



Graduate employment outcomes 2013–2023

Trends, differences across fields of study, and gender gaps

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Introduction

00

Spain has significant limitations in its labor market in general and in youth employment in particular. Compared with other developed countries, the data show significant problems of unemployment, low earnings, mismatches between educational qualifications and employment, and low quality employment, especially in terms of the types of employment contracts. University graduates in Spain, especially young university graduates, also experience these limitations, compared with graduates in other countries. Young graduates have an employment rate below the EU-27 average, lower average annual earnings, a smaller earnings differential compared to employed people with upper secondary and post-secondary non-tertiary education, and a smaller share of high-level occupations (Pérez and Aldás [dirs.] et al. 2023)).

This image of the graduate employment situation, confirmed year after year, is real but incomplete because it ignores certain changes that need to be taken into account. Over the last decade, the aforementioned weaknesses have been accompanied by positive changes in graduate employment, especially young graduate employment. To perceive the changes we need recent data and appropriate methodological approaches. An analysis focused on total graduate population regardless of time since graduation takes a very broad set of individuals in very different situations, from recent graduates to those who joined the labor market many years ago, with different career paths and experience, different earnings, different levels of knowledge, etc.

For U-Ranking¹, with its focus on university performance and graduate outcomes, the interest lies in

¹ As part of this project, the results of 12th edition of U-Ranking were released this year. Further information is available in the report [U-Ranking 2024 \(Synthetic Indicators of Spanish Universities\)](#).

learning about the employment situation of young graduates in their first few years of work. That requires analyzing the circumstances of labor market entry, which vary over time as a result of changes in the supply of graduates (number of graduates and types of degree) and in the demand for graduates (number and type of jobs created). The changes in these variables may reflect longer-term trends or temporary fluctuations associated with the economic cycle. Both these phenomena can be observed in Spain over the last decade.

Properly identifying these and other variations will enrich and clarify our analyses of trends in employment outcomes for young graduates. The aim of this study is to advance in that direction, taking advantage of recent significant improvements in the information available. For more than ten years now, the availability of public data on Spanish graduate employment outcomes (Ministry of Science, Innovation and Universities [Indicators of Social Security registration of university graduates]; INE 2016, 2020) has been steadily improving through continuous monitoring of graduates' first few years of work, making it possible to obtain a more precise picture of graduate employment. This is the approach adopted by the Ministry of Science, Innovation and Universities in its databases and graduate employment outcome reports (Ministry of Science, Innovation and Universities [Indicators of Social Security registration of university graduates]; Ministry of Universities and CCS 2019), when it selects a cohort of graduates and follows them for four years. To date, the Ministry has analyzed six consecutive cohorts², from academic

² If we include the Ministry's first study, which analyzed the employment outcomes of bachelor's and master's graduates from the 2009-2010 academic year, there are seven cohorts. The number of bachelor's graduates in this first cohort was very small (6,583 compared to a total of 190,749), since the 2009-2010 academic year was only the second year of im-

year 2012-2013 to academic year 2017-2018. The graduates of the first cohort are followed from the year of graduation (2013) until 2017, and those of the last, from 2018 to 2022, which means that data are available for the 10-year period 2013-2022. The Spanish Statistical Office, INE, on the other hand, has conducted two editions of the Graduate Employment Outcome Survey (EILU)³, tracing the employment situation up until 2014 and 2019⁴ of a larger sample (in the more recent survey, 30,000 bachelor's and 11,000 master's graduates), thus providing a valuable supplement to the annual government information, since it allows working with microdata and performing analyses of the influence of personal variables on employment outcomes.

In this report we analyze graduate employment outcomes over the period 2013-2023, based on the information available from INE and the Ministry of Science, Innovation and Universities database. The Ministry database can be used to analyze individuals in their first few years of employment and differentiate between graduates who entered the labor market in different cyclical contexts. Thanks to the various indicators available, we can also analyze the employment outcomes of graduates from both a quantitative (employment rate, earnings) and a qualitative perspective (education-job match, type of contract, employment vs. self-employment). We can also differentiate by branch of knowledge or field of study and assess gender gaps, all of which are highly relevant considerations when assessing education and labor policy.

From our analysis we conclude that the cumulative changes in the labor market over the last decade are substantial and in many cases positive. In view of the changes, which are summarized in the conclusions section, some established views on the graduate employment situation need to be thoroughly revised, as they are based on out-of-date information that no

longer reflects the current situation. Many of the changes are the result of changes that have taken place in the Spanish economy since the end of the real estate boom, gradually leading to a more intensive use of human capital.

The report is structured as follows. The first chapter gives two perspectives on the context in which graduates enter the job market. The first section, based on INE statistics (mainly the Labor Force Survey, EPA), presents an overview of employment trends in Spain, with a focus on graduate employment. Among graduates, the focus is on the youngest group (those aged 22 to 29). The second section of the first chapter, using the Ministry database, provides a second perspective on graduate employment outcomes, namely, the growth in number of graduates, both bachelor's and master's, between 2013 and 2022. It highlights the significant changes in the size and composition of the young graduate population, both in relation to public vs. private universities and to choice of degree. The second chapter provides an analysis of the changes in employment outcomes among the six most recent cohorts of graduates. The first section shows the variations within each cohort and between cohorts, while the second focuses on the differences in employment outcomes between fields of study. The third chapter addresses the differences in employment outcomes for men and women. After analyzing men's and women's academic performance, we examine whether there is any bias in quantity and quality of employment between men and women. Finally, the fourth chapter presents our main conclusions.

plementation of the new bachelor's degrees and the bulk of the graduates were Nursing and Building engineering graduates who had transferred from the Nursing and Technical architecture diploma and had taken adaptation courses to become bachelor's graduates (Ministry of Universities and CCS 2019). The Ministry data are annual from 2013, which is the starting year we have chosen.

³ The data from the first survey were published in 2016 and the data from the second, in 2020.

⁴ For analyses based on these two sources, see Pérez (dir.) et al. 2018 and Pérez and Aldás (dirs.) et al. 2023.

Trends in the graduate labor market

01

As noted earlier, the course of a cohort's working life is highly dependent on the socioeconomic environment in which the cohort enters the labor market. The determinants of that environment include the stage of the economic cycle, the size of the graduating cohorts, the supply of high-level jobs for higher education graduates, and so on.

In this chapter we examine the keys to this employment context. To do that we analyze the years in which the cohorts under consideration entered and participated in the labor market (2013-2023), considering not only trends in GDP and employment, with a focus on occupational level, but also the size of each cohort and the characteristics of the graduates in that period, including the proportion of bachelor's and master's degrees, the breakdown by branch of knowledge and field of study and by type of university (public or private), and also the proportion of men and women in each branch of knowledge.

This background will allow a more precise analysis of the recent changes in graduate employment and potential gender gaps addressed in chapters two and three

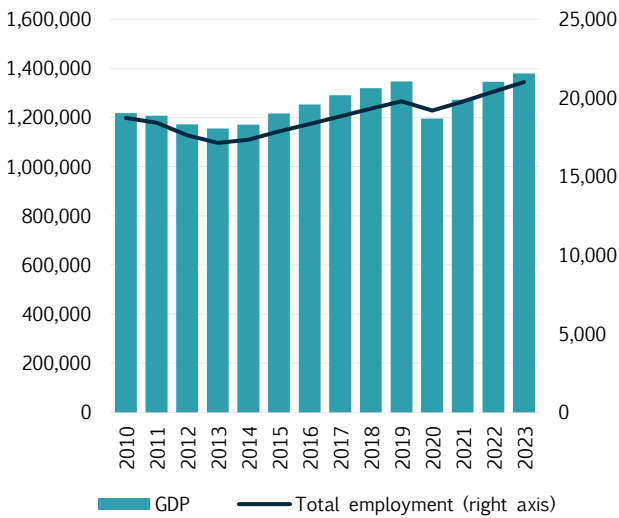
1.1. Graduate employment in Spain

In this section, to provide a frame of reference for the employment context in which each of the cohorts of graduates to be analyzed in subsequent sections

graduated and which therefore will have influenced their ease of access to employment and the quality of the employment available to them, we provide information on trends in employment, unemployment and educational qualifications in Spain between 2010 and 2023 by educational attainment, age group and gender.

Figure 1.1 shows the profile of the Spanish business cycle in which the graduates left university, which we will analyze in terms of GDP and total employment, as measured by the employed population. The data indicate that the six cohorts we will be considering in the following sections graduated almost entirely in a context of recovery and growth. The first cohort graduated in 2013, as Spain was just beginning to emerge from the long, deep crisis that followed the banking crisis sparked by the Lehman Brothers bankruptcy, the real estate collapse, the sovereign debt crisis and the associated austerity measures. That was certainly a difficult period for employment, but the 2013 graduates already faced better opportunities. The rest of the cohorts, from 2014 to 2018, graduated in a context of growth, although the 2016, 2017 and 2018 cohorts experienced, at different points of their early working life (4th, 3rd and 2nd year, respectively), the significant but very time-limited drop in GDP and employment caused by the Covid-19 pandemic.

Figure 1.1. Trends in GDP and employment. 2010-2023. Spain
(thousands of euros and thousands of persons)

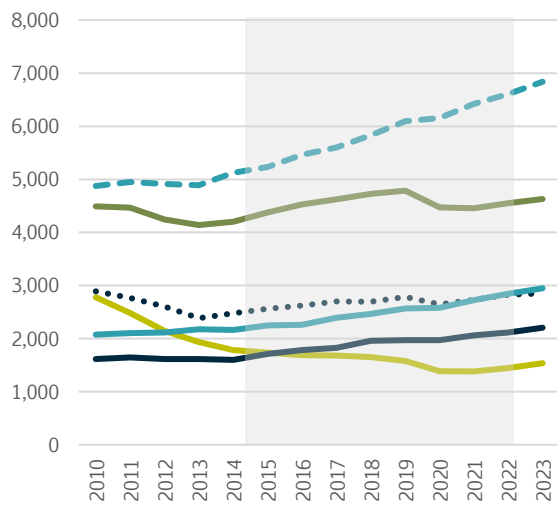


Source: INE (CNA, EPA) and authors' own calculations.

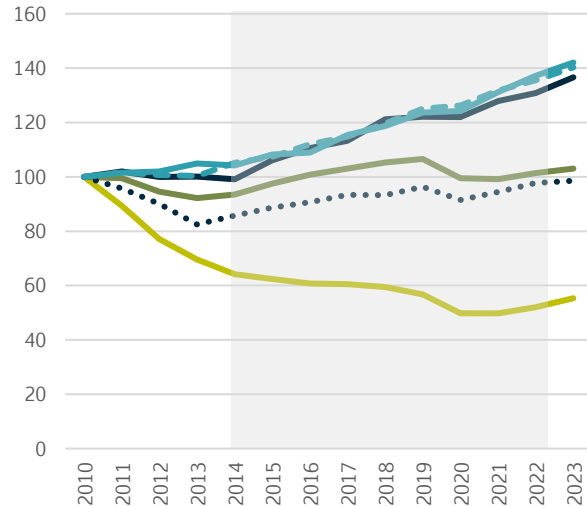
Indeed, employment grew faster among those with higher education, whether university or vocational. As panel b) of **Figure 1.2** shows, the highest growth in the employed population was precisely among university graduates and people who had completed mid- and higher-level vocational education and training (VET). In absolute terms, as Panel a) shows, the share of university graduates in the employed population is twice that of those with higher VET. The number of university graduates in employment increased by 2 million over the study period, giving a rate of 40%, which is 17 percentage points (pp) higher than the overall rate of growth of employment.

Figure 1.2. Trend in employment in Spain by educational attainment. 2010-2023

a) Thousands of people



b) 2010=100



- Up to primary school
- Compulsory secondary education
- Baccalaureate
- Intermediate level vocational training or equivalent
- Higher level vocational training or equivalent
- - - - University

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

Previously, we noted the importance of considering generationally homogeneous populations when analyzing their employment situation. **Figure 1.3** illustrates the importance of this approach when analyzing graduate employment. The growth of the total employed population of graduates is significantly less sensitive to the economic cycle than that of the younger employed population of graduates. While the number of graduates in employment grew steadily throughout the period, the number of young graduates fell until 2013, reflecting the severe impact of the Great Recession on entry to the job market, before recovering as economic growth returned from 2014 onward. Also, young graduates were much more severely affected by the pandemic crisis in 2020, when hardly any new jobs were created. Among the total graduate population, in contrast, the effect of the pandemic is barely perceptible, since existing employment was largely protected. This result corroborates the importance of performing the

analysis of employment outcomes on specific cohorts, which is what we will do in greater detail in the following sections. This analysis also confirms the significant advantages, in terms of job creation, for young graduates compared to young people as a whole.

Figure 1.3 provides additional evidence about the employability premium enjoyed by graduates over the general population. Thus, over the period 2010-2023, total graduate employment grew, in percentage terms, more than general employment; and the population of young graduates in employment grew not only more than that of young people in general but also more than that of the total population. Perhaps the most important point for the future, however, is that this employability premium for young graduates remained undiminished throughout the period and seems rather to have increased, with growth of 58% since 2013, including in the years after the pandemic.

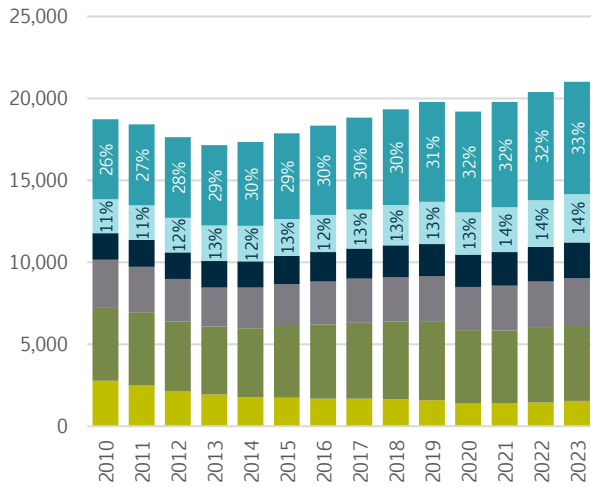
Figure 1.3. Total employed population and total graduate employed population in Spain by age group. 2013=100



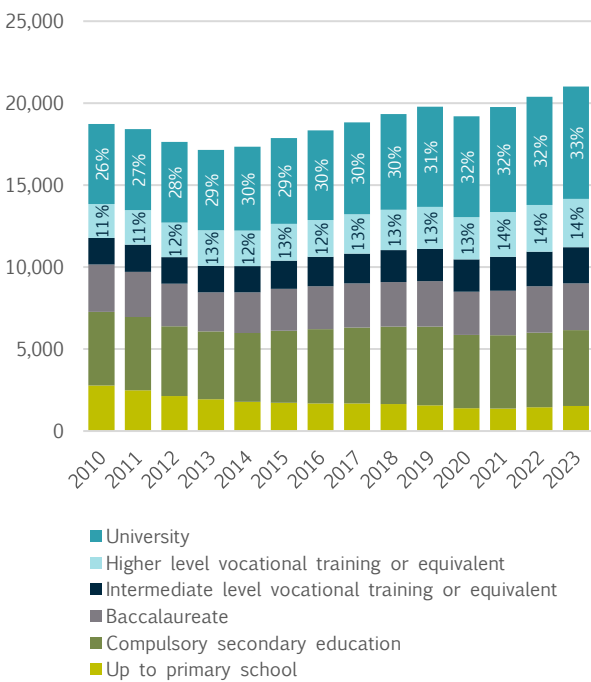
Source: INE (EPA) and authors' own calculations.

Figure 1.4. Distribution of employed population in Spain by educational attainment. 2010-2023 (thousands of people and percentage)

a) Total population



b) Young population (ages 22-29)



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

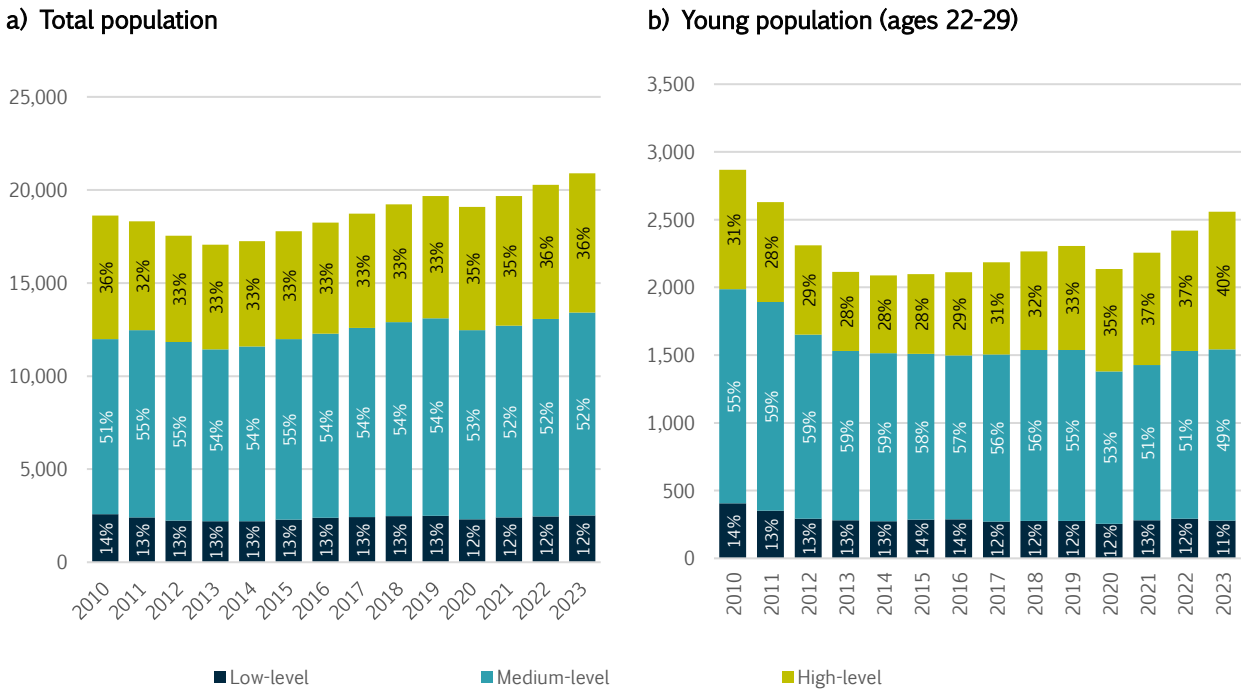
The aforementioned trend in employment alters the composition of the employed population in terms of educational attainment. If employment at a given level of education grows more over an extended period, that level's share in total employment will increase. **Figure 1.4** shows the changing composition of the total employed population and the young employed population (ages 22-29). The faster growth of total graduate and young graduate employment mentioned earlier translates into a 7 p.p.

increase in the graduate share of the total employed population and an 11 p.p. increase in the graduate share of the young employed population. In 2023, 33% of the total employed population and 37% of the young employed population had a university degree. If we include people with higher VET qualifications, in 2023 almost half (47%) the employed population has a higher educational qualification; and in the young employed population the figure rises to 56%, i.e., the majority. The equivalent figures in 2010 were 37% and 39%, marking the scale of the change that has taken place in the educational profile of the employed in Spain.

Another aspect of the change in educational attainment among the employed is the restructuring of the qualifications required by the various occupations, most notably the increase in the proportion of jobs requiring high qualifications, which generally are the ones that best match the educational attainment and competencies of graduates. In the Spanish National Occupational Classification (CNO-11), levels 1 (senior and middle managers), 2 (scientific and knowledge professionals) and 3 (technicians and associate professionals) encompass the most highly qualified jobs. **Figure 1.5** shows that the share of these occupations in total employment in Spain during the period 2010-2023 stagnated at around 36%. Among the young employed population aged 22 to 29, however, these occupations increased their share substantially, from 31% to 40%, climbing from a position below to one above their share among the total employed population.

The fit of educational qualifications to the requirements of the existing jobs determines the education-job match and the ability to meet labor market demands. Generally speaking, the demand for highly qualified workers is met by graduates, but two types of mismatches can arise. The first consists of an oversupply of graduates in relation to the available high-level jobs, resulting in graduate underemployment, which is reflected in their occupying positions in CNO levels 4 to 9. The second is the opposite case, where the demand for highly qualified workers exceeds the supply and some positions cannot be filled satisfactorily. The first type of mismatch has tended to be more common in Spain, but the second type may currently exist in some degrees where there is insufficient supply.

Figure 1.5. Distribution of the employed population by occupational level. Spain (thousands of people and percentage)



Note: The group of high-level occupations corresponds to levels 1-3 in the Spanish National Occupational Classification (CNO-11). It includes: senior officials and managers (level 1); scientific and knowledge professionals (level 2); and technicians and associate professionals (level 3). Military occupations are excluded from the chart.

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

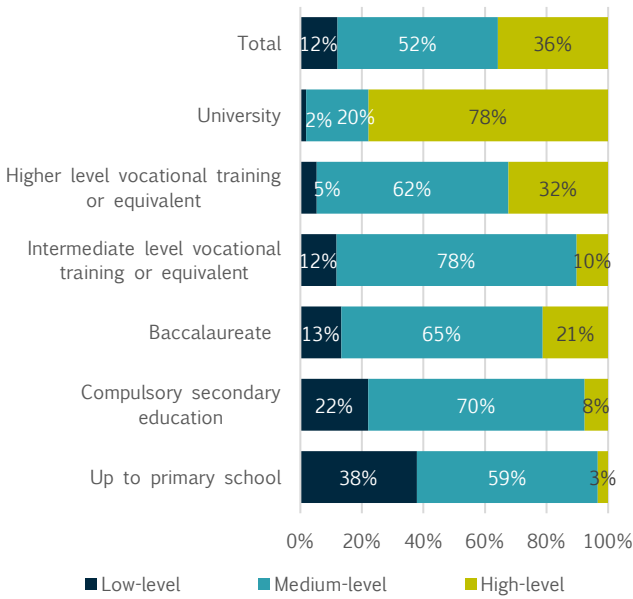
Figure 1.6 gives a static view of the composition of employment in 2023 by educational attainment and occupational level for the general population (panel a) and for young people aged 22 to 29 (panel c). The percentage of university graduates working in high-level occupations, i.e., 78% in 2023 both for graduates as a whole and for young graduates, is much larger than that working in medium- or low-level occupations. High-level occupations account for 32% of total employment among the general population with higher VET and 37% among the young population with higher VET, making higher VET the educational level with the second largest proportion working in such occupations. The 20% of graduates

in medium-level occupations and 2% in low-level occupations indicate the potential scale of the over-qualification affecting some graduates.

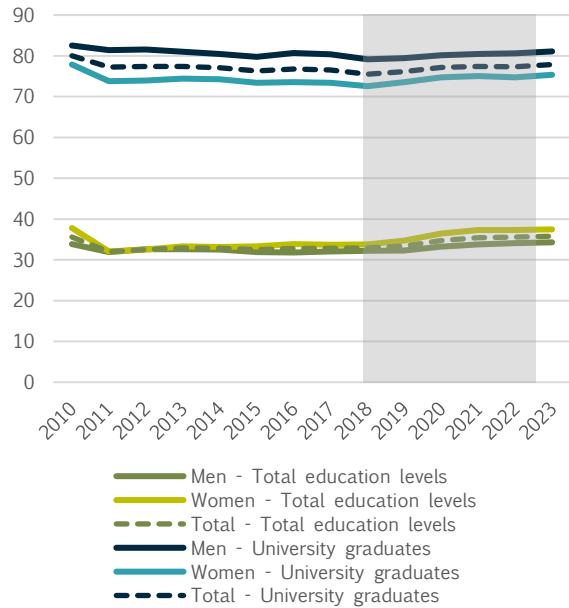
Panels b) and d) show the percentage of the total and graduate employed population working in high-level occupations, distinguishing between men and women. In panel b) we can see that the total graduate population in high-level occupations remains constant over time. The advantage for men over women at this level also remains constant, with no evidence of convergence over the period. In the young graduate population (panel d), although the gap between men and women does not disappear, it narrows.

Figure 1.6. Distribution of employed population by occupational level in Spain (percentage)

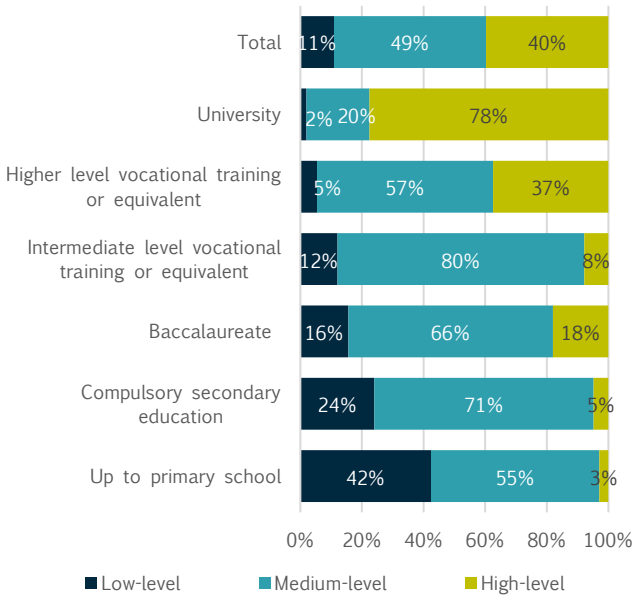
a) Employed population by level of education and employment qualification. 2023



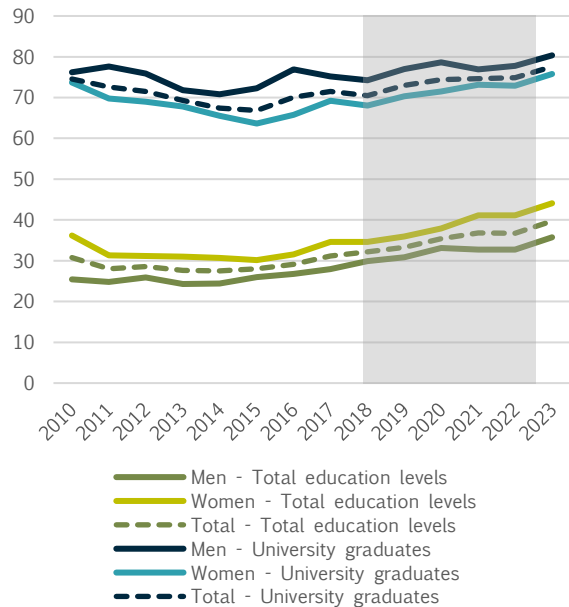
b) Employed population in high-level occupations by gender and level of education. 2010-2023



c) Employed population ages 22-29 by level of education and employment qualification. 2023



d) Employed population ages 22-29 in high-level occupations by gender and level of education. 2010-2023



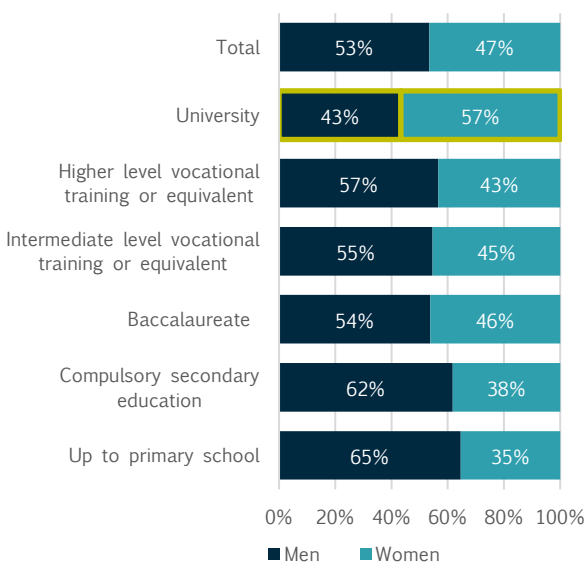
Source: INE (EPA) and authors' own calculations.

As stated in the introduction, one of the aims of this report is to analyze graduate employment outcomes by gender. In addition to what we said above in this regard, panels a) and c) of **Figure 1.7** show that the only level of education at which employment is dominated by women is the graduate level, especially young graduates, confirming that higher education significantly boosts the labor market participation of women. Panels b) and d) show the trend in total graduate employment and young graduate employ-

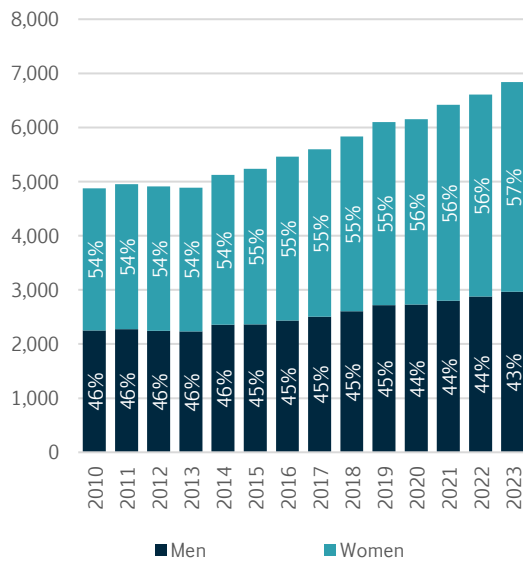
ment by gender. The share of women in graduate employment is consistently higher than that of men, and in the case of total graduate employment is gradually increasing over time. Young graduate employment does not follow the same pattern, since female graduate employment was 64% of the total at the beginning of the period but is 3 pp lower in 2023 because of the more rapid increase in male graduate employment during the growth phases.

Figure 1.7. Distribution of employed population in Spain by gender. 2010-2023

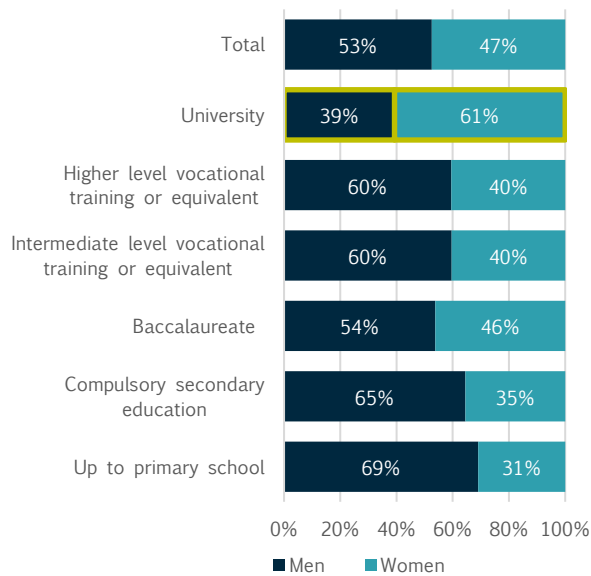
a) Employed population according to level of education and gender. 2023 (percentage)



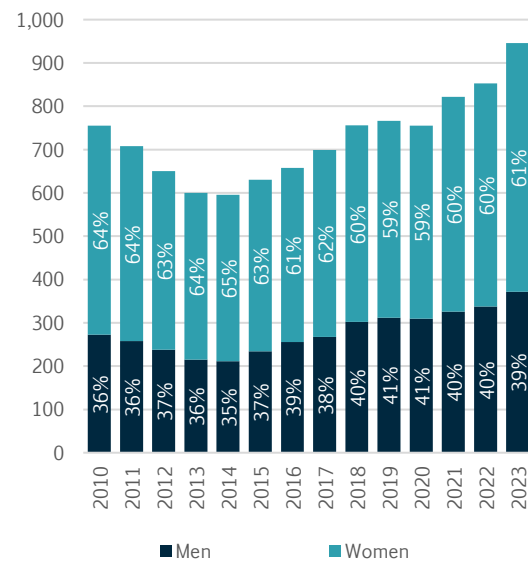
b) Employed graduate population according to gender (thousands of people and percentage)



c) Employed population ages 22-29 according to level of education and gender. 2023 (percentage)



d) Employed graduate population ages 22-29 according to gender (thousands of people and percentage)



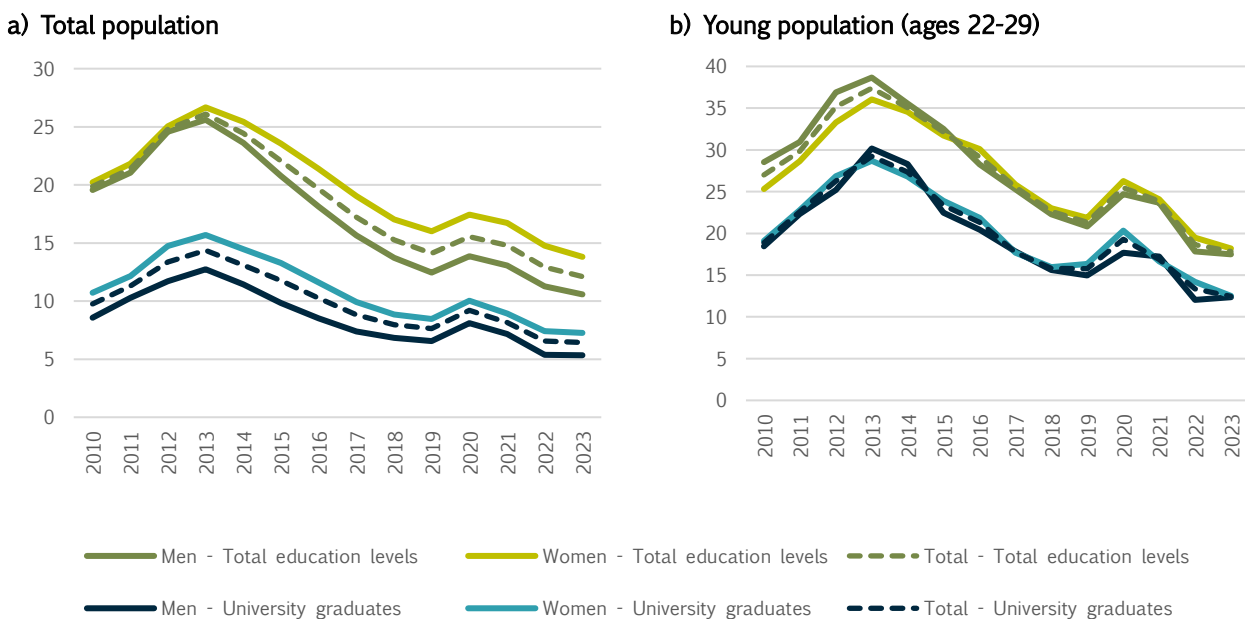
Source: INE (EPA) and authors' own calculations.

A complementary way of looking at employment outcomes is to observe the changes in unemployment rates, as shown in **Figure 1.8**, panel a), for the total employed population, and panel b) for the young employed population (aged 22-29). Unemployment grew during the Great Recession until 2013 and then fell steadily once growth recovered, with a short-lived spike during the pandemic in 2020. However, Figure 1.8 shows that unemployment affected graduates less than it did those with other levels of education, with differences growing to more than 10 pp and increasing precisely when unemployment rebounds. In other words, graduates not only have lower unemployment rates but are less affected by increases in unemployment during the downward phases of the economic cycle. The second thing the chart shows is that, in the total population, the unemployment rate is invariably higher for women than for men, regardless of their educational attainment. Panel b) of Figure 1.8, however, shows how important it is to focus the analysis on specific age cohorts, since the gender differences are much smaller among the population aged 22 to 29 whatever their educational attainment and practically disappear among young graduates. That is, if we filter by age and educational attainment, the gender gap decreases substantially, at least as regards unemployment.

While Figure 1.8 compared unemployment for graduates and for all levels of education and showed a convergence between the genders in the young population, **Figure 1.9** provides a more detailed analysis for each level of education for 2023 and shows the differences in the unemployment rate at each level, both for the population as a whole (panel a) and for the young population (panel b). Panel b) is especially interesting because it shows that the convergence between young men and women does not occur at all levels of education but increases at the higher levels, reaching full convergence among graduates (unemployment is 12.4% for women with a university degree and 12.5% for men). In contrast, the gap in favor of men (lower unemployment) is very significant at the primary level (-10 pp among men) and even at secondary level (-6.4 pp), baccaulaureate (-2.3 pp) and higher VET (-3.5 pp), so that the disappearance of the unemployment gap is a feature almost exclusively of the graduate level (and also of the intermediate VET level).

Lastly, **Figure 1.10** shows the earnings advantage of having completed a university degree. Graduate earnings are 45% above the average, although this advantage accumulates over the course of a person's working life. In any case, young graduates begin to enjoy this earnings advantage just a few years after graduation, and already between the ages of 22 and 29 the premium is 28%.

