revenue”

“Return on government expenditure on public universities (more than €735 million per year) is analysed. For every €100 of public funding spent on SICUP, the return is €226 in wage income, €618 in output, and €402 towards the GDP in Catalonia. Regarding employment, every €16,000 of public expenditure on universities maintains 1 job (FTE)”

Figure 17. Social return on public funding to finance SICUP

Source: AQR-Lab.
2. ECONOMIC IMPACT OF THE PUBLIC SYSTEM OF RD&I ON THE CATALAN ECONOMY
2. ECONOMIC IMPACT OF THE PUBLIC SYSTEM OF RD&I ON THE CATALAN ECONOMY

This second part of the study analyses the impact on the Catalan economy of the RD&I system financed by the public sector in Catalonia.

We have to bear in mind that when analysing the set of institutions undertaking research, development and innovation within the public sector, SICUP (the Catalan Public University System) and entities linked to it, is the primary agent. This part of the study draws a picture of additional RD&I in Catalonia funded by the government.

2.1. EFFECTS OF RD&I FUNDED BY THE PUBLIC SECTOR IN CATALONIA: IMPACT GENERATING AGENTS

To analyse their economic impact, we need to define which agents in the public RD&I system compliment SICUP. We also need to take into account that there is an overlap between SICUP and the RD&I System in Catalonia, given that part of the activity carried out by the RD&I system is undertaken by the Catalan public universities. Likewise, part of SICUP’s activity cannot be equated to the RD&I in a strict sense, in the same way that other entities in the RD&I system are not related to university research, development and innovation.

Figure 18. The overlap between the areas of SICUP activities and the public RD&I System in Catalonia.

The classification proposed by the Secretariat of Universities and Research reveals the public RD&I agents of Catalonia.
It is important to characterise the RD&I agents so as to avoid duplications when calculating the impacts resulting in a fictitious oversizing of their amount.

After analysing the units comprising each of the categories, overlaps are identified: for example, some entities of the SICUP (and those linked to it) are research groups, research institutes and/or include science and technology parks. Likewise, some units of RD&I are found within different categories at the same time. For example, some of the CSIC centres is at the same time a CERCA centre; so, the majority of the research centres and medical research institutions are also CERCA centres: some of the research centres can be found in science & technology parks, some research centres include large research-support infrastructures (GISR), or, also, the entities listed as research centres, which are also found listed as members of technology networks.
Seven impact generating agents are identified: economic SICUP agents; CERCA centre; CSIC centres in Catalonia; large research-support infrastructures (GISR); hospital research centres; technology centres; and lastly, non-university science and technology parks. As the global economic impact generated by SICUP, has been estimated in the first section of this report, the analysis now focuses on calculating the additional impact of RD&I generated in the Catalan economy by the six remaining agents. Annex 1 sets out the group of institutions analysed in this section. Neither the research carried out by SICUP, nor other institutions included in the public RD&I system in Catalonia (for which there is no statistical data) are taken into consideration here. The results are set out below.
2.2. TOTAL ECONOMIC EFFECT ORIGINATING FROM THE PUBLIC SYSTEM OF RD&I IN CATALONIA

Following the same methodology as the previous section, but now adapted to RD&I institutions, the results characterising the additional impact of the public RD&I system, considered in section 1 (SICUP) are now presented.

“In 2015, the public RD&I system generated a total output in Catalonia of €1,168m, which is the equivalent of €3.2m daily”

“The public RD&I system contributed €706m to GDP in Catalonia: €406m direct, and €300m indirect and induced”

“Regarding the labour market, the public RD&I system contributed to creating/maintaining 15,537 FTE jobs: 11,040 direct FTE jobs, and 4,497 indirect and induced jobs”
2.3. TOTAL IMPACT OF THE PUBLIC RD&I SYSTEM IN CATALONIA DISAGGREGATED BY TYPES OF AGENTS

Presenting the distribution of impacts by types of agents is simplified by distinguishing between CERCA centres, their affiliated companies, and the remaining agents (CSIC, GISR, hospital research centres, technology centres, science and technological parks).

Research centres in Catalonia, called CERCA centres, are independent organisms with their own legal personality, driven and informed by the Regional Government of Catalonia, which aims for scientific research excellence. These centres have been created by, or are in partnership with the Catalan public administration, together with Catalan universities and other public/private entities.

---

6 In accordance with article 64.1 of the Law 7/2011, 27 July.
7 CERCA centres have different types of legal personalities: consortium (CREAF, CRAG, CREI, CRM, CVC, CED, CIMNE, CTFC, ICAC, ICCC, IFAE and IDIBAPS), foundations (CMRB, CRG, AGROTECNIO, CTTC, HUVH IR, i2CAT, IC3, IPHES, ICRA, ICRPC, ICIO, IRB Barcelona, IRSiCaixa, IRHSCP, IEEC, VHIO, IMIM, ICN2, ICP Miquel CruzaSource, IBEC, ICFO, IRB Lleida, IJC; IREC, IDIBELL, IdiBGI, IGTP, IISPV, ISglobal i CMRB) public companies operating under the legal regime of private (IRTA).
8 CERCA centres are partly financed by the Directorate-General for Research, which has a specific budget allocation for their structural expenditures. In certain cases, there are other Departments of the Government of Catalonia, which also contribute to the funding of these research centres. It also finances other entities of the Government of Catalonia.
"The total impact (both direct, and indirect and induced) of CERCA centres and their affiliated companies was an output of €775m (66.3% of the total output), a contribution of €475m (67.4%) to Catalan GDP, €278m (66.8%) to wage income, and they created/maintained 11,275 full-time jobs (72.6%)."

