

# Synthetic Indicators of Spanish Universities

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# Acknowledgments



The U-Ranking project, developed by the Ivie (The Valencian Institute of Economic Research) and the BBVA Foundation, is an essential part of a program of activities carried out by both institutions to document and analyze the role of knowledge in social and economic development. This report presents the basic products of the project, U-Ranking and U-Ranking Volume, including the methodology and results for 2023 (11th edition).

The approach of U-Ranking, the selection of variables on which the rankings compiled are based and the methodology used when treating the data have been thoroughly discussed by the Ivie team with a large group of experts on the assessment of universities, university information and management. We would like to thank these specialists from fourteen universities for their invaluable collaboration.

We would also like to acknowledge the support of the Valencian public universities in the initial stages of the project and the suggestions made by members of different Spanish universities since the presentation of the first results in June 2013, which have been followed with interest by many people. From then until May 2023, the U-Ranking website has received nearly 1.2 million hits. In addition, the project is being followed with interest from abroad: 29% of the visits to the website come from outside of Spain, the

majority from Latin America and the United States which jointly represent 20% of total foreign visits. Visits from major European countries such as United Kingdom, France, Germany, Italy and Portugal also have significant percentages. These data provide a stimulus to maintain the continuity of the project while making improvements.

Three main developments have improved the last two editions of the project. The first is the new web, launched in March 2022, with a more practical and mobile friendly design, offering dynamic graphs that can be customized and downloaded by the user. Dynamic sections have replaced the previous static information on university rankings allowing users to choose from a set of options in order to compare the results of the universities in the system as a whole, by region or from a selection of benchmarks. Since it was renewed, more than 45,000 searches have been made in this ranking section by university and nearly 30,000 by degrees. The new edition also includes two guides, one for students and families and a separate guide for guidance counselors, explaining how to use the “Choose a University” tool.

The third new feature, introduced in the 2023 edition, is a tool that allows to rank bachelor's degrees in terms of their employment prospects, both from a quantitative (employment rate and

income level) and qualitative perspective (vertical adjustment -level of studies required- and horizontal -adjustment of job position to the studies pursued-). This calculator aims to enhance the information that prospective students consider during the decision-making process and to facilitate the task of school counselors.

We would like to give special thanks the IUNE Observatory<sup>1</sup> for their collaboration with research and innovation and technological development data, as well as participating in meetings on the availability and suitability of various sources and the problems of their treatment. In this regard, the IUNE Observatory, and specially the INAEUC team, directed by Professor Elías Sanz-Casado, have provided complete Bibliometric data on all the Spanish universities (based on information provided by Clarivate), from which many of the indicators relating to research have been calculated.

Also, the U-Ranking team acknowledges the cooperation of the General Secretariat of Universities and, in particular, the General Sub-Directorate of University Research Activity of the Spanish Ministry of Universities, whom, for another consecutive year, has provided us access to the Integrated System of University Information (SIU). In addition, the Ivie team would like to acknowledge collaboration from the Spanish Ministry of Science and Innovation, through the State Bureau of Investigation, by providing information on the research resources available to universities. The collaboration of all these institutions offers proof of their commitment to transparency and accountability, which are key elements for the university sector to be a profitable investment. It also allows the ranking to be independent from the information provided by the university institutions that appear in it, thus favouring independence with respect to them.

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The results of the U-Ranking project are, therefore, the results of the collaboration of many people and institutions that share the same interest in analyzing the performance of Spanish universities and facilitating comparable and synthetic images of them. With this 11th edition, we celebrate the continuity of a project that, by its nature, offers results that are more and more reliable as the data and basic indicators become more refined.

In this regard, it is also important to highlight that one of the advantages of the U-Ranking project approach is that it pays special attention

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<sup>1</sup> The IUNE Observatory is the result of work carried out by a group of researchers from the universities that make up the “Alianza 4U” (Universidad Carlos III de Madrid, Universidad Autónoma de Madrid, Universitat Autònoma de Barcelona and Universitat Pompeu Fabra). The general coordinator

of IUNE is Elías Sanz-Casado, professor at the Department of Librarianship and Documentation of the Carlos III University Carlos III in Madrid and director of INAEUC (Research Institute for Higher Education and Science).



to the wide range of activities that universities carry out, such as teaching, research and innovation, and, when the information allows, it also takes into account university outcomes in terms of labor market insertion of its graduates. This diversity of perspectives enriches the assessment of university results and shows the limitations of partial views, because the institutions analyzed have different levels of performance in the various areas. Due to this

situation, it is important that the range of results offered be as complete as possible and based on reliable indicators.

The authors of the report are grateful to the BBVA Foundation and the Ivie for their long-standing support and, in any case, assume sole responsibility for the indicators presented and the resulting conclusions.





# Introduction

## 01

This report presents the results of the research undertaken by the Ivié to develop the 11<sup>th</sup> edition of U-Ranking, based on an analysis of university teaching activities and research and innovation.

The 20 indicators chosen for the data bank of the project provide the basis for compiling different rankings of Spanish universities. The first of these rankings is denominated **U-Ranking** and analyzes the performance of the University System, synthesizing the universities' achievements in teaching, research and innovation regardless of their size.

The fact that a smaller university achieves good results is relevant, but we should not ignore that their impact on their environment may be far smaller than a large university with less outstanding results. For example, a university with 100 faculty members that produces 100 patents is more productive than if one with 1,000 members produces 500 patents. However, 500 patents will have more impact on the economy than 100. For this reason we provide a second global ranking, the **U-Ranking Volume**, which considers the combined effect of both variables, results and size, and classifies the universities according to their total contribution to the universities' missions.

In addition to these two general rankings, we construct other more specific ones: **U-Ranking Dimensions**, focused on the classification of universities in the two dimensions that make up the mission of the universities (teaching and research and innovation). Also, **U-Ranking Degrees** ranks the degrees offered by the different universities, providing useful information to potential students for their decision making in the choice of a University.

All of these rankings are approximations of university results, allowing them to be compared from different perspectives. Through such comparisons, synthetic indicators assess their performance by answering to relevant questions, such as the following:

- Which Spanish universities are the most productive or efficient? Which achieve the greatest volume of results? Do the universities at the top of these rankings coincide and do larger universities operate more effectively?
- Do the positions of Spanish universities in international rankings meet the criteria in terms of volume of activity or in terms of output? Are the positions of Spanish universities in the U-Rankings in line with

the best-known international rankings such as that of Shanghai, QS or THE<sup>2</sup>?

- Do the universities with the best research and innovation results stand out for their teaching results? Are both results correlated?
- Do universities maintain their positions over time or do they vary?
- Are the general rankings on university activities as a whole similar to those obtained when comparing specific qualifications? Is the internal heterogeneity of universities high?

The eleventh edition of U-Ranking includes an additional analysis of the labor market insertion of university graduates. For this purpose, a broad definition of labor market insertion is used, which takes into account not only the percentage of graduates who are working five years after graduation, but also their level of income, as well as the vertical adjustment (if the job requires a university degree) and the horizontal adjustment (if, requiring a degree, the characteristics of the job correspond to the degree pursued). This information is intended to answer the following questions:

- How are the employment characteristics of university graduates compared to those of other educational levels? Are their unemployment rates lower? Does their employability respond better to economic crisis? Do they have a wage premium compared to workers with other educational levels?
- What are the characteristics of the Spanish labor market compared to other European benchmark countries? Are the unemployment rates, adjustment levels and income levels of Spanish university graduates higher or lower?
- What are the determinants of labor market insertion? What is the weight of the degree taken compared to other personal variables,

such as gender, age, language levels, public or private ownership of the university, or environmental variables such as the community of residence? Are the determinants of job insertion in graduates of bachelor's degrees different from those in master's degrees?

- Which degrees have the best job placement results?
- Which universities offer the best job placement results for their graduates in each of the degrees?

The answers to these questions can be of great interest in order to obtain a complete view of the Spanish University System. This is the only way to identify the strengths and weaknesses of each of the universities that form part of it, from a comparative perspective, and to classify them according to their position within the system from different relevant perspectives. That is the purpose of this project and report, as noted in other studies carried out by the Ivie and the BBVA Foundation (Pérez y Serrano [Dirs.] 2012; Aldás [Dir.] 2016; Escribá, Iborra and Safón 2019; Pérez [Dirs.] 2018; Pérez, Aldás y Peiró [dirs] 2021), the Spanish University System is far from being homogenous. Not acknowledging its heterogeneity makes its evaluation difficult. Despite the fact that this assessment requires that the different specialization and changing characteristics of each university be taken into account, as well as their real possibility of competing in different areas of its activity, both in teaching and research.

### *Rankings as synthetic indicators of results*

The performance of Spanish universities receives constant attention, and debates about the exploitation of the resources used and their results are increasingly frequent. This debate becomes even more common at times like now, when Spain's new Organic Law for Universities

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<sup>2</sup> Academic Ranking of World Universities (ARWU) (CWCU 2023), QS World University Rankings (QS 2023b) and Times Higher Education World University Rankings (THE 2023).



has introduced significant changes in the regulation of the university system.. The driving force behind this interest is the significant amount of resources currently dedicated to these activities and the recognition of the important role universities play in generating and in the transmission of knowledge, two key areas in the social and economic development of countries today.

In Spain, discussions about university results frequently focus on public universities, for two main reasons: the volume of their activity accounts for most of the Spanish University System, and the origin of the majority of the resources used is public; the assessment of their results is therefore considered to be of general interest. There is also a more practical reason. In Spain, traditionally, it has been more feasible to assess the resources and results of public universities based on relatively homogeneous data, because until recently most of the already numerous private universities (currently, 39 active centers) did not provide the necessary data to carry out analyses. However, the participation of private universities in the Spanish university system is gaining importance and its presence in the public statistics and information systems is increasing. Therefore, a project such as U-Ranking, which aims to provide an overall view of the Spanish University System, should accept the challenge of including these institutions, as it has been doing recently. Thus, recent editions of U-Ranking have included in the ranking system private universities that provided sufficient information of adequate quality, so that the data is homogeneous with that of public universities in order to construct synthetic indicators.

The 11<sup>th</sup> edition of U-Ranking considers 23 of the 39 private Spanish universities that have been active during the 2022-23 academic year. All of those included have information on at least 18 of the 20 indicators used to calculate the synthetic index.

The published rankings include a list of private universities that are not included because of lack of comparable information. This means the reader has an enhanced overview of the system

as a whole and will appreciate that if certain universities are not ranked, it is because they do not provide enough available information. If they were included, they would appear below or above other universities in the ranking, that offer more transparency by disclosing the information to the ranking system.

Assessments to measure university results in many countries, as well as in Spain, are increasingly using rankings to classify institutions from different perspectives and with different criteria. Some international university rankings have found their place in debates about the quality of these institutions, becoming widely used references to assess the position of universities and national University systems. Thus, for example, the presence of 11 Spanish universities (12% of the total 91 public and private Spanish universities with activity) among the first 500 institutions of the world according to the Shanghai Ranking, with only one in the top 200, is a fact often mentioned as proof of the limited quality and insufficient international projection of our university system. However, assessing this issue has multiple facets Pérez, Aldás y Peiró [dirs.] et al. 2021). In this sense, the information used by U-Ranking to construct its national rankings is more complete and homogeneous than the data used by the best-known international rankings.

Researchers, public and private institutions, university associations, along with companies in information and media are increasingly taking more initiatives to compile rankings. The objectives and interests of such initiatives and their scope are diverse, both in terms of university activities studied (many rankings focus on research), as well as in terms of coverage (national and international), the data used and its treatment. Some of these rankings are carried out by firms or institutions with criteria that do not exclude the participation of the institutions evaluated in the process, nor the financing of the channels through which the ranking is disseminated.

Some recent reports (Rauhvargers 2011, 2013) stressed the importance of carefully assessing the criteria with which the rankings are compiled

when demonstrating their significance and interpreting results. Accordingly, IREG Observatory published in 2019 the *Guidelines for Stakeholders of Academic Rankings* that provides recommendations to help stakeholders (students, families, higher education institutions, policymakers, etc.) interpret and use rankings appropriately (IREG 2019).

Indeed, the rankings are a particular way to assess university results and their appeal lies in the fact that they offer simple and concise information. This facilitates comparisons while simplifying them and making them sensitive to the criteria and procedures followed when constructing indicators. It is for this reason that the value given to the rankings should not be separated from how they are compiled, nor from the metric used or the objectives of their authors. In this sense, it is important to emphasize that U-Ranking is a project with a transparent methodology, developed by non-profit institutions.

Among the most recent warnings about the inappropriate use of rankings is the recommendation not to use the rankings provided by universities in terms of research to evaluate the individual research results of their members (commitment no. 4 of the Agreement on Reforming Research Assessment of the Coalition for Advancing Research Assessment-COARA, July 2022).

These precautions are not always present when presenting the results or when using rankings. On the one hand, the reputation of a good position in a ranking turns them into an intangible asset to universities. Therefore, increasingly more universities develop strategies to convey information about themselves (signaling) by advertising their more favorable results, and also to improve their positioning in the rankings. Certainly, the expected return of a good position in a ranking is significant, given that it can affect areas as diverse as recruiting students, attracting researchers, obtaining resources and the social projection of institutions.

On the other hand, the growing interest in these classifications is because they are perceived as

useful tools (despite being imprecise) for various purposes and different stakeholder groups in universities as they:

- a) Provide the members of each university with external references on their strengths and weaknesses, contributing to the perception of their position.
- b) Offer the users of university services easy to interpret information in terms of attractiveness or quality of institutions.
- c) Provide comparative information to governments, with the possibility of being used to assign resources to the university systems or universities or for the accountability of universities to society.
- d) Complement the work of university quality assurance agencies and provide information to analysts interested in having homogenized indicators available.

### *Approach of the project*

In Spain different university rankings are being regularly presented, compiled with diverse perspectives and methodologies. What sets this project apart is that its rankings (U-Ranking, U-Ranking Volume, U-Ranking Dimensions, U-Ranking Degrees) are developed according to criteria that respond to many international recommendations. One of them is that indicators should be created with the objective of studying university activities from a comprehensive approach, i.e. examining teaching, research, and innovation. Another important feature, is that it offers rankings by degrees (U-Ranking Degrees), giving guidance to students when choosing what to study.

The criteria used in developing U-Ranking that should be noted are:

- Offering multiple university rankings, in which university activities are examined from a general perspective, as well as in specific fields (teaching or research and innovation), but also in terms of the performance achieved (U-Ranking) or the total output (U-Ranking Volume) of each university.



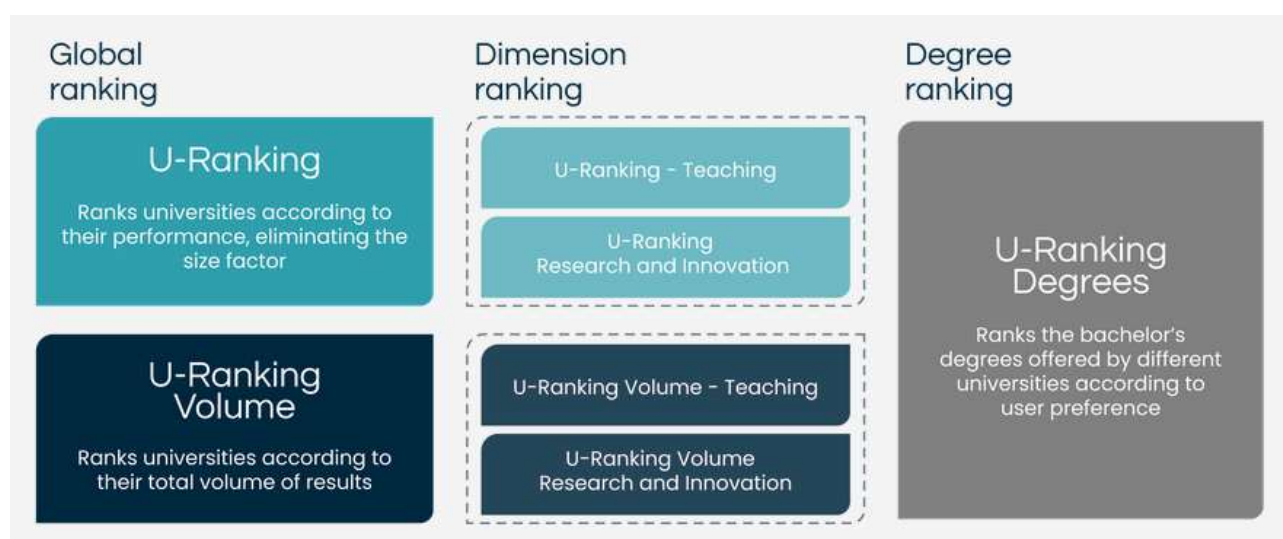
- Taking into account the various perspectives and interests that potential users of the data have when using the rankings. In particular, special attention is paid to the importance that many people give to specific areas of activity, such as degrees, when comparing universities. To deal with this concern, a web tool has been developed which enables users to create personalized rankings in terms of bachelor's degrees (U-Ranking Degrees). It has been designed to guide students, families and counselors when choosing a university in which to study. The advantage of recognizing that users have different preferences is that the following problem can be avoided when constructing synthetic indicators: their excessive dependence on experts' opinions (subjective and sometimes contentious) regarding the weights that should be attributed to teaching or research. This perspective is also taken into account in the personalized rankings, allowing the user to give different weights to teaching and research and innovation according to their preferences and different from the general weights used to create U-Ranking.

The project therefore offers two different products:

- A general collection of rankings on Spanish universities, based on the criteria of the project's team and the experts consulted, allowing each institution to be compared with others from different points of view: results (U-Ranking), volume of results (U-Ranking Volume) and areas of specialization in teaching and research (U-Ranking Dimensions).
- A web tool that provides personalized rankings for different bachelor's degrees, grouped according to area of study and which allows to compare the degrees offered by the universities taking into account the interests and criteria of each user (mainly students enrolling in universities, their parents or school counselors) on their choice of studies, the regions considered when choosing where to study and the importance given to teaching and research and innovation: U-Ranking Degrees.

Figure 1.1 summarizes the different rankings offered by U-Ranking.

Figure 1.1. **Rankings included in the U-Ranking Project**



It is important to point out that all the rankings have a standard information bases: the data correspond to the same set of variables, and the methodology followed in the treatment and aggregation of the variables is also the same. The differences between the various rankings come from the different levels of disaggregation of the variables (university, area of study, or family of degrees) and from the choices the users make to construct their personalized rankings. The adequacy of the information used is fundamental for the construction of the indicators offered.

The project U-Ranking relies on the valuable collaboration with the Spanish Ministry of Universities, allowing access to the Integrated System of University Information (SIIU). The SIIU is a web-based platform that collects, processes, analyzes and disseminates data of the Spanish University System providing homogeneous and comparable statistical information of the Spanish universities. Through the SIIU, the Spanish Ministry aims to make the university system more transparent, so that citizens and researchers alike can analyze it, draw their own conclusions and generate proposals for improvement. Thus, the SIIU is a tremendously valuable project, which is a result of the commitment on behalf of the majority of universities and public administrations that allows society to know the reality and performance of the university system, a system that is key for economic and social development and in which a large amount of resources are allocated.

This platform provides information on the degrees offered by each university, in which schools they are taught, students in each degree and full-time equivalent teaching staff, students in international mobility programs, as well as detailed information by degree on success, performance and drop-out rates and percentage of foreign students in each degree. Since new information is continuously being added and updated in the SIIU, U-Ranking can rely on this

source to access other indicators that can be expected to become more accurate over time.

One of U-Ranking's main objectives is to provide the most useful and detailed information as possible for different groups of people which are the potential users. Consequently, the project includes additional information to the rankings, both in the ranking of universities and in the ranking by degree:

#### a) Ranking of universities:

A university ranking allows to observe the relative position of one institution with respect to others. But it is not easy for university managers or researchers to analyze in depth the performance of a specific university, to assess the aspects in which it stands out or its distance from the average of the system or from a certain university, or a group of universities that are taken as a reference. For this reason, the website <https://u-ranking.es>, includes the section **Data by University** that allows the user to consult the data and ranking results for each university. With this dynamic tool, the user can compare different universities, both for groups of universities (Spanish university system, public or private ownership, or by region), as well as individual universities.

For each university, the U-Ranking and U-Ranking Volume (global and dimensions) indexes obtained in this edition are offered, in relation to the average of the chosen comparison group. The panel also shows a **panel of indicators** for each university, which is a file containing the values for each of the 20 indicators that make up the synthetic index and are compared with the mean value of the universities so that managers can observe the relative distance with the reference group or with other universities. The added value<sup>3</sup> of the indicators is presented on a scale of 0 (minimum value obtained by a university of the system) to 100 (value given to the university that scores the most). In this way, it facilitates the comparison between very

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<sup>3</sup> Without distinction by areas of study, fields of knowledge or degrees.

different indicators and it offers a general profile of each university.

The panel of indicators also contains the position obtained in U-Ranking and U-Ranking Volume in the last six editions. Other basic data on the university is provided, such as year of foundation, type of ownership, student body, faculty and number of degrees.

The information provided is completed with the results of specific analyses carried out in recent editions. Thus, for example, it includes the labor market insertion indicators published by the Ministry of Universities on the situation in 2020 of those graduates who obtained their bachelor's degree four years earlier. The indicators on enrollment rate, percentage of graduates with employment according to their educational level and their average salary for the National Insurance contribution calculation, served as the basis to prepare a ranking on the employability of universities in the 2020 edition (Pérez and Aldás [dirs.] 2020). Data from the INE's Graduate Employment Survey (*Encuesta de Inserción Laboral de los Universitarios*, EILU) has also been used to update and improve this study this year (Pérez and Aldás [dirs.] 2023). Also included are the results on the renewal of degree offerings in the last decade, which were analyzed in the 2021 edition (Pérez and Aldás [dirs.] 2021).

#### **b) Personalized university rankings by degree:**

The Choose a University tool allows to create customized rankings with more than 3,500 degrees based on the user's preferences. In addition, along with the ranking results, it offers information on tuition costs, cut-off marks of the 2022-23 academic course and the most recent results on labor market insertion for each degree program obtained from the Spanish Social Security System (Spanish Ministry of Universities 2023a).

#### **c) Job placement ranking by field of study and database**

In its eleventh edition, the U-Ranking website now includes a section on labor market insertion that offers students, families and guidance

counselors information on the employability of university students in the different fields of study.

On the one hand, the Job Placement Ranking allows for an interactive consultation of the overall job placement results of 101 fields of study, which group together more than 4,000 bachelor's degrees. The classification is based on the information provided by the EILU and analyzes the employment situation in 2019 of graduates from the 2013-2014 academic year. The ranking of the fields of study is based on an index constructed from four indicators of insertion in each field: the employment rate, the percentage of employed persons with net earnings of 1,500 euros, the percentage of employed persons who have a job requiring a university education and the percentage of employed persons with a job related to the field of study pursued. This calculator, in addition to offering the result of the ranking that combines the four indicators, also generates a ranking based on each indicator separately, in case a student gives special importance to one of them.

On the other hand, the U-Ranking website also includes a database that allows to consult and compare the labor market insertion results of each university in each field of study. The tool allows the user to access the complete list or choose the fields of study of most interest to the user, an autonomous community or university and to sort the list according to the value of each indicator.

The indicators used for this database are measured on the basis of three variables from Social Security records: the rate of people registered as employed, the average Social Security contribution base and the adjustment of employment with the education level, measured by the percentage of graduates registered in one of the contribution groups for professionals with higher education (engineers, postgraduates, senior management, graduates and technical engineers).

The data reflects the situation in March 2020 of university students 4 years after graduation and comes from the Integrated University Information System (SIIU) of the General Secretariat of Universities and the Social Security General



Treasury (Ministry of Inclusion, Social Security and Migration).

Easy access to this important information allows future university students to use through the decision-making process that will lead them to choose a degree in which to pursue their studies.

Chapter 5 gives further details regarding the methodology used in the labor market insertion ranking and offers other results on employability of graduates.

### *Structure of the document*

After this introduction, the rest of this document is divided into five chapters, as follows. Chapter 6 describes the methodology used to prepare the rankings. Chapter 3 describes the approach adopted to allow users to personalize the rankings and the online tool constructed for the students. Chapter 4 presents an analysis of the main aggregate results, putting special emphasis on the comparison of the U-Rankings with the main international reference ranking (ARWU) (CWCU 2023). It also provides an analysis of the sensitivity of the results to changes in any of the assumptions used. The results are compared at the level of the university systems of the different autonomous communities. Chapter 5 analyzes the labor market insertion results of university graduates. It also shows the situation of the Spanish labor market and, within this context, analyzes the determinants of the labor market insertion of recent graduates. Based on the different dimensions of labor market insertion, it creates an employability ranking of the 120 fields of study in which the degrees in Spain are classified and offers the position of the universities in this area. , Finally, chapter 6 summarizes the main characteristics and results of the project.

# Methodology

## 02

The U-Ranking project was born from the desire to closely examine the most important national and international rankings available, so as to identify possible ways of reducing their shortcomings. The most significant problems arising with rankings occur in the following areas: (1) university activities studied, (2) disaggregation by subject or type of studies, (3) data availability and use, (4) methodological rigor in the treatment of data and construction of indicators, (5) recognition of the user's perspective when creating and providing data, (6) user-friendly tools to select their preferences in the rankings, and 7) the impossibility of generating synthetic indexes that adapt to the user, making them create their own ranking directly from the indicators offered, which often are inadequate.

The project addresses all these shortcomings and looks for ways to overcome them.

In the first editions of U-Ranking, an extensive chapter was dedicated to the limitations of rankings and the improvements that a new tool like this one should include. The reader can view the corresponding reports —found on the U-Ranking website (<https://u-ranking.es>)— for a detailed analysis of these aspects, which are summarized in this edition.

### *2.1. THE DESIGN OF RANKINGS*

The development and use of rankings entails certain **risks** that should be forewarned. First of all,

it is not wise to base strategies on improving the variables studied, instead of on correcting the underlying problems: the improvement of the institutions should be based on principles of efficiency and the results are reflected in the indicators. For university administrators, the goal is to generate policies that will make their institutions improve in teaching, research and knowledge transfer, trusting that if a ranking is well designed those improvements will be reflected in the indicators used to prepare the ranking.

The opposite approach, i.e. to try to improve the indicators so as to improve an institution's place in the ranking, is not only misguided, but also ineffective. In recent months we have seen examples of this misguided approach, such as the double assignment of the results of highly productive and highly cited researchers to universities in other countries seeking to improve their positions in the rankings, in exchange for financial compensation. Because the methodology used in U-Ranking, is of national scope and double assignments are not possible, is not susceptible to being altered by this type of practice, but still precaution should be taken to prevent the manipulation of the indicators.. For this reason, the use of indicators that are not very robust, with values that are highly sensitive to the criteria of measuring the variables and aggregation procedures, and they must adequately reflect, not only what can be measured, but what should be measured. Finally, a very common risk involving rankings is to focus only on the elite (world-class universities) and

oblivate the rest. This practice can occasionally lead to an inadequate comparison of institutions that have very different specializations and resources.

Some published rankings show **limitations** that users should be aware of. In the case of universities outside the circle of the well-known universities, many rankings are exclusively centered on indicators that focus on research activity and unreliable reputation factors that are sometimes based on surveys. These variables are, however, frequently unreliable when applied to national universities because the survey respondent can evaluate them using a snowball sampling technique, in which some universities notify the faculty members of other universities that they will receive the questionnaire and request an assessment, leaving ample scope for lack of freedom. The exclusive use of these indicators to rank Spanish universities is in many cases inappropriate and risky, leading to wrong conclusions.

In the first three U-Ranking reports, a detailed review of the issues to be considered in the design of a good ranking was carried out and applied to the project. In this report it is not necessary to repeat in detail the aforementioned analysis, but, we will summarize some of the aspects considered:

- The study *Berlin Principles on Ranking of Higher Education Institutions* (IREG 2006, 2019) stresses, among other recommendations, to indicate clearly what the target audience of the ranking is, to be clear when detailing what each indicator measures to be methodologically scrupulous, to focus on the outcomes rather than on the inputs and to maintain a high ethical standard, given the responsibility and impact that rankings have.
- The results of discussions held by the European University Association (Loukkola, Peterbauer y Gover 2020) and the International group of Experts in Rankings (IREG 2006, 2019) highlight the importance of providing a vision of all the institutions, addressing their multidimensional nature and diversity, respecting the user's perspective and maintaining the independence and temporal sustainability of the ranking.

The U-Ranking project expressly includes all the principles which were recently discussed internationally and proposed by the EU. The following sections of this chapter detail the many aspects that have been taken into account during the development of a project that has reached eleven editions, and has worked with these criteria to introduce improvements over time.

## 2.2. ACTIVITIES STUDIED

One of the main shortcomings of certain rankings in providing a general assessment of universities, particularly international ones, is that the activities are examined from a very partial perspective. The problem stems from the limited data availability on the results of teaching activities, and innovation and development technology, which are far less abundant than research.

In fact, most of the important rankings focus on analyzing research, taking little account of another significant function of universities which is teaching and barely considering technological development activities, despite their increasing importance. The rankings which are biased toward research are frequently interpreted as representative of university activity as a whole and they may not be. In fact, they are not, as the U-Ranking results show by the limited correlation between researcher and teacher performance.

There are three possible reasons for this: 1) the data available is used and, without a doubt, the abundance, quality and homogeneity of data on research is much greater than in the other two areas; 2) research activity is considered the most important distinctive element of universities in the last two centuries; and 3) the hypothesis holds that the research quality of professors is a proxy variable for other areas, and therefore observing the results in this area is sufficient to predict the others.

The first reason is practical, but can induce bias by omission in indicators and rankings. The second needs some clarification in that it is a powerful argument regarding postgraduate studies but less so in relation to the degree, especially in mass university systems, such as those of most

developed countries today. In fact, in many of these systems there is a significant concentration of research activity in a small number of universities, while in a large number of institutions there is fundamentally teaching activity. The third reason is a hypothesis, which validity should be tested by developing indicators for all activities and testing whether the correlation between teaching and research results is high. If the validity of this hypothesis is not tested, and given that the intensity of university teaching specialization, research and innovation and technological development varies greatly<sup>4</sup>, overlooking the direct indicators of teaching and of innovation and technological development can bias the rankings. In this sense, the experience of U-Ranking shows a low correlation between teaching and research and knowledge transfer, the importance of including teaching and research innovation indicators becomes more relevant. Chapter 4 offers more information.

Therefore, it is important to take advantage of the data available on university activity in the field of teaching, and innovation and technological development, so that the rankings reflect university activity as a whole more accurately. This also allows us to recognize the different specialization profiles of universities, as some focus more on basic research (as occurs in many of those most often included in the world rankings), others on higher education and professional development, and others on applied research, innovation and technological development.

Currently, the public and homogeneous data available on the innovative activity of Spanish universities does not allow a rigorous, independent evaluation of their performance in the area of knowledge transfer with a sufficient basis, as only one suitable indicator is available. For this reason, "Research and Innovation" is considered a single dimension, which includes one of the indicators most commonly associated with innovation: patents.

Studying the different activities of the universities is a first step in the direction of addressing the

different perspectives on university systems and the different interests that potential users of rankings may have. Thus, a degree student probably shows greater interest in teaching, while postgraduate students and teachers focus more on aspects related to the quality of research. If the data focuses solely on research results, ignoring the teaching results, then these approaches cannot be carried out accurately.

The U-Ranking system specifically studies the two categories of university activities and analyzes the data available on each of them in Spain. The national dimension of the project ensures that reasonably homogeneous data, with great detail, is available with a set of variables representing the activity of Spanish public universities and two-thirds of private universities. In the future, and even though much improvement has been made, it would certainly be desirable to have data available for the rest of the private universities of similar quality and homogeneity as those included in the ranking, which would improve the overall scope of the project.

The total amount of 71 universities included in the ranking is sufficiently high for the data available to allow a contrast of the hypothesis to which we referred earlier: if research results can predict correctly those of teaching or not. The project has examined this specific objective, with the results presented in chapter 4.

### 2.3. DISAGGREGATION OF ACTIVITIES

A further shortcoming noticed when analyzing current rankings is that many deal with universities in a unitary manner, not recognizing the diversity of the areas of knowledge in which these institutions can offer professional development or conduct research or innovation. This problem needs little explanation: to be more useful, a ranking has to provide the user with as much information as possible on the specific areas or scientific fields of their choice, since universities may not be homogeneous in the quality of each of their areas.

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<sup>4</sup> See Pérez and Serrano (dirs.) (2012, ch. 1 and 4) and Pérez and Aldás (dirs.) (2022, section 4.7)..



It is for this reason that ranking systems can be improved by providing disaggregated data by areas of study, fields of knowledge or specific degrees. This last level of detail could be very significant for students, given that their fundamental interest is generally linked to the quality of the specific studies that they want to pursue.

For the disaggregation, the U-Ranking project has worked in several directions. Firstly, it followed the criteria that it is important to start with the most disaggregated data available, maintaining its detail whenever possible, so as not to lose the wealth of its heterogeneity. Secondly, the disaggregated data had to be homogenized properly before adding it to the synthetic indicators. And third, the problems of combining (for the construction of some of the indicators studied) the data disaggregated according to scientific fields or degrees with other data aggregated at university or area of study level had to be solved. When there is no disaggregated data, or its disaggregation makes no sense, the aggregated data has been allocated to the various elements of the set, following the criteria considered more reasonable in each case.

Addressing the above problems is not technically considered to be trivial. For example, in the case of the rankings on specific bachelor's degrees of Spanish universities, to deal with data on areas at different levels of disaggregation, a series of matrices have been created to connect one another. In order to do this, accurate connections had to be established between university, area of study, Web of Science category, areas of the National Evaluation and Foresight Agency (ANEP) and bachelor's degrees.

In allocating research results to each degree, the starting point was data disaggregated by the Web of Science categories (more than 250 items). Given that one classification is not perfectly nested in another, both classifications have been connected, and the two types of errors that could be made have been taken into account:

1. *Inclusion error.* That is, attributing to a given degree the research carried out by teachers from other areas. For example, attributing to the Pharmacy degree of a given university, the research in "Hematology" that has

actually been conducted by teachers from the Faculty of Medicine and who only teach in Medicine.

2. *Exclusion error.* That is, excluding research by teachers in areas that are not exactly the subject of the degree courses they teach in, as a result of being too restrictive when allocating areas to degrees. For example, if in Economy we only allocate the category "Economics", then important research may be missed in the area of "Business and Finance", theoretically more related to Business Administration degrees but also carried out by professors who teach in the degree of Economy.

These problems do not have a perfect solution and one of the alternatives have to be chosen. Therefore, we have opted for a more inclusive criterion: when in doubt about whether to associate a category or scientific field to a degree we have chosen to include it, minimizing exclusion errors on the grounds that they are more serious errors.

## 2.4. INDICATORS, AREAS AND DIMENSIONS

The main pillar of a ranking system is the rigor of the procedure followed when dealing with existing problems so that the created classification is based on appropriate data and is treated with reasonable methodological criteria. Many of the rankings have clear shortcomings in this aspect, which international literature has analyzed in detail.

The U-Ranking system considers that a university ranking should consider all their activities and be structured according to the two following major dimensions:

- *Teaching*
- *Research and innovation*

The assessment of these two dimensions can take into account multiple areas of activity. However, many experts agree that an excessive number of indicators obscure the meaning of a ranking and

complicate the construction of synthetic indices, a complex matter as it is. Following a criterion of (relative) simplicity, four **areas** have been studied in each of the dimensions aforementioned:

- *Access to financing*
- *Output obtained*
- *Quality (particularly in the results and in some cases, resources and processes)*
- *Internationalization of the activities*

The main reference to assess universities should be the results, but these can be studied from the perspective of total volume or from the perspective of their quality. If there were a market that assessed the differences in quality, then results showing a higher quality would have a higher price. However, these prices hardly exist in the area of public universities. The differences in rates, currently very diverse between regions and degrees, respond in many cases to factors that have nothing to do with quality. However, some indicators can supplement, in part, this limited information. Thus, for example, there are indicators on the quality of teaching and research and also on a very relevant feature today regarding the specialization (and quality) of universities: their internationalization.

The assessment of the quality of the output is incomplete if the impact of the university system on its environment is not taken into account. A university can generate high-quality products, but if its size is very small, its contribution to technological development or to the production of human capital through its graduates may have a much smaller influence on the productive environment than a university with somewhat lower levels of quality in its output but a significantly larger size. This obliges us to introduce also the

size factor in the rankings system which is the reason for generating the U-Ranking Volume.

Each of the four areas mentioned has been analyzed using two and three indicators taking into account the dimension that is being studied for each area. Table 2.1 shows the indicators studied, after analyzing the availability of data and discussing alternatives with the group of experts working on the project. Agreements were reached by analyzing the suitability of each indicator in capturing significant data on the area and dimension it forms part of.<sup>5</sup> It is important to stress that the data used is obtained from sources allowing the project database and the rankings based on it not to require universities to provide data directly to U-Ranking.

The logic underlying the selection of indicators, disclosed in summary form, is the following:

## Teaching

- Teaching resources are characterized by budgetary allocations per student, and faculty and research staff per student, with special attention paid to faculty members with PhD.
- Teaching output is measured by using results obtained by students, analyzing how many students undergo evaluation, how many succeed in those evaluations and how many drop out.
- The quality of teaching is very difficult to observe, and we studied as a proxy the quality of students measured by the cut-off mark of each area and the percentage of post-graduate students.
- The internationalization of teaching is shown by the percentage of foreign students and the percentage of students participating in mobility programs.

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<sup>5</sup> In order to ensure the transparency of the process in developing indicators, the definition of each indicator, its source and its time frame are all included in Annex 1 and in the

following website of the project: <https://u-ranking.es/methodology>.

## Research and innovation

- The research process is characterized by data referring to two types of resources: competitive public funds raised and the provision of research staff, scholarships and qualified technical support.
- Output is accounted for by citable papers published in each area and the number of doctoral theses, which are an indicator of the training activity of a researcher in a given area. The number of patents is also included in this area.
- The quality of the research is reflected in the impact the publications have and the citations that these papers generate.
- Finally, a greater proportion of international publications, international co-authoring and

the percentage of research funds from external sources indicate a greater internationalization in research activity.

As shown in table 2.1, U-Ranking 2023 is calculated based on 20 indicators<sup>6</sup>, ten for the evaluation of teaching results and another ten for research and innovation activity. In the case of U-Ranking Universities, 16 of the 20 indicators are obtained by areas of study and the remaining four for the university as a whole. However, the level of detail increases in the case of the U-Ranking Degrees (see chapter 3), in which five of the ten indicators of teaching are obtained for each degree and five of the ten indicators of research and innovation are classified by degree groups, that is, an aggregation in 122 groups of the 3,612 degrees and double degrees offered by the Spanish universities analyzed.

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<sup>6</sup> See Annex 1 for a more detailed description of the definition, source of information and period considered.

Table 2.1. List of indicators, areas and dimensions

Dimension	Area	Indicator
Teaching	Resources	Faculty member per 100 students Budget per student Percentage of faculty member with PhD
	Production	Success rate Evaluation rate Drop-out rate
	Quality	Percentage of postgraduate students Cut-off mark <sup>1</sup>
	Internationalization	Percentage of foreign students Percentage of students in foreign exchange programs
Research and Innovation	Resources	Competitive public resources per faculty member with PhD Contracts with PhDs, research grants and technical support over total budget
	Production	Citable documents with ISI reference per faculty member with PhD Number of patents per 100 faculty members with PhD Number of theses defended per 100 faculty members with PhD
	Quality	Mean impact factor Percentage of publications in the first quartile Citations per document
	Internationalization	European research funds per faculty member with PhD Percentage of publications with international co-authorship

<sup>1</sup> Mark of the last student who gained admission to a degree with limited places.

Source: Own elaboration



## 2.5. PERIOD COVERED BY THE DATA

University rankings aspire to offer an image of the current position of each institution, though they should not be conceived of as a snapshot of a given year. Many indicators have the character of a flow, and as such, can present high variability from year to year, both in the quality of the information and in the distance between the actual reality and what the information reflects, given the delays in the information registered and available. In addition, other indicators reflect the accumulation of results over long periods of time.

The rankings referred to usually recognize this problem by taking comparison periods longer than a single year, either using moving averages and even considering the complete history of the University (as in the case of the treatment of the

Nobel Prize and Fields Medal winners in the Shanghai Ranking). Considering multi-year periods when elaborating the indicators provides greater interannual stability of the rankings and permits specific random disturbances to be smoothed out by considering a longer time range.

Our approach follows this criterion, considering that one cannot reasonably expect abrupt changes in the universities' real situation. Thus, the ranking should avoid giving that impression. Therefore, as information has become available, we have converged toward a 6-year moving average for nearly all the indicators. All of the indicators on research and innovation are already calculated as a mean of six years. Furthermore, since the 6th edition of U-Ranking, teaching results are reached using data by university from six academic years, except for the two exclusions mentioned in table 2.2.

**Table 2.2. Time series used in U-Ranking 2023**

Dimension	Area	Indicator	Period
Teaching	Resources	Faculty member per 100 students	2015-16 to 2020-21
		Budget per student	2015-16 to 2020-21
		Percentage of faculty member with PhD	2015-16 to 2020-21
	Production	Success rate Evaluation rate Drop-out rate	2015-16 to 2020-21 2015-16 to 2020-21 2011-12 to 2016-17
Research and Innovation	Quality	Percentage of postgraduate students Cut-off mark <sup>1</sup>	2015-16 to 2020-21 2022-23
	Internationalization	Percentage of foreign students	2015-16 to 2020-21
		Percentage of students in foreign exchange programs	2015-16 to 2020-21
	Resources	Competitive public resources per faculty member with PhD Contracts with PhDs, research grants and technical support over total budget	2016 to 2021 2016 to 2021
Research and Innovation	Production	Citable documents with ISI reference per faculty member with PhD Number of patents per 100 faculty members with PhD Number of theses defended per 100 faculty members with PhD	2016 to 2021 2016 to 2021 2016 to 2021
	Quality	Mean impact factor Percentage of publications in the first quartile Citations per document	2016 to 2021 2016 to 2021 2016 to 2021
	Internationalization	European research funds per faculty member with PhD	2016 to 2021
		Percentage of publications with international co-authorship	2016 to 2021

<sup>1</sup> Mark of the last student who gained admission to a degree with limited places.

Source: Own elaboration

Table 2.2 shows the updating in terms of years and time series registered by the indicators used in the ranking for 2023. All the indicators include an additional year compared to the previous edition, covering data for the majority of indicators up to 2021.

In sum, the methodology on which the calculation of the U-Ranking system is based leads one to expect that the rankings of universities will not present sudden changes from one year to another, but they contain new information that can generate changes. The existence of an inertia in the rankings seems to be a desirable attribute, since the quality of university institutions does not change radically in the short term, although some of their annual results may do so.

## 2.6. CRITERIA FOR THE CONSTRUCTION OF INDICATORS

A key aspect to trust the meaning of the rankings is that the processes used in its elaboration should be transparent with strong statistical foundations for the construction of indicators. In this regard, the project team contacted experts in the subject and analyzed the methodological principles established in the specialized literature, especially in the *Handbook on constructing composite indicators: Methodology and user guide* (Nardo et al. 2008).

The underlying process of drawing up any of the rankings of universities constructed is structured according to the following six steps—the fifth one being unnecessary in the case of the partial rankings of teaching and research and innovation:

Preparation of the data bank

1. Standardization of indicators
2. Weighting and aggregation of indicators within the areas of each dimension
3. Weighting and aggregation of area indicators, within the dimensions

4. Weighting and aggregation of the dimensions
5. Obtaining of rankings

Figure 2.1 graphically illustrates the time sequence of the steps. To complete each of them it is necessary to solve technical problems, as described and indicated below.

### 2.6.1. Constructing the database and missing data

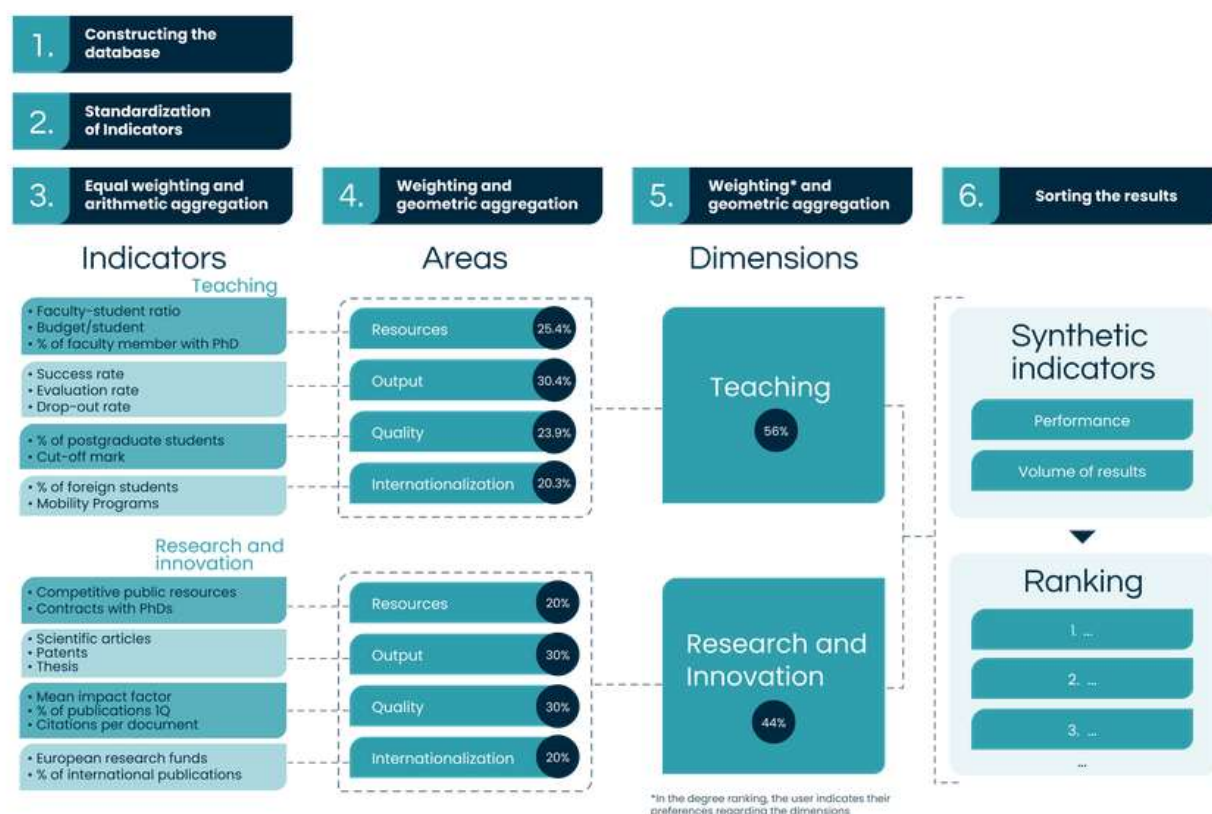
The starting point is to have the necessary available information on the variables to be considered in order to construct each indicator. The data used for the synthetic indices are obtained from public information systems and statistical sources. The main source of information is the Integrated System of University Information (SIIU) of the Spanish Ministry of Universities. The Bibliometric data regarding the research performance of all Spanish universities (based on information provided by Clarivate) and on patents is provided by the INAECU research team in charge of the IUNE Observatory. Information has also been collected from the State Bureau of Investigation on competitive resources and research contracts. Information on European research funds has been obtained from the European Commission's Horizon Dashboard.

For data on the revenue of private universities, public annual accounts and other information from the universities' website section on transparency or audited reports have been used.

The data has been collected with the maximum level of disaggregation available (degree, area of study, area or field of study, ANEP areas), so that the standardizations within each field make the results more comparable.

The initial indicators of the ranking are obtained from the database, and when the information allows it, they are calculated by area of study. This disaggregation is available for 16 of the 20 indicators. In the case of the remaining four indicators, the value of the university for all the areas of study is considered.

Figure 2.1. Methodology



A first technical problem to be solved is the treatment of missing data from certain universities in some variables used. Such gaps may be due to several factors, whether technical (an error in loading the data), or of availability (the university may not have generated certain information or not done so in time) and even strategic (a university may opt not to give certain information because it is not in its interests to do so).

Not facing this problem rigorously would condition the comparability of the universities, the quality of the aggregate indices, and the final results. The methodology applied and the improvements made in the sources of information used have reduced the percentage of indicators with missing values to 1.1% of the approximately 7,500 values of indicators used, thus, no further treatment is required to compensate the absence of data. The following are the criteria that have led to this methodological approach:

First, given that U-Ranking takes into account the specialization by areas of study of the different universities and operates in most indicators with this level of disaggregation, it is important to distinguish whether a possible lack of data is due to the absence of activity in that particular area—for example, a university does not register drop-out rates in Sciences because it does not offer classes for that area of study—or due to one of the reasons stated above. Therefore, the first step in identifying the missing data is to determine which areas of study are offered by a university. The following criteria are established to identify the areas of study in each university that are non-existent or of little importance for evaluating its performance:

- The teaching dimension does not take into account those areas of study in which a university does not offer degrees during the 2022-23 academic year.

- b) In the case of the research activity dimension, the areas of study with no full-time equivalent faculty members with PhD are not considered.

In the 2022-23 academic year, 87 of the 89 active universities offered bachelor's degrees. However, not all of them in all areas of study. Table 2.3 shows the number of universities that, according to the criteria indicated, do not offer bachelor's degrees or do not carry out research in each of the areas. While all the universities, except the recently created Universidad de Vitoria-Gasteiz Euneiz, offer degrees related to Social and Legal Sciences, 26 (24 of which are private) of them, do not offer degrees in Sciences.

Secondly, it should be noted that the indicators are based on the calculation of moving averages, 6 years for most of the cases. If a university does not present any data for the years considered, an average is estimated with data from the available years, thus, reducing the chances of a variable with no data.

In addition, for indicators in which there are a greater number of universities without data, the information is constructed from exhaustive administrative registers, so if a university does not appear it is because it has no activity or no results in that area and therefore its value is 0.

This information is based on competitive resources and research contracts from the State Bureau of Investigation, national patents granted from the INVENES database or income data from European projects from Horizon Dashboard.

Closely linked to the previous reasons is the improvement in the sources of information and their consolidation over time in the collection of university data.

Finally, the minimum requirement for a university to be evaluated in U-Ranking is that it has at least 18 of the 20 indicators used to calculate the synthetic index, as well as the three variables that measure size (student body, full-time equivalent faculty members with PhD and consolidated revenues).

After applying these criteria, the number of data missing is considerably reduced. Out of the 7,385 indicators in U-Ranking 2023, 82 values are missing, which represents 1% of the total. It has been verified that the results do not suffer substantial differences if the missing values are not estimated. Therefore, to not estimate the missing data proves to be the most accurate decision, since it is robust with the methodology applied previously, it simplifies the calculation method, making it easier to reproduce the ranking.

**Table 2.3. Number of universities with no activity or degree offering in research by area of study**

		Public universities	Private universities	Total universities
<b>Teaching</b> <i>With no degree offers in 2021-22</i>	Arts and Humanities	1	10	11
	Social studies and Legal studies	0	1	1
	Sciences	2	24	26
	Engineering and Architecture	0	6	6
	Health Sciences	4	7	11
<b>Research and Innovation</b> <i>With no full-time equivalent faculty member with PhD (on average in the last 6 years)</i>		0	9	9
	Arts and Humanities	0	1	1
	Social studies and Legal studies	0	22	22
	Sciences	0	6	6
	Engineering and Architecture	1	5	6

Note: 87 of the 89 universities with teaching activity in the 2022-23 academic year offer degree programs.

Source: Spanish Ministry of Universities (2023d) and own elaboration.



Treatment of the outliers can be done once the database from which the various indices are obtained is available. An outlier is considered to be any variable outside the interquartile range, i.e. those values not included in the interval defined by the percentile value 25 minus one and a half times the interquartile range and the percentile value 75 plus one and a half times the interquartile range of this same ratio. These values are corrected by assigning them the maximum or minimum value—depending on the case—of this interval.

### 2.6.2. Standardization of indicators

One of the pillars upon which the construction of synthetic indicators is based is the proper standardization of the information, that is, its transformation in order to homogenize it and make possible its comparison and aggregation. There are numerous systems of standardization, such as the Gaussian standard (subtracting from each variable its arithmetic mean and dividing by its standard deviation), relative order (ordering the values according to their relative value), distances from the mean or the median, and the ratio between the variable and its mean or its median.

The standardization chosen must be in consonance with the method of aggregation to be used subsequently. Because as a general rule the geometric aggregation method has been chosen, requiring the value of the standardized variables to be positive, we must exclude the Gaussian and absolute distances from the mean and from the median, which necessarily generate negative values, as alternatives of standardization.

For this reason, the standardization method chosen is the ratio between the variable and its median. Taking into account that the median separates each distribution into two halves, the standardized results will be centered on the value 1: values below the median are bounded between 0 and 1, while those above will be greater than 1.

As previously highlighted, one of the key aspects of U-Ranking is that its methodology takes into account the different areas of study of the universities. Thus, whenever information by areas of study is available, each indicator in level I is

calculated for each area of study and university. Subsequently, each one of the 5 indicators per area of study is standardized by dividing by the median of its area and finally the 5 standardized indicators of each university are aggregated by calculating the arithmetic average weighted by the weight of the student body in each area and university (if the indicator belongs to the teaching dimension) or by the weight of the faculty members with PhD (if it belongs to the research and innovation dimension).

### 2.6.3. Weighting and aggregation of indicators within an area

Once the 20 standardized indicators for each university is obtained, they are aggregated to obtain a synthetic indicator for each area. Thus, for example, to obtain the indicator for the *quality* area in the *Research* dimension we aggregate the standardized values of the *Mean impact factor of publications* and the *Percentage of publications in the first quartile*.

As in the case of standardization, there exist numerous aggregation procedures, such as the arithmetic, the geometric or those based on factor analysis. The choice of one or the other has implications in the substitutability of the indicators or the importance of extreme values (both large and small). The aggregation criterion chosen implies a weighting of the indicators, which is important to bear in mind.

It must be taken into account that some universities might have zeros in some indicator of a specific area (for example, they may not possess *Patents*). For this reason we have opted in this phase for an arithmetic aggregation, ruling out the geometric aggregation because the presence of a zero in the product would cause the whole area analyzed to take a nil value.

As the weighting of the indicators shows the importance assigned to each variable when aggregating it into a synthetic indicator, we also reflect on this question. This is a classic problem in the construction of synthetic indices and generally requires a judgment on the relative importance of each element. In the case of economic aggregates the weights are offered by prices—which reflect the market valuation of the

goods, services or factors exchanged— but in many other cases there are no prices and the indicators have to be constructed following other criteria, frequently based on subjective opinions.

There are three possible approaches to weighting: 1) assignation of identical weights (which also implies a judgment, since the weight of one indicator is conditioned by the number of indicators included); 2) reference consultation among experts to identify the most widely held opinions (by means of surveys or methods such as the Delphi); 3) weighting according to the user's preferences. These three alternatives have been used according to the level of aggregation to be achieved.

At this first level of aggregation (changing of simple indicators into synthetic indicators for each area) we have opted for the first system, that is, equal weighting. This is because in most cases the indicators capture different aspects of the area analyzed, but there are no clear arguments for granting one of them greater or lesser importance. Also, the nature of the information that each indicator captures is fairly homogeneous and in that case there is less interest in giving greater weight to one indicator or another, because in many cases they are correlated. This occurs, for example, in the case of the mean impact of publications index and the percentage of these in the first quartile. Consequently, the different simple indicators will enter into the calculation of the arithmetic mean with the same weight.

#### ***2.6.4. Weighting and aggregation of the area indicators within each dimension***

At the second level of aggregation the indicators of the different areas are grouped into an indicator for each of the dimensions considered:

teaching and research and innovation and technological development. At this stage there are reasons for following a different criterion, as after the arithmetic aggregation of the previous stage no area indicator presents zeros. A *geometric* aggregation method will be used.