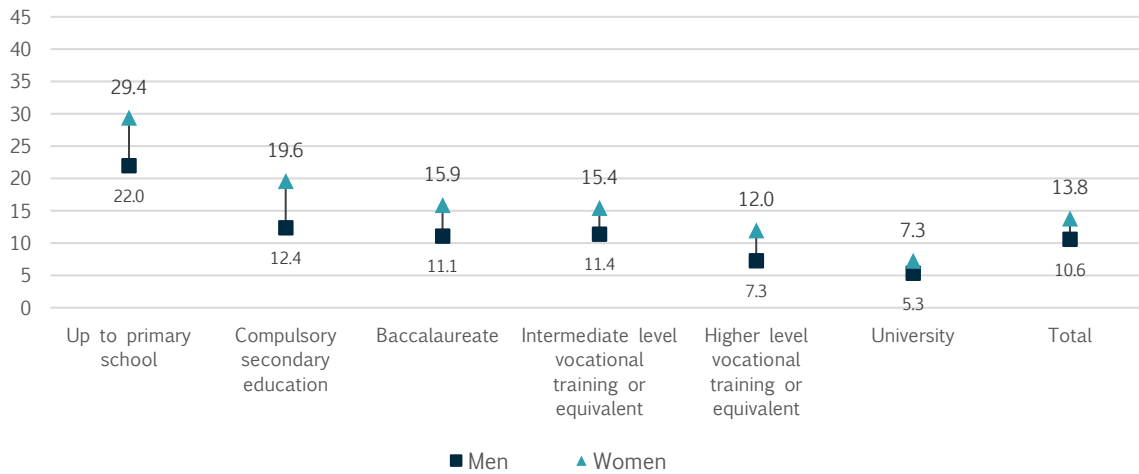
Figure 1.8. Unemployment rate by gender and educational attainment. 2010-2023. Spain



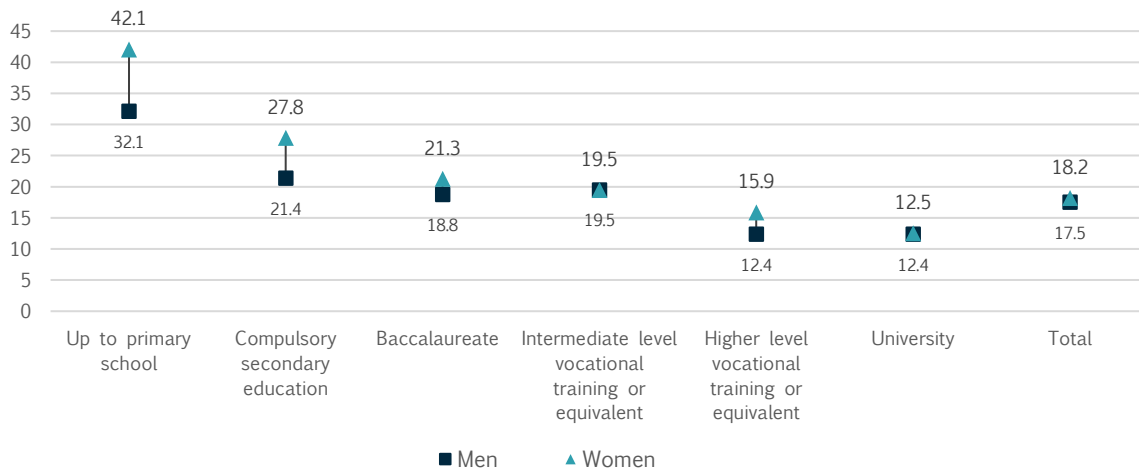
Source: INE (EPA) and authors' own calculations.

Figure 1.9. Unemployment rate by gender and educational attainment. Spain 2023

a) Total population

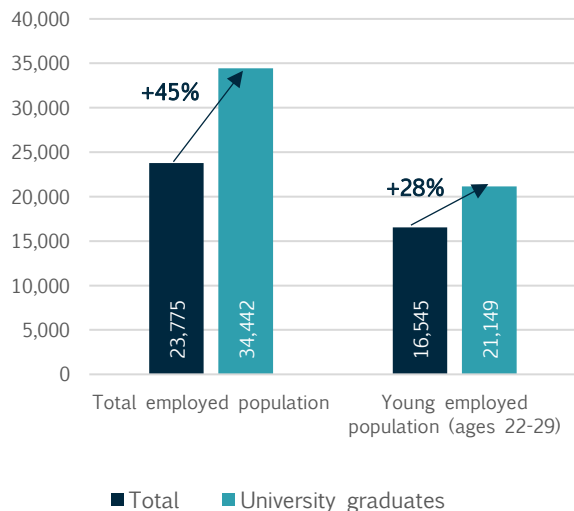


b) Young population (ages 22-29)



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

Figure 1.10. Earnings of the employed population in Spain by age group, educational attainment and gender. 2018 (euros)



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

This overview of trends in the graduate labor market in Spain over the last decade provides a number of useful contextual references for the analysis presented in the following sections:

- It shows the importance of looking specifically at the employment outcomes for recent graduates. Recent graduates do not follow the same patterns as the population as a whole, both on account of their educational attainment and on account of their youth. Young graduates have advantages in finding employment compared to young people in general, but they suffer the effects of the economic cycle and crises such as the pandemic more acutely than the graduate population as a whole.

- The study period (2013-2022) was one of rapid creation of jobs in general and of graduate jobs in particular. These new jobs have been a major source of opportunities for young graduates (aged 22 to 29), whose employment increased by 57.7% in over the 10-year period.
- People with higher education currently represent a large majority (56%) of the employed population aged 22 to 29: 37% are graduates and 19% have higher VET qualifications.
- This improvement in the employment of people with higher education is attributable to the strong growth in high-level occupations in the economy (among the young population 74% and among the total population 33%). The gradual transformation of the structure of production offers better opportunities for more highly qualified labor market entrants, facilitating a substantial reduction in young graduate underemployment.
- The improvements in occupational level have occurred to a greater extent among young people, and the percentage of young graduates in high-level occupations (77.6%) has drawn even with that of graduates as a whole (77.8%).
- Possession of a university degree acts as a powerful lever for the inclusion of women in the labor market, graduate level employment being the only level at which women are the majority (61%). The increase in employment that comes with having a degree hardly differs between genders. Female graduates have an unemployment rate of 6.4%, barely 1 percentage point higher than men (5.3%), and among young graduates the gap practically disappears (12.5% compared to 12.4%).

1.2. Trends in the graduate population between 2013 and 2022

The previous section provided context for the labor market trends observed in Spain over the period in

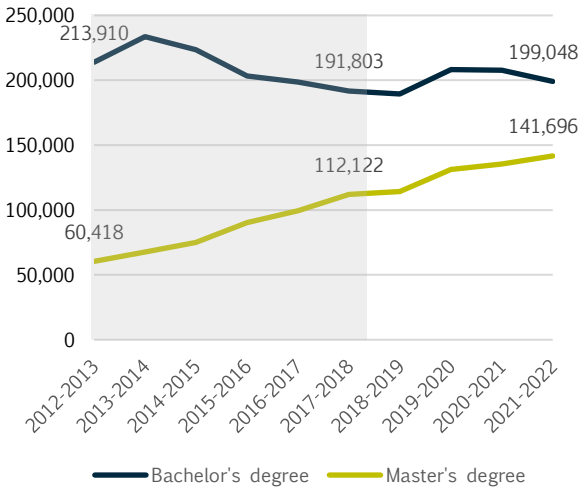
which the cohorts to be analyzed in this study graduated. Another vital point of reference before analyzing employment outcomes is the size and characteristics of the cohorts that graduated and the branches of knowledge in which they graduated. Both variables (general labor market characteristics and economic context, and the size and characteristics of the cohorts of graduates) must be taken into account, since they affect employment outcomes.

The six panels of **Figure 1.11** highlight various characteristics of graduates over the years 2013-2022, in which the six cohorts analyzed entered employment. First, the number of bachelor's graduates slowly decreased, while the number of master's graduates increased sharply, as the Bologna model implemented years earlier became more fully established (panel a). The aggregate number of graduates grew by around 66,000 (+24%) (panel b), albeit at very different speeds depending on the type of degree (bachelor's or master's) and the type of university (public or private).

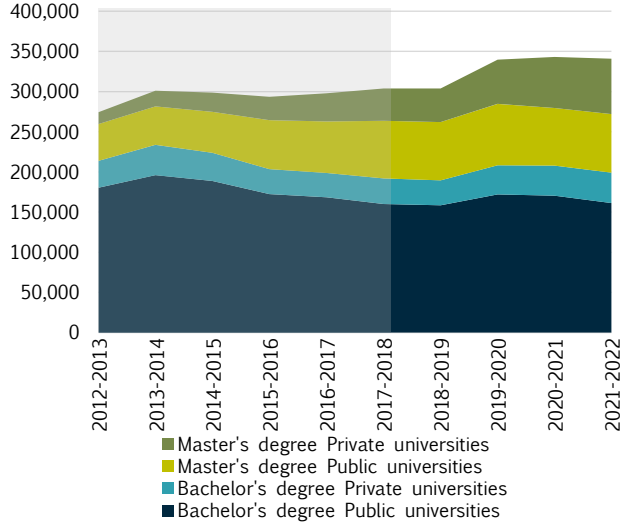
As panel c) shows, the decline in graduates from the public sector and the increase in graduates from the private sector are not very pronounced, so the market share differences shown in panel e) are not strongly marked: the public system lost 3.3 pp to the private system. However, with their strong commitment to master's programs, the private universities, starting from low levels, multiplied their number of master's graduates by five, to almost equal the number from public universities, which also increased but by a multiple of only 1.5 (panel d). As a result of these differences, the share of master's graduates by type of university is now almost equal (panel f). The emergence of new players naturally entails a loss of market share for incumbents, but this trend at master's degree level is also influenced by other variables, including the private sector's greater flexibility and massive commitment to non-face-to-face education, which enables it to attract students whose age and employment or personal circumstances prevent them from participating in face-to-face education.

Figure 1.11. Number of graduates by type of degree and type of university. 2012-13 to 2021-2022 (number of students and percentages)

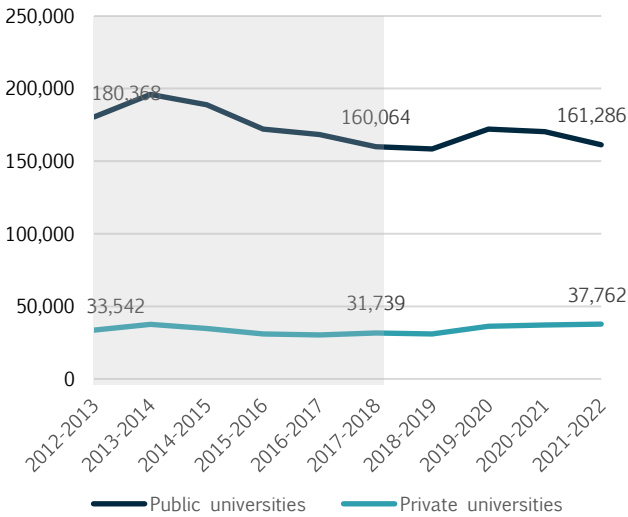
a) Graduates by level of education



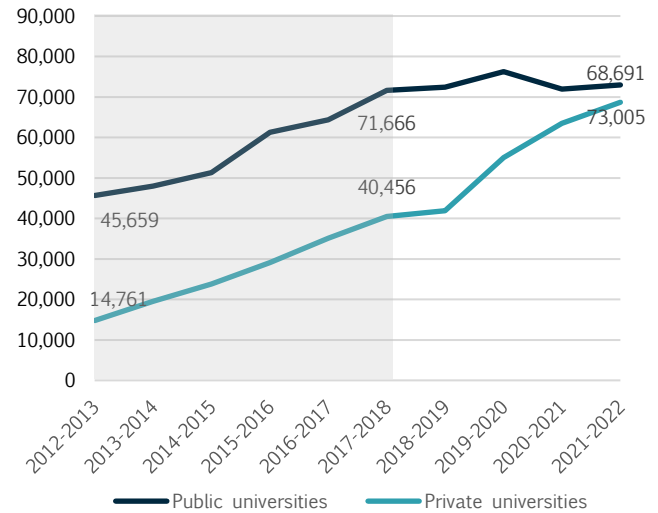
b) University graduates by type of degree and type of university



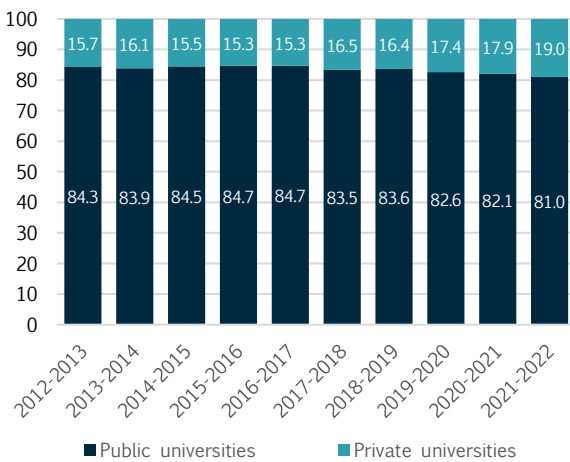
c) University graduates by type of university



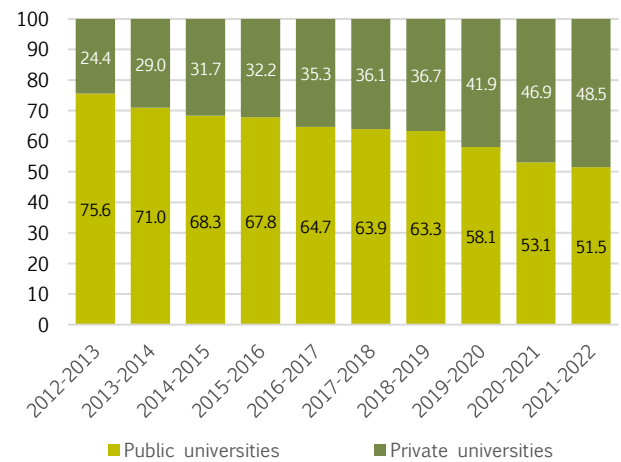
d) Master's degree graduates by type of university



e) Distribution of university graduates by type of university

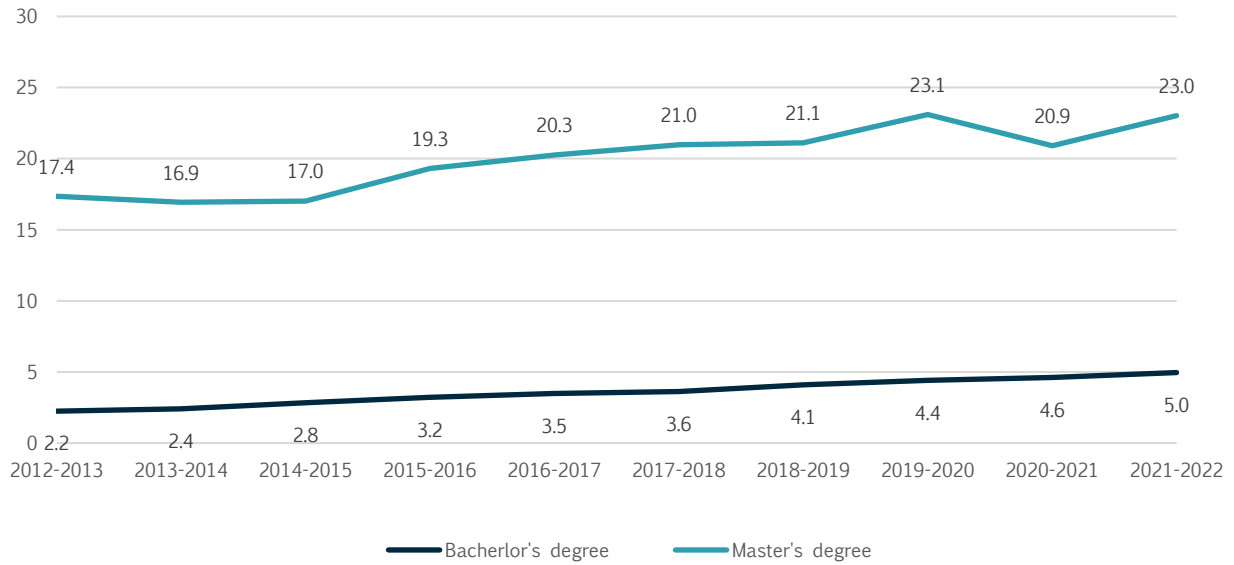


f) Distribution of master's degree graduates by type of university



Source: Ministry of Science, Innovation and Universities (Estadística de estudiantes) and authors' own calculations.

Figure 1.12. Number of foreign graduates by educational attainment (percentage of total graduates)



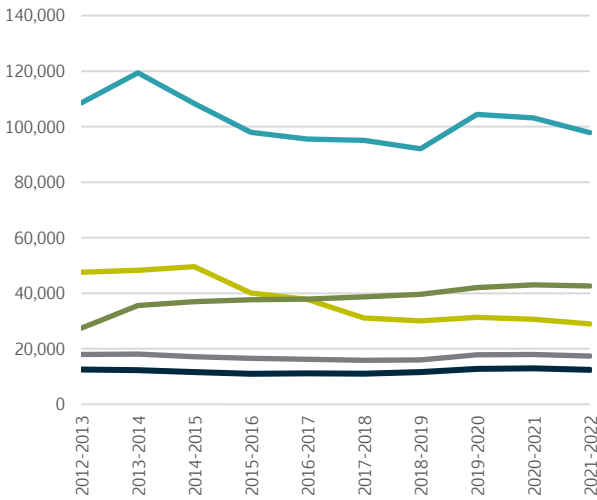
Source: Ministry of Science, Innovation and Universities (Estadística de estudiantes).

A relevant variable for assessing the quality of a university system is the proportion of international students among its graduates. As a university system becomes more recognized, it can be expected to attract an increasing number of students from other countries. After graduation, however, the share of international students can skew the employment data if the data include only graduates employed in Spain—as is the case with the Ministry’s data, which are based on registration with the Spanish Social Security agency—since many of the foreign students will likely return to their countries of origin. To indicate the potential scope of this bias, **Figure 1.12** shows the trend in the number of international graduates as a percentage of the total number of graduates at both bachelor’s and master’s level. At both levels the percentage is increasing over the study period, which can be understood as a sign of recognition of the Spanish university system. But the share of international students among master’s graduates is very high (23% in 2022), almost five times the share at bachelor’s level, where admission systems make recruiting international students much more difficult. This fact should be taken into account when analyzing employment outcomes at both levels.

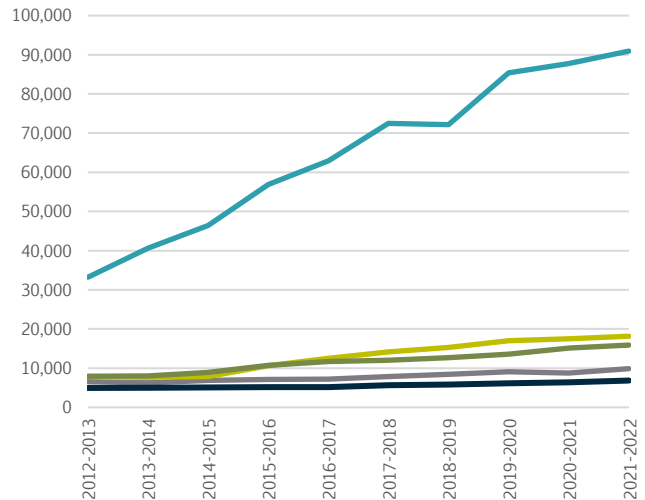
The growth in the total number of bachelor’s and master’s graduates differs across degree programs and branches of knowledge. As panel a) of **Figure 1.13** shows, the stagnation or slight decrease in total bachelor’s graduates is determined by the slight decrease in the branch of Social sciences and law, which accounts for a clear majority of bachelor’s programs and around half of bachelor’s graduates. The number of graduates in the minority branches of Sciences and Arts and humanities remained constant over the period, whereas the trend in two other branches, namely, Engineering and architecture and Health sciences, was significantly different from the previous ones, though in opposite directions. Thus, while Health sciences saw a 55.3% increase in number of graduates, from 27,422 in the 2012-2013 academic year to 42,589 in 2021-2022, Engineering and architecture saw a drop of -39.2%, from 47,589 graduates at the beginning of the period to 28,947 at the end. The trend in these branches of knowledge is important in that, as we shall see, they are the ones with the best employment outcomes, in both qualitative and quantitative terms. These differences in number of bachelor’s graduates in the different branches of knowledge has had an impact on the composition of the graduate cohort, as shown in panel c), especially in the two branches just mentioned, Health sciences and Engineering and architecture. Health sciences increased its share of the total number of bachelor’s graduates by 8.6 pp, while Engineering and architecture lost 7.7 points.

Figure 1.13. Trend in graduates by branch of knowledge and type of degree. 2012-13 to 2021-2022 (number of graduates and percentages)

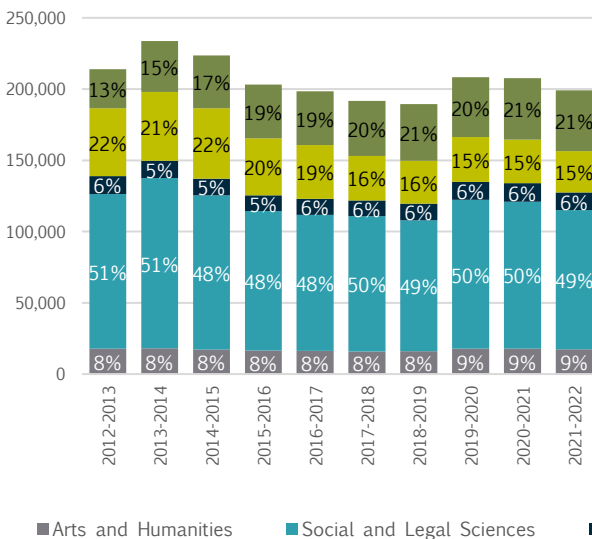
a) Bachelor's degree graduates



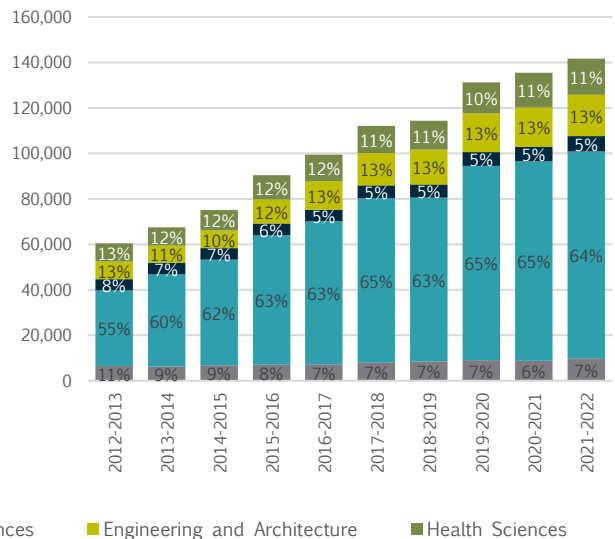
b) Master's degree graduates



c) Distribution of bachelor's degree graduates by branch of knowledge



d) Distribution of master's degree graduates by branch of knowledge



Source: Ministry of Science, Innovation and Universities (Estadística de estudiantes).

Turning to master's level education, the results are similar but only in part. Thus, the strong growth in number of master's graduates is driven by the branch with the most graduates, namely, Social sciences and law, which almost tripled its number of master's graduates over the study period. All the other branches saw increases, but significantly slower than Social sciences and law. Engineering and architecture and Health sciences doubled their number of graduates (panel b), but their share of the total number of master's graduates barely changed (panel d), with a slight loss of share in Sciences (-3 p.p.) and

in Arts and humanities (-4 p.p.). The reason why the master's degree in Engineering and architecture does not show the same loss of share as the bachelor's degree is probably that most of the postgraduate degrees in this branch are qualifying degrees (i.e. required for access to the associated profession), so the conversion rate from bachelor's to master's degree is typically higher⁵. In contrast, the fact that

⁵ According to the latest available data on bachelor's to master's transition rates, 23.7% of students who completed a

the sharp increase in the share of bachelor's degrees in Health sciences does not translate into an equivalent increase in this branch's share of master's degrees has a lot to do with the fact that many of these bachelor's degrees, especially in medicine and pharmacy, already have a MECES 3 level equivalent to a master's degree; also, most medical students do not do a master's degree because once they graduate, they tend to do a residency (MIR). As regards the proportion of men and women among the graduates in the different branches of knowledge, **Figure 1.14** shows, in panel a), the general growth in number of bachelor's graduates by gender and, in panel b), the gender composition of the graduates in each branch of knowledge in the last year available for bachelor's degrees. Panels c) and d) report the same data for master's degrees. In the bachelor's degree we can see that the stagnation or slight decrease in the total number of graduates is driven more by the fall in the number of men than of women. The number of male bachelor's graduates decreased by 13,446 (-13.3%), while the number of female graduates was down only 2,821 (-2.3%) in the 2021-2022 academic year compared to 2012-2013. Women accounted for 60.5% of the total number of bachelor's graduates in the 2021-2022 academic year, but panel b) shows that the share varies by branch of knowledge. Women's share is above average in Arts and humanities (67.3%), Social sciences and law (64.7%) and, above all, Health (72.4%). Women are also the majority, though slightly below the figure for graduates as a whole, in Sciences (54.3%) and are a minority (27.1%) only in Engineering and architecture.

At the master's degree level, where, as we saw, the growth in number of graduates was very significant, panel c) shows that the growth was slightly faster among women, who have increased their share of total master's graduates and are likewise the majority. They accounted for 56.2% in the 2012-2013 academic year and 57.2% in 2021-2022. The gender composition of master's graduates by branch of knowledge is similar to that of bachelor's graduates: women are a large majority in Health (71.9%), Arts

and humanities (62.1%) and Social sciences and law (59.6%), but are a minority not only in Engineering and architecture (32.3%) but also in Sciences, though very close to equilibrium (49.9%)

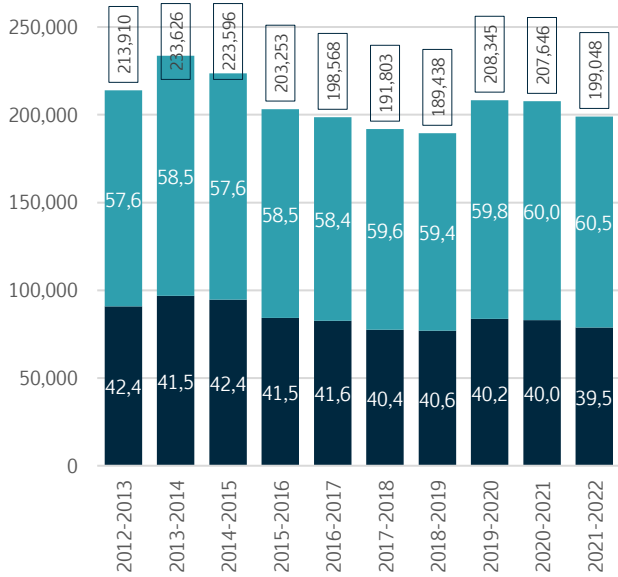
The branches of knowledge are useful groupings of degrees that have certain broad features in common, but there is also considerable diversity within each branch. For example, the Law and Economics degrees both belong to the branch of Social sciences and law but differ in content, career orientation and labor market demand. The foregoing breakdown by branch of knowledge therefore requires further analysis, where this is possible. Given the current diversity of bachelor's degrees, let alone master's degrees, it is difficult to analyze graduate outcomes in each of the thousands of degrees individually. However, without drilling down to the individual degree level, grouping the degrees into 123 fields of study allows for a reasonably detailed analysis, at least at bachelor's level, of the changes in number of bachelor's graduates by branch of knowledge and field of study.

Figure 1.15 compares the number of bachelor's graduates in each field of study, grouped by branch of knowledge, in the cohort that marks the beginning of the study period (academic year 2012-2013) with those in the last cohort for which we have employment outcome data (academic year 2017-2018), which will be analyzed in later sections. The fields of study that appear below the diagonal (dashed line) have lost bachelor's graduates over the years, while those above the diagonal have gained in number of graduates. The greater the distance from the diagonal, the greater the gain or loss. To make the chart easier to read, only the fields with the largest number of graduates are labelled.

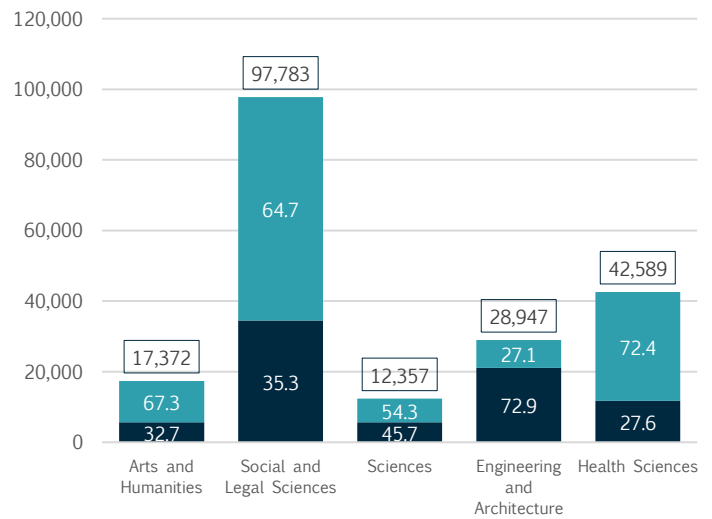
bachelor's degree in the 2020-21 academic year began a master's degree in the immediately following academic year. The percentage is highest (35%) in Engineering and architecture and lowest (13.3%) in Health. No data are available on bachelor's to master's transition rates beyond one year after graduation.

Figure 1.14. Number of graduates by gender and branch of knowledge. 2012-13 to 2021-2022

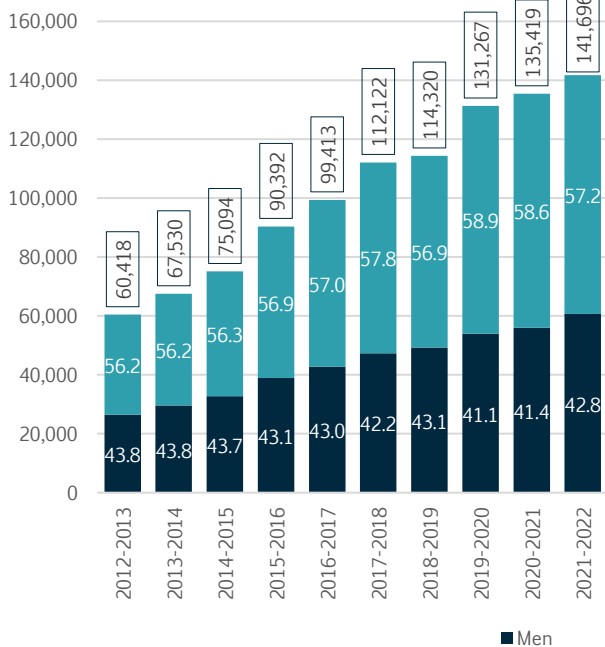
a) Distribution of bachelor's degree graduates by gender from 2012-13 to 2021-2022 (number and percentage)



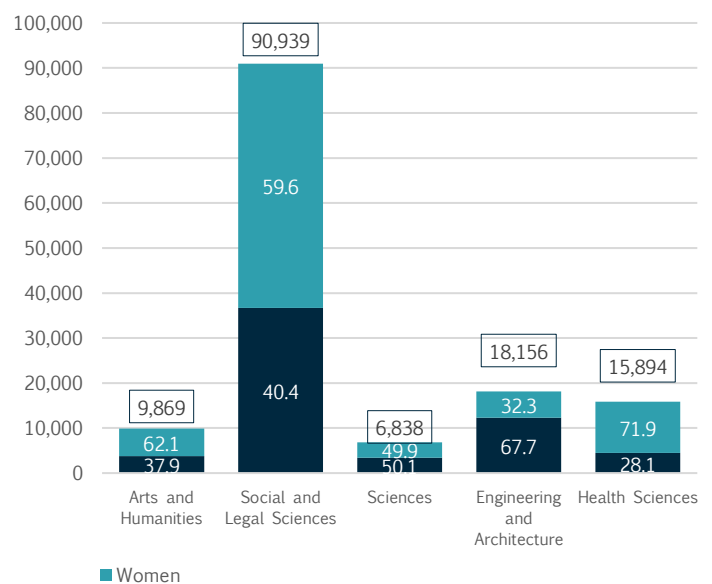
b) Distribution of bachelor's degree graduates by gender and branch of knowledge. 2021-2022 academic year (number and percentage)



c) Distribution of master's degree graduates by gender from 2012-13 to 2021-2022 (number and percentage)



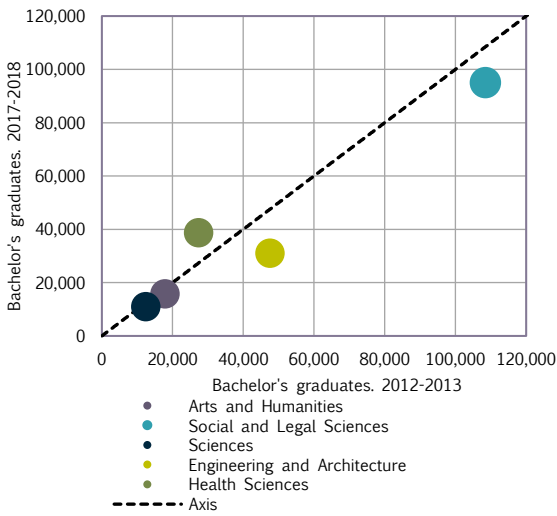
d) Distribution of master's degree graduates by gender and branch of knowledge. 2021-2022 academic year (number and percentage)



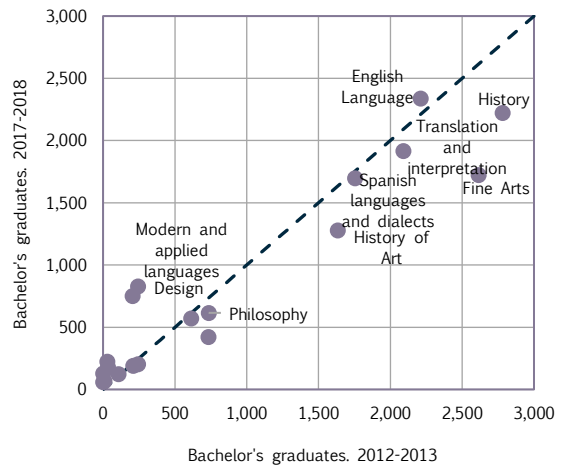
Source: Ministry of Science, Innovation and Universities (Estadística de estudiantes).

Figure 1.15. Changes in the number of bachelor's graduates by branch of knowledge and field of study. 2012-2013 cohort and 2017-2018 cohort (number of graduates)

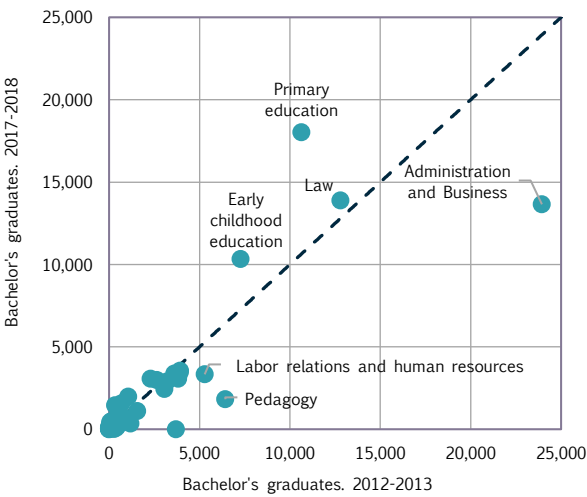
a) Total branches of knowledge



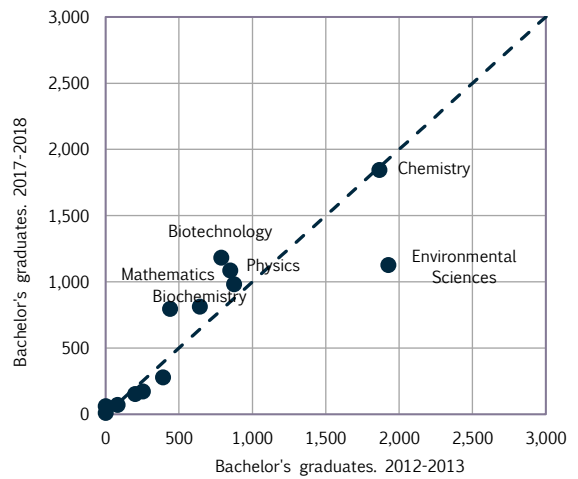
b) Arts and Humanities



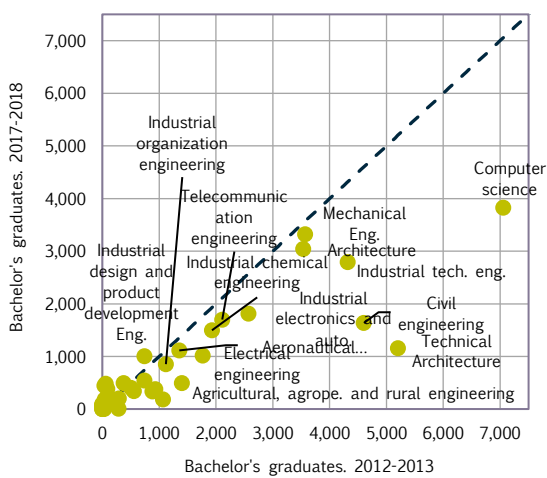
c) Social and Legal Sciences



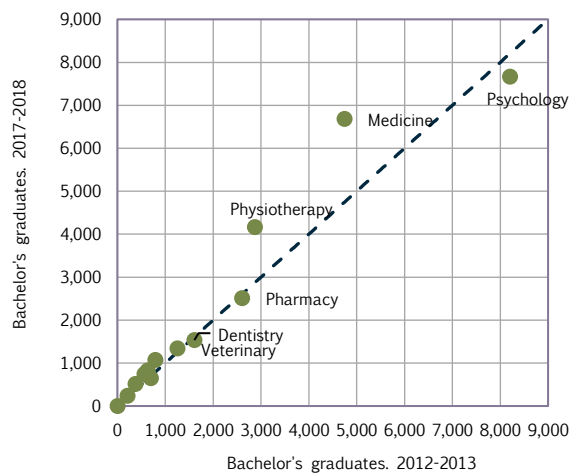
d) Sciences



e) Engineering and Architecture



f) Health Sciences



Source: Ministry of Science, Innovation and Universities (Estadística de estudiantes).