“CERCA centres and their affiliated companies generate two thirds of the total impact estimated by the public RD&I system in Catalonia”

Table 2. TOTAL impact of the Catalan Public RD&I System by types of agents

<table>
<thead>
<tr>
<th>Type of Agent</th>
<th>Output</th>
<th>Contribution to GDP</th>
<th>Wage income</th>
<th>Jobs*</th>
</tr>
</thead>
<tbody>
<tr>
<td>CERCA CENTRES**</td>
<td>€775m</td>
<td>€475m</td>
<td>€278m</td>
<td>11,275</td>
</tr>
<tr>
<td>REST OF AGENTS</td>
<td>€393m</td>
<td>€231m</td>
<td>€138m</td>
<td>4,262</td>
</tr>
<tr>
<td>TOTAL</td>
<td>€1,168m</td>
<td>€706m</td>
<td>€416m</td>
<td>15,537</td>
</tr>
</tbody>
</table>

Source: AQR-Lab. Notes: * Equivalent to full-time jobs. Monetary amounts expressed in millions of euros (€m).** Results collected from CERCA centres and their affiliated companies

Graph 6. Distribution of the TOTAL impact of the Catalan Public RD&I System by type of agent

Source: AQR-Lab.

1 These calculations are done including IRTA and most of the hospital research centres as CERCA centres.
3. TOTAL ECONOMIC IMPACT OF SICUP AND THE PUBLIC RD&I SYSTEM ON THE CATALAN ECONOMY
3. TOTAL ECONOMIC IMPACT OF SICUP AND THE PUBLIC RD&I SYSTEM ON THE CATALAN ECONOMY

The above outlines the impact of the Catalan system of public universities (SICUP) and the Catalan Public RD&I System on the Catalan economy in 2015. Various dimensions are taken into consideration (supply - demand, economic - non-economic, monetarily quantifiable - monetarily non-quantifiable, etc.). This report takes a demand perspective, analysing the impact on the following variables: output; wage income; jobs created (FTE); and tax revenue in cost efficient and measurable terms.

The first part of the study has mainly focused on measuring the economic impact of everyday SICUP activities (universities), and the four additional generating agents: entities linked to SICUP; businesses with ties to SICUP; SICUP students; and visitors to SICUP. The second part, which measures the economic impact originating from the public RD&I system, coincides to a large extent with the methodological framework behind the analysis of the impacts deriving from SICUP, and from a RD&I perspective, complement the higher tertiary activity affecting the Catalan economy.

In the following sections, the most significant characteristics of the total impact generated by the Catalan Public University System (SICUP) and the public RD&I system on the Catalan economy in 2015 are presented.

3.1. TOTAL ECONOMIC EFFECT OF SICUP AND THE PUBLIC SYSTEM ON RD&I IN CATALONIA: MAIN RESULTS

“In 2015, the entire Catalan public higher education system and the entire Catalan RD&I system generated €5,714m (€15.7m daily), contributing €3,660m to the GDP, (1.7% of the total Catalan GDP). Additionally, it generated €2,081m in wage income and contributed to creating/maintaining 69,313 jobs (equivalent to full-time). In terms of tax income generated, €1,386m in tax revenue”
Figure 23. Economic effects resulting from the existence of SICUP and the Public RD&I System in Catalonia

Contribution to GDP in Catalonia: 1.7%

Source: AQR-Lab.

Figure 24. Total impact attributable to the existence of SICUP and the Catalan Public RD&I System disaggregated by types of effects

Source: AQR-Lab. Note: FTE (full-time equivalent). Monetary amounts expressed in millions of euros (€m)
“SICUP and the public RD&I system generated €3.660m of GDP, contributing 1.7% to the Catalan GDP. €2.210m was generated directly and €1.450m in an indirect and induced way”

“As for the contribution to the labour market, the activity of SICUP and associated agents and the Catalan public contributed to creating/maintaining 60,313 jobs (FTE): 38,844 employees (FTE) directly and 21,469 employees (FTE) in an indirect and induced way”

“Wage income rose to €2,081m (€1,445m as a direct effect and €636m due to indirect and induced effects)”

“The fiscal impact of SICUP and the public RD&I system for 2015 was €1,386m in tax revenue from state and regional taxes (€769min VAT, €317m in income tax and €300m in corporation tax). This number exceeds the public contribution by the Catalan Government in 2015 (approximately €1,200m)”

“SICUP and the Catalan Public RD&I System generated a total output in Catalonia valued at €5,714m, Accounting for a daily output of €15.7m”

Figure 25. Daily output in Catalonia originating from SICUP and the Catalan Public RD&I System

“Taking as a reference the total number of people directly employed by SICUP and the Catalan Public RD&I System, there is an output per employee of €147,101, a GDP per employee of €94,223, a wage income per employee of €53,573, a tax revenue per employee of €35,681, and a total of 1.55 FTE jobs per employee”

Source: AQR-Lab
3.2. MULTIPLIER EFFECTS

If we compare the results of the direct impact with the indirect and induced impact, we can conclude that "for every €100 of output directly due to SICUP, €84 of additional revenue were generated in an indirect and induced way (multiplier of 1.84)."

Figure 26. Multiplier effect on output

"Likewise, for every €100 of GVA corresponding to the direct effect, an additional €66 of GVA derived from the indirect and induced effects (multiplier of 1.66); for every €100 of wage income generated directly, an additional €44 in wage income were derived from the indirect and induced effects (multiplier of 1.44); and, finally, for every 100 directly employed, another 55 additional workers are employed as a consequence of indirect and induced effects (multiplier of 1.55)"

Figure 27. Multiplier effect on GVA

Source: AQR-Lab.
3.2. MULTIPLIER EFFECTS

If we compare the results of the direct impact with the indirect and induced impact, we can conclude that for every €100 of output directly due to SICUP, €84 of additional revenue were generated in an indirect and induced way (multiplier of 1.84).

For every €100 of GVA corresponding to the direct effect, an additional €66 of GVA derived from the indirect and induced effects (multiplier of 1.66); for every €100 of wage income generated directly, an additional €44 in wage income were derived from the indirect and induced effects (multiplier of 1.44); and, finally, for every 100 directly employed, another 55 additional workers are employed as a consequence of indirect and induced effects (multiplier of 1.55).