Among the most interesting properties of geometric aggregation is that it limits the substitutability among the components that it aggregates. In other words, geometric aggregation penalizes the universities that have neglected any of the four transversal areas (*Resources, Output, Quality, Internationalization*) as against those that attend to them in a balanced manner.

One reason for using weights instead of an equal distribution is that if all the areas were aggregated with the same weight, this being a geometric mean the number of areas considered would influence the result. For example, if we had decided to group the indicators of quality and internationalization in a single area, their influence on the dimension would have been less than if considered separately. Another reason is that, unlike what occurred with the basic indicators, in this case there may be reasons to grant different values to each area.

Thus the decisions on the number of areas to be considered and their weights are relevant, and we have preferred to ask experts about the importance that should be given to each area. To make this valuation easier we followed the criterion that the number of areas should be small, and similar within each dimension. A survey of former university experts was conducted by applying the Delphi method<sup>7</sup>. Table 2.4 shows the weights given to the different areas by the experts consulted.

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<sup>7</sup> Two rounds of consultations were carried out, after which a 2.1 percentage point reduction was obtained in the average interquartile range.

Table 2.4. **Weights by area**

	Resources	Production	Quality	Internationalization
Teaching	25.4	30.4	23.9	20.3
Research and Innovation	20	30	30	20

Source: Own elaboration.

### 2.6.5. *Weighting and aggregation of the dimensions to obtain the rankings*

The last phase of the methodology establishes how the different rankings of the project are drawn up. The result of the previous phase offers rankings for the two dimensions separately, so no further step beyond those described in the above sections is necessary. The global rankings, U-Ranking and U-Ranking Volume, combine the two dimensions of teaching and research and innovation, a new geometric aggregation is needed and the most reasonable criteria for doing so should be decided.

In the transition from the dimensions to the final ranking we consider that the importance attributed to each dimension can be different depending on the interests of the people contemplating the ranking, that is, of its potential users: students, researchers, managers, society. For this reason, we have concluded that the user's perspective can be the key to giving more or less importance to each of the dimensions. It could be unconvincing to impose weights from a specific standpoint — for example, that of a group of experts, who consider that research is the most important—For individuals with another standpoint, such as students or the career guidance staff, it is more important to attend to the teaching aspects, while for firms the capacity of technological transfer of the universities.

After due reflection, therefore, we have opted to consider two alternatives.

1. First, U-Ranking Degrees offers the option of the system earlier described as *personalized ranking*, based on the user's own preferences. We understand that in this case users are

more likely to seek to compare the universities with fairly closely defined interests and diverse criteria, probably different from those of the experts. For this reason, with the help of a web tool, users can decide the importance of each of the two dimensions when placing the degrees in order, and the tool automatically offers them the ranking corresponding to the preferences revealed by the user.

To apply this first approach we have considered various alternatives for the choice of weights by the user. We opted for the procedure known as Budget Allocation Process, that is, for the distribution by the user of 100 points among the dimensions to be valued. This method, widely used in marketing to find out a consumer's valuation of the characteristics of a product, has the principal advantage of forcing the user to adopt a more active and reflexive position by distributing points, being therefore more aware of the opinion that he/she displays.

2. Second, for the general rankings (U-Ranking and U-Ranking Volume), corresponding to the universities' activities as a whole, the two dimensions are weighted on the basis of the experts' opinions, according to a survey such as that mentioned above when aggregating areas into dimensions, and a Delphi process to achieve convergence among the experts' opinions.

The weights to be given to teaching and research and innovation are, respectively, 56% and 44%. These weights are included as a default option for calculating the personalized.

## 2.7. PERFORMANCE RANKINGS VS. VOLUME RANKINGS

When comparing universities, it is relevant whether or not their size is taken into account. Making one choice or the other is not in itself a methodological advantage or failure, but implies adopting a particular perspective which affects the rankings and must be borne in mind when interpreting the results.

In the same way as when analyzing the activity of a firm or a country we can consider its volume of output or its achieved performance, and both positions are reasonable, the same occurs in the analysis of the results of universities. Neither of the two approaches is, *a priori*, more valid than the other, and the choice depends on the intended use of the results. The per capita GDP is more useful than total gross domestic product (GDP) when comparing the quality of life between countries or regions, but the volume or the growth of GDP are also important for explaining, for example, the employment generated or the importance of a country in the global economy. So, although in some cases the performance reached to obtain the results may be more important than their volume, in other cases the size may be relevant. A very productive and at the same time large university is more beneficial to society than one that offers the same level of productivity but has a small size; likewise, a very large university with a poor level of results is a much bigger problem than a small university with the same level of results.

### 2.7.1. Interest in both approaches

Another reason to pay attention to this aspect is that the existing rankings adopt on occasions an approach based on the performance by which the results are obtained and in other cases deal with the volume of results. For example, some widely cited international rankings —especially, the Academic Ranking of World Universities (ARWU), known as the Shanghai Ranking— are, mainly, volume rankings.

The Shanghai Ranking is rather one of volume, because most of the variables from which it is built —number of Nobel prize- winners or Fields medalists among their ex-students or staff, widely cited researchers, publications in *Nature* or *Science*, articles published in indexed journals— are not relativized by the size of the university. Such variables make up the greater part of the weight in the ranking, while only one indicator (academic performance) is expressed in *per capita* terms. So, the universities' positions in this ranking are conditioned both by their quality and by their size, both qualities being necessary for reaching good positions.

Other rankings, on the other hand, make their comparisons from the point of view of quality. It is the case of the QS World Universities Ranking, whose indicators are taken from surveys of academic reputation or are variables standardized by size. There are rankings that expressly contemplate both approaches, and make differentiated comparisons based on quality or on the total volume of results, as does the I-UGR Ranking<sup>8</sup> of research results.

The reason for acknowledging the interest of both approaches is that the size of institutions can be relevant for valuing the contributions of the universities, but correcting the results for size allows to compare the universities from a perspective that makes them more homogeneous. However, given that, as we said earlier, for the university system as a whole it makes a difference whether a university with high (low) productivity is large or small, we must consider whether universities would have the same position in the performance rankings as in the production volume rankings and bring out the specific significance of each ranking. To sum up:

- The rankings of volume of production are based on indicators not relativized by size, and depend on both the university's performance and its size. Thus, a university may generate a greater volume of research results than another of smaller size, even though the second is more productive.

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<sup>8</sup> This ranking was last updated in 2014.



- The performance rankings are based on indicators of results corrected by size, and seek to measure the output per unit of inputs or resources used. For example, scientific output is measured as a function of the number of faculty members with PhD and the teaching results are relativized by the number of students. This enables some smaller universities to obtain a better final result in the ranking than other much larger ones.

An interesting question is whether size influences performance positively or negatively, that is, whether performance/efficiency increases or decreases with the size of the university. In the first case, the universities' positions in the rankings of volume would be favored by two factors (size and performance). The testing of the two hypotheses is an empirical matter, which can be analyzed by drawing up both types of rankings using the same approach, as will be presented later.

### ***2.7.2. Treatment of the size of universities***

All of the simple indicators with which we started with are relativized by the most appropriate variable (students, faculty members, budget, etc.), so that size does not have a direct influence on the results. Consequently, the general scheme of the methodology leads to measuring each university's results independently of its size, so these are performance rankings. Therefore, to construct volume rankings, the size variable has to be added to the indicators. This task has been undertaken following the criteria detailed below.

The first criterion is to preserve, as far as possible, the methodological homogeneity of both rankings, calculating them on the basis of the same set of indicators and the same aggregation criteria. For this reason the ranking of volume was not drawn up simply by not relativizing those indicators that can be expressed in total terms—for example, reflecting the income from patents or the doctoral

theses read without dividing them by the number of faculty members with PhD—as the Shanghai Ranking does.

It is not reasonable to proceed in that way because some variables cannot be presented in absolute terms, being rates or indices, such as the percentage of publications in the first quartile or the mean impact of publications factor.

If some variables are expressed in absolute terms and others are not, the relative importance of the size within the results would fall only on the variables that can be expressed in absolute terms. In that case, the importance accorded to size would depend implicitly on the proportion of variables that can be expressed in absolute terms. For example, in the variables considered in our study only 14 of the 20 indicators used could be expressed in absolute terms, which would be equivalent to the acknowledged importance of size being 70%. This percentage would be arbitrary because it would reflect the number of indicators that form part of the database expressed in absolute terms.

This solution is unsatisfactory, and we have explored other alternatives for introducing size. The option chosen consists of calculating the volume of results of each university by multiplying the performance index by a measure of size. We have considered three indicators of the size of a university: the number of faculty members, the number of students, and the budget. Each one has its specificities and can be a better proxy of different aspects of the university's activity that do not have the same importance in each of them. To avoid skewing the size proxy in one or other direction in the most general indices—which could favor some institutions by giving greater weight to one of the aspects—we have taken as indicator of size the arithmetic mean of the three variables, previously standardized by its mean value.

## 2.8. PRIVATE UNIVERSITIES

U-Ranking 2023 analyzes 48 public and 23 private universities. Private universities are an important part of the Spanish University System.

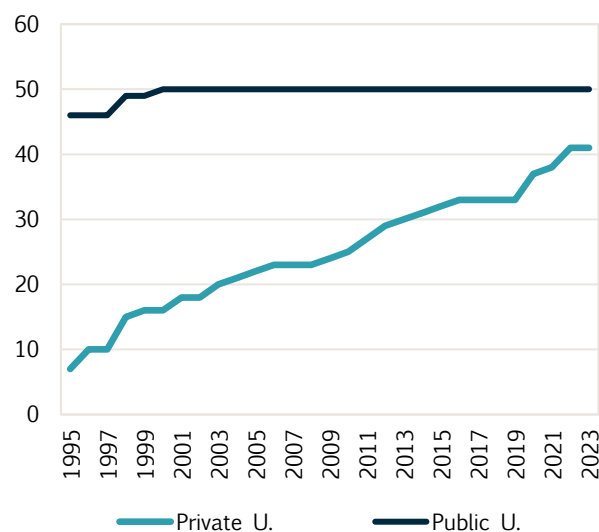
As shown in figure 2.1, they have experienced a large growth in the last twenty years, quadrupling in number to 41 institutions out of the 91 that make up the Spanish University System today (see panel a). In the past 4 years, 8 universities have been created, of which 5 are in Madrid, 1 in Galicia, 1 in the Basque Country and 1 in the Canary Islands. In 2019, ESIC and CUNEF, previously considered centers attached to public universities, were recognized as universities. In addition, two universities were created this year, Universidad Internacional de Villanueva and Universidad de les Hespérides, and Universidad Internacional de la Empresa in 2020. In 2021, Universidad Euneiz and la Universidad Intercontinental de la Empresa were established, and Universidad de Diseño, Innovación y Tecnología in 2022. Of these 41 private universities, 39 carried out their teaching activity during the 2022-23 academic course<sup>9</sup>.

Likewise, the number of bachelor's and master's degree students has multiplied sixfold, from 52,000 to more than 370,000 students in the 2021-2022<sup>10</sup> academic year, which represents 22% of university students studying in Spain, compared to 4% 28 years ago.

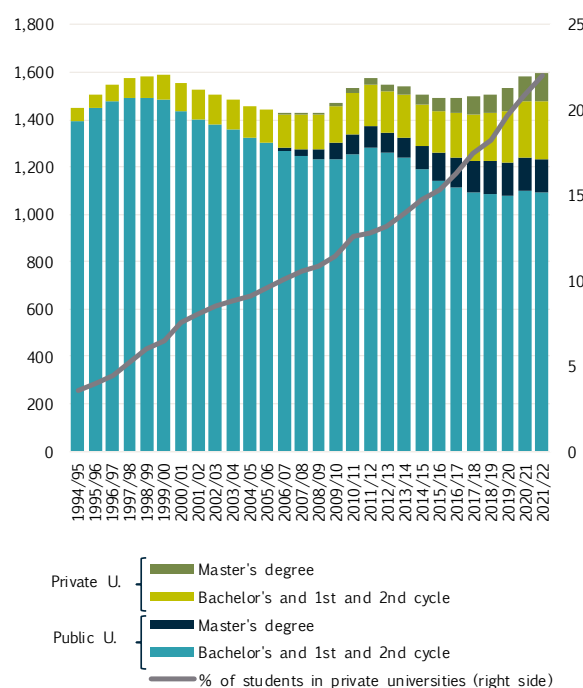
An important characteristic of private universities, apart from their relative young age of existence, is their smaller size. If we compare the number of private universities as a percentage of the total (45%) and the number of private university students as a percentage of the total (22%), it becomes clear that private universities are generally smaller.

Figure 2.1. Evolution of the number of universities and students. 1994/95 to 2022/23 academic years

### a) Number of public and private universities



### b) University students by level of studies and type of university. 1994/95 to 2021/22 academic years (number and percentage)



Note: Student data for the 2021/22 academic course are provisional.

Source: Spanish Ministry of Universities (2023c, 2023f).

<sup>9</sup> The two universities with no teaching activity are: University of the Hesperides and University of Design, Innovation and Technology.

<sup>10</sup> Data on students in the last academic year does not include students from the universities created in 2020 and 2021, since information on these universities has not yet been provided by the Ministry.

Another distinctive feature is their greater degree of specialization in postgraduate studies, especially master's degrees. Private universities have placed great emphasis on these type of degrees, as the makeup of their students shows<sup>11</sup>. Whereas the proportion of master's degree students in public universities is 11.5%, in private universities it is 32%. Indeed, almost half of master's degree students in Spain study at a private university.

Due to the idiosyncrasies of private universities, one of the indicators defined in the methodology, Cut-off marks<sup>12</sup> (Teaching), is not applicable to these institutions. Students must pass a university admissions test in order to study a degree regardless of whether it is offered by a public or private university. However, for private universities, the mark obtained does not always constitute a criterion of admission, since they have their own procedures, based on specific tests, personal interviews and academic record.

As a result, private universities do not publish cut-off marks for their degrees.<sup>13</sup> Therefore, for private universities this variable will be set at 5. This limitation also affects the UNED, to the extent that, due to its characteristics, cannot set cut-off marks, it must accept all enrollment requests from students who have passed the university entrance tests regardless of the mark.

It is more frequent for private universities to present information gaps in certain variables than public universities, limiting, in some cases, their comparability. The U-Ranking 2023 edition has reviewed all the information available for private universities following the criteria to include those

institutions that provide at least 18 out of the 20 indicators considered for the public system<sup>14</sup>, as well as the three variables that measure for size (student body, full-time equivalent faculty members with PhD and consolidated revenues). As a result, in the 11<sup>th</sup> edition of U-Ranking the following 23 private universities are analyzed:

- IE Universidad
- Mondragon Unibertsitatea
- Universidad a Distancia de Madrid
- Universidad Alfonso X el Sabio
- Universidad Camilo José Cela
- Universidad Cardenal Herrera-CEU
- Universidad Católica de Valencia San Vicente Mártir
- Universidad Católica San Antonio
- Universidad de Deusto
- Universidad de Navarra
- Universidad Europea de Canarias
- Universidad Europea de Madrid
- Universidad Europea de Valencia
- Universidad Internacional de La Rioja
- Universidad Internacional de Valencia
- Universidad Nebrija
- Universidad Pontificia Comillas
- Universidad San Pablo CEU
- Universitat Abat Oliba CEU
- Universitat de Vic-Universitat Central de Catalunya
- Universitat Internacional de Catalunya
- Universitat Oberta de Catalunya
- Universitat Ramon Llull

When comparing the 2023 list of universities with the U-Ranking 2022 edition, Universidad Internacional I de Castilla is no longer included.

<sup>11</sup> This hyperspecialization has led the administration to establish in Article 5.1 of Royal Decree 640/2021, of July 27, on the creation, recognition and authorization of universities and university centers, and institutional accreditation of university centers, a minimum number of degrees (10) to create a university.

<sup>12</sup> The cut-off mark is the mark of the last student who gained admission to a degree with limited places. This mark is only a guideline and varies from one year to the next, depending on the number of available places and the marks

of the students registered.

<sup>13</sup> For private universities, the cut-off mark for each degree is 5 since the prerequisite is to pass the university admissions test.

<sup>14</sup> Since the indicators are based on moving averages, the requirement has been for each of the chosen indicators to have information on the years that are necessary to calculate them.

# User personalized rankings

## 03

Universities develop different actions, but also different profiles of people and organizations interested in them: undergraduate or graduate students, professors, managers, members of the governing body or Board of Directors, heads of university policy in the Public Administration, journalists, citizens, companies, social agents, administrations, etc. The importance granted by people or groups to the different activities of the universities may be different and their interest may focus basically on one or more of their activities. For example, students are likely to focus on aspects related with the degree that they wish to study and teachers may focus more on research. Therefore, aggregating the information on each of the aspects is not only a complex problem, but the criteria may depend on the user.

Given the high number of users that might value the universities' activity from a particular viewpoint, it makes sense to consider the possibility of drawing up personalized rankings, established that take into account the different interests of the user. The U-Ranking project considers this question and in the case of bachelor's degrees, it offers a tool that provides information on the ranking of degrees to students, their families and careers advisers, personalized according to their specific interests.

### *3.1. EXAMPLES OF PERSONALIZED RANKINGS*

Constructing synthetic indicators by acknowledging the preferences of users has been available thanks to the interactivity permitted by web tools. Through them, the user can value personally each one of the dimensions considered, indicating which areas they want to consider and which are the most important for them. Web technology allows these preferences identified by the users themselves to be incorporated and combined with other elements contributed by the experts, such as the selection of variables and aggregating them in intermediate indicators according to criteria as described in chapter 2.

Two interesting examples of this approach, referring to very distinct areas, are those corresponding to the "Talent Attractiveness" Index, developed by the OECD (2023), and the CHE Ranking, a ranking of university degrees drawn up by the German Center for Higher Education (CHE 2023a).

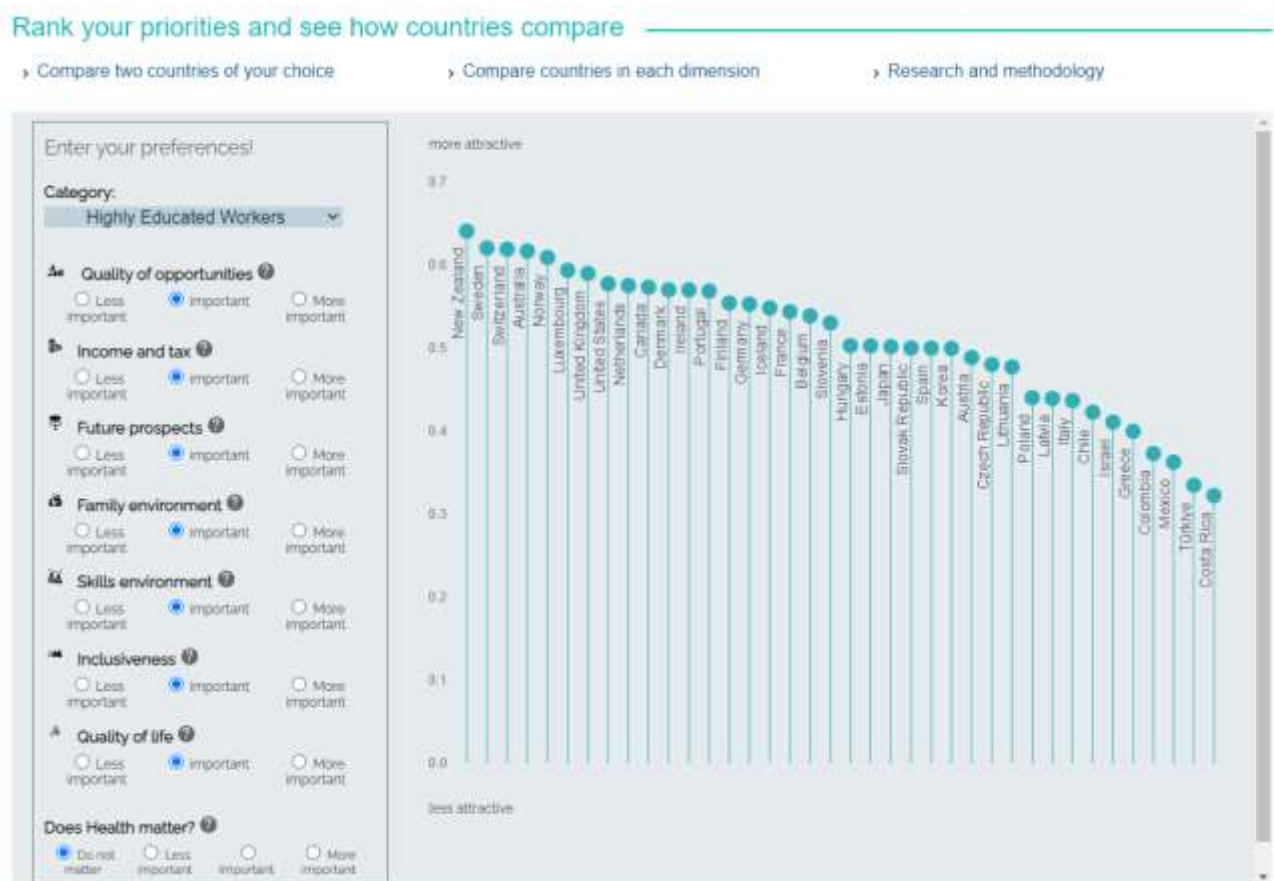
The OECD (2023) draws up a synthetic index that ranks countries according to their ability to attract and retain talent based on three types of migrants: university students, entrepreneurs

and workers with higher education. The index rates country performance based on different dimensions: quality of opportunities, income and taxes, future prospects, family environment, skills, inclusion and quality of life. In order to calculate the index, the user must specify the importance given to each of the dimensions considered.

Experts justify and prepare the set of relevant dimensions and variables and, once the user has introduced their valuation of each area, the web tool shows a synthetic index of talent attraction that takes into account the importance given by the user, as well as the category it belongs to.

A similar approach is used by one of the university rankings analyzed, the CHE Ranking, drawn up by Germany's Center for Higher Education for the journal *Zeit*. In this case, the student who wishes to choose a degree needs to select the subject they wish to study, the type of course of their interests and the aspects they consider to be most important (teaching, subsequent employment opportunities, research, etc.). A personalized university ranking is created based on their preferences.

Figure 3.1. Talent Attraction Index



Source: OECD (2023).



Figure 3.2. CHE Ranking

The image shows the top section of the ZEIT Campus CHE Ranking website. The header is dark with the 'ZEIT Campus' logo on the left and navigation links ('ZEIT ONLINE', 'Abo', 'Mehr', 'Anmelden') on the right. Below this is a secondary header with the 'CHE Ranking' logo and links for 'SUBJECTS', 'UNIVERSITY TOWNS', 'ABOUT', and 'DE / EN'. The main banner has a teal background with white icons and text: 'GERMANY'S LARGEST UNIVERSITY RANKING' and 'Facts & Assessments by 120,000 Students and 3,000 Professors'. A search bar with the placeholder 'town, university or course of study...' and a 'SEARCH' button is present. Below the banner is a section titled 'SELECT YOUR RANKING' with two dropdown menus: 'Which subject?' and 'What type of institution/degree?'. Both dropdown menus are circled in black. A 'SHOW RANKING' button is to the right of the second dropdown.

ZEIT Campus

CHE Ranking

GERMANY'S LARGEST UNIVERSITY RANKING

Facts & Assessments by 120,000 Students and 3,000 Professors

town, university or course of study...

SEARCH

SELECT YOUR RANKING

Which subject?

What type of institution/degree?

SHOW RANKING

Figure 3.2. (Cont.) CHE Ranking

**SELECT YOUR RANKING**

Which subject?  What type of institution/degree?  **SHOW RANKING**

[to home page](#)

## RANKING FOR ECONOMICS

ALL TYPES OF INSTITUTIONS

Top group Middle group Bottom group Not grouped

### SELECTED CRITERIA

4. Teacher support (S) ☐

3. Support in the study entry phase [points] (F) ☐

2. Overall study situation (S) ☐

1. Total number of students (F) ☐

### ORDER

alphabetical according to rank groups

**Mark and compare universities**

- ☐ Uni Augsburg
- ☐ Uni Bamberg
- ☐ Uni Bayreuth
- ☐ FU Berlin
- ☐ HU Berlin
- ☐ HWR Berlin
- ☐ TU Berlin
- ☐ Uni Bonn
- ☐ TH Deggendorf
- ☐ Uni Düsseldorf
- ☐ Uni Duisburg-Essen
- ☐ Uni Erlangen
- ☐ Uni Göttingen
- ☐ Uni Halle-Wittenberg
- ☐ Uni Hamburg
- ☐ Uni HH Hamburg
- ☐ Uni Heidelberg
- ☐ Uni Kiel
- ☐ Uni Köln
- ☐ Uni Lindeburg
- ☐ Uni Meersburg
- ☐ Uni Mannheim
- ☐ Uni Marburg
- ☐ LMU München

**Academic studies and teaching**

- ☐ Courses offered (S) ☐
- ☐ Exams (S) ☐
- ☒ 2. Overall study situation (S) ☐
- ☐ Research orientation (S) ☐
- ☐ Study organisation (S) ☐
- ☐ Support in studies (S) ☐
- ☒ 3. Support in the study entry phase [points] (F) ☐
- ☒ 4. Teacher support (S) ☐

**Equipment**

- ☐ IT-infrastructure (S) ☐
- ☐ Library (S) ☐
- ☐ Rooms (S) ☐

**Result of study**

- ☐ Graduations in appropriate time, master's % (F) ☐
- ☐ Graduations in appropriate time, undergraduate % (F) ☐

**International orientation**

- ☐ Support for stays abroad (S) ☐

**Students**

- ☒ 1. Total number of students (F) ☐

**Job market and career-orientation**

- ☐ Bachelor theses in cooperation with work environment % (F) ☐
- ☐ Job market preparation (S) ☐
- ☐ Master theses in cooperation with work environment % (F) ☐
- ☐ Share of professors with work experience % (F) ☐
- ☐ Teaching by practitioners % (F) ☐

**Research**

- ☐ Doctorates per professor (F) ☐
- ☐ Publications per professor (F) ☐
- ☐ Research reputation % (P) ☐
- ☐ Third party funds per academic [TE] (F) ☐

**Town and University**

- ☐ Population of the town (F) ☐
- ☐ Proportion of students in this town % (F) ☐
- ☐ Student accommodation rent [€] (F) ☐
- ☐ Students at this campus (F) ☐

**Apply selection**

[Restore pre-selection](#)

Source: CHE (2023a).

### 3.2. DESCRIPTION OF THE WEB TOOL FOR GENERATING PERSONALIZED RANKINGS OF DEGREES

This personalized ranking approach has been used in U-Ranking to classify degrees in order, constructing rankings of universities for the different bachelor's degrees. In the future it is intended to extend this approach to other university activities, for example, to master's degrees, when the necessary databases are available. The first step in this direction is the analysis carried out in the 2022 edition of U-Ranking on postgraduate education.

The value of a web tool like this depends much on the effort made to facilitate its use. The objective of U-Ranking is to present a simple, easy-to-use tool to minimize the number of clicks needed to obtain the relevant information, which is above all the corresponding ranking. This simple approach must be present both when limiting the degrees to be compared and when permitting the user to declare their preferences in order to draw up the personalized rankings. In order to make the procedure more user-friendly, the website has been redesigned, as well as the Choose a University tool, which can be accessed by clicking on the icon that appears at the top of the website (Figure 3.3). Next, three questions are displayed that must be answered by the user to obtain a personalized ranking by degree, according to the student's interests in three aspects (Figure 3.4):

- *What to study*
- *Where to study*
- *Study and research*

In order to harmonize the tool with the most frequent potential users we performed trials among students ages 17 to 18 years old, who are less familiar with the concepts used in the university world than the experts participating in the project. Based on these trials, the necessary corrections were made to better adapt the tool to the students and to make the results easier to understand. The tool is presented on the screen of the project's website via the *Select University* tab.

Figure 3.3. Choose a university



In the first step, the user must choose the bachelor's degree or degrees they wish to study. More than 3,600 degrees offered by 71 universities analyzed are classified into 122 *groups of degrees* to simplify the selection process. To make the user's decision even easier, the degree groups are clustered into 26 families of degrees.

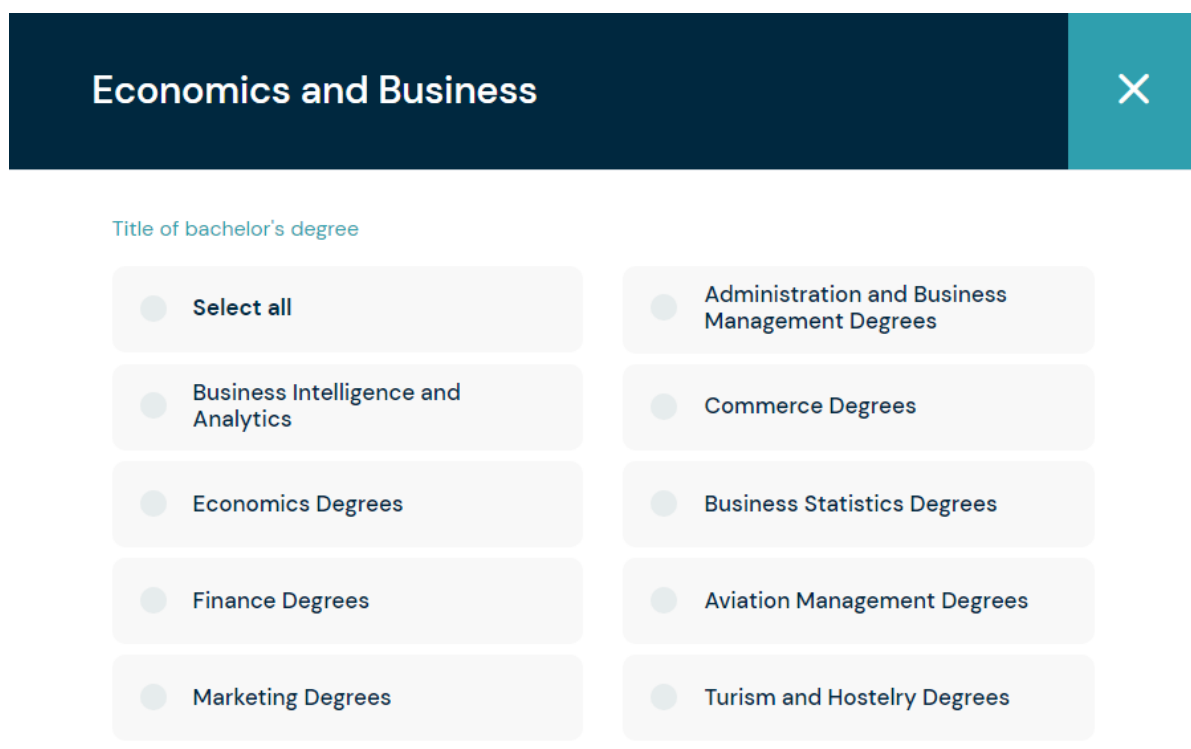
When choosing a family of degrees, as for example "Economy and Business Administration", the bachelor's degrees included in this family of degrees are displayed. This list of degrees is not extensive or literal, since "Business intelligence" and "Business analytics" have been grouped together.

The grouping of the degrees is intended to facilitate the user's selection process but does not reduce the results of the ranking. Thus, regardless of this initial simplification, the final results show all the degrees included in the selection, as well as the center where they are taught whenever there are several options.

Figure 3.4. Steps to create a personalized ranking



Figure 3.5. Step 1. Choose a bachelor's degree



The user can choose either one or several groups of degrees, whether they belong to the same family or not. For example, he/she could select the “Degree in Analytics and Business Intelligence” (from the Economics family) and the “Degree in Engineering and Data Science (from the Computer Science and Telecommunications family).

The following step is to choose the autonomous community or regions considered as places in which to study (figure 3.6). Thus, the user must mark those chosen in the corresponding list. If

the user does not want to geographically limit their choice, they can “Select all”. The option of restricting the search to specific autonomous communities is a response to the fact that many students do not contemplate the idea of moving as an alternative or a restriction. In this case, their interest will be to know which of the studies offered are valued best in the territories considered. In any way, complementary information is offered to position their options in relation to the remaining offers in the Spanish University System.

Thirdly, the user must declare their preference regarding the importance they give to study and research when valuing the universities' profiles (figure 3.7), by distributing the 100 points available to the importance they grant to teaching and to research. The resulting ranking will order the degrees and universities taking into account these weights. By default, 56 points are given to teaching and 44 to research and innovation, which are the weights used for the U-Ranking calculation.

Once these three steps are completed, the personalized ranking corresponding to the criteria introduced is displayed (figure 3.8). The ranking places in order the universities that offer the bachelor's degrees chosen in the pre-selected territories according to their preference.

The first column shows the position of each degree considered in the personalized ranking. The second shows the value of the index reached for each specific degree. The official name of the degree appears in the third column. As we observe in the example, various bachelor's degrees can occupy the same position in the ranking, since the indices are rounded to one decimal point because greater precision is not considered to reflect, more accurately, differences among the degrees. In these cases, the degrees are ordered according to the value of the index, considering all the decimals. In the fourth column, in addition to the name of the university, the campus where the degree is taught appears. Clicking on the name of the university takes you to its website.

Figure 3.6. **Step 2. Choose a Spanish region**

Choose the regions where you would like to study  
Select one or several options

<input type="checkbox"/> Select all	<input type="checkbox"/> Andalucía	<input type="checkbox"/> Aragón
<input type="checkbox"/> Canarias	<input type="checkbox"/> Cantabria	<input type="checkbox"/> Castilla y León
<input type="checkbox"/> Castilla-La Mancha	<input type="checkbox"/> Cataluña	<input type="checkbox"/> Comunidad de Madrid
<input type="checkbox"/> Comunidad Foral de Navarra	<input type="checkbox"/> Comunitat Valenciana	<input type="checkbox"/> Extremadura
<input type="checkbox"/> Galicia	<input type="checkbox"/> Illes Balears	<input type="checkbox"/> La Rioja
<input type="checkbox"/> País Vasco	<input type="checkbox"/> Principado de Asturias	<input type="checkbox"/> Región de Murcia

Figure 3.7. **Step 3. Indicate percentage of importance given to Teaching and Research and Innovation**

Indicate, on a scale of 0 to 100, how important the relationship between quality of teaching and research and innovation is for you.

Teaching 56%

56 %

Research & Innovation 44%

44 %



Figure 3.8. **Personalized ranking of degrees**

**X Economics and Business** [DOWNLOAD PDF](#)

In the selected regions there are 18 options for the chosen degrees

Ranking	Index	Degree	University	Cut-off mark	Credit Cost €	Employment rate	Employed as graduates	Average contribution base
1	1.6	Grado en Management and Technology / Empresa y Tecnología	Universidad Carlos III (Comunidad de Madrid)	12.60	16.92	—	—	—
2	1.5	Grado en Datos y Analítica de Negocio / Bachelor in Data and Business Analytics	IE Universidad	See +	—	—	—	—
2	1.5	PCEO Grado en Administración de Empresas y Datos / Grado en Analítica de Negocios ( Dual Degree Business Administration and Data and Business Analytics )	IE Universidad	See +	—	—	—	—
3	1.4	Grado en Empresa y Tecnología	Universitat Autònoma de Barcelona (Comunidad de Madrid)	8.38	17.68	67.8	38.5	—
4	1.2	Grado en Inteligencia y Analítica de Negocios / BIA	Universitat de València (Comunidad Valenciana)	11.93	12.79	—	—	—
4	1.2	Grado en Dirección de Empresas Tecnológicas	Universitat Ramon Llull Barcelona (Cataluña)	See +	—	79.3	62.2	—
4	1.2	Grado en Inteligencia Empresarial y Análisis de Datos	Universitat Ramon Llull Barcelona (Cataluña)	See +	—	—	—	—

The last five columns contain complementary information which is useful in the decision process. The cut-off mark of the last year, the price per credit on first registration and information on graduate employability which will be described in the next section.

Table 3.1 shows the level of disaggregation of each of the indicators included in the calculation of the personalized ranking of degrees<sup>15</sup>. These indicators are the twenty that are used to calculate the rankings by institutions. The sources and the years used are also the same; however, the level of disaggregation varies. While the indicators in the general ranking are collected at area of study or university level, more disaggregated information is used for the personalized ranking when available. Thus, 9 of the 20 indicators involved in the calculation of the synthetic index of each degree correspond

to a degree or group of degrees. It should be noted that the only difference with regards to the methodology of the general ranking is that the standardization of the indicators of the personalized ranking of degrees is done by groups of degrees, not by area of study. In other words, the reference group for each degree would be the one that belongs to the same family of degrees and therefore, it is the median value of this family used for the standardization.

To sum up, the web tool for constructing personalized rankings is easy to use, very flexible, and is underpinned by a rigorous methodology identical to the one described in previous sections on how general rankings are constructed. Therefore, it is a complement to the latter with a high interest potential for students, families and careers counselors, as well as for universities themselves.

<sup>15</sup> The dimensions, areas, and indicators used, as well as the definition of the indicators, sources, and period coincide with what is described in Annex 1 (overall ranking).

As shown in the table, the only variation is in the column of level of disaggregation.

Table 3.1. Indicators and level of disaggregation of the information used for the ranking by degree

Dimension	Area	Indicator	Level
Teaching	Resources	Faculty member per 100 students	Area of study
		Budget per student	University
		Percentage of faculty member with PhD	Area of study
	Production	Success rate	Bachelor's Degree
		Evaluation rate	Bachelor's Degree
		Drop-out rate	Bachelor's Degree
	Quality	Percentage of postgraduate students	Area of study
		Cut-off mark	Bachelor's Degree
	Internationalization	Percentage of foreign students	Bachelor's Degree
		Percentage of students in foreign exchange programs	University
Research and Innovation	Resources	Competitive public resources per faculty member with PhD	Area of study
		Contracts with PhDs, research grants and technical support over total budget	Area of study
	Production	Citable documents with ISI reference per faculty member with PhD	Area of study
		Number of patents per 100 faculty members with PhD	University
		Number of thesis defended per 100 faculty members with PhD	Area of study
	Quality	Mean impact factor	Group of degrees
		Percentage of publications in the first quartile	Group of degrees
		Citations per document	Group of degrees
	Internationalization	European research funds per faculty member with PhD	University
		Percentage of publications with international co-authorship	Group of degrees

Source: Own elaboration

The more than 30,000 personalized rankings that have been calculated in the last year testify to the level of interest in the tool. For this interest in the tool to be effective and useful, it is essential to keep all the supporting information up-to-date and to constantly improve the data offered, taking the users' experience into account. Along this line, last year's edition included information on the labor market insertion by degrees. In addition to an update of this data, this year's edition has improved the usability of the tool.

### 3.3. COMPLEMENTARY INFORMATION ON GRADUATE EMPLOYABILITY

Graduate employability according to the degrees offered by a university influences the users' valuations of its services. The demand can be reinforced if a university offers degrees with a favorable employability outlook, especially if a

certain degree has better employability results than those of the same degree in another university. Consequently, since the 8th edition of U-Ranking, employability indicators are offered instead of environmental data as in previous editions.

An analysis of graduate employability is carried out with data from the report "Inserción laboral de los egresados universitarios" (Ministry of Universities 2019) on the Spanish Social Security system affiliation rates of bachelor's degree students four years after their graduation. In 2015, the Ministry of Universities published its first report with employability data along with the corresponding indicators on graduates from the 2009-10 academic course, focusing on 1st and 2nd cycle students. The 8<sup>th</sup> edition published the labor market results of the second wave of indicators corresponding to the situation from 2015 to 2018 of students who graduated in 2013-2014.

Currently, U-Ranking includes the latest data published by the Ministry of Universities in May 2022 on the situation from 2017 to 2020 of bachelor's degree students who graduated in 2015-2016.

We have focused our attention on the employment situation of university graduates four years after obtaining their degree<sup>16</sup>, taking into account three indicators of degree employability:

- a) Percentage of university graduates affiliated to the Spanish Social Security system four years after graduating
- b) Percentage of graduates in 2020 affiliated to the Spanish Social Security system in contribution categories compatible with a university degree four years after graduating.
- c) Average annual salary for the National Insurance contribution calculation base in 2020 for graduates who work full-time 4 years after obtaining the degree.

Data on employability is presented as a supplementary to the ranking of degrees. The web tool offers the value of the degree for each

one considered, with information for nearly 1,900<sup>17</sup> degrees.

As in previous editions, 2023 also includes the price per credit for over 3,612 bachelor's degrees analyzed by U-Ranking, based on university statistics provided by the Spanish Ministry of Universities (2023b). These prices, despite the maximum limit set by the Spanish Ministry, can vary depending on the region, the university, the level of degree —bachelor, master, doctorate— the level of experimentality of the degree and the type of ownership of the center<sup>18</sup> offering that degree. As can be seen in table 3.2, the current range of fees by regions is considerable, even more if differences of experimentality and level of degree are considered.

For this reason, it is relevant that the U-Ranking user will be able to easily know the price per credit at first registration for each bachelor's degree. The prices included in U-Ranking correspond to those established for the 2022-2023 academic year. Also, the cost was included by degree course or by credit offered by private universities when available on their webpage.

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<sup>16</sup> The report provides the data one year after graduation, but this information distorts the reality of degrees that require qualifying master's degrees to practice or additional national tests such as the MIR in medicine that make insertion unlikely one year after graduation.

<sup>17</sup> Of these, there are 334 degrees with no employment information in 2020 and the 2018 data is provided for

graduates in the 2013-2014 academic year, which is indicated with an asterisk (\*).

<sup>18</sup> U-Ranking also includes bachelor's degrees imparted by private centers affiliated to public universities. In general, the price of these degrees includes an extra cost added on to the public prices.

**Table 3.2. Public price per credit at the time of first enrollment by region. 2022-2023 academic year (€/credit)**

Region	Average price	Min. price	Max. price
Andalusia	12.62	12.62	12.62
Aragon	18.20	13.50	21.30
Asturias	12.34	8.63	15.70
The Balearic Islands	15.48	11.18	20.08
The Canary Islands	12.45	9.47	14.59
Cantabria	13.34	9.95	15.56
Castile-La Mancha	15.81	12.13	18.87
Castile and Leon	16.40	12.59	22.32
Catalonia	18.14	17.69	18.46
The Valencian Community	15.26	11.84	18.00
Extremadura	14.22	9.88	17.74
Galicia	11.96	9.85	13.93
Madrid	18.53	16.92	20.68
Murcia	15.70	14.38	16.78
Navarre	19.12	15.10	21.38
Basque Country	16.51	13.42	18.89
La Rioja	16.89	14.08	22.68
UNED	16.21	13.20	21.04
<b>Total Public universities</b>	<b>15.62</b>	<b>8.63</b>	<b>22.68</b>

Note: In Catalonia, the Generalitat de Catalunya, the public universities and the Universitat Oberta de Catalunya (UOC), through the Agency for Management of University and Research Grants (AGAUR), have applied the "Equidad" (Equity) grants, which involve a reduction in the price paid per credit of enrollment by bachelor's and master's degree students of these universities, based on the level of family income, so the resulting prices, after deducting the grant, are those set out in Annex 6 of the Price Decree.

Source: Spanish Ministry of Universities (2023b).





# Main results

## 04

This chapter reviews the principal results obtained in the 11<sup>th</sup> edition of U-Ranking, corresponding to 2023, in which the rankings by university and the personalized rankings of bachelor's degrees have been updated. All the rankings are available at the project's website [www.u-ranking.es](http://www.u-ranking.es).

The 2023 rankings will be analyzed in this section from four different perspectives in order to emphasize the contribution made by the project and its methodology: a) comparing them with existing rankings to evaluate their similarities and differences; b) assessing the sensitivity of the results to changes in some of the hypotheses set forth, specifically the relative weights assigned to teaching and research activities, and the importance of considering or not the size of the university; c) comparing this year's results with the 2023 edition; d) and examining the differences in the performance of the various regional university systems.

### 4.1. U-RANKING

Table 4.1 offers the ranking of 71 Spanish universities classified according to their indices of performance (U-Ranking). Keeping in mind that performance is the relationship between the volume of university results in the areas analyzed and the resources used to accomplish them. Thus, if two universities generate the same results, the one that makes use of less resources to achieve them will have a higher performance.

The order is based on the value of the synthetic indicator obtained for each university which is offered in the second column. The universities are ordered according to the value of this indicator, rounded to one decimal as a greater detail of the index would not reflect the differences among universities more accurately, given the set of decisions adopted in the process of construction of indicators already described in chapter 2. As shown in the table, various universities obtain the same index and therefore occupy the same position in the ranking. As a result of this criterion, the 71 universities are grouped into 11 levels of performance. Within each group of universities with similar results, the universities are ordered according to the complete value of the index, however, the differences in second place are not necessarily important.

Universities that are 15 years or younger are marked with an asterisk (\*) in table 4.1, so the reader can put into context the results in the following sense. Universities must be able to show their teaching potential from the start, because graduates must acquire all the competences associated to a degree. This is the result of the need to create research teams and to obtain equipment and infrastructure, as well as the needed organizational requirements to develop their full potential. Pointing out the universities with 15 years or less of existence allows to keep in mind that the research and transfer results of these younger universities are often lower, and this may be due to their youth.

Table 4.1 shows a list of the universities that have not been grouped due to lack of sufficient information to construct the indices. The purpose of including this group is to highlight the transparency of the universities that are included in the rankings, as they generate and disclose the information required in order to be included, regardless of their final position. Eleven universities that are not in the ranking list are marked with an asterisk because they belong to the group that have existed less than 15 years.

When interpreting the results of a university included in the ranking, it is important to bear in mind, therefore, that a large part of the private university system is not included due to lack of information. Thus, it is probable likely that any university in the ranking could conceivably have an indeterminate number of universities behind it, even at the lowest level of performance (11th place in the 2023 ranking) because of insufficient information to construct the indices.

Table 4.1. U-Ranking of Spanish universities 2023

University	Ranking	Index	University	Ranking	Index	University	Ranking	Index
Universidad Carlos III de Madrid	1	1.5	U. Internacional de Catalunya	5	1.1	Universidad Católica San Antonio	9	0.7
Universitat Politècnica de Catalunya	1	1.5	Universidad de Alicante	5	1.1	U. Internacional de La Rioja*	9	0.7
Universitat Pompeu Fabra	1	1.5	Universidad Pública de Navarra	5	1.1	Universidad Cardenal Herrera-CEU	9	0.7
Universitat Politècnica de València	2	1.4	Vic- Universitat Central de Catalunya	5	1.1	Universidad Católica de Valencia	10	0.6
Universitat Autònoma de Barcelona	2	1.4	Universitat de les Illes Balears	5	1.1	Universidad Abat Oliba CEU	10	0.6
Universidad Autónoma de Madrid	3	1.3	Universidade da Coruña	5	1.1	Universidad A Distancia de Madrid	10	0.6
Universidad Politécnica de Madrid	3	1.3	Universidad del País Vasco	5	1.1	Universidad Camilo José Cela	11	0.5
Universitat de Barcelona	3	1.3	Universidad de Almería	5	1.1	U. Internacional Valenciana*	11	0.5
Universitat Rovira i Virgili	3	1.3	Universidad de Salamanca	5	1.1	Universidad Europea de Canarias*	11	0.5
IE Universidad	4	1.2	Universidad de Sevilla	6	1.0	Universidad Alfonso X El Sabio	11	0.5
Universidad de Cantabria	4	1.2	Universidad Rey Juan Carlos	6	1.0	Universidad Europea de Valencia*	11	0.5
Universitat de València	4	1.2	Universidad de Málaga	6	1.0			
Universidad de Navarra	4	1.2	Universitat Oberta de Catalunya	6	1.0	CUNEF Universidad*		
Universidad de Alcalá	4	1.2	Universidad de León	6	1.0	ESIC Universidad*		
Universidad de Deusto	4	1.2	Universidad de Oviedo	6	1.0	Universidad Católica de Ávila		
U. de Santiago de Compostela	4	1.2	Universidad de Cádiz	6	1.0	Universidad del Atlántico Medio*		
Universidade de Vigo	4	1.2	Universidad de Murcia	6	1.0	Universidad Euneiz*		
Universitat de Girona	4	1.2	Universidad de Jaén	6	1.0	Universidad Europea del Atlántico*		
Universitat Ramon Llull	5	1.1	Universidad de Valladolid	6	1.0	Universidad Europea Miguel de Cervantes		
Universidad de Granada	5	1.1	Universidad de Huelva	7	0.9	Universidad Fernando Pessoa- Canarias*		
U. Miguel Hernández de Elche	5	1.1	Universidad Nebrija	7	0.9	Universidad Francisco de Vitoria		
U. Politécnica de Cartagena	5	1.1	Universidad San Pablo-CEU	7	0.9	Universidad Intercontinental de la Empresa*		
Universidad de Burgos	5	1.1	Universidad Pontificia Comillas	7	0.9	Universidad Internacional de Andalucía		
Universidad Complutense de Madrid	5	1.1	Universidad de Extremadura	7	0.9	Universidad Internacional de la Empresa*		
Universidad Pablo de Olavide	5	1.1	U. de Las Palmas de Gran Canaria	7	0.9	Universidad Internacional Isabel I de Castilla*		
Universitat Jaume I de Castellón	5	1.1	Universidad de Castilla- La Mancha	7	0.9	Universidad Internacional Menéndez Pelayo		
Universidad de Córdoba	5	1.1	Universidad de La Laguna	7	0.9	Universidad Internacional Villanueva*		
Universidad de La Rioja	5	1.1	Universidad Europea de Madrid	8	0.8	Universidad Loyola de Andalucía*		
Universitat de Lleida	5	1.1	UNED	8	0.8	Universidad Pontificia de Salamanca		
Universidad de Zaragoza	5	1.1	Mondragón Unibertsitatea	8	0.8	Universidad San Jorge		

Note: Universities are ordered from the highest to the lowest index value. Universities with the same index value are ordered alphabetically. The 18 universities listed in the last column have not been analyzed due to lack of data.

\* Universities 15 years or younger.

Source: BBVA-Ivie Foundation (U-Ranking 2023).

The cardinal and ordinal aspects of the universities that constitute notable differences are discussed below. A first aspect worth mentioning is that the range of the index from which this ranking is derived continues to show, as in previous editions, significant differences in performance among Spanish universities, with the most productive ones having results that are three times higher than those in end positions.

The leading group in U-Ranking is made up of 18 universities occupying from the first to the fourth positions (various universities share the same position), increasing their results to 20% above the national average. Among them, the first are Universidad Carlos III de Madrid, Universitat Politècnica de Catalunya and Pompeu Fabra, which share the first place, as in the previous edition. They are followed in second place by the Universitat Politècnica de València and the Universitat Autònoma de Barcelona. In third place are four other public universities: Autònoma de Madrid, Politècnica de Madrid, Universitat de Barcelona and Universitat Rovira i Virgili. Nine universities are in fourth position, with the top three private universities (IE Universidad, Navarra and Deusto), accompanied by the public universities of Cantabria, Universitat de València, Alcalá, Santiago de Compostela, Vigo and Girona.

In fifth place, still above the average, are 21 universities. Other groups of universities with similar levels of performance are: ten that share sixth place, that make up the first group below the average of the system, seven in seventh position, three others are found in eighth place, three in ninth and another three in tenth place. Five universities occupy the eleventh place which is the last place of the system to be included in the ranking, although we insist that behind these universities there may be a good number of institutions that do not appear in the ranking because they do not offer sufficient information and are marked in gray in a final box..

The eighteen universities in the top four groups are basically the same universities as in the 2022 edition<sup>20</sup>. The main changes are the drop of one position of the Universities of Navarra and Cantabria, which fall one position (from third to fourth group),

and the universities Ramon Llull and Miguel Hernández, which move from fourth to fifth place.

## 4.2. U-RANKING VOLUME

Table 4.2 shows the index and the ranking of the 71 Spanish public universities analyzed according to their volume of results (U-Ranking Volume). It differs from that of the previously discussed performance ranking because it calculates the size of each university. The volume index is justified because a small university can also have a great performance (i.e., its researchers can publish almost all of their articles in first quartile [Q1] journals), but if its size is very small, its impact on the environment and university system as a whole will be limited. In turn, a very large university may have a low performance rate (i.e., the percentage of articles published in Q1 journals is small), but if its size makes the total output bigger (the total number of published Q1 articles is higher), its total impact will be significantly relevant.

In the volume ranking there are many more different positions in the ranking because there are less universities that share the same position with others as a group. Unlike the performance ranking, in which universities are grouped in 12 levels, in U-Ranking Volume, the 71 universities analyzed are ordered in 36 different positions, indicating the greater heterogeneity in the university system in terms of the size-performance binomial, adding variability to the ranking.

As can be seen in table 4.2, in first place is the Universidad Complutense, with an index (5.6) close to one point above the second-placed Universidad de Barcelona (4.7). This in turn has an index 0.4 points higher than that of the University of Valencia (4.3), in third place. They are followed in fourth and fifth position, separated by a tenth of a point, by the universities of Granada (4.2) and Seville (4.1). The sixth position is occupied by the University of the Basque Country, and in seventh and eighth place are the polytechnics of Madrid and Valencia. The Autonomous University of Barcelona and the Polytechnic University

<sup>20</sup> In the 2022 ranking, 20 universities were placed between the first and fourth positions.

of Catalonia close the top ten positions in the volume ranking. The ten universities that occupy the first ten places are the same that in the previous edition headed the top nine positions (in 2022 two universities shared the seventh position), showing the great stability of the results. Between the eleventh and twenty-first place are 15 universities, all of which are public. The rest are shown below, most of them grouped in levels shared by at least three or more universities.

The ranking by volume shows the smaller size of private universities compared to public ones. Due to their size, they rank lower in the ranking by volume of results than in the ranking by performance. Thus, in table 4.2, it can be observed that all the private universities are located in the lower half of the list. The highest-ranking private universities in terms of volume of results when combining better results with a larger size are UOC and Universitat Ramon Llull in twenty-third place and Universidad de Navarra in twentieth place.

Table 4.2. U-Ranking Volume of Spanish universities 2023

University	Ranking	Index	University	Ranking	Index	University	Ranking	Index
Universidad Complutense de Madrid	1	5.6	Universitat Pompeu Fabra	23	1.3	Universidad Católica de Valencia	32	0.4
Universitat de Barcelona	2	4.7	Universidade da Coruña	23	1.3	Universidad Cardenal Herrera-CEU	32	0.4
Universitat de València	3	4.3	Universidad de Extremadura	23	1.3	Universidad de La Rioja	32	0.4
Universidad de Granada	4	4.2	Universidad de La Laguna	23	1.3	Vic- Universitat Central de Catalunya	32	0.4
Universidad de Sevilla	5	4.1	Universitat Oberta de Catalunya	23	1.3	Universidad Nebrija	33	0.3
Universidad del País Vasco	6	3.8	Universitat Ramon Llull	23	1.3	U. Internacional de Catalunya	33	0.3
Universidad Politécnica de Madrid	7	3.6	Universidad de Navarra	24	1.2	Mondragón Unibertsitatea	33	0.3
Universitat Politècnica de València	8	3.5	Universitat Rovira i Virgili	24	1.2	Universidad Alfonso X El Sabio	33	0.3
Universitat Autònoma de Barcelona	9	3.4	U. de Las Palmas de Gran Canaria	25	1.1	Universidad Camilo José Cela	34	0.2
Universitat Politècnica de Catalunya	10	3.3	Universitat Jaume I de Castellón	25	1.1	U. Internacional Valenciana*	34	0.2
Universidad Autónoma de Madrid	11	3.0	Universidad de Cantabria	25	1.1	Universidad A Distancia de Madrid	35	0.1
Universidad de Zaragoza	12	2.7	U. Miguel Hernández de Elche	26	1.0	IE Universidad	35	0.1
UNED	13	2.6	Universidad de Jaén	26	1.0	Universidad Europea de Valencia*	35	0.1
Universidad de Málaga	14	2.4	Universitat de Girona	26	1.0	Universidad Abat Oliba CEU	35	0.1
U. de Santiago de Compostela	14	2.4	Universitat de les Illes Balears	26	1.0	Universidad Europea de Canarias*	36	<0,1
Universidad Carlos III de Madrid	15	2.2	Universidad de Almería	26	1.0	CUNEF Universidad*		
Universidad Rey Juan Carlos	16	2.1	Universidad Pablo de Olavide	27	0.9	ESIC Universidad*		
Universidad de Murcia	16	2.1	Universidad de León	28	0.8	Universidad Católica de Ávila		
Universidad de Salamanca	17	1.9	Universitat de Lleida	28	0.8	Universidad del Atlántico Medio*		
Universidad de Alicante	17	1.9	Universidad Europea de Madrid	28	0.8	Universidad Euneiz*		
Universidad de Oviedo	18	1.8	Universidad de Deusto	29	0.7	Universidad Europea del Atlántico*		
Universidad de Castilla- La Mancha	19	1.7	Universidad Pública de Navarra	29	0.7	Universidad Europea Miguel de Cervantes		
Universidad de Valladolid	19	1.7	U. Internacional de La Rioja*	29	0.7	Universidad Fernando Pessoa- Canarias*		
Universidade de Vigo	20	1.6	Universidad de Huelva	29	0.7	Universidad Francisco de Vitoria		
Universidad de Alcalá	20	1.6	Universidad San Pablo-CEU	30	0.6	Universidad Intercontinental de la Empresa*		
Universidad de Córdoba	21	1.5	Universidad de Burgos	30	0.6	Universidad Internacional de Andalucía		
Universidad de Cádiz	22	1.4	Universidad Pontificia Comillas	30	0.6	Universidad Internacional de la Empresa*		
			U. Politécnica de Cartagena	31	0.5	Universidad Internacional Isabel I de Castilla*		
			Universidad Católica San Antonio	31	0.5	Universidad Internacional Menéndez Pelayo		
						Universidad Internacional Villanueva*		
						Universidad Loyola de Andalucía*		
						Universidad Pontificia de Salamanca		
						Universidad San Jorge		

Note: Universities are ordered from the highest to the lowest index value. Universities with the same index value are ordered alphabetically. The 18 universities listed in the last column have not been analyzed due to lack of data.