Panel a) shows the number of graduates at bachelor's level by branch of knowledge and confirms the results already discussed at this level. The Social sciences and law branch is below the diagonal, together with Engineering and architecture, as both have lost bachelor's graduates, the latter more than the former. The other branches are very close to the diagonal because the changes are very small, except for Health sciences, which, as we saw, experienced significant growth in number of graduates.

Having thus illustrated how the charts are to be interpreted, panels b) to f) show the same information for the fields of study included in each branch of knowledge. Thus, most of the fields of study in the Arts and humanities branch lost graduates over the period, especially Fine arts (-34%), History (-20%) and Art history (-22%), offset by fields such as Applied modern languages (+267%) and Design (+242%).

In Social sciences and law (panel c), the biggest drop (among the bachelor's degrees with the largest number of graduates) was in Business administration and management, mainly because these degrees have been split up into separate programs addressing specific corporate functions, such as Marketing, which grew by 130%, and Communication, which grew by 422%. A similar loss of graduates is observed in Labor relations and human resources and in Pedagogy. Most of the fields that gained in share of graduates are related to teaching, most notably the specialties of Primary education and Early childhood education.

The Sciences branch (panel d), as we saw, experienced a slight growth overall, driven by the growth in fields tangential to the Health sciences branch, such as Biotechnology (+50%), Biochemistry (+27%) and Food science and technology (+82%), and also by gains in the more traditional fields of Physics (28%) and Mathematics (+12%), which have seen a revival of interest. These fields compensate for the decline in Environmental science.

The chart for Engineering and architecture (panel e), which is the branch that has lost the most graduates over the study period, is highly revealing, as virtually all the fields of study are below the diagonal. Major losses are observed in fields associated with civil

works and housing (Technical architecture, Civil engineering and Architecture), reflecting the lasting impact of the crisis in the construction sector prior to the study period. In the case of Computer science, the sharp decline (-45%) may be traced to a combination of a drop in demand for degrees in this branch and the emergence of new engineering degrees in the same field, including Computer engineering (+342%), Multimedia engineering (+297%) and Software and application development (+323%).

Lastly, Health sciences (panel f) is the branch that experienced the strongest growth. This can be attributed to the fields of Medicine (+41%) and Physiotherapy (+45%), which absorbed the drop in Psychology (-7%), while the demand for most of the other fields in this branch, including Pharmacy (-3%), Dentistry (-5%) and Veterinary medicine (+8%), remained broadly stable.

Turning to master's graduates, we noted at the beginning of this section that the number almost doubled and that the increase was led by the branch of Social sciences and law (which saw a decline in number of graduates at bachelor's level). An analysis of the 153 fields of study in which the master's degrees are grouped shows that the biggest changes occurred in particular areas, notably in regulated professional fields (i.e. those in which a qualifying master's degree is required in order to exercise the profession) and in fields linked to business. **Table 1.1** lists the 20 fields of study with more than 1,000 graduates in the 2017-2018 cohort. These 20 fields have seen a 2.3 times increase in number of graduates and together account for 63% of the total number of graduates, with the master's degree in Secondary school education accounting for a particularly large share (19%). The table includes fields of study associated with qualifying master's degrees related to education (Secondary school education, Pedagogy, Specific didactics), law, engineering (Engineering in industrial technologies, Architecture and Civil engineering) and General health psychology. Besides these qualifying master's degrees, the fields with the largest number of graduates and in which numbers have increased most include those related to business (Business administration, Marketing, Accounting and tax management, Labor relations and human resources).

Table 1.1. Changes in number of master's degrees in fields of study with more than 1,000 graduates. 2012-2013 and 2017-2018 cohorts

Field	No. of graduates		Increase in no. of graduates	% of total	
	2012-2013	2017-2018		2012-2013	2017-2018
1 Secondary school education	10,123	21,611	11,488	16.8%	19.3%
2 Business administration	3,729	8,309	4,580	6.2%	7.4%
3 Legal profession	101	6,604	6,503	0.2%	5.9%
4 Pedagogy	1,277	5,443	4,166	2.1%	4.9%
5 Workplace health and safety	3,755	3,157	-598	6.2%	2.8%
6 Psychology	1,646	2,743	1,097	2.7%	2.4%
7 Law	2,132	2,354	222	3.5%	2.1%
8 Marketing	500	2,218	1,718	0.8%	2.0%
9 Industrial technology engineering	179	2,206	2,027	0.3%	2.0%
10 General health psychology	0	2,050	2,050	0.0%	1.8%
11 Medicine	1,089	1,676	587	1.8%	1.5%
12 Social work	1,115	1,575	460	1.8%	1.4%
13 Specific didactics	244	1,476	1,232	0.4%	1.3%
14 Economics	1,052	1,392	340	1.7%	1.2%
15 Architecture	358	1,389	1,031	0.6%	1.2%
16 Accounting and tax management	353	1,387	1,034	0.6%	1.2%
17 Labor relations and human resources	760	1,362	602	1.3%	1.2%
18 Spanish languages for foreigners	498	1,163	665	0.8%	1.0%
19 Other master's degrees	489	1,149	660	0.8%	1.0%
20 Civil engineering	725	1,135	410	1.2%	1.0%
Total degrees with more than 1,000 graduates	30,125	70,399	40,274	50%	63%
Total	60,418	112,122	51,704	100%	100%

Note: Fields in the Social sciences and law branch are shown in white, Health sciences fields in blue, Engineering and architecture fields in grey, and Sciences fields in yellow.

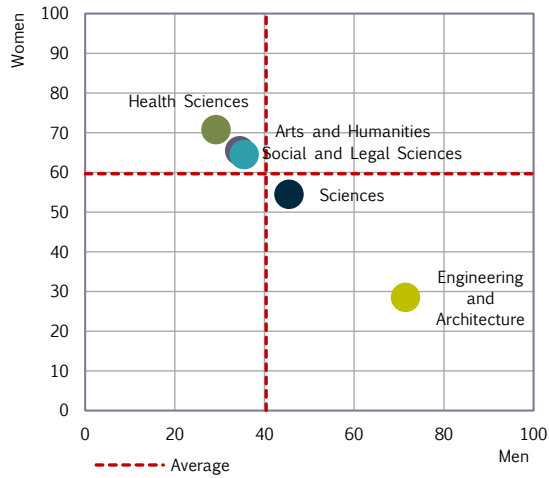
Source: Ministry of Science, Innovation and Universities (Estadística de estudiantes).

Regarding gender differences in the 2017-2018 cohort, **Figure 1.16** clearly reflects the fact that some fields of study are female-dominated and others male-dominated. Panel a) shows that the average proportion of men and women among bachelor's graduates as a whole is approximately 60% women and 40% men, as indicated by the dashed red line. The proportions differ by branch of knowledge, as we saw earlier: Health sciences, above all, but also Arts and humanities and Social and legal sciences have an above-average proportion of women (and a correspondingly below-average proportion of men), whereas Sciences (with a larger proportion of women but below the average for bachelor's graduates as a whole) and, above all

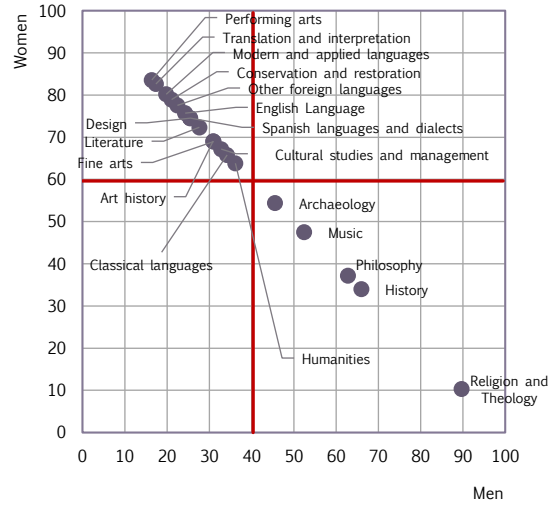
and very clearly, Engineering and architecture are male-dominated, with women having a below-average proportion and men being in the majority. Repeating this analysis for the fields in each branch of knowledge (panels b to f), we see that even in the most male-dominated branches (Engineering and architecture) and the most female-dominated ones (Health sciences) there are fields of study where the pattern is less pronounced or even inverted. Some Arts and humanities degrees, such as Performing arts, Translation and Communication, English language, Design, Literature and Fine arts, have an above-average presence of female graduates, while the opposite is the case in Archaeology, Music, Philosophy and History.

Figure 1.16. Distribution of bachelor's graduates by branch of knowledge and field of study. 2017-2018 cohort (percentage of total for each branch/field)

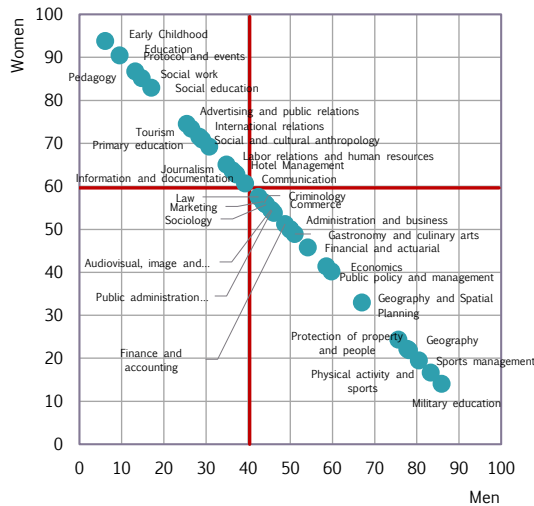
a) Total branches of knowledge



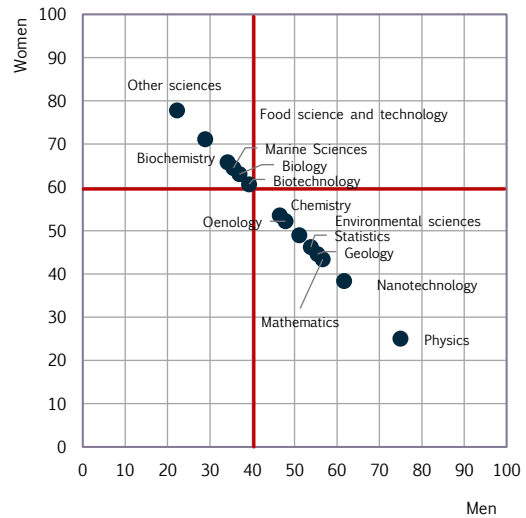
b) Arts and Humanities



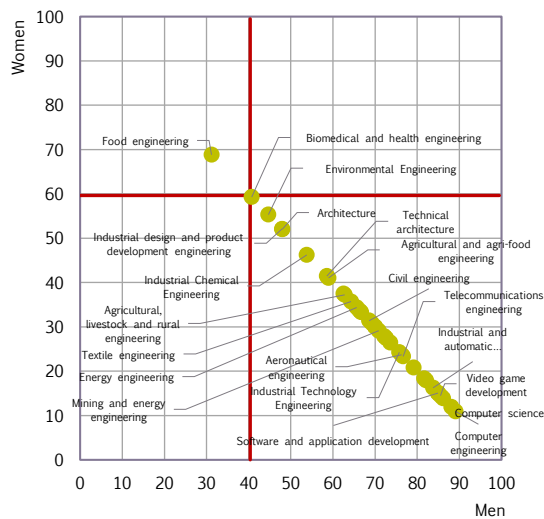
c) Social and Legal Sciences



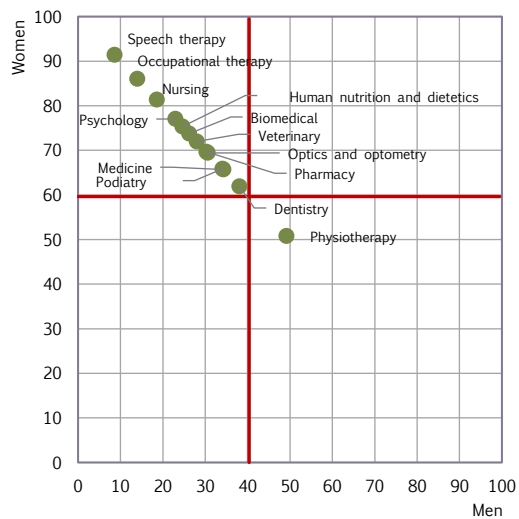
d) Sciences



e) Engineering and Architecture



f) Health Sciences



Source: Ministry of Science, Innovation and Universities (Estadística de estudiantes).

In Social sciences and law, the overall approximate gender balance is the result of a strong predominance of women in degrees related to education (Early childhood education, Pedagogy, Primary education, Social education) and in Social work and Advertising and public relations, offset by a predominance of men in Physical activity and sport, Geography and land use planning, Politics and public management, Economics and Gastronomy.

Sciences, which is slightly male-dominated but nearly balanced, has some more female-dominated fields, such as Biochemistry, Food science and technology and Biology, and other highly male-dominated fields, such as Physics, Nanotechnology, Mathematics, Statistics and Geology.

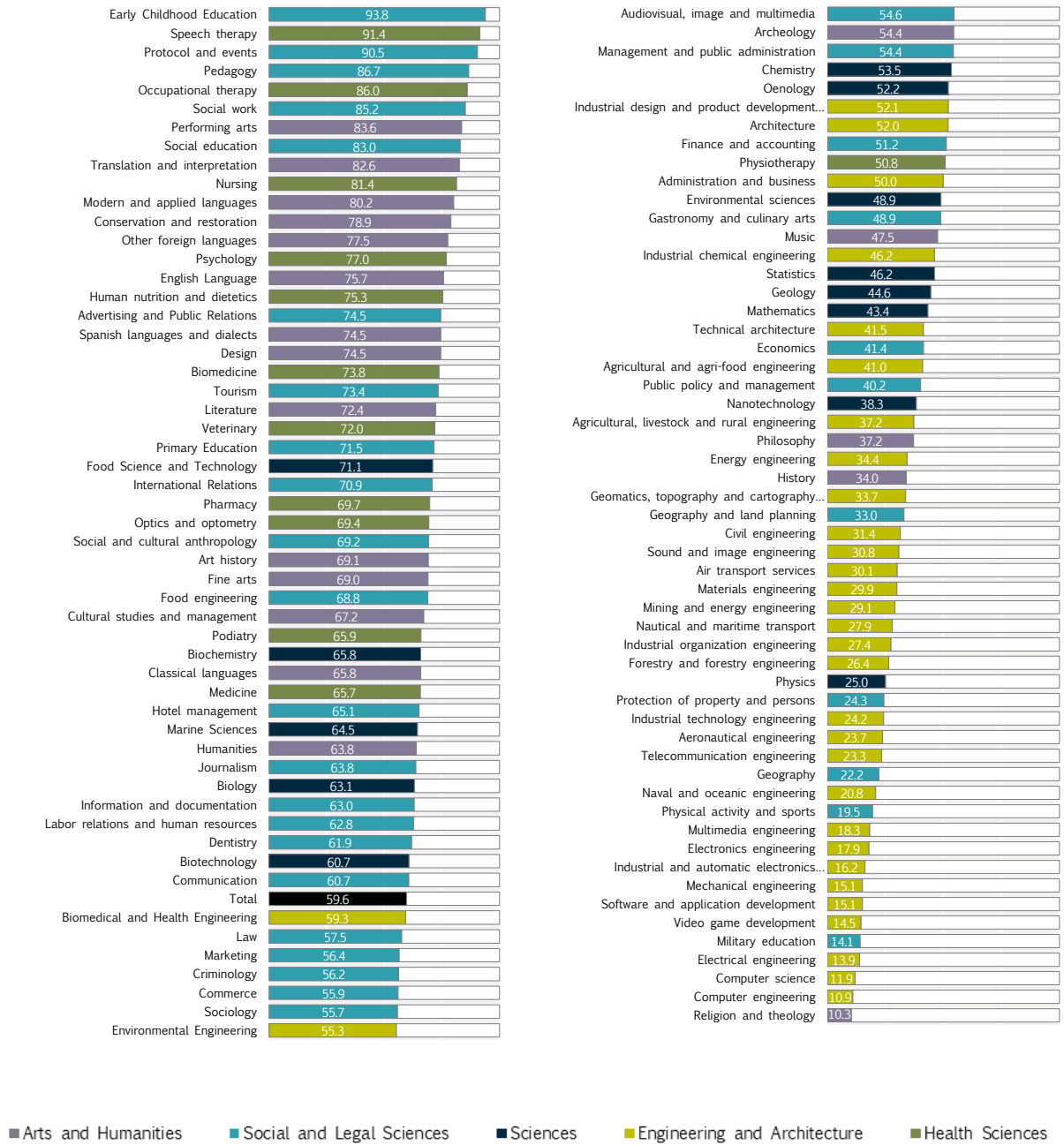
The two branches with the greatest gender imbalance are Engineering and architecture, and Health sciences. Engineering and architecture has only one field, namely Food engineering, in which women predominate, while men account for more than 80% of the bachelor's graduates in fields such as Computer science, Video game development, Software development and Electronic engineering. Architecture, Environmental engineering and Biomedical engineering are more balanced. The opposite is the case in Health sciences, where the vast majority of fields, especially Speech therapy, Occupational therapy, Nursing and Psychology, are female-dominated, Medicine, Podiatry and Dentistry are roughly in line with the abovementioned average ratio of women to men among master's graduates as a whole (i.e. 60:40), and only Physiotherapy has an above-average percentage of men. Finally, **Figure 1.17** lists the fields of study in descending order according to women's share of the total number of bachelor's graduates.

It can also be illuminating to analyze the cohorts of bachelor's graduates by field and type of university (public or private), since universities are subject to different constraints and follow different strategies when designing their curriculum depending on whether they are publicly or privately owned. In

many cases, to meet its responsibilities as a public service a publicly owned university will tend to adopt a generalist approach, aiming to cover most areas of knowledge, whereas many private universities choose to specialize based on demand, location, profitability and certain constraints set by law (e.g. minimum ratio of bachelor's to master's degrees). These differences in approach lead to different specializations and thus also to different mixes of fields of study, depending on the type of university.

Figure 1.18 confirms this for the aggregate of the branches of knowledge in panel a) and for the individual fields of study in each branch of knowledge in panels b) to f). Panel a) shows that the private universities have a larger proportion of bachelor's graduates in Social sciences and law and Health sciences than the public universities (more so in the former branch than in the latter), whereas in the other three branches, especially Engineering and architecture, the opposite is the case, the proportion of bachelor's graduates being larger in the public universities. In Arts and humanities, the public universities' share of graduates is greater in most fields of study, especially History, Fine arts, Art history, Philosophy and Translation and interpretation; only in Humanities and Design do the private universities have a larger share. The overall preponderance of the private universities in Social sciences and law is attributable to their preponderance in the fields that have the largest number of graduates, including Law, Business administration and Early childhood education. In other fields in this same branch, such as Economics, Social work and Tourism, the public universities predominate. In Sciences and in Engineering and architecture the public universities' share of the total number of graduates is greater than that of the private ones in all the fields of study. In Sciences this predominance is especially marked in Biology, Chemistry and Environmental sciences, whereas in Engineering and architecture it is most pronounced in Chemistry, Aeronautics and Electronic engineering. Only in Architecture do the private universities have a larger share of the total number of graduates.

Figure 1.17. Proportion of women among bachelor's graduates. 2017-18 cohort (percentage of female graduates in each field of study)

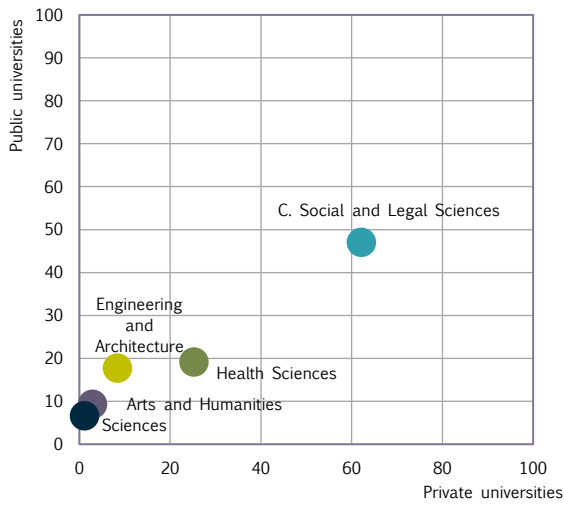


Note: Fields of study with more than 50 bachelor's graduates, ranked in descending order of percentage of women.

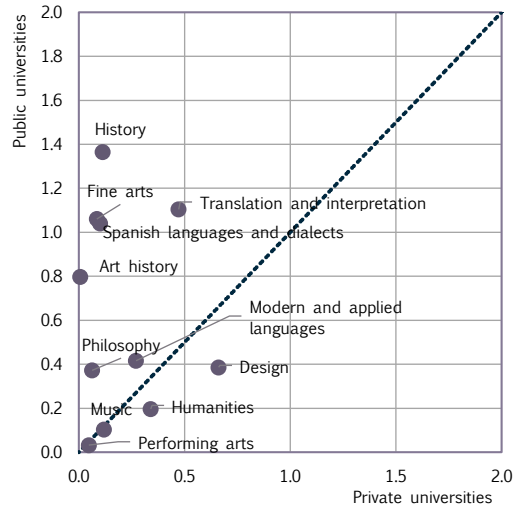
Source: Ministry of Science, Innovation and Universities (Estadística de estudiantes).

Figure 1.18. University specialization by type of university. Distribution of bachelor's graduates by branch of knowledge and field of study. 2017-2018 cohort (no. of bachelor's graduates as % of total)

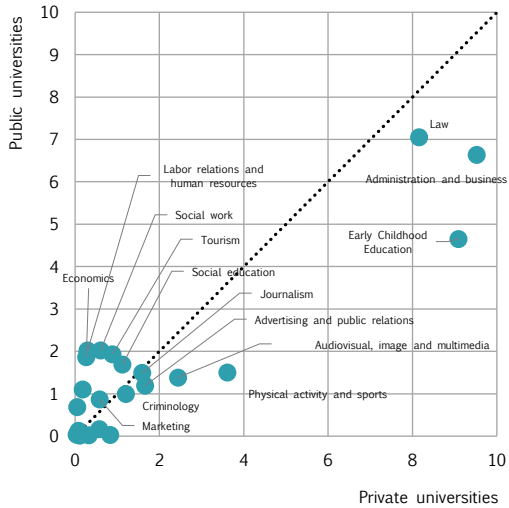
a) Total branches of knowledge



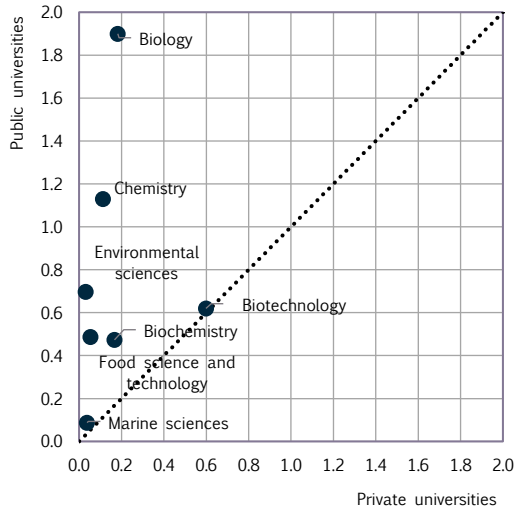
b) Arts and Humanities



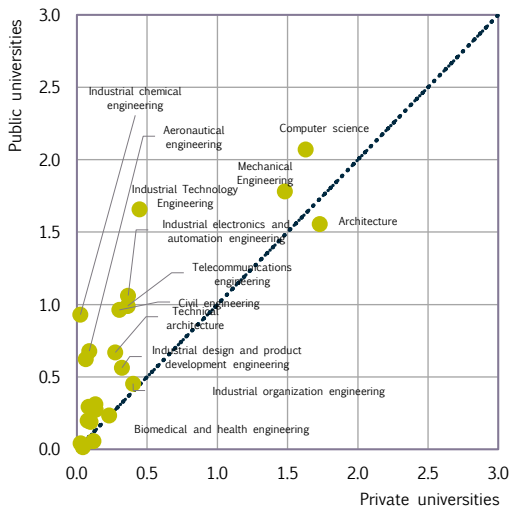
c) Social and legal sciences



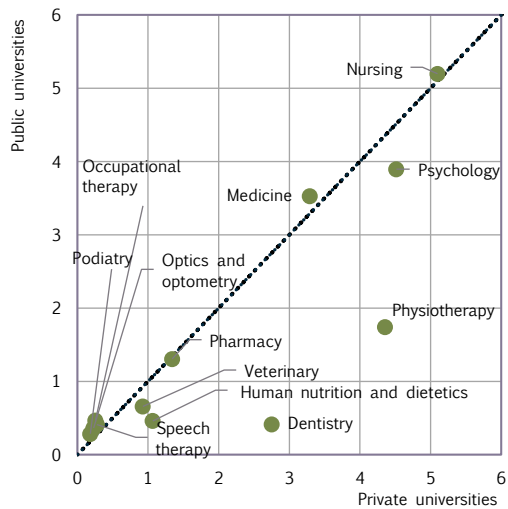
d) Sciences



e) Engineering and architecture



f) Health sciences



Source: Ministry of Science, Innovation and Universities (Estadística de estudiantes).

The main conclusions to be drawn from this outline of trends in the numbers of university graduates are that the study period saw significant growth in graduate numbers and, above all, changes in the composition of graduate cohorts, in different directions. The key takeaways are:

- The number of graduates increased significantly between 2013 and 2022, by a total of 24%, but has remained stable in recent years at around 340,744 new graduates per year.
- The increase in the number of university graduates is due to a substantial increase in the number obtaining master's degrees, whereas the number of bachelor's graduates has remained stable. Master's graduates have increased as a percentage of total graduates, currently accounting for 42% of the total.
- The private universities have increased their share of the total number of graduates, but to a much larger extent in master's degrees (81%) than in bachelor's degrees (19% in 2022).
- The composition of the graduate cohorts by branch of knowledge has changed, with a marked decrease in the share of Social sciences and law at bachelor's level (in contrast to master's level, where the share of this branch of knowledge has increased) and, above all, in Engineering and architecture, while the proportion of Health sciences graduates has increased. However, the changes in the number of graduates within each branch vary widely, with increases and decreases within each one.
- Women account for 60.5% of bachelor's graduates and 57.2% of master's graduates. The drop in number of bachelor's graduates is attributable to the lower participation of men. The number of male bachelor's graduates decreased by 13,446 (-13.3%), while the number of female bachelor's graduates in 2021-2022 was down 2,821 (-2.3%) compared to 2012-13. In master's degrees, in contrast, the number of graduates of both genders increased, although women more men (+138.8% vs. +129.1%).
- The share of men and women in each branch of knowledge varies. In Health sciences, women account for around 72% of graduates, both bachelor's and master's, while in Engineering they account for barely a third of the total.
- The general predominance of women over men among graduates is clear (roughly 60% vs. 40%) and is most pronounced in Health sciences (70% vs. 30%); only in Engineering and architecture are the proportions reversed (30%-70%). Within each branch, however, the ratio of women to men among graduates varies widely, indicating that the female or male domination of individual fields of study is highly variable.



Recent changes in graduate employment outcomes

02

Having presented the general context of the labor market in the period in which the cohorts to be analyzed graduated and the general trends in graduate numbers over that period, we now focus on the Ministry of Universities database, which adds special value to the study of employment outcomes in the first few years after graduation, namely, the statistics on graduates' Social Security status (i.e. registration when employed).

In this section, we use the information on the six cohorts analyzed over the period 2013-2022 to study the effect of the changes occurring within each cohort and between cohorts, looking at different dimensions of employment outcomes, both quantitative (status as employed, earnings) and qualitative (education-job match, type of contract). We also study the differences in employment outcomes associated with exogenous variables such as the type

of degree (bachelor's or master's, branch of knowledge) and the ownership (public or private) of the university of graduation. **Table 2.1** shows the time matrix we shall be using to analyze employment outcomes by graduate cohort and year after graduation.

The intra-cohort analysis looks at how the graduates' working lives evolve over the four years in which there has been follow-up. For example, we may consider by how much the percentage registered as employed improves between the first and fourth year after graduation. The comparison between cohorts (inter-cohort analysis) looks for clear trends in the aforementioned variables between one cohort and another, comparing the different cohorts in the same years after graduation. For example, we may compare the extent to which the percentage of each cohort registered as employed increases between the first and the fourth year after graduation.

Table 2.1. Time matrix for the analysis of graduate employment outcomes

Graduate cohort	Graduation year	Years after graduation			
		1 year	2 years	3 years	4 years
2012-2013	2013	2014	2015	2016	2017
2013-2014	2014	2015	2016	2017	2018
2014-2015	2015	2016	2017	2018	2019
2015-2016	2016	2017	2018	2019	2020
2016-2017	2017	2018	2019	2020	2021
2017-2018	2018	2019	2020	2021	2022

Source: Authors' own calculations.

2.1. The characteristics of employment outcomes: intra-cohort and inter-cohort differences

Figure 2.1 provides a good summary of the differences within and between cohorts over the decade covered by the six cohorts analyzed, panel a) for bachelor's graduates and panel b) for master's graduates. The panels display the information relating to six quantitative and qualitative employment outcome indicators. The chart shows the value of each indicator at the end of the first and fourth years after graduation, and the segment linking the square to the triangle shows the change in the variable. The cohorts are ordered chronologically from left to right.

Starting with the bachelor's degree graduates, the first measure is the labor market absorption of graduates, as indicated by Social Security registration rates, which shows a strong improvement over the four-year period for each cohort. In the first year of graduation, the registration rate ranges from 44.8% to 55.1%, while in the fourth year the figure varies between 70.6% and 77.8%. Thus: (a) the biggest impact on access to employment is in the first year of job search; (b) by the end of the four-year period the rate of employment has increased by more than 20 pp. On the other hand, the Social Security registration rate rises with each successive cohort, both in year 1 and in year 4, with the rise between the first and sixth cohorts being slightly higher in year 1 (+10.3 pp) than in year 4 (+7.2 pp). This indicator thus confirms the section 1.1 conclusion regarding the positive trends in graduate employment based on the INE Active Population Survey (EPA) data, with the added detail that the improvements in graduate Social Security registration rates are also achieved sooner.

The second employment outcomes indicator relates to the match between qualifications and occupation, which is estimated by the percentage of employed graduates in the cohort who contribute to Social Security in an occupational group appropriate to graduates. This indicator sends somewhat different messages. The graduates in each cohort improve their education-job match as their career advances (from one to four years after graduation), and the improvement has increased in the more recent cohorts (+10.7 p.p. in the 2012-2013 cohort vs. 17.9

p.p. in 2017-2018 cohort). However, part of the inter-cohort improvement occurs because the graduates' initial job fit one year after joining the labor market has worsened somewhat over time. In their first year of employment, fewer than half of the graduates are contributing to Social Security in an occupational group appropriate to their educational attainment, and the percentage drops from 47.4% for the first cohort to 44.1% for the sixth (a drop of 3.3 pp).

A second measure of employment quality is earnings, as indicated by the average assessment base for Social Security contributions⁶. The experience accumulated between the first and fourth year after graduation translates into an increase in the contribution base, and the improvement increases in successive cohorts. In the first cohort (2012-2013) the average contribution base in the fourth year after graduation is 17.7% higher than in the first year, while in the last of the cohorts (2017-2018) it is 33.5% higher. In this indicator the inter-cohort improvement is attributable to the values for year 4, as the values for year 1 are relatively stable.

The percentage of graduates who have a full-time contract is another possible indicator of job quality, except where part-time working is desired (e.g. to be able to combine work with study). Such precise analysis is not feasible with the information available, so this limitation must be taken into account when assessing these figures. With that caution, the data again indicate that the percentage of full-time contracts increases over the four years after graduation and that the improvement is greater in the more recent cohorts: 7.8 pp in the first cohort and 14.1 pp in the last. These differences have accelerated since the 2015-2016 cohort and are mainly attributable to the increase in the year 4 percentage of full-time contracts, since the year 1 percentage is lower in the last three cohorts than in the first three.

As regards the percentage of open-ended contracts, the data show a significant increase four years after graduation, ranging from 56.5% in the first cohort to 62.4% in the cohort that graduated in 2017-2018.

⁶ It is important to bear in mind, when analyzing trends, that the data on average contribution bases are given in nominal terms, without accounting for inflation. In real terms, any increases will always be smaller than in nominal terms, and any falls will always be more pronounced.

However, these results must be treated with caution, given the change in methodology from the 2014-2015 cohort onward, where the type of contract (and the type of working day, occupational group and

contribution base) is that of the longest contract recorded in March and not that of the contract held on March 23, as had been the case until then.