3.3. DISTRIBUTION OF TOTAL IMPACT OF SICUP BY SECTORS OF ECONOMIC ACTIVITY

Impact of SICUP and the Public System of RD&I

As mentioned above, the total economic impact affects various sectors of the Catalan economy to a greater or lesser extent, beyond those who have a direct link with the activities of the universities, and the activities of other centres of RD&I. As a result, the impacts reach all the different sectors and industries of the economy.
“27.6% of the total output of SICUP and the Catalan Public RD&I System (€1,579m), combined with 31.4% of jobs created (18,915) were attributed to higher education. In the case of research and development, the total output amounted to €918m (16.1% of the total), and the number of jobs 12,390 (20.5% of the total). The remainder is divided between other sectors of the Catalan economy”

Graph 7. Distribution of total economic impact of SICUP and the Catalan Public RD&I System by economic sector: output (€m)

<table>
<thead>
<tr>
<th>Economic Sector</th>
<th>Impact (€m)</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Higher education</td>
<td>1579</td>
<td>27.6%</td>
</tr>
<tr>
<td>Research and development</td>
<td>918</td>
<td>16.1%</td>
</tr>
<tr>
<td>Real estate</td>
<td>354</td>
<td>6.2%</td>
</tr>
<tr>
<td>Retail, exc. vehicles, motor</td>
<td>262</td>
<td>4.6%</td>
</tr>
<tr>
<td>Food and beverage services</td>
<td>226</td>
<td>4.0%</td>
</tr>
<tr>
<td>Accommodation services</td>
<td>213</td>
<td>3.7%</td>
</tr>
<tr>
<td>Wholesale and intermediaries, exc.</td>
<td>178</td>
<td>3.1%</td>
</tr>
<tr>
<td>Construction industry</td>
<td>170</td>
<td>3.0%</td>
</tr>
<tr>
<td>Other professional and technical activities</td>
<td>133</td>
<td>2.3%</td>
</tr>
<tr>
<td>Production and distribution of electricity</td>
<td>115</td>
<td>2%</td>
</tr>
</tbody>
</table>

Source: AQR-Lab.

“In addition to the higher education and the research and development sector, (which makes up 43.7% of output and 51.9% of jobs), it is proven that other sectors also benefit from SICUP and the Catalan Public RD&I System. For example: real estate; the retail trade; food and beverage services; accommodation services; the wholesale trade; the construction industry; legal activity; accountants and tax advisors; other professional and technical activities; other types of road transport; production and distribution of electricity, etc.”

Comparing the total economic impact on the labour market (FTE jobs), this shows that of the 60,313 FTE jobs created, almost half (48.1%) are outside of the Higher Education and Research and development sector. It is noteworthy that 29,008 FTE jobs derived from SICUP and the Catalan Public System of RD&I can be found in very diverse sectors, for example the retail industry (4,320 ETC jobs), food and beverage services (2,368 ETC jobs).
Graph 8. Distribution of total economic impact of SICUP and the Catalan Public RD&I System: FTE jobs

<table>
<thead>
<tr>
<th>Economic Sector</th>
<th>Jobs</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Higher education</td>
<td>18,915</td>
<td>31.4%</td>
</tr>
<tr>
<td>Research and development</td>
<td>12,390</td>
<td>20.5%</td>
</tr>
<tr>
<td>Retail, exc. vehicles, motor vehicles, etc.</td>
<td>4,320</td>
<td>7.2%</td>
</tr>
<tr>
<td>Food and beverage services</td>
<td>2,368</td>
<td>3.9%</td>
</tr>
<tr>
<td>Accommodation services</td>
<td>2,186</td>
<td>3.6%</td>
</tr>
<tr>
<td>Domestic services</td>
<td>1,432</td>
<td>2.4%</td>
</tr>
<tr>
<td>Other professional and technical activities</td>
<td>1,404</td>
<td>2.3%</td>
</tr>
<tr>
<td>Other types of road transport</td>
<td>1,359</td>
<td>2.3%</td>
</tr>
<tr>
<td>Legal activities, accountants and advisors</td>
<td>1,267</td>
<td>2.1%</td>
</tr>
<tr>
<td>Wholesale and intermediaries, exc.</td>
<td>1,209</td>
<td>2.0%</td>
</tr>
</tbody>
</table>

Source: AQR-Lab.

“This impact is not limited to just a few sectors, but has relevant multiplier effects, distributing the impact over other sectors not directly related to education and RD&I. 51.9% of total jobs created are not in Higher Education or Research and Development.”

Figure 30. Total economic impact by economic sectors: FTE jobs

Source: AQR-Lab.
3.4. TAX REVENUE ORIGINATING FROM SICUP AND THE PUBLIC RD&I SYSTEM, AND SOCIAL RETURN ON PUBLIC INVESTMENT

Taking as a reference the government spending on Catalan public universities and on the public RD&I system, which amounted to 1,200 million euros, and the return on this investment to society can be analysed. So, for every €100 of public spending on SICUP and the Catalan RD&I system, the return to investment to society amounted to €173 in wage income, €476 in output and a contribution of €305 to Catalonia’s GDP.

“This funding can also be considered a profitable investment when looking at the tax revenue. In 2015, for every €100 of government spending on universities and the public RD&I System, €113 were generated in tax revenue”

“In employment terms, every €20,000 of public funds on public universities creates/maintains 1 FTE job”

---

Figure 31. Return to public investment in SICUP and the Catalan public RD&I spending

Source: AQR-Lab.
3.5. SUMMARY

The figures in this study show the relevance and contribution of public university education together with public RD&I on the Catalan economy. Magnitudes are relevant and it is clear that the return is greater than the investment. These results are in spite of the underestimations made in the study. Therefore, there is still scope for improvement and reaping even more return on investment to society.

Apart from the global impact, all sectors of the economy are also affected in that they are not limited to the higher education sector and RD&I alone. Moreover, there is a regional distribution of the impact, which reaches beyond the Barcelona metropolitan area, which receives the main impact.

Either way, the impact of university education and research goes beyond monetary quantification and affects many other areas of society, especially social, culture, healthcare, environment, communications, etc.