\* Universities 15 years or younger.

Source: BBVA-Ivie Foundation (U-Ranking 2023).

### 4.3. U-RANKING VOLUME VS. U-RANKING PERFORMANCE

The comparison of the above two tables indicates that the differences are substantial between U-Ranking Volume and U-Ranking, which measures performance. But both approaches can be useful, depending on the question to be answered.

The differences in the values of the indicators are much greater in the volume ranking due to the importance of size. The indicator of total results ranges from 5.6 to less than 0.1, very much wider than for the indicator of performance, which goes from 1.5 to 0.5.

Figure 4.1 combines the two types of rankings and facilitates the comparison of the position of each university in both. The results of U-Ranking Volume, which depend on the size, are shown on the vertical axis, while on the horizontal axis the results of U-Ranking, which measures the performance and corrects the effects of size, are seen.

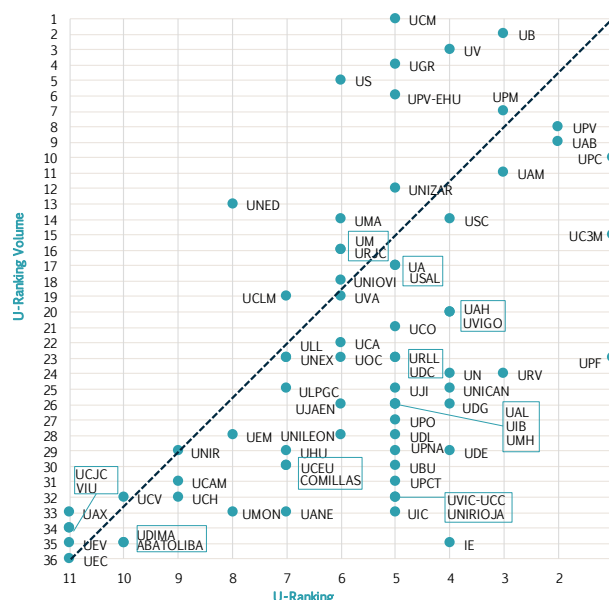
The universities are ordered from top to bottom on the first axis and from right to left on the second. In each case the scale is different, to reflect that each ranking establishes a different number of groups of universities with the same index. As can be observed, the dispersion of points in the figure is significant and reflects that there is no definite correlation between the two rankings. Therefore, size does not seem, in general, to have any defined positive or negative influence on performance.

The universities with the highest output are located in the upper part of the figure: Universidad Complutense, Universitat de Barcelona, Universidad de Granada, Universitat de València, Universidad de Sevilla, Universidad del País Vasco, Universitat Politècnica de València, Universidad Politécnica de Madrid, Universitat Autònoma de Barcelona, Universitat Politècnica de Catalunya, Universidad Autónoma de Madrid, Universidad de Zaragoza and UNED.

However, not all of these large universities show a good performance (not all are on the right side of the figure), while other smaller ones stand out in this regard and do appear on the right side. An example of the former case is UNED, a large university with a great volume of results that is placed among the top 13 universities in U-Ranking Volume. An example of the latter are Universitat Pompeu Fabra and Universidad Carlos III, which obtain the highest performance in U-Ranking, but appear in the middle of the U-Ranking Volume, as do other very productive medium- or small-sized universities such as Universitat Rovira i Virgili, Universidad de Cantabria and Universidad de Navarra.

**Figure 4.1. U-Ranking vs. U-Ranking Volume of the Spanish public universities**

#### Position in each ranking

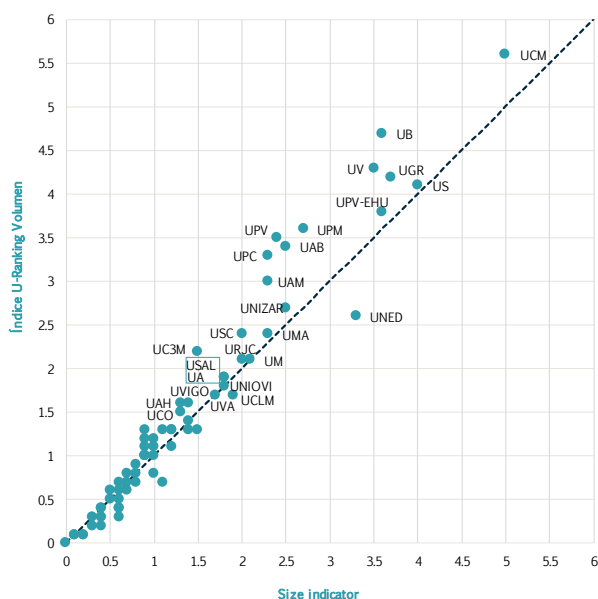


Note: See Annex 2 for a list of abbreviations.  
Source: BBVA-Ivie Foundation (U-Ranking 2023).

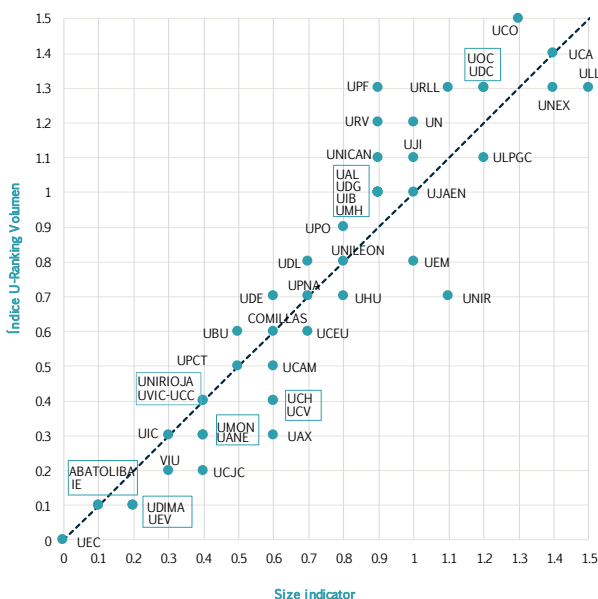


### Figure 4.2. U-Ranking Volume vs. Size indicator

a) Total



b) Universities with a U-Ranking Volume Index below 1.5



Note: The size indicator is a standard arithmetic mean of the teachers, students and budget of each university. See Annex 2 for a list of abbreviations.

Source: BBVA-Ivie Foundation (U-Ranking 2023).

In fact, examples of higher or lower performance can be found among universities of very different sizes.<sup>21</sup> Figure 4.2 shows the relationship in panel a (all the universities) and b (universities with a U-Ranking Volume index inferior to or same as 1.5) between size on the horizontal axis and the index of U-Ranking Volume for each university on the vertical axis. Those situated above the diagonal achieve results higher than the average performance, in relation to the one that corresponds according to their size.

#### 4.4. U-RANKING VS. SHANGHAI RANKING

Many universities are interested in being compared with the best in the world, thus explaining the increasing popularity attained by some international rankings. In view of the importance given to these popular references, the question arises whether U-Ranking offers different or similar results as international ones. As an external reference for comparison, we will consider the Academic Ranking of World Universities (ARWU), also known as the Shanghai Ranking, which without a doubt has become the most widely known.

Since the 2017 edition the Shanghai Ranking offers a list of the top 1,000 universities from among the more than 20,000 higher education institutions that exist in the world. In the last edition of ARWU, 40 Spanish universities (39 public and 1 private) have been included among these 1,000. ARWU presents an individual positioning system for the first 100 universities, the next 100 appear in groups shared by 50 universities (101 to 150 and 151 to 200), and from position 201 onwards the universities are grouped in sections of 100.

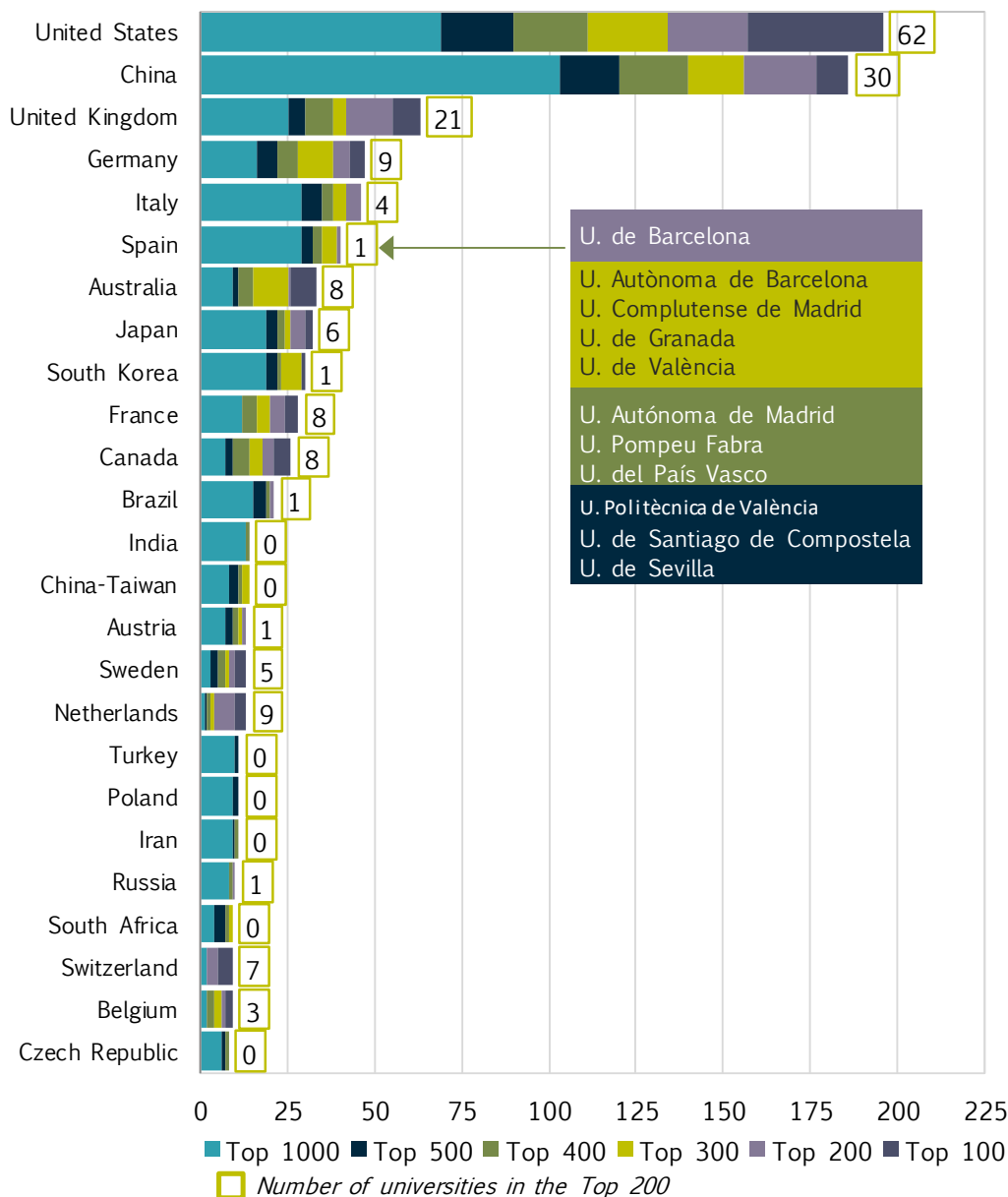
<sup>21</sup> As mentioned previously, the indicator of size is the result of calculating the standardized arithmetic mean of the number

of students, faculty members and budget of each university.

In the latest edition, as can be seen in figure 4.3, 11 Spanish universities appear in the top 500. All except one, Universitat de Barcelona, appear below the 200th place. Spain is located in the seventh position in the figure that shows the weight of the countries in the 1,000 universities of the ranking. When only the first 500 universities are considered, Spain's position improves from that perspective since, only 12% of Spanish universities are in the Top 500, but 44% appear in the ranking, that includes a total of 1,000.

The positioning system by groups published in the ranking makes it impossible to compare with U-Ranking, but it is possible to obtain an individual ranking of the 40 universities which are among the top 1,000 in the world on the basis of six standardized indicators disseminated by ARWU. Once the Spanish universities have been sorted by means of this calculation, a comparison between U-Ranking and the international ranking can be made (see figures 4.4 and 4.5).

**Figure 4.3. Spanish universities in the 2022 Shanghai Ranking**



Note: Ordered from the countries' highest to lowest number of universities in the Top 1,000.

Source: CWCU (ARWU 2022).

The results of U-Ranking Volume and Shanghai Ranking are much more similar than if we compare our two U-Rankings (performance and volume) with each other, as shown in the following figures. The reason is that ARWU uses indicators that, in general, do not minimize because of size. Only one of the six indicators it uses, with a weight of 10% in the ranking, takes into account size, that is measured by the number of full-time equivalent faculty members it has. Figure 4.4 represents on the horizontal axis the position of the Spanish universities in U-Ranking Volume and in the vertical axis, their place in the Shanghai Ranking. Regardless of the different number of levels that each ranking sets, both offer a similar order, and therefore the universities are mostly grouped around areas I and III of the figure.

The universities located in area IV of the figure have comparatively a better position in our ranking. The case of Universitat Politècnica de Catalunya stands out, occupying a clearly better position in U-Ranking Volume than in the Shanghai Ranking. The universities in area II, on the contrary, are comparatively better placed in the Shanghai Ranking. The common denominator in many cases is that these are small but more productive universities, such as Pompeu Fabra, whose greater efficiency already became apparent in the U-Ranking's measurement of performance.

In figure 4.4, the universities that are among the Top 500 of the 2022 Shanghai Ranking are highlighted with dark blue colored squares. Almost all are among the top universities in U-Ranking Volume: Universidad Complutense de Madrid, Universitat de Barcelona, Universidad de Granada, Universitat de València, Universidad del País Vasco, Universidad de Sevilla,

Universitat Politècnica de València, Universidad Autónoma de Madrid and Barcelona and Santiago de Compostela. The Universitat Pompeu Fabra has a more discreet position in U-Ranking Volume due to its smaller size. The differences with ARWU are much more substantial in the case of the U-Ranking of performance (figure 4.5) since the Shanghai Ranking scarcely corrects the indicators used to take into account size and, therefore, it is more a ranking of volume of results than of performance.<sup>22</sup>

To view the position of universities that stand out in both of the U-Rankings classifications (performance and volume) and their position in the Shanghai Ranking, the shaded area in figure 4.6 shows the fifteen universities that stand out in U-Ranking, both for their high performance and their great volume of results. The universities listed in the 2022 Shanghai Ranking are highlighted in dark blue.

The shaded area contains all the universities also highlighted by the Shanghai Ranking. On the other hand, three universities appear in prominent positions in U-Ranking (shaded area) but not in the Shanghai Top 500 of the 2022 Ranking: Universidad Carlos III and Politècnica de Madrid and Politècnica de Catalunya, which have not yet been included in the Top 500 of the international ranking, and Universidad de Zaragoza that appears between positions 501-600 in this year's edition.

To illustrate at the same time the extent to which the three rankings compared generate different groupings of the universities a Venn diagram can be used that represents the ones that form part of the first quartile in each of the classifications and the intersections among the three.

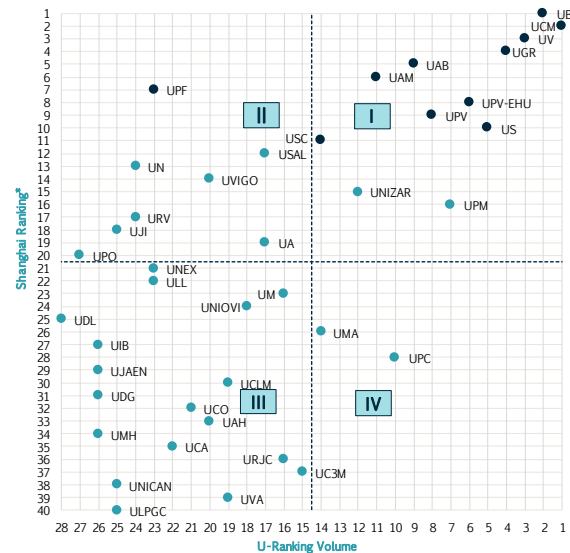
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<sup>22</sup> As an example, the Shanghai Ranking uses as an indicator of teachers' quality the number of teachers who have

received a Nobel Prize or a Fields Medal, not this number divided by the number of professors of the university.

Figure 4.4. **U-Ranking Volume vs. Shanghai Ranking**

Position in each ranking



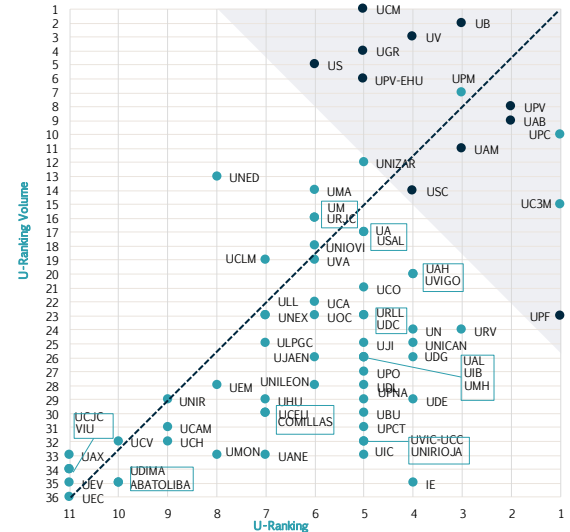
Note: Results correspond to an adaptation for 40 Spanish universities that appear in the ranking based on their score in the 5 indicators used and their relative position with respect to the university with the highest score. See Annex 2 for a list of abbreviations.

● Universities in the Shanghai Ranking Top 500 2022.

Source: BBVA-Ivie Foundation (U-Ranking 2023) and CWCU (ARW 2022).

Figure 4.6. **U-Ranking and the Spanish universities in the Top 500 of Shanghai Ranking**

Position in each ranking



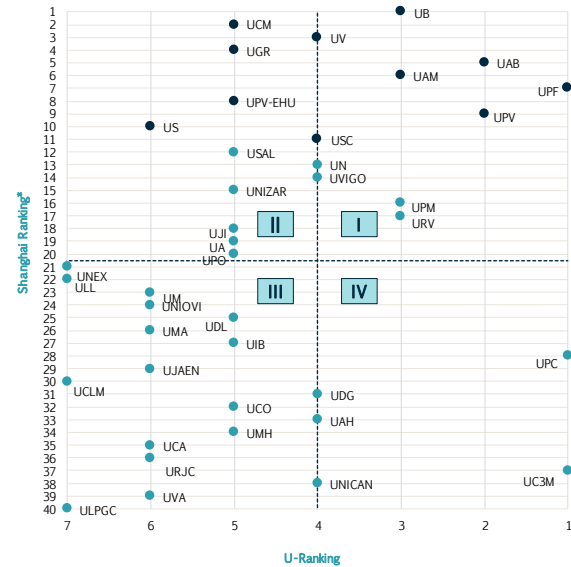
See Annex 2 for a list of abbreviations.

● Universities in the Shanghai Ranking Top 500 2022.

Source: BBVA-Ivie Foundation (U-Ranking 2023) and CWCU (ARW 2022).

Figure 4.5. **U-Ranking vs. Shanghai Ranking**

Position in each ranking

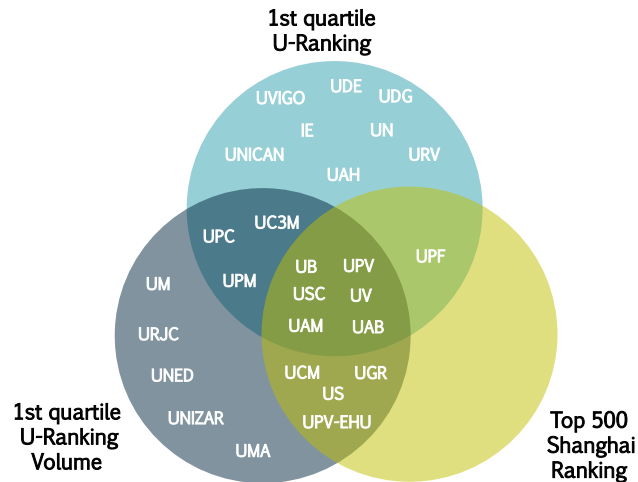


Note: Results correspond to an adaptation for 40 Spanish universities that appear in the ranking based on their score in the 5 indicators used and their relative position with respect to the university with the highest score.

● Universities in the Shanghai Ranking Top 500 2022.

Source: BBVA-Ivie Foundation (U-Ranking 2023) and CWCU (ARWU 2022)

Figure 4.7. **U-Ranking vs. Shanghai Ranking**



Note: The 11 Spanish universities in the Top 500 of the Shanghai Ranking 2022 and the first 18 universities in U-Ranking Volume and U-Ranking are included

See Annex 2 for a list of abbreviations.

Source: BBVA-Ivie Foundation (U-Ranking 2023) and CWCU (ARWU 2022).

In the middle area of the diagram (figure 4.7) appear the six universities situated in the first quartile of the three rankings, namely, Universitat de Barcelona, Universitat de València, Universitat Politècnica de València, Universidad Autónoma de Barcelona and Madrid and Universidade de Santiago de Compostela. Ten other universities are in the first quartile in two of the rankings: Universitat Pompeu Fabra, in Shanghai and U-Ranking; Universidad Complutense de Madrid, Universidad de Granada, Universidad de Sevilla and Universidad del País Vasco-EHU, in Shanghai and U-Ranking Volume; Universidad del País Vasco-EHU, and, in Shanghai and U-Ranking Volume; and the Polytechnics of Cataluña and Madrid, along with Universidad Carlos III, in U-Ranking (performance) and U-Ranking Volume. Finally, thirteen universities stand out by only one of the three criteria considered.

In sum, these results show important coincidences between the rankings when identifying the universities that stand out, but also significant differences that reflect the different approach of each ranking. It is especially interesting to observe that of the eleven Spanish universities that the Shanghai Ranking places in its Top 500, six also appear in the first quartile of our two rankings, in the intersection of the three circles of the diagram; five other ones are found in the two top positions in the ranking of performance (Universitat Pompeu Fabra, Universitat Autònoma de Barcelona and Universitat Politècnica de València) and volume (Universidad Complutense de Madrid and Universitat de Barcelona).

Therefore, it can be said that, of the eleven Spanish universities included in the Top 500 of the Shanghai Ranking, all are found in our first quartile because of their greater volume of results according to U-Ranking Volume and six among our most productive universities according to U-Ranking of performance. Consequently, our classifications, especially of volume, present a substantial harmony with those of the Shanghai Ranking, which strengthens their interest as instruments for identifying best practice and greatest impact. They also allow us to see that there may be differences in the rankings according to the perspective with which they are drawn up, but indicate that some universities are well positioned from any perspective.

The issue that arises is if the synthesis between U-Ranking Volume and Shanghai is high, what contribution does the U-Ranking project make? First, it includes the entire Spanish university system while ARWU leaves out a large part of it. If the indicators are to be used as a benchmark by the universities to identify weaknesses and strengths and to set strategic policies, U-Ranking allows this task, while ARWU does not. Also, we have seen that the ARWU approach is only volume-based, while the U-Ranking project also offers productivity analysis, which is a valuable approach to answer questions about performance. Finally, ARWU does not perform a comprehensive analysis of the dimensions of university activity, leaving aside the teaching dimension, which is present in U-Ranking.

#### 4.5. COMPARISON OF RESULTS WITH OTHER INTERNATIONAL RANKINGS

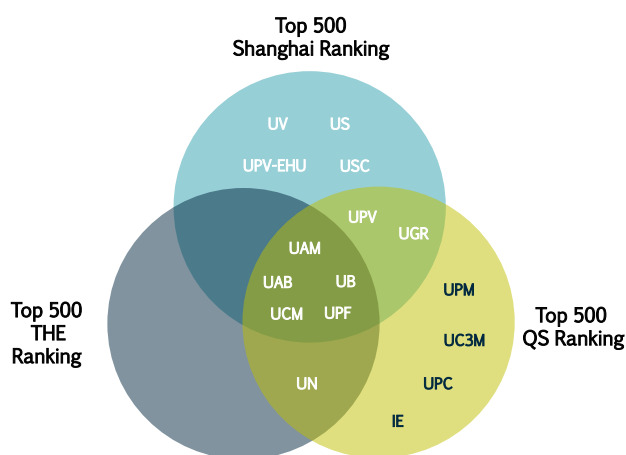
Although the Shanghai Ranking is consolidating its influence as the most cited international indicator, there exist other initiatives of high international repute, such as the Times Higher Education (THE) or the QS Ranking. The principal differences between these two and the Shanghai Ranking are that they (i) consider the role of teaching and (ii) incorporate subjective valuations based on surveys of international employers and experts. The results for the Spanish universities that appear in the three initiatives present similarities but also some differences, as shown in figure 4.8.

In the intersection of the three rankings we find five universities (Universidad Autónoma de Madrid, Universitat Autònoma de Barcelona, Universitat de Barcelona, Complutense de Madrid and Universitat Pompeu Fabra) which also appear in the top positions of our rankings and belong to the group of universities at the *frontier* of figure 4.6—that is, universities that are not dominated by hardly any other university—. If we compare the universities that appear in the international rankings mentioned in figure 4.8 with the efficient frontier of figure 4.6 for U-Ranking, only one, Universidad de Navarra, appears in more than one of the rankings, namely, QS and THE, but is not in our efficient frontier, and another, IE University, is listed in QS and is not in our efficient frontier either.



These results confirm the presence of a group of Spanish universities in the top positions our university system, regardless of the prism with which they are analyzed and that the discrepancies between our ranking and any of the well-known international rankings are not any greater than those among them.

**Figure 4.8. Comparison of the results of three international rankings. 2022-2023**



Note: See Annex 2 for a list of abbreviations.

Source: CWCU (ARWU 2022), THE (2023) and QS (2023).

## 4.6. RESEARCH VS. TEACHING: SENSITIVITY ANALYSIS

One of the biggest problems inherent to any composite indicator is the effect of the relative weight of the elements composing it. The U-Ranking methodology expressly considers that teaching and research and innovation can be regarded differently important to each user of university services. Therefore, the web tool “Choose a university” allows to draw up personalized rankings that take into account each user’s preferences in this sense.

The question posed in this section is how much the general rankings of the universities would change if the weights allocated to teaching and to research were to change. In the results presented above the weights used to calculate the rankings were those obtained by applying the Delphi method that captures the opinions of the experts who collaborated in the design of the project as well as other available information.<sup>23</sup>

Given that other experts or users of rankings may have different valuations about the weights that should be assigned to different activities, we should analyze whether the results are sensitive or not—in the latter case we will say that they are *robust*—to changes in the weights.

Would the results differ much if a greater weight was granted to research, as in other well-known rankings? Can a university occupy a high place in a ranking if the weights of teaching and research and innovation change to better suit its strengths? The answers to these questions are important in assessing whether the results of a ranking are reliable, in other words, if they are oversensitive to the arbitrary nature of the weight assigned to research or any other university activity. As we shall see, the answer to each question is very different.

Most rankings place great emphasis on research because the information on the results of this activity is abundant and seems more precise and reliable. This bias tendency, based on the “use of what can be measured”, is attempted to be minimized by arguing that teaching and research are highly correlated. However, this hypothesis has barely been tested due to a lack of indicators of teaching results or lack of consensus on which most appropriately reflect an institution’s quality of life. Thus, studying the sensitivity of the rankings to changes in the weight of teaching and research and innovation is not an easy task, but allows us to analyze whether the results of universities in both activities are indeed correlated or whether these

<sup>23</sup> The weights used are 56% for teaching, 34% for research and 10% for innovation and technological development. The weights were established on the basis of the opinion of the experts consulted and agree practically with the distribution of resources among the teaching and research activities in the universities’ budgets. It also reflects an intensity of

research activity in accordance with the results of the Spanish universities: if we consider that in the top universities of the world by their research results these activities had a weight of 85-90%, the corresponding figure for the Spanish universities would be 35%.

one-dimensional rankings offer a partial view that should be recognized.

The fact that research dimension is easier to measure should not be an excuse to not measure quality of teaching. Likewise, the existence of a positive correlation between the quality of teaching and that of research should not hide the fact that disparity is also possible: if for the same level of research quality there are different teaching results between two universities, ignoring this information biases the results in favor of one and against the other. This fact becomes more evident since there is a strong disparity in the importance attributed to research by universities in the Spanish University System depending on whether they are public or private, and other features, such as their age, location or strategies..

To value the effect of the selection of the weights given to teaching and to research and innovation we performed an analysis of sensitivity to their variations on the ranking of performance. We calculated three rankings that are differentiated by the very different relative weights of research and of teaching and innovation:

- Option 1: Teaching 30% / Research and innovation 70%
- Option 2: Teaching 70% / Research and innovation 30%
- U-Ranking 2022: Teaching 56% / Research and innovation 44%

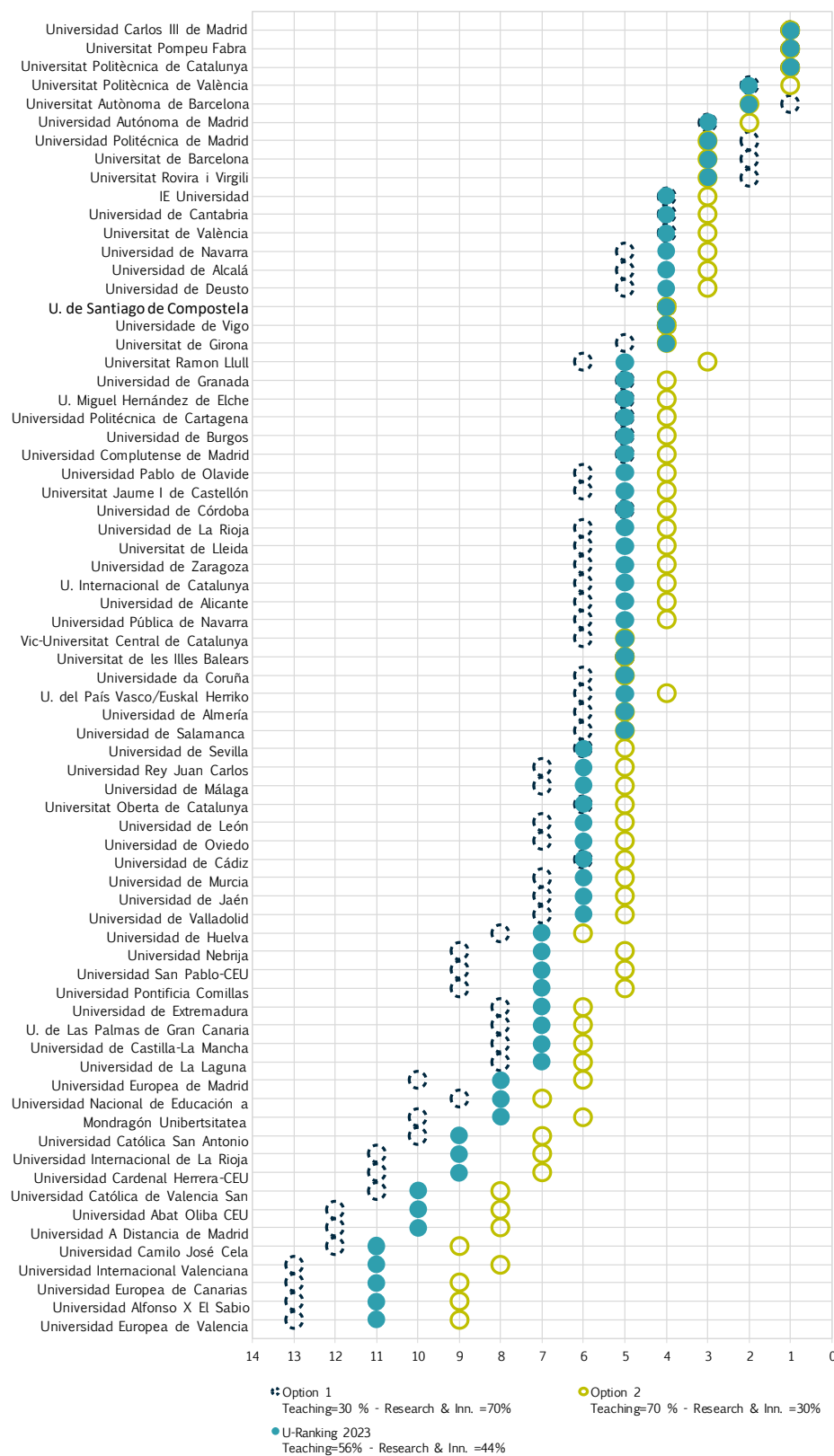
Figure 4.9 shows the effect on the position in the ranking of each of Spain's 71 universities analyzed when the weight of research and innovation varies, according to the three weightings chosen.

The changes in position in the ranking are visible by right to left movements of the solid-colored circle that represents the position with the weights of U-Ranking 2022, which corresponds to the third option, are characterized by:

- If the weight of research and innovation were to increase to 70% (option 1), the gaps in the results would widen, generating 13 levels in the ranking instead of the current 12, but the maximum variations of a university would be in general 2 places. The main pattern of these changes is that the worsening in the ranking is more intense among private universities, since they are institutions with less research activity. From the 23 private universities, 13 would fall 2 places, 8 would fall 1 place and 2 would not vary. In the case of public universities, the variations would be much more moderate, since 18 universities maintain their position and 26 go down one place. The increase in the weight of research imply improvements in one position for 4 universities..
- On the other hand, if the weight given to research and innovation were reduced to 30% (option 2), there would be only a few improvements in position. Note that the ranking generates 12 levels, instead of 9, because, as will be explained in section 4.7, the differences in teaching performance are less than the differences in research performance. As the weight given to teaching increases, the number of groups decreases. Thus, 56 of the 71 universities would improve at least one position, including all the private ones, except Vic-UCC which stays the same, given their higher degree of teaching specialization. One private universities, Universidad Internacional Valenciana (VIU)—would improve 3 places, limiting the majority of the rest of to an improvement of 2 places. Public universities that improve their position would rise 1 place at the most.

These result reveals a pattern of sensitivity of the ranking to changes in weights: because of their high degree of specialization in teaching, private universities are much more sensitive than public universities to increases in the weight of research and innovation.

Figure 4.9. **Evolution of U-Ranking according to variations in the weight of research and innovation**



Note: Universities are ordered by their position in the global performance ranking with the following weights: 56/44

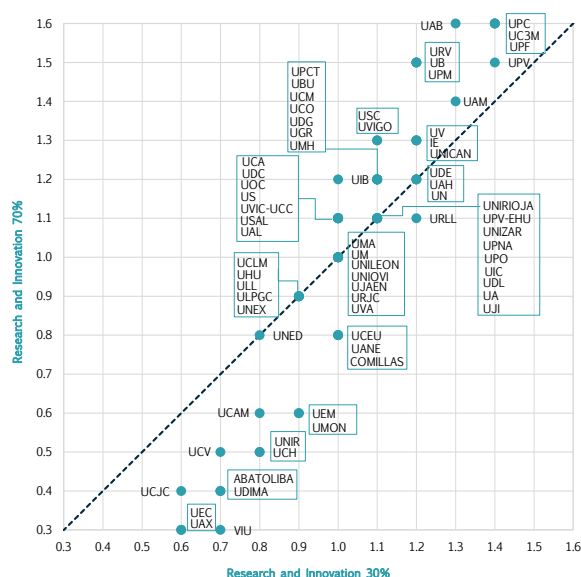
Source: BBVA-Ivie Foundation (U-Ranking 2023).

Thus, the rankings are sensitive to changes in the weights given to teaching and to research and innovation, if we compare weightings as different as those corresponding to our options 1 and 2. However, a university does not pass from the top places to the bottom ones no matter how substantial the changes in the weights may be, although, it is true that some can improve in the ranking if greater importance is accorded to teaching or research. In U-Ranking, we have been able to verify how radical changes in the weights never generate variations in more than two positions, except for the three positions of a single university, VIU, by greatly reducing the weight of research.

We must consider that, as with any type of measuring instrument, the sensitivity to changes is desirable. If the instrument is insensitive to very significant changes in the weights that reflect a different attribution of importance to different factors, it would not be useful if it does not react to changes, it cannot be expected to react to changes in indicator levels, which is what makes a university better or worse in the ranking. In this sense, U-Ranking proves to be tolerant to moderate changes in the weights, but reacts to significant changes.

Figure 4.10. **U-Ranking for two different weights in research**

### Weights of Teaching / Research and Innovation: 70/30 vs. 30/70. Index



Note: See Annex 2 for a list of abbreviations.

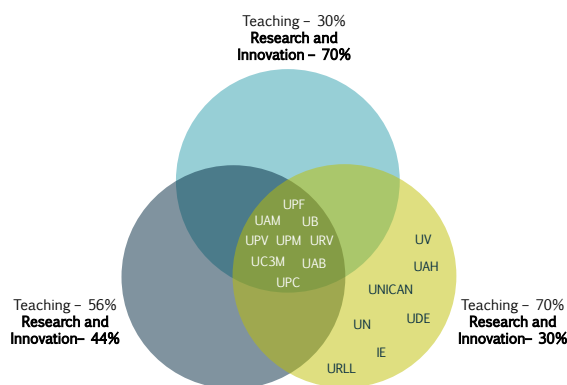
Source: BBVA-Ivie Foundation (U-Ranking 2023).

If instead of focusing on the analysis of sensitivity of the ranking, in other words, in the positions of the universities, we consider the values of the index by which U-Ranking is obtained, we observe that their stability when changing the weights of teaching and research and innovation is also notable. Figure 4.10 presents the synthetic indicator from which U-Ranking is derived for research and innovation weights of 30% (horizontal axis) and 70% (vertical axis). It shows that a drastic change in the weights would cause an increase of only three decimal points for Universitat Autònoma de Barcelona, Universitat Rovira I Virgili, Universitat de Barcelona and Universidad Politécnica de Madrid improving their index. In the opposite direction, if the index were to worsen, several universities would fall by four decimal points: Universidad Internacional de Valencia (VIU), and three decimal points for eight private universities: Universidad Europea de Madrid, Universidad Europea de Canarias, UDIMA, Universidad Alfonso X El Sabio, Abat Oliba CEU, Mondragón, UNIR and Universidad Cardenal Herrera.

To offer another sample of the stability of the groups of universities, the Venn diagram in figure 4.11 presents the results of the U-Ranking for the three weights described above. Based upon the value of the index, each circle contains the dominant universities. Looking at the diagram we see that changing the weights does not alter the index so much as to cause the appearance or disappearance of universities in those top positions. In fact, once again there is a group of leading universities in Spain that have maintained these positions regardless of the approach adopted in the analysis. When more weight is given to teaching, reducing the importance of research, seven universities - Universitat de València, Universidad de Alcalá, Deusto, IE Universidad, Cantabria, Navarra and Ramon Llull- share the top three positions with the nine universities in the intersection.

**Figure 4.11. Effects of the change in the weight given to research in U-Ranking on the top-ranking universities**

**Top universities according to different weights given**



Note: The universities that occupy the first 3 positions in each option are included (9 first universities when the weight of Research and Innovation is 70% or 40% and 16 when it is 30%).

See Annex 2 for a list of abbreviations.

Source: BBVA-Ivie Foundation (U-Ranking 2023).

## 4.7. TEACHING AND RESEARCH AND INNOVATION RANKINGS

The methodology used constructs indicators with the results of the universities in teaching and research and innovation, which are then aggregated to draw up the two global rankings presented (U-Ranking and U-Ranking Volume). The partial results for each university in each of the two dimensions can be arranged in order to obtain a *teaching ranking* and a *research and innovation ranking*. Each of them can be calculated according to both variants: volume of results and performance. This is a different way to consider whether universities are different in their teaching and research and innovative performance, without entering a debate on the importance of both types of activities.

Figure 4.12 shows by means of *box plots* the distribution corresponding to the indices of the different dimensions and the global index of a university in the case of performance (panel a) and volume of results (panel b). It shows the distributions

for the university system as a whole and for public vs. private universities. The extremes of the green lines represent the maximum and minimum values reached by the indices in each dimension and define the range of variation of the index; the top of the central box indicates the 75% percentile and the 25% percentile is marked by the bottom of the box, so that between them is situated 50% of the distribution (interquartile range). The border between the two parts of the box defines the median value. From the comparative analysis of the panels, four essential features stand out:

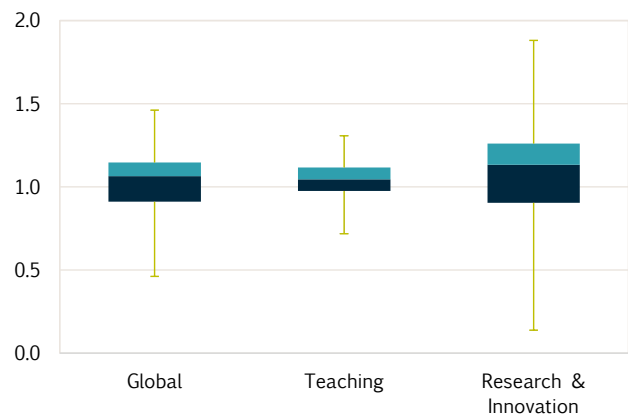
- The differences between public universities are much greater if their volume of results is analyzed instead of their performance. This feature is observed in both dimensions, but is greater in research and innovation activities than in teaching. Given the total weight of public universities in the university system, this pattern applies to the average of the system.
- In private universities, since they all have a smaller size, the situation is the opposite, and the volume index has much greater homogeneity than the performance index. The heterogeneity of performance is superior in research activities.
- Differences in performance are greater in general in research than in teaching for both public and private universities. The range of the teaching index is 0.6 points and 1.8 for research. This result is important because it makes research the main discriminating factor in U-Ranking positions.
- The median for the total number of universities in the distribution of the indices is 1 (see figure 4.12, panels a1 and b1). However, when we analyze private universities (figure 4.12, panels a3 and b3), we clearly observe the difference that exists in specialization to which we have been making reference. Fixing our attention on the indices of performance, the median is higher than the average of the system in teaching and, meanwhile, it is half in research and innovation.



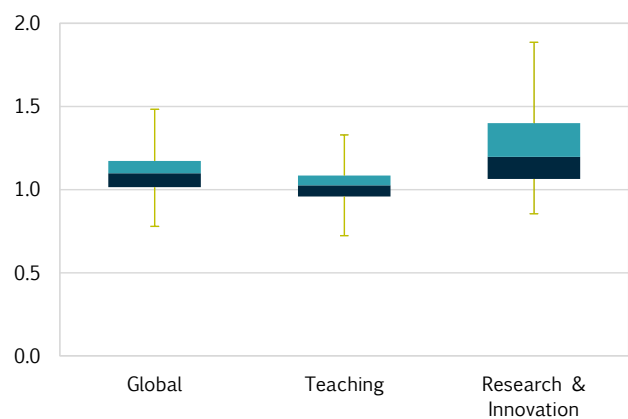
Figure 4.12. **U-Ranking. Distribution of the indices obtained in each dimension**

a) U-Ranking (performance)

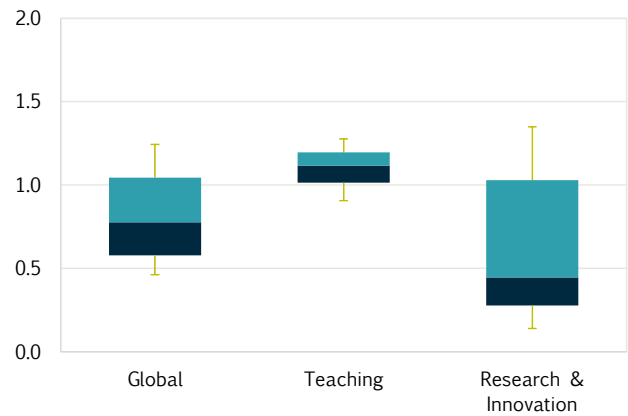
a1. Total universities



a2. Public universities

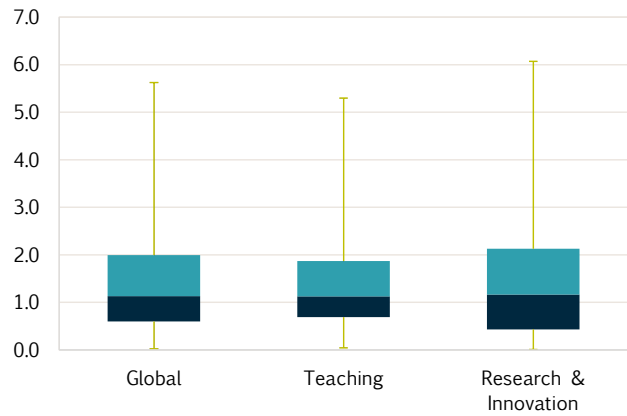


a3. Private universities

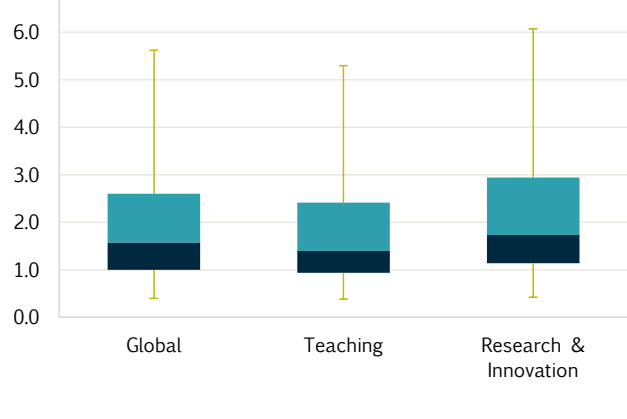


b) U-Ranking Volume

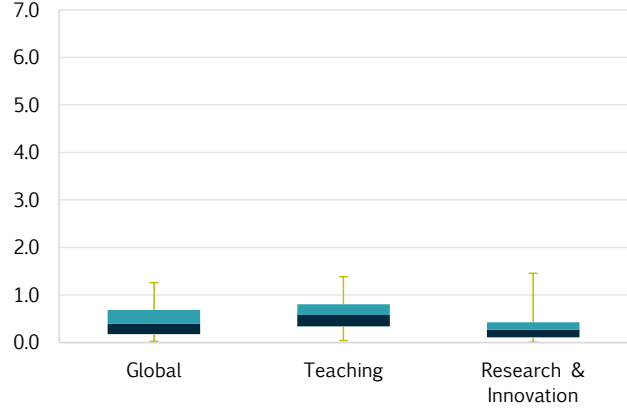
b1. Total universities



b2. Public universities



b3. Private universities



Source: BBVA-Ivie Foundation (U-Ranking 2023).

**Table 4.3. Correlation coefficients of the indices and rankings for each dimension**

	Index	Ranking
Total universities	0.08	0.16
Public universities	0.73	0.70
Private universities	0.13	0.11

Note: The ranking values are calculated by means of a Spearman correlation coefficient and the index values by means of a Pearson correlation coefficient..

Source: BBVA-Ivie Foundation (U-Ranking 2023).

Table 4.3 shows the coefficients of correlation between performance indexes and positions in teaching and research and innovation rankings. Once again, we can observe that the behavior is different depending on whether a university is private or public. While the correlation is high and fairly homogeneous among dimensions in public universities, in private universities it is found at 0.1, and takes a lower value than in previous editions for universities with this type of ownership, showing an increasing gap in the performance of this type of activities in private universities<sup>24</sup>.

These results suggest that complementarity exists among teaching and research activities, but it is much higher in public universities than in private ones. If the university system as a whole is analyzed, the existence of groups of institutions with different characteristics that result from the coexistence of private and public institutions cannot be ignored, as analyzed by Aldás (dir.) (2016). If we did, it could lead to biases in the analysis of the reality of the university system.

A validation of these differences can be obtained by checking if the hypothesis that research results can predict correctly those of teaching is true or not, this being the assumption of many rankings that concentrate exclusively on the research dimension. Therefore, the rates of performance in research and innovation are represented against the rates of performance in teaching (figure 4.13, panel a). We can see that the

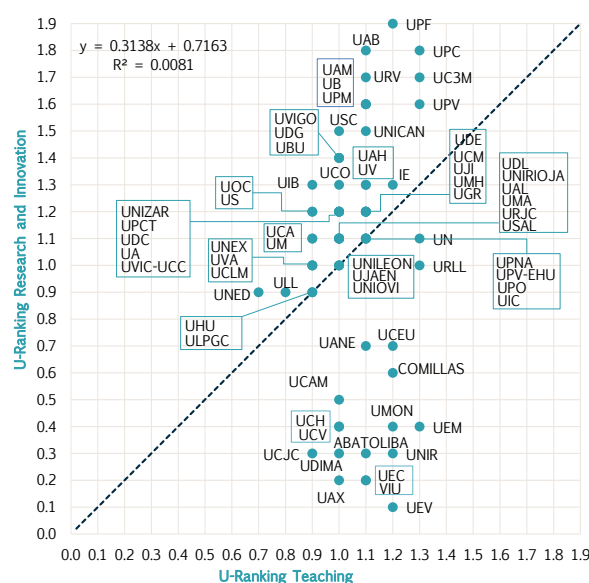
observations are grouped vertically and the relationship is practically insignificant as confirmed by the coefficient of determination of the regression line not reaching 1%.

This result is important because many rankings exclusively analyze the research work carried out by the institutions, assuming that good results in the latter imply good results in the former, when this is not the case. Hence the importance of using a multidimensional configuration for rankings, as done in U-Ranking.

If we examine the universities by type of ownership and focus the analysis mainly on the public system (figure 4.13, panel b), the adjustment between the synthetic indices of teaching and research and innovation improves and reaches a coefficient of determination of 0.53, giving evidence of stronger relationship than in the private system but, in any case, limited.

**Figure 4.13. U-Ranking. Teaching vs. Research**

#### a) Public and private universities

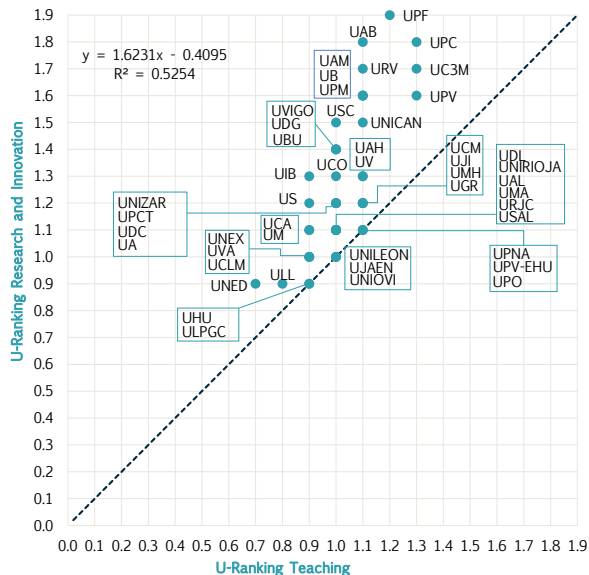


<sup>24</sup> In the correction of this trend, it seems to be understood the reinforcement of the requirement of the development of a minimum of research activity that marks the recent Royal Decree 640/2021, of July 27, on the creation, recognition and authorization of universities and university centers, and institutional accreditation of university centers

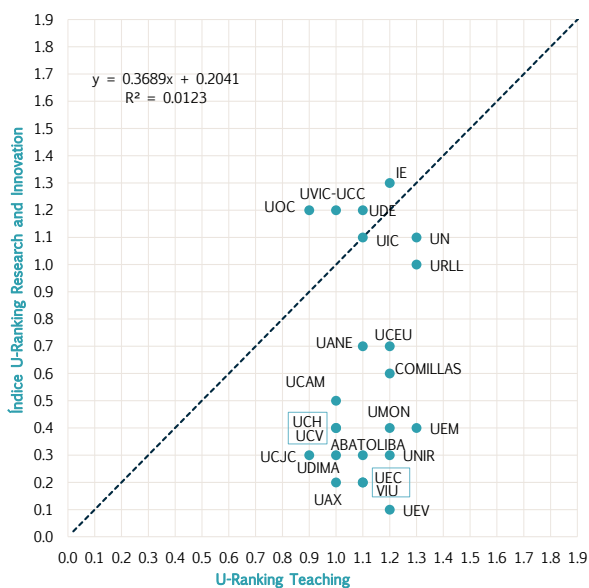
that, in its article 6, establishes the obligation of a research plan, with details of research groups and resources as well as a minimum investment in these tasks of 5% of the budget, as well as a minimum investment in these tasks of 5% of the budget.

Figure 4.13. (Cont.) **U-Ranking. Teaching vs. Research**

b) **Public universities**



c) **Private universities**



Note: See Annex 2 for a list of abbreviations.

Source: BBVA-Ivie Foundation (U-Ranking 2023).

If we examine the universities by type of ownership and focus the analysis mainly on the public system (figure 4.13, panel b), the adjustment between the synthetic indices of teaching and research and

innovation improves and reaches a coefficient of determination of 0.53, giving evidence of stronger relationship than in the private system but, in any case, limited.

In the subset of private universities, the relationship is even smaller than for the overall system (figure 4.13, panel c). The graph allows us to segment the universities of this type into two groups which, with similar teaching performance, show important differences in research performance, being higher in universities such as IE University, Navarra, Ramon Llull, Deusto, UIC, UOC or UVIC-UCC.

Finally, after describing the results of the rankings of teaching and research and innovation, tables 4.4 to 4.7 present in detail the results of the rankings for each of the dimensions drawn up for all Spanish universities (U-Ranking of teaching and research and innovation and U-Ranking Volume for each of the aforesaid dimensions). In the performance ranking a well-defined pattern of teaching specialization of private universities can be seen: all improve when comparing their position in teaching ranking with the global ranking and worsen when considering the research ranking. That pattern is also shown in panel c of figure 4.13: almost all the private universities are located below the diagonal. This is because their research rate is lower than their teaching rate (the only exceptions being IE Universidad, Universitat Oberta de Catalunya, Universidad de Deusto and Universitat de Vic-Universitat Central de Catalunya, which have a research index that is higher than the teaching index). On the other hand, the opposite happens among public universities in all of the cases.

If we focus on the analysis of teaching performance, Table 4.4 shows six universities that take the lead, three are public (Universitat Politècnica de València, Universidad Carlos III de Madrid and Universitat Politècnica de Catalunya) and three private: Europea de Madrid, Navarra and Ramon Llull. As can be seen in table 4.5, which analyzes research performance, there are no private university among the 11 that occupy the first five places of this ranking, which is led by the Universitat Pompeu Fabra in first place, followed in second place by Universitat Autònoma de Barcelona and Universitat Politècnica de Catalunya.