Figure 2.1. Employment outcomes one and four years after graduation by cohort (percentages and euros)

a) Bachelor's degree graduates

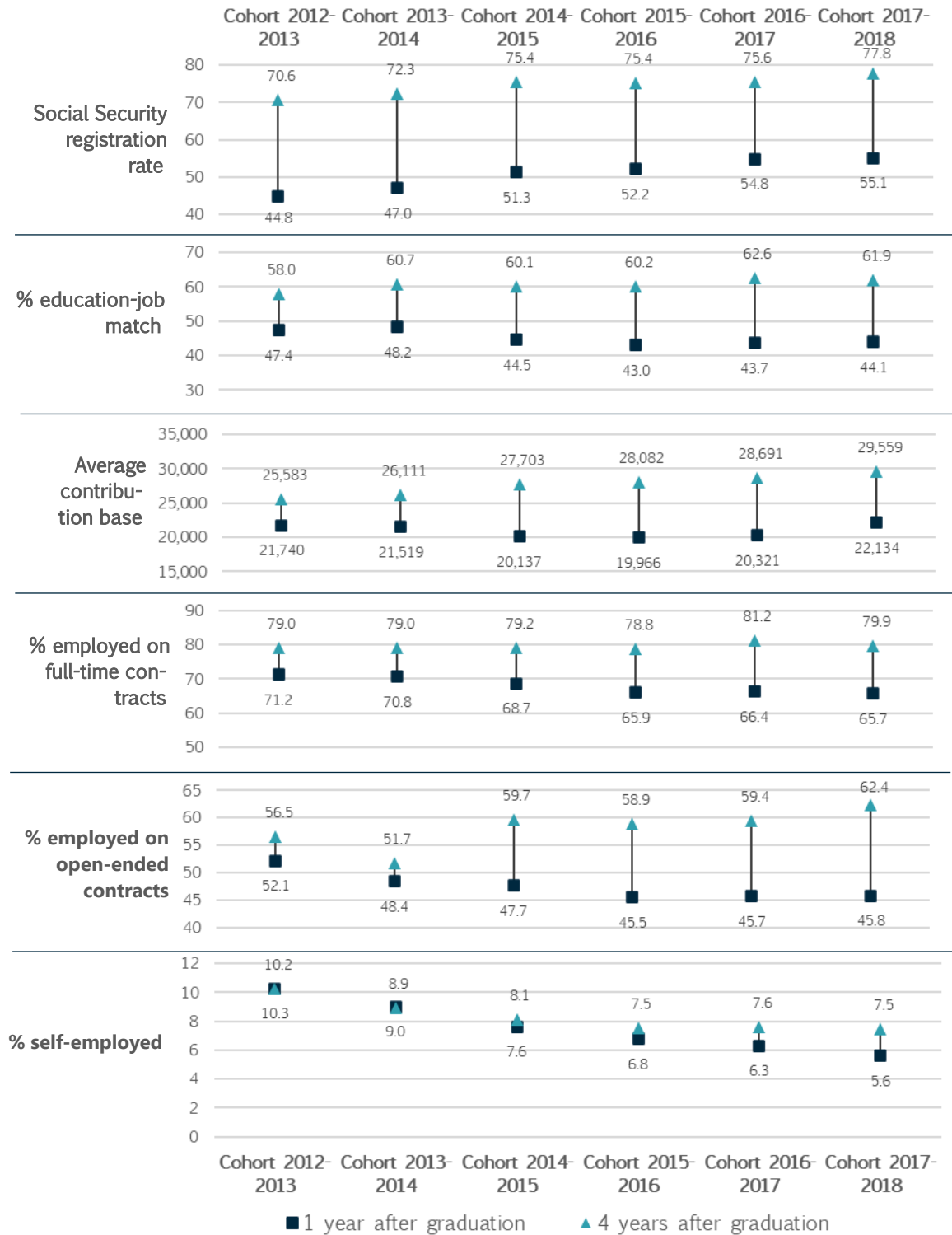
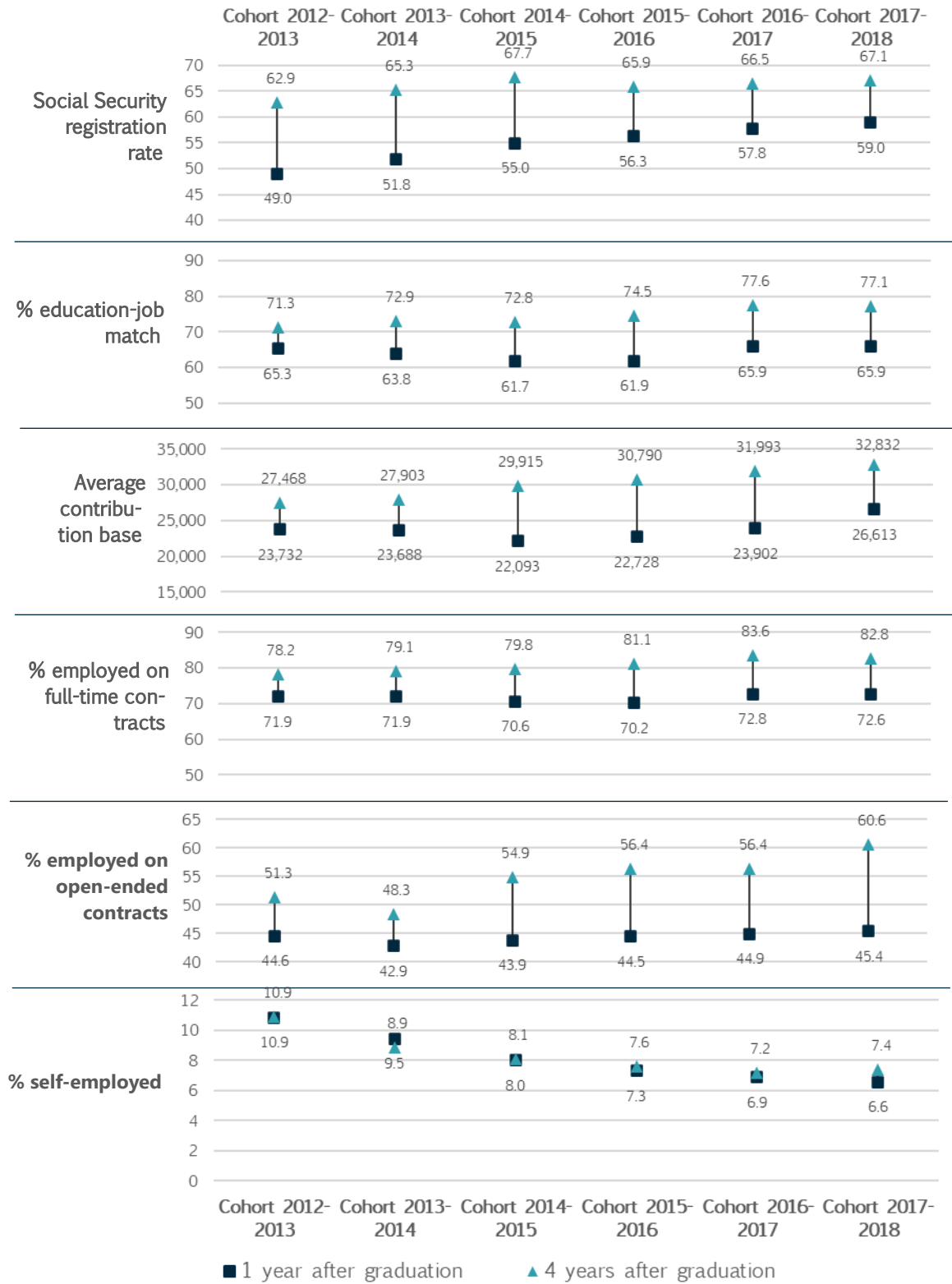


Figure 2.1. Employment outcomes one and four years after graduation by cohort (percentages and euros) (CONT.)

b) Master's degree graduates



Source: Ministry of Science, Innovation and Universities (Indicadores de afiliación a la S.S. de los egresados universitarios) and authors' own calculations.

A final feature of graduate employment outcomes that may be of interest is the percentage of self-employed. This is not in itself an indicator of job quality, since self-employment may reflect the exercise of a liberal profession or a propensity for entrepreneurship and the development of business initiatives; but it may also be an unsought alternative when unable to find an employer. Given that the study period was marked by strong job creation, especially for graduates, the decline in the percentage of self-employment across successive cohorts (around 10% in the first cohort, falling in the last cohort to 5.6 in year 1 and 7.5 in year 4) is consistent with some self-employment being unsought. On the other hand, the similarity of the year 1 and year 4 percentages may indicate that many of the self-employed are permanently self-employed for reasons relating to the way work in some professions is organized.

Panel b) of Figure 2.1 analyzes the same variables for master's graduates. Most of the conclusions are the same as set out for bachelor's graduates: employment outcomes improve over the years in two different ways. Social Security registration rates increase in successive cohorts because they start off higher in the first year and because the increase between the first and fourth years is greater, confirming that graduate employment improved significantly over the 10-year study period. The education-job match, the average contribution base and the percentage of full-time employment all improve in successive cohorts, mainly because the improvements between the first and fourth year are greater in the more recent cohorts. The percentage of self-employment does not change with each successive year after graduation, at least not in the four years considered, but decreases in the more recent cohorts, possibly because the growth in employment led to a fall in the number of university graduates who registered as self-employed for lack of a job.

To directly compare the employment indicators for bachelor's and master's graduates, **Figure 2.2** shows the figures for each cohort four years after graduation for both types of degree. It is striking that the Social Security registration rate of master's graduates is consistently lower than that of bachelor's graduates, since such a gap in employability is un-

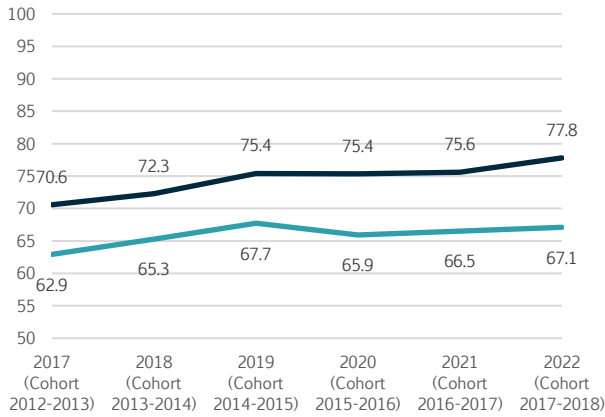
expected⁷. One possible explanation for this finding, as pointed out in the previous chapter (Figure 1.12), is the large proportion of international students among master's graduates (23% in the 2021-2022 academic year). Since our employment indicator is Social Security status in Spain, any graduates who work abroad after graduation or who do not register with Spanish Social Security for any other reason are excluded. A majority of foreign master's graduates are likely to return to their home countries after graduation and this is probably a cause of the anomalous result. This hypothesis is confirmed if we focus exclusively on Spanish national graduates: as **Figure 2.3** shows, the Social Security registration rate four years after graduation is higher among master's than among bachelor's graduates, in both cases with the increasing inter-cohort trend noted earlier.

For the rest of the indicators, panels b) to f) of Figure 2.2 show that education-job match, contribution base and percentage of full-time employment are invariably higher among master's graduates than among bachelor's graduates. Significant differences are observed in average contribution bases, which increase both intra-cohort and inter-cohort, indicating a positive earnings gap for the higher educational attainment. Education-job match also improves substantially after completing a master's degree, and the differential increases in successive cohorts, from 13 pp to 15 pp. This trend may be an indication that the labor market gives greater recognition to a master's degree. In contrast, bachelor's graduates enjoy a slight advantage in percentage of open-ended contracts. In percentage of self-employed there are no significant differences between bachelor's and master's graduates, and the decreasing trend noted earlier is observed at both levels.

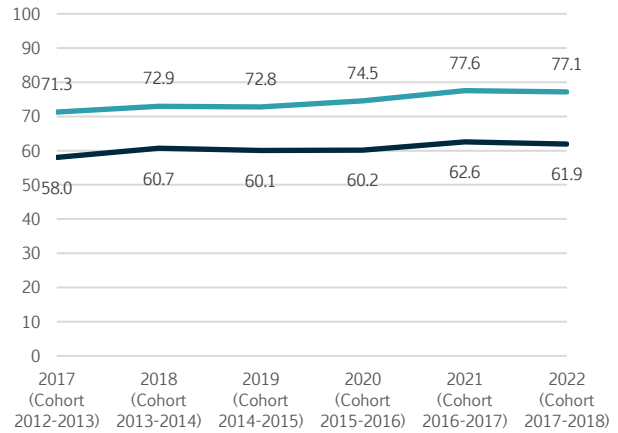
⁷ Labor Force Survey (EPA) data show that in 2023 the employment rate of the population with a bachelor's degree or equivalent was 69%, compared to 73% for the population that has completed a master's degree. Among the population aged 22-29, the equivalent rates are 69% and 78%, respectively.

Figure 2.2. Trends in employment outcome indicators four years after graduation. Differences by level of education and graduation cohort (percentages and euros)

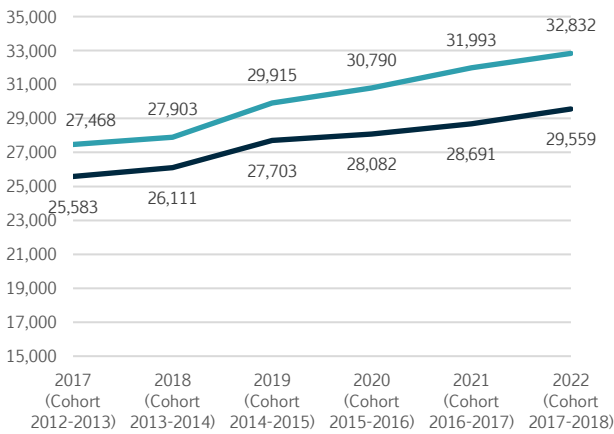
a) Social Security registration rate (percentage)



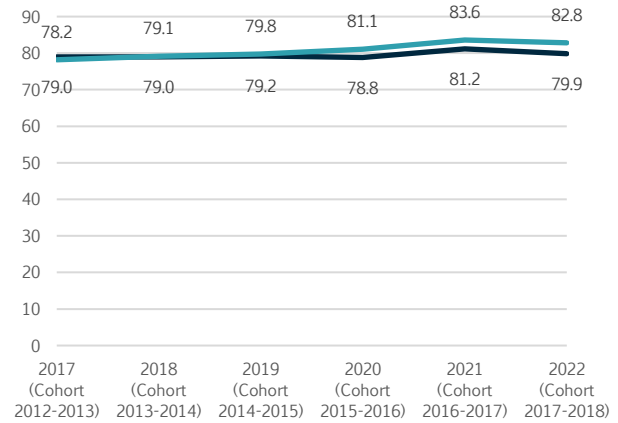
b) Education-job match (percentage)



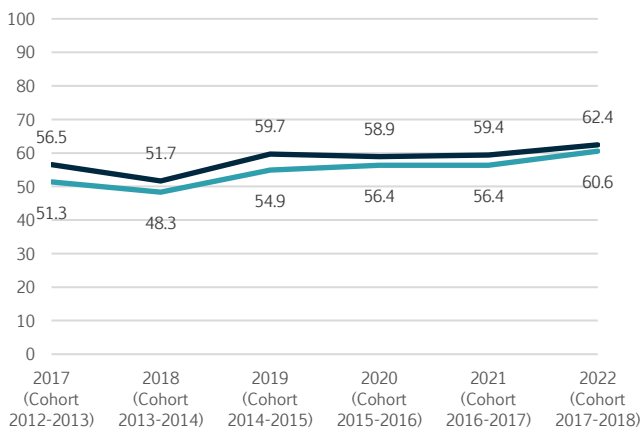
c) Average contribution base (euros)



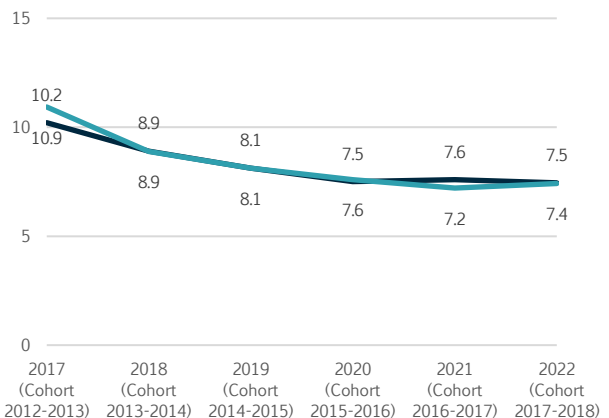
d) Full-time employment (percentage)



e) Open-ended contracts (percentage)



f) Self-employment (percentage)

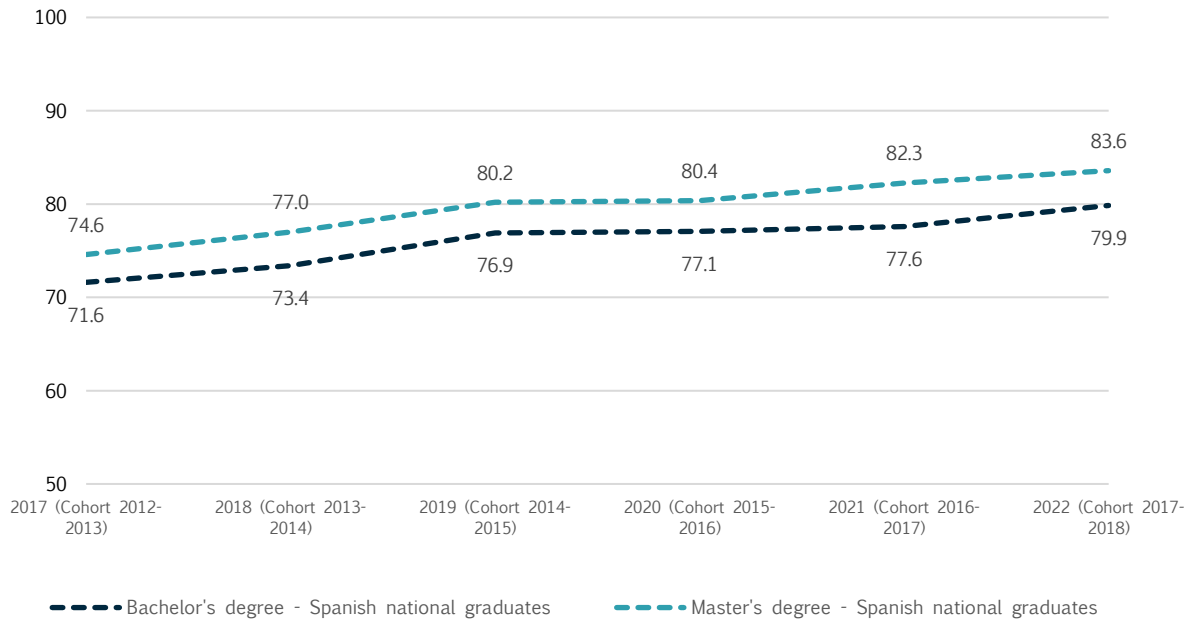


— Bachelor's degree

— Master's degree

Source: Ministry of Science, Innovation and Universities (Indicadores de afiliación a la S.S. de los egresados universitarios).

Figure 2.3. Trends in graduate Social Security registration rates four years after graduation by level of education and nationality (percentage)



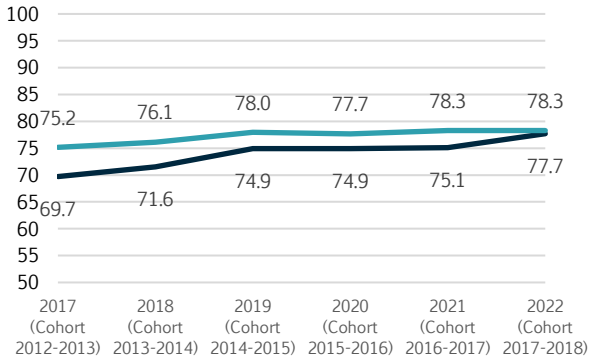
Source: Ministry of Science, Innovation and Universities (Indicadores de afiliación a la S.S. de los egresados universitarios).

A variable of interest when analyzing employment outcomes is the influence of the type of ownership (public or private) of the university from which the students graduate. **Figure 2.4** shows the relevant analysis for bachelor's degrees and **Figure 2.5** for master's degrees. For bachelor's degrees, the main conclusion as regards the Social Security registration rate (panel a), which in the first cohorts analyzed is higher in private than in public universities, is that the rates have converged in a context in which both type of university have experienced growth. No such convergence is observed in other qualitative indicators: both in education-job match (panel b) and in average contribution base (panel c), the advantage enjoyed by graduates of private universities remains constant in each successive cohort. Education-job match is approximately 12 pp higher in private universities and the average contribution base is around 3,400 euros per year higher. Although the average contribution base has risen in both types of university, there has been no convergence. As regards full-time employment and open-ended contracts, there is very little difference between the public and private universities, the figures having remained fairly stable over the study period. The percentage of self-employment has declined steadily with each successive cohort and is low in both public and private universities, though consistently higher (around 5 pp higher) in the private sector.

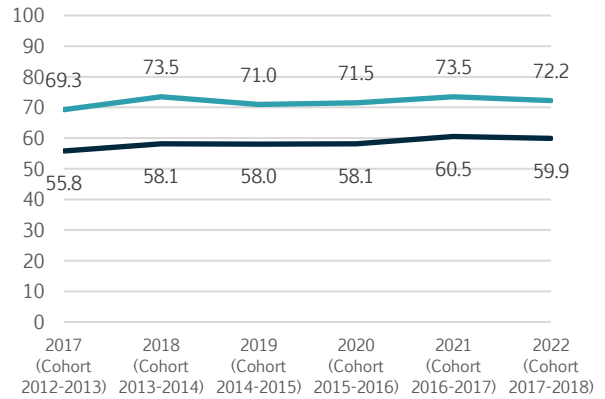
The conclusions are much the same for master's graduates. The Social Security registration rate is very similar in public and private universities, and the advantage enjoyed by graduates of private universities has declined. Average contribution base and education-job match are still higher in the private universities, with differences similar to those observed among bachelor's graduates. The percentages of full-time employment and open-ended contracts also converge, becoming almost identical in the last cohort, although the convergence is more marked in open-ended contracts, given that the differences in favor of private universities were more pronounced in the first cohorts. Finally, the same decreasing trend in self-employment is observed among master's graduates as among bachelor's graduates, with private universities having higher percentages (around 2.2 pp higher) in the last cohort.

Figure 2.4. Trends in employment outcome indicators for bachelor's graduates four years after graduation. Differences by type of university and graduation cohort

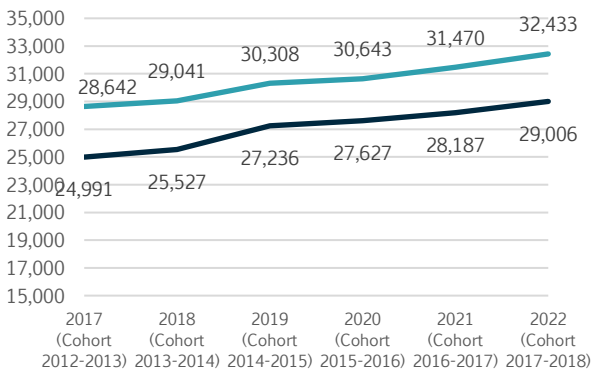
a) Social Security registration rate (percentage)



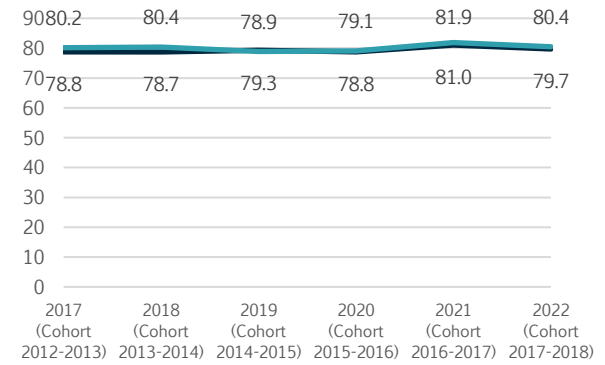
b) Education-job match (percentage)



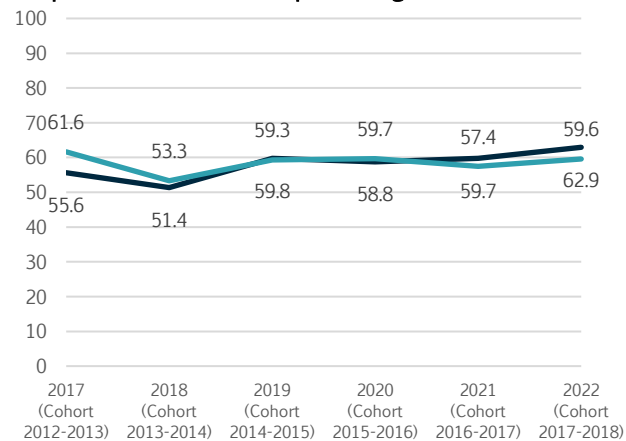
c) Average contribution base (euros)



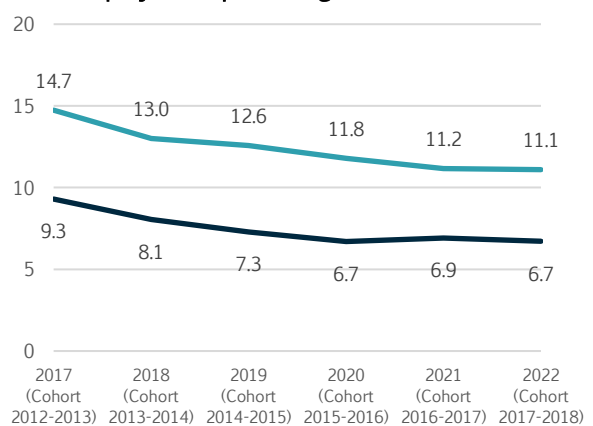
d) Full-time employment (percentage)



e) Open-ended contracts (percentage)



f) Self-employment (percentage)



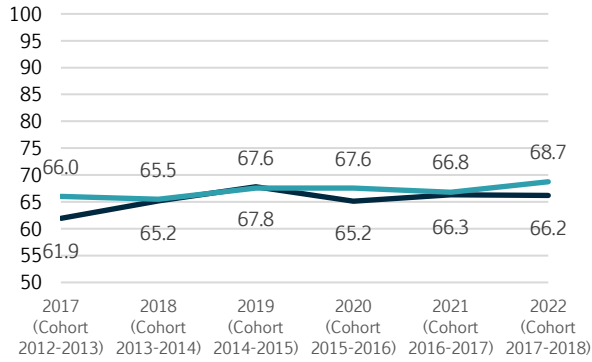
Public universities

Private universities

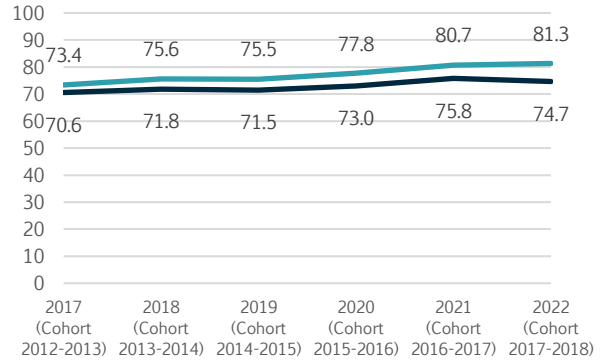
Source: Ministry of Science, Innovation and Universities (Indicadores de afiliación a la S.S. de los egresados universitarios).

Figure 2.5. Trends in employment outcome indicators for master's graduates four years after graduation. Differences by type of university and graduation cohort

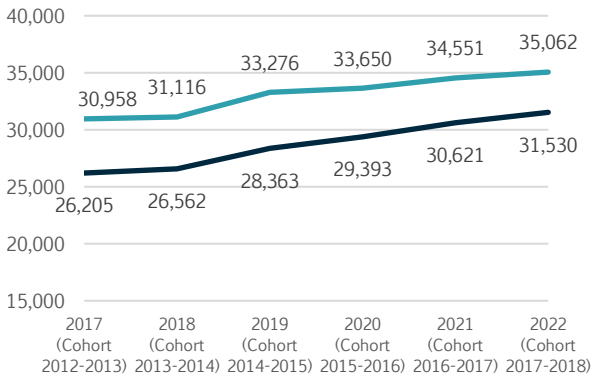
a) Social Security registration rate (percentage)



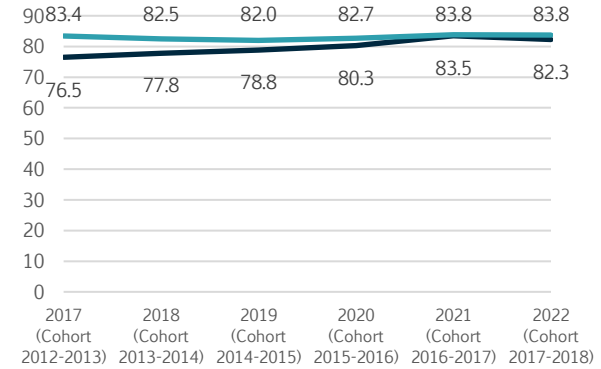
b) Education-job match (percentage)



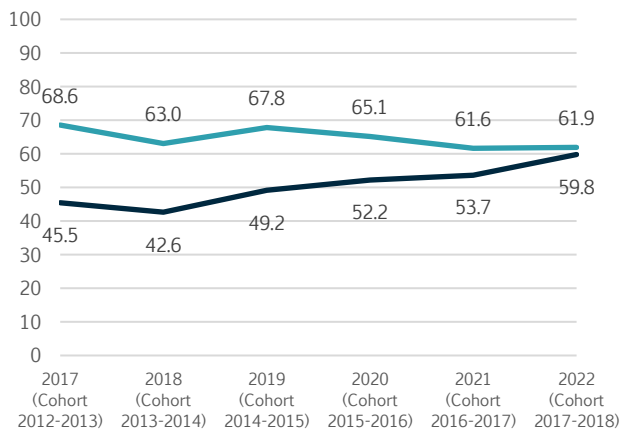
c) Average contribution base (euros)



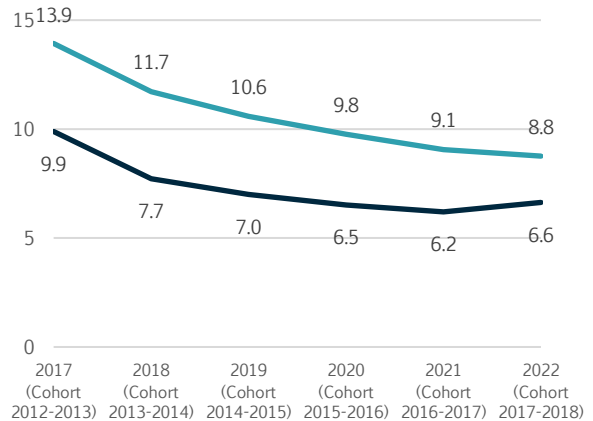
d) Full-time employment (percentage)



e) Open-ended contracts (percentage)



f) Self-employment (percentage)



Public universities

Private universities

Source: Ministry of Science, Innovation and Universities (Indicadores de afiliación a la S.S. de los egresados universitarios).

The last variable we analyze for its impact on employment outcomes is the branch of knowledge. The question we ask is to what extent the results we have presented are similar across branches of knowledge or whether there are significant differences between branches. Once again we divide our analysis between bachelor's graduates (**Figure 2.6**) and master's graduates (**Figure 2.7**).

Starting with bachelor's graduates, the first thing to note is that in none of the branches do the changes in employment outcome differ in sign from the aggregate, although there are differences in level between branches. Two branches stand out in qualitative and quantitative terms, namely, Health sciences and Engineering and architecture. Both outperform the rest in terms of Social Security registration rate and reach a very similar average contribution base. They are also the two top-performing branches in terms of education-job match, although Health sciences has significantly better results, reaching almost 90%. It would seem that in Health sciences, probably because of the nature of the largely public sector employers, graduates almost always have a contribution base that reflects their university qualifications. In contrast, the percentage of open-ended contracts in Health sciences is notably the lowest of all the branches. This contradiction, given that the rest of the indicators for this branch reflect a high quality of employment, is explained by the fact that in the years after graduating a significant number of bachelor's graduates in Health sciences (Medicine, Pharmacy and Psychology) undertake a residency program, which may last for a number of years, without an open-ended contract. The percentage of self-employment, though decreasing as in all the branches, is also highest in Health sciences, owing to the tradition of professional practice in fields such as dentistry, ophthalmology, pharmacy, physiotherapy and podiatry, where public health service coverage is limited.

Although all the other branches lag behind the previous two, the levels of Social Security registration

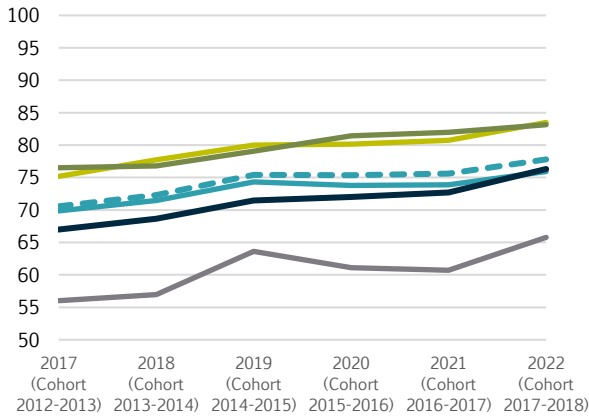
are similar for Sciences and Social sciences and law, and markedly lower for Arts and humanities, which also has the lowest percentage of full-time employment. In other indicators the disadvantages are apparent also in other branches: in Social sciences and law, as well as Arts and humanities, for education-job match; and in Sciences for average contribution base. Sciences have the lowest percentage of self-employment.

The main differences with respect to master's graduates are as follows: the Social Security registration rates of Social sciences and law and Sciences are equal to those of Engineering and architecture, while Health sciences leads the field; and education-job match is more similar across branches, again led by Health sciences. The average contribution base has also increased in successive cohorts, as it has for bachelor's graduates, although the three branches with the highest contribution bases (Health sciences, Engineering and architecture and Social sciences and law) are at a more similar level. The biggest difference with respect to bachelor's graduates is in the percentage of self-employment in the Health sciences branch, which, unlike in the other branches, increases in the more recent cohorts of master's graduates.

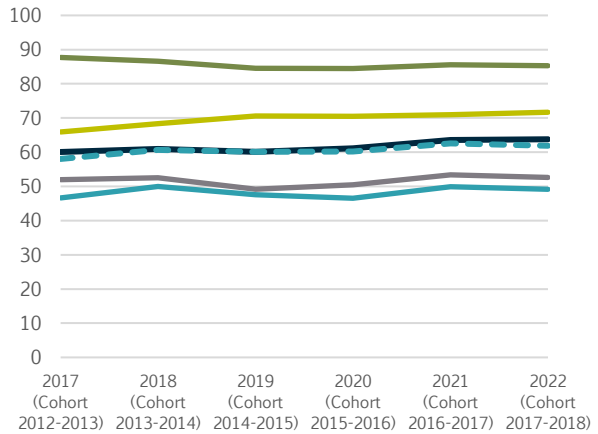
To make it easier to appreciate the essential differences between the bachelor's and master's indicators, **Figure 2.8** shows the values of the employment outcome indicators for the last cohort, by branch of knowledge. In addition to the aforementioned distortion in the Social Security registration rate caused by the share of foreign graduates, which appears to be smaller among master's graduates owing to greater mobility, we see that, in all branches of knowledge, a master's degree is associated with higher earnings and better education-job match. These differences are more pronounced in the branches that have a larger proportion of qualifying master's degrees, namely, Social sciences and law and Engineering and architecture.