The following section analyses the five socioeconomic dimensions making up the strictly economic analysis of Catalan public universities.
ANNEX. Research Institutions included in the analysis

A.1 CERCA Centres
Research centres in Catalonia recognised as CERCA centres and included in the analysis on impact in Part 2 are listed below:

» CED Centre for Demographic Studies
» AGROTECNIO Centre for Research in Agro-technology
» CIMNE International Centre for Numerical Methods in Engineering
» CMRB Barcelona Centre for Regenerative Medicine
» CRAG Consortium CSIC-IRTA-UAB Centre for Research in Agronomics
» CREAF Ecological and Forestry Applications Research Centre
» CREAL Centre for Research in Environmental Epidemiology
» CREI Centre for Research in International Economics
» CRG Centre for Genomic Regulation
» CRM Centre for Mathematical Research
» CTFC Forest Sciences Centre of Catalonia
» CTTC Centre Technological Centre of Communications of Catalonia
» CVC Computer Vision Centre
» HUVH IR Vall d’Hebron University Hospital Research Centre
» I2CAT The Internet Research Centre
» IBEC Institute of Bioengineering of Catalonia
» IC3 Catalan Institute of Climate Sciences
» ICAC Catalan Institute of Classical Archaeology
» ICCC Cardiovascular Research Centre
» ICFO The Institute of Phototonic sciences
» ICIQ Institute of Chemical Research of Catalonia
» ICN2 Catalan Institute of Nanoscience and Nanotechnology
» ICP Catalan Institute of Paleontology Miquel Crusà Source
» IPHES Catalan Institute for Human Paleoecology and Social Evolution
» IRB Barcelona Institute for Research in Biomedicine
» IRB Lleida Institute for Research in Biomedicine
Some of these research centres could have been included in hospital institutions. Nevertheless, the criteria followed has been to include them in the analysis in the part corresponding to CERCA centres and exclude them from RD&I related to hospital institutions.

However, although the classification of RD&I of the Secretariat for Universities and Research groups IRTA centres as independent research centres, given that in 2015, IRTA was considered a CERCA centre, all activities of IRTA centres also count as an integral part of CERCA. These are listed below:

Likewise, even though the classification of the RD&I centres of the General Secretariat for Universities and Research group IRTA centres separately, given that in 2015 IRTA was a CERCA centre, all activities in IRTA centres count as an integral part of CERCA. These are listed below:

In addition, the activities of companies and organisations where CERCA centres participate with social capital are also analysed. Of these 64 companies, we have obtained data for 33 companies. The data analysed takes into account the participation of CERCA centres.

---

9 This is the case for: Vall d’Hebron University Hospital Research Centre, HUVHIR; Bellvitge Biomedical Research Institute, IDIBELL; Girona Biomedical Research Institute, IDIBGI; Germans Trias i Pujol Health Sciences Research Institute, IGTP; Pere Virgili Hospital Research centre, IISPV; Santa Creu i Sant Pau Hospital Research Centre, IRHSCSP; Mar Institute of Medical Research Foundation, IMIM; August Pi i Sunyer Biomedical Research Institute, IDIBAPS; and Lleida Institute for Research in Biomedicine, IRBLleida.

10 Agrofruit Export SA; Càmara Arrossera del Montsià and Secció de Crèdit SCCL; Cooperativa Agricola i Seccio De Credit de la Selva del Camp; Sociedad Cooperativa Catalana; Kic Innoenergy Iberia SL; Buildair Engineering and Arquitectura SA; Transmural Biotech SL; Quantech Atz SA; Linkcare Health Services SL; Healthapp SL; RSM Gasso Cimne Energy SL; Nanopack Technology & Packaging SL; Blanca from the Pyrenees SL; Apa Processing BZ SL; Chemotargets SL; Bionure Farma SL; Iproteos SL; Ledmotive Technologies SL; Mosaic Biomedicals SL; Efflogics Technologies SL; Rob Surgical Systems SL; Fresh Water Nature SL; Ingenieria Aeronautica Ingenia AIE; Specific Pig SL; Cloud Sizing Services SL; CIMNE Tecnologia SA; Hemophotonics SL; COMPASS Ingeniería y Sistemas SA; Pharmatools Digital Interactive Services SL; Tecnologías Avanzadas para el Ocio SL; Immunnovative Developments SL; Copaga Avicola SA; Societat Promotora del Parc Tecnologic de Tarragona SL.
A.2. Network of research centres of the Spanish National Research Council (CSIC) in Catalonia

» Blanes Centre for Advanced Studies, CEAB
» Cardiovascular Research Centre CIC11
» Centre for Research and Development, CID
» Mediterranean Marine and Environmental Research Centre, CMIMA
» Institution Milà and Fontanals, IMF
» Botanical Institute of Barcelona, IBB
» Institute of Economic Analysis, IAE
» Research Institute of artificial intelligence, IIIA
» Institute of Biomedical Research of Barcelona, IIBB
» Institute of Evolutionary Biology, IBE
» Institute of Molecular Biology of Barcelona, IBMB
» Institute of Material Science of Barcelona, ICMAB
» Institute of Space Sciences, ICE
» Institute of Earth Sciences Jaume Almera, ICTJA
» Institute of Marine Sciences, ICM
» Institute of Environmental Assessment and Water Research, IDAEA
» Institute of Microelectronics of Barcelona, IMB-CNMT
» Institute of Advanced Chemistry of Catalonia, IQAC
» Institute of Robotics and Industrial Informatics, IRII
» Ebre Observatory of Astrophysics
» Marine Technology Unit, UTM

A.3. Large research-support infrastructures (GISR).

» Barcelona Supercomputing Centre, BSC-CNS
» Consortium for the Construction, Equipping and Exploitation of the Synchrotron Light Source, CELLS

In addition, Catalonia has other ICTS, including a GISR agent:

» Consortium for University Services of Catalonia (CSUC)

The remainder are not included as they belong to bodies included in other categories of agents (and counted there) or because the necessary information is unavailable.