Table 4.4. U-Ranking of Spanish universities 2023. Teaching

University	Ranking	Index	University	Ranking	Index	University	Ranking	Index
Universitat Politècnica de València	1	1.3	U. Miguel Hernández de Elche	3	1.1	Universidad Camilo José Cela	5	0.9
Universidad Carlos III de Madrid	1	1.3	Universidad de Cantabria	3	1.1	Universidad de Valladolid	5	0.9
Universidad Europea de Madrid	1	1.3	Universitat Jaume I de Castellón	3	1.1	Universitat de les Illes Balears	5	0.9
Universidad de Navarra	1	1.3	Universidad del País Vasco	3	1.1	Universidad de Huelva	5	0.9
Universitat Ramon Llull	1	1.3	Universidad de La Rioja	4	1.0	U. de Las Palmas de Gran Canaria	5	0.9
Universitat Politècnica de Catalunya	1	1.3	Universitat de Lleida	4	1.0	Universidad de Sevilla	5	0.9
U. Internacional de La Rioja*	2	1.2	Universidad Politécnica de Cartagena	4	1.0	Universidad de Murcia	5	0.9
Universidad Pontificia Comillas	2	1.2	Universidad Católica San Antonio	4	1.0	Universitat Oberta de Catalunya	5	0.9
Mondragón Unibertsitatea	2	1.2	Universidad Cardenal Herrera- CEU	4	1.0	Universidad de Cádiz	5	0.9
Universidad Europea de Valencia*	2	1.2	Universidad de Zaragoza	4	1.0	Universidad de Extremadura	5	0.9
Universitat Pompeu Fabra	2	1.2	Universidad de León	4	1.0	Universidad de Castilla- La Mancha	5	0.9
Universidad San Pablo- CEU	2	1.2	Universidad de Alicante	4	1.0	Universidad de La Laguna	6	0.8
IE Universidad	2	1.2	Universidad de Almería	4	1.0	UNED	7	0.7
Universidad Autónoma de Madrid	3	1.1	Universidad de Oviedo	4	1.0	CUNEF Universidad*		
Universitat de València	3	1.1	Universitat de Girona	4	1.0	ESIC Universidad*		
Universidad de Deusto	3	1.1	Universidad Alfonso X El Sabio	4	1.0	Universidad Católica de Ávila		
Universidad Nebrija	3	1.1	Vic- Universitat Central de Catalunya	4	1.0	Universidad del Atlántico Medio*		
Universidad de Alcalá	3	1.1	Universidad de Salamanca	4	1.0	Universidad Euneiz*		
Universidad Politécnica de Madrid	3	1.1	Universidad A Distancia de Madrid	4	1.0	Universidad Europea del Atlántico*		
U. Internacional Valenciana*	3	1.1	Universidad Católica de Valencia	4	1.0	Universidad Europea Miguel de Cervantes		
U. Internacional de Catalunya	3	1.1	Universidad Rey Juan Carlos	4	1.0	Universidad Fernando Pessoa- Canarias*		
Universitat de Barcelona	3	1.1	Universidad de Córdoba	4	1.0	Universidad Francisco de Vitoria		
Universidad Pablo de Olavide	3	1.1	Universidad de Jaén	4	1.0	Universidad Intercontinental de la Empresa*		
Universitat Autònoma de Barcelona	3	1.1	Universidad de Burgos	4	1.0	Universidad Internacional de Andalucía		
Universidad de Granada	3	1.1	Universidade de Vigo	4	1.0	Universidad Internacional de la Empresa*		
Universidad Pública de Navarra	3	1.1	U. de Santiago de Compostela	4	1.0	Universidad Internacional Isabel I de Castilla*		
Universidad Europea de Canarias*	3	1.1	Universidad de Málaga	4	1.0	Universidad Internacional Menéndez Pelayo		
Universidad Abat Oliba CEU	3	1.1	Universidade da Coruña	4	1.0	Universidad Internacional Villanueva*		
Universitat Rovira i Virgili	3	1.1				Universidad Loyola de Andalucía*		
Universidad Complutense de Madrid	3	1.1				Universidad Pontificia de Salamanca		
						Universidad San Jorge		

Table 4.5. U-Ranking of Spanish universities 2023. Research and Innovation

University	Ranking	Index	University	Ranking	Index	University	Ranking	Index
Universitat Pompeu Fabra	1	1.9	Universitat de Lleida	9	1.1	U. Internacional de La Rioja*	16	0.3
Universitat Autònoma de Barcelona	2	1.8	Universidad de La Rioja	9	1.1	Universidad A Distancia de Madrid	16	0.3
Universitat Politècnica de Catalunya	2	1.8	Universidad de Cádiz	9	1.1	Universidad Abat Oliba CEU	16	0.3
Universidad Carlos III de Madrid	3	1.7	Universidad de Salamanca	9	1.1	Universidad Camilo José Cela	16	0.3
Universitat Rovira i Virgili	3	1.7	Universidad de Navarra	9	1.1	U. Internacional Valenciana*	17	0.2
Universitat Politècnica de València	4	1.6	Universidad de Almería	9	1.1	Universidad Alfonso X El Sabio	17	0.2
Universitat de Barcelona	4	1.6	Universidad Pablo de Olavide	9	1.1	Universidad Europea de Canarias*	17	0.2
Universidad Politécnica de Madrid	4	1.6	Universidad de Málaga	9	1.1	Universidad Europea de Valencia*	18	0.1
Universidad Autónoma de Madrid	4	1.6	Universidad de Murcia	9	1.1			
Universidad de Cantabria	5	1.5	Universidad del País Vasco	9	1.1	CUNEF Universidad*		
U. Santiago de Compostela	5	1.5	Universidad Pública de Navarra	9	1.1	ESIC Universidad*		
Universidade de Vigo	6	1.4	Universidad Rey Juan Carlos	9	1.1	Universidad Católica de Ávila		
Universitat de Girona	6	1.4	U. Internacional de Catalunya	9	1.1	Universidad del Atlántico Medio*		
Universidad de Burgos	6	1.4	Universidad de Valladolid	10	1.0	Universidad Euneiz*		
IE Universidad	7	1.3	Universitat Ramon Llull	10	1.0	Universidad Europea del Atlántico*		
Universitat de València	7	1.3	Universidad de León	10	1.0	Universidad Europea Miguel de Cervantes		
Universidad de Alcalá	7	1.3	Universidad de Oviedo	10	1.0	Universidad Fernando Pessoa- Canarias*		
Universitat de les Illes Balears	7	1.3	Universidad de Jaén	10	1.0	Universidad Francisco de Vitoria		
Universidad de Córdoba	7	1.3	Universidad de Castilla- La Mancha	10	1.0	Universidad Intercontinental de la Empresa*		
U. Politécnica de Cartagena	8	1.2	Universidad de Extremadura	10	1.0	Universidad Internacional de Andalucía		
Universidad de Deusto	8	1.2	Universidad de La Laguna	11	0.9	Universidad Internacional de la Empresa*		
U. Miguel Hernández de Elche	8	1.2	Universidad de Huelva	11	0.9	Universidad Internacional Isabel I de Castilla*		
Universidade da Coruña	8	1.2	U. de Las Palmas de Gran Canaria	11	0.9	Universidad Internacional Menéndez Pelayo		
Universidad Complutense de Madrid	8	1.2	UNED	11	0.9	Universidad Internacional Villanueva*		
Universidad de Granada	8	1.2	Universidad Nebrija	12	0.7	Universidad Loyola de Andalucía*		
Vic- Universitat Central de Catalunya	8	1.2	Universidad San Pablo- CEU	12	0.7	Universidad Pontificia de Salamanca		
Universitat Oberta de Catalunya	8	1.2	Universidad Pontificia Comillas	13	0.6	Universidad San Jorge		
Universidad de Zaragoza	8	1.2	Universidad Católica San Antonio	14	0.5			
Universidad de Sevilla	8	1.2	Mondragón Unibertsitatea	15	0.4			
Universidad de Alicante	8	1.2	Universidad Europea de Madrid	15	0.4			
Universitat Jaume I de Castellón	8	1.2	Universidad Cardenal Herrera- CEU	15	0.4			
			Universidad Católica de Valencia	15	0.4			

Note: Universities are ordered from the highest to the lowest index value. Universities with the same index value are ordered alphabetically. The 14 universities listed in the last column have not been analyzed due to lack of data.

\*Universities 15 years or younger.

Source: BBVA-Ivie Foundation.

Table 4.6. U-Ranking Volume of Spanish universities 2023. Teaching

University	Ranking	Index	University	Ranking	Index	University	Ranking	Index
Universidad Complutense de Madrid	1	5.3	Universidad de La Laguna	20	1.2	Universidad Nebrija	28	0.4
Universidad de Granada	2	4.0	Universidad Europea de Madrid	20	1.2	Universidad de La Rioja	28	0.4
Universitat de Barcelona	2	4.0	Universidade da Coruña	20	1.2	Vic - Universitat Central de Catalunya	28	0.4
Universitat de València	3	3.9	U. de Las Palmas de Gran Canaria	20	1.2	U. Internacional de Catalunya	28	0.4
Universidad del País Vasco	4	3.8	Universitat Oberta de Catalunya	21	1.1	U. Internacional Valenciana*	29	0.3
Universidad de Sevilla	5	3.7	Universitat Pompeu Fabra	21	1.1	Universidad Camilo José Cela	29	0.3
Universitat Politècnica de València	6	3.2	Universitat Jaume I de Castellón	21	1.1	Universidad A Distancia de Madrid	30	0.2
Universidad Politécnica de Madrid	7	3.0	Universitat Rovira i Virgili	22	1.0	Universidad Europea de Valencia*	30	0.2
Universitat Politècnica de Catalunya	8	2.8	Universidad de Jaén	22	1.0	IE Universidad	31	0.1
Universitat Autònoma de Barcelona	9	2.7	U. Miguel Hernández de Elche	23	0.9	Universidad Abat Oliba CEU	31	0.1
Universidad Autónoma de Madrid	10	2.6	Universidad de Cantabria	23	0.9	Universidad Europea de Canarias*	32	<0,1
Universidad de Zaragoza	10	2.6	Universidad de Almería	23	0.9	CUNEF Universidad* ESIC Universidad* Universidad Católica de Ávila Universidad del Atlántico Medio* Universidad Euneiz* Universidad Europea del Atlántico* Universidad Europea Miguel de Cervantes Universidad Fernando Pessoa- Canarias* Universidad Francisco de Vitoria Universidad Intercontinental de la Empresa* Universidad Internacional de Andalucía Universidad Internacional de la Empresa* Universidad Internacional Isabel I de Castilla* Universidad Internacional Menéndez Pelayo Universidad Internacional Villanueva* Universidad Loyola de Andalucía* Universidad Pontificia de Salamanca Universidad San Jorge		
UNED	11	2.4	Universidad Pablo de Olavide	23	0.9			
Universidad de Málaga	12	2.3	Universitat de Girona	23	0.9			
Universidad Rey Juan Carlos	13	2.0	Universitat de les Illes Balears	24	0.8			
U. de Santiago de Compostela	13	2.0	Universidad San Pablo- CEU	24	0.8			
Universidad Carlos III de Madrid	14	1.9	Universidad de León	24	0.8			
Universidad de Murcia	14	1.9	Universidad Pontificia Comillas	24	0.8			
Universidad de Salamanca	15	1.8	Universidad Pública de Navarra	25	0.7			
Universidad de Alicante	15	1.8	Universitat de Lleida	25	0.7			
Universidad de Oviedo	15	1.8	Universidad de Deusto	25	0.7			
Universidad de Valladolid	16	1.6	Universidad de Huelva	25	0.7			
Universidad de Castilla- La Mancha	16	1.6	Universidad Católica San Antonio	25	0.7			
Universidad de Alcalá	17	1.5	Universidad Católica de Valencia	26	0.6			
Universitat Ramon Llull	18	1.4	Universidad Cardenal Herrera- CEU	26	0.6			
Universidade de Vigo	19	1.3	Universidad Alfonso X El Sabio	26	0.6			
U. Internacional de La Rioja*	19	1.3	Universidad de Burgos	27	0.5			
Universidad de Córdoba	19	1.3	Mondragón Unibertsitatea	27	0.5			
Universidad de Navarra	19	1.3	U. Politécnica de Cartagena	27	0.5			
Universidad de Cádiz	19	1.3						
Universidad de Extremadura	19	1.3						

Table 4.7. U-Ranking Volume of Spanish universities 2023. Research and Innovation

University	Ranking	Index	University	Ranking	Index	University	Ranking	Index
Universidad Complutense de Madrid	1	6.1	Universidad de La Laguna	21	1.4	Universidad Cardenal Herrera- CEU	33	0.2
Universitat de Barcelona	2	5.9	Universidad de Extremadura	21	1.4	Universidad Católica de Valencia	33	0.2
Universidad de Sevilla	3	4.7	Universidad de Cantabria	22	1.3	Mondragón Unibertsitatea	33	0.2
Universitat de València	3	4.7	Universitat de Girona	23	1.2	IE Universidad	34	0.1
Universitat Autònoma de Barcelona	4	4.5	Universidad de Navarra	23	1.2	Universidad Alfonso X El Sabio	34	0.1
Universidad de Granada	4	4.5	Universitat Jaume I de Castellón	23	1.2	Universidad Camilo José Cela	34	0.1
Universidad Politécnica de Madrid	5	4.4	Universitat de les Illes Balears	23	1.2	Universidad A Distancia de Madrid	34	0.1
Universitat Politècnica de Catalunya	6	4.0	Universitat Ramon Llull	24	1.1	U. Internacional Valenciana*	34	0.1
Universitat Politècnica de València	6	4.0	U. de Las Palmas de Gran Canaria	24	1.1	Universidad Abat Oliba CEU	35	<0,1
Universidad del País Vasco	7	3.9	U. Miguel Hernández de Elche	24	1.1	Universidad Europea de Valencia*	35	<0,1
Universidad Autónoma de Madrid	8	3.6	Universidad de Almería	25	1.0	Universidad Europea de Canarias*	35	<0,1
U. de Santiago de Compostela	9	3.0	Universidad de Jaén	25	1.0	CUNEF Universidad* ESIC Universidad* Universidad Católica de Ávila Universidad del Atlántico Medio* Universidad Euneiz* Universidad Europea del Atlántico* Universidad Europea Miguel de Cervantes Universidad Fernando Pessoa- Canarias* Universidad Francisco de Vitoria Universidad Intercontinental de la Empresa* Universidad Internacional de Andalucía Universidad Internacional de la Empresa* Universidad Internacional Isabel I de Castilla* Universidad Internacional Menéndez Pelayo Universidad Internacional Villanueva* Universidad Loyola de Andalucía* Universidad Pontificia de Salamanca Universidad San Jorge		
Universidad de Zaragoza	10	2.9	Universidad Pablo de Olavide	26	0.9			
UNED	11	2.8	Universitat de Lleida	27	0.8			
Universidad de Málaga	12	2.6	Universidad de León	27	0.8			
Universidad Carlos III de Madrid	13	2.5	Universidad de Deusto	27	0.8			
Universidad de Murcia	14	2.2	Universidad Pública de Navarra	28	0.7			
Universidad Rey Juan Carlos	14	2.2	Universidad de Burgos	28	0.7			
Universidad de Salamanca	15	2.1	Universidad de Huelva	28	0.7			
Universidad de Alicante	15	2.1	U. Politécnica de Cartagena	29	0.6			
Universidade de Vigo	16	2.0	Universidad San Pablo- CEU	30	0.5			
Universidad de Castilla- La Mancha	17	1.8	Vic - Universitat Central de Catalunya	31	0.4			
Universidad de Valladolid	17	1.8	Universidad de La Rioja	31	0.4			
Universidad de Oviedo	17	1.8	Universidad Europea de Madrid	31	0.4			
Universitat Pompeu Fabra	18	1.7	Universidad Pontificia Comillas	31	0.4			
Universidad de Alcalá	18	1.7	U. Internacional de Catalunya	32	0.3			
Universidad de Córdoba	18	1.7	U. Internacional de La Rioja*	32	0.3			
Universidad de Cádiz	19	1.6	Universidad Católica San Antonio	32	0.3			
Universitat Rovira i Virgili	19	1.6	Universidad Nebrija	32	0.3			
Universidade da Coruña	20	1.5						
Universitat Oberta de Catalunya	20	1.5						

Note: Universities are ordered from the highest to the lowest index value. Universities with the same index value are ordered alphabetically. The 14 universities listed in the last column have not been analyzed due to lack of data.

\*Universities 15 years or younger.

Source: BBVA-Ivie Foundation.



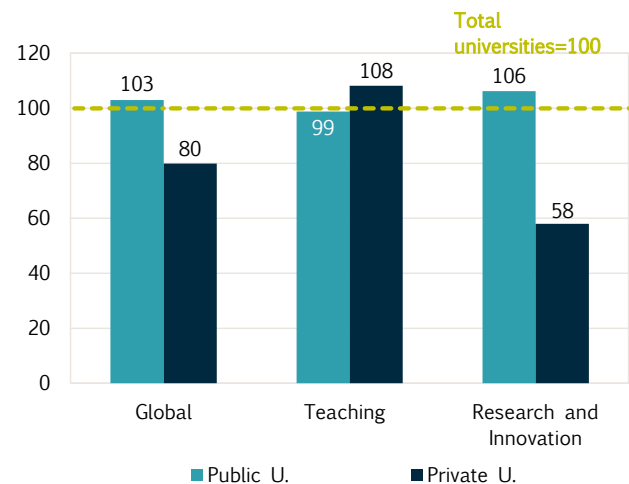
#### 4.8. PUBLIC AND PRIVATE UNIVERSITIES' RESULTS COMPARED

The increased weight of private universities in the Spanish University System is making the comparison of the results depending on the ownership of the universities –public or private– much more relevant. It is undeniable that many variables may cause non-equivalent results: private universities are much younger on average, many are located in geographic areas with higher per capita income, a less diversified range of courses than the public system, to a greater extent because their age of existence has allowed them to decide which degrees to specialize in, and also a smaller size. But to determine the differences in the results it's necessary to find first evidence that these differences do exist. The indices of the U-Ranking system allow us to address this issue with accurate data.

Figure 4.14 shows the average results for U-Ranking indices for teaching and research and innovation, as well as in the global index of results. If we take the average of the system as basis 100, built as an average weighted by the weight of the individual indices of universities, the performance of the private universities is 23 points less than the public system. This result is due, primarily, to a specialization in these universities, that is much more focused on the teaching dimension, in which they achieve a greater performance than public universities (9 points), but with research results that are well below those of public universities (their performance being 48 points lower).

Figure 4.14. **Average performance of the Spanish public and private universities**

**Total universities=100**



Source: BBVA-Ivie Foundation (U-Ranking 2023).

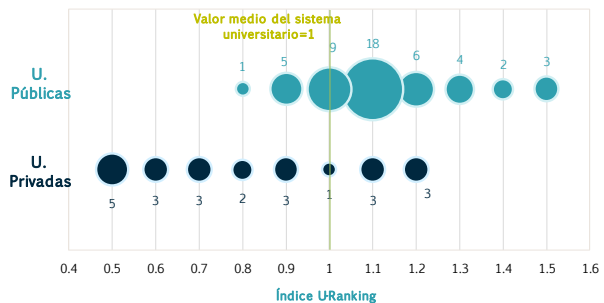
Averages may hide a more complex reality characterized by a great heterogeneity of results. The heterogeneity shared by private and public university systems, is clearly visible in figure 4.15. In all the panels (global, teaching and research and innovation) we observe how the distribution of both types of universities along the range that represents the index indicates diversity in the results.

In short, public and private university systems are both heterogeneous with respect to the performance of the institutions that comprise them, there being a great diversity in the global, teaching and research and innovation results. However, the public university system stands out with respect to private universities in their research achievements and innovation results. On the other hand, the teaching specialization of the private system achieves better results in this dimension.

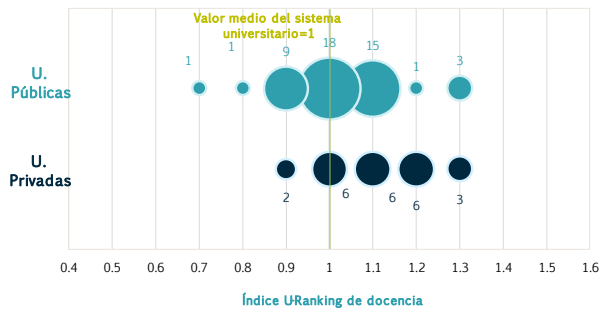
Figure 4.15. Index and number of universities with the same index. 2022

Index and number of universities with the same index

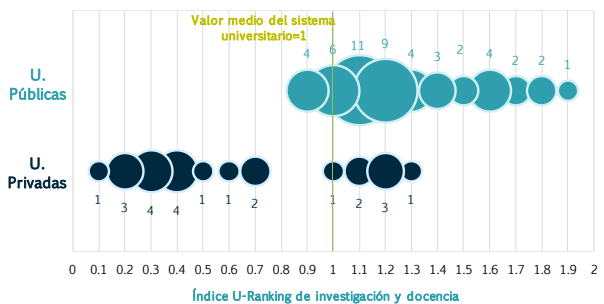
a) Global



b) Teaching



c) Research and Innovation



Source: BBVA-Ivie Foundation (U-Ranking 2023).

4.9. U-RANKING 2022 AND 2023

The aim of this section is to evaluate the stability of results of the different editions of U-Ranking. For this purpose, two types of comparisons are offered between the results of this edition and the one carried out in 2022. First, the correlation between the results of both editions is calculated (table 4.8) and then the dispersion of the indices in both editions is presented (table 4.9).

The results obtained by U-Ranking 2023 are highly correlated with those presented in 2022. As table 4.8 shows, the coefficients of correlation between the indices and the rankings corresponding to the two editions are very high. All the correlations, both those referring to the positions in the ranking (Spearman) and to the values of the synthetic indicator (Pearson), are significant to 1% and, for the global index are around the maximum value of 1 in all cases. This result is important because it means that the small changes introduced and data updates have not significantly altered the results confirming the reliability of the methodology used. and, at the same time, that there have been no significant structural changes in the system caused by a specific event, but rather the mere natural evolution of the system over the course of a fiscal year.

Table 4.8. Correlation coefficients of 2022 and 2023 U-Rankings

	Performance		Volume	
	Index	Ran-king	Index	Ran-king
Global	0.99	0.98	1.00	1.00
Teaching	0.99	0.98	1.00	1.00
Research and Innovation	0.99	0.97	1.00	1.00

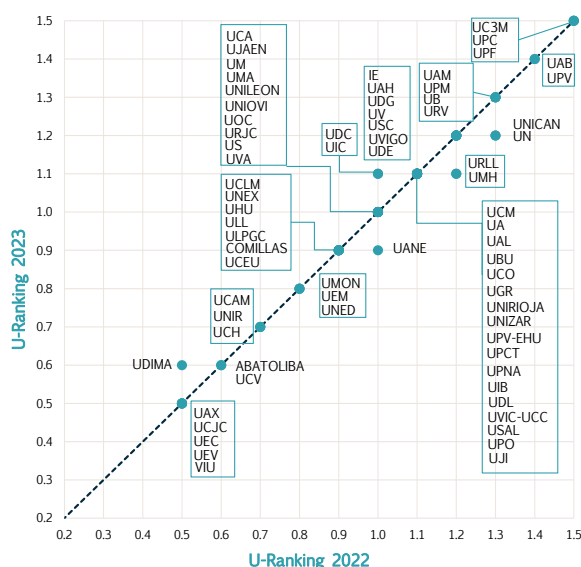
Note: The ranking values are calculated by means of a Spearman correlation coefficient and the index values by means of a Pearson correlation coefficient.

Source: BBVA-Ivie Foundation (U-Ranking 2023).

The close fit between the indexes of both editions of the rankings can also be appreciated in the figures which show on the horizontal axis the synthetic indicator of each university in 2022 and on the vertical axis the results for 2023, both for U-Ranking (figure 4.16) and for U-Ranking Volume (figure 4.17). In both cases, the vast majority of universities are concentrated in the 45-degree diagonal, reflecting the fact that the index obtained in this edition is the same as in the previous one.

**Figure 4.16. U-Ranking (performance) of the Spanish public universities. 2022 and 2023**

## Index



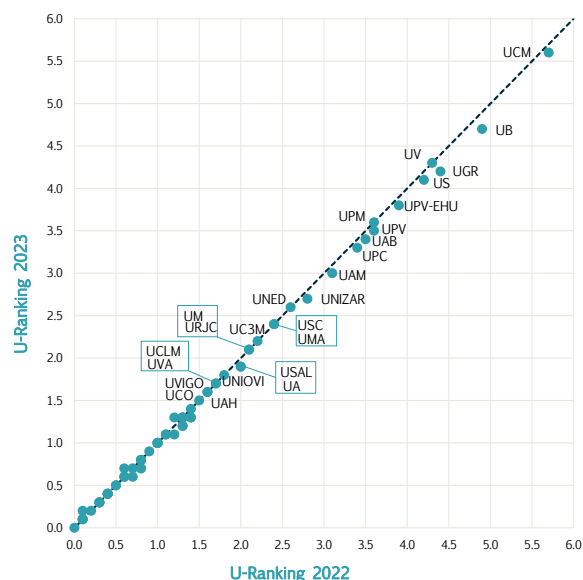
Note: See Annex 2 for a list of abbreviations.

Source: BBVA-Ivie Foundation (U-Ranking 2023).

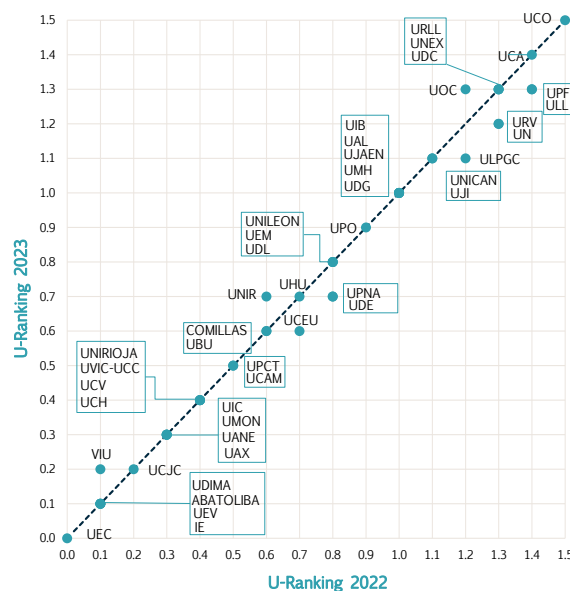
**Figure 4.17. U-Ranking Volume of the Spanish public universities. 2022 and 2023**

## Index

a) Total universities



b) Universities with a less than 1.5 index in U-Ranking 2023



Note: See Annex 2 for a list of abbreviations.

Source: BBVA-Ivie Foundation (U-Ranking 2023).

#### 4.10. REGIONAL UNIVERSITY SYSTEMS

Universities undertake their teaching and research activities in a certain geographic context that influences them. On the one hand, if they are public, investment efforts as well as incentive policies, fees, quality assurance and plans to boost internationalization vary greatly from one region to another. On the other hand, the socio-economic environments of each region are different: there are differences in the levels of income, the population's educational levels, type of industries, labor market, urbanization, etc.

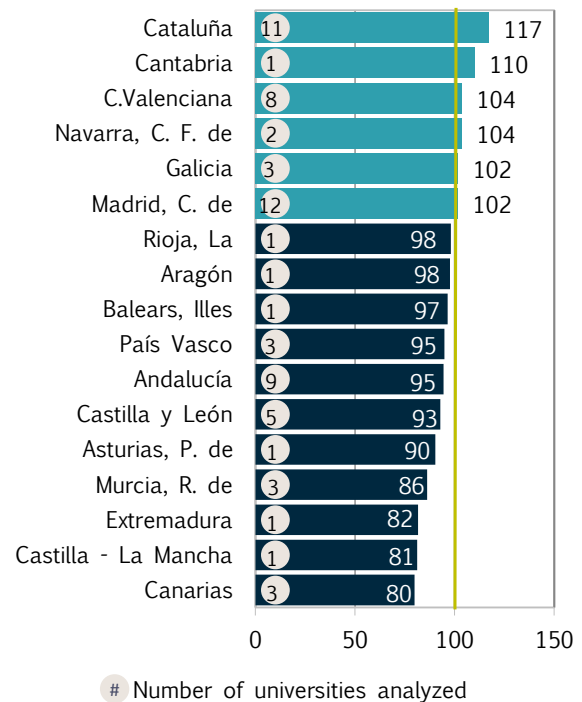
Many of these circumstances influence the location of private universities, which are clearly concentrated in the most prosperous regions of Spain, so that the number of regional public and private universities is uneven. For all these reasons, it is interesting to analyze the performance of the so-called *regional university systems*. To the extent that the variables used to calculate the rankings reflect these regional differences, the synthetic indicators will show that the performances of the university systems are not the same.

Figure 4.18 shows the averages of the 2023 U-Ranking index of all universities, both public and private, of each autonomous community in panel a. The six distance-learning universities have been removed from this analysis because, given their teaching method, it would be difficult to assign their scope of action to a particular region. Panel b shows the regional averages of the index if only on-site public universities are taken into account. Both graphs show the number of universities in each region, which shows that the size and complexity of the systems vary greatly.

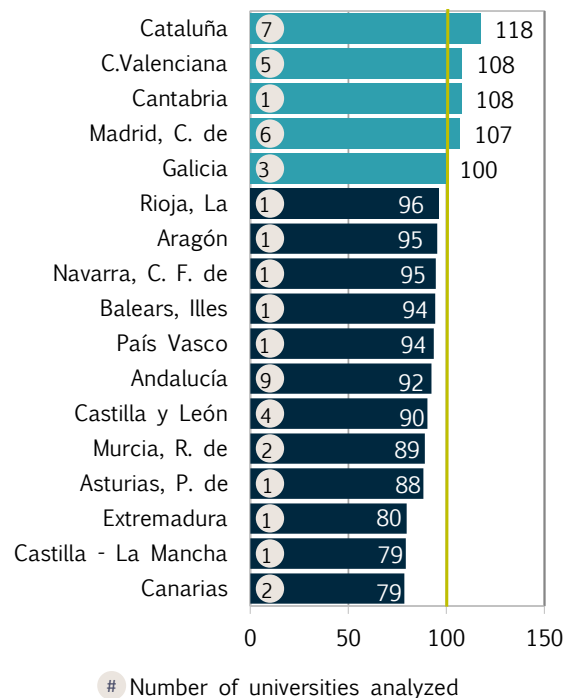
The results show, in fact, large differences regarding performance among the regional university systems: the autonomous community with the highest performance exceeds by 37 percentage points the region with the lowest performance.

Figure 4.18. Performance of the regional university systems in U-Ranking 2023. Spain=100

##### a) On-site universities



##### b) On-site public universities



Note: Distance-learning universities not included.

Source: BBVA-Ivie Foundation (U-Ranking 2023).

The best-performing university systems are those of Catalonia (11 of the universities analyzed in U-Ranking), and Cantabria (with just one university), which have performance indices of 17% and 10%, respectively. They are followed by the Valencian Community and Navarra (+4%), and Madrid (+2%) and Galicia (+2%) all of which are above average.

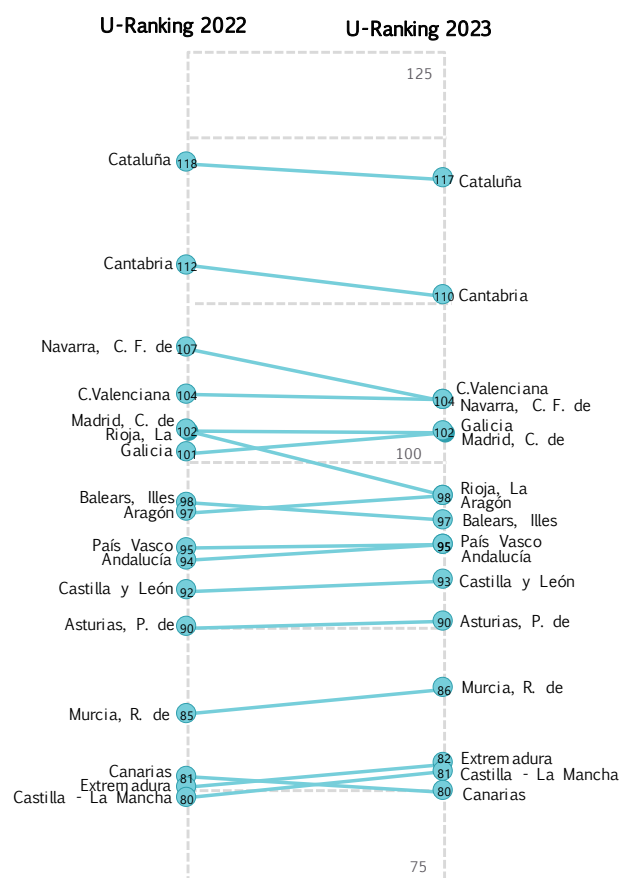
Among the regional university systems with performance levels below the average, we can distinguish several levels: some do not reach 5% — Balearic Islands, Aragon, La Rioja, Andalucía and Basque Country—, others are less than 10% — Castile and Leon and Asturias—, while other communities are over 10%, as is the cases of Murcia, Extremadura, Castile-La Mancha and Canary Islands.

Panel b of figure 4.18 analyzes regional performance based only on on-site public universities. When compared with panel a, the changes allow us to see how the performance of private universities affects the performance of the region. Thus, the Valencian Community and Madrid significantly improve their position when only public universities are taken into account, while Navarra's performance worsens. Catalonia maintains first place in both cases.

When comparing the regional university systems, we must take into account that private universities, which on average have a lower performance, tend to be concentrated, as we already have seen, in regions with high levels of income and large potential markets. This is not to say, however, that the autonomous communities with more private universities rank lower, as those with the highest concentration of private universities (especially Madrid and Catalonia) also have a large number of strong public universities and there are also some public institutions that stand out for their performance, especially in the teaching field..

Finally, figure 4.19 compares the results obtained by the autonomous communities in the 2022 edition with the results from the present edition. In general, we can highlight their stability, but some changes should be noted. The gap between the community with the highest and lowest performance indexes has narrowed from 38 to 37 points.. Thus, a continuation of the convergence process experienced in recent years can be seen.

Figure 4.19. Evolution of the regional university systems. 2022 and 2023. Spain =100



Note: Distance-learning universities not included.

Source: BBVA-Ivie Foundation (U-Ranking 2023).







# Analysis of graduate employment outcomes

05

A key reason for young people to go to university is that having a degree is associated with significantly better career prospects, expanded opportunities for participation in society and politics, and a higher quality of life (Pérez and Aldás [dirs.] 2023; CES 2020; Pastor [dir.] 2019; Pérez [dir.] 2018). This report analyzes the advantages enjoyed by recent graduates of the Spanish University System (SUS) in terms of employment.

First, however, there are certain points to be considered that explain the structure of the report:

- a) First, the Spanish labor market has for decades displayed serious inefficiencies, on both the supply and the demand side, that put young people at a disadvantage. University graduates in Spain are less affected by these inefficiencies, yet they have fewer advantages than graduates in other countries and are unable to escape the impact of the economic cycle on employment. These issues are addressed in the first section with reference to national and international labor statistics prepared by the Spanish National Statistics Institute (INE) and Eurostat.
- b) Second, not all graduates entering the labor market have the same opportunities, as the opportunities depend on many different variables (personal factors, specialization and type of degree, university, socio-economic background, local environment, job search methods, etc.). The INE's Graduate Employment

Survey (*Encuesta de Inserción Laboral de los Universitarios*, EILU) provides information that we can use to analyze the importance of various factors that may influence employment outcomes and thus study graduate employment from different angles: from whether the graduates are employed or not to the quality of their employment (earnings, or degree of match with the education received). The determinants of these employment outcomes are analyzed in the second section.

- c) Third, since the EILU data confirm that graduates' employment opportunities differ by field of study, the size and subtle shadings of these differences need careful consideration. In particular, it would be useful to know which degrees or fields of study have particular employment strengths or weaknesses in terms of employment rate, earnings, types of occupations, or education-job match. In the third section we analyze the ranking of approximately 100 fields of study in all these dimensions of graduate employment outcomes.
- d) Fourth, based on the analysis of graduate employment by field of study using the EILU data, we explore the universities' performance in terms of their graduates' employment success. This performance depends mainly on the universities' educational specialization but can also be influenced by other characteristics of each institution. To capture these effects that can influence the universities' graduate

employment outcomes, we use information provided by the Ministry of Universities, based on data from social security records, to rank the universities by their graduate employment outcomes in each field-of-study group. Lastly, the Ministry of Universities information is combined with the EILU data to generate an overall ranking of the universities by graduate employment outcomes, taking each university's performance in each field-of-study group, the overall employment outcome index in that field-of-study group, and the composition of the university's program offering into account.

## 5.1. GRADUATE EMPLOYMENT AND THE LABOR MARKET

The Spanish labor market has been functioning poorly for decades. This is apparent mainly in the unemployment rate, which rarely falls below 10%, is usually in double digits even in times of economic boom, and shoots up during crises. Importantly, those most affected by unemployment are the less educated and the young. Graduates are less likely to be unemployed than those with a lower level of education, but recent graduates have been more prone to unemployment. They have also been unable to escape the effects of the economic cycle.

In this first section we review the national and international labor statistics prepared by the INE and Eurostat in order to present an overview of employment outcomes for Spanish university graduates in the 21st century. In the following sections we will look in greater detail, from different

perspectives, at the substantial differences in employment outcomes among different groups of graduates who have entered the labor market in the last decade.

### 5.1.1. Graduate employment and the business cycle

The economic environment in which a graduate is seeking employment has a major influence on the

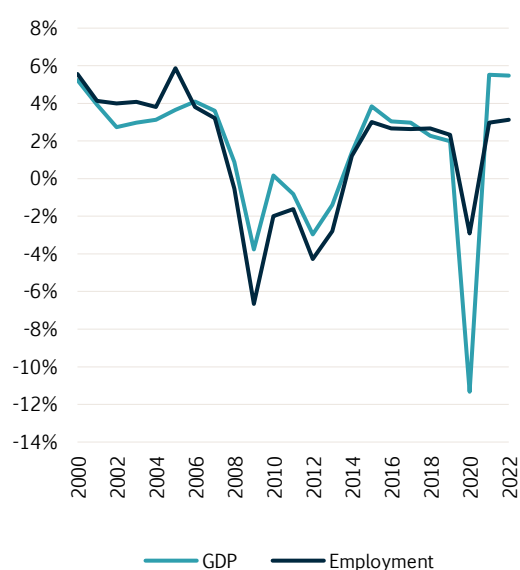
employment opportunities he or she is likely to encounter. Finding a job will not be as easy in times of economic crisis as in times of recovery or growth.

Panel *a* of figure 5.1 shows the rate of growth of gross domestic product (GDP) and employment in Spain, illustrating the substantial differences in the rates of job creation and destruction at different times in the cycle. In periods of strong economic growth, large numbers of jobs are created; but in periods of crisis or stagnation they are destroyed at a tremendous rate.

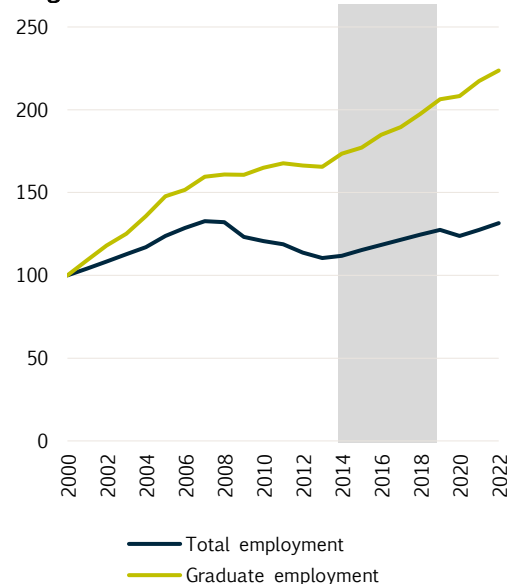
Panel *b* shows how total employment and graduate employment respond differently to the economic cycle. The rises and falls in rate of growth seen in panel *a* are reflected in total employment but less markedly in graduate employment, partly because graduates are more resilient to changes in the cycle, and the fluctuations occur around a trend that has been clearly increasing in Spain in the 21st century. For graduates just entering the labor market, therefore, there will always be opportunities, but the extent of the opportunities will vary with the cycle.

Figure 5.1. GDP and employment. 2000-2022. Spain

## a) Rates of change (percentage)



## b) Total employment and number of university graduates (2000=100)



Source: INE (CNE, EPA) and authors' own calculations.

The graduate employment opportunities that are to be analyzed here should be seen in this general context. The graduates in question are those who graduated in academic year 2013-2014 (those analyzed in the EILU survey) and 2015-2016 (those analyzed in the Ministry of Universities data). The former are subject to follow-up until 2019 and the latter until March 2020<sup>23</sup>. The period from 2014 to 2019 was one of economic recovery after the major financial crisis that began in 2008. During this period, GDP grew at an average annual rate of 2.8%, total employment at 2.7% and graduate employment at 3.5%. Thus, the economic environment of the 2014-2019 period as a whole was favorable for job creation in general and for graduate employment in particular. The graduate employment opportunities that are to be analyzed here should be seen in this general context. The graduates in question are those who graduated in academic

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As already mentioned, employment rates tend to be higher among graduates than among those with lower levels of education, and economic cycles affect employment and unemployment in these two groups differently. Figure 5.2 shows the unemployment rate for the Spanish population by level of

<sup>23</sup> Looking at the chart, it may seem as if the situation in 2020 was severely adversely affected by the pandemic, with a tightening of labor market conditions and a significant decline in economic activity. However, the social security data used by the Ministry of Universities are from 23 March 2020, i.e. the week in which the state of alarm was declared. So there was no time for the adverse effects of the lockdown on employment to be reflected in graduate employment in the analysis based on the Ministry data or the INE survey data (EILU), which covers the period 2014-2019.

<sup>24</sup> Looking at the chart, it may seem as if the situation in 2020 was severely adversely affected by the pandemic, with a tightening of labor market conditions and a significant decline in economic activity. However, the social security data used by the Ministry of Universities are from 23 March 2020, i.e. the week in which the state of alarm was declared. So there was no time for the adverse effects of the lockdown on employment to be reflected in graduate employment in the analysis based on the Ministry data or the INE survey data (EILU), which covers the period 2014-2019.

education. Two features stand out: a) unemployment rates are consistently lower among university graduates than among those with lower levels of education; and b) when the economy starts to contract (as can be seen in the chart at the time of the 2008 economic crisis), university graduates are less prone to unemployment than those with lower levels of education. In 2007, for example, the year before the crisis broke, there was barely seven percentage points difference between the unemployment rate of the university-educated population and that of the population with only primary education or less, whereas in 2013, at the height of the crisis, the difference was 27 percentage points.

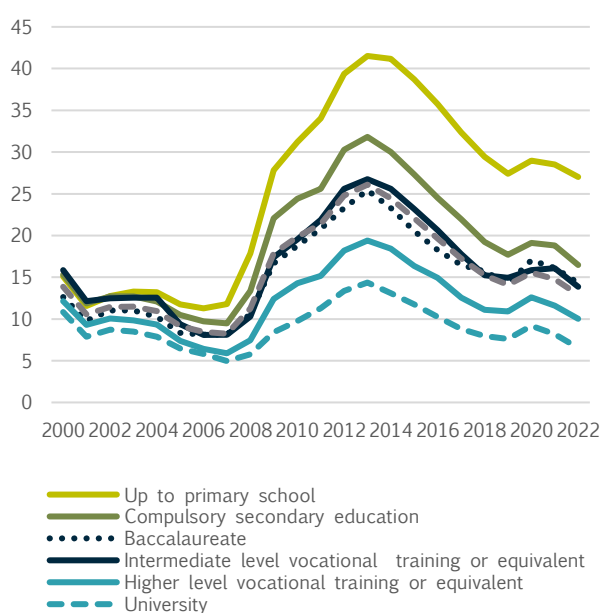
Since the economy recovered, from 2014 onward, the gap in unemployment rates between the different levels of education has narrowed somewhat yet remains much larger than at the beginning of the century. In Spain, therefore, university graduates are more likely to find jobs than those with lower

levels of education, and their job opportunities tend to be less sensitive to crises. This employment advantage for university graduates has always existed but was significantly accentuated by the Great Recession.

However, these figures are for the population aged 16 or over as a whole, whereas a more interesting comparison for recent university graduates would be with the younger population. This limited comparison is more relevant for university graduates because the changes in the level and terms of their employment (especially salary, but also education-job match) are greater than those of employees with lower levels of education.

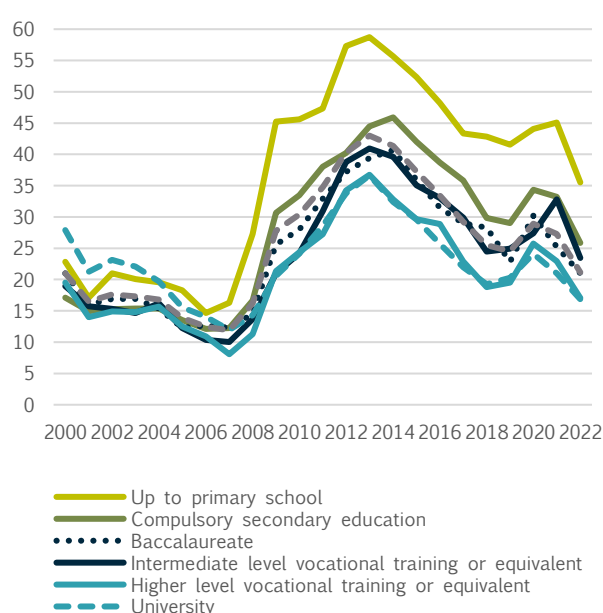
Accordingly, focusing on the age range for recent graduates entering the labor market, i.e. the population aged 22 to 26<sup>25</sup>, Figure 5.3 shows several relevant features of the situation.

Figure 5.2. Unemployment rate by level of educational attainment. Spain (percentage)



Source: INE (EPA) and authors' own calculations.

Figure 5.3. Unemployment rate by level of educational attainment. Population aged 22-26. Spain (percentage)

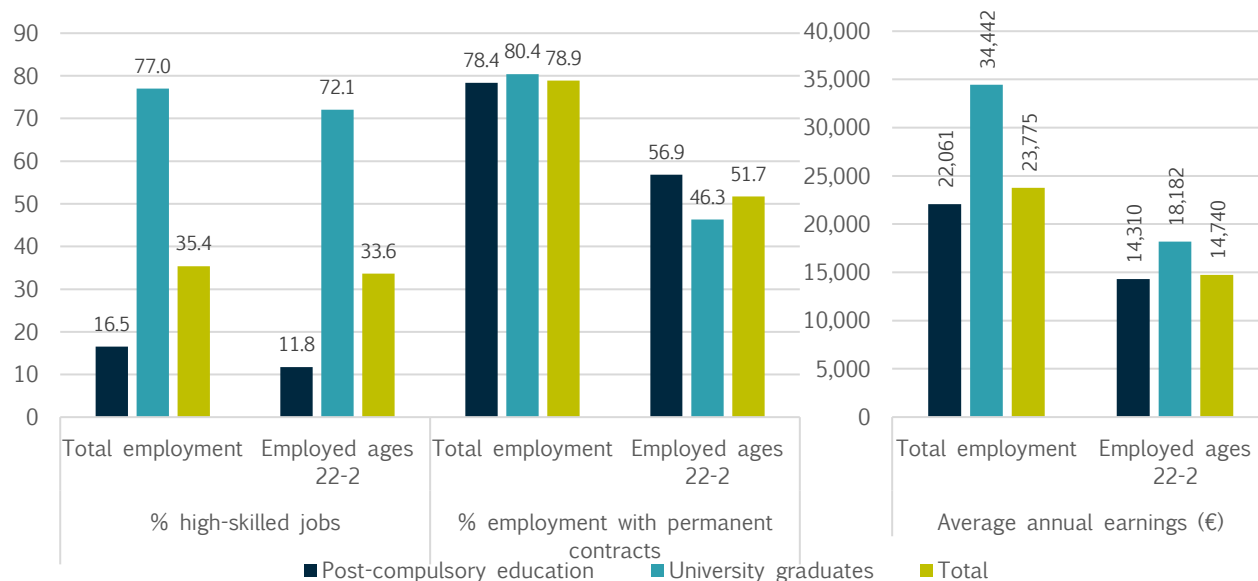


Source: INE (EPA) and authors' own calculations.

<sup>25</sup> Most degree courses in Spain last four years and the usual age of admission to university is 18, hence the range from graduation at 22 to four years later, which is when the

Ministry of Universities data analyzes the employment situation.

Figure 5.4. Relative advantages of young Spanish university graduates: skilled occupations, permanent contracts and higher earnings. Total population and young people aged 22 to 26. Spain 2022 (percentage and euros)



Note: the group of highly skilled occupations corresponds to groups 1-3 in the Spanish National Occupational Classification (CNO-11). It includes: senior officials and managers (group 1); scientific and knowledge professionals (group 2); and technicians and associate professionals (group 3). The earnings data are for 2018.

Source: INE (EPA, EES) and authors' own calculations.

First, we see that the lower levels of unemployment and the greater resistance to crises among university graduates are maintained, but the differences with respect to young people who have other levels of education are less pronounced. This is partly because young people aged 22-26 who have not pursued higher education will have advanced further in their professions than university students; and partly because early employment outcomes for people with higher vocational qualifications or equivalent are very similar to those for university graduates, although subsequently the gap widens in favor of graduates. Second, however, unemployment rates among graduates aged 22-26 are significantly higher than among graduates as a whole. In 2022, whereas the average graduate unemployment rate was 6.5%, the unemployment rate for graduates aged 22 to 26 was 16.8%; and over the period we shall later be studying in detail (2014-2019), it varied between 31.4% and 20.3%.

Besides the greater likelihood of being employed, university graduates have certain advantages over other workers, especially over young people entering the labor market with lower levels of education, in areas as important as earnings, type of contract and type of occupation. Figure 5.4 summarizes the

differences between young people in general and university graduates in these areas, using three indicators: high-skilled jobs, permanent contracts, and average annual earnings. In permanent contracts, the differences between university graduates, the population with post-compulsory education and the general population are small and university graduates can even be seen to be at a disadvantage compared to the average. In type of employment, however, university graduates have a clear advantage in terms of their share of skilled occupations, both compared to the general population (77% compared to 16.5%) and compared to the population aged 22-26 (72.1% compared to 11.8%). They also have clear advantages in average annual earnings, although the advantages are much smaller on first entering the labor market. Thus, among the general population, university graduates have annual earnings around 12,000 euros higher than those with post-compulsory education; and although the differences are smaller among the population aged 22-26, average earnings are also almost 4,000 euros higher for university graduates.

In short, university graduates are in a relatively more favorable position with respect to

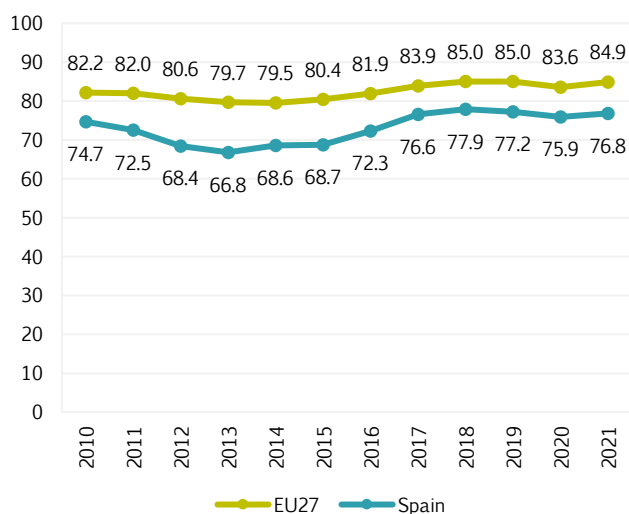
employment than the population as a whole but are still affected by some of the problems in the Spanish labor market. The employment difficulties are clearly greater for young people, including university graduates, since they face obstacles to labor market entry even in periods of expansion. Moreover, the advantages in terms of earnings, job stability and types of occupation are less pronounced for young graduates than for the graduate population as a whole.

### 5.1.2. Graduate employment in Spain in a European perspective

The scale of the graduate employment difficulties in Spain is thrown into relief when set in a European context. In the EU27 as a whole the employment advantages for young university graduates are greater, and in some central and northern EU countries considerably greater.

As figure 5.5 shows, the employment rates of recent higher education leavers (which includes university graduates and people with higher vocational qualifications) in their first few years in the labor market are significantly lower in Spain (between 7 and 8 percentage points lower) than in the EU27 as a whole. The problem was even more severe during the Great Recession; and despite the subsequent narrowing there remains a very significant employment gap for university graduates in Spain.

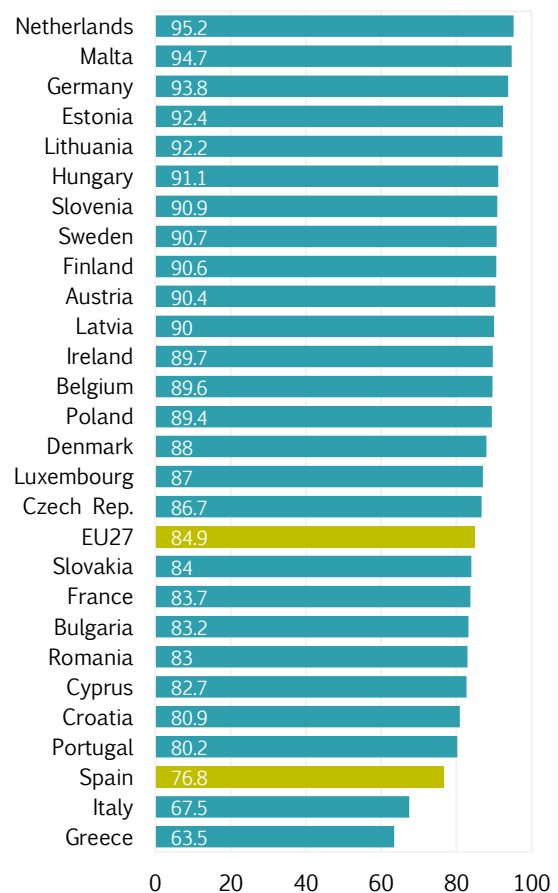
**Figure 5.5. Employment rate of recent higher education leavers aged 20-34. 2010-2021 (percentage)**



Note: 1 to 3 years after graduation  
Source: Eurostat (LFS).

The differences are even greater if we compare Spain with the countries of central and northern Europe, where the gap widens to more than 15 percentage points in the case of the Netherlands and Germany, among others (figure 5.6). In 11 European countries the employment rate of recent higher education leavers aged 20-34 exceeds 90%, whereas in 2021 in Spain it does not reach 77%. Clearly, in Spain there are more problems in putting the accumulated human capital to good use: lower activity rates and higher unemployment rates for young people with tertiary education. The lower employment rate has negative implications both for individual opportunity and for society, as it indicates a waste of part of the public and private resources invested in education.