Figure 2.6. Trends in employment outcome indicators for bachelor's graduates four years after graduation. Differences by branch of knowledge and graduation cohort

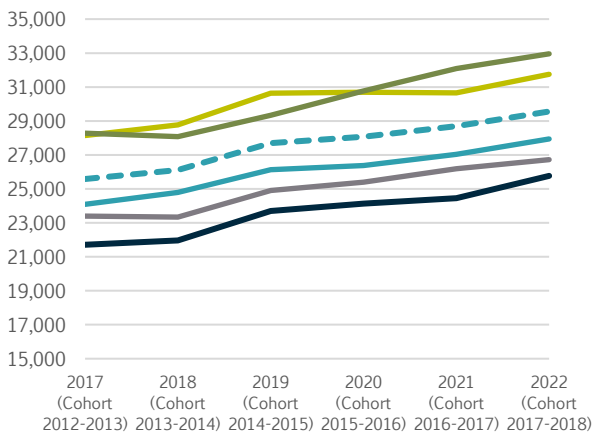
a) Social Security registration rate (percentage)



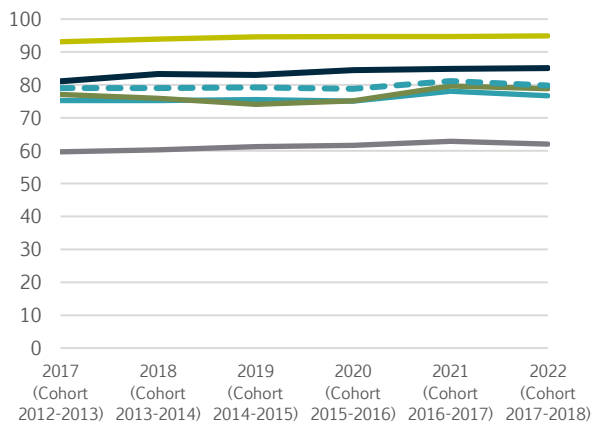
b) Education-job match (percentage)



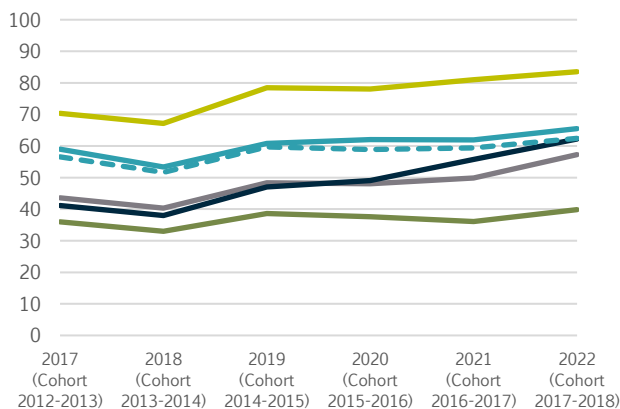
c) Average contribution base (euros)



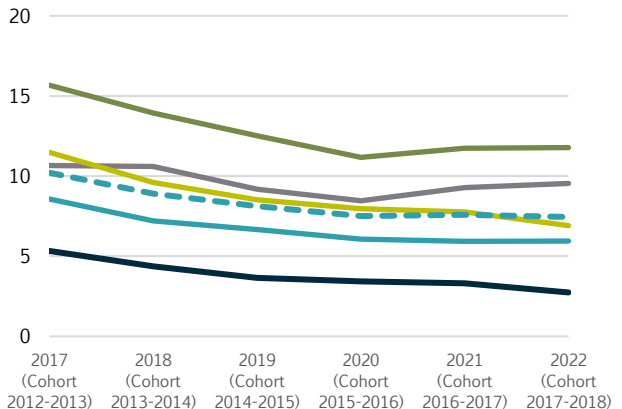
d) Full-time employment (percentage)



d) Open-ended contracts (percentage)



e) Self-employment (percentage)

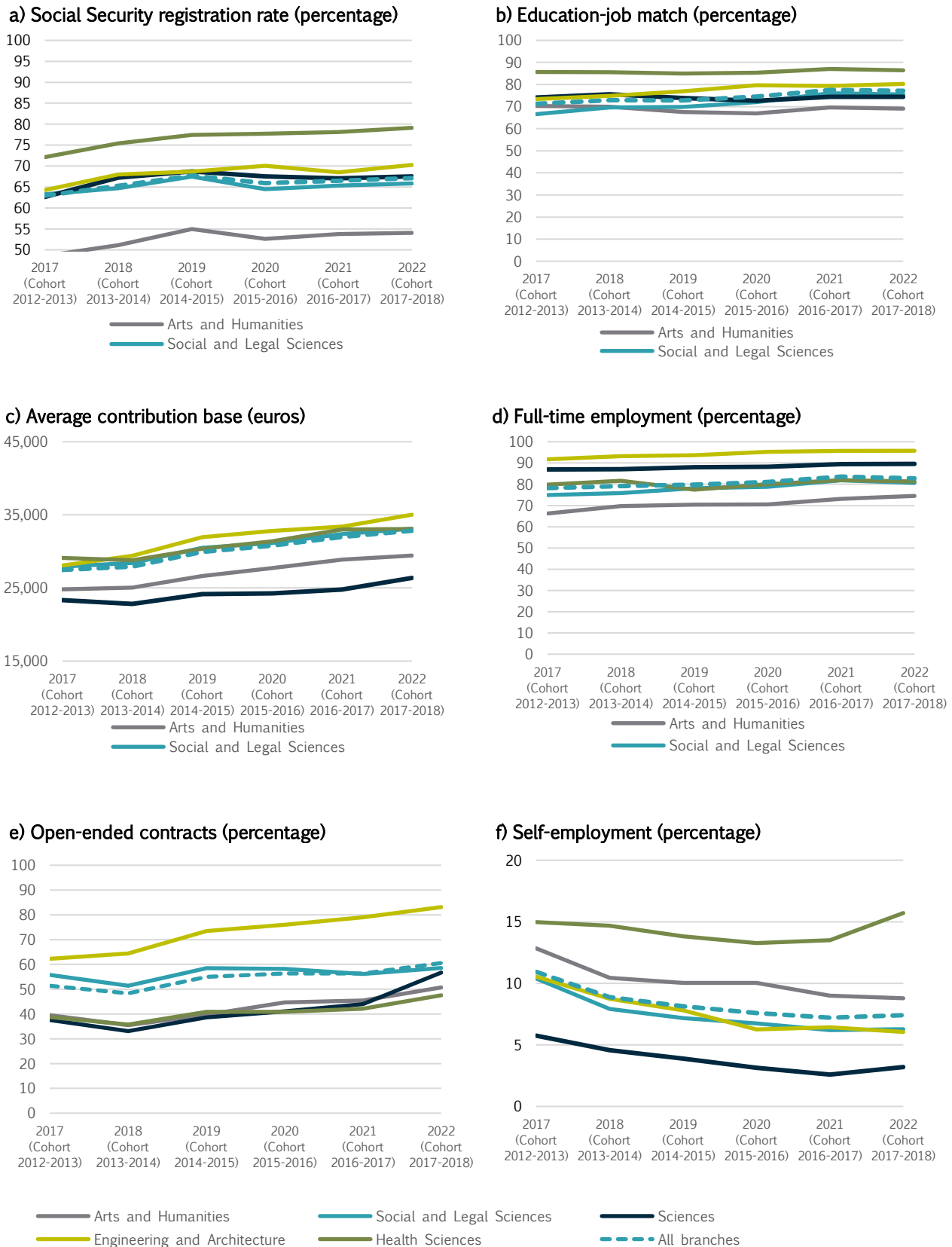


Arts and Humanities
 Social and Legal Sciences
 Sciences

 Engineering and Architecture
 Health Sciences
 All branches

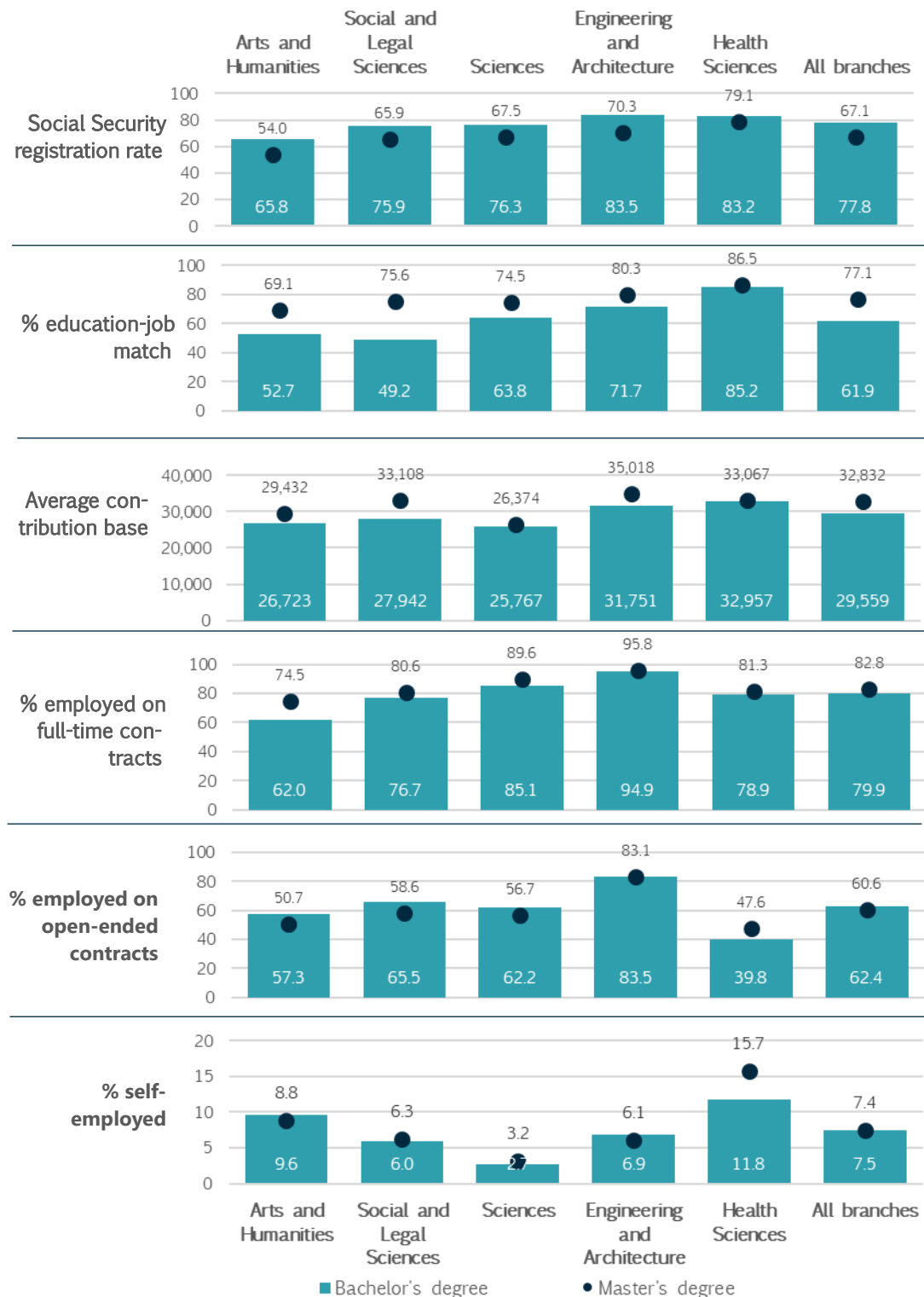
Source: Ministry of Science, Innovation and Universities (Indicadores de afiliación a la S.S. de los egresados universitarios).

Figure 2.7. Trends in employment outcome indicators for master's graduates four years after graduation. Differences by branch of knowledge and graduation cohort



Source: Ministry of Science, Innovation and Universities (Indicadores de afiliación a la S.S. de los egresados universitarios).

Figure 2.8. Employment outcomes four years after graduation by branch of knowledge and type of degree. Situation of the 2017-18 cohort in 2022



Source: Ministry of Science, Innovation and Universities (Indicadores de afiliación a la S.S. de los egresados universitarios).

The general conclusions of our analysis of the changes in employment outcomes over time in each cohort, and in successive cohorts, are as follows:

- All the indicators show clear improvements in Social Security registration rates over time within each cohort, confirming the positive messages for recent graduates indicated in Chapter 1.
- Employment outcomes also improve with each successive cohort. Four years after graduation, the graduates in the last cohort have results that are either better than all the previous cohorts (Social Security registration rate, average contribution base and open-ended contracts) or practically the same as the 2016-17 cohort (education-job match, full-time employment and self-employment).
- The positive effects across the six cohorts are apparent mainly in the Social Security registration rate, possibly because graduates' opportunities improve thanks to the general growth in employment. They are also apparent in the percentage of open-ended contracts four years after graduation.
- The patterns are fairly similar among bachelor's and master's graduates, with better results among the master's graduates, especially in education-job match and average contribution base and especially in the branches with a larger proportion of qualifying master's degrees (Social sciences and law and Engineering and architecture).
- Graduates of private universities enjoy stable employment advantages compared to graduates of public universities in average contribution base and education-job match (master's graduates to a lesser extent than bachelor's graduates), but not in Social Security registration rate or the other indicators. The percentage of self-employment is declining among graduates of both types of university but is higher among graduates of private universities.
- The differences in employment outcome indicators between branches of knowledge persist over time, and all branches share in the gen-

eral improvement trends, each at its own level. The Health sciences and Engineering and architecture branches have the best Social Security registration rates and average contribution bases, while Arts and humanities performs worst in the most indicators.

2.2. Trends in employment by field of study

In the previous section we analyzed the trends in the various employment outcome indicators in general and by type of university and branch of knowledge. However, each branch of knowledge comprises a potentially diverse set of degree programs that may have very different results in terms of graduate employment. We therefore need to explore the employment outcomes of the different degree programs in more detail. To do that, we use the classification provided by the Ministry, in which degrees are grouped into homogeneous fields of study: a total of 122⁸ in the case of bachelor's degrees⁹.

Since the volume of information to be presented is large, given that there are many fields of study, and, as shown in the previous section, the trends over time reveal no fluctuations, the analysis focuses on the first (2012-2013) and last (2017-2018) cohorts in their fourth year after graduation, i.e., 2017 and 2022, respectively. For each of the six employment outcome indicators used in the previous section (Social Security registration rate, education-job match, average contribution base, percentage of full-time employment, percentage of open-ended contracts and percentage of self-employment) the fields of study, grouped by branch of knowledge, are ordered based on the most recent value of the indicator (year 4, last cohort), represented by a dot. The initial value of the indicator (year 4, first

⁸ In 111 of these fields it is possible to compare the results of the 2012-13 cohort with those of 2017-18.

⁹ Since the Ministry does not provide a direct equivalence between fields of study and branches of knowledge and not all universities associate a given degree with the same field of study or branch of knowledge (e.g. some universities assign the degree in Nutrition and dietetics to the field of Science, whereas others assign it to Health sciences), the analysis in this section is based on its own classification, which resolves these dilemmas by assigning the degree in question to the branch of knowledge to which degrees are most commonly assigned.

cohort) is shown by a horizontal bar, and the change between the two years (2017 and 2022) is given in percentage points. For each branch of knowledge the ranking also shows the average value of the indicator for all the fields in that branch and the average for all the branches (labeled “TOTAL”).

Figure 2.9 shows the results for the Social Security registration rate indicator by field of study, with a separate panel for each branch of knowledge. The key points are:

- In Arts and humanities, the Social Security registration rate is below the average in all the fields of study. The new degrees introduced during the study period (which for that reason lack the horizontal bar for the initial year), such as Cultural studies and management and Performing arts, achieve higher rates than many other degrees in the same branch. In contrast, the more traditional degrees (History, Art history, Philosophy, Fine arts) show worse results. Overall, all the fields in this branch improved their results over the period covered by the cohorts analyzed, with an average improvement of nearly 10 pp.
- Owing to the explosion of data science in recent years, the ranking by Social Security registration rate in the Sciences branch is headed by the fields most closely linked to this discipline, namely, Statistics and Mathematics, with an improvement of 10.9 and 8.4 pp, respectively, between the first and last cohorts, against the background of a general improvement in this indicator in the Sciences branch.
- Medicine leads the Health sciences fields in this indicator, where Nursing has experienced strong growth of more than 24 pp, reaching second position. Only Podiatry, Physiotherapy and Dentistry have worse Social Security registration rates than at the beginning of the period.
- In Social sciences and law, unlike in Arts and humanities, the new degrees introduced during the period (Hotel management, Occupational health and safety, Gastronomy and Culinary arts) do not rank high in this indicator. Some of the more traditional degrees in this branch, such as Economics, Sociology, Geography and Law, have results below the average for the branch as a whole¹⁰.
- In Engineering and architecture, almost all the fields have Social Security registration rates above the overall average for all the branches, although Architecture is one of the few more traditional fields with below-average results, along with some engineering degrees linked to the naval sector. Computer science in its different versions (Computer science and Computer engineering) leads the ranking in this indicator, together with Electrical engineering. The increase in the Social Security registration rate in this branch is high in general (+8.3 pp), despite the already high levels at the start of the period.

Education-job match is measured through the Social Security contribution group to which a registered worker is assigned. As can be seen in **Figure 2.10**, the fit has seen a modest improvement over the study period, although in some branches (e.g. Health sciences) any improvement was going to be difficult, as the starting average was already very high.

- Health sciences and Engineering and architecture have a high proportion of regulated degrees. Given the definition of the indicator, the percentage of graduates working in positions aligned with their university degree is necessarily going to be high, as in many cases professional association membership is mandatory. Medicine, Nursing and Dentistry thus lead the education-job match ranking in Health sciences, and the same applies to engineering degrees in which the signing of project documents plays a fundamental role (Civil engineering, Electrical engineering, Electronic engineering, etc.).
- Many of the employment opportunities for philology graduates are in teaching, in which both public and private-sector employers must contribute for their teaching staff in the appropriate contribution group. This probably explains why in the Arts and humanities branch

¹⁰ It should be noted that Law is a degree in which there tends to be a large proportion of contributors to mutual insurance schemes, rather than to Social Security, thus reducing the Social Security registration rate.

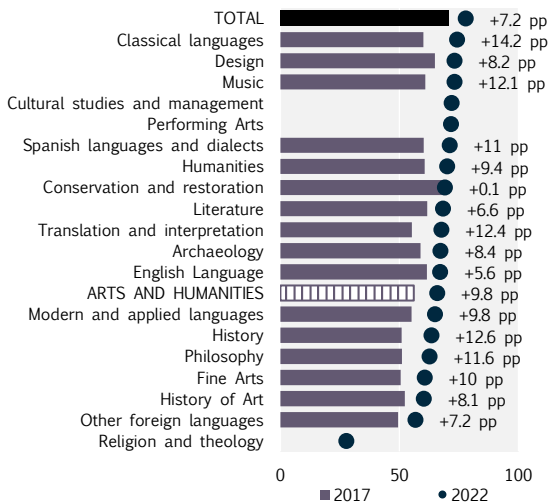
the job fit ranking is led by language-related fields (Classical languages, Spanish languages and dialects, English language), alongside Primary and early childhood education in the branch of Social sciences and law. Data from the Spanish graduate employment outcome survey EILU confirm this hypothesis, insofar as the percentage of bachelor's graduates reported to be working as "teaching professionals" five years after graduation is 69% for graduates in Spanish languages and dialects and 59% for graduates in Classical languages.

Also, 49% of Philosophy graduates work in teaching.

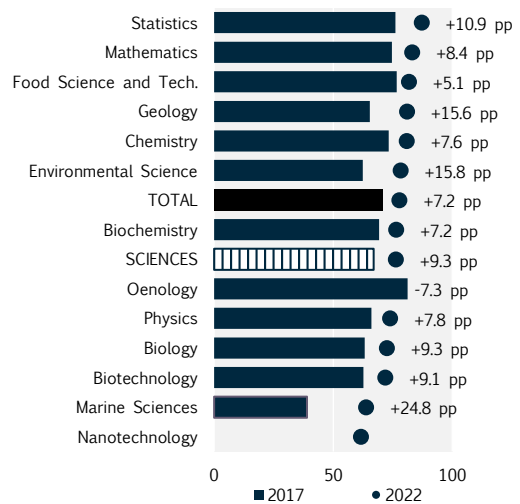
- The fact that employment in sectors such as hospitality and tourism is often seasonal and temporary makes for a lower job quality profile. This explains why the Social sciences fields most closely linked to these sectors (Tourism, Hotel management, Protocol and events, Gastronomy and Culinary arts) have the worst results in the education-job match indicator.

Figure 2.9. Social Security registration rate of university graduates four years after graduation by branch of knowledge and field of study. 2012-13 cohort and 2017-2018 cohort. Situation in 2017 and 2022 (percentages)

a) Arts and humanities



b) Sciences



c) Health Sciences

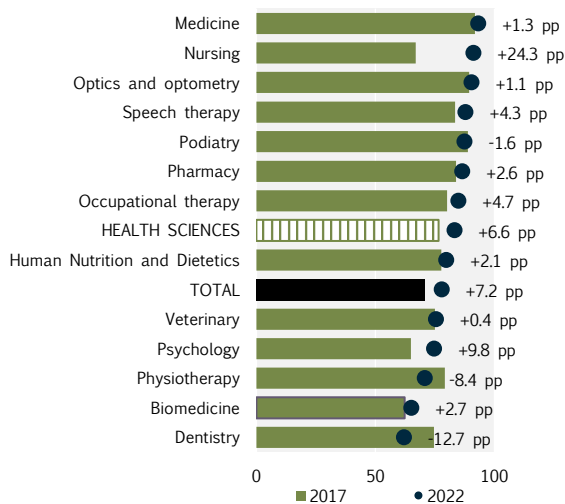
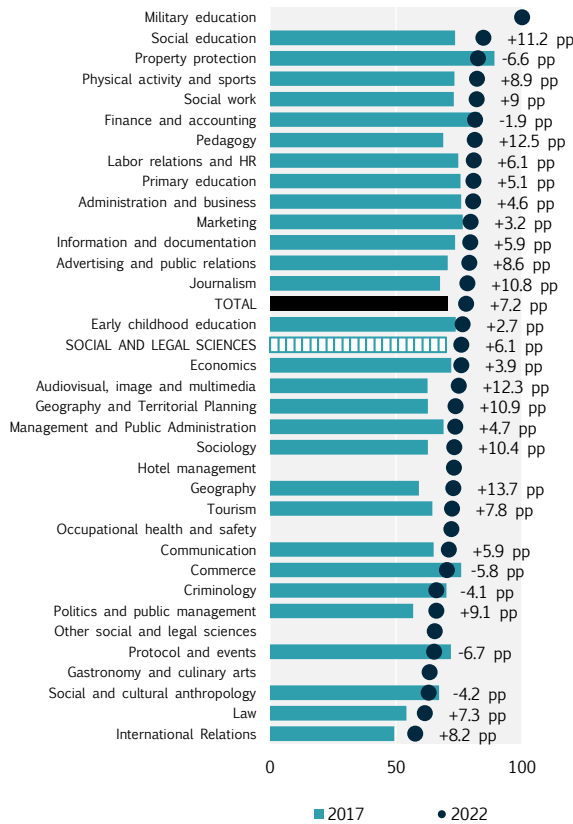
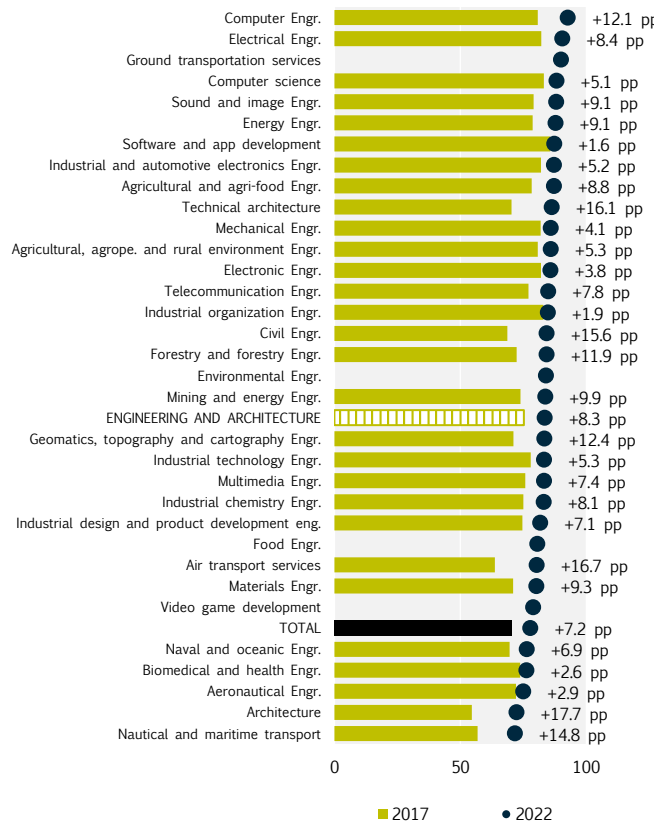


Figure 2.9. Social Security registration rate of university graduates four years after graduation by branch of knowledge and field of study. 2012-13 cohort and 2017-2018 cohort. Situation in 2017 and 2022 (percentages) (CONT.)

d) Social and Legal Sciences



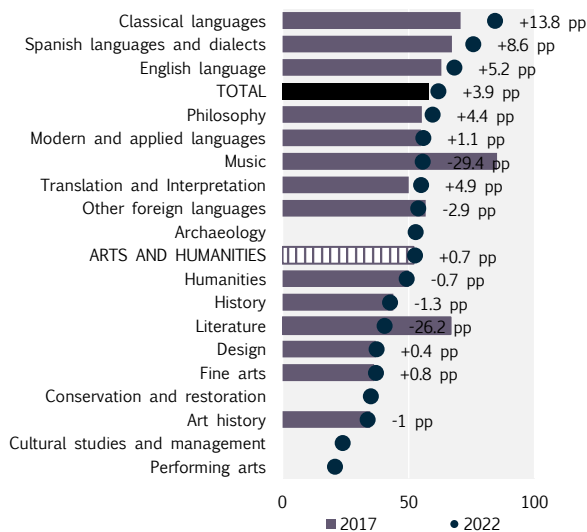
e) Engineering and Architecture



Note: Ranked from highest to lowest Social Security registration rate in 2022.
Source: Ministry of Science, Innovation and Universities (Indicadores de afiliación a la S.S. de los egresados universitarios).

Figure 2.10. Percentage of employed graduates with a contract appropriate to their qualifications four years after graduation by branch of knowledge and field of study. 2012-13 cohort and 2017-2018 cohort. Situation in 2017 and 2022 (percentages)

a) Arts and Humanities



b) Sciences

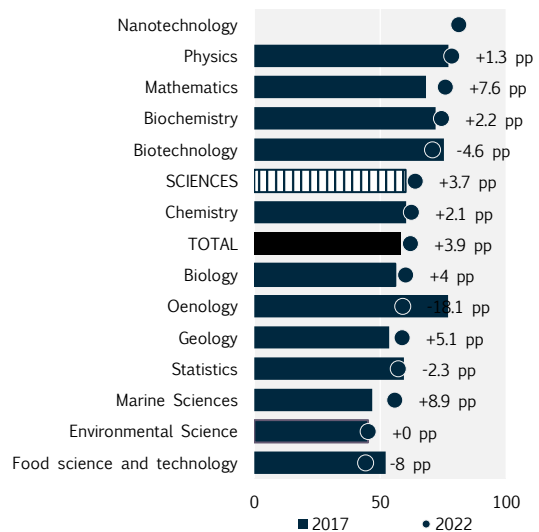
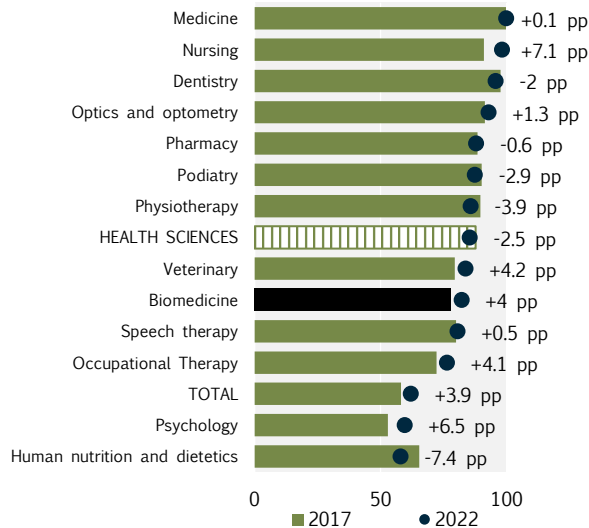
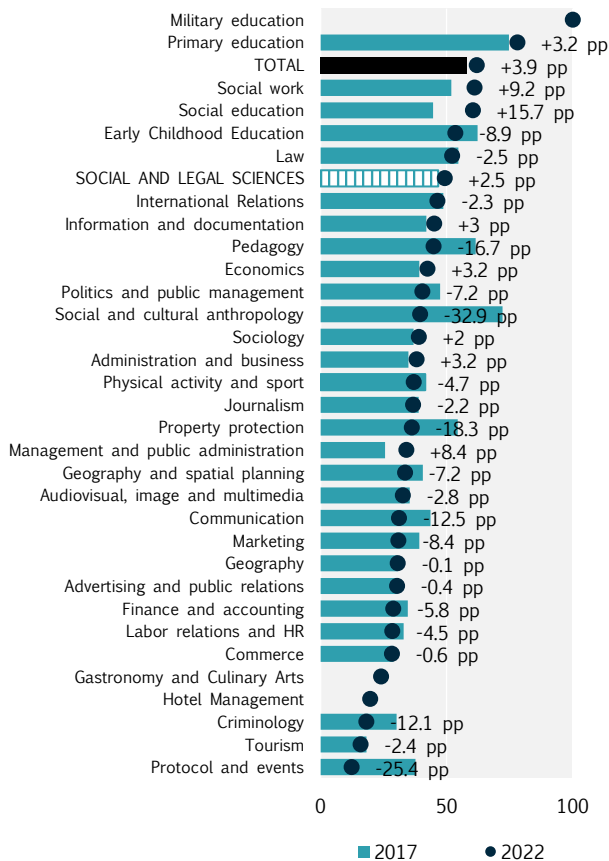


Figure 2.10. Percentage of employed graduates with a contract appropriate to their qualifications four years after graduation by branch of knowledge and field of study. 2012-13 cohort and 2017-2018 cohort. Situation in 2017 and 2022 (percentages) (CONT.)

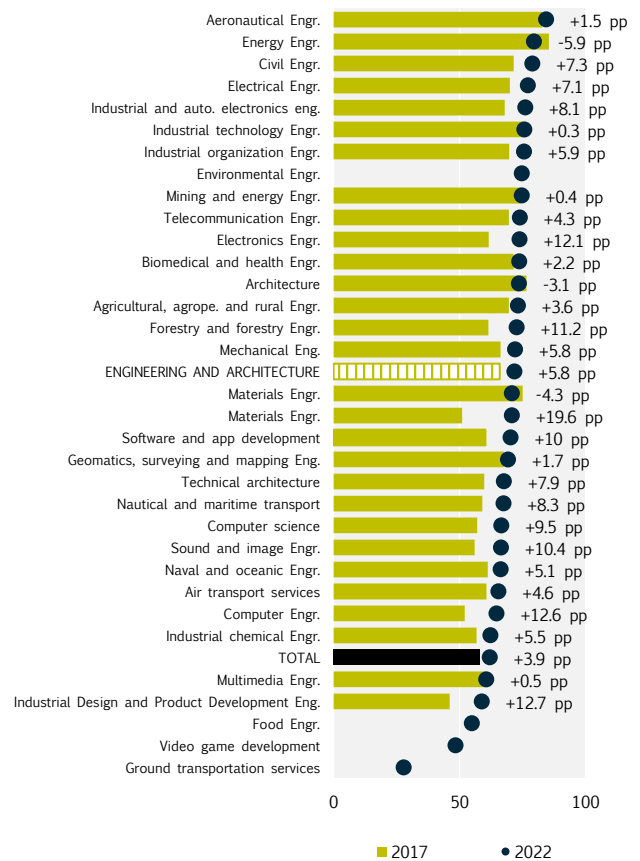
c) Health Sciences



d) Social and Legal Sciences



e) Engineering and Architecture



Note: Ranked from highest to lowest adjustment in 2022.

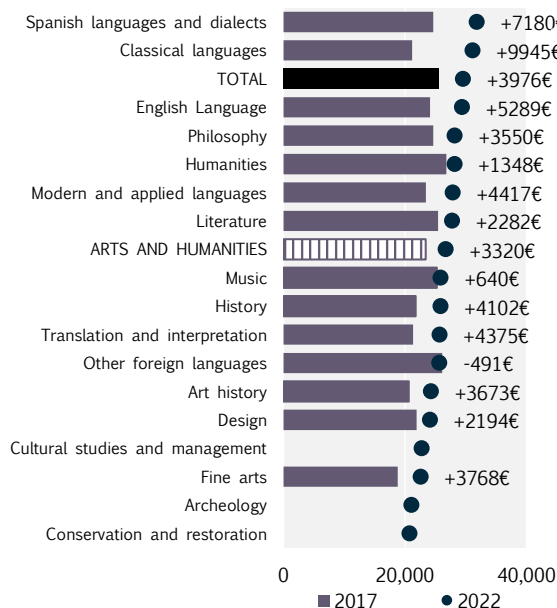
Source: Ministry of Science, Innovation and Universities (Indicadores de afiliación a la S.S. de los egresados universitarios).

The average contribution base serves as a proxy for graduate earnings. Overall, as we saw earlier and as **Figure 2.11** shows, the average contribution base has improved in all branches and most fields, but there are major differences between branches and between fields of study in absolute level and rate of change:

- The Health sciences and Engineering and architecture branches have average contribution bases above the overall average for all the branches, while the rest of the branches fall below the general average.
- Two factors, relating to labor market demand and the supply of graduates, appear to determine the different earnings levels.
 - On the one hand, the demand for Engineering and architecture graduates is high, and new degrees such as Computer engineering and degrees linked to it such as Computer science and Software development lead the ranking by average contribution base. At the same time, in many of these fields the supply of graduates has not increased and in some has even decreased, as there is little demand for these degrees among students, especially women, resulting in a shortage of graduates.
 - A second factor that may be influencing the contribution base in some degrees is the proportion of public-sector employment. Secondary school teaching is the main source of demand for philology and philosophy degrees, which explains why these fields have above-average contribution bases in the Arts and humanities branch, as confirmed by the EILU data mentioned earlier in relation to education-job match.
- A combination of these two factors, namely, high labor market demand and a significant proportion of public-sector employment, probably contribute to Medicine and Nursing having the highest earnings in the Health sciences branch.
- In the Social sciences and law branch, public-sector employment contributes to the high ranking of Primary education. The more traditional degrees in this branch, such as Business administration, Economics and Law, rank high, while degrees linked to the tourism sector appear towards the bottom.

Figure 2.11. Average contribution base of graduates registered with Social Security four years after graduation by branch of knowledge and field of study. 2012-13 cohort and 2017-2018 cohort. Situation in 2017 and 2022 (thousands of euros)

a) Arts and Humanities



b) Sciences

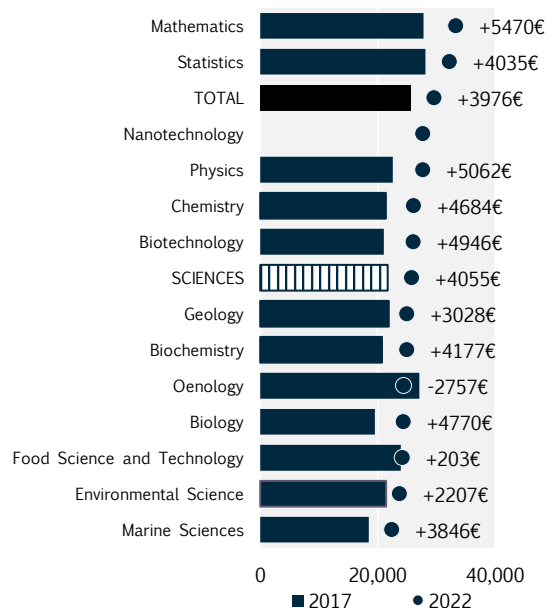
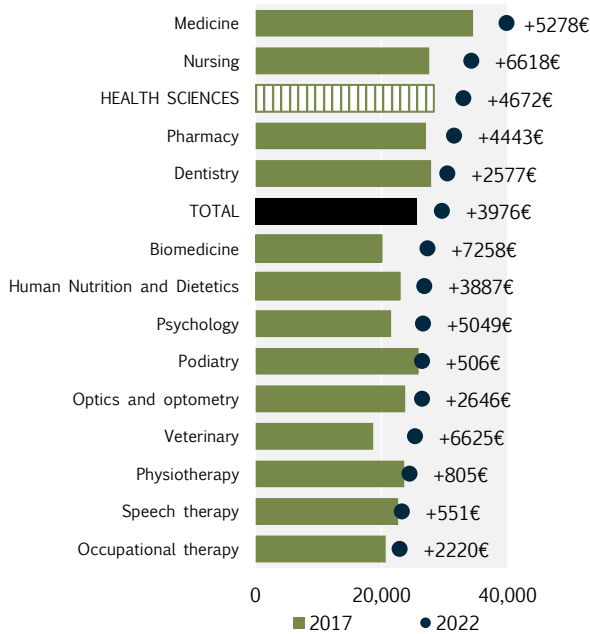
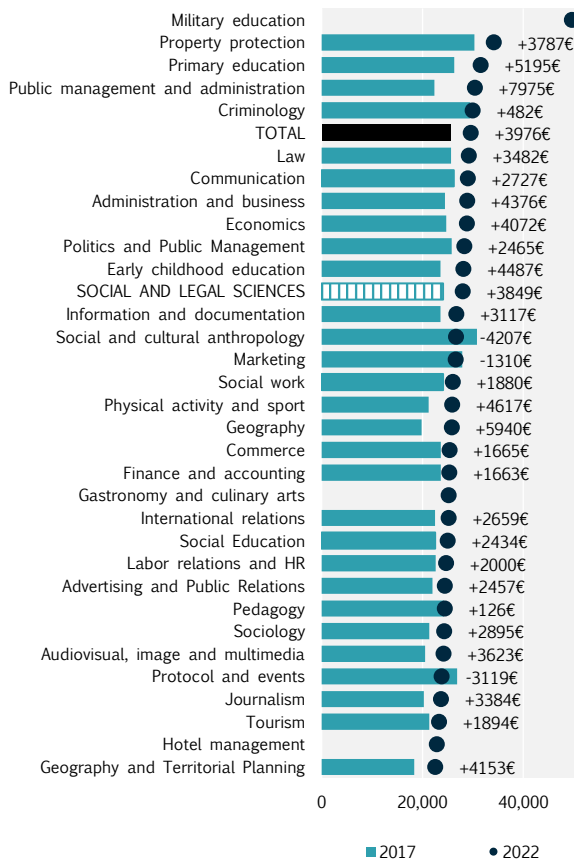


Figure 2.11. Average contribution base of graduates registered with Social Security four years after graduation by branch of knowledge and field of study. 2012-13 cohort and 2017-2018 cohort. Situation in 2017 and 2022 (Thousands of euros) (CONT.)

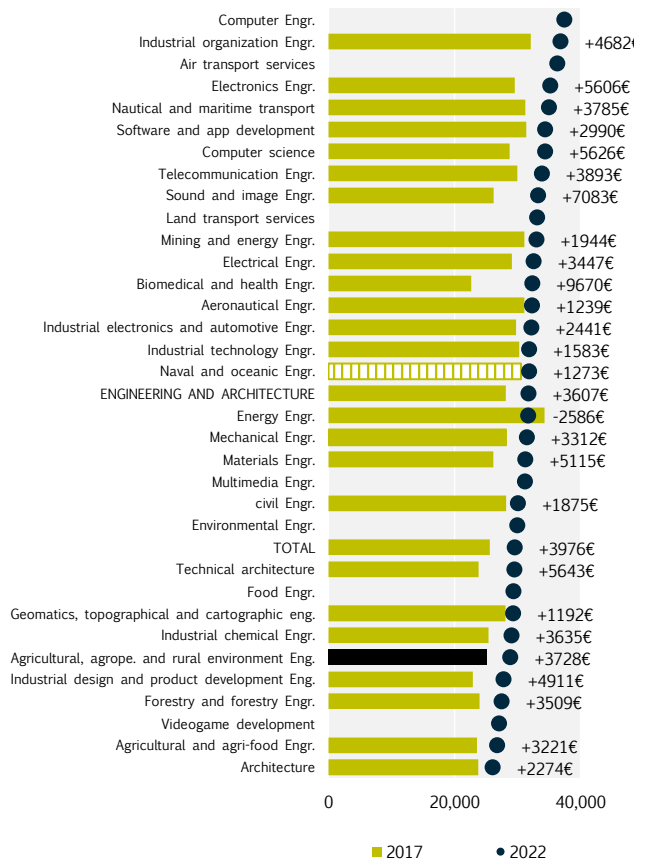
c) Health Sciences



d) Social and Legal Sciences



e) Engineering and Architecture



Note: Average contribution base of employed workers with full-time contracts. Ranked from highest to lowest average contribution base in 2022.