11 The Centre for Cardiovascular Research (CIC), a centre combining CSIC and Catalan Institute of Cardiovascular Sciences (ICCC), as the latter belongs to CERCA, the analysis takes this into account so as not to oversize the impact of ICCC activity.

12 As in the case of the Spanish National Genome Analysis Centre (CNAG).
A.4. Hospital Research Centres (and medical research institutions)

Another pillar of the RD&I system are hospital research centres carrying out biomedical research. The Agency for Health Quality and Assessment of Catalonia (2015) encompasses medical research in institutions associated with hospitals and research centres and those not connected to health care centres.

Among institutes affiliated with hospitals or health centres, 10 are CERCA centres (HUVHIR; IDIBELL; IDIBGI; IGTP; IISPV; IRHSCSP; IMIM; IDIBAPS; VHIO and IRB). Research centres not connected to are listed as follows: CERCA; CMRB; CREAL; CRESIB; CGR; IBEC; ICCC; IJC; IMPPC and IRB. All belong to CERCA, and therefore count as an integral part of CERCA.

The category established to gather together research centres and medical research centres, following the criteria of the Agency for Health Quality and Assessment of Catalonia (AQuAS) includes:

- Hospital Consortium Parc Taulí
- Joan Costa Roma Foundation
- IDIAP Jordi Gol

A.5. Technology centres

This category includes entities to which the Catalan Government awards the TECNIO stamp for innovative technological advance. Likewise, this category also includes EURECAT, a technology centre which has integrated various TECNIO centres in recent years. These are listed below:

- Centre for Chemical Technology Centre of Catalonia (CTQC)
- Cecot Innovation Foundation (FCI)
- EURECAT

A.6. Science and Technology Parks

Taking the inventory of the of the Secretariat of Universities and Research as a reference, science and technology parks already taken into account in Part 1 have been excluded in this section (from this category of agents). Nor are included those in which determining which part of the economic results can be linked to RD&I activities is unfeasible. This is this case for 22@Barcelona, Barcelona North Technology Park, and the Barcelona Zona Franca Consortium. Parks analysed are:

---

13 Alone, this is not IDIAP Jordi Gol.
14 The necessary information to include the following centres is unavailable: The Wood and Furniture Technology Centre of Catalonia (CENFIM), and the Lleida Institute of Technology (ITL).
15 Some RD&I centres registered as TECNIO centres by the Secretariat for Universities and Research, have been taken on by EURECAT and so their contribution is included in EURECAT. This is also the case for the following centres: Barcelona Media - Innovation Centre (BM-CI), LEITAT Technology Centre, ASCAMM Foundation, Barcelona Digital Technology Centre (bDIGITAL), CETEMMSA Foundation, Technological Centre for Nutrition and Health (CTNS), and CTM Foundation.
Socioeconomic Impacts of Public Universities and the Public Research System in Catalonia

» Barcelona Innovation and Tecnology (b-TEC)
» Reus Tecnoparc (Tecnoparc)
» Viladecans-Barcelona Aerospace and Mobility Park (PAMV)
» Audiovisual Park of Catalonia (PAC)
» Lleida Agri-food Science and Technology Park (PCiTAL)  
» Barcelona Biomedical Research Park (PRBB)  
» Valles Technology Park (PTV)

Other parks considered for the study, but not included due to lack of data are as follows: Viladecans Business Park and Barcelona Media Park (PBM).

16 In the case of Lleida Agri-food Science and Technology Park (PCiTAL), activity partially allocated to SICUP, as it is a consortium of Lleida City Council and University of Lleida 50-50. Thus, the part not included previously in PART A is now calculated here.

17 The consortium PRBB is part of the Government of Catalonia, Barcelona City Council, and Pompeu Fabra University and presided over by the Advisory for Economics and Knowledge for the Government of Catalonia. Pompeu Fabra University, however, participates in the Consortium and has a significant presence in the PRBB. Due to this unusual position, it has its own entity, and this explains why it is not included in the analysis in PART A of this study.
4. THE CATALAN UNIVERSITY SYSTEM AS A TOOL FOR REGIONAL SOCIO-ECONOMIC DEVELOPMENT AND TRANSFORMATION: A STUDY OF INDICATORS AND KEY DIMENSIONS
4. THE CATALAN UNIVERSITY SYSTEM AS A TOOL FOR REGIONAL SOCIO-ECONOMIC DEVELOPMENT AND TRANSFORMATION: A STUDY OF INDICATORS AND KEY DIMENSIONS

Research Team:

Juan Antonio Duro (coord.),
Department of Economics, URV

Agustí Segarra,
Department of Economics, URV

Mertxe Teruel,
Department of Economics, URV

Pere Segarra,
Department of Business Management, URV

M. Dolors Setó,
Department of Business Management, URV

4.1. Introduction

Apart from their traditional function, such as offering courses and undertaking basic research, universities, through economic and social paths, have been taking on other more visible functions, bringing them closer to society. This section focuses on the (real or potential) significance of public universities in these other areas. These areas or dimensions are, less studied by institutions on the whole. In particular, these “practical areas”, which are the main focus of the study, are related to certain dimensions of the Catalan economy, which need to be strengthened, either because they show strategic weaknesses, or because they are sources of strict potential in the global context.