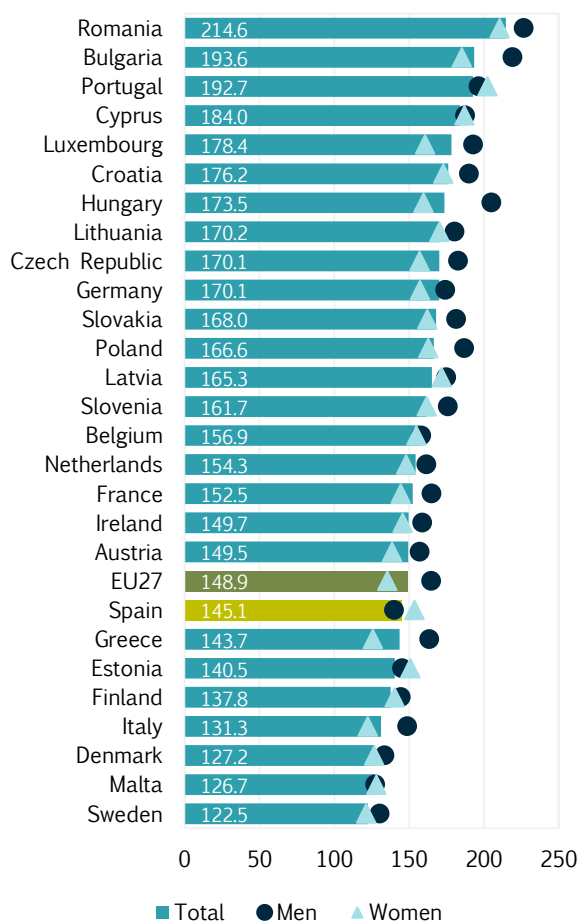
**Figure 5.6. Employment rate of recent higher education leavers aged 20-34. Comparison with EU27 2021 (percentage)**



Note: 1 to 3 years after graduation  
Source: Eurostat (LFS).



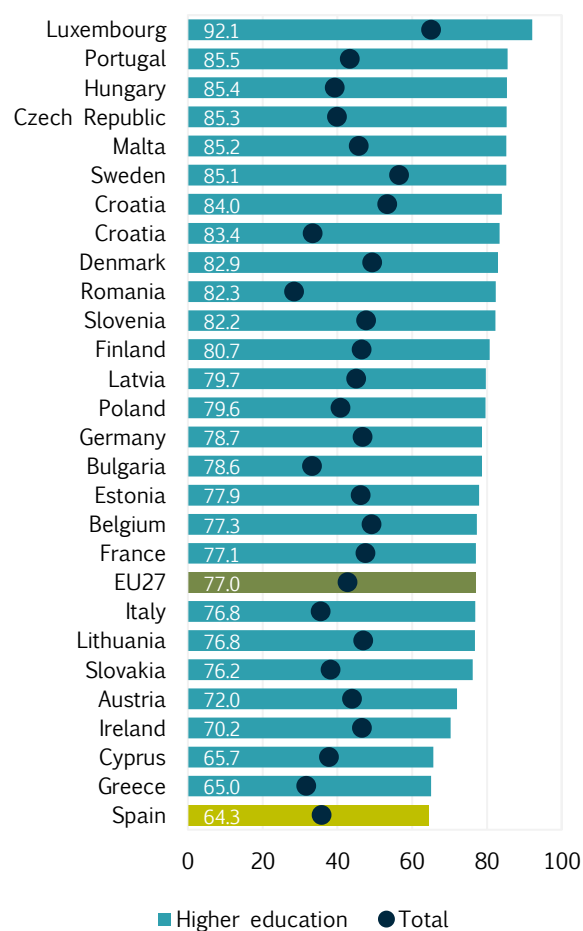
Figure 5.7. Average annual earnings of employed workers with higher education relative to those of employed workers with post-compulsory secondary education. EU27 countries. 2018



Source: Eurostat (SES) and authors' own calculations.

In the other two indicators (earnings and skilled occupations) the advantage enjoyed by graduates compared to the employed population in general is somewhat less in Spain than in the EU27 as a whole. As figure 5.7 shows, the average annual earnings of a Spanish worker with higher education are, on average, 1.45 times higher than those of a worker with compulsory secondary education, compared to an EU27 average of 1.49. Compared to a large number of countries, the differences are greater, and in some cases (e.g. Germany) more than 20 percentage points.

Figure 5.8. Employed workers in highly skilled occupations. EU27 countries. 2022 (percentage)



Note: data for the second quarter of 2022

Source: Eurostat (LFS).

Part of the earnings gap is explained by the types of occupation to which university graduates have access: if highly skilled occupations pay higher salaries and university graduates have a larger share of this type of occupation, we can expect to see a larger gap in average earnings between graduates and non-graduates. Spain has a shortage of people employed in highly skilled occupations because its economy has a shortage of knowledge-intensive business activities. This has the effect of narrowing the earnings gap for university graduates because some of them are employed in occupations for which, in theory, they are overqualified.

Figure 5.8 confirms the Spanish economy's weakness in its use of human capital. In Spain, less than 40% of employed workers are in highly skilled jobs, on a par with Italy and Greece. This weakness is the result of the country's having specialized in

sectors such as construction, trade and hospitality, which account for a significant proportion of the economy and have relatively few highly skilled jobs. A large number of university graduates are thus not employed in highly skilled jobs but in jobs requiring medium or even low qualifications. The chart shows that only 64.3% of Spanish graduates have highly skilled jobs, compared to an EU average of 77%, and more than 80% in 12 EU27 countries. The EU's two largest countries, Germany and France, outperform Spain by 14 and 13 percentage points and the Netherlands and some Nordic countries, by 20 percentage points.

Note that in the Nordic countries the percentage of university graduates with highly skilled jobs is high, but the earnings gap between graduates and workers with medium education is smaller than in Spain. The data in figure 5.7 suggest that the average earnings gap may be higher or lower not only because of the relative abundance or scarcity of skilled jobs, but also because of the supply of skilled workers (the greater the supply the smaller the gap) and the functioning of labor market institutions, as they also influence wage inequalities.

In summary, the comparison indicates that the employment problems facing graduates in Spain are greater than in the EU27 as a whole and are reflected in lower employment rates and higher unemployment rates. The problems are also reflected in smaller earnings gaps and smaller percentages of graduates employed in highly skilled jobs. The result of the comparison between Spain and the average for the EU27 is adverse in all the employment outcome indicators and is even more adverse if the comparison is with the economies of central and northern Europe, which make better use of graduates' human capital.

### ***5.1.3. Graduate employment in a regional perspective***

In the previous section we have seen the differentiating characteristics of the Spanish labor market in general and of young graduates in particular, compared to the countries of the European Union.

Yet these characteristics are not homogeneous across the regions (autonomous communities) of Spain and we can observe very significant differences between regions, both in levels of employment and in quality of employment. These differences deserve attention, as they are relevant when assessing the conditions under which graduates resident in different regions enter the labor market.

As can be seen in table 5.1, there is a group of regions with employment rates up to 19 percentage points above the national average, namely, Catalonia, Madrid, Navarra, the Basque Country and the Balearic Islands. In contrast, the graduate unemployment rate is especially high, compared to the national average, in the regions of Extremadura, Asturias, Andalusia, Castilla-La Mancha, Cantabria and the Canary Islands.

This difference in employment levels is closely related to the quality of employment. Thus, in Catalonia, Madrid, Navarra and the Basque Country, the percentage of graduates in skilled jobs is above the national average, and the same is true of average annual graduate earnings. In view of these indicators, these four regions, all with clearly above-average income levels, appear as the peak of graduate employment. In a relatively very different situation are the regions in which graduates have not only lower employment rates but also a lower percentage of permanent contracts and lower average earnings.

The most dynamic regional labor markets with the strongest demand for skilled human capital mark out geographical areas of employment opportunity, and so universities in these areas have locational advantages as regards the employability of their graduates. This hypothesis will be confirmed or refuted in our later analyses of graduate employment, but the data provided so far indicate that geographical location may be a relevant factor in employment outcomes. In a context of perfect mobility, the impact of these regional differences could also shape graduates' decisions about where to study or where to live once they have graduated and are looking for work.

Table 5.1 Employment of graduates aged 22-26 by region. 2022

## a) Average values (percentages and euros)

	Employment rate	Unemployment rate	% permanent contracts	% highly-skilled occupations	Average annual earnings (2018)
Andalucía	46.1	27.2	34.1	71.8	15,891
Aragón	57.9	15.6	41.9	62.4	18,346
Asturias (Principado de)	52.6	28.3	29.5	76.0	16,064
Baleares (Islas)	69.5	17.0	40.1	62.9	21,151
Canarias	59.2	21.9	41.5	59.4	16,760
Cantabria	51.3	21.5	51.2	68.6	19,980
Castilla y León	58.7	13.2	37.7	76.7	17,690
Castilla-La Mancha	53.1	26.7	46.5	68.7	15,514
Cataluña	73.8	10.5	56.1	73.1	18,641
Comunitat Valenciana	56.3	20.5	39.0	64.4	18,143
Extremadura	49.9	29.0	31.0	77.1	13,116
Galicia	48.3	23.8	34.0	64.0	16,808
Madrid (Comunidad de)	73.5	10.5	60.1	75.7	19,517
Murcia (Región de)	56.7	15.8	41.3	67.2	11,731
Navarra (Comunidad Foral de)	72.7	9.6	32.0	77.9	22,339
País Vasco	69.3	12.5	36.5	82.8	19,140
Rioja (La)	59.4	13.0	24.0	82.8	19,874
<b>Spain</b>	<b>61.7</b>	<b>16.8</b>	<b>46.3</b>	<b>72.1</b>	<b>18,182</b>

## b) Spain=100

	Employment rate	Unemployment rate	% permanent contracts	% highly-skilled occupations	Average annual earnings (2018)
Andalucía	74.8	161.5	73.7	99.7	87.4
Aragón	93.9	92.6	90.6	86.6	100.9
Asturias (Principado de)	85.2	168.3	63.8	105.5	88.4
Baleares (Islas)	112.7	100.7	86.6	87.3	116.3
Canarias	96.0	130.1	89.6	82.4	92.2
Cantabria	83.2	127.7	110.6	95.2	109.9
Castilla y León	95.2	78.4	81.4	106.4	97.3
Castilla-La Mancha	86.1	158.6	100.4	95.3	85.3
Cataluña	119.7	62.5	121.1	101.4	102.5
Comunitat Valenciana	91.3	121.9	84.1	89.3	99.8
Extremadura	80.8	172.0	66.8	106.9	72.1
Galicia	78.3	141.3	73.4	88.8	92.4
Madrid (Comunidad de)	119.1	62.1	129.8	105.0	107.3
Murcia (Región de)	92.0	93.7	89.2	93.3	64.5
Navarra (Comunidad Foral de)	117.8	57.2	69.0	108.1	122.9
País Vasco	112.3	74.0	78.8	114.9	105.3
Rioja (La)	96.2	76.9	51.8	114.8	109.3
<b>Spain</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>

Note: the employment rate is defined as the employed population aged 22-26 as a percentage of the total population aged 22-26.  
Source: INE (EPA, EES) and authors' own calculations.

## 5.2. DIFFERENCES IN EMPLOYMENT OUTCOMES BETWEEN GRADUATES

The previous section provides an overview of graduate employment in Spain in the expansive economic environment of the years before the COVID-19 pandemic. This was the period when the cohort who graduated in the middle of the previous decade entered the labor market. Their employment outcomes are analyzed in detail in this and the following sections.

Our account of graduate employment outcomes based on average values has identified certain general employment problems, but the focus of the rest of this report is on the differences in the extent to which these problems affect different individuals and different groups of graduates. In this second section we look at differences between individuals, in the third at differences between fields of study and in the fourth at differences between universities.

The analysis in this section is divided into three subsections. The first describes the employment profiles considered and the second, the explanatory variables that may affect employment. The third subsection presents the results of the analysis of the determinants of graduate employment outcomes, based on the estimation of four *probit* models. Lastly, subsection 4 repeats the analysis for master's graduates.

### 5.2.1. Employment profiles considered

To determine what factors explain the ease with which a university graduate finds employment, we need to specify the dimensions of employment considered relevant and the empirical evidence available on those dimensions. We consider the relevant dimensions to be those already mentioned in the first section, namely, being employed or not, earnings and employment quality. At present, the best source of evidence on these dimensions is the 2020 Graduate Employment Survey (EILU), which analyzes the employment history of bachelor's and master's degree graduates who graduated in the 2013-2014 academic year over five years, until 2019. The other relevant source is the database

built by the Ministry of Universities using social security data, which we will use to supplement the EILU in Chapter 4 for the reasons indicated below.

The EILU provides information on the transition from university to the labor market of higher education leavers (including bachelor's graduates and people with basic and higher vocational qualifications) and master's graduates who graduated in the 2013-14 academic year, with follow-up until 2019. The analysis presented in this report focuses on the employment situation in 2019 of the university graduates. The EILU sample base consists of 31,000 bachelor's graduates and people with vocational qualifications (degrees and diplomas), making it possible to estimate employment outcomes at the national level by field of study, covering a total of 101 different fields.

Throughout the document we will indicate similarities and differences compared to the employment outcomes of master's degree graduates using EILU data, which has a sample base of 11,480 respondents.

The EILU provides a broader set of information than the Ministry of Universities' education, mobility and employment database: degree studied, periods spent at other universities, scholarships received, job search, employment situation and professional status, working hours, occupation, educational attainment level and field of study that best match the job, net monthly earnings, social security registration, etc.

Despite being sample data, rather than population data (as provided by the Ministry of Universities), the EILU data have the following advantages:

- They include graduates working abroad<sup>26</sup> and registered with mutual societies.
- The earnings indicator refers to all graduates, not only those registered with social security as being in full-time employment.
- The EILU data allow other indicators, such as education-job match, to be taken into consideration.

<sup>26</sup> According to EILU data, 6.84% of graduates are resident abroad. The percentage of expatriates varies considerably

by field of study. For instance, 30.6% of Biomedicine graduates are living outside Spain, 96.8% of them working.

In this study, graduate employment is conceptualized using variables that allow for a broad analysis of employment outcomes<sup>27</sup>, not only in terms of being employed or not but also in terms of employment quality. Using the EILU data, our analysis focuses on four dimensions of graduate employment:

- **Employment rate:** the percentage of bachelor's graduates who were in employment five years after graduation<sup>28</sup>.
- **Earnings:** whether the job provides the graduate with high earnings. The variable is defined as the number of graduates with net earnings of 1,500 euros or more per month as a percentage of the total number of graduates in employment<sup>29</sup>.
- **Education-job match:** whether the job held requires a university education. The variable is defined as the number of graduates whose current job belongs in groups 1 to 3 of the Spanish National Classification of Occupations (CNO) as a percentage of the total number of graduates in employment<sup>30</sup>.
- **Field of study-job match.** The variable is defined as the number of graduates who consider themselves to be working exclusively in their field of study or a related field as a percentage of the total number of graduates in employment.

The EILU information characterizes the employment situation of each university graduate surveyed from these four points of view, revealing a wide diversity

of situations. First of all we find geographical diversity, as can be seen in table 5.2, which confirms the findings of table 5.1.

The data in table 5.2 show that the more serious problem with employment in Spain has to do with quality of employment, rather than quantity (i.e. being employed or not). We already saw that Spain lags the EU27 in its graduate employment rate; but with the necessary precautions (given that we are comparing data from different sources), the EILU data for 2019 can be seen to offer a more optimistic view of the particular situation of those who graduated in the 2013-14 academic year, whose employment rate is 86%. However, the average percentages for Spain in the employment quality indicators

are lower than those for the employment rate: only 54% of graduates have earnings of more than 1,500 euros per month (a modest amount five years after graduation); more than 20% are in jobs that do not require a university education; and almost 25% are in jobs that do not match their specialization.

The table shows considerable variation between regions. In employment rate, the difference between Catalonia (91.6%) and Andalusia (76.4%) is more than 15 pp. The percentage earning more than 1,500 euros ranges from 62.8% in the Basque Country to 38.5% in Extremadura. In education-job match the range is from 82.4% in Asturias to 73.4% in the Balearic Islands. And for field of study-job match, the figure goes from 78.3% in Navarra to 69.5% in Extremadura.

<sup>27</sup> As the Economic and Social Council points out in its report on young people and the labor market (CES 2020) from an economics of education approach, the match between the education received and the requirements of the job is a key variable when analyzing labor market access, together with the employment rate. The education-job match is analyzed in both a horizontal perspective (i.e. the match between the field of study and the field of work) and a vertical perspective (i.e. the match between the level of education and the qualifications required for the job).

<sup>28</sup> Employment includes unpaid work for a family business, paid internships or training scholarships, and residencies (MIR, FIR).

<sup>29</sup> EILU provides data on net monthly earnings in seven bands: Less than €700, €700 to €999, €1,000 to €1,499,

€1,500 to €1,999, €2,000 to €2,499, €2,500 to €2,999, and €3,000 or more). 54.3% of graduates earn 1,500 euros or more five years after graduation.

<sup>30</sup> Education-job match is measured using this indicator, although the EILU also provides data on the percentage of graduates who consider that their job matches their level of education. This is a subjective indicator of education-job match. On average, 79.8% of graduates consider that a university education (including master's degrees and doctorates) is the most appropriate level of education to perform their current job, compared to 79.6% of graduates in jobs classified in CNO groups 1 to 3. The correlation coefficient of both indicators is 0.82. In this report we have chosen to use the occupation-based indicator because of its parallelism with the indicators offered by the Ministry of Universities.

Table 5.2. Average employment indicators by region of habitual residence. Situation in 2019 of graduates who graduated in the 2013-14 academic year

	Employment rate	% employed with earnings of €1,500 or more	Vertical match (% in highly skilled jobs)	Horizontal match (% working in their field of study or a related field)
Andalucía	76.4	40.7	74.7	72.9
Aragón	86.1	48.9	78.5	76.4
Asturias, Principado de	82.8	48.9	82.4	75.0
Balears, Illes	89.1	57.5	73.4	75.6
Canarias	82.3	49.8	80.1	75.7
Cantabria	80.9	53.1	81.8	75.8
Castilla y León	84.7	49.8	78.4	74.8
Castilla-La Mancha	81.5	50.8	79.8	75.6
Cataluña	91.6	59.4	80.3	77.7
Comunitat Valenciana	84.2	44.3	77.8	75.8
Extremadura	80.0	38.5	74.8	69.5
Galicia	83.6	46.6	78.9	76.6
Madrid, Comunidad de	90.1	58.9	82.2	74.9
Murcia, Región de	83.4	44.8	78.5	76.4
Navarra, Comunidad Foral de	91.5	60.6	79.3	78.3
País Vasco	89.8	62.8	79.1	76.2
Rioja, La	88.6	44.3	75.9	72.9
Other countries	91.4	81.0	88.6	77.4
	86.1	54.3	79.6	75.6

Source: INE (EILU) and authors' own calculations.

It is worth pointing out that graduates who have gone abroad in their search for a job have the highest earnings, the best vertical match and an employment rate almost equal to that of the top-ranking region in this dimension (Catalonia). These figures are in agreement with the greater availability of quality employment in the other European countries as seen in figures 5.7 and 5.8 and indicate that international mobility is a source of good career opportunities that some graduates have seized.

### 5.2.2. Variables that affect employment outcomes

Identifying the variables that can influence graduate employment outcomes is an important step towards improving those outcomes, and the information provided by the EILU indicates that the variables are large in number and vary greatly in importance. Essentially, we can expect employment outcomes to be influenced by four main factors:

- The *personal characteristics* of the student. Possible career determinants include: their ability to work when they start university, their previous education, their family background, their mobility (i.e. their willingness to leave

their home region to study for a degree that is not available in their region or to attend a particular university), and their sex.

- The *student's decisions* concerning their university education: choice of degree, choice of university, mobility during the degree to join an international program such as Erasmus or the Spanish exchange program SICUE, voluntary internships, etc.
- *Environment-related factors* such as the economic cycle or the region of residence, with its level of demand for skilled labor.
- The *job search methods used*, i.e. the paths and tools used to find employment.

Thus, besides the education received, there are three other relevant sources of influence on employment outcomes to be considered. If we were to ignore them, we would probably attribute their effect to the educational variables, resulting in biased estimates, as we would be omitting variables which, as our analysis shows, are significant in many cases.

The EILU data are a rich source of variables that can be used as proxies of the potentially significant dimensions included in the four types of explanatory variables:



1. Personal factors: sex (male or female), age (under 30, between 30 and 34, over 34), command of more than one language, and having received an award or scholarship for merit. We use these variables to capture an individual's intrinsic ability, as this will influence employment.
2. Educational factors: type of university (public or private), teaching method (on-site or distance learning), periods spent abroad or in another Spanish university during the degree course, voluntary internships (extracurricular) and, of course, choice of degree.
3. Environment-related factors: to reflect that the regional labor market situation can affect graduate employment opportunities (see table 5.2), we also consider the region in which the graduate resides after graduation and include an additional geographical variable for those resident abroad.
4. Job search methods: those included in the EILU, which are a combination of services that may be provided by the university (university career service, job board, continuation of internships), initiatives taken by the graduate (preparing for public service exams, starting a business, using public job services, monitoring job ads in the press or on the internet), and direct contacts initiated by an employer.

Table 5.3 shows the average values of the employment outcome indicators for each of the explanatory factors or variables considered in the analysis. The variables relating to the choice of degree are not included because they are analyzed in detail in section 3; and the regions are not included because they were already described in table 5.2.

Although the precise impact of each variable on the likelihood of the employment outcomes will be analyzed later using the appropriate econometric tools, Table 5.3 provides some preliminary conclusions: the main sex-related difference is the percentage earning 1,500 euros or more, which for male graduates is 63% but for female graduates only 48%; older graduates have higher earnings, probably because many were already working while studying for the degree; those who received a merit scholarship have higher earnings and a job that more closely matches their qualifications; graduates of private universities and on-site universities have better employment rates and higher quality of employment; mobility during the degree, whether abroad or to a different region, does not significantly improve employment outcomes but does improve quality of employment in terms of earnings and education-job match, as also do extracurricular internships.

Table 5.3. Average values of the employment outcome indicators according to different factors. Situation in 2019 of graduates who graduated in the 2013-2014 academic year(percentage)

		Sample distribution	Employment rate	% employed with earnings of €1,500 or more	Vertical match (% in highly skilled jobs)	Horizontal match (% working in their field of study or a related field)
Gender	Male	41,5	87,8	63,0	81,3	75,1
	Female	58,5	84,9	48,0	78,9	75,9
Age	Under 30	49,5	85,3	50,4	80,4	78,2
	30-34 years old	28,8	86,7	52,3	76,8	74,0
	35 years and older	21,7	87,2	66,0	82,7	71,8
Excellence award or scholarship	No	95,4	86,0	53,6	79,4	75,2
	Yes	4,6	87,0	67,8	89,2	83,2
Languages	Mother tongue(s) only	4,5	83,7	49,3	75,9	68,8
	At least one language other than mother tongue	95,5	86,2	54,7	80,1	75,9
Ownership	Private	16,1	90,6	67,2	88,1	81,0
	Public	83,9	85,2	51,7	78,2	74,5
Type of teaching	On-line	5,5	89,8	66,4	79,8	62,4
	In person	94,5	85,9	53,6	79,9	76,4
Stay abroad	No	82,7	85,9	52,7	79,2	75,3
	Yes	17,3	87,1	61,8	83,1	76,9
Stay in another Spanish university	No	90,3	85,9	53,1	79,3	75,3
	Yes	9,7	87,8	66,1	85,4	78,2
Extracurricular internship	No	72,1	85,5	53,8	79,3	74,7
	Yes	27,9	87,7	55,6	81,5	77,8
Search for employment	Job offers in the newspaper, internet	29,9	86,4	52,4	77,7	74,4
	Public employment services	9,3	83,0	55,2	82,9	79,1
	University employment services (job board, alumni associations, ...)	9,7	87,8	60,4	84,8	83,3
	Through temporary employment agencies	5,1	79,8	38,1	64,7	63,6
	Job placement program	9,6	86,6	60,9	85,4	81,0
	He contacted the employer on his own initiative or used personal contacts (family, friends)	35,9	86,1	47,0	76,8	73,3
	The employer contacted him/her	18,6	88,2	51,2	78,7	75,8
	Continued with the internship in companies/institutions	8,4	91,0	53,9	80,6	83,2
	Prepared for a public contest / state employment	14,9	91,1	75,9	86,2	78,0
	Set up own business	4,5	93,5	44,2	86,6	74,4
	Other	2,3	89,5	45,7	83,1	74,3
Total		100,0	86,1	54,3	79,6	75,6

Source: INE (EILU) and authors' own calculations.

### 5.2.3. Modeling the determinants of employment outcomes for bachelor's graduates

In analyzing the determinants of employment outcomes, the impact of the relevant variables in each of the four dimensions considered is taken into account. The determinants were modeled by estimating four probit models: the probability of being employed, of earning 1,500 euros or more per month, of having a job that requires a university

degree, and of having a job that matches the field of study.

The main results are summarized in the four panels of figure 5.9<sup>31</sup>. Each panel shows the estimated marginal effects—i.e. the contribution (positive or negative) to the probability of a successful outcome—of one of the explanatory variables: being employed in panel *a*; earning more than 1,500 euros in panel *b*; having a job that requires a

<sup>31</sup> The detailed results of the four estimated models can be seen in Annex 3, Table A3.2.

university degree in panel *c*, and having a job that matches the field of study in panel *d*.

The marginal effects are calculated by comparison to the reference individual<sup>32</sup>. That is, they indicate by how much the probability of a successful outcome will change as a result of being male rather than female, having done an extracurricular internship vs. not having done one, having studied at a public university vs. a private one, and so on. A positive sign indicates an increase in the probability of a successful outcome and a negative sign, a decrease. The magnitude of the effect is measured in percentage points; for example, 5.2 would indicate an increase of 5.2 percentage points in the probability of a successful employment outcome.

### Personal factors<sup>33</sup>

- *Sex*. Being male has no significant impact on the likelihood of finding employment but increases the likelihood of having higher earnings (+8.0 percentage points [pp]) and of vertical match, i.e. match between the job and the level of educational attainment (+2.2 pp).
- *Age*. The standard age for finishing a bachelor's degree is 22 or 23, but the reference category in the analysis are those who graduated at age 35 or over. It is to be expected, therefore, that this group will have been working while studying (as is often the case, for example, in distance learning universities). Accordingly, graduates under 30 are less likely to earn more than 1,500 euros (−10.7 pp), as also are those aged 30–34 (−10.9 pp), because they have less work experience. Younger graduates are also less likely to achieve a

vertical match (having a job that requires a degree), although they do tend to have a better horizontal match (having a job that matches their field of study).

- *Having received an award* (e.g. bachelor's prize) *or a scholarship for merit*. This variable does not significantly increase the likelihood of being employed, but it does increase the likelihood that the job will be of higher quality because it is better paid (+8.4 pp), requires a university degree (+5.9 pp) or is more closely matched to the field of study (+3.4 pp).
- *Languages*. Perhaps because it has long been considered a core requirement and so has become commonplace among the graduate population, the only significant effect of knowing more than one language is an increase (+4.0 pp) in the probability of a match between the job and the field of study.

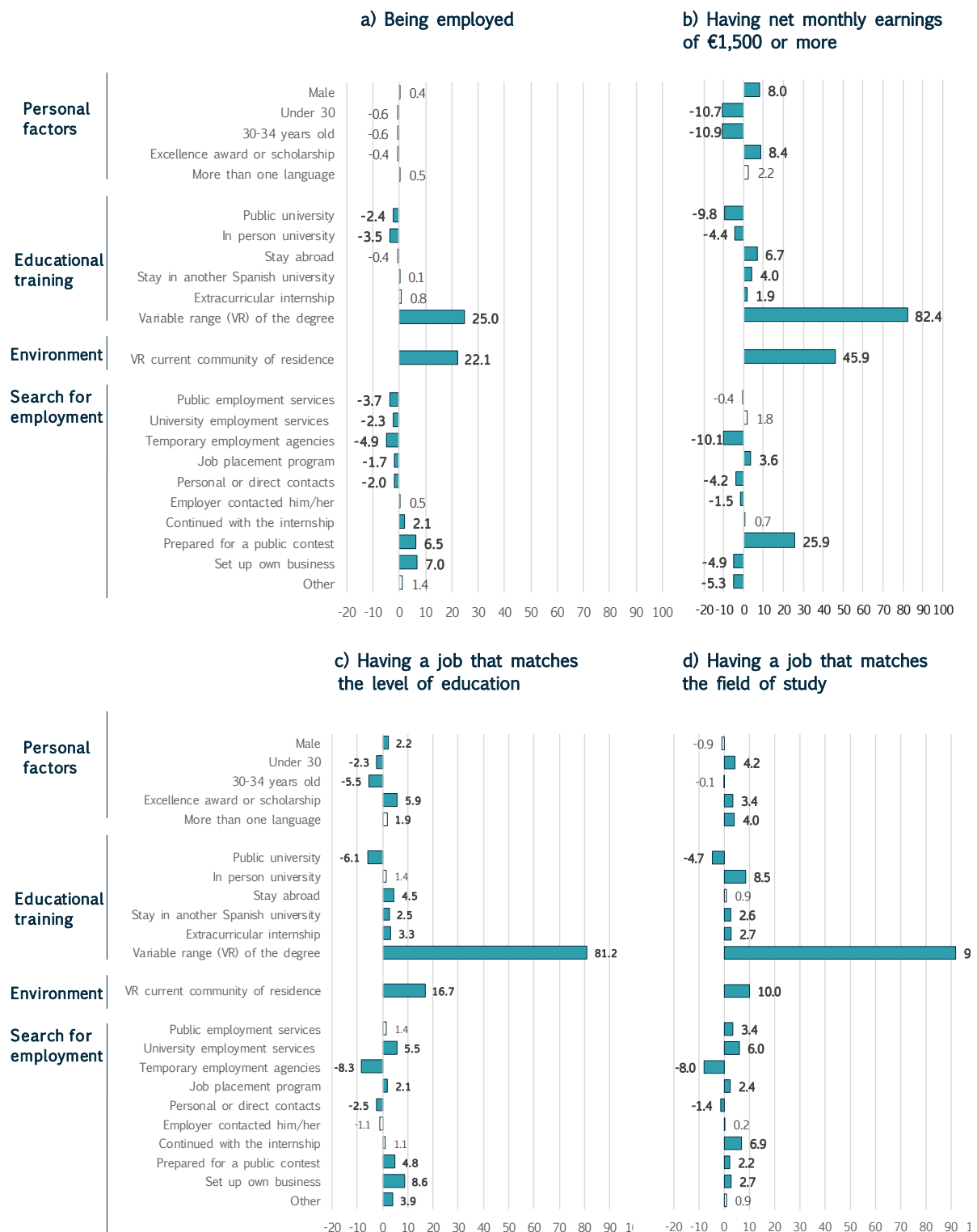
### Education received

- *Type of university*. This variable is relevant not so much for the size of its marginal effects as for the fact that the effects are consistent across the four employment outcome variables analyzed. Compared to graduates of private universities, the graduates of public universities are less likely to be employed five years after graduation (−2.4 pp), to earn more than 1,500 euros (−9.8 pp), to have found a vertical match (−6.1) and to have found a horizontal match (−5.7 pp). The graduates of private universities are therefore at an advantage, especially in quality of employment.

<sup>32</sup> The reference categories are: being female, being more than 34 years old, not having received an award or scholarship for merit, not speaking any other languages apart from the mother tongue, having studied at a private university, having studied at a distance learning university, not having spent a study period abroad or in another Spanish university, not having completed an extracurricular internship, having studied History of Art, having conducted the job search through job offers in the press or on the Internet, and residing in Andalusia after graduation.

<sup>33</sup> In addition to the personal factors already described, we analyzed the effect on the dependent variables of whether the graduate's mother and father had been to university. Whether the mother went to university makes very little difference, with an increase in the probability of higher earnings (3.7 pp), vertical match (4.9 pp) and horizontal match (1.3 pp) where she did. In cases where the father went to university, we also see an increase in the probability of higher earnings (5.5 pp), vertical match (5 pp) and horizontal match (2 pp). To make the results easier to read, we dispensed with these variables in our final analysis.

Figure 5.9. University graduates. Marginal effects on the probability of...  
(percentage points)



Note: Light blue bars and bold figures represent significant effects at 1%, 5% and 10%.

R.V.: range of variation of significant marginal effects at 1%, 5% and 10%.

Source: INE (EILU) and authors' own calculations.

- *Distance learning universities.* The proportion of students who are working while studying is significantly higher in distance learning universities than in traditional on-site universities, because distance learning makes it easier to do both simultaneously. It is not surprising, therefore, that compared to graduates of distance learning universities, graduates of on-site universities are less likely to be employed (−3.5 pp) and less likely to be earning more than 1,500 euros per month (−4.4 pp), since years of work experience tend to be reflected in earnings. The field of study-job match is also better among graduates of distance learning universities (+8.5 pp), perhaps because a significant number of such students choose their field of study to match the work they have been doing and to improve their opportunities in that field of work.
- *Mobility.* Mobility is found to improve outcomes, not in terms of being employed or not, but in quality of employment. Having completed a study period abroad during the degree course increases the probability of having higher earnings (+6.7 pp) and having a job that requires a university degree (+4.5 pp). Mobility within Spain (i.e. study periods at other Spanish universities under the SICUE program) also increases the probability of having higher earnings (+4 pp), having a vertical education-job match (+2.5 pp) and having a job that matches the field of study (+2.5 pp).
- *Extracurricular internships.* The great majority of university degree courses include mandatory internships, so this variable is unlikely to indicate any differences in the employability of their graduates. However, students can also complete voluntary or extracurricular internships, which are associated with a statistically significant increase in quality of employment, with a +1.9 pp increase in the probability of being in the higher earnings bracket, a +3.3 pp increase in vertical match and a +2.7 pp increase in horizontal match.
- *Field of study.* The choice of degree (we have taken the Art History degree as a reference for calculating the marginal effects on account of its low employment outcomes) affects very noticeably all the dimensions of employment considered, especially those reflecting quality of employment. The probability of being employed varies by +25 pp, that of being in a higher earnings bracket by +82.4 pp, that of achieving a vertical match by +81.2 pp and that of achieving a horizontal match by +91.8 pp<sup>34</sup>.

#### Local environment

- *Region of residence.* This variable, too, plays a very significant role in explaining differences in employment status and quality of employment, second only to the field of study. It highlights how employment outcomes depend substantially on the local employment environment, and also on mobility to escape the constraints of living in a region with a weak labor market. The variable we have used to capture the local environment is the region of residence of the graduate after graduation. This may be the region the graduate was living in while studying or different, as a result of mobility, which may be in either direction, i.e. back to the home region if the student moved away to study, or away from the home region in search of employment. The mobility variable includes regional labor market differences, both in terms of levels of unemployment and in terms of the level of demand for skilled labor in the local economy. The region of residence taken as a reference is Andalusia, which has the worst average employment outcomes (table 5.2). Figure 5.9 panels *a* to *d* show that residing in or moving to another region can increase the likelihood of being employed by +22.1 pp, the likelihood of earning more than 1,500 euros by +45.9, the likelihood of a horizontal match by +16.7 pp and that of a vertical match by +10.0 pp.

<sup>34</sup> Rodríguez, Vidal and Vieira (2019) analyze the influence of demographic, educational and labor variables on horizontal match between education and job using EILU data from 2014. The various logistic regression models presented show the great influence of the degree subject, grouped by areas

of knowledge. Thus, taking demographic and educational variables into account, the field of study is the determining variable and graduates in Health Sciences are six times more likely to find a job that matches their specialization than graduates in Social Sciences or Law.

- *Residence abroad.* This variable is included as a separate area of residence in order to differentiate those who, since graduation, have either returned to their home country (foreigners) or have found work outside Spain (Spaniards). It has significant effects on all the outcome dimensions considered.

### ***Job search method***

- *Influence on being employed.* The results are measured against the most common search method, which is looking for job offers in the press and on the internet. This method is more effective than using public employment services (−3.7 pp), university job services (−2.3 pp), temporary work agencies (−4.9 pp), job boards (−1.7 pp) or direct contact by an employer (−2.0 pp). On the other hand, continuing an internship (+2.1 pp), preparing for public service exams (+6.5 pp) and self-employment or entrepreneurship (+7.0) all increase the likelihood of being employed.
- *Influence on quality of employment.* Seeking a career in public service through an entrance examination increases the probability of belonging to the group of high earners (+25.9 pp), indicating that public sector starting salaries for graduates are clearly higher than their private sector equivalent. Using temporary employment agencies also influences outcomes, but negatively: it reduces (−10.1 pp)

the probability of having high earnings very significantly, always compared to the earnings of those who found employment using the reference method, i.e. press and internet. These results are fairly similar to those for vertical and horizontal match: using temporary employment agencies reduces the likelihood of either type of match (−8.3 pp vertical and −8.0 pp horizontal), whereas preparing for public service exams and self-employment increase it, while continuation of internships increases the likelihood of horizontal match (+6.9).

In conclusion, the main determinants of being employed or not and quality of employment are, in order of size of their marginal effects, first, the choice of degree and, second, the region the graduate lives in or moves to to find work. Degree choice and mobility are thus the key determinants, modulated by the other variables analyzed.

These results have a positive reading: these are variables the student can influence through an appropriate choice of degree or through mobility decisions. The challenge lies in the fact that making the right decision requires a certain level of information on the characteristics of each degree terms of employability and on the characteristics of regional labor markets. Given the importance of the choice of degree, in section 5.3 below we analyze the bachelor's degree programs offered by Spanish universities in relation to employment outcomes.



#### 5.2.4. Modeling the determinants of employment outcomes for master's graduates

In the previous section we analyzed the determinants of employment outcomes for bachelor's graduates. For various technical reasons, mainly to do with the availability of information<sup>35</sup>, we make no attempt to analyze master's graduates in the same level of detail but nevertheless are able to determine the main similarities and differences in employment outcomes between bachelor's and master's graduates. We repeated the econometric exercise for master's graduates to analyze the relative importance of the different types of variables (personal factors, education, local environment and job search methods) in order to check whether the main determinants are similar or significantly different.

Figure 5.10<sup>36</sup> shows the marginal effects on the probability of being employed, of having vertical and horizontal match and of high earnings for master's graduates<sup>37</sup>. Compared to figure 2.1, the results are very similar<sup>38</sup>. Choice of degree is the key variable for explaining differences between graduates. Choosing one master's degree rather than another can increase the probability of being employed by 32.7 pp, the probability of having a horizontal match by 73.3 pp, that of having a vertical match by 33.6 pp and that of having net monthly earnings of 1,500 euros or more by 77.4 pp.

As in the case of bachelor's graduates, the second explanatory factor is the region of residence as an indicator of the regional labor market situation. Seeking employment in one region rather than another can increase the probability of being employed by 7.6 pp, that of finding a vertical and horizontal job match by 13.9 pp and 33.6 pp, respectively, and that of earning more than 1,500 euros by 46.9 pp.

The rest of the significant factors, though less important, have effects similar in magnitude to those observed for bachelor's degrees: having studied at a private university moderately increases the likelihood of being employed, of having higher earnings and of finding a vertical (job-to-level of education) match, but does not affect the likelihood of finding a horizontal (job-to-field of study) match. Finding work through temporary employment agencies negatively affects earnings and education-job match, while seeking employment in public service positively affects the probability of being employed and the education-job match, with a particularly strong impact on the probability of having higher earnings (26 pp) in the years analyzed (the first few years after graduation).

In short, the conclusions to be drawn from our analysis of the determinants of employment outcomes for master's graduates are very similar to those for bachelor's graduates.

<sup>35</sup> Given the information available at master's level, the analyses reported in this document for bachelor's graduates cannot be performed for master's graduates. As will be seen in section 4, the report evaluates employment outcomes by university and degree group using a combination of the information provided by the EILU and the Ministry of Universities and the Social Security agency. For reasons of statistical secrecy, the Ministry does not publish information on the indicators used in at least 42% of cases (university/field-of-study group combinations).

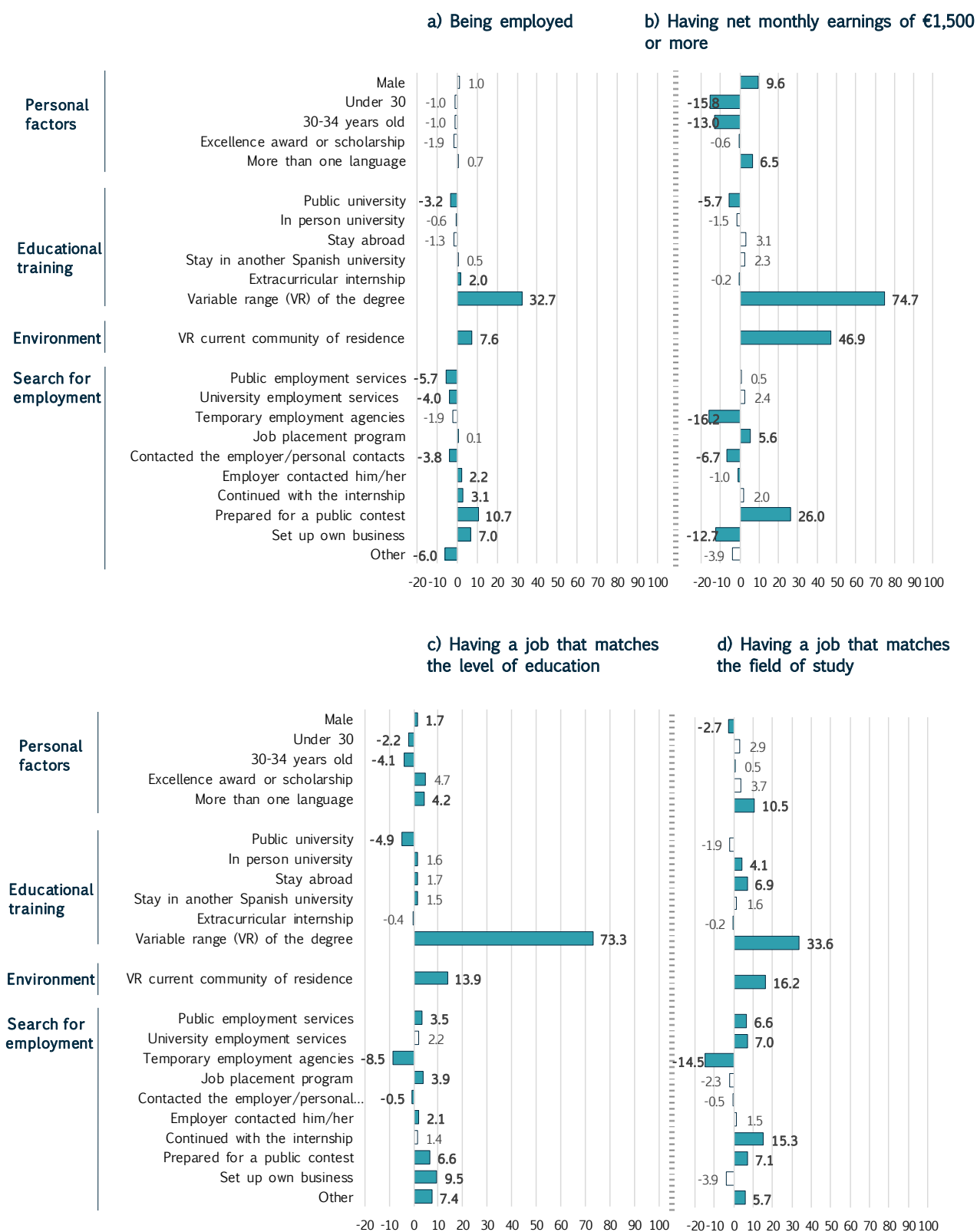
<sup>36</sup> The detailed results of the four estimated models can be seen in **Annex 3, Table A3.2**.

<sup>37</sup> The reference categories are: being female, being more than 34 years old, not having received an award or

scholarship for merit, not speaking any other languages apart from the mother tongue, having studied at a private university, having studied at a distance learning university, not having spent a study period abroad or in another Spanish university, not having completed an extracurricular internship, having studied Fine Arts, having conducted the job search through job offers in the press or on the internet, and residing in Andalusia after graduation.

<sup>38</sup> For both exercises we use the same reference categories, except for the field of study. For the master's degree, we use Fine Arts rather than Art History because Art History is not one of the fields in which the EILU groups master's degrees, Fine Arts being the closest equivalent according to the coding used in the survey.

Figure 5.10. Master's graduates. Marginal effects on the probability of...  
(percentage points)



Note: Light blue bars and bold figures represent significant effects at 1%, 5% and 10%.

R.V.: range of variation of significant marginal effects at 1%, 5% and 10%.

Source: INE (EILU) and authors' own calculations.

### 5.3. GRADUATE EMPLOYMENT OUTCOMES BY FIELD OF STUDY

The analysis of the determinants of the differences in graduate employment outcomes presented in section 5.2 has shown that the main determinant is the choice of degree. In this section we focus exclusively on this variable to assess the size of the differences in employment outcomes between different fields of study.

In the 2020 U-Ranking report (Pérez and Aldás [dirs.] 2020), graduate employment was analyzed based on the information provided by the Ministry of Universities from social security records of people registered as employed and built a synthetic index of employment outcomes by degree, based on three indicators this source provides: the employment rate (i.e. the percentage registered with social security as being employed); the percentage of those in employment whose job matches their educational level; and the average social security contribution base of those in full-time employment.

This same information is also available now, but the analysis can be improved by incorporating an additional statistical source to supplement and overcome the limitations of the Ministry of Universities data, obtained exclusively from social security records. For example, the Ministry data do not include the employment outcomes of graduates who are working abroad or who are working in Spain but are not registered with the social security agency because they are covered by mutual associations serving certain professions.

The additional source is the INE's Graduate Employment Survey (EILU), which is described in the previous section. The EILU provides information on the transition from university to the labor market of graduates who graduated in the 2013-14 academic year, their employment status in 2019, and several of the aspects of their education and entry to work discussed in previous sections.

This section is divided into three subsections. The first looks at the differences in employment

outcomes in the four dimensions we have been considering. The second builds a synthetic index of employment outcomes based on the four dimensions and presents a general assessment of the differences between the 101 fields of study considered. The third replicates the synthetic index, aggregating the 101 fields of study into 10 groups. Finally, we compare the ranking of bachelor's degrees with the ranking of master's degrees and produce a synthetic index combining the two.

#### 5.3.1. Differences in employment status and quality of employment

At present there are more than 4,000 different degree programs offered by the Spanish University System. But many of these programs cover similar subjects and so they can be grouped in 100 or so fields of study. There are marked differences in employment outcomes between these fields of study, but the scale of the differences varies across the four dimensions of graduate employment considered.

Table 5.4 presents some descriptive statistics of the employment indicators used (all of which are percentages), broken down by field of study. The median of the indicators reaches different levels, the employment rate being higher than the quality of employment indicators. Among the quality indicators, the lowest median is that of the percentage of employed graduates earning 1,500 euros or more per month. As regards the magnitude of the differences in the value of the indicators by field of study, the largest differences are in the earnings variable, followed by the two education-job match indicators. The differences between fields of study are thus greater in quality of employment than in employment status (being employed or not), although the range of values in employment status is also considerable. Looking at the interquartile range (Q1-Q3), the differences are also greater in quality of employment than in employment rate. Following the classification of employment indicators provided by the Ministry of Universities, the fields of study can be aggregated into 10 large groups<sup>39</sup>. This classification has advantages over

<sup>39</sup> The determinants of graduate employment have also been analyzed using field-of-study groups (10) rather than separate fields of study (101). The field-of-study group to which a degree belongs also significantly affects all the dimensions

of employment outcomes analyzed: the probability of being employed by +15 pp, that of earning more than 1,500 euros per month by +32 pp, vertical adjustment by +31 pp and horizontal adjustment by +28 pp. See Annex 4 for details.

Table 5.4. Descriptive statistics of employment outcome indicators by field of study

	Employment rate	% employed with earnings of €1,500 or more	% in highly skilled jobs	% working in their field of study or a related field
Min	63.8	10.7	34.7	22.4
Q1	82.0	37.0	71.7	60.5
Average	86.8	50.6	79.3	70.7
Q3	91.4	69.0	89.9	80.5
Max	97.5	91.8	100.0	99.4

Source: INE (EILU) and authors' own calculations.

Table 5.5. Average employment outcome indicators by field-of-study group and by field of study for graduates of the Spanish University System. Situation in 2019 of graduates who graduated in the 2013-14 academic year

	Graduates	Employment rate	% employed with earnings of €1,500 or more	% in highly skilled jobs	% working in their field of study or a related field
IT	6,859	96.3	79.7	92.8	89.0
Engineering, industry and construction	38,686	92.0	72.9	87.8	79.4
Health and social services	33,181	92.1	60.6	93.3	90.5
Agriculture, livestock, forestry, fishing, and veterinary science	4,033	88.6	48.1	80.8	77.0
Education	41,108	82.2	50.5	83.8	76.4
Business, administration and law	48,349	84.0	52.7	64.9	73.6
Science	12,233	83.6	39.2	82.6	71.3
Social sciences, journalism and documentation	21,241	85.1	39.9	72.1	63.5
Services	7,720	84.4	37.9	60.5	62.7
Arts and humanities	20,216	77.1	36.4	72.3	57.2
<b>Total</b>	<b>233,626</b>	<b>86.1</b>	<b>54.3</b>	<b>79.6</b>	<b>75.6</b>

Source: INE (EILU) and authors' own calculations.

the grouping into five branches of knowledge and although it does not map exactly to those five branches, it allows for interesting breakdowns of some of them, especially Social sciences and Engineering. The Social sciences and law branch, for example, which groups a large number of degree programs and more than 100,000 students, is divided, in the Ministry of Universities classification, into three groups: Education; Business and administration and law; and Social sciences, journalism and documentation; and some of its degrees are included in other field-of-study groups<sup>40</sup>. The Engineering and architecture branch can be divided into three groups: Computer science; Engineering, industry and construction; and a small group comprising Agriculture, livestock farming, forestry, fishing and veterinary science. The Health, Sciences,

and Arts and humanities branches correspond basically to three of the field-of-study groups considered, and added to these is a Services group that includes degrees from various branches.

Table 5.5 shows the average values of each of these 10 field-of-study groups. The field-of-study group cells are shaded darker green the more positive the employment outcome and darker red the more negative the outcome. The table shows, in the first column, the number of graduates in each field-of-study group; in the second column the employment rate for that group; and in the other columns the three indicators of employment quality. Table 5.6 repeats the analysis by field of study, grouping the fields in 10 sections corresponding to the field-of-study groups.

<sup>40</sup> Some fields of study belonging to the Social sciences and law branch, such as tourism, and physical education and sports, are classified in the Services group. Social work is classified in the Health and social services group, while

psychology and veterinary studies, both linked to the Health sciences branch of knowledge, are classified in the Social sciences, journalism and documentation and Agriculture and livestock farming groups, respectively.

Table 5.6. Average employment outcome indicators by field-of-study group and by field of study for graduates of the Spanish University System. Situation in 2019 of graduates who graduated in the 2013-14 academic year

	Graduates	Em- p- loy- ment rate	% employed with earnings of €1,500 or more	% in highly skilled jobs	% working in their field of study or a related field
<b>IT</b>	<b>6,859</b>	<b>96.3</b>	<b>79.7</b>	<b>92.8</b>	<b>89.0</b>
Software and application development and multimedia engineering	187	97.4	77.6	90.1	90.5
Computer Science	6,672	96.3	79.7	92.8	89.0
<b>Engineering, industry and construction</b>	<b>38,686</b>	<b>92.0</b>	<b>72.9</b>	<b>87.8</b>	<b>79.4</b>
Telecommunications engineering	743	97.5	78.8	89.9	81.3
Telecommunication Engineering	2,335	97.1	79.5	91.2	86.1
Industrial organization engineering and nanotechnology	1,101	96.7	75.4	86.2	74.8
Aeronautical Engineering	1,543	96.6	91.8	96.3	84.9
Computer Engineering	86	96.0	86.4	95.4	87.8
Industrial technology engineering	5,091	94.4	84.1	92.3	87.3
Electrical engineering	1,686	93.5	83.2	87.1	85.6
Oenology	112	93.4	56.5	81.7	83.8
Industrial chemical engineering and environmental engineering	2,132	93.3	64.7	84.0	66.6
Energy engineering	141	93.2	82.8	95.5	80.5
Mechanical engineering	3,861	92.5	72.7	86.1	82.9
Naval and oceanic engineering	553	92.2	86.8	75.4	83.5
Industrial electronics and automatic engineering	2,525	91.4	78.4	86.4	82.1
Food science and technology and food engineering	587	91.0	39.7	92.3	72.1
Architecture and Urban and Landscape Planning	3,841	90.8	64.1	94.6	86.8
Civil Engineering	5,332	90.3	72.8	87.1	73.3
Technical Architecture	3,849	89.8	56.2	78.3	73.1
Materials engineering and textile engineering	172	88.1	81.5	94.0	66.1
Mining and energy engineering	807	87.0	74.7	83.2	64.5
Sound and image engineering	437	86.3	75.7	88.6	70.8
Industrial design and product development engineering	946	86.2	58.4	83.7	67.0
Geomatics, topography and cartography engineering	806	79.2	56.4	83.7	61.5
<b>Health and social services</b>	<b>33,181</b>	<b>92.1</b>	<b>60.6</b>	<b>93.3</b>	<b>90.5</b>
Podiatry	433	96.9	41.0	96.2	82.6
Dentistry	1,785	96.4	68.2	100.0	99.4
Medicine	5,571	95.0	91.8	99.9	99.2
Pharmacy	2,872	92.9	70.4	91.8	95.4
Nursing	11,700	92.7	66.9	97.5	94.7
Optics and optometry	797	91.6	46.4	92.7	87.1
Physiotherapy	3,426	91.4	33.9	95.8	88.3
Human nutrition and dietetics	884	91.0	32.4	75.1	68.4
Biomedical and health engineering	106	90.1	82.5	90.8	77.0
Occupational therapy	711	88.8	15.4	82.5	77.7
Speech therapy	631	86.3	22.4	85.1	76.0
Social work	4,265	86.2	33.1	74.1	70.7
<b>Agriculture, livestock, forestry, fisheries, and veterinary science</b>	<b>4,033</b>	<b>88.6</b>	<b>48.1</b>	<b>80.8</b>	<b>77.0</b>
Agricultural and agri-food engineering	417	91.4	53.3	79.1	71.1
Agricultural, livestock and rural environment engineering	1,173	88.9	56.7	77.2	76.2
Forestry and forest engineering	765	88.8	50.6	71.7	62.7
Veterinary	1,423	88.1	39.0	91.8	90.2
Horticultural and gardening engineering	255	84.9	41.8	66.9	59.6
<b>Education</b>	<b>41,108</b>	<b>82.2</b>	<b>50.5</b>	<b>83.8</b>	<b>76.4</b>
Social education	2,422	87.7	28.2	80.4	75.7
Other teachers	1,393	83.8	37.5	72.7	63.5
Primary education	19,624	83.5	60.6	88.3	79.9
Pedagogy	5,025	81.9	49.8	81.8	74.6
Early Childhood Education	12,644	78.9	40.6	79.3	73.2

Note: within each group the fields are ranked by employment rate.

Source: INE (EILU) and authors' own calculations.

Table 5.6. (cont.)