Source: Ministry of Science, Innovation and Universities (Indicadores de afiliación a la S.S. de los egresados universitarios).

Figure 2.12 shows the percentage of employed graduates in the first and last cohorts who have full-time contracts four years after graduation. As indicated earlier, this indicator is interpreted as an indicator of employment quality on the assumption that graduates always prefer full-time to part-time jobs and that their employment status is thus determined by the job supply. However, as graduates' preferences are unknown, this interpretation is risky. Bearing that caution in mind, the results may be taken to indicate that:

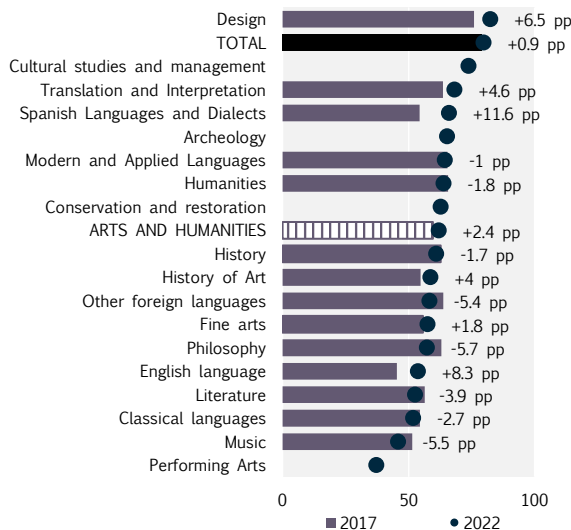
- In most branches (Sciences, Social sciences and law and Engineering and architecture) the percentage of full-time employment is very high and the ranking is determined by small differences of a few percentage points, so there is little to be gained by discussing the differences between the upper and lower parts of the ranking.
- In the other two branches, however, the differences are more marked. In Health sciences,

part-time employment appears to predominate in occupations such as Nutrition, Podiatry, Physiotherapy, Speech therapy and Dentistry in which most service provision takes place in private health centers, either because professionals work for several such private health centers or combine such work with other activities (in hospitals or in teaching, for example), or because the service is provided over a period exceeding the duration of a complete working day and so positions are filled by more than one person, but not always full-time.

- In Arts and humanities, the high proportion of part-time employment in degrees closely linked to teaching (Music, Classical languages, Literature, English language, Philosophy), which appear towards the bottom of the ranking, may conceivably be due to the fact that part-time hiring is relatively common in private education.

Figure 2.12. Percentage of employed graduates with a full-time contract four years after graduation by branch of knowledge and field of study. 2012-13 cohort and 2017-2018 cohort. Situation in 2017 and 2022 (percentages)

a) Arts and Humanities



b) Sciences

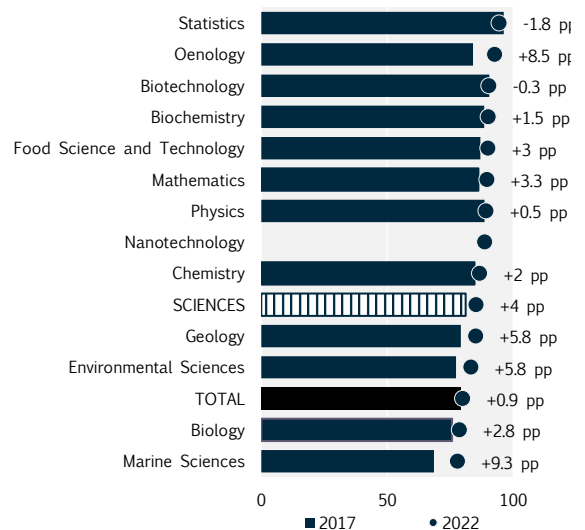
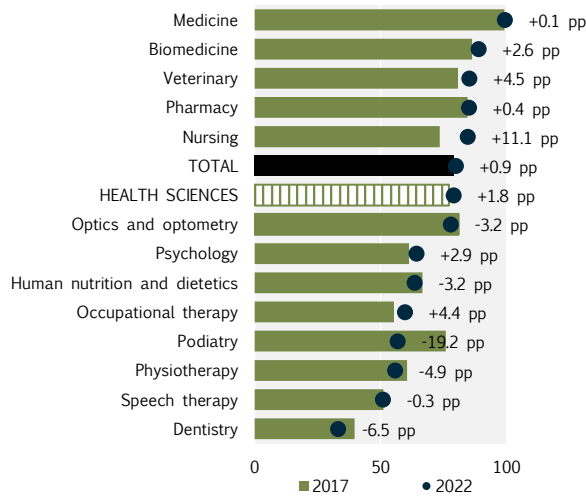


Figure 2.12. Percentage of employed graduates with a full-time contract four years after graduation by branch of knowledge and field of study. 2012-13 cohort and 2017-2018 cohort. Situation in 2017 and 2022 (percentages) (CONT.)

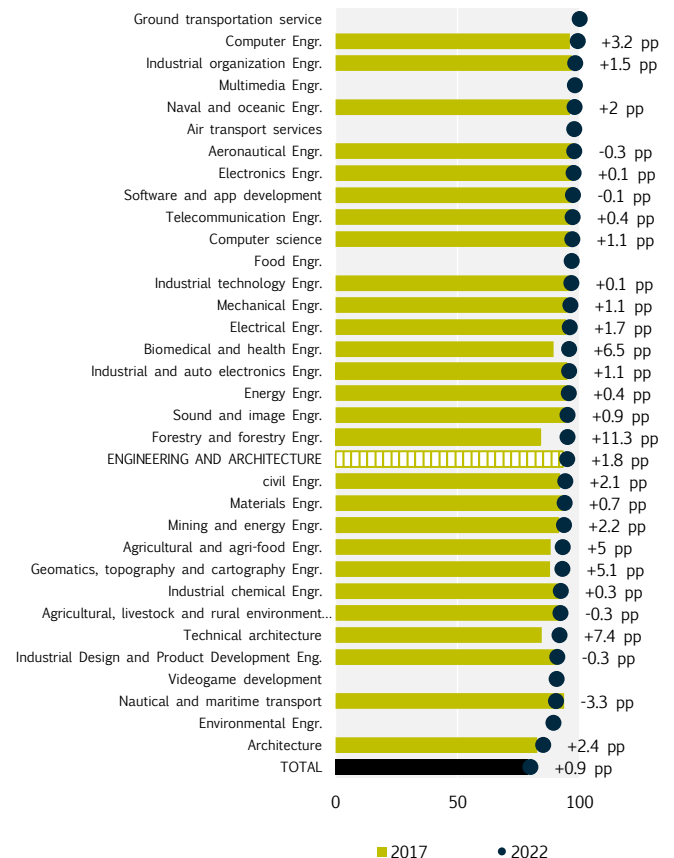
c) Health Sciences



d) Social and Legal Sciences



e) Engineering and Architecture



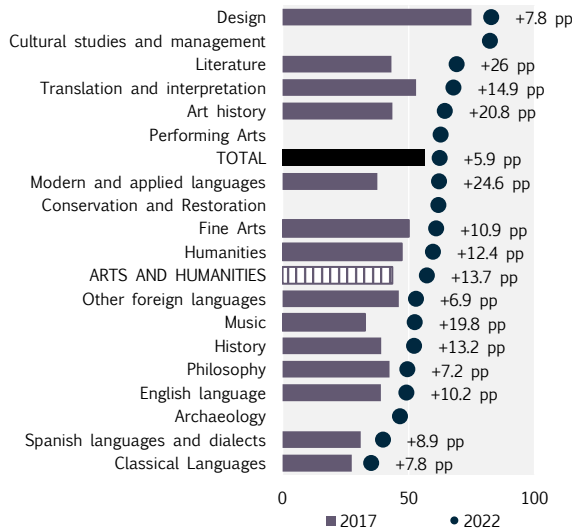
Note: Ranked from highest to lowest percentage of employed graduates with a full-time contract in 2022.
Source: Ministry of Science, Innovation and Universities (Indicadores de afiliación a la S.S. de los egresados universitarios).

Open-ended contracts are another indicator of job quality and **Figure 2.13** shows several identifiable patterns in this indicator, some of which are linked to results already discussed:

- In Health sciences, the almost zero percentage of Medicine graduates with an open-ended contract has to do with the fact that the vast majority will be in their residency period, with a contract that by definition is not open-ended.
- In Arts and humanities, the fields we associate with a high proportion of teaching, namely, Classical languages, Spanish languages and dialects, English language, Philosophy, History and Music, have the lowest percentage of open-ended contracts in their branch. The reason is to be found in hiring practices in private education and the high level of temporary contracts for substitute teachers in public education.
- This explanation can be extrapolated to the three lowest-ranking fields in the Social sciences and law branch, namely, Geography, Early childhood education and Primary education. In contrast, the fields in this branch linked to the economy and business (Business studies, Business administration, Marketing, Finance and accounting and Economics), have a high level of open-ended contracts.
- In Engineering and architecture, the percentage of open-ended contracts is generally high, but the new degrees in transport services (Aeronautical management, Business logistics, Air transport management and operations, Transport science and Logistics, among others) are among those with the highest percentage, alongside Computer science and Software development.

Figure 2.13. Percentage of employed graduates with an open-ended contract four years after graduation by branch of knowledge and field of study. 2012-13 cohort and 2017-2018 cohort. Situation in 2017 and 2022 (percentages)

a) Arts and Humanities



b) Sciences

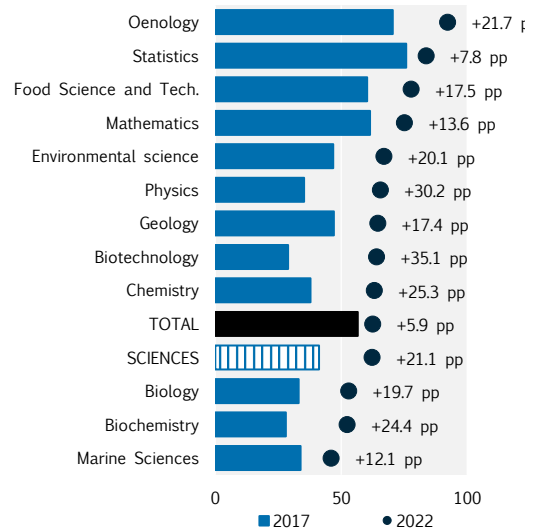
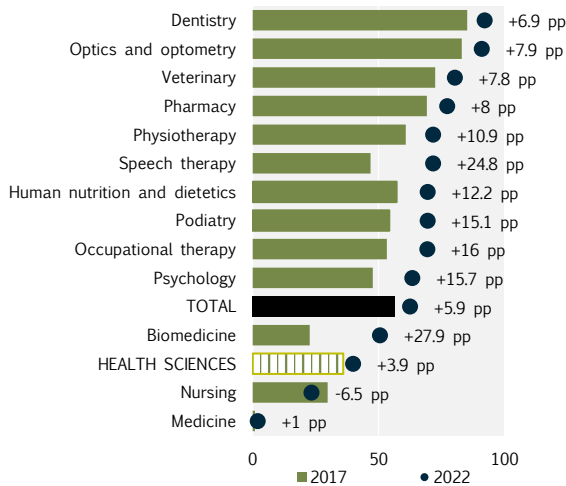
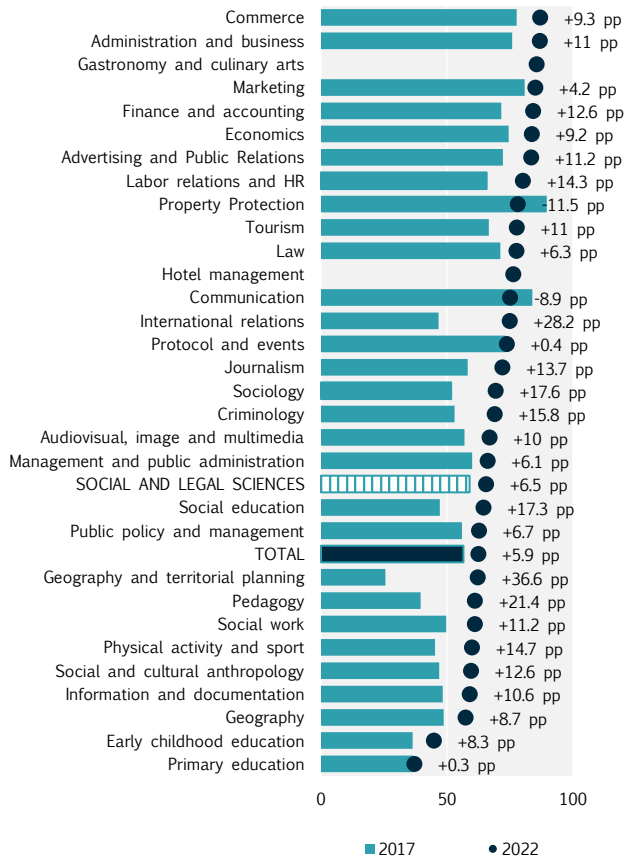


Figure 2.13. Percentage of employed graduates with an open-ended contract four years after graduation by branch of knowledge and field of study. 2012-13 cohort and 2017-2018 cohort. Situation in 2017 and 2022 (percentages) (CONT.)

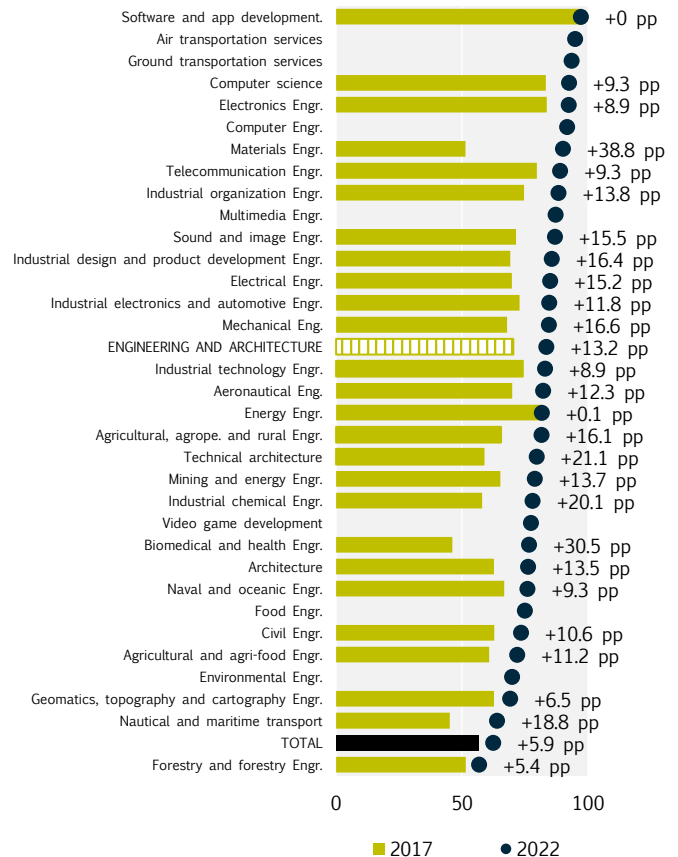
c) Health Sciences



d) Social and Legal Sciences



e) Engineering and Architecture



Note: Ranked from highest to lowest percentage of employed graduates with an open-ended contract in 2022. Source: Ministry of Science, Innovation and Universities (Indicadores de afiliación a la S.S. de los egresados universitarios).

In general, as **Figure 2.14** shows, the percentage of self-employment is very low in all branches of knowledge, so we will comment only on the fields in which it is highest.

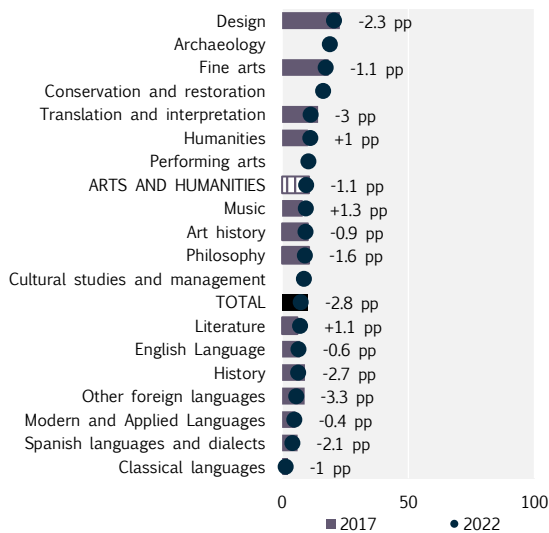
- Fields in the Health sciences branch linked to exercise of a profession in private health centers are associated with a high percentage of self-employment, as in many cases the graduate may own the health center or hire additional staff on a freelance basis. Indeed, as can be seen in panel c), Podiatry, Dentistry, Human nutrition and dietetics, Dentistry, Human nutrition and dietetics,

Speech therapy and Physiotherapy all have a significant proportion of self-employment, in some cases exceeding 50% of the graduates in a cohort (Podiatry and Dentistry).

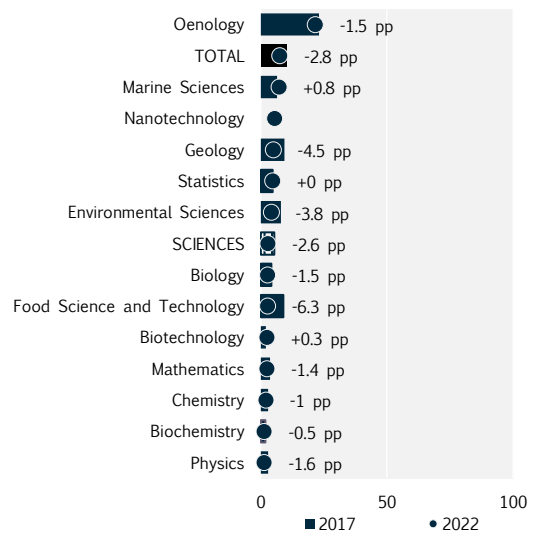
- Much the same can be said of degrees related to the work done by firms of professionals, as in the case of some Engineering and architecture degrees, where Architecture and Technical architecture are the two fields with a significantly above-average percentage of self-employment.

Figure 2.14. Percentage of employed graduates who are self-employed four years after graduation by branch of knowledge and field of study. 2012-13 cohort and 2017-2018 cohort. Situation in 2017 and 2022 (percentages)

a) Arts and Humanities



b) Sciences



c) Health Sciences

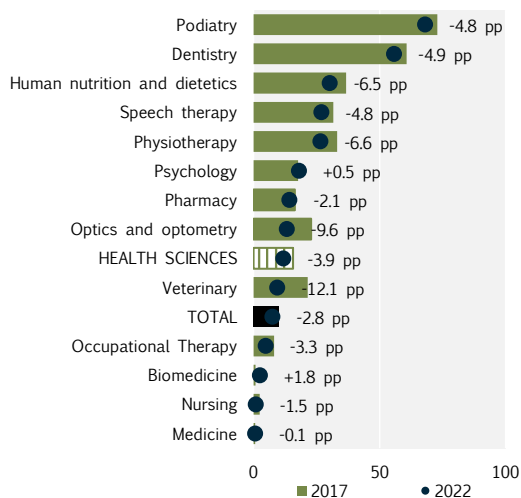
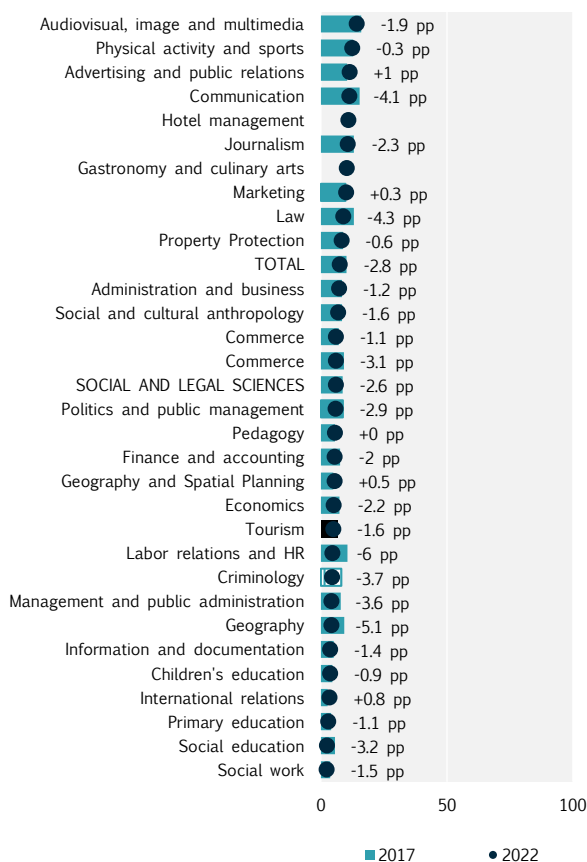
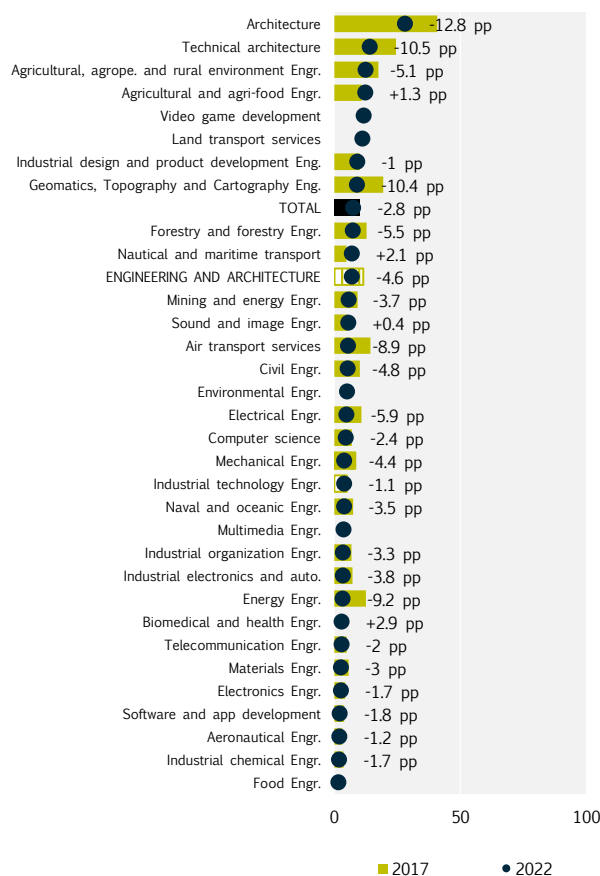


Figure 2.14. Percentage of employed graduates who are self-employed four years after graduation by branch of knowledge and field of study. 2012-13 cohort and 2017-2018 cohort. Situation in 2017 and 2022 (percentages) (CONT.)

d) Social and Legal Sciences



e) Engineering and Architecture



Note: Ranked from highest to lowest percentage of affiliates who are self-employed in 2022.
 Source: Ministry of Science, Innovation and Universities (Indicadores de afiliación a la S.S. de los egresados universitarios).

The main conclusions of this section are as follows:

- The diversity of employment outcomes within the branches is notable, although the average for each branch remains significant.
- There is also diversity between indicators, since good results in one indicator (e.g., Social Security registration rate) does not always predict good results in others (e.g., open-ended contracts). In general, at field of study level, Social Security registration rate, education-job match, average contribution base and percentage of full-time contracts are highly correlated, so we can say there is a significant

relationship between the quantitative and qualitative dimensions of employment outcomes (excluding the percentage of open-ended contracts and of self-employment from the quantitative dimension).

- The organization of production (public vs. private, professionals vs. companies) is a relevant factor in explaining certain features of employment outcomes, namely, full- vs. part-time contracts, temporary vs. open-ended contracts and self-employment vs. employment.

Gender differences in employment outcomes

03

Several studies have signaled quantitative and, above all, qualitative differences in graduate employment outcomes between men and women. A few years ago, with data up to 2018, we found that, with better university results, women's jobs were less stable and lower-paid (BBVA Foundation and Ivie 2019). Part of our research for this report has been aimed at exploring the factors that can explain part, if not all, of that finding. One factor is the choice of degree (Gorjón, Kallage and Martínez de Lafuente 2021), given women's lower propensity to choose degrees in Engineering and architecture, where employment rates (Social Security registration) and earnings are higher (Cobrerros, Galindo and Raigada 2024). But it is not the only factor, since we also find differences among graduates in the same field of study.

Since employment outcomes are driven by a large number of factors (including economic context, degree choice and household socioeconomic status, among others), a strict analysis of potential gender gaps requires isolating as many of those factors as possible and taking changes over time into account, especially in a period of such upheaval in the graduate labor market as was seen over the last decade.

A cross-sectional study based on a survey of a particular cohort has the advantage of isolating the influence of the economic cycle and including in the sample individuals with different levels of experience accumulated within the cohort but cannot be used to analyze trends in the phenomenon of interest, in this case the potential gender gap, over time. The approach adopted here of combining

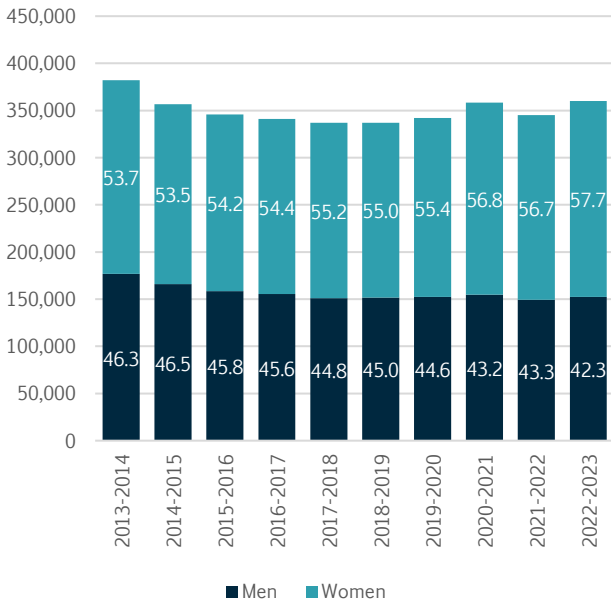
longitudinal studies of homogeneous cohorts is therefore more appropriate, given the available sources, to determine the extent to which each cohort isolates the effects of the cycle and also assess trends by monitoring the problem across successive cohorts.

To correctly frame the analysis of any potential employment outcome gap, it is advisable to assess not only the final situation after graduation but throughout the degree course, starting with the situation at entry to university (as already pointed out, biases in degree choice may have an impact on employment outcomes), and to continue with the academic results during the degree course to see if they help explain the gap. In this perspective, the employment outcome is the final phase of an analysis that encompasses university entry, academic performance while at university, and employment. That sequence of analysis provides the structure for this section.

3.1 Entry of women into the university system

Figure 3.1 shows the total number of new students entering the Spanish university system over the last decade and a breakdown by gender. In addition to the aforementioned stability in terms of total numbers of undergraduate students, we see a growing majority of women. In the 2022-2023 academic year, 57.7% of new students were women, 4 pp more than 10 years earlier, in the 2013-2014 academic year.

Figure 3.1. New bachelor's degree students by gender. Academic years 2013-2014 to 2022-2023 (number of students and percentages)



Source: Ministry of Science, Innovation and Universities (Estadística de estudiantes) and authors' own calculations.

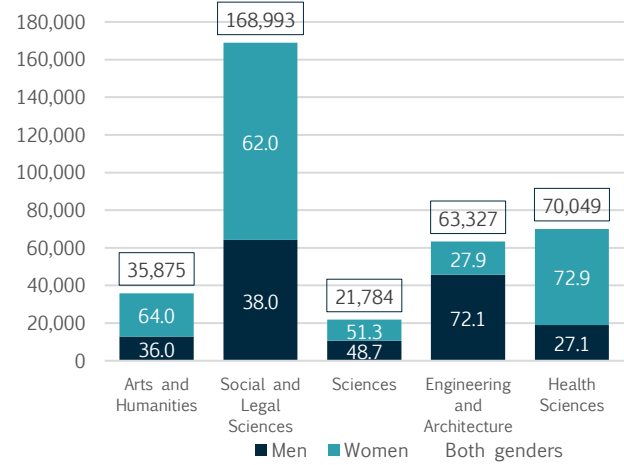
As pointed out in previous reports (Pérez and Aldás [dirs.] et al. 2023), employment outcomes are highly influenced by the choice of degree, so it seems appropriate to assess whether the observed majority of women is the same across all branches of knowledge. Panel a) of Figure 3.2 shows the total number of new students in each branch and the percentage of women. Although the overall average is highly influenced by the large proportion of women in the branch of Social sciences and law, we can see that women are a majority in all the branches except Engineering and architecture, in which they account for barely a quarter of total enrolment. In the other branches, the percentage varies from 72.9% in Health sciences to 51.3% in Sciences.

In terms of new students' choice of branch, panel b) of Figure 3.2 shows that the majority option for women is Social sciences and law (50.5%), followed by Health sciences (24.6%). Social Sciences and law is also the majority option for men (42.1%), but the difference compared to women is significant. Also significant is the fact that men's second choice is Engineering and architecture (30%), which is chosen by only 8.5% of women. The main degree choice biases therefore lie in the 21.5 pp difference between the percentage of men who opt for engineering sub-

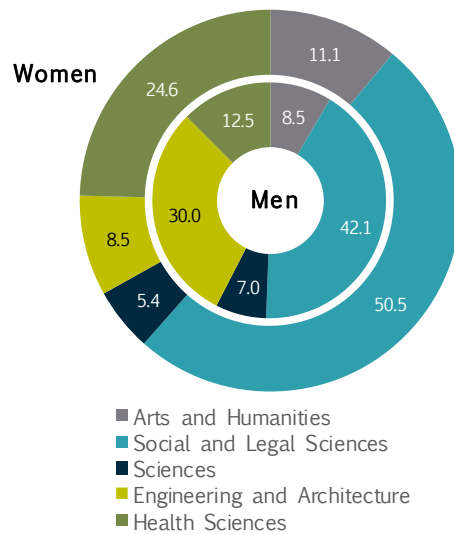
jects compared to women and the 12.1 pp difference between the percentage of women who opt for health-related subjects compared to men. The impact of these biases on employment outcomes will be analyzed in depth later.

Figure 3.2. Distribution of newly enrolled students in bachelor's programs by branch of knowledge and gender. Academic year 2022-23

a) Number and percentage in each branch of knowledge

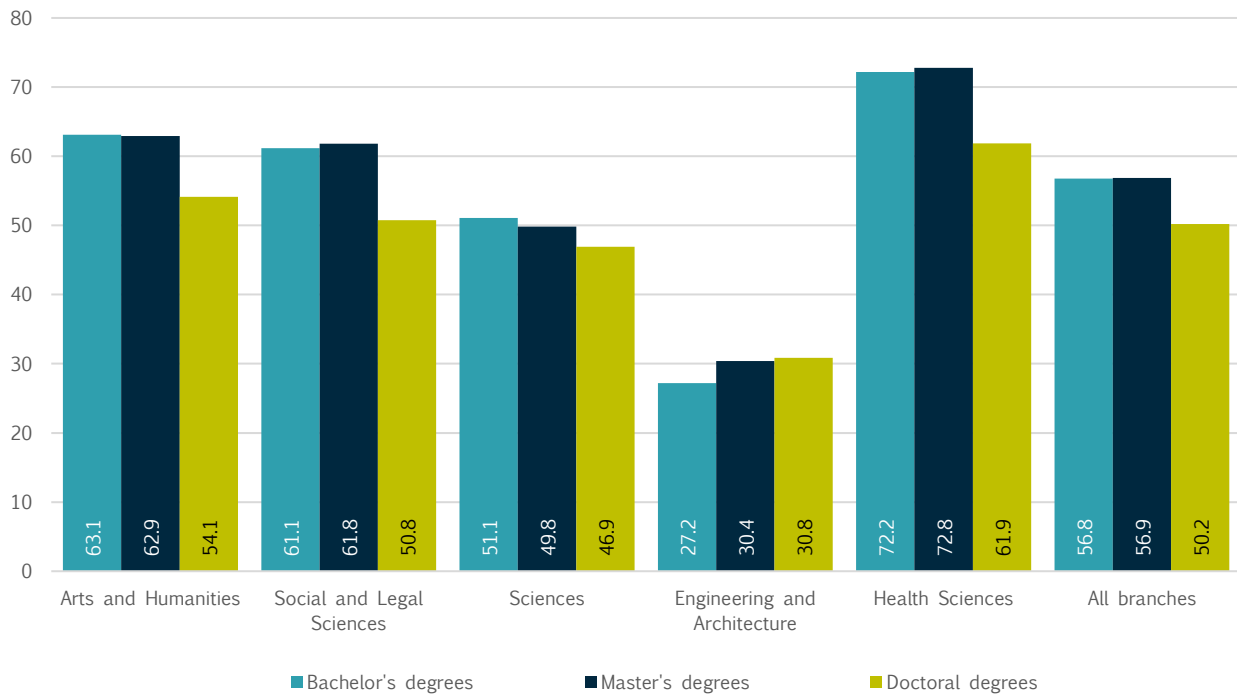


b) Distribution by branch of knowledge and gender



Source: Ministry of Science, Innovation and Universities (Estadística de estudiantes) and authors' own calculations.

Figure 3.3. Women's share of total students by type of degree and branch of knowledge. Academic year 2022-2023 (percentage)

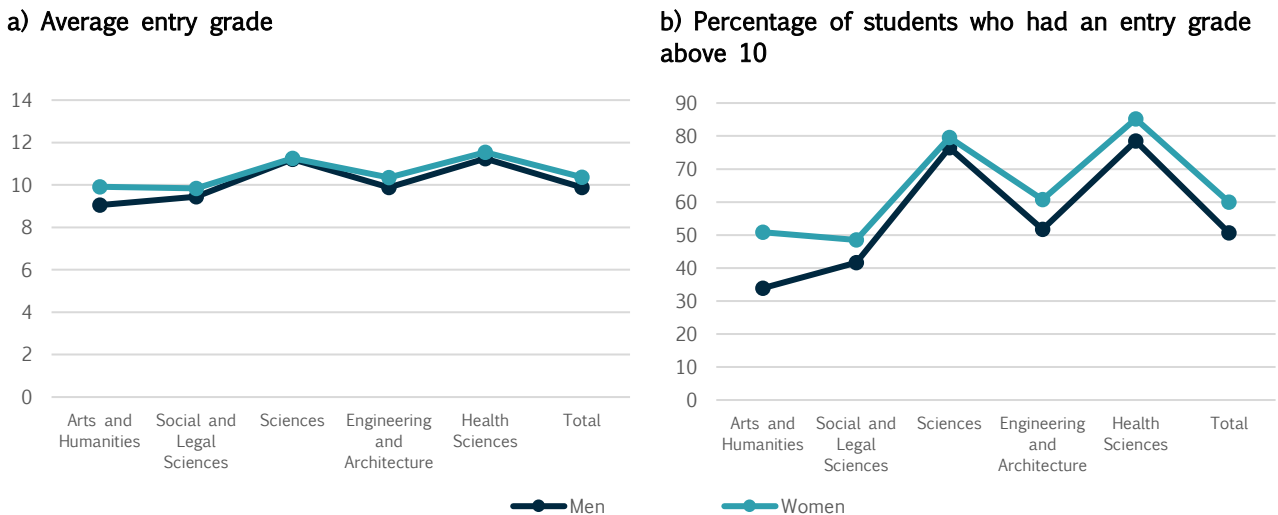


Source: Ministry of Science, Innovation and Universities (Estadística de estudiantes) and authors' own calculations.

In previous sections we found that most of the employment quality indicators were better at master's level than among bachelor's graduates. Final employment quality could therefore be affected by the fact that the transition rate from bachelor's to master's, and even doctoral, degrees differs between men and women. **Figure 3.3** shows the percentage of women among total enrolled students (not, for reasons of data availability, among newly enrolled students) at each of the three levels (bachelor's, master's and doctoral degrees) by branch of knowledge. Three features stand out: first, that women are the majority among bachelor's students in the four branches in which they were already the majority on first enrolment (all except Engineering and architecture); second, that in master's degrees women are not the majority in Sciences either; and third, that at doctoral level the proportion of women is lower in all four branches in which they are the majority at bachelor's level. Note that in the branch in which women are not the majority (Engineering and architecture), the percentage of women increases slightly at master's and doctoral level, that is, it increases proportionately more at these levels than that of men.