In this part, the focus is put on five dimensions. The first is output from the labour market with regard to university studies. This focus is due to the high unemployment rate in the country compared to other European countries, and the corrective capacity of the public university system. Secondly, the situation and evolution of technology transfer and innovation practices in the Catalan public universities is analysed, given Catalonia’s global standing in terms of innovation, which is not especially relevant in the European context, as shown in data from the European Commission (Regional Innovation Scoreboard). Thirdly, public universities have a significant influence on internationalisation, which is a determining variable when it comes to both regional and individual economic competitiveness, and where PIMES are still in an unfavourable position. Fourthly, the role of entrepreneurship in universities is examined, especially in the technology field, as the rate of entrepreneurial activity in Catalonia is lower than in other countries based in innovation (GEM). Finally, the concept of social responsibility within universities is reviewed, taking into account the growing impact they are having on this area.
4.2. Universities and the Labour Market

University education is not only directed at bettering learning and socio-cultural guidance, but also at increasing the employability of the population, and the quality of the workforce. Therefore, indicators of differential labour conditions of graduate students are also included, in terms of both quantity and quality. The indicators in terms of results are related to three basic elements, which are to a certain extent connected. Firstly, the probability of being employed (employability), seen as a basic element of wellbeing. Secondly, indicators relative to employment stability, which is not only relevant when it comes to the wellbeing of individuals or a collective, but also has a ‘knock-on’ effect on the global economic growth through an increase in consumer spending. In third place are earnings. In fact, more chance of having a job or having stable employment, and to be well rewarded, could be taken as the basis of an index of ‘work happiness’. On the other hand, this Chapter also reviews briefly universities’ continuing education activities, and the more practical modules of official degrees, which until now, have gone relatively unnoticed, even though they have experienced considerable impetus in recent years.

Summary of results in terms of labour output for university graduates:

- they have a higher rate of employment than the rest of the population of the same age
- they have been less impacted by the economic crisis
- they are less affected by the rise in long-term unemployment resulting from the global economic crisis
- they have less employment stability (this is partly related to the age factor)
- they take up fewer entrepreneurial positions
- but overall, they have relatively higher earnings
Regarding practical and professional training, the most significant points are as follows:

» The number of students participating in internship programmes has grown (from 9.5% to 15%)
» Approximately 12,000 work opportunities were advertised by universities in 2014 (7% of students)
» The number of students undertaking official Master’s Degrees and Postgraduate courses has grown to 41,000 in the 2014-15 academic year
» Tailor made courses have risen to 17,500 students
» MOOCs have 14,000 students
» 29,000 students are taking language courses
» Continuing education courses have had 3,900 students

Therefore, public universities and the university education they provide is correlated with better outputs in the labour market (than the rest of population of a similar age). In addition, universities have promoted a more practical approach in both their degree programmes and continuing education courses, with the goal of increasing the global employability and other labour conditions of the population.

4.3. Knowledge Transfer and Innovation

Catalan universities are key players in the innovation system and their participation through knowledge transfer and cooperation in R&D projects has become increasingly essential. Over recent decades their involvement has increased greatly and they are currently a vital part of the system, making huge efforts in research and knowledge transfer. In the last few years, despite the negative effects of restrictive R&D policies implemented by both Catalan and Spanish governments, university-business contacts have increased within the Catalan Innovation System. Catalan companies are using more intensively the knowledge and technology generated by Catalan universities through different external sources (agreements with other companies, client-supplier relationships, public knowledge transfer centres, non-profit private institutions, etc.). However, the income that finally reaches university coffers falls well short of revenue from other sources.

It must be taken into account that the recent financial crisis has had a negative impact on innovation activities in Catalan businesses. Since 2010 the number of Catalan companies applying for patents has decreased; likewise, their investment in R&D, and the number of innovating companies participating in R&D projects in collaboration with other companies, universities and technology centres. Added to this downward trend in the last few years is the impact of restrictive policies that the Spanish government has implemented in science and technology. In this context, any analysis of university-business knowledge transfer must take into account the restrictions affecting Catalan companies, and indirectly, university structures, whose mission is to transfer knowledge to the country’s production sector.

In addition, at an operational level, the Catalan university today is a combination of both teaching and research (basic and applied) as well as a set of varied, and at times contradictory, initiatives linked to knowledge transfer and cultural activities. These elements co-exist in “creative tension” and periodically come into conflict; a conflict that usually ends in compromise and a change in policy, in which different,
and seemingly opposing elements, such as business initiative and knowledge dissemination, are reconciled. These are the contradictions currently at the heart of the Catalan university system.

Catalan universities are the most highly ranked in Spain, both in national and international rankings. However, they are faced with the challenge of creating more flexible structures with the capacity to learn and adapt to new scenarios. They must promote inter-disciplinary departments, more flexible and creative academic disciplines with greater capacity for self-management, which are suitable for forging closer links with private businesses. This new scenario, foreseen for the 21st century, also raises a challenge for the Public Administration, which must design scientific and technological infrastructures in which both university organisations and companies are included. We can refer to a social contract or the Triple Helix Model, which fosters a point of contact between government, universities and the private sector.

A summary of findings with regard to knowledge transfer and innovation in Catalan public universities would be as follows:

- The scientific potential in Catalan universities is demographically and economically more significant than in the rest of Spain: submitted theses represent 24.1% of the total in Spain, and scientific articles, 28.7% (greater productivity from the Catalan university network).
- Links between external stakeholders of the innovation system and universities are noteworthy.
- Resources destined for research group collaboration in Catalan universities represent 39.7% of the total in Spain.
- Revenue for R&D&I hiring represents 20.8%.
- However, not so promising are results related to patents. National patents registered at the OEPM (Spanish Patent and Trademark Office) only represent 15.1% of the total in Spain.
- International patents (Patent Cooperation Treaty-PCT) represent 21.5%.

Graph 9. Main indicators of knowledge transfer from Catalan universities (2014)

Source: compiled by authors
Thus, much remains to be done. By positioning itself at a certain distance from the hub of European regions that form the technological border, Catalonia fails to offer the most suitable setting for strengthening university-business ties. This situation makes us careful not to adopt an excessively optimistic discourse, which might lead us to plan an unattainable future. We should not let ourselves be carried away too hastily. In practice, when taking into consideration available resources and the organisation of our innovation system, it is wise to be prudent. Nonetheless, we should not lose sight of the fact that progress made since the creation of a more decentralised university, more in keeping with the regional situation of Spain, has been highly positive.

4.4. Internationalisation

The internationalisation of the university system is a process with a long history. Thus, knowledge generation and transfer, of a universal nature, is the cornerstone of universities. Notwithstanding, the internationalisation of the university system has been intensified and transformed in recent decades in response to the phenomenon of globalisation. In fact, the creation of the European Higher Education Area responded to the need to provide greater flexibility to international movements in higher education.