	Graduates	Employment rate	% employed with earnings of €1,500 or more	% in highly skilled jobs	% working in their field of study or a related field
<b>Business, management and law</b>	<b>48,349</b>	<b>84.0</b>	<b>52.7</b>	<b>64.9</b>	<b>73.6</b>
Financial and actuarial	158	93.8	79.2	72.7	70.4
Commerce	399	90.5	51.8	61.8	65.1
Administration and business	21,463	88.5	54.9	58.8	77.5
Advertising and public relations	3,154	87.4	42.6	75.7	58.5
Marketing	948	86.3	69.0	73.2	63.1
Management and Public Administration	605	84.0	27.3	43.6	44.0
Finance and accounting	946	79.3	39.2	34.7	73.2
Labor Sciences	4,667	78.8	40.5	55.8	63.3
Law	15,958	78.7	55.7	76.7	76.2
Protocol and events	51	77.6	38.1	67.5	55.5
<b>Science</b>	<b>12,233</b>	<b>83.6</b>	<b>39.2</b>	<b>82.6</b>	<b>71.3</b>
Biomedicine	250	92.9	52.7	96.0	86.3
Statistics	240	92.7	64.8	80.9	68.0
Physics	914	89.1	56.5	95.3	76.1
Mathematics	840	88.9	70.4	90.8	84.2
Biotechnology	785	86.8	41.0	94.4	83.9
Environmental Sciences	1,864	85.7	32.2	73.8	51.8
Chemistry	1,971	83.1	41.9	85.0	78.7
Geology	374	82.0	33.6	73.5	58.2
Biology	3,585	80.7	27.9	77.7	72.4
Geography and land management	366	78.4	25.7	66.8	46.6
Biochemistry	832	77.7	39.8	93.1	76.3
Marine sciences	212	77.7	22.7	69.8	65.9
<b>Social sciences, journalism and documentation</b>	<b>21,241</b>	<b>85.1</b>	<b>39.9</b>	<b>72.1</b>	<b>63.5</b>
Criminology	1,335	88.7	58.7	59.4	43.9
Economics	4,104	87.8	55.4	59.2	71.4
Journalism	3,870	87.0	33.1	75.3	67.7
Social and Cultural Anthropology and Cultural Studies and Management	619	86.1	60.8	91.0	35.4
Geography	256	84.6	38.2	57.9	22.4
Sociology and Gender Equality	831	84.5	42.0	67.3	47.5
Politics and Public Management	1,426	84.3	49.2	66.7	48.5
Information and documentation	484	82.8	23.8	60.5	57.4
International Relations	133	82.7	67.3	78.5	48.4
Psychology	8,022	82.7	28.4	80.7	69.3
Communication	161	81.5	42.0	79.0	60.6
<b>Services</b>	<b>7,720</b>	<b>84.4</b>	<b>37.9</b>	<b>60.5</b>	<b>62.7</b>
Services (other studies)	136	96.1	84.2	68.2	70.6
Land transport and air transport services	116	91.8	70.2	69.5	55.0
Nautical and maritime transport	242	87.9	78.6	67.1	82.8
Physical activity and sports	3,866	86.6	33.8	76.4	68.3
Tourism	3,360	80.8	36.4	39.5	54.1
<b>Arts and humanities</b>	<b>20,216</b>	<b>77.1</b>	<b>36.4</b>	<b>72.3</b>	<b>57.2</b>
Design	534	86.1	34.9	77.7	79.1
Translation and interpretation	1,917	85.8	40.2	79.4	63.4
Audiovisual, image and multimedia	2,923	83.8	37.0	77.7	60.0
Music and Performing Arts	367	83.2	61.5	88.7	63.0
English Language	2,368	82.5	39.1	73.9	64.4
Classical Languages	190	81.2	28.3	78.4	64.4
Spanish languages and dialects	1,990	79.8	53.1	85.7	76.9
Humanities	658	78.2	33.4	59.3	55.0
Other foreign languages	557	77.6	48.1	72.6	51.6
Archaeology	91	77.0	10.7	62.0	54.0
Modern and applied languages	404	75.1	44.2	63.4	46.6
Fine Arts	2,750	72.1	21.0	67.3	55.3
History	2,853	71.5	31.3	62.7	39.0
Literature	99	68.5	53.2	81.8	61.3
History of Art	1,541	65.0	25.4	51.3	35.8
Philosophy	809	63.8	42.0	74.2	44.7
Conservation and restoration	165	63.8	16.6	82.2	60.5
<b>Total</b>	<b>233,626</b>	<b>86.1</b>	<b>54.3</b>	<b>79.6</b>	<b>75.6</b>

Note: within each group the fields are ranked by employment rate. Source: INE (EILU) and authors' own calculations.

Source: INE (EILU) and authors' own calculations.



The relevant pattern of employment outcomes by field-of-study group and by field of study is as follows:

- The most favorable outcomes, both in employment status and in quality of employment, are for the Computer science, Engineering, industry and construction, and Health and social services groups. The fields of study in these three groups account for practically all the dark green in the table. In almost all cases these fields of study have employment rates above 90% and an education-job match above 80%. In most Computer science and Engineering degrees, more than 75% of graduates earn more than 1,500 euros per month.
- The least favorable outcomes (shaded red) are concentrated in the Arts and humanities group, together with a significant number of fields of study in the Social sciences, journalism and documentation group. In many cases the employment rates are below 80%, but it is in quality of employment that we find the worst outcomes, with horizontal match often below 60% and a majority of graduates earning less than 1,500 euros.
- In the intermediate zone (from pink to yellow) we find fields of study from all branches of knowledge, but above all from the Agriculture, Education, Science and Business groups. The greatest weaknesses in these fields of study are seen in the quality of employment indicators, especially low earnings and horizontal job mismatch. Horizontal mismatch means that the job is unrelated to the degree subject. This problem is also apparent in the fields of study shaded red and may indicate that the education received by graduates in these fields of study does not prepare them for the jobs they occupy, in contrast to the fields of study shaded green.

It is worth drawing attention to the first column in the table, showing the number of graduates in each field of study. We see huge differences in size, from one field with more than 20,000 graduates to others with fewer than 100. More concerning is that the red cells include degrees that are taken by thousands of students, despite the poor employment outcome indicators.

### 5.3.2. Synthetic index and ranking of fields of study by employment outcomes

Using various different employment outcome indicators enriches the analysis but also makes it more difficult to establish simple comparisons of outcomes by field of study and thus establish a ranking. One way to overcome this drawback is by calculating a synthetic index from the four indicators considered. There are many ways such a synthetic index can be constructed and several options are reasonable, so we must explain the criteria we have used (Nardo *et al.* 2008).

Although all the simple indicators incorporated in the synthetic index are percentages, they have different means and medians, which would influence the relative weight assigned to each indicator in an undesirable way. To prevent this, each employment indicator is normalized with respect to the median value of the 101 fields of study.

The resulting indices are aggregated using a geometric mean. The weights given to the indices distribute the importance of employment, earnings and education-job match equally (1/3) in the synthetic indicator. Since the education-job match area includes two indicators, half of the one-third assigned to this area is assigned to each indicator.

The following expression is used to calculate the synthetic indicator of employment outcomes by field of study ( $c$ ), following the criteria just described:

$$Ind.EILU_c = \left( \frac{EMPLEO_c}{MED.EMPLEO} \right)^{1/3} * \left( \frac{ING1500_c}{MED.ING1500} \right)^{1/3} * \left( \frac{AJUSCNO3_c}{MED.AJUSCNO3} \right)^{0.5/3} * \left( \frac{AJUSAREA_c}{MED.AJUSAREA} \right)^{0.5/3}$$

Where:

- $EMPLEO_c$  graduates in field of study  $c$  who are currently employed as a percentage of total graduates in field of study  $c$ .
- $ING1500_c$  employed graduates in field of study  $c$  who have net monthly earnings of 1,500 euros or more as a percentage of total employed graduates in field of study  $c$
- $AJUSCNO3_c$  employed graduates in field of study  $c$  who have an occupation related to groups 1 to 3 of the Spanish National

Classification of Occupations (CNO) as a percentage of total employed graduates in field of study  $c$ .

- $AJUSAREA_c$  employed graduates in field of study  $c$  who say they are working exclusively in their field of study or their own field or a related field as a percentage of total employed graduates in field of study  $c$
- $MED.EMPLEO$  ,  $MED.ING1500$  ,  $MED.AJUSCNO3$  and  $MED.AJUSCAREA$  the median values for all the fields of study.

Table 5.7 presents the ranking of the fields of study according to the synthetic index. Columns 4 to 7 of the table show the values of each of the indicators included in the calculation, so that we can check why a field of study is in a particular position. For example, podiatry degrees rank 42nd, despite their good results in employment and education-job match. This is because the percentage of employed graduates earning 1,500 euros or more per month is well below the average.

Table 5.7 orders the fields of study using the synthetic indicator to create the ranking by employment outcomes. The range of values is from 1.38 (Medicine) to 0.52 (Archeology) and the pattern of outcomes is as follows:

- As was to be expected, the top of the ranking is dominated by fields of study associated with the Health, Engineering and Computer science groups. The top 20 positions belong almost exclusively to these three groups, with employment outcome indices at least 20% above the average.
- The other (26) fields with above-average indices belong mainly to other degrees in the same three groups, accompanied mainly by degrees in the Sciences (4) and Social sciences (7) groups, especially business-related subjects.
- Most of the fields of study in the Social sciences group have indices below the average. Together with a heterogeneous set of degrees in natural sciences and some engineering subjects, they fill the range of values of the index between 0.8 and 1.0.
- The values of the synthetic employment outcomes index below 0.8 are highly concentrated in fields of study belonging to the Arts and humanities group, along with some from the Social sciences group.

Cuadro 5.7. Employment outcome by field-of-study for graduates of the Spanish University System

	Field of study	Graduates	Employment rate	% employed with earnings of €1,500 or more	% in highly skilled jobs	% working in their field of study or a related field	Synthetic index
1	Medicine	5,571	95.0	91.8	99.9	99.2	1.38
2	Aeronautical engineering	1,543	96.6	91.8	96.3	84.9	1.35
3	Computer Engineering	86	96.0	86.4	95.4	87.8	1.32
4	Industrial technology engineering	5,091	94.4	84.1	92.3	87.3	1.29
5	Computer science	6,672	96.3	79.7	92.8	89.0	1.29
6	Telecommunication engineering	2,335	97.1	79.5	91.2	86.1	1.28
7	Software and Apps Development and Multimedia En	187	97.4	77.6	90.1	90.5	1.28
8	Energy engineering	141	93.2	82.8	95.5	80.5	1.27
9	Electrical engineering	1,686	93.5	83.2	87.1	85.6	1.27
10	Electronics engineering	743	97.5	78.8	89.9	81.3	1.26
11	Dentistry	1,785	96.4	68.2	100.0	99.4	1.26
12	Naval and oceanic engineering	553	92.2	86.8	75.4	83.5	1.25
13	Biomedical and health engineering	106	90.1	82.5	90.8	77.0	1.24
14	Pharmacy	2,872	92.9	70.4	91.8	95.4	1.23
15	Industrial and automatic electronics engineering	2,525	91.4	78.4	86.4	82.1	1.22
16	Nursing	11,700	92.7	66.9	97.5	94.7	1.22
17	Industrial organization and nanotechnology engine	1,101	96.7	75.4	86.2	74.8	1.21
18	Mechanical engineering	3,861	92.5	72.7	86.1	82.9	1.20
19	Materials engineering and textile engineering	172	88.1	81.5	94.0	66.1	1.20
20	Other services* Other services* Other services* Oth	136	96.1	84.2	68.2	70.6	1.20
21	Mathematics	840	88.9	70.4	90.8	84.2	1.19
22	Financial and actuarial	158	93.8	79.2	72.7	70.4	1.17
23	Architecture and Urban and Landscape Planning	3,841	90.8	64.1	94.6	86.8	1.17
24	Civil engineering	5,332	90.3	72.8	87.1	73.3	1.17
25	Sound and image engineering	437	86.3	75.7	88.6	70.8	1.16
26	Nautical and maritime transport	242	87.9	78.6	67.1	82.8	1.16
27	Mining and energy engineering	807	87.0	74.7	83.2	64.5	1.13
28	Industrial Chemical and Environmental Engineering	2,132	93.3	64.7	84.0	66.6	1.11
29	Biomedicine	250	92.9	52.7	96.0	86.3	1.11
30	Statistics	240	92.7	64.8	80.9	68.0	1.11
31	Oenology	112	93.4	56.5	81.7	83.8	1.10
32	Physics	914	89.1	56.5	95.3	76.1	1.09
33	Primary Education	19,624	83.5	60.6	88.3	79.9	1.09
34	Marketing	948	86.3	69.0	73.2	63.1	1.07
35	Land and air transport service	116	91.8	70.2	69.5	55.0	1.07
36	Agricultural, livestock and rural engineering	1,173	88.9	56.7	77.2	76.2	1.06
37	Music and Performing Arts	367	83.2	61.5	88.7	63.0	1.05
38	Technical architecture	3,849	89.8	56.2	78.3	73.1	1.05
39	Optics and optometry	797	91.6	46.4	92.7	87.1	1.05
40	Industrial design and product development enginee	946	86.2	58.4	83.7	67.0	1.05
41	Agricultural and agri- food engineering	417	91.4	53.3	79.1	71.1	1.04
42	Podiatry	433	96.9	41.0	96.2	82.6	1.02
43	Spanish languages and dialects	1,990	79.8	53.1	85.7	76.9	1.02
44	International Relations	133	82.7	67.3	78.5	48.4	1.01
45	Law	15,958	78.7	55.7	76.7	76.2	1.01
46	Administration and business	21,463	88.5	54.9	58.8	77.5	1.00

Source: INE (EILU) and authors' own calculations.

Cuadro 5.7. (cont.)

	Field of study	Graduates	Employment rate	% employed with earnings of €1,500 or more	% in highly skilled jobs	% working in their field of study or a related field	Synthetic index
47	Geomatics engineering, topography and cartography	806	79.2	56.4	83.7	61.5	0.99
48	Pedagogy	5,025	81.9	49.8	81.8	74.6	0.99
49	Biotechnology	785	86.8	41.0	94.4	83.9	0.99
50	Economics	4,104	87.8	55.4	59.2	71.4	0.99
51	Veterinary	1,423	88.1	39.0	91.8	90.2	0.98
52	Forestry and forest engineering	765	88.8	50.6	71.7	62.7	0.97
53	Commerce	399	90.5	51.8	61.8	65.1	0.97
54	Social and cultural anthropology Cultural studies and	619	86.1	60.8	91.0	35.4	0.97
55	Food Science and Tech. and Food Eng.	587	91.0	39.7	92.3	72.1	0.96
56	Physiotherapy	3,426	91.4	33.9	95.8	88.3	0.95
57	Chemistry	1,971	83.1	41.9	85.0	78.7	0.95
58	Criminology	1,335	88.7	58.7	59.4	43.9	0.93
59	Biochemistry	832	77.7	39.8	93.1	76.3	0.93
60	Literature	99	68.5	53.2	81.8	61.3	0.92
61	Advertising and public relations	3,154	87.4	42.6	75.7	58.5	0.91
62	Translation and interpretation	1,917	85.8	40.2	79.4	63.4	0.91
63	Education for children	12,644	78.9	40.6	79.3	73.2	0.91
64	Communication	161	81.5	42.0	79.0	60.6	0.90
65	Public policy and management	1,426	84.3	49.2	66.7	48.5	0.90
66	Design	534	86.1	34.9	77.7	79.1	0.89
67	Other foreign languages	557	77.6	48.1	72.6	51.6	0.89
68	Horticultural engineering and gardening	255	84.9	41.8	66.9	59.6	0.88
69	English language	2,368	82.5	39.1	73.9	64.4	0.88
70	Other teachers	1,393	83.8	37.5	72.7	63.5	0.87
71	Physical activity and sport	3,866	86.6	33.8	76.4	68.3	0.86
72	Audiovisual, image and multimedia	2,923	83.8	37.0	77.7	60.0	0.86
73	Human nutrition and dietetics	884	91.0	32.4	75.1	68.4	0.86
74	Social work	4,265	86.2	33.1	74.1	70.7	0.86
75	Journalism	3,870	87.0	33.1	75.3	67.7	0.85
76	Sociology and gender equality	831	84.5	42.0	67.3	47.5	0.85
77	Social Education	2,422	87.7	28.2	80.4	75.7	0.84
78	Labor Sciences	4,667	78.8	40.5	55.8	63.3	0.83
79	Protocol and events	51	77.6	38.1	67.5	55.5	0.82
80	Geology	374	82.0	33.6	73.5	58.2	0.82
81	Modern and applied languages	404	75.1	44.2	63.4	46.6	0.82
82	Psychology	8,022	82.7	28.4	80.7	69.3	0.81
83	Environmental Sciences	1,864	85.7	32.2	73.8	51.8	0.80
84	Biology	3,585	80.7	27.9	77.7	72.4	0.80
85	Classical Languages	190	81.2	28.3	78.4	64.4	0.79
86	Finance and accounting	946	79.3	39.2	34.7	73.2	0.78
87	Speech Therapy	631	86.3	22.4	85.1	76.0	0.78
88	Philosophy	809	63.8	42.0	74.2	44.7	0.78
89	Humanities	658	78.2	33.4	59.3	55.0	0.77
90	Tourism	3,360	80.8	36.4	39.5	54.1	0.75
91	Marine Sciences	212	77.7	22.7	69.8	65.9	0.71
92	Geography	256	84.6	38.2	57.9	22.4	0.71
93	Information and documentation	484	82.8	23.8	60.5	57.4	0.71
94	Geography and land management	366	78.4	25.7	66.8	46.6	0.70
95	History	2,853	71.5	31.3	62.7	39.0	0.70
96	Occupational therapy	711	88.8	15.4	82.5	77.7	0.69
97	Management and public administration	605	84.0	27.3	43.6	44.0	0.67
98	Fine arts	2,750	72.1	21.0	67.3	55.3	0.66
99	Conservation and restoration	165	63.8	16.6	82.2	60.5	0.61
100	Art history	1,541	65.0	25.4	51.3	35.8	0.60
101	Archaeology	91	77.0	10.7	62.0	54.0	0.51
<b>Total</b>		<b>233,626</b>	<b>86.09</b>	<b>54.33</b>	<b>79.63</b>	<b>75.57</b>	

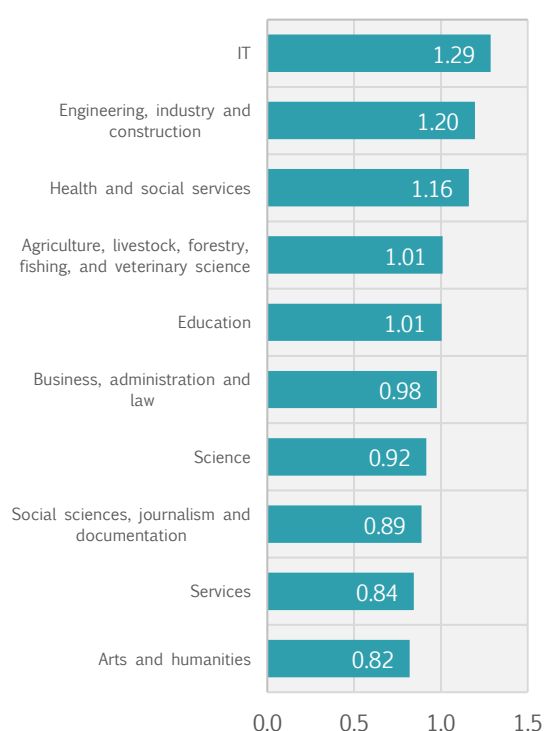
Source: INE (EILU) and authors' own calculations.

### 5.3.3. Synthetic index of employment outcomes by field-of-study group

Finally, in this section we explain the results of the synthetic index of employment outcomes based on the aggregation of the 101 fields of study in the 10 groups shown in table 5.6.

Figure 5.11 shows each field-of-study group's potential for successful employment outcomes as an index. As already explained, the index includes the employment rate and the quality of employment in terms of earnings and education-job match. The results confirm the conclusions drawn from our analysis of outcomes by field of study, i.e., better outcomes in the Computer science, Engineering<sup>41</sup> and Health groups, and worse outcomes in the Humanities and Services groups, the latter encompassing fields as diverse as physical education and sports, tourism, land and air transport, and nautical science and maritime transport).

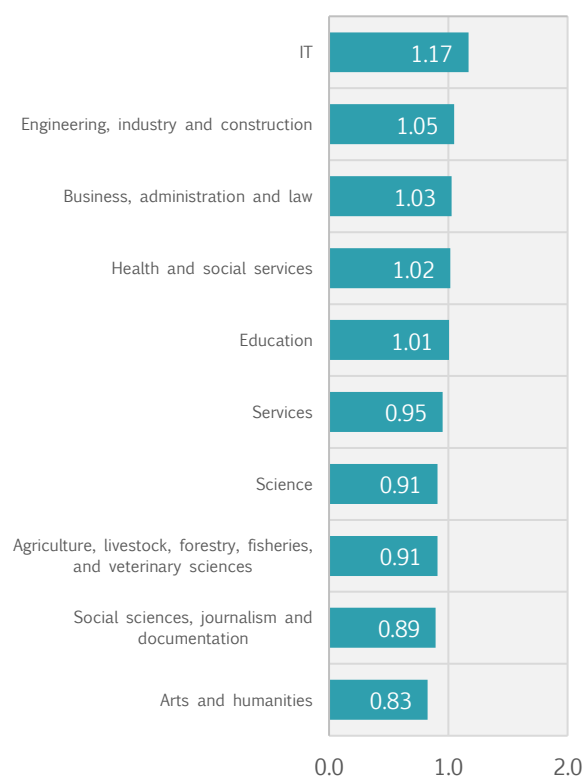
Figure 5.11. Employment outcome index by field-of-study group for bachelor's graduates



Source: INE (EILU) and authors' own calculations.

<sup>41</sup> Including the Agriculture, livestock farming, forestry, fishing and veterinary science group, which, as we saw in section 3, includes mainly engineering subjects (agriculture and agri-

Figure 5.12. Employment outcome index by field-of-study group for master's graduates



Source: INE (EILU) and authors' own calculations.

Figure 5.11 shows the index that aggregates the four employment outcome indicators for bachelor's graduates and Figure 5.12 does the same for master's graduates. The field-of-study groups are ordered from highest to lowest employment outcome. The order is very similar in both cases. At both bachelor's and master's level, graduates in the Computer science and Engineering, industry and construction groups are the most employable and Arts and humanities graduates, the least employable.

However, there are also some differences. Graduates in Health, who rank third at the bachelor's level, rank below graduates in Business, administration and law at the master's level.

Note that medical graduates graduate with a MECES 3 degree, which is equivalent to a master's degree, and usually look for a residency (MIR), so

food, agriculture, agriculture and the rural environment, and forestry and woodlands, among others).

they do not generally take a master's program in the Health area, which may explain the slight drop in employability. On the other hand, graduates of master's degrees in Business, administration and law are in third place, partly because for law graduates a master's degree is required in order to practice (lawyer or court agent) and practicing is likely to significantly affect the job match and earnings variables.

These particularities of certain bachelor's and master's degrees suggest that the importance of completing a master's degree varies across groups and fields of study, and there is no reason to assume it will always be an advantage in achieving a successful employment outcome. To check this, the following table shows the synthetic indicator of employment outcomes that results from combining the outcomes for bachelor's and master's graduates. Table 5.8 shows several interesting features of the situation:

- The three groups with the best employment outcomes (Computer science, Health, and Engineering) have the best outcomes in both bachelor's and master's programs.
- In the Education, Business, administration and law, and Sciences groups, the master's degrees (which in many cases are required for professional practice) push the index higher.
- The employment outcomes of graduates in Services, journalism and communication and Arts and humanities also improve with a master's degree, compared to those who have only a bachelor's degree, although in both cases the indices are at the bottom of the ranking.

**Table 5.8. Combined index and ranking of bachelor's and master's level field-of-study groups by employment outcomes**

Level	Field-of-study group	Employment rate	% employed with earnings of €1,500 or more	% in highly skilled jobs	% working in their field of study or a related field	Overall Synthetic Index	Overall Ranking
Bachelor's	IT	96,3	79,7	92,8	89,0	1,20	1
Master's	IT	94,3	83,7	95,6	73,7	1,18	2
Bachelor's	Health and social services	92,1	60,6	93,3	90,5	1,14	3
Bachelor's	Engineering, industry and construction	92,0	72,9	87,8	79,4	1,13	4
Master's	Engineering, industry and construction	90,6	70,5	88,8	62,7	1,07	5
Master's	Health and social services	88,6	63,4	94,4	63,5	1,07	6
Master's	Education	88,8	62,1	90,1	64,8	1,06	7
Master's	Business, administration and law	89,3	70,8	79,0	64,1	1,03	8
Bachelor's	Agriculture, livestock, forestry, fishing, and veterinary science	88,6	48,1	80,8	77,0	1,00	9
Bachelor's	Education	82,2	50,5	83,8	76,4	1,00	10
Master's	Science	80,9	49,6	91,6	65,5	0,99	11
Master's	Agriculture, livestock, forestry, fisheries, and veterinary sciences	89,1	48,2	81,2	64,4	0,98	12
Master's	Services	92,6	63,9	74,4	49,4	0,96	13
Master's	Social sciences, journalism and documentation	84,4	52,5	83,8	53,3	0,95	14
Bachelor's	Sciences	83,6	39,2	82,6	71,3	0,95	15
Bachelor's	Business, management and law	84,0	52,7	64,9	73,6	0,92	16
Master's	Arts and humanities	75,3	45,8	83,1	55,2	0,90	17
Bachelor's	Social sciences, journalism and documentation	85,1	39,9	72,1	63,5	0,89	18
Bachelor's	Arts and humanities	77,1	36,4	72,3	57,2	0,84	19
Bachelor's	Services	84,4	37,9	60,5	62,7	0,83	20

Source: INE (EILU) and authors' own calculations.



## 5.4. UNIVERSITIES RANKED BY GRADUATE EMPLOYMENT OUTCOMES

The U-Ranking project has been comparing the teaching, research and knowledge transfer performance of Spanish universities for more than a decade, but does not regularly compare their performance in terms of graduate employment outcomes, although employability is an important goal for society. The reason for not including the employment dimension in the annual rankings is the shortage of statistical information on outcomes. Significant progress has been made in recent years, but we still do not have annual data on employment outcome indicators, broken down by university, comparable to the data used to generate the teaching and research indices.

The employment outcome data used in this report, based on the EILU, show that valuable assessments of labor market outcomes are possible at certain intervals, but not annually. Despite the size of the EILU sample (more than 31,000 respondents), individual university-level data are not available, so it is impossible to analyze the influence of individual institutions on employment outcomes. Given the interest of such comparisons, in this section we attempt to overcome this difficulty by exploring whether it is possible to rank universities by their graduates' employment outcomes using other sources of information.

One option is to use the employment database provided by the Ministry of Universities, with the collaboration of the Spanish social security agency. This database does provide a breakdown by university and is a valuable tool that already has information on five cohorts of graduates. However, as pointed out earlier in this document and in previous works (Pérez *[dir.]* 2018; Pérez and Aldás *[dirs.]* 2019), and more recently by Hernández and Pérez (2023)<sup>42</sup>, the Ministry database has certain limitations that can skew the results. To minimize these limitations, we combine the two sources to construct the university rankings by employment outcomes and present results only where the impact of data biases can be minimized.

### 5.4.1. Method to construct a ranking of universities by employment outcomes

After analyzing the determinants of employment outcomes, we concluded that the main determinant was the student's choice of degree. Next most important were environment variables, mainly the region of residence, reflecting the influence of local labor market dynamics and the level of demand for specialized workers. Based on this finding, in the following section we take the degree subjects as a key variable, seeking to determine which subjects provided greater opportunities to find employment and achieve better terms of employment. Logically, the next step should be to determine which universities have the best graduate employability, given the mix of degrees they offer, any specific steps they take to facilitate graduate employment, and the way they teach.

Ranking the universities by graduate employability would show the universities' ability to influence factors which may foster or hinder employability and over which they have control, such as the degree programs they offer or, in the case of the younger universities, the regions in which they have chosen to establish themselves. However, the source we have been using in the previous analyses, the EILU, does not provide information on employment outcomes by university. An alternative is to use the employment database of the Ministry of Universities, which does provide such information. However, this option has the limitation that since the data are cross-referenced against social security records, it omits graduates who work abroad or who are not registered with the social security agency because they are registered instead with a mutual society.

When using the Ministry's data to rank universities in an individual degree subject or field of study, there should be no significant biases, since there is no reason why the proportion of expatriates and mutual society members among graduates in any given field of study should differ between universities. There is, however, a potential for bias when the universities are ranked according to the employment outcomes of their graduates across all of their degree programs, given that some

<sup>42</sup> In the report *La Universidad española en cifras 19-20*, the authors note that "the employment data based on social

security records do not give a neutral picture of employment outcomes by degree nor, therefore, by university, since they affect the degrees and universities asymmetrically."

universities may have a larger proportion of graduates in degree programs in which there is a larger proportion of expatriates or mutual society members.

To overcome this limitation and be able to rank the universities by graduate employment outcomes, in this section we conducted our analysis in two successive stages.

First, we ranked the universities within each field-of-study group using the Ministry of Universities data, since the bias, if any, within each group is expected to be minimal. The indicators used are based on the Ministry data and, while not strictly the same as those based on the EILU, reflect the same underlying variable, namely, employment outcomes, measured in this case using three variables obtained from social security records: employment rate, average social security contribution base, and percentage of graduates registered in one of the contribution groups for professionals with higher education (engineers, postgraduates, senior management, graduates and technical engineers). The three indicators are aggregated in a single index to make the results easier to visualize, as follows:

$$Ind.SS_{UG} = \left( \frac{TAFI_{GU}}{MED.TAFI_G} * \frac{BMC_{GU}}{MED.BMC_G} * \frac{AJUSGC_{GU}}{MED.AJUSGC_G} \right)^{1/3}$$

Where  $TAFI_{GU}$ ,  $AJUSGC_{GU}$ ,  $BMC_{GU}$  the values of the employment rate, the percentage of graduates registered in a social security contribution group that fits with university level education, and the contribution base of field-of-study group  $G$  at university  $UMED.TAFI_G$ ,  $MED.AJUSGC_G$  and  $MED.BMC_G$  the median value of each field-of-study group for the universities represented in that group.

Once the universities have been ranked according to their graduate employability performance in each field-of-study group, the field-of-study groups are ranked using the EILU-based synthetic index defined in previous sections. This second index, obtained using the EILU data with the indicators already discussed in previous sections, is unaffected by the biases affecting the Ministry data.

The notation of this expression is that described in section 3.2 but referenced to the field-of-study groups.

$$Ind.EILU_G = \left( \frac{EMPLEO_G}{MED.EMPLEO} \right)^{1/3} * \left( \frac{ING1500_G}{MED.ING1500} \right)^{1/3} * \left( \frac{AJUSCNO3_G}{MED.AJUSCNO3} \right)^{0.5/3} * \left( \frac{AJUSAREA_G}{MED.AJUSAREA} \right)^{0.5/3}$$

The bias problem is thus avoided because the index  $Ind.EILU_G$  captures the highest or lowest employability of each field-of-study group based on unbiased data, while the index  $Ind.SS_{UG}$  captures the performance of each university within each field-of-study group. And since bias affects graduates in any given field or group of fields equally, all universities will be equally affected.

In sum, a university's performance in each field-of-study group is not biased if it is calculated by combining the university's performance within the group with the group's overall employability, assigning a weight of 1/3 to individual university performance and 2/3 to field-of-study group performance<sup>43</sup>:

$$Ind.IL_{UG} = (Ind.SS_{UG} * 1/3) + (Ind.EILU_G * 2/3)$$

<sup>43</sup> The weights of 2/3 and 1/3 assigned to overall field-of-study group performance and individual university performance are derived from the calculation of a Theil index to measure the inequality of employment outcome results (in employment rates and percentage of employees in jobs that match their level of education), both by field of study and university and by field-of-study group and university, based on data from the Ministry of Universities and the Spanish social security agency. The Theil index can be broken down into a component that measures inequality within field-of-study groups and a component that measures inequality

between groups. The results show that employment outcome inequality is more closely linked to the subject studied than to the university at which it was studied. Depending on the indicator analyzed (employment rate or education-job match) and the grouping of fields of study (94 fields or 10 groups), the proportion of the inequality linked to the field of study ranges from 48% to 74%. We have opted to assign a weight of 66.6% to the EILU index and 33.3% to the social security-based index. The results of an exercise using weights of 60% and 40% present a correlation of 0.994 with the analysis presented in this report.

This indicator shows the performance of a university in a given field-of-study group. But each university will offer a different mix of degree programs, some with better employment outcomes, some worse. To construct a final employability index for each university, we therefore need to take each university's program offering into account. The overall employment outcomes index for a university ( $Ind.IL_U$ ) is constructed as a weighted average of the university's performance in each field-of-study group:

$$Ind.IL_U = \sum_{g=1}^G \frac{GRAD_{UG}}{GRAD_U} (Ind.IL_{UG})$$

Where  $\frac{GRAD_{UG}}{GRAD_U}$  are the graduates in field-of-study group  $g$  at university  $U$  as a percentage of the total graduates of that university.

From here on, the section is structured following the proposed methodological approach. First, we analyze the universities' employment outcome performance within each field-of-study group. Then we build an overall ranking, taking into account each university's performance in each field-of-study group and the share of each group in the university's program offering.

By way of illustration, figure 5.13 combines the overall employment outcome results in each field of study obtained via the EILU index on the ordinate axis and the results in each field of study and university obtained from the Ministry of Universities data (SS index) on the abscissa. The different scales on the axes show that the EILU information is given twice the weight of the social security data. The figure shows that, in general, choice of degree is decisive for employment outcomes, but that outcomes may also

vary depending on the university at which the degree was taken. The value of the employment outcome index increases the further the (field-of-study group/university) pair is from the origin. In general, the choice of degree is key; but in some cases there are larger differences within a field-of-study group.

#### 5.4.2. Ranking of universities by graduate employment outcomes for each field-of-study group

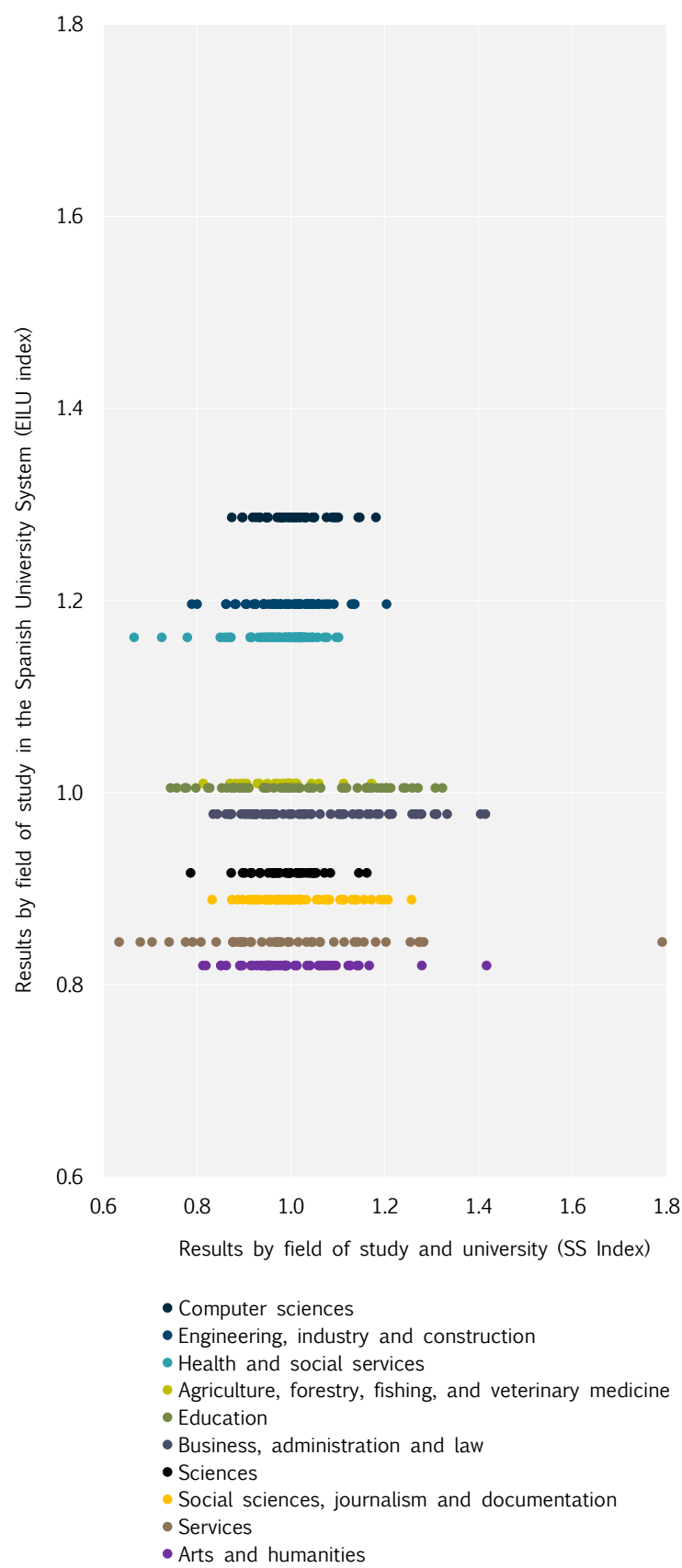
Tables 5.9 to 5.18 show, for each of the 10 field-of-study groups considered, the universities ranked according to the employment outcomes index  $Ind.SS_{UG}$  built using the Ministry of Universities data. Note that the tables do not show all the universities that offer degrees in each field-of-study group but only those that have complete information for the indicators that make up the index<sup>44</sup>.

As can be seen in table 5.9, the Computer science group, which also includes software development and multimedia engineering, it is led by one private university (the European University of Madrid, EUM) and one public university (León). The performance of the first 10 universities is clearly marked by the level of earnings (i.e. average social security contribution base), rather than the employment rate (i.e. social security registration), where there is more diversity between universities. Thus, the six universities in fifth to tenth place are located either in Catalonia or, especially, in Madrid (in addition to the EUM in first place), where salaries are higher insofar as the cost of living is higher: Autónoma de Madrid, Politécnica de Madrid, Rey Juan Carlos, Carlos III, Politécnica de Catalunya and Universidad Complutense de Madrid. Remember that mobility means that the university of graduation does not have to be in the region of residence.

<sup>44</sup> With the data from the sources used we are able to confidently compare the graduate employment outcomes of 73 universities (48 public and 25 private), from which 98% of the bachelor's graduates graduated in the 2015-16

academic year. **Annex 5** shows the number and percentage of graduates and the number of field-of-study groups per university included in this analysis.

Figure 5.13. Combination of employment outcome indices



Source: Authors' own calculations

Table 5.9. Ranking of universities by graduate employment outcomes: graduates in Computer science

	University	Graduates	Employment rate	Average contribution base	% education-job match	Synthetic index $Ind.SS_{UG}$
1	Universidad Europea de Madrid	36	94.4	40,194	76.5	1.18
2	Universidad de León	113	91.2	34,482	84.5	1.15
3	Universidad Católica Santa Teresa de Jesús de Ávila	52	88.5	38,043	78.3	1.14
4	Universidad de Extremadura	42	92.9	32,861	76.9	1.10
5	Universidad Autónoma de Madrid	81	84.0	35,651	77.9	1.10
6	Universidad Politécnica de Madrid	222	84.7	38,713	70.2	1.09
7	Universidad Rey Juan Carlos	81	88.9	37,934	68.1	1.09
8	Universidad Carlos III	140	91.4	37,279	66.4	1.09
9	Universitat Politècnica de Catalunya	335	87.5	37,246	67.2	1.08
10	Universidad Complutense	132	84.1	34,972	69.4	1.05
11	Universidad de Murcia	44	86.4	27,937	84.2	1.05
12	Universidad de Alcalá	105	88.6	34,575	65.6	1.04
13	Universidad de Málaga	45	82.2	34,954	67.6	1.03
14	Universidad de Cádiz	82	86.6	31,102	71.8	1.03
15	Universitat Oberta de Catalunya	312	87.5	39,309	55.7	1.03
16	Universitat de Barcelona	36	86.1	36,273	61.3	1.03
17	Universidad de Deusto	40	97.5	28,721	66.7	1.02
18	Universidad de Castilla-La Mancha	133	91.0	32,592	62.8	1.02
19	Universitat Autònoma de Barcelona	196	82.7	35,169	63.0	1.01
20	Universidad Nacional de Educación a Distancia	43	79.1	35,645	64.7	1.01
21	Universidad Pública de Navarra	49	91.8	30,391	64.4	1.01
22	Universidad de Zaragoza	79	89.9	29,559	67.6	1.01
23	Universidad Católica San Antonio	100	91.0	31,207	62.6	1.00
24	Universidad de Granada	146	83.6	29,176	72.1	1.00
25	Universidad de La Laguna	83	86.8	28,335	70.8	1.00
26	Universidad de Almería	40	92.5	27,727	67.6	0.99
27	Universidad de Jaén	60	85.0	29,200	68.6	0.99
28	Universidad de Sevilla	238	85.7	31,751	61.8	0.98
29	Universidad Pontificia de Salamanca	49	87.8	34,062	55.8	0.98
30	Universidad de Córdoba	45	97.8	26,710	63.6	0.98
31	Universitat Ramon Llull	49	75.5	35,352	62.2	0.98
32	Universitat Pompeu Fabra	41	90.2	35,469	51.4	0.98
33	Universidade de Vigo	158	85.4	28,959	65.9	0.97
34	Universitat Politècnica de València	284	88.4	28,911	63.0	0.97
35	Universitat de València	85	82.4	28,615	64.3	0.95
36	Universidad de Salamanca	78	88.5	29,406	58.0	0.95
37	Universidad del País Vasco	133	90.2	30,218	55.0	0.95
38	Universidad de Alicante	150	85.3	27,324	64.1	0.95
39	Universidad de La Rioja	33	90.9	26,250	60.0	0.93
40	Universidade de Santiago de Compostela	46	80.4	26,329	67.6	0.93
41	Universidade da Coruña	221	88.2	30,289	52.3	0.93
42	Universidad de Valladolid	70	92.9	30,779	47.7	0.92
43	Universidad de Oviedo	231	85.7	29,946	49.5	0.90
44	Universitat Jaume I	95	82.1	27,359	56.4	0.90
45	Universidad de Las Palmas de Gran Canaria	45	82.2	29,378	48.7	0.87

Source: Ministry of Universities (SIU), Social Security General Treasury (Ministry of Inclusion, Social Security and Migration) and authors' own calculations.

Table 5.10 shows the ordering of the 62 universities that have sufficient information to calculate the index in the Engineering, industry and construction group, which, as we saw in section 3, includes most engineering degrees, architecture, and degrees in food science and technology. The first place in employability goes to the UNED, which like other distance learning universities has a large proportion of students who are working while studying, so that

its graduates always have a high employment rate and their contribution base tends to be higher because they have been working for longer. As the indicators show, the UNED graduates also have the highest education-job match. Six of the top ten in this group are private universities, which typically have a smaller number of graduates than the public universities. This finding suggests that the more personalized employment assistance which smaller

Table 5.10. Ranking of universities by graduate employment outcomes: graduates in Engineering, industry and construction

	University	Graduates	Employment rate	Average contribution base	% education-job match	Synthetic index <i>Ind. SS<sub>UG</sub></i>
1	Universidad Nacional de Educación a Distancia	111	81.1	39,961	91.1	1.20
2	Universidad de León	941	82.9	35,317	84.7	1.14
3	Universidad Camilo José Cela	103	81.6	35,260	85.7	1.13
4	Universitat de Vic - Universitat Central de Catalunya	66	84.9	40,222	71.4	1.13
5	Mondragon Unibertsitatea	224	87.1	33,784	74.9	1.09
6	Universidad Carlos III	681	82.5	33,905	76.5	1.08
7	Universidad Católica San Antonio	135	82.2	32,711	78.4	1.08
8	Universidad Politécnica de Cartagena	551	84.0	30,352	81.0	1.07
9	Universidad Pontificia Comillas	210	74.3	34,680	78.2	1.06
10	Universidad Europea de Madrid	396	78.0	33,322	77.4	1.06
11	Universidad Nebrija	58	86.2	34,204	68.0	1.06
12	Universitat Oberta de Catalunya	37	89.2	39,019	57.6	1.06
13	Universidad Católica Santa Teresa de Jesús de Ávila	40	77.5	34,828	74.2	1.06
14	Universidad de Alcalá	459	81.3	32,118	74.8	1.05
15	Universidad de Deusto	74	83.8	29,927	77.4	1.05
16	Universidad Alfonso X el Sabio	393	77.1	31,575	79.5	1.05
17	Universitat Rovira i Virgili	202	84.2	30,813	74.1	1.04
18	Universidad Pública de Navarra	391	90.3	30,685	69.1	1.04
19	Universitat Ramon Llull	254	72.4	32,795	79.9	1.04
20	Universidad de Valladolid	543	81.2	29,678	78.2	1.04
21	Universidade de Vigo	759	84.9	29,625	74.7	1.04
22	Universidad Politécnica de Madrid	3,923	74.6	32,199	77.7	1.03
23	Universidad de Navarra	308	70.5	32,812	80.7	1.03
24	Universidad del País Vasco	1,931	81.3	31,419	72.7	1.03
25	Universidad de Cádiz	367	84.2	29,126	73.5	1.02
26	Universidad Rey Juan Carlos	304	82.9	30,167	71.8	1.02
27	Universidad de Huelva	115	89.6	30,153	66.0	1.02
28	Universidad de Castilla-La Mancha	560	84.8	27,745	75.2	1.01
29	Universidad Complutense	125	86.4	28,639	71.3	1.01
30	Universidad San Pablo - CEU	111	60.4	32,393	89.6	1.01
31	Universitat Politècnica de Catalunya	4,004	78.8	32,939	66.7	1.01
32	Universidad de Salamanca	416	84.1	29,582	69.4	1.01
33	Universidad de Jaén	316	81.0	28,063	73.8	1.00
34	Universidade da Coruña	781	80.9	27,939	73.4	0.99
35	Universidad Miguel Hernández de Elche	218	83.5	28,539	68.7	0.99
36	Universidad de Zaragoza	840	81.2	29,150	69.1	0.99
37	Universidad de Cantabria	407	78.4	29,248	69.3	0.98
38	Universidad de Almería	57	84.2	26,559	70.8	0.98
39	Universidad de Sevilla	1,757	75.4	28,578	73.1	0.98
40	Universidad de La Rioja	111	86.5	30,680	58.3	0.97
41	Universidad de Oviedo	824	82.4	28,176	66.3	0.97
42	Universidad de Córdoba	259	80.7	26,859	70.3	0.97
43	Universitat Jaume I	280	86.8	27,312	64.2	0.97
44	Universidad de Burgos	322	79.8	27,432	69.3	0.96
45	Universidad de Extremadura	414	82.1	26,407	69.4	0.96
46	Universidad de Málaga	676	77.7	27,992	69.0	0.96
47	Universitat Autònoma de Barcelona	338	77.2	30,579	62.1	0.95
48	Universidad de Alicante	536	76.1	27,379	68.4	0.94
49	Universitat Politècnica de València	2,591	77.9	27,181	66.9	0.94
50	Universidad Autónoma de Madrid	214	78.0	29,917	60.5	0.94
51	Universitat de les Illes Balears	51	76.5	31,275	59.0	0.94
52	Universidad de Las Palmas de Gran Canaria	322	77.6	25,541	67.6	0.93
53	Universidad de La Laguna	272	78.7	25,404	66.8	0.92
54	Universitat de Lleida	124	87.9	27,267	55.1	0.92
55	Universitat Pompeu Fabra	116	73.3	32,446	52.9	0.91
56	Universidad de Granada	1,011	71.0	26,431	66.4	0.90
57	Universidade de Santiago de Compostela	149	71.8	25,897	62.6	0.88
58	Universitat de Girona	219	84.5	29,763	46.0	0.88
59	Universitat de València	146	83.6	25,106	51.6	0.86
60	Universidad Cardenal Herrera - CEU	69	71.0	24,067	63.3	0.86
61	Universidad de Murcia	77	70.1	23,024	53.7	0.80
62	Universitat de Barcelona	125	79.2	28,812	36.4	0.79

Source: Ministry of Universities (SIU), Social Security General Treasury (Ministry of Inclusion, Social Security and Migration) and authors' own calculations.



universities are able to provide may be a factor in improving their graduate employment outcomes. Once again, being located in a region with a high demand for skilled workers boosts the employment outcomes of some public universities (Carlos III) and also the private universities which, given their more recent establishment and ability to choose location, are concentrated in the regions with the most dynamic economies.

Table 5.11 provides the information for the Health and social services group which, together with the main Health fields (medicine, nursing, pharmacy, dentistry, physiotherapy, and biomedical and health engineering) includes occupational therapy and social work. Because the main employer of these graduates is the public health service and, for that reason, salaries are more uniform, we find a greater diversity of regions at the top of this ranking. An Andalusian university, Córdoba, leads the employment outcomes ranking, along with universities in Catalonia (UPF, UAB, UB), Navarra (UN), Valencia (UCV), Cantabria (UC), Asturias (Oviedo) and Galicia (USC), with public universities predominating over private among the top ten.

Table 5.12 analyzes the Agriculture, livestock farming, forestry, fishing and veterinary science group, which is somewhat peculiar in being highly specialized by subject (it includes only five fields of study) and small (only 4,033 graduates). Accordingly, the ranking includes only 26 universities and is dominated by universities in regions in which the primary sector plays a significant role and the potential demand for graduates in these subjects is relatively high. Thus, Almería, La Laguna, Lleida, Extremadura, Huelva and León appear in the top ten, and the ranking is led by Universidad Católica de Ávila, with the UPCT, UCM and UAB making up the rest of the top ten.

Table 5.13 shows the results for the Education group, which includes the fields of social education, primary education, early childhood education and pedagogy and is the second largest in number of graduates (41,108) after Business administration and law. We find that nine of the top ten universities are private and are located in regions that have a very high proportion of private and semi-private schools, which create more demand for these graduates. The top ten also include universities whose degree programs in the Education field are taught entirely or in part by distance learning, such as Universidad de La Rioja and Universidad Camilo José Cela, which in the cohort studied here produced 1,680 and 2,352 teachers, respectively (more than the large public universities such as UB, UV, UCM or UAM).

Table 5.14 shows the ranking for the Business, administration and law group, which, as already mentioned, is the largest group (48,349 graduates) and which, besides law and labor sciences, includes the fields relating to companies' main functional areas, i.e. financial and actuarial, commercial, administration and business, marketing, etc. Unlike field-of-study groups whose graduates are subject to specialized demand, such as Health and Education, the flexible, broad-spectrum nature of the education provided in the Business, administration and law group means that, as in the case of group 1, the production of graduates tends to be concentrated in universities located in regions with strong a business sector (mainly the Madrid region and Catalonia) and in distance learning universities (three of the top ten: UNED, UDIMA and UOC). The order is thus determined mainly by earnings and education-job match, rather than by the employment rate. All the top ten universities are privately owned, except for UC3M.

Table 5.11. Ranking of universities by graduate employment outcomes: graduates in Health and social services

	University	Graduates	Employment rate	Average contribution base	% education-job match	Synthetic index $Ind. SS_{UG}$
1	Universidad de Córdoba	268	86.9	37,351	98.3	1.10
2	Universitat Pompeu Fabra	214	87.4	37,822	95.2	1.10
3	Universidad del País Vasco	972	92.9	35,373	90.8	1.08
4	Universidad de Navarra	452	90.9	34,708	92.9	1.07
5	Universitat Autònoma de Barcelona	1,254	86.0	36,081	90.8	1.06
6	Universidad Católica de Valencia	682	90.5	31,941	94.8	1.05
7	Universidad de Cantabria	307	92.5	32,925	89.8	1.05
8	Universidad de Oviedo	471	90.5	32,472	92.0	1.04
9	Universitat de Barcelona	1,572	87.4	34,998	87.1	1.04
10	Universidade de Santiago de Compostela	922	84.8	33,060	93.4	1.03
11	Universidad San Pablo - CEU	375	86.9	31,874	94.2	1.03
12	Universidad de Castilla-La Mancha	833	91.7	30,453	92.8	1.03
13	Universidad de Extremadura	670	89.0	30,620	94.3	1.02
14	Universidad de Sevilla	1,260	86.1	31,606	93.8	1.02
15	Universitat de Lleida	290	87.6	33,047	88.2	1.02
16	Universidad de Alcalá	502	88.3	30,878	93.5	1.02
17	Universidad de Valladolid	741	91.6	30,855	90.0	1.02
18	Universidad de Zaragoza	888	89.6	31,504	89.5	1.02
19	Universidad Católica Santa Teresa de Jesús de Ávila	69	94.2	27,465	96.9	1.02
20	Universitat Internacional de Catalunya	296	73.7	35,851	95.0	1.02
21	Universidad Autónoma de Madrid	676	89.6	31,295	89.1	1.02
22	Universidad Pontificia de Salamanca	242	85.5	29,909	97.1	1.01
23	Universitat de les Illes Balears	242	86.4	30,845	92.3	1.01
24	Universidad de La Laguna	664	87.1	31,573	89.5	1.01
25	Universitat Rovira i Virgili	511	83.4	33,909	86.9	1.01
26	Universidad Fernando Pessoa-Canarias	42	85.7	29,223	97.2	1.01
27	Universidad Nebrija	192	87.5	29,197	95.2	1.01
28	Universidad de Salamanca	829	85.0	31,230	90.9	1.00
29	Universidad Pontificia Comillas	159	88.7	28,921	92.9	1.00
30	Universidad Rey Juan Carlos	457	88.4	30,305	88.6	1.00
31	Universidad de Burgos	98	91.8	29,021	88.9	1.00
32	Universidad Miguel Hernández de Elche	433	86.1	32,707	83.4	0.99
33	Universidad de La Rioja	108	91.7	30,992	81.8	0.99
34	Universidad de Murcia	997	87.5	29,798	89.1	0.99
35	Universidad de León	225	87.1	28,036	93.9	0.99
36	Universidad Internacional de La Rioja	76	89.5	32,197	79.4	0.99
37	Universidad de Cádiz	605	78.7	31,460	90.1	0.98
38	Universitat Ramon Llull	244	88.5	31,077	80.6	0.98
39	Universitat de València	1,484	84.0	31,062	84.1	0.97
40	Universidad Complutense	1,927	87.4	29,877	83.6	0.97
41	Universidad de Granada	1,320	80.9	29,998	88.5	0.97
42	Universidad Cardenal Herrera - CEU	470	73.2	31,047	93.6	0.96
43	Universidad de Las Palmas de Gran Canaria	534	86.3	29,387	83.1	0.96
44	Universidad de Málaga	736	81.3	30,669	84.1	0.96
45	Universidad Pública de Navarra	210	86.7	29,480	81.3	0.95
46	Universidad Católica San Antonio	460	84.6	27,228	89.5	0.95
47	Universidade de Vigo	304	85.9	26,752	88.1	0.95
48	Universidad Alfonso X el Sabio	992	68.4	30,755	96.2	0.95
49	Universidade da Coruña	306	88.2	24,517	91.9	0.94
50	Universidad de Huelva	220	85.0	28,277	81.8	0.94
51	Universidad Politécnica de Madrid	39	84.6	30,043	75.8	0.93
52	Universitat de Vic - Universitat Central de Catalunya	203	68.0	32,450	83.3	0.92
53	Universitat Politècnica de Catalunya	114	89.5	28,027	72.6	0.91
54	Universitat de Girona	429	60.8	34,051	87.7	0.91
55	Universidad Nacional de Educación a Distancia	499	81.4	29,687	65.5	0.87
56	Universidad de Jaén	336	78.6	24,809	80.3	0.87
57	Universidad de Alicante	452	82.3	26,950	69.4	0.86

Source: Ministry of Universities (SIU), Social Security General Treasury (Ministry of Inclusion, Social Security and Migration) and authors' own calculations.

Table 5.12. Ranking of universities by graduate employment outcomes: graduates in Agriculture, livestock farming, forestry, fishing, and veterinary science

	University	Graduates	Employment rate	Average contribution base	% education-job match	Synthetic index <i>Ind. SS<sub>UG</sub></i>
1	Universidad Católica Santa Teresa de Jesús de Ávila	74	91.9	33,989	80.9	1.17
2	Universidad de Almería	90	85.6	30,380	83.1	1.11
3	Universidad Politécnica de Cartagena	35	91.4	28,412	71.9	1.06
4	Universidad de La Laguna	51	88.2	26,777	75.6	1.04
5	Universitat de Lleida	71	87.3	26,305	71.0	1.01
6	Universidad de Extremadura	229	85.2	24,205	78.5	1.01
7	Universidad de Huelva	52	86.5	27,039	68.9	1.01
8	Universidad de León	173	77.5	25,461	79.9	1.00
9	Universidad Complutense	120	77.5	24,266	82.8	1.00
10	Universitat Autònoma de Barcelona	132	73.5	25,685	82.5	1.00
11	Universidade de Santiago de Compostela	193	80.8	22,185	85.9	0.99
12	Universidad de Córdoba	253	72.7	26,149	81.0	0.99
13	Universidad Pública de Navarra	96	84.4	30,671	59.3	0.99
14	Universidad Politécnica de Madrid	323	83.9	28,564	62.7	0.99
15	Universidad Cardenal Herrera - CEU	92	79.4	23,208	80.8	0.98
16	Universidad de Zaragoza	176	77.8	23,264	79.6	0.97
17	Universidad de Murcia	120	78.3	21,216	85.1	0.97
18	Universidade de Vigo	67	73.1	29,083	63.3	0.95
19	Universidad de Sevilla	138	81.2	26,580	58.9	0.93
20	Universidad Alfonso X el Sabio	126	61.9	22,970	88.5	0.93
21	Universidad de Valladolid	92	82.6	24,901	56.6	0.90
22	Universidad de Castilla-La Mancha	72	80.6	24,168	58.6	0.90
23	Universidad de Las Palmas de Gran Canaria	63	74.6	19,594	76.6	0.89
24	Universidad de Salamanca	59	78.0	21,944	63.0	0.88
25	Universitat Politècnica de València	158	77.2	25,945	51.6	0.87
26	Universitat Politècnica de Catalunya	42	71.4	27,274	43.3	0.81

Source: Ministry of Universities (SIU), Social Security General Treasury (Ministry of Inclusion, Social Security and Migration) and authors' own calculations.