A characteristic at university entrance that can affect the relative performance of men and women during their time at university and their employment after graduation is the grade with which they enter university. A priori, higher grades should translate into better performance and better employment opportunities and thus help explain potential employment outcome gaps. Panel a) of **Figure 3.4** shows that the average entry grade of men and women is very similar in all branches of knowledge and the slight difference, if any, is in favor of women. Average university entrance exam grades have become greatly compressed over time and the differences cannot be detected in this indicator. In panel b), therefore, we show the percentage of students who had an entry grade above 10. This chart shows more clearly the higher performance of women in all branches of knowledge, especially in Arts and humanities but also in the branches that have higher entry requirements, namely, Sciences and, above all, Health sciences.

Figure 3.4. University entry grade indicators. Academic year 2022-23



Source: Ministry of Science, Innovation and Universities (Estadística de estudiantes) and authors' own calculations.

3.2. Women's academic performance at university

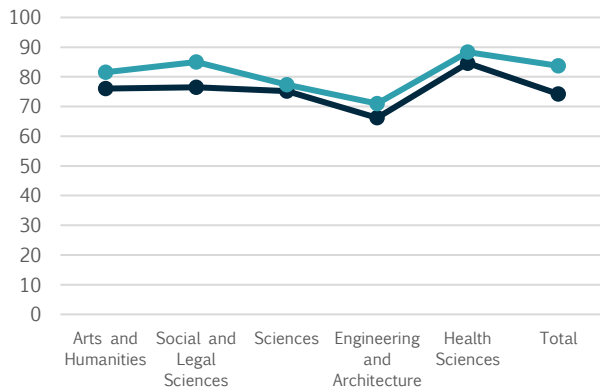
The university entry grade data suggest that women can be expected to perform better than men during their studies, unless for some reason they fail to adapt or achieve the expected results. To assess what happens, in this section we evaluate students' performance at bachelor's level separately for each branch of knowledge, using the following indicators: performance rate, or ratio of credits earned to credits enrolled in; success rate, or ratio of credits earned to credits attempted (presented for examination); overall drop-out rate, defined as the sum of the drop-out rates in the first, second and third year of the program; efficiency rate, or ratio of total credits earned to credits enrolled in since starting the program; timely completion rate, defined as the percentage of new students who complete their degree in or before the expected year of completion; and lastly, average grade in the graduate's academic record.

The six panels of **Figure 3.5** show the aforementioned performance indicators for men and women in each branch of knowledge. The data are those of the most recent academic year available. The general

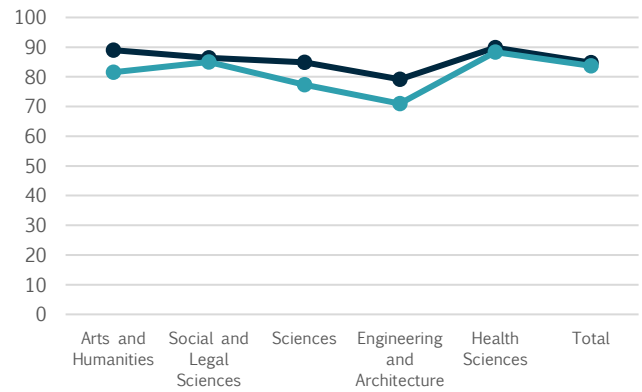
conclusion is that women's performance is consistently higher than men's in all the indicators and in all the branches, with a single exception, namely, the success rate (panel b), which is slightly higher for men, who have a higher ratio of credits earned to credits enrolled in than women. A particularly significant finding, in our opinion, is the marked difference in drop-out rates, which is invariably higher for men, specifically, 10 pp higher in the aggregate of all the branches and between 6 and 7 pp higher in the branches with the highest drop-out rates, namely, Arts and humanities and Engineering and architecture (panel c). Women also perform better in the timely completion rate, i.e. completing the degree within the expected time (panel e). The timely completion rate is especially low in Engineering and architecture, where only 20% of graduates complete their studies in the expected time. As seen earlier, the percentage of women in this branch is lower by choice, but the women who do opt for this branch do not perform worse than the men. The cumulative final average grades (panel f) are very similar for men and women in Arts and humanities, Sciences, and Engineering and architecture, whereas the difference in favor of women is somewhat more pronounced in Social sciences and law and Health sciences.

Figure 3.5. Process and academic performance indicators by gender. Academic year 2021-2022

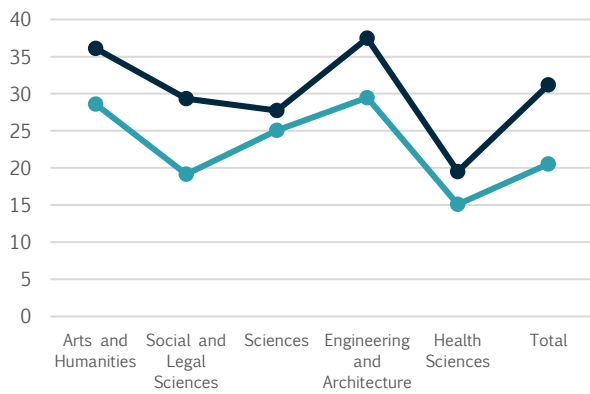
a) Performance rate in bachelor's degrees



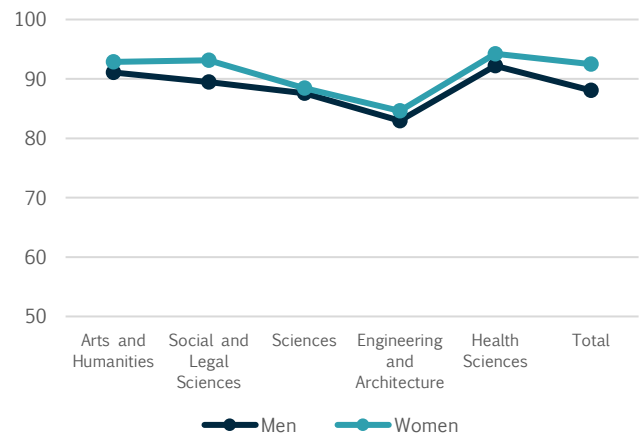
b) Success rate in bachelor's degrees



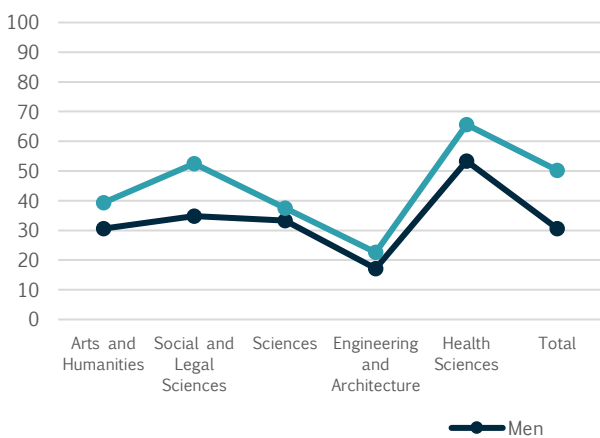
c) Drop-out rate¹ in bachelor's degrees



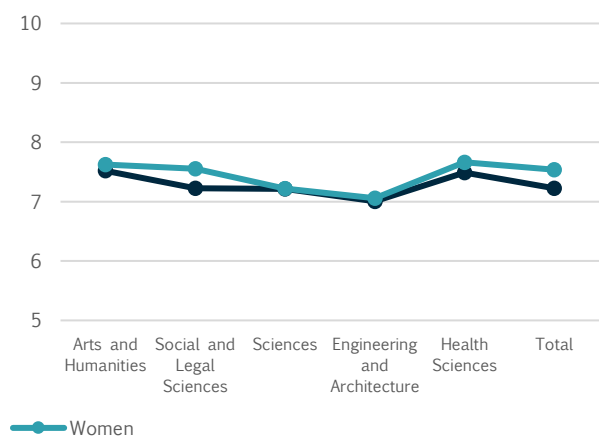
d) Efficiency rate of bachelor's degree graduates



e) Timely-completion rate¹ of bachelor's degrees



f) Final average grades



¹Data refers to the 2017-2018 cohort.

Source: Ministry of Science, Innovation and Universities (Indicadores de rendimiento académico) and authors' own calculations.

3.3 Employment outcomes for women graduates

From the above results it is clear that if performance during the degree program were a driver of differences in employment quality, the difference should be in favor of women, as they perform better. In this section we consider to what extent this hypothesis holds or whether the reality of the labor market is different. To do this, we review the six employment outcome indicators used for the successive cohorts and compare their values for male and female graduates. **Figure 3.6** shows this comparison for bachelor's graduates and **Figure 3.7** for master's graduates.

Panel a) of Figure 3.6 seems to confirm, for bachelor's graduates, the results reported by Gorjón, Kallage and Martínez de Lafuente (2021), who, with reference to the Basque Country, find no significant differences between men and women in the likelihood of having a job three years after graduation, once degree choice differences are taken into account¹¹. In this panel, the Social Security registration rate four years after graduation is practically the same for men as for women (barely two tenths of a percentage point of difference in 2022 for the 2017-2018 cohort). If any trend can be detected, it is one of convergence towards equality (in 2018, for the 2012-2013 cohort, the difference was 1.2 pp in favor of men). Nor are there any significant differences in education-job match (the difference is only 1.1 pp and, moreover, in favor of women).

However, more significant differences, in this case in favor of men, are observed in other employment quality indicators, such as earnings (average contribution base, panel b), percentage of full-time contracts (panel d) and percentage of open-ended contracts (panel e). Although earnings tend to converge over time (the initial difference of around 2,800 euros in nominal terms falls to around 1,800 euros in 2022), there is no appreciable convergence in types of contracts. It remains to explore the reasons for these differences and, in particular, whether the

difference in remuneration is due to discrimination or other causes.

As the earnings figures are the average for all the branches and we already know that women are under-represented in degrees related to Engineering and architecture, it may be that those degrees are better paid in the market and that this is why women have lower average earnings in the cohort as a whole. We therefore repeat the analysis for each individual branch of knowledge and field of study. Something similar may apply in the case of full-time and open-ended contracts. We saw earlier that the Health sciences branch, in which women are greatly over-represented, has some of the lowest percentages of full-time and open-ended contracts. We shall explore this possibility later.

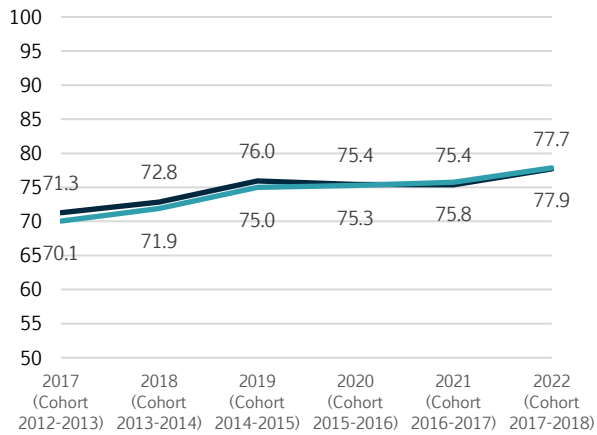
The percentage of self-employment (panel f) is also lower for women than for men, although, as we have repeatedly pointed out, this is not an indicator of employment quality and could reasonably be considered an indicator of entrepreneurial potential or, equally, a reflection of patterns of professional practice, or of the inclusion or non-inclusion of certain benefits in the portfolio of public health services, etc.

Figure 3.7 evaluates these same indicators for master's graduates, with very similar results. The Social Security registration rates are somewhat more disparate, but in this case increasingly in favor of women. There are hardly any appreciable differences in education-job fit, which is significantly higher than at bachelor's level owing to the more specialized nature of master's degrees. The differences in average contribution base, full-time contracts and open-ended contracts are once again in favor of men, with very limited convergence over the study period. The percentage of self-employment is also higher among men, although the gap closes slightly in 2022.

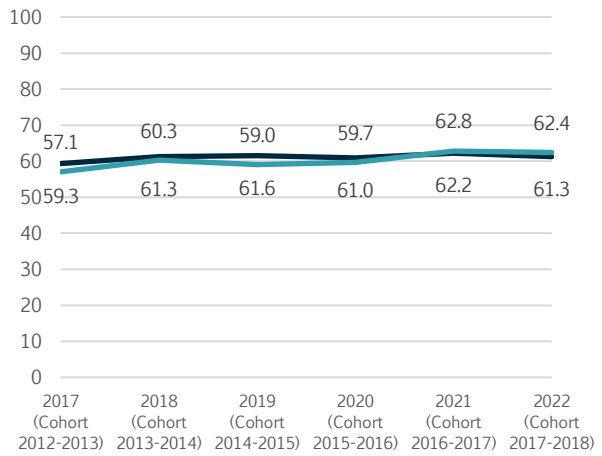
¹¹ These authors base their results on a different source, namely, the University of the Basque Country (UPV/EHU) alumni employment outcome survey, hence the different time frames chosen (our results show the situation four years after graduation).

Figure 3.6. Trends in employment outcome indicators for bachelor's graduates four years after graduation. Differences by gender and graduation cohort

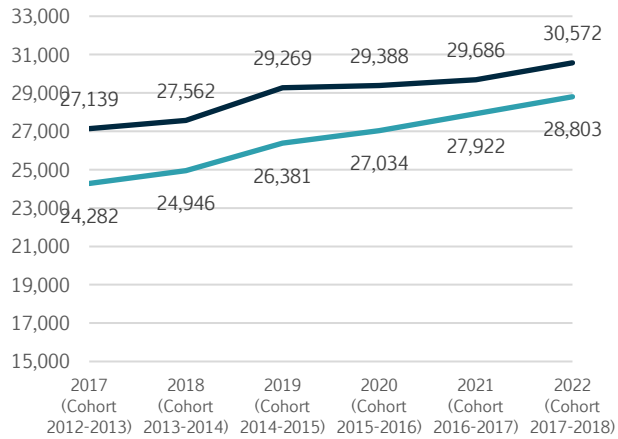
a) Social Security registration rate (percentage)



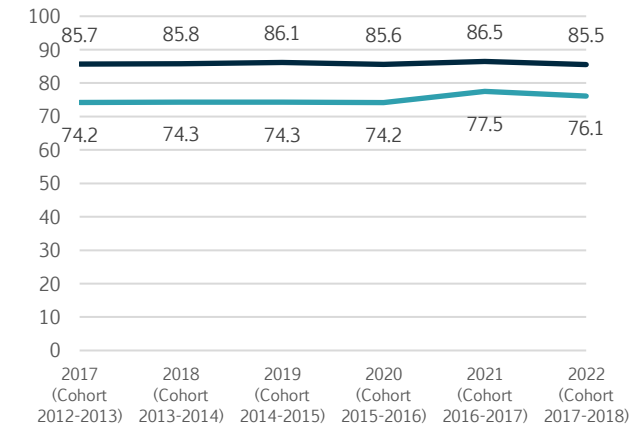
b) Education-job match (percentage)



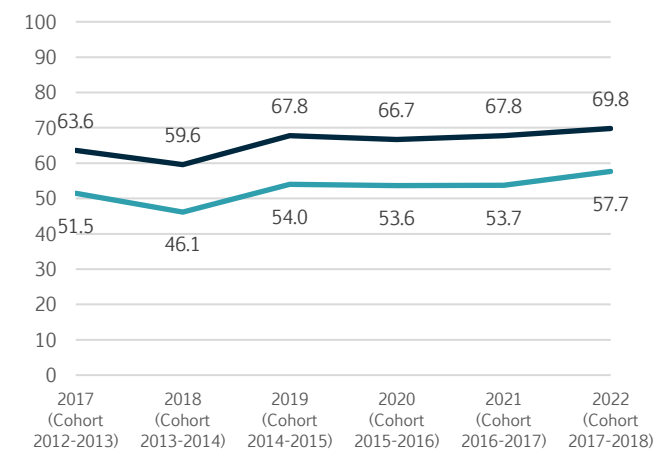
c) Average contribution base (euros)



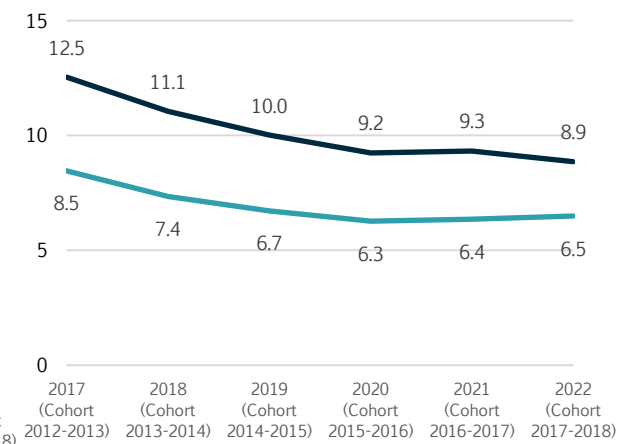
d) Full-time employment (percentage)



e) Open-ended contracts (percentage)



f) Self-employment (percentage)

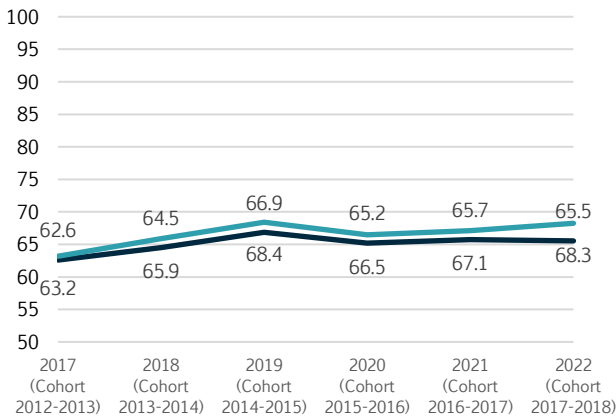


— Men — Women

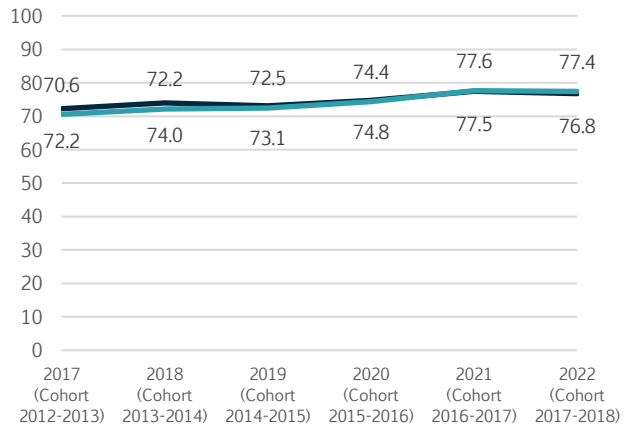
Source: Ministry of Science, Innovation and Universities (Indicadores de afiliación a la S.S. de los egresados universitarios) and authors' own calculations.

Figure 3.7 Trends in employment outcome indicators for master’s graduates four years after graduation. Differences by gender and graduation cohort

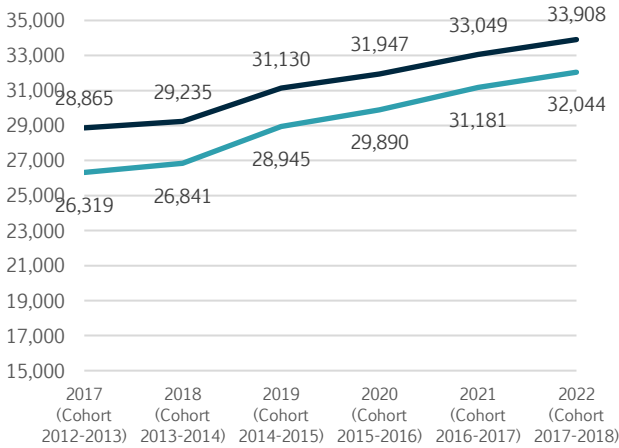
a) Social Security registration rate (percentage)



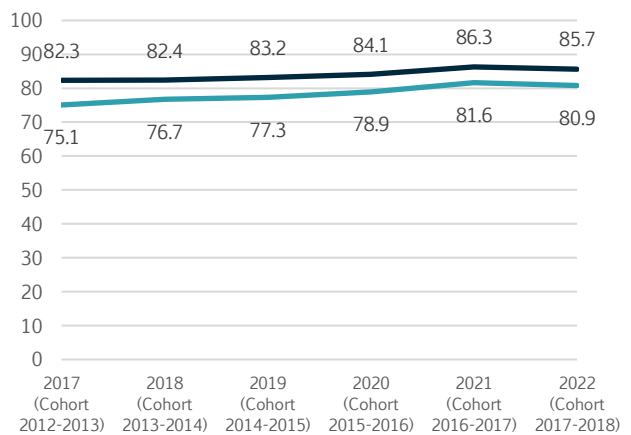
b) Education-job match (percentage)



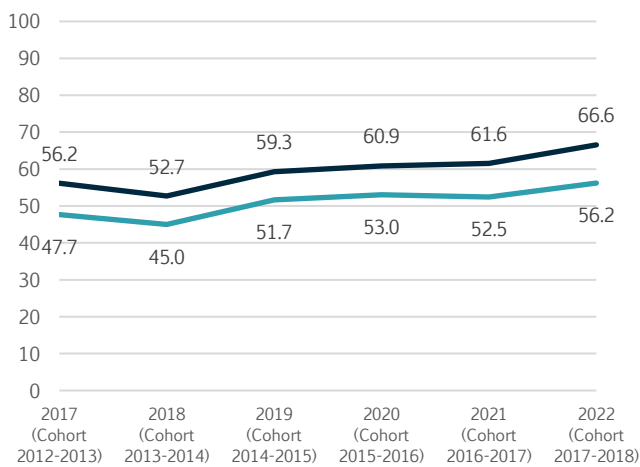
c) Average contribution base (euros)



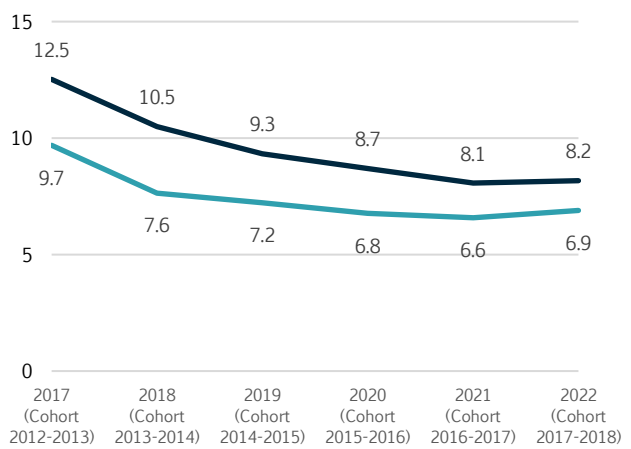
d) Full-time employment (percentage)



e) Open-ended contracts (percentage)



f) Self-employment (percentage)



— Men — Women

Source: Ministry of Science, Innovation and Universities (Indicadores de afiliación a la S.S. de los egresados universitarios) and authors’ own calculations.

To investigate the reasons for the differences in the overall averages, **Figure 3.8** provides an analysis of each indicator for each individual branch of knowledge, with reference to bachelor's (panel a) and master's (panel b) graduates. For each indicator, the chart shows the differences between the percentages of men and women in the most recent cohort (2017-2018) four years after graduation, i.e. in 2022. To make the chart easier to read, the bars are colored differently according to whether the difference is favorable (positive values, blue) or unfavorable (negative values, green) to women. The last column shows the overall average, which we showed for the last cohort in Figures 3.6 and 3.7.

For bachelor's graduates, the general statement that the Social Security registration rate and the education-job match are very similar for men and women, and that where there is a difference it is in favor of women holds true for most branches of knowledge, except for Engineering and architecture in both variables and for Sciences in education-job match. Even so, the difference is no more than 5 pp, whether in favor of men (Engineering and architecture) or in favor of women (Health sciences).

These slight alternating differences between men and women in individual branches disappear in respect of the average contribution base and the percentage of full-time contracts. Here, the difference is consistently in favor of men in all the branches. The biggest difference is in Engineering and architecture, where men have an average contribution base around 2,300 euros higher than women, and the second biggest is in Social sciences and law (1,690 euros). The differences in percentage of full-time employment range from more than 8 pp in favor of men in Social sciences and law to virtually zero in Health sciences.

Thus, in response to the hypotheses formulated earlier, while it is true that women are less well represented in the branches in which average earnings are higher and this may contribute to their lower overall average earnings, low representation in a branch does not fully explain the differences, since women also have lower earnings in the branches in which they are highly represented. The same applies to full-time contracts. The percentages are highest in Engineering and architecture, where women are under-represented, but also in Health sciences, where they are over-represented. The level of representation probably helps accentuate the overall average

differences, but the differences are consistently in favor of men in all the other branches too.

The results shown in panel b) for master's graduates are practically identical to those of panel a) for bachelor's graduates, confirming the persistent differences across the two types of degree.

Our findings show that women contribute more students to the university system, obtain better grades during their time in the system, but, despite achieving an equal rate of employment and equal education-job match, nevertheless receive lower remuneration and are less likely to be hired on full-time, open-ended contracts than their male peers. And this regardless of the branch of knowledge in which they earned their degree.

A fuller explanation would require working with sources that can provide microdata but with too great a time lag¹². Some studies (De la Rica, Gorjón and Quesada 2021) using microdata show that part of the gap has to do with women having lower work intensity, which takes the form of more part-time work, coincides with living as a couple and is accentuated with the arrival of children, while men's work intensity tends to increase after these life events. Our data, however, are average contribution bases for full-time contracts only, so the concept of work intensity used by the authors just cited, if it were to explain the differences, would be not so much because women are more inclined to part-time work, which cannot be concluded from our average contribution bases, but because they may give up, or may never be offered, positions that frequently require increasing work intensity (managerial positions, greater responsibility in certain intermediate positions).

¹² The most recent Graduate Employment Outcome Survey (EILU), published by the Spanish Statistical Office, INE, in 2020, provides results for 2019. A new survey is planned and when completed would allow proper testing of this hypothesis.

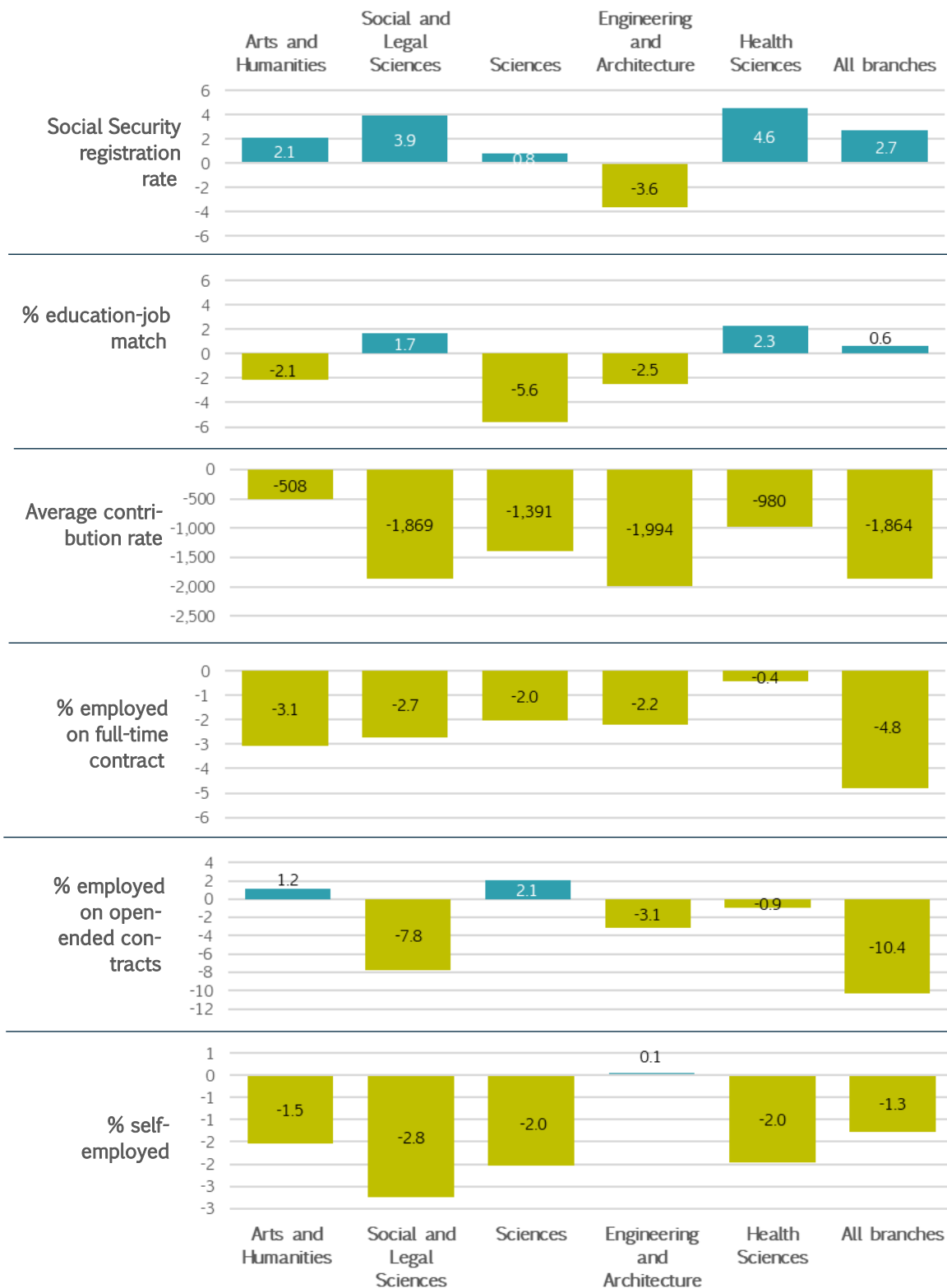
Figure 3.8. Advantages (+) and disadvantages (-) of women compared to men in employment outcomes four years after graduation by branch of knowledge. Situation of the 2017-18 cohort in 2022. Women minus men (percentage points and euros)

a) Bachelor's degree graduates



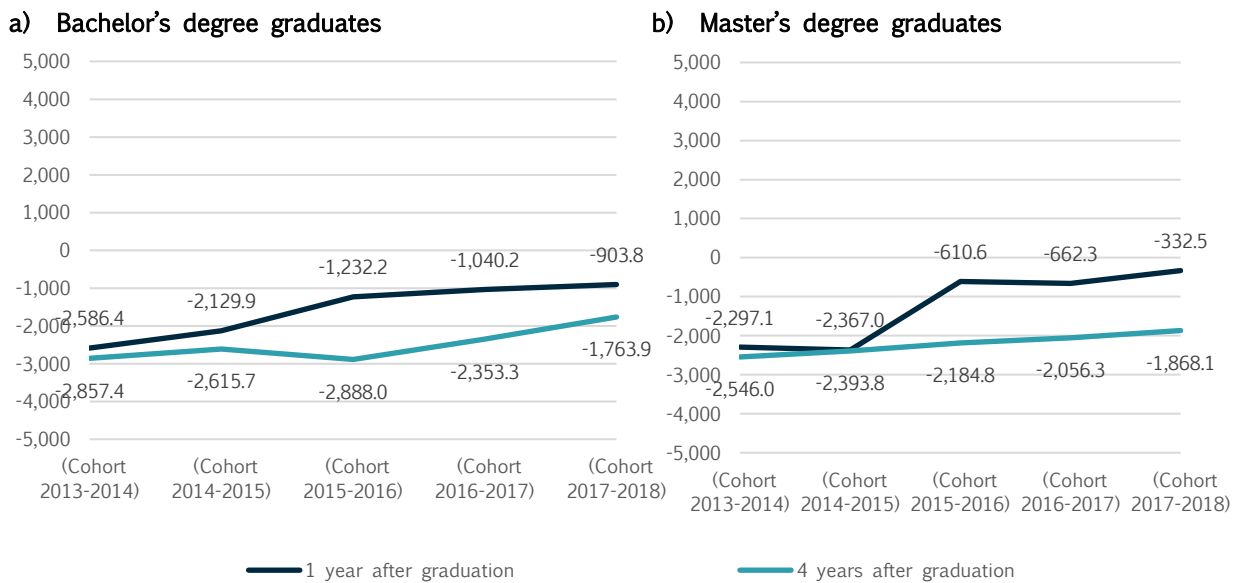
Figure 3.8. Advantages (+) and disadvantages (-) of women compared to men in employment outcomes four years after graduation by branch of knowledge. Situation of the 2017-18 cohort in 2022. Women minus men (percentage points and euros) (CONT.)

b) Master's degree graduates



Source: Ministry of Science, Innovation and Universities (Indicadores de afiliación a la S.S. de los egresados universitarios) and authors' own calculations.

Figure 3.9. Differences in graduate contribution base over time since graduation by gender and cohort. Women – men (euros)



Source: Ministry of Science, Innovation and Universities (Indicadores de afiliación a la S.S. de los egresados universitarios) and authors' own calculations.

Table 3.1. Distribution of employed graduates aged 22 to 29 by occupational level (CNO-11) and gender

	Graduates	
	Men	Women
1 Senior officials and managers	3.2	1.7
2 Scientific and knowledge professionals	61.3	62.4
3 Technicians; associate professionals	15.9	11.7
4 Accounting and administrative staff and other office workers	7.0	8.8
5 Catering, personal services, protection and sales workers	8.0	12.6
6 Skilled workers in the farming, livestock, forestry and fisheries sectors	0.2	0.1
7 Artisans and skilled workers in the manufacturing and construction industries (except plant and machinery operators)	1.0	0.3
8 Plant and machinery operators, and assembly workers	1.1	0.6
9 Elementary occupations	2.4	1.8

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

Exploring the hypothesis of a reduction in work intensity on the part of women is not easy with the sources used in this study, but some additional evidence can be gleaned. Panel a) of **Figure 3.9** shows the gap in earnings (average contribution base) between men and women in successive cohorts one year and four years after graduating with a bachelor's degree. Panel b) provides the same information for master's graduates. At both levels the earnings gap is in favor of men (i.e. the difference between women's contribution base and men's is negative). The most striking thing, however, is that the gap is larger four years after graduation than one year after (i.e. the negative difference is larger). Why would increased job experience, even in the first few years of employment, cause men's earnings to increase more than women's? This finding could possibly

support the hypothesis of reduced work intensity (i.e. reduced progress towards better paid positions, e.g. management) in women. But it does not tell us to what extent the gap widens because (for a great variety of possible reasons) women do not seek such positions or because such positions are not offered to women as commonly as they are to men.

Additional evidence may be found in the percentage of female graduates in highly qualified positions. To bring the Labor Force Survey data as close to our cohort analysis as possible, we focus exclusively on the young employed population (aged 22-29). **Table 3.1** shows the distribution of the young male and female employed population by occupational level, where high-level jobs are usually defined to comprise levels 1 (senior officials and managers), 2 (scientific

and knowledge professionals) and 3 (specialists and associate professionals). We see that while 75.8% of young female graduates are employed in high-level jobs, the percentage of men at this level (80.4%) is 4.6 pp higher, confirming the bias we have been discussing. Moreover, the percentage of men at senior official and manager level is almost twice that of women.

3.4. Differences in employment outcomes for women and men by field of study

As noted earlier, it is important to analyze gender differences in employment outcomes at the level of the individual branch of knowledge, but aggregation at branch level can mask a diversity of results among the component degrees. Hence the need to explore differences in employment outcome indicators between the fields of study within each branch. Figures 3.10 to 3.14 provide this information for each indicator, with a separate panel for the degrees grouped in each of the five branches. The figure reported is in all cases the difference between the value of the indicator (e.g. Social Security registration rate) for women and the value of the same indicator for men. A positive value therefore signifies an advantage for women and a negative value, a disadvantage for women (since the indicator is higher for men). To supplement this information, each panel shows the proportion of women among the total graduates in that degree. In all cases the data are for the last cohort analyzed (the 2017-2018 cohort) as of the year 2022, i.e., four years after graduation.

Since there are many degrees in which female graduates are dominant, before we look at each indicator individually it may be of interest to consider whether the fields of study preferred by women at both bachelor's and master's levels are associated with advantages or disadvantages in employment outcomes. **Table 3.2** shows the correlation between the ratio of women to men in the 100 fields for which information is available and the six employment outcome indicators for women graduates four years after graduation. In almost all cases the correlation is negative and statistically significant. For instance, the correlation between women

having a higher Social Security registration rate and the proportion of women in the various fields of study is -0.234 ($p < 0.05$), i.e. negative and barely significant, confirming that if there is any relationship between the ratio of women to men in an occupation and employment outcomes, it is despite this characteristic. In other words, women have no advantage in Social Security registration rate in the more female-dominated fields of study. In education-job match, the correlation coefficient has the same value and sign as for the Social Security registration rate (-0.23). In percentage of open-ended contracts, the negative relationship intensifies to -0.38 ; in average contribution base it is -0.46 ; and in open-ended contracts, around -0.5 . Only in percentage of self-employment is the correlation with the ratio of women to men in the fields of study positive (0.23), though weak. But correlation is not causation and the differences between fields of study are considerable and worth describing, as they may be attributable to other factors.