Based on the submitted data, the main conclusions to be highlighted are as follows:

» The internationalisation of universities goes hand in hand with social and economic changes worldwide. In this process, the concept of the internationalisation of higher education has gone from being a flow of students and university staff to a cross-cutting phenomenon affecting all areas of university organisation.

» The Catalan Public University System (SICUP) is well performing in international rankings. Despite the economic recession, the visualisation of academic activity and research has been maintained.

» It has become clear that undergraduate and postgraduate student mobility to and from other countries, especially at undergraduate level, is low. Policies to attract international mobility should be planned and, above all, strengthened. Particularly necessary are measures which can be implemented to attract students at doctoral level given that this represents the entry of highly-qualified students.

» As for human resources, the number of foreign lecturers in Catalan universities has fallen and only a small percentage of administrative and service staff is of foreign origin. This points to a potential decline in the capacity of universities to promote Internationalisation at home (IaH). Policies to attract foreign personnel should be promoted and implemented and, at the same time, the international perspective of in-house staff, regardless of their nationality, should be strengthened.

» University students lack knowledge of foreign languages. Likewise, education policies to promote foreign language proficiency should not be directed at lower educational levels.
» The findings highlight the mixed capacity of Catalan universities to attract research talent and, therefore, the need to promote research visibility internationally. Not only should universities be positioned in specific research areas, but the different lines of research they are responsible for internationalising should be broadened.

» Economic resources allocated through competitions at international level have decreased significantly. This is an important point given that national resources have dropped even more. This situation puts a strain on university systems and negatively affects one of its basic cornerstones: research.

» Finally, findings point to a need to promote international collaboration in research. Access to resources and facilities to gain access to international networks are necessary to strengthen universities, not only internally but also as stakeholders of the Innovation System.

Thus, the internationalisation of universities reflects emerging trends in which it is necessary to establish and strengthen international relationships, increase the flow of human capital and knowledge, and meet new career profiles of a more international nature. Yet, the responsibility of achieving internationalisation should not only lie with the university system, but with the entire education and cultural system, which should take steps to enable these goals to be met globally.

4.5. Entrepreneurship

In its broadest sense, the concept of entrepreneurship has been incorporated in all universities in the last five years, although the concept of business creation has been in the forefront since the 1990s. This shift of focus by universities is actually very recent. Despite the fact that entrepreneurship is currently being adopted by all universities, its levels of implementation are quite irregular, making it difficult for firm conclusions based on model analyses to be drawn. Although external sources have been used for this report, it must also be highlighted that an important part of the analyses included here come from our own survey conducted among all the directors of Entrepreneurship Departments at public universities.

The strategy for promoting entrepreneurship at universities involves:

» Initiatives to encourage self-employment among students, including awareness-raising, training and tailored guidance.
» Initiatives to promote high-tech companies in specialist areas in which the university can exercise leadership (spin-offs).
On the other hand, which are the key elements needed to develop entrepreneurship promotion strategies?

» A specific organisational structure (chairs, institutions, foundations, alumni associations, technology parks, etc.)
» A contingency budget to finance entrepreneurship promotion activities
» External sponsorship availability
» Access to public funding to promote entrepreneurship
» Staff with full-time dedication
» Curricular activities
» Scheduled extra-curricular activities
» Specific skill training activities
» Pseudo-leisure activities
» Specific technical services (business incubators, co-working, networking, etc.)
» Lecturer commitment
» Services for the creation and mentoring of university spinoffs

Some key findings from the university survey are as follows:

» 6 universities have unified structures
» 4 institutions lack their own budget to finance entrepreneurship activities
» 5 Catalan public universities have teams of 4 or more people working full-time in entrepreneurship
» Professor-led tutoring exists in only 62.5 % of universities
» 4 universities have accelerators
» 6 universities have technology monitoring and industrial and intellectual property protection services
» 5 universities have incubators
» Few curricular subjects are taught as yet
» On average, over 50% of students are unaware of courses offered by universities to develop entrepreneurial competencies
» Since 2010, stagnation in the development of Spanish university spin-offs has been observed
» Year on year, each university has significantly increased the number of entrepreneurial projects. The average went from 35.4 projects per university in 2014 to 132.3 in 2016.
» The creation of university-led business projects fell from an average of 5.5 businesses/year per university to 3.6
» Start-up creation is not growing

These data, therefore, reveal the difficulties in consolidating university technology transfer in the face of the paradigm shift required by a new economic landscape, like the one that has emerged at the end of the recent economic recession.
Table 3: Evolution of entrepreneurship management in Catalan public universities

<table>
<thead>
<tr>
<th>Results of entrepreneurial management</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Year 2014</td>
</tr>
<tr>
<td>Number of entrepreneurial projects initiated</td>
<td>35.40</td>
</tr>
<tr>
<td>Number of projects</td>
<td>5.50</td>
</tr>
<tr>
<td>Number of start-ups</td>
<td>2.67</td>
</tr>
<tr>
<td>Number of spin-offs</td>
<td>1.63</td>
</tr>
<tr>
<td>Number of external businesses created</td>
<td>2.33</td>
</tr>
<tr>
<td>Number of businesses financed</td>
<td>8.00</td>
</tr>
<tr>
<td>’Number of SPIN-OFF businesses closed down</td>
<td>1.50</td>
</tr>
<tr>
<td>Number of patents implanted via spin-offs or equivalent</td>
<td>1.57</td>
</tr>
</tbody>
</table>

Note: mean values per university. Compiled by authors based on data from Catalan public universities.

In the next few years, this paradigm shift in higher education should be examined more closely in two respects:

» At learning goal level, to enhance training to incorporate personnel in existing projects, and to train people able to create their own projects.

» In the creation of the structures needed to facilitate the development of high value knowledge emerging from the university itself, and to train talented individuals who can lead projects with growth potential.

The unclear situation underlying the creation of companies linked to universities via start-up and spin-off projects demonstrates the need to raise greater awareness among professors of the need not only to transmit entrepreneurship, but also to strengthen the transfer of the knowledge generated by it.