Table 5.15 shows the ranking for the Science group, which includes fields such as statistics, physics, mathematics, chemistry and biology. Overall, private universities are less represented, probably because degree programs in these fields require investments in equipment and laboratories that are not readily compatible with short-term profitability. Only one private university (Vic-Central de Catalunya) makes it into the top ten. The graduates of this field-of-study group have notably high education-job match. The ranking is led by Politécnica de Madrid, with the Politécnica de Valencia and the Politécnica de Catalonia also in the top

ten. The UNED appears in second place, mainly thanks to the higher average contribution base of all the universities in this group, which, as pointed out previously, tends to be a feature of distance learning universities, since they have a significant proportion of students who are working while studying. The remaining top ten positions are taken by Universidad de les Illes Balears, Cantabria, Valladolid and La Rioja, with notably small cohorts of graduates, which may make it easier to provide an effective career service. UPV/EHU is the only one among the top ten in this group to have a large number of graduates (almost 500).

Table 5.13. Ranking of universities by graduate employment outcomes: graduates in Education

	University	Graduates	Employment rate	Average contribution base	% education-job match	Synthetic index <i>Ind. SS<sub>UG</sub></i>
1	Universidad Católica Santa Teresa de Jesús de Ávila	90	88.9	32,433	91.3	1.32
2	Universidad Europea de Madrid	315	92.4	30,691	89.7	1.31
3	Universidad Camilo José Cela	2,352	86.4	30,741	87.8	1.27
4	Universidad Pontificia de Salamanca	753	86.7	30,885	84.7	1.26
5	Mondragon Unibertsitatea	263	92.8	32,359	73.0	1.24
6	Universitat Ramon Llull	391	89.0	28,767	84.5	1.24
7	Universidad Internacional de La Rioja	1,680	87.7	29,755	77.5	1.21
8	Universitat Internacional de Catalunya	130	90.0	27,690	79.5	1.20
9	Universidad de Deusto	326	88.7	31,736	70.2	1.20
10	Universitat de Girona	330	90.9	27,338	77.7	1.19
11	Universitat Oberta de Catalunya	417	74.8	29,775	84.6	1.18
12	Universitat de Vic - Universitat Central de Catalunya	222	89.2	27,260	75.3	1.17
13	Universidad del País Vasco	893	89.6	31,230	65.0	1.17
14	Universitat de les Illes Balears	512	88.5	28,158	72.0	1.16
15	Universidad Pública de Navarra	244	85.7	29,617	70.3	1.16
16	Universidad Internacional Valenciana	104	76.0	29,741	78.5	1.16
17	Universitat de Lleida	323	86.4	27,295	71.7	1.14
18	Universitat de Barcelona	1,016	90.9	26,639	65.7	1.12
19	Universidad Católica de Valencia	599	84.5	26,727	70.0	1.12
20	Universitat Autònoma de Barcelona	598	85.5	26,545	68.9	1.11
21	Universidad de Navarra	72	73.6	25,917	81.1	1.11
22	Universitat Rovira i Virgili	386	87.1	25,838	60.7	1.06
23	Universidad Nacional de Educación a Distancia	726	79.2	26,444	62.3	1.05
24	Universidade de Santiago de Compostela	543	74.4	26,158	65.8	1.04
25	Universitat de València	1,131	82.8	26,177	58.4	1.04
26	Universidade de Vigo	422	78.0	24,779	62.3	1.02
27	Universidad Cardenal Herrera - CEU	219	78.5	26,241	57.6	1.01
28	Universitat Jaume I	372	85.0	25,901	52.5	1.01
29	Universidad de Cantabria	274	74.1	27,594	55.2	1.00
30	Universidad de Las Palmas de Gran Canaria	488	78.9	25,897	54.3	0.99
31	Universidad de Zaragoza	591	81.7	25,055	53.6	0.99
32	Universidad Católica San Antonio	547	73.3	26,445	56.1	0.99
33	Universidad Pablo de Olavide	85	69.4	23,215	66.1	0.98
34	Universidad de La Rioja	186	82.3	25,907	47.7	0.96
35	Universidade da Coruña	326	77.6	25,017	50.2	0.95
36	Universidad de Oviedo	375	72.5	24,432	54.0	0.94
37	Universidad de Alicante	680	77.4	26,224	47.2	0.94
38	Universidad de Castilla-La Mancha	788	73.0	25,080	51.8	0.94
39	Universidad de Alcalá	467	81.4	23,990	44.0	0.91
40	Universidad Rey Juan Carlos	573	77.0	24,093	45.6	0.91
41	Universidad de La Laguna	518	75.5	23,105	47.8	0.90
42	Universidad Complutense	1,367	79.9	22,209	46.9	0.90
43	Universidad de Córdoba	477	67.5	25,769	46.6	0.89
44	Universidad de Jaén	600	65.7	25,726	47.5	0.89
45	Universidad de Salamanca	616	65.4	24,614	48.1	0.88
46	Universidad de Murcia	845	70.1	23,881	45.8	0.88
47	Universidad de Valladolid	810	76.8	24,515	40.7	0.88
48	Universidad Autónoma de Madrid	651	78.2	23,180	41.7	0.87
49	Universidad de Granada	1,436	66.6	23,745	46.2	0.86
50	Universidad de Burgos	313	77.3	23,465	38.8	0.85
51	Universidad de Huelva	494	71.7	24,200	37.0	0.83
52	Universidad de Sevilla	1,122	68.7	23,685	38.9	0.82
53	Universidad de Extremadura	716	65.5	22,569	39.0	0.80
54	Universidad de León	224	74.1	22,578	31.9	0.78
55	Universidad de Málaga	882	73.1	22,317	32.3	0.77
56	Universidad de Almería	539	72.9	20,418	33.1	0.76
57	Universidad de Cádiz	406	60.6	24,943	30.9	0.74

Source: Ministry of Universities (SIU), Social Security General Treasury (Ministry of Inclusion, Social Security and Migration) and authors' own calculations.

Table 5.14. Ranking of universities by graduate employment outcomes: graduates in Business, administration and law

	University	Graduates	Employment rate	Average contribution base	% education-job match	Synthetic index <i>Ind. SS<sub>UG</sub></i>
1	Universidad Pontificia Comillas	626	64.2	36,933	76.4	1.41
2	Universidad Católica Santa Teresa de Jesús de Ávila	144	77.8	34,963	65.2	1.40
3	Universitat Ramon Llull	859	73.5	37,598	54.8	1.33
4	Universidad Nebrija	132	58.3	40,457	61.0	1.31
5	Universidad a Distancia de Madrid	108	75.0	33,810	56.8	1.31
6	Universidad Internacional de La Rioja	205	74.6	34,372	55.6	1.31
7	Universidad de Deusto	509	77.8	30,126	57.1	1.28
8	Universidad Carlos III	806	71.8	31,837	58.0	1.28
9	Universitat Oberta de Catalunya	969	80.6	35,122	46.0	1.27
10	Universidad San Pablo - CEU	434	72.1	28,869	62.3	1.27
11	Universidad Autónoma de Madrid	763	72.5	29,673	59.3	1.26
12	Universidad de Navarra	338	68.1	29,423	57.4	1.22
13	Mondragon Unibertsitatea	136	81.6	29,617	46.9	1.21
14	Universidad Nacional de Educación a Distancia	1,495	63.5	34,901	51.1	1.21
15	Universitat Abat Oliba CEU	109	87.2	28,532	43.2	1.19
16	Universidad Loyola Andalucía	92	83.7	26,289	48.1	1.18
17	Universidad Pública de Navarra	286	85.0	27,082	44.4	1.17
18	Universidad Alfonso X el Sabio	55	74.6	24,063	56.1	1.16
19	Universidad Complutense	2,414	72.1	28,015	47.8	1.15
20	IE Universidad	128	43.0	35,936	61.8	1.14
21	Universitat Pompeu Fabra	1,044	79.0	28,823	40.7	1.13
22	Universidad Católica San Antonio	128	73.4	25,121	47.9	1.11
23	Universidad Pablo de Olavide	350	65.7	26,586	50.0	1.11
24	Universitat Internacional de Catalunya	96	72.9	28,813	41.4	1.11
25	Universidad Camilo José Cela	58	70.7	24,943	48.8	1.10
26	Universidad Cardenal Herrera - CEU	154	73.4	24,864	46.9	1.10
27	Universidad Europea de Madrid	319	51.7	29,594	53.3	1.08
28	Universitat Autònoma de Barcelona	831	79.3	27,819	34.8	1.06
29	Universitat de les Illes Balears	355	72.4	28,688	35.0	1.04
30	Universitat Politècnica de València	277	79.8	25,696	35.3	1.04
31	Universidad Rey Juan Carlos	1,965	68.6	26,744	38.5	1.03
32	Universidad de Zaragoza	926	75.5	25,365	36.5	1.03
33	Universidad del País Vasco	1,150	79.1	26,022	33.6	1.03
34	Universitat de València	1,715	71.2	24,376	39.6	1.02
35	Universitat de Barcelona	1,484	79.7	27,953	30.3	1.02
36	Universitat de Lleida	214	76.2	26,214	33.7	1.02
37	Universidad de León	424	67.9	24,043	39.6	1.00
38	Universitat Politècnica de Catalunya	147	65.3	31,169	31.3	1.00
39	Universidad de Valladolid	922	73.1	24,858	34.7	1.00
40	Universidad de Oviedo	605	68.9	23,598	37.4	0.98
41	Universidade da Coruña	601	72.4	23,555	34.0	0.97
42	Universidad Católica de Valencia	133	69.9	24,777	33.3	0.97
43	Universidad de Castilla-La Mancha	718	70.2	23,453	34.7	0.96
44	Universidad de Murcia	703	65.7	22,274	39.0	0.96
45	Universidad de Jaén	478	66.7	22,480	37.3	0.96
46	Universidad de Cantabria	342	67.0	24,748	33.6	0.95
47	Universidad de Córdoba	391	64.7	23,979	35.6	0.95
48	Universitat de Vic - Universitat Central de Catalunya	59	88.1	24,980	25.0	0.95
49	Universidad de La Rioja	141	73.1	23,336	32.0	0.95
50	Universidad de Salamanca	598	64.9	23,305	35.6	0.94
51	Universidad Miguel Hernández de Elche	289	77.5	23,695	29.0	0.94
52	Universitat Rovira i Virgili	408	75.7	24,873	28.2	0.94
53	Universidad de Alicante	928	69.5	22,985	31.9	0.93
54	Universidad de Burgos	268	71.3	24,769	28.8	0.93
55	Universidade de Santiago de Compostela	535	68.6	22,546	32.7	0.92
56	Universidad de Granada	1,464	59.8	23,692	35.4	0.92
57	Universidade de Vigo	574	69.5	21,694	33.1	0.92
58	Universidad de Alcalá	365	72.3	25,021	27.3	0.92
59	Universidad de Sevilla	1,558	65.1	23,018	32.7	0.92
60	Universitat Jaume I	419	77.1	22,963	27.2	0.91
61	Universitat de Girona	310	80.3	24,946	23.7	0.91
62	Universidad de La Laguna	578	67.8	22,214	31.1	0.90
63	Universidad de Extremadura	713	67.6	22,191	30.5	0.89
64	Universidad de Almería	487	69.0	22,573	27.4	0.87
65	Universidad Politécnica de Cartagena	71	70.4	21,412	28.0	0.87
66	Universidad de Huelva	307	69.4	25,370	23.9	0.87
67	Universidad de Las Palmas de Gran Canaria	471	60.9	22,477	30.3	0.87
68	Universidad Pontificia de Salamanca	43	81.4	19,543	25.7	0.86
69	Universidad de Málaga	828	67.6	22,047	25.7	0.84
70	Universidad de Cádiz	706	61.6	22,841	26.4	0.83

Source: Ministry of Universities (SIU), Social Security General Treasury (Ministry of Inclusion, Social Security and Migration) and authors' own calculations.



Table 5.15. Ranking of universities by graduate employment outcomes: graduates in Sciences

	University	Graduates	Employment rate	Average contribution base	% education-job match	Synthetic index <i>Ind. SS<sub>UG</sub></i>
1	Universidad Politécnica de Madrid	69	75.4	29,406	75.0	1.16
2	Universidad Nacional de Educación a Distancia	184	71.7	33,286	66.7	1.14
3	Universitat de les Illes Balears	146	80.8	25,301	66.1	1.08
4	Universidad de Cantabria	57	77.2	24,809	68.2	1.07
5	Universidad de Valladolid	100	76.0	23,883	68.4	1.05
6	Universidad del País Vasco	494	74.1	25,160	66.4	1.05
7	Universitat de Vic - Universitat Central de Catalunya	49	75.5	27,278	59.5	1.05
8	Universitat Politècnica de Catalunya	96	63.5	29,312	65.6	1.05
9	Universidad de La Rioja	38	84.2	23,134	62.5	1.05
10	Universitat Politècnica de València	148	66.2	25,103	72.5	1.04
11	Universitat de Lleida	76	77.6	24,512	62.7	1.04
12	Universitat de Barcelona	893	73.7	27,301	58.4	1.03
13	Universidad Complutense	963	71.9	26,101	61.3	1.03
14	Universitat Jaume I	47	89.4	24,247	52.4	1.02
15	Universidade de Santiago de Compostela	294	70.1	23,615	68.0	1.02
16	Universitat de València	618	74.8	22,672	65.8	1.02
17	Universidad de Zaragoza	275	76.4	23,444	61.9	1.01
18	Universidad Autónoma de Madrid	600	71.8	24,657	62.0	1.01
19	Universidad de Navarra	109	67.0	24,026	65.8	1.00
20	Universidad de Alicante	283	74.6	24,362	57.8	1.00
21	Universitat Autònoma de Barcelona	721	73.2	26,052	54.9	1.00
22	Universidad de Castilla-La Mancha	132	76.5	22,242	61.4	0.99
23	Universidad de La Laguna	197	72.6	23,550	60.8	0.99
24	Universidad de Oviedo	238	67.7	21,623	70.2	0.99
25	Universidad de Almería	73	76.7	22,527	57.1	0.98
26	Universidad de Córdoba	238	68.9	20,962	67.7	0.97
27	Universidad de Murcia	297	71.4	21,471	63.7	0.97
28	Universidad de Cádiz	171	62.0	22,447	68.9	0.97
29	Universidad Miguel Hernández de Elche	100	65.0	23,349	63.1	0.97
30	Universitat de Girona	225	76.0	24,153	51.5	0.96
31	Universidad de Salamanca	401	71.3	22,024	59.8	0.96
32	Universidad de Sevilla	562	62.6	23,881	62.8	0.96
33	Universidad de Granada	573	64.2	23,205	61.4	0.95
34	Universidad Pablo de Olavide	124	63.7	21,903	62.0	0.93
35	Universidad de León	153	70.6	22,428	54.6	0.93
36	Universidad de Alcalá	289	74.7	23,078	50.0	0.93
37	Universidad de Málaga	189	65.6	22,998	54.0	0.92
38	Universidad de Extremadura	126	75.4	21,394	50.5	0.92
39	Universidade de Vigo	165	66.7	20,574	59.1	0.91
40	Universitat Rovira i Virgili	119	79.0	23,728	41.5	0.90
41	Universidad Rey Juan Carlos	126	79.4	24,731	39.0	0.90
42	Universidade da Coruña	106	63.2	21,999	50.8	0.87
43	Universidad de Jaén	116	59.5	22,149	39.1	0.79

Source: Ministry of Universities (SIU), Social Security General Treasury (Ministry of Inclusion, Social Security and Migration) and authors' own calculations.

Table 5.16 shows the results for the Social sciences, journalism and documentation group. The main fields in this group, in terms of number of graduates, are psychology, economics, journalism, politics and public management, and criminology. Others include anthropology, geography, information and documentation, international relations and communication, all with far fewer graduates. The universities at the top of the ranking can be seen to owe their position to two features: the higher earnings typical of distance learning universities (UOC, UDIMA and UNED) because of having

a larger proportion of students who work while studying; and having a reasonable education-job match. In a context in which education-job match is lower in general than in other field-of-study groups, the universities that do achieve reasonably good results are pushed into the top positions, viz. Deusto, Abat Oliva, Pontificia de Comillas, UAM, UN, UCV and UC3M. Once again, the driver of education-job match appears to be the fact of graduating in a region with more demand for skilled labor, namely, the Basque Country, Catalonia and Madrid.



Table 5.16. Ranking of universities by graduate employment outcomes: graduates in Social sciences, journalism and documentation

	University	Graduates	Employment rate	Average contribution base	% education-job match	Synthetic index $Ind. SS_{UG}$
1	Universitat Oberta de Catalunya	544	78.7	32,161	53.7	1.26
2	Universidad a Distancia de Madrid	124	70.2	34,725	49.4	1.21
3	Universidad Nacional de Educación a Distancia	1,516	67.3	31,554	55.5	1.20
4	Universidad de Deusto	135	79.3	21,007	69.2	1.19
5	Universitat Abat Oliba CEU	92	73.9	28,124	52.9	1.17
6	Universidad Pontificia Comillas	88	77.3	22,698	60.3	1.16
7	Universidad Autónoma de Madrid	623	70.8	25,979	55.1	1.14
8	Universidad de Navarra	105	62.9	24,058	66.7	1.14
9	Universidad Católica de Valencia	79	76.0	21,080	61.7	1.13
10	Universidad Carlos III	419	74.2	27,028	47.0	1.11
11	Universidad Internacional de La Rioja	95	83.2	29,727	38.0	1.11
12	Universidad Pontificia de Salamanca	151	69.5	21,456	61.9	1.10
13	Universitat Pompeu Fabra	462	68.2	29,699	42.9	1.08
14	Universitat Ramon Llull	201	76.6	24,478	46.1	1.08
15	Universidad Cardenal Herrera - CEU	54	77.8	25,729	42.9	1.08
16	Universitat de Barcelona	1,020	75.5	26,182	42.5	1.07
17	Universidad de Extremadura	63	71.4	25,681	44.4	1.06
18	Universidad de Castilla-La Mancha	76	80.3	23,463	42.6	1.05
19	Universitat Rovira i Virgili	157	74.5	23,687	42.7	1.03
20	Universidad del País Vasco	545	78.5	23,434	39.7	1.02
21	Universidad de Almería	164	65.2	20,911	53.3	1.02
22	Universidad Europea de Madrid	108	64.8	24,887	44.3	1.01
23	Universitat de València	949	68.7	23,362	43.7	1.01
24	Universitat de Girona	187	75.4	26,400	34.8	1.00
25	Universitat de Vic - Universitat Central de Catalunya	59	84.8	21,303	38.0	1.00
26	Universitat de les Illes Balears	177	69.5	23,759	41.5	1.00
27	Universidad de Oviedo	196	66.3	23,456	43.9	1.00
28	Universidad de Zaragoza	232	76.3	23,248	38.4	1.00
29	Universidad Católica San Antonio	144	61.8	26,438	41.6	1.00
30	Universitat Autònoma de Barcelona	898	78.7	24,018	35.4	0.99
31	Universitat Jaume I	295	76.3	23,057	37.8	0.99
32	Universidad de Cantabria	52	73.1	26,021	34.2	0.98
33	Universidad Pública de Navarra	65	64.6	27,748	35.7	0.98
34	Universidad Complutense	1,807	67.0	23,300	40.7	0.97
35	Universidade de Santiago de Compostela	384	64.1	21,150	46.3	0.97
36	Universidad Miguel Hernández de Elche	286	66.8	22,686	40.8	0.97
37	Universidad Rey Juan Carlos	716	74.6	24,447	33.9	0.97
38	Universidad de Jaén	203	61.1	22,076	44.4	0.96
39	Universidad de Sevilla	835	67.8	22,573	38.9	0.95
40	Universidad San Pablo - CEU	205	65.9	24,835	36.3	0.95
41	Universidade de Vigo	40	80.0	23,536	31.3	0.95
42	Universidad de Huelva	175	58.3	20,829	48.0	0.95
43	Universidad de Murcia	407	68.1	21,640	39.4	0.95
44	Universidad de Alcalá	147	66.0	26,485	33.0	0.94
45	Universidad de Salamanca	649	59.8	27,560	33.8	0.93
46	Universidad de Valladolid	188	78.2	25,853	27.2	0.93
47	Universidad de La Laguna	329	66.6	20,130	40.2	0.92
48	Universidad Pablo de Olavide	110	62.7	24,241	34.8	0.92
49	Universidad de Málaga	461	62.7	23,283	35.3	0.91
50	Universidad de Granada	808	59.2	22,405	37.2	0.90
51	Universidad de Cádiz	123	62.6	22,619	33.8	0.89
52	Universidade da Coruña	86	70.9	21,820	29.5	0.87
53	Universidad de Alicante	285	67.4	24,439	24.0	0.83

Source: Ministry of Universities (SIU), Social Security General Treasury (Ministry of Inclusion, Social Security and Migration) and authors' own calculations.

Table 5.17. Ranking of universities by graduate employment outcomes: graduates in Services

	University	Graduates	Employment rate	Average contribution base	% education-job match	Synthetic index <i>Ind. SS<sub>UG</sub></i>
1	Universidad Carlos III	94	89.4	44,219	82.1	1.79
2	Universitat Politècnica de Catalunya	44	75.0	32,782	48.5	1.28
3	Universidad Pontificia de Salamanca	141	71.6	27,987	58.4	1.27
4	Universidad del País Vasco	143	79.7	30,847	47.4	1.27
5	Universidad Pablo de Olavide	94	71.3	28,347	55.2	1.25
6	Universidad de León	82	74.4	25,996	50.8	1.20
7	Universidad Autónoma de Madrid	245	77.6	30,374	39.5	1.18
8	Universitat Rovira i Virgili	103	68.0	30,946	41.4	1.16
9	Universidad Politécnica de Madrid	195	80.0	26,492	39.7	1.14
10	Universidade da Coruña	189	73.5	28,433	39.6	1.14
11	Universidad Nacional de Educación a Distancia	118	73.7	28,782	36.8	1.11
12	Universidad de Salamanca	59	76.3	28,879	33.3	1.09
13	Universidad de La Laguna	131	75.6	26,890	33.3	1.06
14	Universidad Católica San Antonio	211	72.5	23,426	39.9	1.06
15	Universidad de Granada	316	66.1	24,054	40.7	1.05
16	Universidad de Cádiz	160	61.9	27,780	37.4	1.04
17	Universidad Miguel Hernández de Elche	130	74.6	22,490	37.1	1.03
18	Universitat de Vic - Universitat Central de Catalunya	90	84.4	26,634	26.3	1.02
19	Universidad de Las Palmas de Gran Canaria	223	78.0	26,585	27.0	1.00
20	Universidad de Cantabria	60	70.0	25,531	31.0	0.99
21	Universitat Ramon Llull	163	81.0	25,448	25.8	0.98
22	Universidad de Oviedo	83	62.7	25,491	32.7	0.97
23	Universidad Europea de Madrid	100	66.0	25,946	30.3	0.97
24	Universidad de Murcia	154	73.4	22,010	31.9	0.97
25	Mondragon Unibertsitatea	80	61.3	22,547	36.7	0.96
26	Universitat Autònoma de Barcelona	186	79.0	26,980	23.1	0.96
27	Universitat de Barcelona	275	77.5	24,677	24.4	0.94
28	Universidad de Extremadura	93	68.8	19,201	32.8	0.92
29	Universidad Católica de Valencia	237	74.3	22,702	25.6	0.91
30	Universidade de Vigo	121	76.9	20,828	25.8	0.90
31	Universidad de Almería	101	73.3	21,480	25.7	0.89
32	Universitat de Lleida	127	78.0	23,289	22.2	0.89
33	Universidad de Huelva	77	68.8	23,342	24.5	0.89
34	Universidad de Alcalá	135	78.5	22,438	21.7	0.88
35	Universidad de Zaragoza	109	74.3	21,831	23.5	0.88
36	Universitat de València	277	72.9	22,904	22.8	0.88
37	Universitat de Girona	389	74.6	24,163	18.6	0.84
38	Universidad de Sevilla	218	66.5	22,397	20.0	0.81
39	Universidad Rey Juan Carlos	263	67.7	24,488	16.9	0.79
40	Universitat de les Illes Balears	118	73.7	25,936	13.8	0.78
41	Universidad de Alicante	269	69.1	20,553	16.1	0.74
42	Universidad de Córdoba	63	68.3	20,685	14.0	0.70
43	Universidad de Málaga	103	53.4	22,771	14.6	0.68
44	Universidad Complutense	199	64.8	22,006	10.1	0.63

Source: Ministry of Universities (SIU), Social Security General Treasury (Ministry of Inclusion, Social Security and Migration) and authors' own calculations.

Table 5.17 shows the results for the Services group, which is small (third smallest after Agriculture and Computer science, with 7,720 graduates in the cohort analyzed) and made up of very diverse fields (as diverse as tourism, physical education and sports, land and air transport, and nautical science and maritime transport). Accordingly, there are no clear overall patterns, as any ranking will depend greatly on the percentage of graduates in each field of study in each university. The employment

rate and average contribution base vary widely among the top ten universities and, as in the previous group, the ranking is decided by education-job match. Many different regions are represented among the top ten in this group. Although Madrid predominates (UC3M, UAM, UPM), we also find Castilla y León (Pontificia de Salamanca y León), Catalonia (UPC, URV), the Basque Country (UPV/EHU), Andalusia (UPO) and Galicia (UDC).

Table 5.18. Ranking of universities by graduate employment outcomes: graduates in Arts and humanities

	University	Graduates	Employment rate	Average contribution base	% education-job match	Synthetic index <i>Ind.SS<sub>UG</sub></i>
1	Universidad de La Rioja	127	80.3	31,899	84.3	1.42
2	Universitat Oberta de Catalunya	265	80.4	33,913	58.2	1.28
3	Universidad del País Vasco	633	72.8	28,576	57.9	1.17
4	Universidad de Jaén	141	55.3	29,733	69.2	1.14
5	Universidad de Deusto	191	74.4	27,606	54.9	1.14
6	Universidad Nacional de Educación a Distancia	886	57.3	33,528	56.5	1.13
7	Universidad de les Illes Balears	155	72.3	25,573	58.0	1.12
8	Universidad de Zaragoza	321	68.9	24,650	58.8	1.10
9	Universitat de València	748	66.8	25,764	56.8	1.09
10	Universitat de Girona	139	77.7	25,160	49.1	1.08
11	Universidad Pontificia Comillas	87	57.5	29,360	56.0	1.08
12	Universidad de Alicante	453	62.9	25,625	57.9	1.07
13	Universitat Rovira i Virgili	131	76.3	24,098	50.0	1.07
14	Universidad San Pablo - CEU	67	73.1	22,589	55.1	1.06
15	Universidad de Castilla-La Mancha	315	61.9	25,602	56.9	1.06
16	Universidad de Oviedo	248	56.5	25,893	58.6	1.04
17	Universidad de Extremadura	201	63.2	24,469	54.3	1.03
18	Universitat de Lleida	106	72.6	23,877	45.5	1.01
19	Universidad de Las Palmas de Gran Canaria	227	64.3	25,230	48.0	1.01
20	Universitat de Barcelona	1,152	68.8	25,473	42.1	0.99
21	Universidad de Córdoba	274	56.9	24,355	53.2	0.99
22	Universitat Ramon Llull	134	76.9	23,977	39.8	0.99
23	Universidad de Cádiz	170	54.1	24,366	55.4	0.99
24	Universidad de Murcia	580	61.9	23,134	51.0	0.99
25	Universidad de Almería	142	54.9	24,492	53.9	0.98
26	Universidad de Alcalá	227	64.3	23,321	47.3	0.98
27	Universitat de Vic - Universitat Central de Catalunya	132	75.0	22,882	40.4	0.97
28	Universidad de Santiago de Compostela	344	52.6	23,555	54.7	0.96
29	Universitat Jaume I	280	68.9	24,298	39.9	0.96
30	Universitat Autònoma de Barcelona	897	70.5	24,761	38.1	0.96
31	Universidad de Salamanca	763	52.8	23,911	52.4	0.95
32	Universidad Autónoma de Madrid	518	63.7	22,368	46.1	0.95
33	Universidad de La Laguna	260	59.2	23,223	47.4	0.95
34	Universitat Pompeu Fabra	444	66.4	23,471	41.7	0.95
35	Universitat Politècnica de Catalunya	164	75.6	24,191	35.5	0.95
36	Universidad Pablo de Olavide	198	53.0	23,167	52.4	0.95
37	Universidade da Coruña	115	60.9	22,772	45.7	0.94
38	Universidad Camilo José Cela	189	70.4	23,135	38.4	0.94
39	Universidad de Granada	1,069	50.3	24,187	51.1	0.94
40	Universidad de Navarra	112	53.6	22,650	50.0	0.93
41	Universidad Europea de Madrid	85	57.7	25,028	40.8	0.92
42	Universidad de Valladolid	309	51.8	24,270	46.3	0.91
43	Universidad Complutense	1,747	61.4	22,757	39.2	0.90
44	Universidad Carlos III	129	63.6	23,134	36.6	0.89
45	Universidad de Sevilla	840	52.3	24,159	42.6	0.89
46	Universidade de Vigo	272	59.6	19,462	42.0	0.86
47	Universidad Rey Juan Carlos	228	70.2	23,691	28.1	0.85
48	Universidad de Málaga	555	53.7	22,355	38.9	0.85
49	Universitat Politècnica de València	391	58.8	21,425	33.0	0.82
50	Universidad de Burgos	114	70.2	20,197	28.8	0.81

Source: Ministry of Universities (SIU), Social Security General Treasury (Ministry of Inclusion, Social Security and Migration) and authors' own calculations.

Lastly, table 5.18 shows the results for the Arts and humanities group, which, as we saw in section 3, has the lowest levels of employment and earnings. It is a very broad group, with a total of 20,216 graduates spread across fields such as translation

and interpretation, audiovisual, image and multimedia, languages (classical, English, Spanish), fine arts, history and art history. Apart from Universidad de La Rioja, which leads the ranking with high scores in all three employment outcome indicators,

the other universities in the top ten owe their position to various combinations of indicators. The distance learning universities (UOC and UNED) place second and fifth, respectively, again thanks to their high contribution bases, although the UOC also has a high employment rate. In general, it is the higher contribution bases that explain the prominent positions achieved by a number of universities in different regions. Besides those already mentioned, the top ten include universities in the Basque Country (UPV/EHU, Deusto), Andalusia (Jaén), Catalonia (Girona), Balearic Islands (Illes Balears), Aragon (Zaragoza) and Valencia (UV).

To sum up, the rankings of universities by their employment outcomes in each field-of-study group show very different patterns in each group, both as regards which indicators affect employment outcomes most (employment rate, employment quality) and as regards the characteristics of the universities that perform best (public/private, region, distance/on-site, large/small, etc.). This finding advises caution when assessing a university's performance in graduate employment, as performance may vary across degree subjects.

#### ***5.4.3. Overall ranking of universities by employment outcomes***

Over the course of this section we have seen that the rankings by field-of-study groups are shaped by different factors. In some cases, the determinants were environment-related variables such as graduating in a region with a highly specialized or dynamic economy that generates demand for skilled workers. In other cases, the top slots in the ranking were determined by particular features of the demand for graduates, e.g. in the health sector, where strong public sector demand makes for more homogeneous salaries, or education, where, especially in certain regions, recent graduates encounter a high demand from semi-private and private schools, which are not subject to the competitive examination procedures that can delay employment in public education. In other cases, the determinants of top positions were characteristics of the universities themselves, such as their distance learning methods.

Therefore, although aggregating the results for the various field-of-study groups in an overall index of universities is an interesting exercise to get an overview of the graduate employability performance

of the Spanish University System as a whole, the sheer variety of determinants indicates that the resulting snapshot should be viewed with caution, as there are many qualifications to be made.

Moreover, we must not forget that there is one other determinant of employment outcomes, apart from those discussed, that comes into play when we construct the synthetic index, namely, the relative importance of each field-of study group in each university. A university that offers mainly degree programs belonging to field-of-study groups that have higher employability will probably do better in the ranking.

We should bear in mind, therefore, that some of the variables that influence employment outcomes, such as the degree offering or the geographical location, are strategic decisions that each university may make, subject to different constraints. The younger universities and the private ones have greater freedom to make such decisions than those that have grown up over centuries and the public ones. All this can influence their graduate employment outcomes.

Table 5.19 shows the ranking of universities according to the overall synthetic index (IL Index). Remember that the IL index combines the indices of individual university performance within each field-of-study group with the overall graduate employment outcome index for the field-of-study group as a whole and takes the composition of each university's degree offering into account. The last three columns show the average indicators for the universities obtained from social security registration data to provide a clue as to which aspects of the employment outcomes explain the final result. The list includes 67 universities because it shows only those that offer degrees in three or more field-of-study groups, since it would not be reasonable to assign a university a position in the overall ranking based on a hyperspecialization in only one or two field-of-study groups.

There are various conclusions to be drawn from these results. In our analysis of the determinants of employment outcomes in section 2, we saw that the choice of degree was the most important factor. It is no surprise, therefore, that the **mix of degrees offered by a university** is the key determinant of the university's position in the ranking, as the following pattern shows:

Table 5.19. Overall ranking of universities by employment outcomes

	University	Index	Graduates	Employment rate	Average contribution base	% education-job match
1	Universidad Politécnica de Madrid	1.13	4,771	76.0	32,141	74.5
2	Universidad Católica Santa Teresa de Jesús de Ávila	1.12	469	85.3	33,547	79.1
3	Universidad Politécnica de Cartagena	1.12	657	82.9	29,465	75.3
4	Universitat Politècnica de Catalunya	1.12	4,946	78.7	32,807	64.6
5	Universidad Nebrija	1.11	382	75.3	32,461	77.3
6	Universidad Pontificia Comillas	1.10	1,170	70.0	34,152	77.1
7	Universidad Alfonso X el Sabio	1.09	1,566	70.0	29,705	87.0
8	Universitat Internacional de Catalunya	1.09	522	75.9	31,026	77.9
9	Mondragon Unibertsitatea	1.08	703	84.5	31,140	65.0
10	Universidad Pública de Navarra	1.08	1,341	86.1	29,438	64.0
11	Universidad Carlos III	1.08	2,269	76.0	32,504	63.1
12	Universidad Camilo José Cela	1.08	2,702	84.2	30,289	83.2
13	Universidad de León	1.08	2,335	77.7	30,339	69.6
14	Universidad Internacional de La Rioja	1.07	2,056	86.2	30,498	74.2
15	Universidad Pontificia de Salamanca	1.07	1,379	82.5	29,510	79.1
16	Universidad de Navarra	1.07	1,496	74.2	31,008	76.9
17	Universitat Politècnica de València	1.07	3,894	76.1	26,845	60.8
18	Universitat Oberta de Catalunya	1.07	2,544	80.0	34,331	56.0
19	Universitat Ramon Llull	1.06	2,295	78.6	32,507	62.6
20	Universidad Europea de Madrid	1.06	2,146	63.3	31,306	76.2
21	Universidad San Pablo - CEU	1.06	1,192	74.2	28,901	71.5
22	Universidad del País Vasco	1.05	6,894	82.3	29,822	63.2
23	Universidad de Deusto	1.05	1,351	80.1	29,094	60.8
24	Universidad Cardenal Herrera - CEU	1.05	1,058	74.9	27,545	72.6
25	Universidad de Cantabria	1.04	1,499	77.1	28,404	61.8
26	Universidad Católica de Valencia	1.04	1,730	83.4	28,235	71.7
27	Universidade da Coruña	1.04	2,731	77.7	26,128	57.9
28	Universidad de Oviedo	1.03	3,271	75.8	27,127	61.1
29	Universidad de La Rioja	1.03	744	81.5	27,585	59.0
30	Universidad de Castilla-La Mancha	1.03	3,627	78.7	26,967	64.2
31	Universidad Católica San Antonio	1.03	1,725	76.8	27,283	64.3
32	Universidad de Zaragoza	1.03	4,437	80.2	27,230	61.9
33	Universidade de Vigo	1.02	2,882	76.8	25,931	60.3
34	Universitat de Lleida	1.02	1,331	82.7	27,612	61.5
35	Universitat Rovira i Virgili	1.02	2,017	80.5	28,338	59.0
36	Universidad de Valladolid	1.02	3,775	77.8	27,281	57.0
37	Universidad Miguel Hernández de Elche	1.01	1,456	76.2	27,091	57.7
38	Universidad de Alcalá	1.01	2,696	78.6	27,891	57.8
39	Universidad Nacional de Educación a Distancia	1.01	5,578	68.1	32,037	57.5
40	Universitat de Vic - Universitat Central de Catalunya	1.01	880	80.2	28,319	59.2
41	Universidade de Santiago de Compostela	1.01	3,410	72.9	26,718	68.2
42	Universitat de les Illes Balears	1.01	1,756	79.8	27,761	59.6
43	Universidad de Las Palmas de Gran Canaria	1.00	2,373	74.7	26,096	56.4
44	Universidad Autónoma de Madrid	1.00	4,371	75.4	27,786	59.8
45	Universidad de Burgos	1.00	1,115	76.8	25,578	49.6
46	Universidad de Extremadura	1.00	3,267	75.1	25,733	59.9
47	Universitat Autònoma de Barcelona	1.00	6,051	79.0	28,706	56.9
48	Universidad de Sevilla	1.00	8,528	70.5	26,666	57.7
49	Universitat Pompeu Fabra	1.00	2,321	75.0	29,387	47.7
50	Universidad de Jaén	1.00	2,250	69.2	25,260	55.8
51	Universitat de València	1.00	7,153	75.7	25,975	57.4
52	Universitat de Barcelona	1.00	7,573	79.8	28,813	54.8
53	Universidad de La Laguna	1.00	3,083	74.8	25,569	57.9
54	Universidad de Córdoba	1.00	2,268	70.9	26,881	61.8
55	Universidad de Cádiz	0.99	2,790	68.5	27,242	56.8
56	Universidad Rey Juan Carlos	0.98	4,713	74.0	26,711	45.9
57	Universitat Jaume I	0.98	1,788	79.0	24,882	45.3
58	Universitat de Girona	0.98	2,228	76.8	27,293	49.9
59	Universidad de Salamanca	0.98	4,468	69.0	26,865	58.8
60	Universidad de Murcia	0.98	4,224	72.8	24,875	59.6
61	Universidad de Alicante	0.98	4,036	73.2	25,067	48.6
62	Universidad de Granada	0.98	8,143	65.5	25,493	56.7
63	Universidad Complutense	0.98	10,801	73.5	26,343	54.6
64	Universidad de Huelva	0.97	1,440	72.5	25,918	47.9
65	Universidad de Málaga	0.97	4,475	70.0	25,414	49.0
66	Universidad Pablo de Olavide	0.96	1,062	63.9	24,695	52.5
67	Universidad de Almería	0.96	1,966	71.8	23,610	46.0

Note: the overall ranking includes only universities that have graduates in three or more of the 10 field-of-study groups analyzed. Universitat Abat Oliba CEU, IE Universidad, Universitat a Distancia de Madrid, Universidad Fernando Pessoa-Canarias, Universidad Internacional Valenciana and Universidad Loyola Andalucía are excluded from the overall analysis. Source: INE (EILU), Ministry of Universities (SIU), Social Security General Treasury (Ministry of Inclusion, Social Security and Migration) and authors' own calculations.



- The polytechnic universities, whose degree offering includes a large proportion of field-of-study groups with very good employment outcomes, such as Computer science and Engineering, occupy three of the top four positions in the ranking; and all four Spanish polytechnic universities are in the first quartile of the ranking.
- The large universities with a tradition of general studies (UCM, UB, UV, UGR, US, USAL) tend to offer programs in all the fields of specialization and have graduate employment outcomes in the lower third of the ranking. The offering may be changed over the long term, but any such decision must first overcome the institutional culture (and the tradition of paying limited attention to employment outcomes) and inertia. Change is also held back by a conception of the university as a public service, with the argument that less employable degrees should continue to be offered for reasons such as satisfying students' interests or preserving the wealth represented by disciplines with a long tradition.
- Many private and newer universities that have designed their degree offering more recently have opted for a mix that results in good employment outcomes. Also, probably because of their size, they provide more personalized career guidance. Thus, the top ten include six private universities: Católica de Ávila, Nebrija, Pontificia de Comillas, UAX, UIC and Mondragón.

In our analysis of the determinants of employment outcomes in section 2 we saw that the second

most influential variable was the **region** in which the graduate resides. This is not necessarily the region of the university from which the person graduated, as he or she may have moved to a different region in which there is more demand for his or her particular skills. Conversely, there is nothing to stop a person who graduated from a university located in a region with high demand for skilled workers from returning to his or her home region, even if it offers fewer employment opportunities.

Nevertheless, a graduate is more likely to reside in a dynamic region if his or her university is located in that region, as this will save the trouble of additional mobility decisions. Being located in a particular region may therefore be an advantage or a disadvantage for a university in terms of employment outcomes. Consistent with this logic, the universities located in the regions with the lowest GDP per capita, namely Andalusia, Extremadura, Canary Islands (UEX, US, UJA, UCO, UCA, UGR, US, UHU, UMA, UAL, ULPGC, ULL), are all in the lower third of the employment outcomes ranking (positions 45 and below), confirming the importance of the local environment in graduate employment outcomes.

These regional differences, together with the degree offering, also explain the good performance of the new private universities, since they have been able to choose not only their degree offering without too many restrictions but also their location. The private universities we mentioned as being among the top ten are all located in Madrid, Catalonia or the Basque Country, except for Universidad Católica de Ávila, which is geographically very close to the top-ranking region.



# Conclusiones

## 06

The aim of U-Ranking is to generate classifications that allow to analyze the Spanish universities with broad datasets that consider the main dimensions of their activities: teaching, research and innovation. Two main rankings are obtained with this project: U-Ranking, which correcting for size, measures the performance of Spanish universities and ranks them according to their level, and U-Ranking Volume, which measures the results without considering their size. The methodology used in U-Ranking is rigorous and in harmony with the recommendations of recent international studies on this subject.

Adding the information on the results of the universities in different areas has its challenges. However, not considering them and examining the numerous indicators that can be considered separately is not a practical solution, since most of the people interested in comparing universities want information presented in a simple manner, not large and complex volumes of information. Therefore, students, faculty members, researchers, university managers or politicians, and communications media appreciate having synthetic indicators available. Rankings, if constructed with suitable criteria and clear metrics, can be useful in this sense, because they condense the results of universities in several areas, reducing the effort that users have to make to obtain and analyze the information, which in many cases, the user has to do personally.

U-Ranking indices allow to analyze the results in teaching, research and innovation of all the public universities in Spain (48) and 23 private

universities that offer the information needed to make the comparison. Data for the rest of the private universities that are currently not included will be in the future when information on their activities becomes available and can be compared with the data offered by the 71 universities that are now included.

The rankings were constructed from 20 variables that take into account the following aspects: (i) the universities' different missions (teaching, research and innovation); (ii) the existence of differences in the results of a university in the different areas of study; and (iii) the importance of considering the preferences of the users of university services when constructing some rankings.

The project generates two general university rankings —volume of performance (U-Ranking) and volume of results (U-Ranking Volume)— and four partial rankings: two of teaching and two of research and innovation, in terms both of volume and of performance. These six university profiles can be of interest for assessing them from different perspectives, since the images projected of a university by each ranking are not the same for all of them. It corresponds to the users of the information —university or political leaders, researchers, students, analysts, etc.— to consider which images are the most relevant for their needs or interests.

The main results of the 2023 edition of U-Ranking are:

1. The synthetic indicators from which the rankings are obtained show that the differences in performance among universities are relevant: the level of the indicator of those with better results triples that of the universities with lower performance levels.
2. The differences among universities in terms of volume of results are much greater, since they are influenced by performance and the different sizes of the universities.
3. Public universities dominate the Spanish University System. The Universities Carlos III de Madrid, Politècnica de Catalunya and Pompeu Fabra take the lead in U-Ranking 2023. They are followed by Politècnica de Valencia and the Universitat Autònoma de Barcelona. Four universities share third place: Universidad Autònoma de Madrid, Universidad Politècnica de Madrid, Universitat de Barcelona and Universitat Rovira i Virgili.
4. The first private universities appear in the fourth position, where IE Universidad, Universidad de Navarra and Universidad de Deusto appear together with six public universities: Cantabria, Universitat de València, Alcalá, Santiago de Compostela, Vigo and Girona.
5. The leadership of some of public universities is especially outstanding in the research and innovation. Positions 1 to 5 are occupied by 11 universities, all of them public. Almost half (5) are located in Catalonia, three in Madrid and the other three in Valencia, Galicia and Cantabria. The Universitat Pompeu Fabra heads the research and innovation ranking, followed by the U. Autònoma de Barcelona and the U. Politècnica de Catalunya. The third position is occupied by U. Carlos III de Madrid and U. Rovira y Virgili.
6. The teaching ranking is headed by a group of 6 universities, three public (U. Politècnica de València, U. Carlos III, Universitat Politècnica de Catalunya) and three private (U. Europea de Madrid, U. de Navarra and U. Ramon Llull).
7. There is a group of universities, made up of institutions with varied profiles among which predominate those of larger dimension that occupy the prominent places regarding volume of results and also performance. Most of them appear among the top 500 universities in well-known international rankings, such as Shanghai, THE and QS. U-Ranking confirms that Spanish universities that appear in the international rankings with greater volume of results are more productive. The repeated signals of quality sent by these institutions allow us to identify them as excellent universities, a conclusion that is repeated with different classification criteria. Consequently, efforts to improve the positioning of Spanish universities at international level should focus on these institutions.
8. In private universities, the ranking confirms their high specialization and remarkable performance in teaching which exceeds by 9 percentage points the average of public universities. Three out of six universities with a high level of performance in teaching are private. When evaluating this result, it is important to note that the private universities that have been included in the ranking have higher indicators than the majority of private ones that are not included due to lack of information, in view of the values which are available. Thus, the average level of the teaching results of private universities could be lower if U-Ranking included all the private universities.
9. The specialization in teaching of private universities has its counterpart in a worse relative position with respect to the public system in terms of research performance which is 48 percentage points lower than that of public universities, with the first private university (IE Universidad) appearing in seventh place in the research and innovation ranking. None of the 19 universities with best performance in research is private. Public universities present higher levels of performance in research, and innovation.
10. Research activity is much more visible among public universities, however it varies greatly in terms of intensity and results. Thus, specialization in teaching is also an aspect

that distinguishes the public university system. The greater intensity of the differences in research and innovation performance indexes is evidence that this mission of the university is significantly more concentrated than teaching in some areas of the university system, as well as within the universities in specific areas and individuals.

11. Some well-known international initiatives—such as the Shanghai Ranking or THE—have increased the visibility of the classifications of universities and the social demand for such rankings. But these rankings emphasize the indicators of research and training of high international prestige, often at graduate level, leaving out most of the activity of our university system, which focuses on the teaching of bachelor's degrees and does not compete in the world leagues. The orientation towards research indicators is also characteristic of other national rankings, drawn up with guarantees of quality but are based on indicators of the activities of universities that are too partial since they include very few on teaching activities. Our results highlight the key importance of combining research performance with teaching performance measurements. Using the former as a proxy for the latter offers a very biased view of reality because the correlation between the two measures is low. The incorporation of private universities blurs the relationship between the two dimensions because they combine strong teaching performance and (in many cases) weak research performance, confirming the need to acknowledge the heterogeneity of the Spanish University System.
  12. Differences in the results of the universities are also seen at regional level. Catalonia, whose university system is clearly the leader, Cantabria, Valencian Community, Navarre, Galicia and Madrid have the most productive university systems, with performance levels above the Spanish average. Differences in performance among the regional university systems are great: 37 percentage points between the best-performing region and the worst-performing region.
  13. The analysis of regional performance levels of only on-site public universities reveals that in some regions—Madrid and the Valencian Community—the importance of private universities lowers their performance, while in other regions—Comunidad Foral de Navarra—improves their performance, and in other regions—Catalonia—it has no effect, indicating a greater homogeneity of performance between the public and private universities in those regions.
- The analysis of the insertion of university students carried out in U-Ranking 2023 also offers some interesting conclusions. The study focuses on the job experience of graduates from 2014 and explores the labor market in the years of expansion prior to the COVID-19 outbreak. The conclusions of greatest interest are as follows:
14. Spanish university graduates enjoy significant advantages when entering the labor market compared to people with other educational levels: they are less affected by unemployment and economic crises, they have higher salaries and higher quality of employment, mostly concentrated in highly skilled jobs.
  15. These advantages over the rest of Spanish employees disappear when compared with their European equivalents. Recent Spanish university graduates have employment rates that are 8 percentage points lower than the EU average, a wage premium relative to those with post-secondary education that is significantly lower than that of most European countries, and the same is true for the percentage of those in highly skilled jobs.
  16. When analyzing the determinants of labor market insertion, the choice of degree is the variable that has the greatest impact on job insertion and quality of employment. Choosing a particular degree with a good insertion rates can increase the probability of being employed by up to 25 percentage points compared to other degrees; it can increase by 82 percentage points the probability of earning 1,500 euros or more per month, by 81 points the probability of

having a job that matches the level of educations and almost double (92 points) the probability of having a job that matches the field of study pursued.

17. The second most important determinant for insertion is the region of residence after graduation. The characteristics of the labor market and the economic fabric of the different regions can increase the likelihood of being employed by 22 percentage points, of earning more than 1,500 euros by 45.9 points, of having a job that matches the level of educations by 16.7 points and of having a job that matches the field of study pursued by 10 points. These results confirm the importance of graduate mobility in improving their employment opportunities, thus moving to another region can reduce the negative impact of other employment factors.

The great importance of the choice of degree on employability has justified the elaboration of a ranking of 101 fields of study, based on an index constructed from the four dimensions of graduate employability analyzed: the employment rate, net earnings of over 1,500 euros or more per month, education-job match and field of study-job. The results make it possible to establish three levels of insertion.

18. The fields related to information technology, engineering and health have the most favorable insertion results, with employment rates that exceed 90% and adjustment indicators 80%. In most of the degrees associated with technology and engineering, the percentage of graduates earning more than 1,500 euros net per month exceeds 75%.
19. The field related to arts and humanities, along with a significant number of fields in the group of social sciences, journalism and documentation, present least favorable outcomes, with employment rates below 80%, but above all with poor study-job match (often below 60%) and a majority of graduates earning less than 1,500 euros. In other words: the most important differences between fields of study in terms of employment opportunities are those related

to the quality of the jobs (salaries and tasks to be performed).

20. There are fields with intermediate employability results in all branches, but especially in agriculture, education, science and business, with weaknesses, fundamentally, in the indicators of job quality: educational mismatch between the studies pursued and the tasks, and low salary levels.

The report also offers an ordering of the universities according to their labor market insertion results, taking into account the limitations of the information in this regard. These findings support the significance of the region in which a university is located and the speciality of the degrees it offers:

21. The composition of the degrees offered by the universities means that the polytechnic universities, with a high weight of groups of degrees with very good insertion results, such as computer science or engineering, occupy three of the first four places in the ranking, with the four Spanish universities of this type in the first quartile of the classification.
22. The large universities that come from general studies (Universidad Complutense de Madrid, Universitat de Barcelona, Universitat de València, Universidad de Granada, Universidad de Sevilla, Universidad de Salamanca), which due to their historical origin usually deal with all fields of specialization, have job placement results that place them in the bottom third of the ranking.
23. Many private and young universities, which have recently structured their offerings, have opted for a composition of their training offerings that leads to good results in terms of labor market insertion. In addition, probably because of their size, they also take a more personalized approach to this variable. Thus, six private universities appear among the top ten: Católica de Ávila, Nebrija, Pontificia de Comillas, Universidad Alfonso X, Universitat Internacional de Catalunya and Universidad de Mondragón.

With regard to the importance of the autonomous community, the location of the university in certain communities promotes insertion results in some cases, while other locations hinder them:

24. Of the twenty on-site universities with the best insertion of graduates, fifteen are located in high-income regions (Madrid, Catalonia, Navarre and the Basque Country). The universities that stand out in teaching and research and, at the same time, in the labor market insertion of their graduates - Universidad Carlos III de Madrid and Universitat Politècnica de Catalunya- are located in highly developed communities.
25. The universities located in regions with a low GDP per capita level and a productive fabric that is less intensive in human capital (Andalusia, Extremadura, Canary Islands) are all in the lower third of the job placement ranking (positions 45 onwards): Universidad de Extremadura, Universidad de Sevilla, Universidad de Jaén, Universidad de Córdoba, Universidad de Cádiz, Universidad de Granada, Universidad de Sevilla, Universidad de Huelva, Universidad de Málaga, Universidad de Alicante, Universidad de La Palmas de Gran Canaria, Universidad de La Laguna, confirming the importance of the environment in the insertion of university graduates.
26. The good positions of the new private universities are favored because not only have they had the option of choosing their offer of studies without too many restrictions, but also the place where they are located. Thus, those among the top ten are all located in Madrid, Catalonia or the Basque Country, with the exception of the Catholic University of Avila, which is very close to the first autonomous community.







# Annexes

## Annex 1: Glossary of Indicators and statistical sources

Dimension	Area	Indicator and definition	Source	Period	Level
Teaching	Resources	<b>Faculty member per 100 students:</b> Full-time equivalent faculty and research staff in centers belonging to the University per 100 full-time equivalent students in studies of 1st and 2nd cycle, bachelor's and master's degrees and students in doctoral degrees (all of these students registered in centers belonging to the University)	SIU	2015-16 a 2020-21	Area of study
		<b>Budget per student:</b> Effective income of the University by number of full-time equivalent students in studies of 1st and 2nd cycle, bachelor's and master's degrees and of students in doctoral degrees (all of these students registered in centers belonging to the University)	SIU SABI WEB	2015-16 a 2020-21	Universidad
		<b>Percentage of faculty member with PhD:</b> Full-time equivalent faculty members with PhD in centers belonging to the University over total full-time equivalent faculty and research staff in centers belonging to the University	SIU	2015-16 a 2020-21	Area of study
	Production	<b>Success rate in bachelor's degree studies:</b> Number of credits passed by grade students registered in an academic year over total credits evaluated within the same course (excluding transfer and recognized credits)	SIU	2015-16 a 2020-21	Area of study
		<b>Evaluation rate in bachelor's degree studies:</b> Number of credits evaluated by grade students registered in an academic year over total credits registered within the same course (excluding transfer and recognized credits)	SIU	2015-16 a 2020-21	Area of study
		<b>Overall dropout rate in undergraduate studies:</b> sum of the dropout rates in the first, second and third years of undergraduate studies	SIU	2011-12 a 2016-17	Area of study
	Quality	<b>Percentage of postgraduate students:</b> Full-time equivalent students registered in master's degrees over the total number of full-time equivalent students registered in studies of 1st and 2nd cycle, bachelor's and master's degrees (all of these students registered in centers belonging to the University)	SIU	2015-16 a 2020-21	Area of study
		<b>Cut-off mark:</b> Mark of the last general group1 student that gained admission to a degree with limited places	SIU	2022-23	Area of study
	Internacionalization	<b>Percentage of foreign students:</b> Non-Spanish students of 1st and 2nd cycle, bachelor's and master's degrees over the total number of students of 1st and 2nd cycle, bachelor's and master's degrees	SIU	2015-16 a 2020-21	Area of study
		<b>Percentage of students in international mobility programs:</b> Number of bachelor's and master's degree students who study abroad through a mobility program over total number of bachelor's and master's degree students	SIU	2015-16 a 2020-21	Universidad

Dimension	Area	Indicator and definition	Source	Period	Level
Research and innovation	Resources	<b>Competitive public resources per faculty member with PhD:</b> Competitive public resources for undirected research projects, including both projects and complementary actions and ERDF funds, over the total number of faculty members with full-time equivalent PhD	Agencia Estatal de Investigación SIIU	2016 a 2021	Area of study
		<b>Contracts with PhDs, research grants and technical support over total budget:</b> Competitive resources obtained for research staff training, Juan de la Cierva, Ramón and Cajal and support technicians over total effective income	Agencia Estatal de Investigación SIIU SABI WEB	2016 a 2021	Area of study
	Production	<b>Citable documents with ISI reference per faculty member with PhD:</b> Documents with ISI reference published per faculty members with full-time equivalent PhD	IUNE (Thomson Reuters) SIIU	2016 a 2021	Area of study
		<b>Number of patents per 100 faculty members with PhD:</b> Number of national patents granted to each Spanish university by the Spanish Patents and Trade Marks Office per 100 faculty members with PhD	IUNE (INVENES) SIIU	2016 a 2021	University
		<b>Doctoral theses read per 100 faculty members with PhD:</b> Doctoral theses read per 100 faculty members with full-time equivalent PhD	SIIU	2016 a 2021	Area of study
	Quality	<b>Mean impact factor:</b> Mean impact factor of the publications with at least one author affiliated to the University	IUNE (Thomson Reuters)	2016 a 2021	Area of study
		<b>Percentage of publications in the first quartile:</b> Publications corresponding to journals in the first quartile of relevance within the Thomson Reuters classification by areas, over the total number of publications belonging to that area	IUNE (Thomson Reuters)	2016 a 2021	Area of study
		<b>Citations per document:</b> Citations received per document from the date of publication to the date of data gathering	IUNE (Thomson Reuters)	2016 a 2021	Area of study
	Internacionalization	<b>European research funds per faculty members with PhD:</b> Funding received by the university from EU research funds per every 100 full-time equivalent faculty members with PhD	European Commission (Horizon Dashboard) SIIU	2016 a 2021	University
		<b>Percentage of publications with international co-authorship:</b> Publications with at least one co-author affiliated to a foreign institution over the total number of publications	IUNE (Thomson Reuters)	2016 a 2021	Area of study

## Annex 2: List of university abbreviations

Abbreviation	University	Type of ownership
ABATOLIBA	Universitat Abat Oliba CEU	Private
COMILLAS	Universidad Pontificia Comillas	Private
IE	IE Universidad	Private
UA	Universidad de Alicante	Public
UAB	Universitat Autònoma de Barcelona	Public
UAH	Universidad de Alcalá	Public
UAL	Universidad de Almería	Public
UAM	Universidad Autónoma de Madrid	Public
UANE	Universidad Nebrija	Private
UAX	Universidad Alfonso X El Sabio	Private
UB	Universitat de Barcelona	Public
UBU	Universidad de Burgos	Public
UC3M	Universidad Carlos III de Madrid	Public
UCA	Universidad de Cádiz	Public
UCAM	Universidad Católica San Antonio	Private
UCEU	Universidad San Pablo-CEU	Private
UCH	Universidad Cardenal Herrera-CEU	Private
UCJC	Universidad Camilo José Cela	Private
UCLM	Universidad de Castilla-La Mancha	Public
UCM	Universidad Complutense de Madrid	Public
UCO	Universidad de Córdoba	Public
UCV	Universidad Católica de Valencia San Vicente Mártir	Private
UDC	Universidade da Coruña	Public
UDE	Universidad de Deusto	Private
UDG	Universitat de Girona	Public
UDIMA	Universidad A Distancia de Madrid	Private
UDL	Universitat de Lleida	Public
UEC	Universidad Europea de Canarias	Private
UEM	Universidad Europea de Madrid	Private
UEV	Universidad Europea de Valencia	Private
UGR	Universidad de Granada	Public
UHU	Universidad de Huelva	Public
UIB	Universitat de les Illes Balears	Public
UIC	Universitat Internacional de Catalunya	Private
UJAEN	Universidad de Jaén	Public
UJI	Universitat Jaume I de Castellón	Public
ULL	Universidad de La Laguna	Public
ULPGC	Universidad de Las Palmas de Gran Canaria	Public
UM	Universidad de Murcia	Public
UMA	Universidad de Málaga	Public
UMH	Universidad Miguel Hernández de Elche	Public
UMON	Mondragon Unibertsitatea	Private
UN	Universidad de Navarra	Private
UNED	Universidad Nacional de Educación a Distancia	Public
UNEX	Universidad de Extremadura	Public
UNICAN	Universidad de Cantabria	Public
UNILEON	Universidad de León	Public
UNIOVI	Universidad de Oviedo	Public
UNIRIOJA	Universidad de La Rioja	Public
UNIR	Universidad Internacional de La Rioja	Private
UNIZAR	Universidad de Zaragoza	Public
UOC	Universitat Oberta de Catalunya	Private
UPC	Universitat Politècnica de Catalunya	Public
UPCT	Universidad Politécnica de Cartagena	Public
UPF	Universitat Pompeu Fabra	Public
UPM	Universidad Politécnica de Madrid	Public
UPNA	Universidad Pública de Navarra	Public
UPO	Universidad Pablo de Olavide	Public
UPV	Universitat Politècnica de València	Public
UPV-EHU	Universidad del País Vasco/Euskal Herriko Unibertsitatea	Public
URJC	Universidad Rey Juan Carlos	Public
URLL	Universitat Ramon Llull	Private
URV	Universitat Rovira i Virgili	Public
US	Universidad de Sevilla	Public
USAL	Universidad de Salamanca	Public
USC	Universidade de Santiago de Compostela	Public
UV	Universitat de València	Public
UVA	Universidad de Valladolid	Public
UVIC-UCC	Vic-Universitat Central de Catalunya	Private
UVIGO	Universidade de Vigo	Public
VIU	Universidad Internacional Valenciana	Private

### Annex 3: Analysis of the determinants of labor market insertion

Table A3.1. Determinants of labor market insertion of university graduates  
(marginal effects of probit-type regressions; percentage points)

		Active	Net monthly earnings of 1,500 euros or more	Education-job match	Study-job match
Gender	Male	0.0038 (0.0048)	0.0803 *** (0.0073)	0.0219 *** (0.0061)	-0.0091 (0.0067)
Age ref: 35 years or older	Under 30 years old	-0.0057 (0.0068)	-0.1065 *** (0.0098)	-0.0234 *** (0.0085)	0.0424 *** (0.0090)
	30 to 34 years old	-0.0063 (0.0069)	-0.1094 *** (0.0099)	-0.0547 *** (0.0084)	-0.001 (0.0090)
Scholarship	Excellence award or scholarship	-0.0042 (0.0117)	0.084 *** (0.0161)	0.0592 *** (0.0168)	0.0338 ** (0.0164)
Language	More than one language	0.0046 (0.0104)	0.0224 (0.0160)	0.0187 (0.0125)	0.0398 *** (0.0140)
Type of university	Public-owned	-0.0237 *** (0.0069)	-0.0983 *** (0.0097)	-0.0607 *** (0.0088)	-0.0469 *** (0.0094)
	On-site university	-0.0349 *** (0.0111)	-0.0436 *** (0.0158)	0.014 (0.0124)	0.0846 *** (0.0129)
Mobility	Another country	-0.0044 (0.0059)	0.067 *** (0.0093)	0.0453 *** (0.0080)	0.0088 (0.0086)
	Another Spanish university	0.0005 (0.0076)	0.04 *** (0.0114)	0.0254 ** (0.0100)	0.0255 ** (0.0106)
Work training	Extracurricular internships	0.0076 (0.0050)	0.0187 ** (0.0076)	0.0334 *** (0.0064)	0.027 *** (0.0070)
Degree ref: History of Art	Pedagogy	0.0661 *** (0.0251)	0.2033 *** (0.0491)	0.2191 *** (0.0328)	0.2867 *** (0.0390)
	Early childhood education	0.0405 * (0.0229)	0.1005 ** (0.0467)	0.1882 *** (0.0302)	0.2593 *** (0.0364)
	Primary education	0.0624 *** (0.0225)	0.2303 *** (0.0461)	0.2692 *** (0.0297)	0.3152 *** (0.0357)
	Other teachers	0.0884 *** (0.0329)	0.0593 (0.0674)	0.1751 *** (0.0442)	0.1983 *** (0.0514)
	Social education	0.1042 *** (0.0273)	0.0511 (0.0540)	0.2128 *** (0.0358)	0.298 *** (0.0430)
	Audiovisual, image and multimedia	0.0478 * (0.0265)	0.0641 (0.0518)	0.1407 *** (0.0343)	0.1305 *** (0.0402)
	Design	0.0527 (0.0379)	0.0452 (0.0678)	0.1331 *** (0.0510)	0.2662 *** (0.0580)
	Fine arts	0.0161 (0.0264)	-0.0273 (0.0573)	0.0955 (0.0355)	0.119 *** (0.0433)
	Conservation and restoration	-0.0168 (0.0396)	-0.0771 (0.0851)	0.2172 *** (0.0629)	0.1459 ** (0.0661)
	Music and Performing Arts	0.0986 ** (0.0393)	0.2175 *** (0.0803)	0.2538 *** (0.0745)	0.1859 *** (0.0594)
	Archaeology	0.0137 (0.0457)	-0.226 * (0.1188)	0.0216 (0.0613)	0.0713 (0.0725)
	History	0.0228 (0.0252)	0.0129 (0.0517)	0.0694 ** (0.0337)	0.0197 (0.0402)
	Philosophy	-0.0234 (0.0351)	0.0906 (0.0686)	0.1284 *** (0.0477)	0.0507 (0.0547)
	Humanities	0.0633 * (0.0346)	0.0093 (0.0673)	0.014 (0.0492)	0.108 ** (0.0550)
	English language	0.0699 ** (0.0279)	0.1152 ** (0.0574)	0.1276 *** (0.0396)	0.1885 *** (0.0443)
	Classical languages	0.1221 *** (0.0431)	0.0807 (0.0813)	0.1846 *** (0.0554)	0.1754 *** (0.0615)
	Other foreign languages	0.0483 (0.0386)	0.1732 ** (0.0733)	0.1063 ** (0.0515)	0.0855 (0.0577)



	Active		Net monthly earnings of 1,500 euros or more		Education-job match		Study-job match	
Translation and interpretation	0.0881 (0.0342)	**	0.0937 (0.0587)		0.1485 (0.0442)	***	0.1585 (0.0475)	***
Spanish languages and dialects	0.0632 (0.0291)	**	0.2041 (0.0592)	***	0.2327 (0.0416)	***	0.2834 (0.0468)	***
Literature	-0.0487 (0.0450)		0.1624 (0.0867)	*	0.1883 (0.0646)	***	0.1582 (0.0780)	**
Modern and applied languages	0.0324 (0.0387)		0.0455 (0.0794)		0.0243 (0.0615)		0.031 (0.0626)	
Economy	0.1183 (0.0256)	***	0.2485 (0.0490)	***	0.028 (0.0318)		0.2392 (0.0392)	***
Policy and public management	0.0739 (0.0323)	**	0.107 (0.0603)	*	0.0612 (0.0433)		0.0662 (0.0498)	
International relations	0.0371 (0.0459)		0.2577 (0.0840)	***	0.1047 (0.0657)		0.043 (0.0705)	
Psychology	0.0703 (0.0240)	***	0.0252 (0.0479)		0.1978 (0.0311)	***	0.2311 (0.0372)	***
Social and Cultural Anthropology and Cultural Studies and Management	0.0719 (0.0407)	*	0.2142 (0.0755)	***	0.2925 (0.0560)	***	0.0002 (0.0621)	
Criminology	0.1037 (0.0362)	***	0.1606 (0.0655)	**	0.009 (0.0435)		0.0348 (0.0521)	
Geography	0.0732 (0.0522)		0.0989 (0.0843)		0.0662 (0.0537)		-0.1385 (0.0692)	**
Sociology and Gender Equality	0.0797 (0.0395)	**	0.1008 (0.0725)		0.0781 (0.0513)		0.0741 (0.0548)	
Communication	-0.0214 (0.0449)		-0.0263 (0.0749)		0.1211 (0.0606)	**	0.1842 (0.0652)	***
Journalism	0.0768 (0.0256)	***	0.0442 (0.0506)		0.114 (0.0333)	***	0.1799 (0.0394)	***
Information and documentation	0.0817 (0.0354)	**	-0.0994 (0.0787)		0.0352 (0.0472)		0.1522 (0.0567)	***
Financial and actuarial	0.2277 (0.0607)	***	0.4661 (0.0753)	***	0.116 (0.0511)	**	0.2294 (0.0647)	***
Finance and accounting	0.0763 (0.0450)	*	0.183 (0.0665)	***	-0.0862 (0.0452)	*	0.2471 (0.0566)	***
Administration and company	0.1209 (0.0225)	***	0.2367 (0.0456)	***	0.018 (0.0287)		0.2889 (0.0352)	***
Work science	0.0608 (0.0266)	**	0.1377 (0.0512)	***	0.0244 (0.0336)		0.1969 (0.0402)	***
Management and public administration	0.086 (0.0348)	**	0.0007 (0.0653)		-0.0459 (0.0423)		0.049 (0.0502)	
Marketing	0.0909 (0.0385)	**	0.3497 (0.0667)	***	0.1072 (0.0473)	**	0.1639 (0.0577)	***
Protocol and events	0.0085 (0.0532)		0.0262 (0.1028)		0.0385 (0.0696)		0.0839 (0.0815)	
Advertising and public relations	0.0823 (0.0280)	***	0.1122 (0.0522)	**	0.1173 (0.0354)	***	0.1104 (0.0415)	***
Trade	0.1243 (0.0389)	***	0.2213 (0.0640)	***	0.0313 (0.0443)		0.1835 (0.0532)	***
Law	0.0753 (0.0228)	***	0.2263 (0.0460)	***	0.1364 (0.0294)	***	0.2774 (0.0358)	***
Biology	0.063 (0.0256)	**	0.0382 (0.0514)		0.1657 (0.0341)	***	0.2384 (0.0405)	***
Biochemistry	0.0317 (0.0377)		0.1122 (0.0678)	*	0.3575 (0.0540)	***	0.2596 (0.0583)	***
Biotechnology	0.0899 (0.0349)	**	0.0921 (0.0654)		0.3308 (0.0592)	***	0.3165 (0.0613)	***
Biomedicine	0.1311 (0.0465)	***	0.1605 (0.0631)	**	0.3698 (0.0594)	***	0.3326 (0.0660)	***
Environmental sciences	0.0937 (0.0267)	***	0.0601 (0.0503)		0.1411 (0.0329)	***	0.1038 (0.0392)	***

	Active	Net monthly earnings of 1,500 euros or more	Education-job match	Study-job match
Chemistry	0.0771 *** (0.0273)	0.1526 *** (0.0522)	0.2487 *** (0.0368)	0.3075 *** (0.0423)
Marine science	0.0548 (0.0396)	-0.074 (0.0766)	0.0938 * (0.0498)	0.1811 *** (0.0588)
Geography and land use planning	0.0393 (0.0412)	0.0308 (0.0719)	0.0865 * (0.0499)	0.0506 (0.0567)
Geology	0.0555 (0.0377)	0.0346 (0.0655)	0.111 (0.0488)	0.1398 ** (0.0544)
Physics	0.1077 *** (0.0352)	0.1782 *** (0.0607)	0.3684 *** (0.0486)	0.2942 *** (0.0506)
Math	0.1378 *** (0.0288)	0.3589 *** (0.0526)	0.2912 *** (0.0395)	0.3567 *** (0.0435)
Statistics	0.156 *** (0.0405)	0.3244 *** (0.0675)	0.1949 *** (0.0493)	0.2321 *** (0.0543)
Software and application development and multimedia engineering	0.2405 *** (0.0591)	0.4168 *** (0.0778)	0.2639 *** (0.0679)	0.4565 *** (0.0750)
Computing	0.2119 *** (0.0268)	0.4144 *** (0.0477)	0.3095 *** (0.0325)	0.4375 *** (0.0380)
Industrial Chemical Engineering and Environmental Engineering	0.1636 *** (0.0371)	0.3475 *** (0.0580)	0.2102 *** (0.0432)	0.1843 *** (0.0472)
Power engineering	0.143 *** (0.0512)	0.5118 *** (0.0741)	0.36 *** (0.0724)	0.3023 *** (0.0630)
Electric engineering	0.1988 *** (0.0404)	0.5181 *** (0.0607)	0.2587 *** (0.0433)	0.3815 *** (0.0489)
Computer engineering	0.1996 *** (0.0672)	0.5661 *** (0.1127)	0.3772 *** (0.0861)	0.4402 *** (0.1058)
Sound and image engineering	0.0903 ** (0.0412)	0.3967 *** (0.0672)	0.2436 *** (0.0577)	0.2227 *** (0.0547)
Telecommunication engineering	0.2295 *** (0.0374)	0.431 *** (0.0573)	0.2769 *** (0.0428)	0.382 *** (0.0486)
Industrial electronic and automatic engineering	0.1387 *** (0.0319)	0.4519 *** (0.0535)	0.2384 *** (0.0384)	0.3482 *** (0.0462)
electronics engineering	0.2535 *** (0.0472)	0.3991 *** (0.0775)	0.2643 *** (0.0622)	0.3287 *** (0.0644)
Engineering in industrial design and product development	0.1053 *** (0.0378)	0.2707 *** (0.0624)	0.1961 *** (0.0463)	0.172 *** (0.0516)
Engineering in industrial technologies	0.1751 *** (0.0293)	0.4918 *** (0.0502)	0.2916 *** (0.0354)	0.3784 *** (0.0420)
Mechanical Engineering	0.148 *** (0.0292)	0.3896 *** (0.0510)	0.235 *** (0.0361)	0.3577 *** (0.0421)
Aeronautical engineering	0.2565 *** (0.0573)	0.5858 *** (0.0663)	0.371 *** (0.0561)	0.3529 *** (0.0527)
Marine and ocean engineering	0.1889 *** (0.0462)	0.5978 *** (0.0707)	0.1946 *** (0.0505)	0.3816 *** (0.0547)
Industrial Organization Engineering and Nanotechnology	0.2219 *** (0.0452)	0.3889 *** (0.0631)	0.2576 *** (0.0492)	0.2586 *** (0.0528)
Food Science and Technology and Food Engineering	0.1442 *** (0.0313)	0.1852 *** (0.0588)	0.3501 *** (0.0464)	0.2397 *** (0.0497)
Oenology	0.1899 *** (0.0521)	0.2804 *** (0.0834)	0.214 *** (0.0583)	0.3861 *** (0.0689)
Materials Engineering and Textile Engineering	0.0888 ** (0.0444)	0.433 *** (0.0711)	0.3206 *** (0.0681)	0.1994 *** (0.0597)
Mining and energy engineering	0.1162 *** (0.0311)	0.4049 *** (0.0556)	0.1947 *** (0.0391)	0.1923 *** (0.0446)
Architecture and urbanism and landscaping	0.1172 ***	0.2725 ***	0.3414 ***	0.3912 ***

	Active	Net monthly earnings of 1,500 euros or more	Education-job match	Study-job match	
	(0.0309)	(0.0507)	(0.0394)	(0.0422)	
Geomatic engineering, topography and cartography	0.0375 (0.0370)	0.2226 *** (0.0646)	0.2139 *** (0.0450)	0.1743 *** (0.0547)	
Technical architecture	0.1308 *** (0.0281)	0.2621 *** (0.0502)	0.1729 *** (0.0352)	0.2641 *** (0.0403)	
Civil Engineering	0.1299 *** (0.0263)	0.3678 *** (0.0492)	0.2424 *** (0.0338)	0.2563 *** (0.0384)	
Agricultural and agri-food engineering	0.1477 *** (0.0378)	0.2407 *** (0.0599)	0.1901 *** (0.0441)	0.2462 *** (0.0505)	
Agricultural, agricultural and rural engineering	0.1493 *** (0.0295)	0.2709 *** (0.0526)	0.1703 *** (0.0358)	0.3035 *** (0.0429)	
Horticultural and gardening engineering	0.1301 *** (0.0395)	0.1446 ** (0.0695)	0.0838 (0.0519)	0.1733 *** (0.0594)	
Forestry and forest engineering	0.1252 *** (0.0288)	0.1966 *** (0.0520)	0.1083 *** (0.0356)	0.1936 *** (0.0412)	
Veterinary Science	0.1038 *** (0.0268)	0.1127 ** (0.0511)	0.3033 *** (0.0370)	0.4301 *** (0.0446)	
Odontology	0.2031 *** (0.0515)	0.3635 *** (0.0675)	0 (.)	0.7793 *** (0.0695)	
Medicine	0.1557 *** (0.0284)	0.497 *** (0.0535)	0.7228 *** (0.0763)	0.7283 *** (0.0613)	
Nursing	0.168 *** (0.0244)	0.3544 *** (0.0467)	0.4623 *** (0.0353)	0.5271 *** (0.0387)	
Biomedical and health engineering	0.0862 (0.0578)	0.3763 *** (0.0846)	0.226 *** (0.0774)	0.2216 *** (0.0774)	
Optics and optometry	0.1389 *** (0.0418)	0.2098 *** (0.0636)	0.333 *** (0.0644)	0.3944 *** (0.0643)	
Physiotherapy	0.1633 *** (0.0314)	0.0594 (0.0529)	0.3872 *** (0.0490)	0.3952 *** (0.0493)	
Speech therapy	0.089 ** (0.0429)	0.0071 (0.0812)	0.2493 *** (0.0596)	0.2831 *** (0.0659)	
Human nutrition and diet	0.141 *** (0.0452)	0.0982 (0.0677)	0.1449 *** (0.0497)	0.1936 *** (0.0553)	
Podology	0.2902 *** (0.0767)	0.2028 *** (0.0692)	0.401 *** (0.0617)	0.3333 *** (0.0594)	
Occupational therapy	0.1354 *** (0.0438)	-0.0736 (0.0818)	0.2381 *** (0.0517)	0.2903 *** (0.0601)	
Pharmacy	0.1946 *** (0.0325)	0.3971 *** (0.0541)	0.3102 *** (0.0413)	0.5418 *** (0.0525)	
Social work	0.1108 *** (0.0250)	0.0597 (0.0483)	0.157 *** (0.0309)	0.256 *** (0.0376)	
Physical activity and sport	0.0947 *** (0.0251)	0.0568 (0.0499)	0.1597 *** (0.0325)	0.2137 *** (0.0388)	
Tourism	0.0524 ** (0.0258)	0.0857 * (0.0506)	-0.0887 *** (0.0328)	0.1141 *** (0.0394)	
Nautical and maritime transport	0.1202 *** (0.0378)	0.4516 *** (0.0706)	0.0961 ** (0.0466)	0.3548 *** (0.0573)	
Ground transportation service and Air transportation service	0.1065 * (0.0578)	0.3494 *** (0.0731)	0.0877 (0.0556)	0.1041 * (0.0622)	
Services (other studies)	0.1842 *** (0.0672)	0.4833 *** (0.0785)	0.0743 (0.0558)	0.224 *** (0.0660)	
Job search ref: job offers in the press, internet	Through public employment services	-0.037 *** (0.0070)	-0.0042 (0.0117)	0.0139 (0.0100)	0.0341 *** (0.0110)
	University employment services (employment offices, alumni associations, ...)	-0.0229 *** (0.0072)	0.0178 (0.0112)	0.0554 *** (0.0097)	0.06 *** (0.0111)
	Temporary employment agencies	-0.0492 ***	-0.1006 ***	-0.0828 ***	-0.0799 ***

	Active	Net monthly earnings of 1,500 euros or more	Education-job match	Study-job match
	(0.0090)	(0.0154)	(0.0115)	(0.0131)
Employment exchange	-0.0168 ** (0.0072)	0.0362 *** (0.0115)	0.0205 ** (0.0101)	0.0235 ** (0.0111)
Direct contact with employer or personal contacts (family, friends)	-0.0197 *** (0.0046)	-0.0416 *** (0.0070)	-0.0253 *** (0.0058)	-0.0144 ** (0.0065)
Contacted by employer	0.0047 (0.0055)	-0.0154 * (0.0084)	-0.0108 (0.0069)	0.0022 (0.0076)
Continued with the internships in firms/institutions after graduation	0.0211 ** (0.0084)	0.0074 (0.0118)	0.0107 (0.0099)	0.0686 *** (0.0119)
Prepared public employment exams	0.0652 *** (0.0071)	0.2593 *** (0.0102)	0.0475 *** (0.0091)	0.0215 ** (0.0096)
Create own business	0.0698 *** (0.0118)	-0.0485 *** (0.0157)	0.0857 *** (0.0139)	0.0268 * (0.0138)
Other	0.0138 (0.0133)	-0.0526 ** (0.0221)	0.0393 ** (0.0190)	0.009 (0.0201)
Region of residence ref: Andalucía	Aragón	0.056 *** (0.0116)	0.0439 ** (0.0185)	0.0108 (0.0156)
	Asturias, Principado de	0.0335 *** (0.0128)	0.0273 (0.0214)	0.0481 *** (0.0179)
	Balears, Illes	0.0789 *** (0.0152)	0.1743 *** (0.0217)	-0.012 (0.0181)
	Canarias	0.0309 *** (0.0109)	0.0695 *** (0.0185)	0.0394 *** (0.0153)
	Cantabria	0.0134 (0.0159)	0.0596 ** (0.0282)	0.0257 (0.0222)
	Castilla y León	0.0499 *** (0.0105)	0.028 * (0.0168)	0.0016 (0.0140)
	Castilla-La Mancha	0.0096 (0.0112)	0.0338 * (0.0190)	0.007 (0.0157)
	Cataluña	0.1132 *** (0.0088)	0.197 *** (0.0133)	0.0537 *** (0.0111)
	Valencian Community	0.0444 *** (0.0088)	0.0433 *** (0.0147)	0.0151 (0.0120)
	Extremadura	0.0128 (0.0126)	-0.0598 ** (0.0234)	-0.0206 (0.0173)
	Galicia	0.0379 *** (0.0104)	0.0314 * (0.0172)	0.0192 (0.0140)
	Madrid	0.0921 *** (0.0078)	0.1601 *** (0.0123)	0.0661 *** (0.0103)
	Murcia	0.0281 ** (0.0117)	-0.0061 (0.0201)	-0.016 (0.0166)
	Navarra	0.0921 *** (0.0178)	0.1421 *** (0.0247)	0.009 (0.0209)
	Basque Country	0.0859 *** (0.0113)	0.1736 *** (0.0172)	0.0072 (0.0146)
	Rioja, La	0.0671 *** (0.0254)	0.0057 (0.0372)	-0.0025 (0.0273)
	Ceuta	-0.1076 * (0.0575)	0.0985 (0.1117)	-0.0287 (0.1108)
	Melilla	0.011 (0.0458)	0.1631 ** (0.0822)	0.2066 * (0.1120)
	Other country	0.109 *** (0.0119)	0.3995 *** (0.0178)	0.1234 *** (0.0157)
Pseudo R2	0.0791	0.1953	0.1491	0.1012
Log. Likelihood	-75.015	-106.760	-83.678	-97.889
Observations	30,321	25,949	26,385	26,446
Method	Average marginal effects			

Note: The table shows the marginal effects and the robust standard errors are in parentheses.

\* p<0,10, \*\* p<0,05, \*\*\* p<0,01 Source: INE (EILU) and own elaboration.

Table A3.2. Determinants of labor market insertion of master's degree graduates (marginal effects of probit regressions; percentage points)

		Active	Net monthly earnings of 1,500 euros or more	Education-job match	Study-job match
Gender	Male	0.0104 (0.0080)	0.0964 *** (0.0119)	0.0166 * (0.0088)	-0.027 ** (0.0132)
Age ref: 35 years or older	Under 30 years old	-0.0096 (0.0108)	-0.1575 *** (0.0165)	-0.0216 * (0.0122)	0.0291 (0.0180)
	30 to 34 years old	-0.0101 (0.0095)	-0.1298 *** (0.0141)	-0.0412 *** (0.0105)	0.0049 (0.0153)
Scholarship	Excellence award or scholarship	-0.0185 (0.0217)	-0.0055 (0.0372)	0.0473 (0.0318)	0.0366 (0.0438)
Language	More than one language	0.0065 (0.0194)	0.0645 ** (0.0287)	0.0423 ** (0.0194)	0.1048 *** (0.0321)
Type of university	Public-owned	-0.0324 *** (0.0109)	-0.0567 *** (0.0160)	-0.0487 *** (0.0114)	-0.019 (0.0169)
	On-site university	-0.0055 (0.0153)	-0.0153 (0.0203)	0.0156 (0.0140)	0.0414 * (0.0216)
Mobility	Another country	-0.0132 (0.0163)	0.0313 (0.0275)	0.017 (0.0192)	0.0691 ** (0.0314)
	Another Spanish university	0.0045 (0.0142)	0.0228 (0.0215)	0.0154 (0.0142)	0.0162 (0.0224)
Work training	Extracurricular internships	0.0201 ** (0.0096)	-0.0017 (0.0143)	-0.0037 (0.0109)	-0.002 (0.0159)
Degree ref: Fine Arts	Educational Sciences	0.2121 *** (0.0440)	0.2202 *** (0.0838)	0.1379 *** (0.0478)	0 (0.0833)
	Training of primary school teachers	0.1352 *** (0.0504)	0.3612 *** (0.0934)	0.0826 (0.0566)	0.0302 (0.0947)
	Teacher training for secondary education and vocational and vocational training	0.1181 *** (0.0331)	0.2852 *** (0.0779)	0.0937 ** (0.0417)	0.0073 (0.0760)
	Education (Other studies)	0.1112 ** (0.0512)	0.2705 *** (0.1049)	-0.021 (0.0650)	-0.1623 (0.1101)
	Audiovisual and Media Techniques	0.0555 (0.0441)	0.2013 ** (0.0917)	0.0176 (0.0579)	-0.1168 (0.0918)
	Music and performing arts	0.1085 ** (0.0457)	0.1842 * (0.1070)	0.1248 ** (0.0598)	0.0589 (0.0996)
	Arts (Other studies)	0.102 ** (0.0495)	0.1169 (0.1081)	-0.1034 * (0.0580)	-0.1684 (0.1084)
	Religion and theology	0.098 (0.0619)	0.1586 (0.1183)	0.0967 (0.0719)	-0.0428 (0.1230)
	History and archaeology	0.0132 (0.0410)	0.0306 (0.0898)	-0.0391 (0.0519)	-0.2213 ** (0.0902)
	Philosophy and ethics	0.0631 (0.0546)	0.1341 (0.0952)	0.0331 (0.0639)	-0.1624 * (0.0984)
	Humanities (Other studies)	0.0738 (0.0474)	0.2242 ** (0.1001)	0.0342 (0.0552)	-0.2382 ** (0.1036)
	Second Language Learning	0.098 ** (0.0433)	0.2449 *** (0.0912)	0.081 (0.0551)	-0.0578 (0.1001)
	Literature and Linguistics	0.0519 (0.0637)	0.1757 * (0.0966)	0.1561 ** (0.0678)	0.0112 (0.0988)
	Languages (Other studies)	0.0059 (0.0546)	0.265 ** (0.1246)	0.0578 (0.0664)	-0.0226 (0.1119)
	Economics	0.1712 *** (0.0457)	0.3224 *** (0.0972)	-0.0275 (0.0573)	-0.0977 (0.0983)
	Political Science	0.0892 ** (0.0435)	0.2239 ** (0.0951)	0.0293 (0.0523)	-0.1766 * (0.0915)
	Psychology	0.0737 * (0.0403)	0.1793 ** (0.0832)	0.0728 (0.0471)	0.0043 (0.0822)
	Sociology, anthropology, social and cultural geography	0.0551 (0.0380)	0.0834 (0.0889)	0.0684 (0.0499)	-0.2241 ** (0.0907)
	Social and behavioral sciences (Other studies)	0.1616 ***	0.2561 ***	0.0242	-0.1201

	Active	Net monthly earnings of 1,500 euros or more	Education-job match	Study-job match
	(0.0491)	(0.0947)	(0.0601)	(0.0944)
Journalism and communication	0.0921 **	0.245 ***	0.067	-0.1314
	(0.0431)	(0.0928)	(0.0651)	(0.0980)
Library science, documentation and archives	0.114 **	0.2069 **	-0.0576	-0.0301
	(0.0461)	(0.0942)	(0.0524)	(0.0955)
Accounting and tax management	0.1861 ***	0.3254 ***	-0.0612	0.2003 **
	(0.0440)	(0.0895)	(0.0496)	(0.0921)
Finance, banking and insurance	0.1978 ***	0.4083 ***	-0.0228	0.0908
	(0.0471)	(0.0887)	(0.0477)	(0.0928)
Management and administration	0.121 ***	0.4072 ***	0.0081	-0.0445
	(0.0360)	(0.0808)	(0.0437)	(0.0796)
Marketing and advertising	0.1346 ***	0.2041 **	-0.0307	-0.1568 *
	(0.0440)	(0.0970)	(0.0525)	(0.0949)
Wholesale and retail sales	0.1507 ***	0.2829 ***	-0.0194	-0.1499
	(0.0548)	(0.0973)	(0.0552)	(0.1042)
Business and administration (Other studies)	0.2209 ***	0.4685 ***	0.1027	-0.145
	(0.0666)	(0.1130)	(0.0665)	(0.1098)
Law	0.1082 ***	0.3311 ***	-0.0057	0.0264
	(0.0366)	(0.0816)	(0.0443)	(0.0808)
Biology	0.0997 **	0.1694 *	0.0841	-0.0536
	(0.0431)	(0.0918)	(0.0543)	(0.0934)
Biochemistry	0.0497	0.2679 ***	0.1884 ***	-0.0113
	(0.0409)	(0.0917)	(0.0561)	(0.0923)
Life Sciences (Other Studies)	0.0429	0.1776 *	0.1003 *	-0.0792
	(0.0438)	(0.0961)	(0.0559)	(0.0982)
Environmental Science	0.1178 **	0.0731	0.0025	-0.1737 *
	(0.0473)	(0.0984)	(0.0534)	(0.1020)
Natural Environments and Wildlife	0.0146	0.0336	-0.015	-0.0384
	(0.0430)	(0.1060)	(0.0534)	(0.0979)
Chemistry	0.0344	0.2394 **	0.1874 ***	0.0395
	(0.0444)	(0.0950)	(0.0549)	(0.0905)
Earth Sciences	0.0958 **	0.0099	0.0696	-0.1362
	(0.0443)	(0.0953)	(0.0526)	(0.0919)
Physics	0.0565	0.2338 **	0.2892 ***	-0.0233
	(0.0422)	(0.0942)	(0.0677)	(0.0967)
Mathematics	0.2448 ***	0.4328 ***	0.2489 ***	0.236 **
	(0.0541)	(0.0945)	(0.0881)	(0.1022)
Statistics	0.124 **	0.5408 ***	0.2785 ***	0.1987 *
	(0.0499)	(0.1005)	(0.0877)	(0.1154)
Chemical, physical and geological sciences;	0.196 ***	0.3502 ***	0.1684	0.1148
Mathematics and statistics (Other studies)	(0.0681)	(0.1123)	(0.1031)	(0.1209)
Database and network design and administration	0.1832 **	0.4958 ***	0.0628	0.1394
	(0.0851)	(0.0996)	(0.0640)	(0.1028)
Application and software development and analysis	0.1896 ***	0.3669 ***	0.183 ***	0.0143
	(0.0510)	(0.0914)	(0.0582)	(0.0903)
Information and communications	0.1747 ***	0.5323 ***	0.2234 ***	0.2347 **
Communications and Information Technology (Other Studies)	(0.0490)	(0.0911)	(0.0557)	(0.0938)
Chemical engineering and processes	0.0869 *	0.585 ***	0.1099	0.1464
	(0.0496)	(0.1131)	(0.0683)	(0.1085)
Environmental control and technology	0.1719 ***	0.2406 **	0.1031 *	-0.2173 **
	(0.0484)	(0.0940)	(0.0548)	(0.0940)
Electricity and energy	0.1525 ***	0.3994 ***	0.0632	-0.2465 ***
	(0.0423)	(0.0852)	(0.0478)	(0.0857)
Electronics and automation	0.1714 ***	0.4978 ***	0.0595	0.2506 ***
	(0.0516)	(0.0969)	(0.0845)	(0.0933)
Machinery and metallurgy	0.1556 ***	0.3467 ***	0.1505 ***	0.0845
	(0.0466)	(0.0876)	(0.0513)	(0.0842)



	Active		Net monthly earnings of 1,500 euros or more		Education-job match		Study-job match
Motor vehicles, ships and aircraft	0.2663 (0.0606)	***	0.4913 (0.0979)	***	0.1802 (0.0611)	***	0.0349 (0.1020)
Engineering and allied professions (Other studies)	0.1501 (0.0482)	***	0.4159 (0.0951)	***	0.0265 (0.0550)		-0.0461 (0.0939)
Food industry	0.065 (0.0414)		0.2499 (0.0913)	***	0.0312 (0.0567)		-0.0124 (0.0897)
Industries of other materials (wood, paper, plastic, glass,...)	0.1354 (0.0528)	**	0.4093 (0.1003)	***	0.1124 (0.0628)	*	-0.0975 (0.0988)
Architecture, urban planning and construction	0.1245 (0.0444)	***	0.235 (0.0901)	***	0.0601 (0.0552)		-0.0164 (0.0914)
Civil and building engineering	0.14 (0.0455)	***	0.3898 (0.0907)	***	0.2058 (0.0551)	***	0.063 (0.0923)
Agricultural production, livestock farming horticulture and gardening	0.15 (0.0417)	***	0.2384 (0.0856)	***	0.0127 (0.0483)		0.0342 (0.0870)
Forestry	0.1366 (0.0568)	**	0.1595 (0.1059)		0.0347 (0.0640)		0.0399 (0.1065)
Fishing	0.0806 (0.0506)		0.1341 (0.1102)		-0.0081 (0.0630)		-0.2349 (0.1067)
Veterinary	0.1566 (0.0560)	***	0.2661 (0.0958)	***	0.2545 (0.0914)	***	0.0385 (0.1034)
Dentistry	0.19 (0.0670)	***	0.498 (0.0953)	***	0 (.)		0.2244 (0.1006)
Medicine	0.1106 (0.0467)	**	0.4928 (0.0963)	***	0.4408 (0.0732)	***	0.063 (0.0929)
Nursing	0.2105 (0.0456)	***	0.3941 (0.0947)	***	0.1765 (0.0839)	**	-0.0051 (0.0920)
Diagnostic technology and medical treatment	0.1029 (0.0432)	**	0.3531 (0.0926)	***	0.1245 (0.0532)	**	-0.1413 (0.0968)
Therapy and rehabilitation	0.1085 (0.0411)	***	0.2404 (0.0899)	***	0.1487 (0.0641)	**	-0.0435 (0.0893)
Pharmacy	0.0824 (0.0435)	*	0.4241 (0.0944)	***	0.1818 (0.0633)	***	0.068 (0.0990)
Health (Other Studies)	0.104 (0.0474)	**	0.2371 (0.0853)	***	0.272 (0.0538)	***	-0.0097 (0.0866)
Social work and counseling	0.1378 (0.0409)	***	0.1793 (0.0850)	**	0.0559 (0.0484)		-0.0895 (0.0860)
Hospitality	0.1966 (0.0845)	**	0.0792 (0.1548)		-0.0833 (0.0753)		-0.216 (0.1905)
Physical activities and sports	0.1393 (0.0458)	***	0.1984 (0.0876)	**	0.0575 (0.0494)		-0.1553 (0.0888)
Travel, tourism and leisure	0.0961 (0.0509)	*	0.0389 (0.1036)		-0.2918 (0.0575)	***	-0.073 (0.1063)
Occupational health and safety	0.1732 (0.0370)	***	0.298 (0.0807)	***	-0.0005 (0.0448)		-0.1429 (0.0792)
Protection of property and persons and military education	0.0866 (0.0588)		0.3475 (0.0932)	***	-0.1559 (0.0540)	***	-0.0481 (0.0963)
Transportation services	0.1333 (0.0491)	***	0.3753 (0.1031)	***	-0.0179 (0.0567)		-0.0492 (0.0989)
Job search ref: job offers in the press, internet	-0.0571 (0.0130)	***	0.0045 (0.0198)		0.0354 (0.0148)	**	0.0657 (0.0202)
Through public employment services	-0.0404 (0.0116)	***	0.0237 (0.0191)		0.0222 (0.0158)		0.0699 (0.0211)
University employment services (employment offices, alumni associations, ...)	-0.019 (0.0175)		-0.1618 (0.0318)	***	-0.0854 (0.0187)	***	-0.1453 (0.0334)
Temporary employment agencies	0.0014 (0.0125)		0.0559 (0.0194)	***	0.0394 (0.0149)	***	-0.0228 (0.0225)
Employment exchange	-0.0381 (0.0084)	***	-0.067 (0.0129)	***	-0.0048 (0.0093)		-0.0053 (0.0144)
Direct contact with employer or personal contacts (family, friends)	0.0219	**	-0.0103		0.0211	*	0.0149
Contacted by employer							

		Active	Net monthly earnings of 1,500 euros or more	Education-job match	Study-job match
		(0.0103)	(0.0155)	(0.0123)	(0.0176)
Region of residence ref: Andalucía	Continued with the internships in firms/institutions after graduation	0.0313 * (0.0175)	0.0195 (0.0224)	0.0135 (0.0166)	0.1533 *** (0.0260)
	Prepared public employment exams	0.1069 *** (0.0147)	0.2601 *** (0.0176)	0.0662 *** (0.0133)	0.0711 *** (0.0178)
	Create own business	0.0696 *** (0.0207)	-0.1271 *** (0.0260)	0.0953 *** (0.0208)	-0.0387 (0.0307)
	Other	-0.0603 *** (0.0183)	-0.0387 (0.0322)	0.0743 *** (0.0234)	0.0571 * (0.0345)
	Aragón	0.0897 *** (0.0238)	0.0409 (0.0331)	0.0475 * (0.0249)	-0.0102 (0.0370)
	Asturias, Principado de	-0.0327 (0.0234)	0.0305 (0.0365)	0.0441 (0.0281)	0.0151 (0.0420)
	Balears, Illes	0.0782 *** (0.0254)	0.142 *** (0.0375)	0.0235 (0.0246)	0.0648 (0.0438)
	Canarias	0.026 (0.0259)	0.0255 (0.0381)	0.0121 (0.0252)	-0.0251 (0.0381)
	Cantabria	0.0274 (0.0258)	-0.0754 (0.0472)	0.0005 (0.0307)	-0.0148 (0.0552)
	Castilla y León	0.0435 ** (0.0180)	-0.0633 ** (0.0302)	-0.0201 (0.0223)	-0.0157 (0.0319)
	Castilla-La Mancha	0.0055 (0.0236)	-0.0118 (0.0338)	-0.0449 * (0.0241)	-0.0517 (0.0371)
	Cataluña	0.0864 *** (0.0163)	0.1366 *** (0.0229)	0.0246 (0.0168)	0.0674 *** (0.0253)
	Valencian Community	0.0298 ** (0.0145)	0.0225 (0.0238)	-0.025 (0.0176)	0.0028 (0.0266)
	Extremadura	0.0183 (0.0235)	-0.1209 *** (0.0380)	-0.0017 (0.0290)	-0.0797 * (0.0408)
	Galicia	0.0284 * (0.0161)	-0.1038 *** (0.0263)	0 (0.0199)	-0.0344 (0.0289)
	Madrid	0.0373 *** (0.0138)	0.0932 *** (0.0220)	0.0078 (0.0167)	0.0302 (0.0238)
	Murcia	0.0262 (0.0181)	-0.0094 (0.0307)	-0.0088 (0.0237)	-0.0391 (0.0347)
	Navarra	0.1041 *** (0.0248)	0.0711 * (0.0411)	-0.0142 (0.0263)	0.0102 (0.0448)
	Basque Country	0.0584 *** (0.0176)	0.1389 *** (0.0288)	0.0038 (0.0192)	0.005 (0.0326)
	Rioja, La	0.0714 (0.0457)	0.0075 (0.0567)	0.0506 (0.0369)	-0.0731 (0.0616)
	Ceuta	-0.1848 (0.1236)	0.0945 (0.2345)	-0.1801 (0.1391)	-0.0087 (0.2599)
	Melilla	0.0029 (0.0961)	0 (.)	0.0808 (0.1181)	0 (.)
	Other country	0.1014 *** (0.0220)	0.3484 *** (0.0363)	0.0942 *** (0.0243)	0.0823 ** (0.0358)
Pseudo R2		0.0987	0.165	0.117	0.0526
Log. Likelihood		-18,222	-27,713	-17,957	-32,215
Observations		11,082	9,590	9,783	9,806
Method		Average marginal effects			

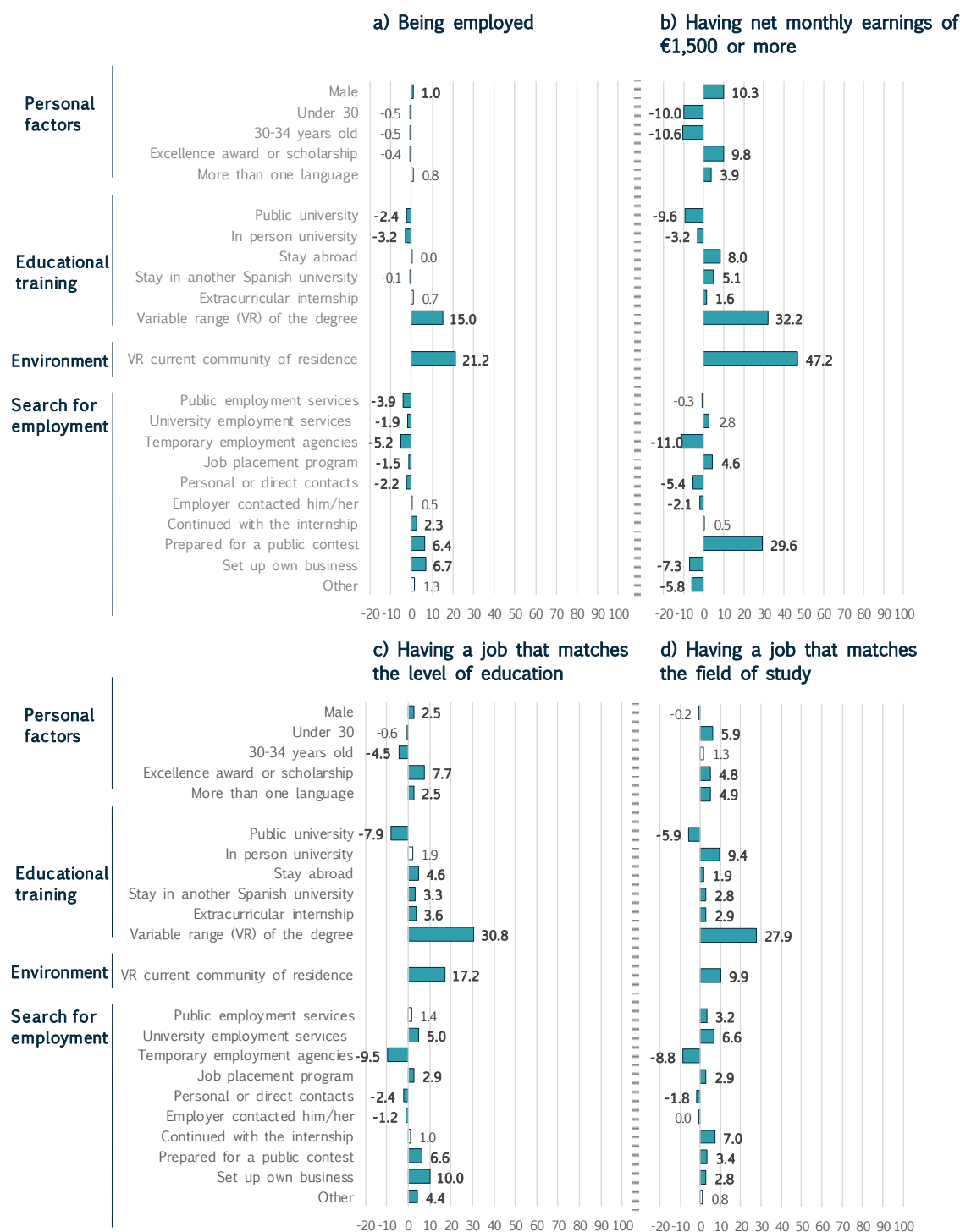
Note: The table shows the marginal effects and the robust standard errors are in parentheses.

\* p<0,10, \*\* p<0,05, \*\*\* p<0,01

Source: INE (EILU) and own elaboration.

## Annex 4. Analysis of the determinants of labor market insertion with the variable study group

Figure A41. University graduates. Marginal effects on the likelihood of ... (percentage points)



Note: Figure in bold and light blue represent significant effects at 1%, 5% or 10%. R.V.: refers to the range of variation of the marginal significant effects at 1%, 5% or 10%. The reference categories are: being a female, being over 34 years old, not being granted awards or scholarships of excellence, not speaking more than one language, studying at a private university, studying at on-line university, not having studied abroad or at other Spanish universities, not having extracurricular internships, studying a degree related to arts and humanities, having sought employment through offers, ads in the press or Internet, and residing after graduation in Andalusia.

Source: INE (EILU) and own elaboration.

## Annex 5. Universities analyzed and information available

Table A5.1. Number of graduates and study groups in the 2015-16 academic year at each university and data on labor market insertion available for analysis

	Graduates of the 2015-16 academic course	Number of study groups	Data available for analysis			
			Graduates	Groups	% graduates	% groups
Universitat Abat Oliba CEU	225	3	201	2	89%	67%
Universidad Pontificia Comillas	1,200	6	1,170	5	98%	83%
IE Universidad	181	3	128	1	71%	33%
Universidad de Alicante	4,036	9	4,036	9	100%	100%
Universitat Autònoma de Barcelona	6,051	10	6,051	10	100%	100%
Universidad de Alcalá	2,696	9	2,696	9	100%	100%
Universidad de Almería	1,966	10	1,966	10	100%	100%
Universidad Autónoma de Madrid	4,371	9	4,371	9	100%	100%
Universidad Nebrija	433	7	382	3	88%	43%
Universidad Alfonso X el Sabio	1,674	10	1,566	4	94%	40%
Universitat de Barcelona	7,573	9	7,573	9	100%	100%
Universidad de Burgos	1,222	10	1,115	5	91%	50%
Universidad Carlos III	2,342	8	2,269	6	97%	75%
Universidad de Cádiz	2,790	9	2,790	9	100%	100%
Universidad Católica San Antonio	1,749	8	1,725	7	99%	88%
U. Católica Santa Teresa de Jesús de Ávila	489	8	469	6	96%	75%
Universidad San Pablo - CEU	1,238	9	1,192	5	96%	56%
Universidad Cardenal Herrera - CEU	1,087	7	1,058	6	97%	86%
Universidad Camilo José Cela	2,852	8	2,702	4	95%	50%
Universidad de Castilla-La Mancha	3,699	10	3,627	9	98%	90%
Universidad Complutense	10,801	10	10,801	10	100%	100%
Universidad de Córdoba	2,268	9	2,268	9	100%	100%
Universidad Católica de Valencia	1,799	8	1,730	5	96%	63%
Universidade da Coruña	2,731	9	2,731	9	100%	100%
Universidad de Deusto	1,405	8	1,351	7	96%	88%
Universitat de Girona	2,282	10	2,228	8	98%	80%
Universidad a Distancia de Madrid	323	7	232	2	72%	29%
Universitat de Lleida	1,389	10	1,331	8	96%	80%
Universidad Europea de Canarias	20	2			0%	0%
Universidad Europea de Madrid	2,155	9	2,146	8	100%	89%
Universidad Europea de Valencia	85	3			0%	0%
Universidad Fernando Pessoa-Canarias	42	1	42	1	100%	100%
Universidad de Granada	8,143	9	8,143	9	100%	100%
Universidad de Huelva	1,577	10	1,440	7	91%	70%
Universitat de les Illes Balears	1,795	10	1,756	8	98%	80%
Universitat Internacional de Catalunya	615	6	522	3	85%	50%
Universidad de Jaén	2,276	9	2,250	8	99%	89%
Universitat Jaume I	1,890	10	1,788	7	95%	70%
Universidad Loyola Andalucía	92	1	92	1	100%	100%
Universidad de La Laguna	3,083	10	3,083	10	100%	100%
Universidad de Las Palmas de Gran Canaria	2,464	10	2,373	8	96%	80%
Universidad de Murcia	4,224	10	4,224	10	100%	100%
Universidad de Málaga	4,475	9	4,475	9	100%	100%
Universidad Miguel Hernández de Elche	1,569	9	1,456	6	93%	67%
Mondragon Unibertsitatea	748	6	703	4	94%	67%
Universidad de Navarra	1,496	7	1,496	7	100%	100%
Universidad Nacional de Educación a Distancia	5,578	9	5,578	9	100%	100%
Universidad de Extremadura	3,267	10	3,267	10	100%	100%
Universidad de Cantabria	1,573	9	1,499	7	95%	78%
Universidad de León	2,457	10	2,335	8	95%	80%
Universidad de Oviedo	3,303	10	3,271	9	99%	90%
Universidad Internacional de La Rioja	2,088	6	2,056	4	98%	67%
Universidad de La Rioja	807	10	744	7	92%	70%

	Graduates of the 2015-16 academic course	Number of study groups	Data available for analysis			
			Graduates	Groups	% graduates	% groups
Universidad de Zaragoza	4,437	10	4,437	10	100%	100%
Universitat Oberta de Catalunya	2,574	7	2,544	6	99%	86%
Universitat Politècnica de Catalunya	4,946	8	4,946	8	100%	100%
Universidad Politécnica de Cartagena	660	4	657	3	100%	75%
Universidad Pompeu Fabra	2,420	8	2,321	6	96%	75%
Universidad Politécnica de Madrid	4,771	6	4,771	6	100%	100%
Universidad Pública de Navarra	1,341	7	1,341	7	100%	100%
Universidad Pablo de Olavide	1,074	8	1,062	7	99%	88%
Universidad Pontificia de Salamanca	1,421	8	1,379	6	97%	75%
Universitat Politècnica de València	3,931	9	3,894	7	99%	78%
Universidad del País Vasco	6,894	9	6,894	9	100%	100%
Universidad Rey Juan Carlos	4,713	9	4,713	9	100%	100%
Universitat Ramon Llull	2,313	9	2,295	8	99%	89%
Universitat Rovira i Virgili	2,043	10	2,017	8	99%	80%
Universidad de Sevilla	8,528	10	8,528	10	100%	100%
Universidad de Salamanca	4,468	10	4,468	10	100%	100%
Universidade de Santiago de Compostela	3,410	9	3,410	9	100%	100%
Universitat de València	7,153	9	7,153	9	100%	100%
Universidad de Valladolid	3,808	10	3,775	9	99%	90%
Universitat de Vic – U. Central de Catalunya	880	8	880	8	100%	100%
Universidade de Vigo	2,882	10	2,882	10	100%	100%
Universidad Internacional Valenciana	120	2	104	1	87%	50%
Universidades excluidas	1,772	26	0	0	0%	0%
<b>Total</b>	<b>203,253</b>	<b>634</b>	<b>198,969</b>	<b>512</b>	<b>98%</b>	<b>81%</b>

Note: Universidad San Jorge, Universidad Francisco de Vitoria, Universidad Miguel de Cervantes and Universidad Isabel I de Castilla do not authorize the publication of their data.

Source: Ministry of Universities (2023b) and own elaboration.

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