In conclusion, an entrepreneurial culture is an absolute mid- and long-term necessity, but studying and transmitting it have become a short-term obligation.

4.6. Impact of corporate social responsibility in universities

Increasingly, social issues are gaining greater relevance in a university context, and particularly in Catalan public universities. Although concern for social issues has always existed in Catalan universities, it is true that in recent years – within the scope of corporate social responsibility – it has gathered momentum and several social enterprises have been launched, while other long-standing initiatives have been strengthened. Generally speaking, a commitment to corporate social responsibility has been explicitly recognised by all Catalan public universities and even greater visibility has been given to this issue on
university websites, an indicator of growing interest. Thus, universities have increasingly been incorporating corporate social responsibility into their vision and different missions, with regard to people and their environment, the university's external image and its own management and internal governance.

We must highlight the difficulties in obtaining data homogeneity when trying to find indicators that provide a first assessment of corporate social responsibility in Catalan public universities. While key reference data and indicators are available in areas such as teaching, research or technology transfer – collected systematically by the universities – this is not the case in the area of social responsibility.

Despite efforts to move forward in this direction, an extensive, uniform set of indicators that allow data to be collected systematically to more rigorously evaluate the social impact of universities, is still not available, making this study more difficult to carry out, as it conditioned by its very nature.

Accordingly, one of the most important contributions of this Chapter is a description of the main social-related dimensions and a proposed list of indicators for each one of them. This has resulted in a total of 11 dimensions and a set of 62 indicators (which can be consulted in the online version of this report).

Table 4. Catalan public universities have a social impact in the following fields or dimensions

<table>
<thead>
<tr>
<th>D1. TRAINING FOR SPECIFIC GROUPS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Included here are all university-led training initiatives directed at specific groups, such as the elderly or “third age”, or over 55 year-olds.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>D2. DISABILITY SERVICES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Included here are all initiatives aimed at enhancing the integration of people with disabilities in the university.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>D3. DEVELOPMENT COOPERATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>These include all initiatives in the field of solidarity aimed at generating a positive impact and making improvements, especially in developing countries.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>D4. VOLUNTEERING</th>
</tr>
</thead>
<tbody>
<tr>
<td>Included here are all voluntary and solidarity activities carried out by the university community to the benefit of the local community (or the environment) in existing situations of violation, deprivation or lack of rights, or when there are opportunities to achieve better living conditions and social cohesion.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>D5. SERVICE-LEARNING PROGRAMMES</th>
</tr>
</thead>
<tbody>
<tr>
<td>These include activities carried out by universities to incorporate a proposal called Learning through Service into its educational approach. Learning through Service combines learning and service to the community in one project in which participants learn while working on the real needs of their community with a view to making improvements.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>D6. CULTURE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Broadly speaking, all the cultural activities carried out by universities are included here: music, theatre, cinema, art, dance, poetry, exhibitions, etc.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>D7. HEALTH/SPORT</th>
</tr>
</thead>
<tbody>
<tr>
<td>These include any sporting practices in universities, and any practices related to promoting healthy lifestyle habits, especially directed at the university community.</td>
</tr>
</tbody>
</table>

| D8. GENDER EQUALITY |
Included here are all initiatives carried out by universities that contribute to equal opportunities for men and women.

**D9. ALUMNI**
The links that the university maintains with former students and other people who may have a special interest in being part of the university are included here.

**D10. SOCIAL RECOGNITION**
These include all university-led initiatives aimed at raising greater awareness in society of what universities do.

**D11. ENVIRONMENT**
All actions taken by universities in their commitment to caring for the environment are included here.

Source: compiled by authors

Identifying these 11 dimensions and their indicators – albeit roughly – has enabled us to become aware of the positive impact generated by Catalan public universities in society at large, and on people and their environment in particular, through a wide range of initiatives related to issues such as the integration of certain groups facing difficulties, gender equality, development cooperation, voluntary work, service-learning, culture, sport and health, protection of the environment, an interest in bringing universities closer to people, and links with alumni.

Partial findings from the survey conducted in universities reveal that:

- 6 of the Catalan public universities taking part in this study have training programmes directed at certain social groups, such as the over 55 year-olds and the elderly.
- All of the universities have Disability Services and a Disability Care Plan to facilitate student adaptation.
- All universities have a Gender Equality Unit. Specifically, in the last five years, Catalan public universities have achieved gender balance in the hiring of women as lecturers and researchers.
- All universities have an Office or Service for Cooperation for Development. A wide range of international cooperation projects are currently in progress in areas such as health, communications, information technology and agriculture, with a greater presence in Africa and Latin America.
- All universities have Volunteer Services, or similar, which channel all the voluntary work initiatives carried out by universities. Moreover, according to data provided by the Catalan public universities taking part in this study, over 271 voluntary initiatives or activities have been carried out, benefiting over 145 social organisations, with the participation of over 3,205 people from the university community.
- Learning through Service (LTS) is one of the most recent initiatives undertaken by universities in an attempt to generate a positive impact and make improvements in the communities in which they operate. According to the data, 5 Catalan public universities taking part in this study have some experience in service-learning.
- 5 of the Catalan public universities involved in this study carry out cultural activities in their broadest sense. So, for example, the variety of cultural activities may range between 4 and 15 activities per university.
» All Catalan public universities in this study have a Sports Service, or similar. Specifically, according to the data provided, over 17,679 people took part in over 617 sporting activities in the 2014-2015 academic year.

» All universities have an alumni association, which enables former students to maintain contact with the university. As for numbers, data provided by the universities taking part in this study revealed a total of 126,550 former students in alumni associations.

» All Catalan public universities are active on social networking sites, and the study has revealed a growing number of followers of the main social networks.

» Among the Catalan public universities taking part in this study, 5 have a Sustainability Plan, and 6 have carried out environmental awareness activities or campaigns.

Thus, in order to highlight the university's social dimension, we should continue to move forward in this direction, recognising the important efforts being made by public universities in Catalonia to address corporate social responsibility.