Figure 3.10 analyzes the employment rate (Social Security registration rate). In the analysis by branch of knowledge we found that graduate employment rates were higher for women than for men in all the branches except Engineering and architecture, and since the rate for a branch is the average of the rates for the fields of study in that branch, a similar result is reflected in the individual fields of study. Generally speaking, the differences either way are very small in all the branches. The biggest differences (more than 5 pp) in favor of women are in Art history in the Arts and humanities branch; in Biochemistry, Mathematics and Food science and technology in the Sciences branch; in Dentistry, Psychology and Speech therapy in the Health sciences branch; in Business studies, Pedagogy, Information and documentation, Anthropology and International relations in the Social sciences and law branch; and in Environmental engineering and Biomedical engineering in the Engineering and architecture branch. The biggest differences to the disadvantage of women are in a small number of fields, namely, Literature, Biomedicine, Gastronomy and Materials engineering. There is no obvious feature of these degrees that would explain the differences, except perhaps the traditional association of haute cuisine with male chefs manifested in the field of Gastronomy.

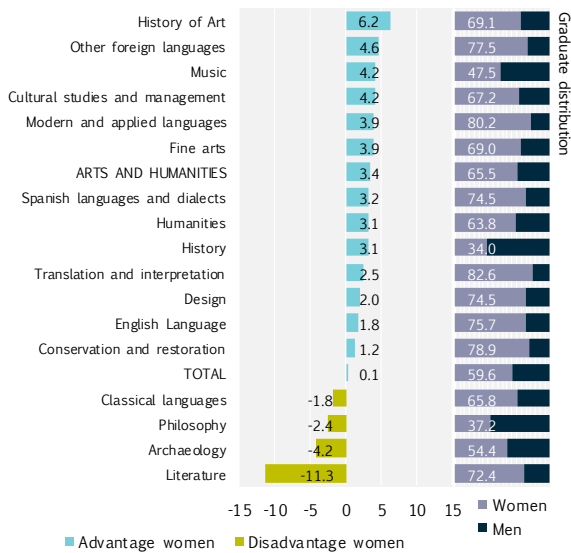
Table 3.2. Correlation coefficient between the ratio of women to men and employment outcomes for female graduates four years after graduation by field of study

	Ratio of women to men		
	Pearson correlation coefficient	Significance	Number of fields
Social Security registration rate	-.234*	0.02	101
% education-job match	-.234*	0.02	101
Average contribution base	-.458**	0.00	98
% employed with full-time contracts	-.500**	0.00	101
% employed with open-ended contracts	-.381**	0.00	101
% self-employed	.229*	0.02	101

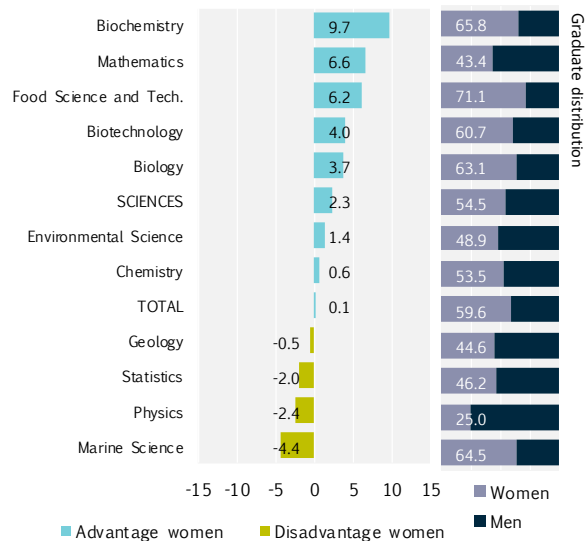
* The correlation is significant at the 0.05 level (bilateral).
 ** The correlation is significant at the 0.01 level (bilateral).

Figure 3.10. Advantages (+) and disadvantages (-) in Social Security registration rates of women compared to men four years after graduation by field of study. Situation of the 2017-18 cohort in 2022. Women minus men (percentage points and percentages)

a) Arts and Humanities



b) Sciences



c) Health Sciences

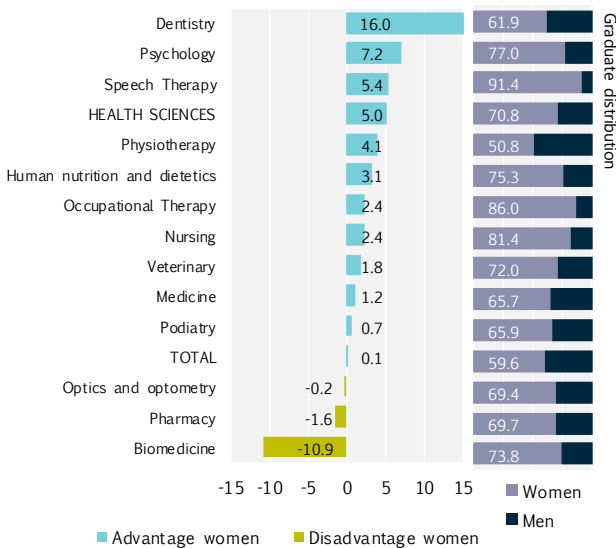
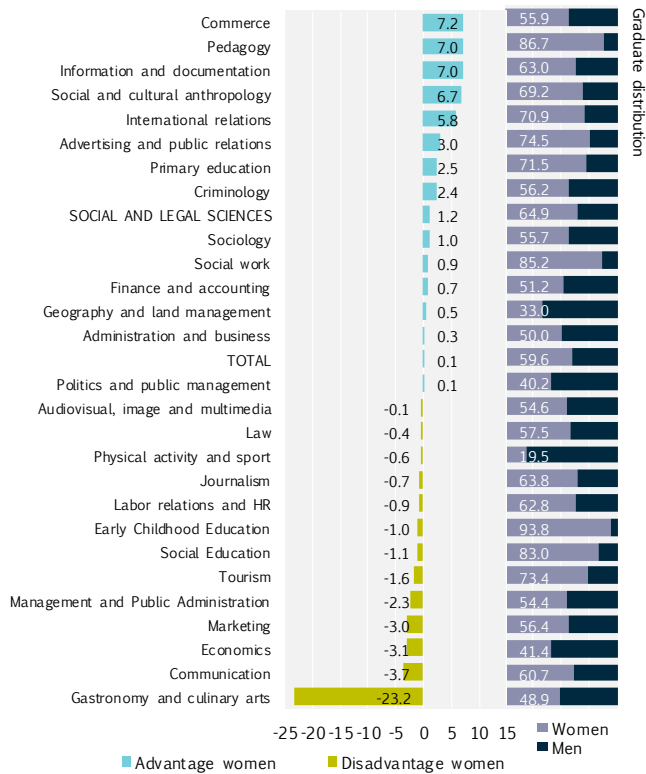
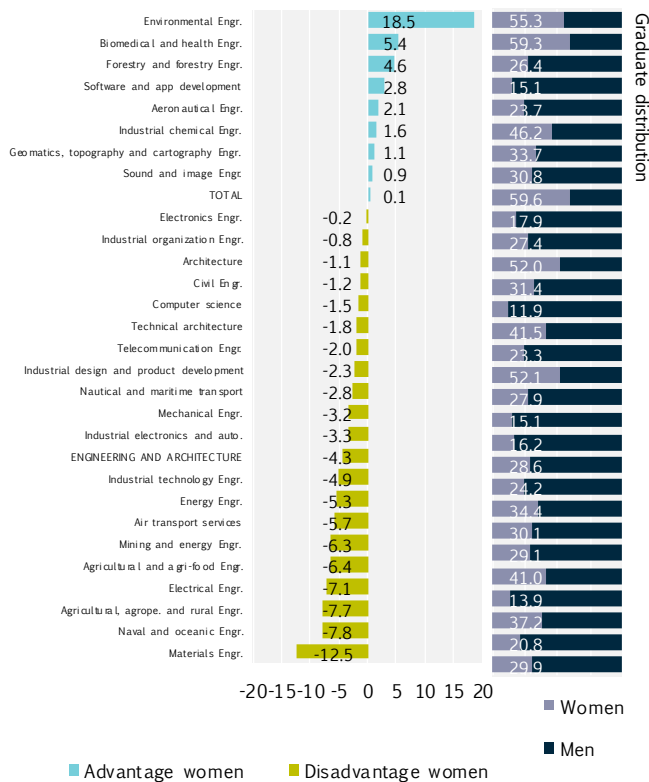


Figure 3.10. Advantages (+) and disadvantages (-) in Social Security registration rates of women compared to men four years after graduation by field of study. Situation of the 2017-18 cohort in 2022. Women minus men (percentage points and percentages) (CONT.)

d) Social and Legal Sciences



e) Engineering and Architecture



Source: Ministry of Science, Innovation and Universities (Indicadores de afiliación a la S.S. de los egresados universitarios).

Figure 3.11 shows the same analysis for education-job match, where, as we saw in the analysis by branch of knowledge, the differences are small (never more than 5 pp) and alternately in favor of women (Arts and humanities, Social sciences and law and Health sciences) and in favor of men (Sciences and Engineering and architecture), but always within this narrow range of differences. In the analysis by field of study, we find that the biggest disadvantages for women are in degrees related to artistic activities in the Arts and humanities branch, namely, Fine arts, Design, and Art

history. In Social sciences and law, the biggest disadvantage in education-job match is in highly versatile degrees (i.e. which may find application in very diverse occupations), such as Business administration and Communication. In the Engineering and architecture branch the disadvantage is most pronounced in Industrial organization engineering and Air transport services, which includes degrees such as Aeronautical management, Business logistics, Transport management and logistics, and Commercial aviation pilots and air operations.

Figure 3.11. Advantages (+) and disadvantages (-) in education-job match of women compared to men four years after graduation by field of study. Situation of the 2017-18 cohort in 2022. Women minus men (percentage points and percentages)

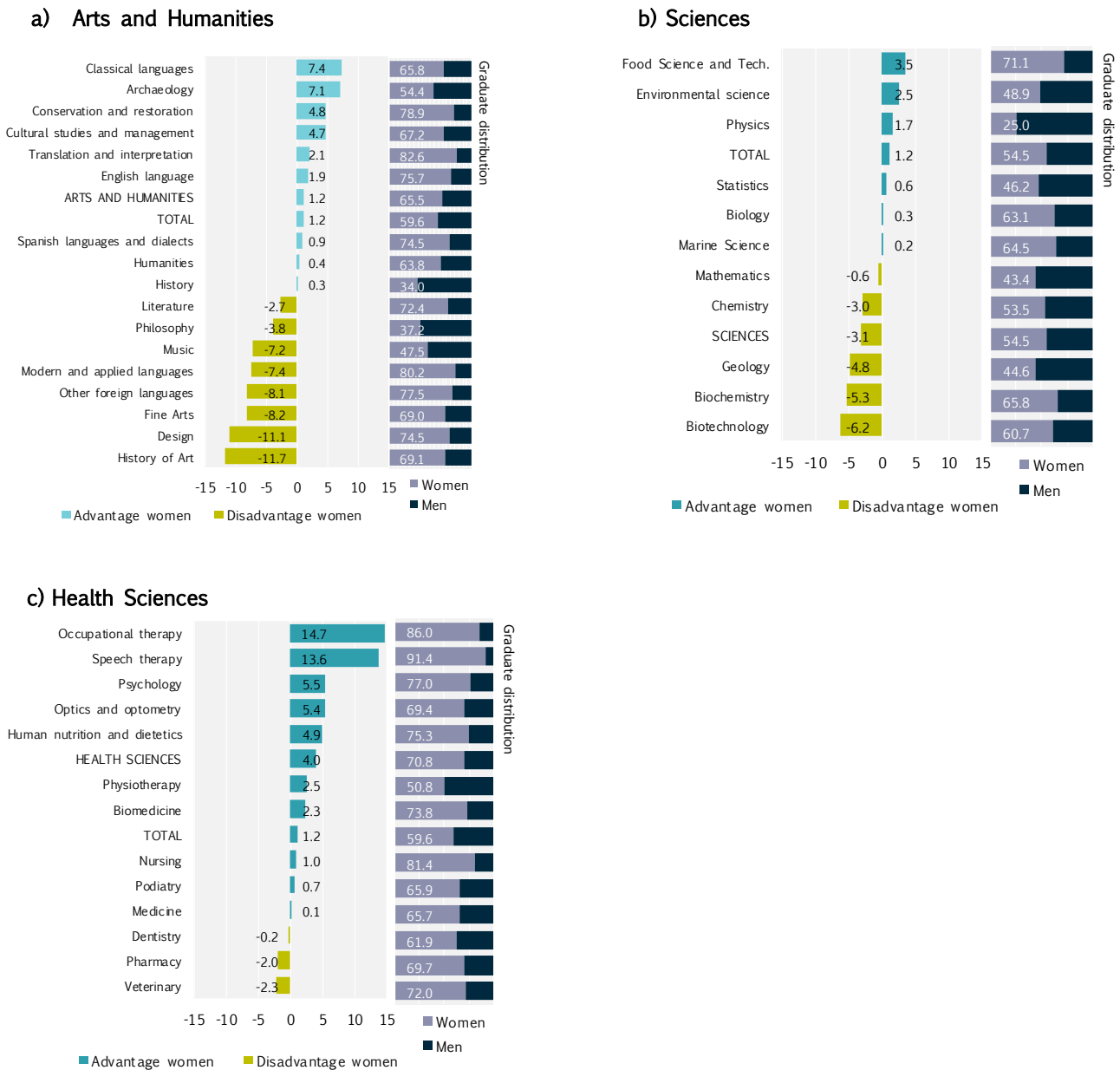
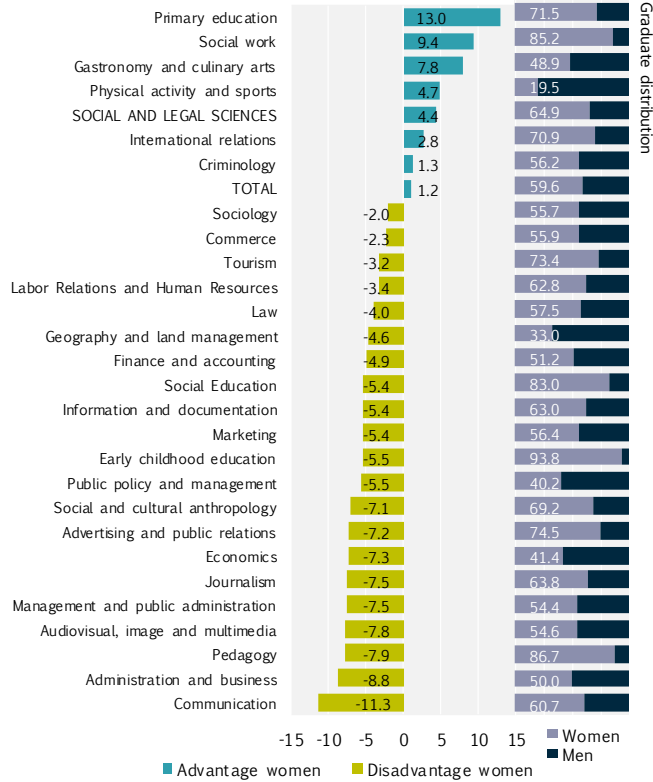
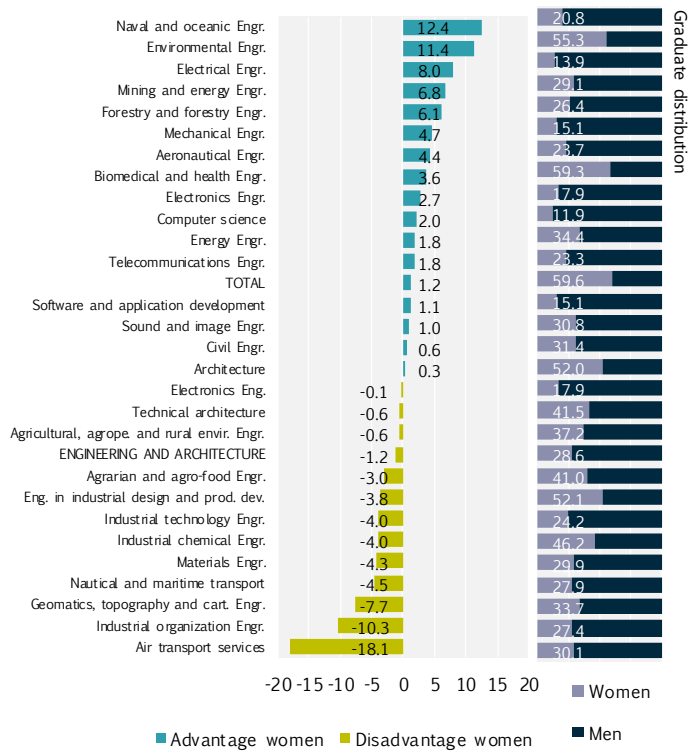


Figure 3.11. Advantages (+) and disadvantages (-) in education-job match of women compared to men four years after graduation by field of study. Situation of the 2017-18 cohort in 2022. Women minus men (percentage points and percentages) (CONT.)

d) Social and Legal Sciences



e) Engineering and architecture



Source: Ministry of Science, Innovation and Universities (Indicadores de afiliación a la S.S. de los egresados universitarios).

In the two employment outcome indicators considered so far, the mismatches between men and women are quite limited and work in both directions. The same cannot be said of earnings, as measured by the average contribution base, which, as we have already seen, in the overall average of all the branches were more than 1,700 euros per year lower for women. We found this difference consistently in all the branches, especially Engineering and architecture (around 2,300 euros per year in favor of men). As can be seen in **Figure 3.12**, in all the branches, consistent with the overall average, there are very few degrees in which women have a higher average contribution base than men. In some branches there does seem to be a relationship between lower education-job match and lower earnings. In Arts and humanities, for example, most of the degrees in which the education-job match for women is lowest (Art history, Design, Fine arts, Modern and applied lan-

guages, Music) are also the ones in which women have the lowest average contribution base compared to men. We find the same in Engineering and architecture (Industrial organization engineering and Air transport services) and in Sciences (Biotechnology). This relationship is to be expected, because if the contribution group does not match the university qualification, the remuneration is likely to be lower, although this is not apparent either in Social sciences and law or in Health sciences. In Health sciences, the mismatches seem to be greatest in degrees less closely linked to clinical practice in hospitals or private health centers, such as Psychology (only recently included in private health centers), Optics and Occupational therapy. In Social sciences and law, the fields with the biggest differences in favor of men are Social and cultural anthropology (-6,000 euros/year) and Criminology (-10,000 euros/year).

Figure 3.12. Advantages (+) and disadvantages (-) in average contribution base of women compared to men four years after graduation by field of study. Situation of the 2017-18 cohort in 2022. Women minus men (in thousands of euros and percentages)

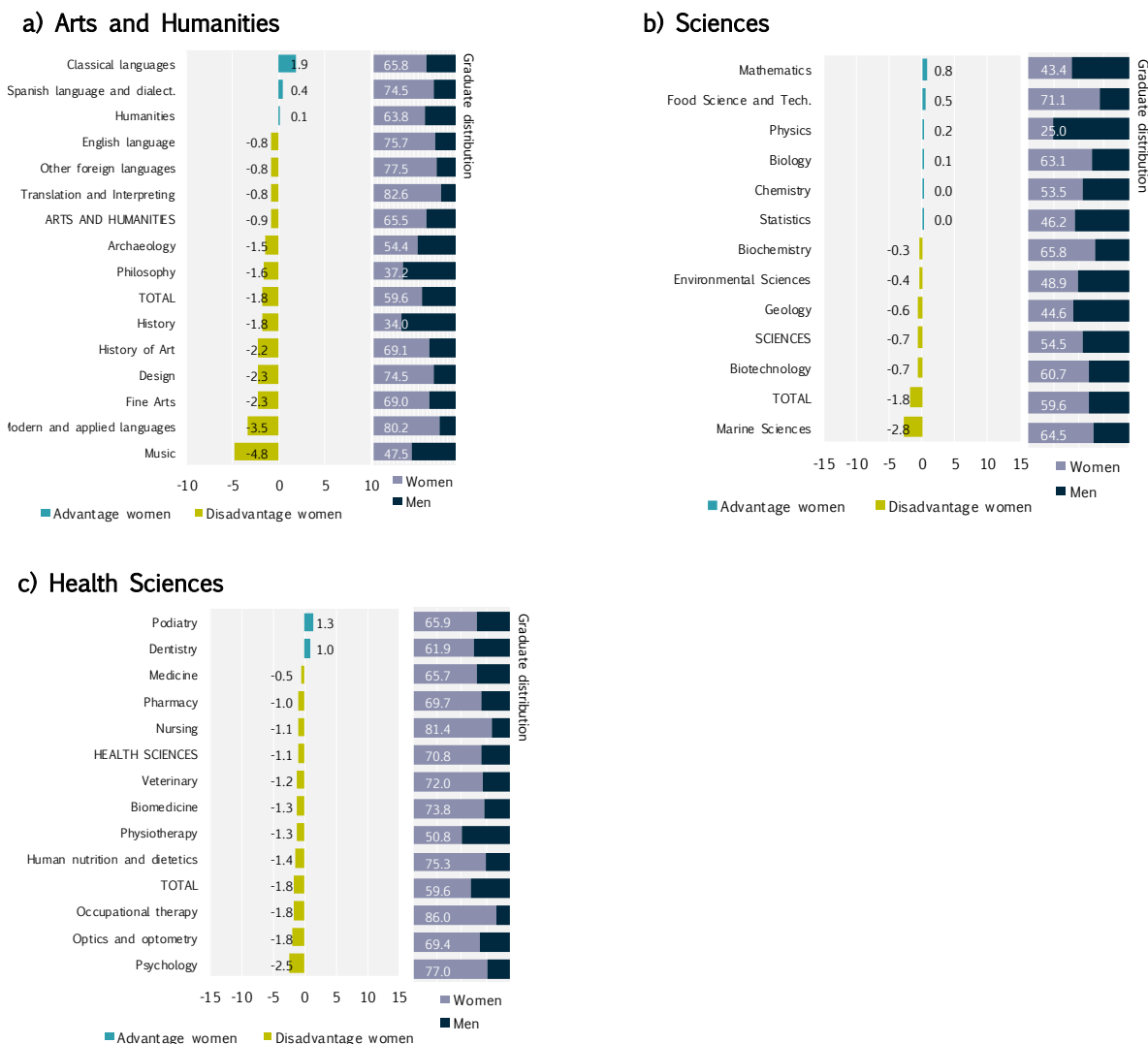
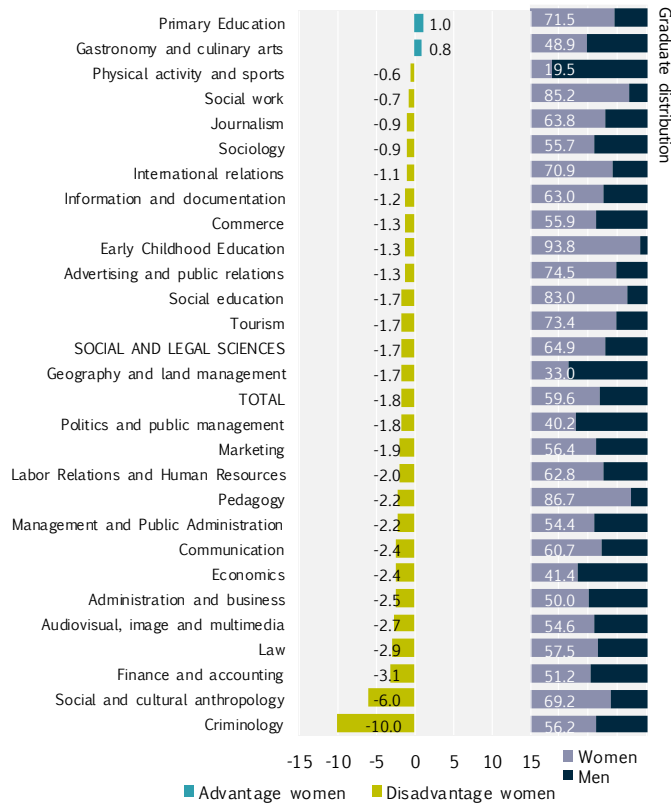
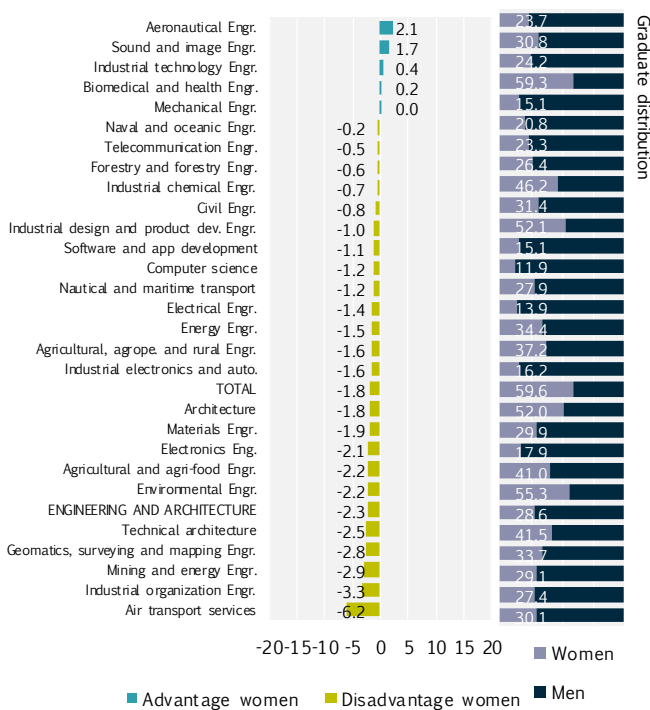


Figure 3.12. Advantages (+) and disadvantages (-) in average contribution base of women compared to men four years after graduation by field of study. Situation of the 2017-18 cohort in 2022. Women minus men (in thousands of euros and percentages) (CONT.)

d) Social and Legal Sciences



e) Engineering and architecture



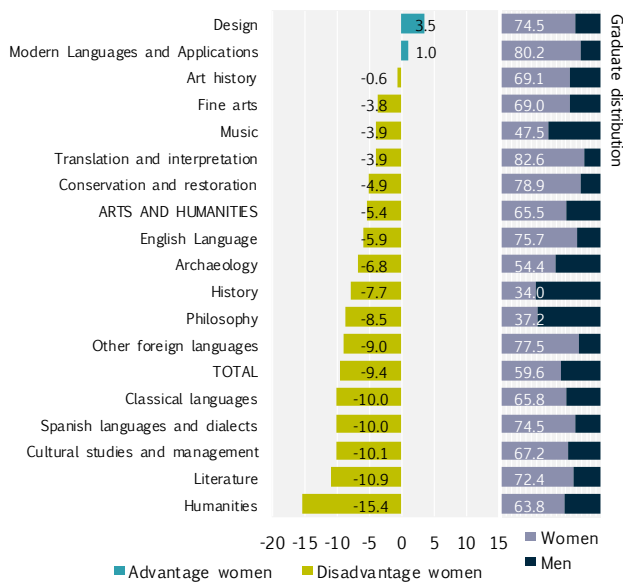
Source: Ministry of Science, Innovation and Universities (Indicadores de afiliación a la S.S. de los egresados universitarios).

Some studies cited in the previous section find that women may have a lower work intensity than men and so are more likely to opt for part-time contracts. To complement this indicator, **Figure 3.13** shows the differences in the percentage of men and women with full-time contracts. In most of the fields of study in all the branches, women graduates work less full-time and more part-time than men. To what extent this is a

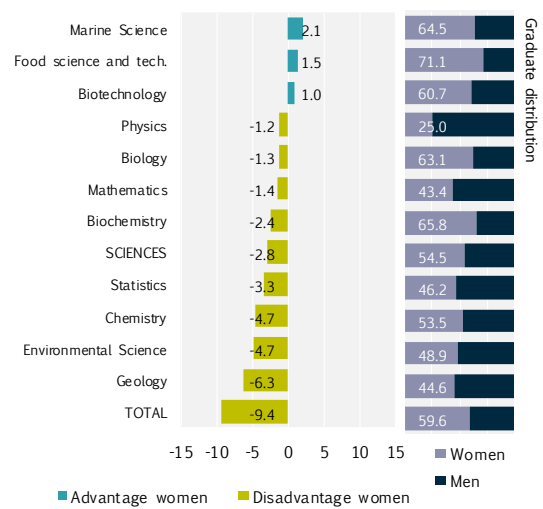
choice cannot be determined with the data used here, but the fact that the difference is observed consistently in all branches and fields suggests that it reflects a decision made by women for various reasons and is not imposed by the labor market.

Figure 3.13. Advantages (+) and disadvantages (-) in percentage of full-time employment of women compared to men four years after graduation by field of study. Situation of the 2017-18 cohort in 2022. Women minus men (percentage points and percentages)

a) Arts and Humanities



b) Sciences



c) Health Sciences

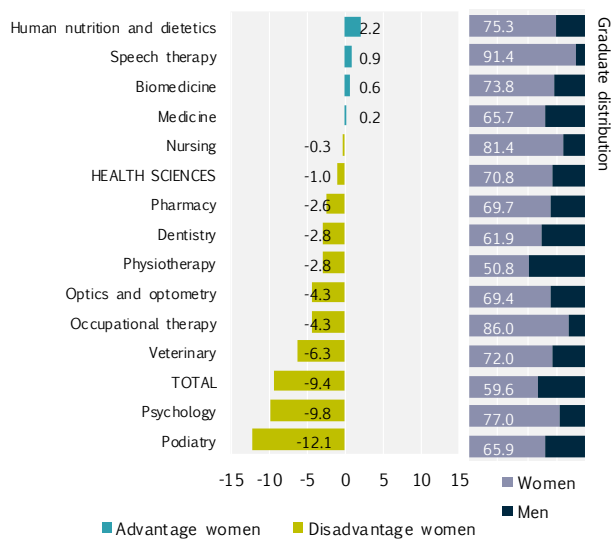
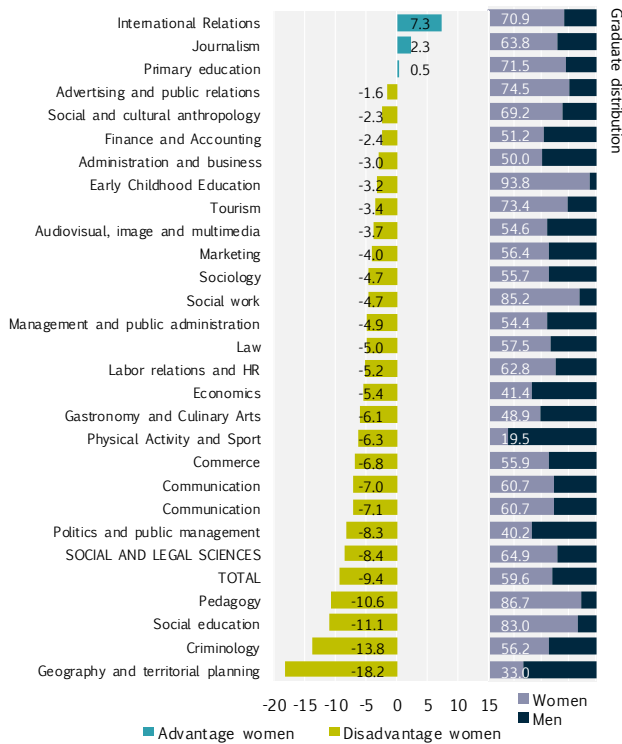
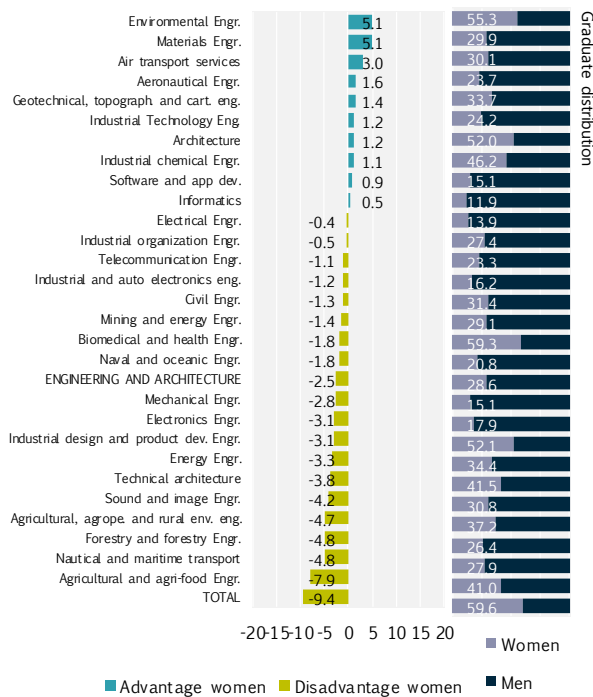


Figure 3.13. Advantages (+) and disadvantages (-) in percentage of full-time employment of women compared to men four years after graduation by field of study. Situation of the 2017-18 cohort in 2022. Women minus men (percentage points and percentages) (CONT.)

d) Social and Legal Sciences



e) Engineering and architecture



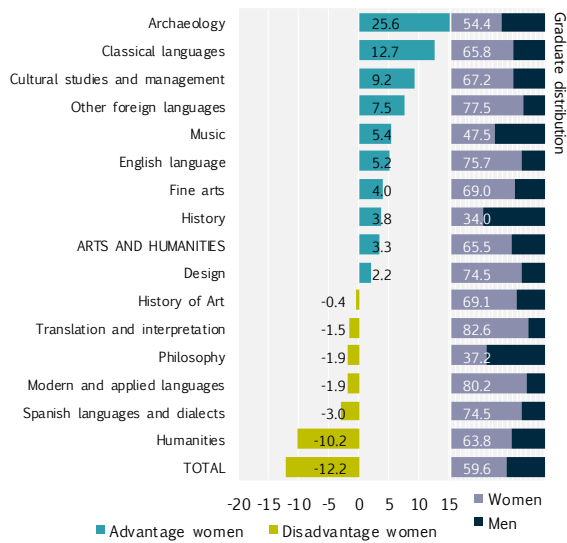
Source: Ministry of Science, Innovation and Universities (Indicadores de afiliación a la S.S. de los egresados universitarios).

The gender differences in percentage of open-ended contracts, shown in **Figure 3.14**, indicate a disadvantage for women in certain fields of study but with no clear causal pattern. Humanities in the Arts and humanities branch, Marine sciences in Sciences, Podiatry in Health sciences, Gastronomy in Social sciences and law and Electronic engineering in Engineering and architecture

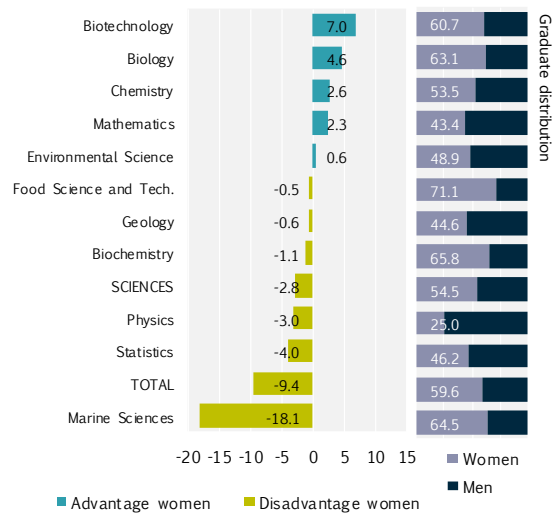
are the fields in which the difference in percentage of open-ended contracts in favor of men is greatest. The fields in those same branches in which the difference is most in favor of women are, respectively, Archaeology, Biotechnology, Biomedicine, Pedagogy and Environmental engineering.

Figure 3.14. Advantages (+) and disadvantages (-) in percentage of open-ended contracts of women compared to men four years after graduation by field of study. Situation of the 2017-18 cohort in 2022. Women minus men (Percentage points and percentages)

a) Arts and Humanities



b) Sciences



c) Health Sciences

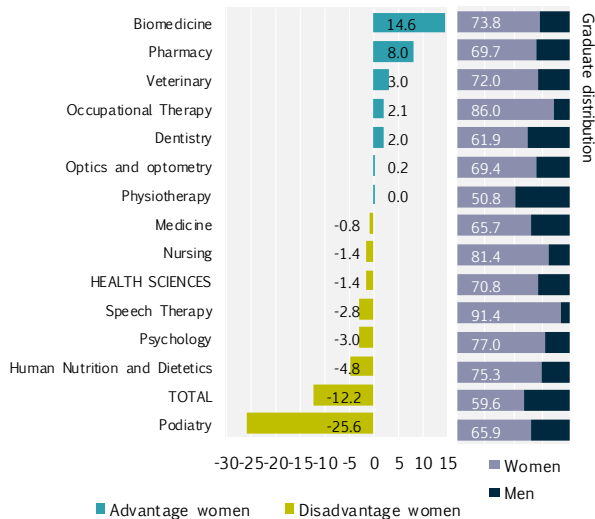
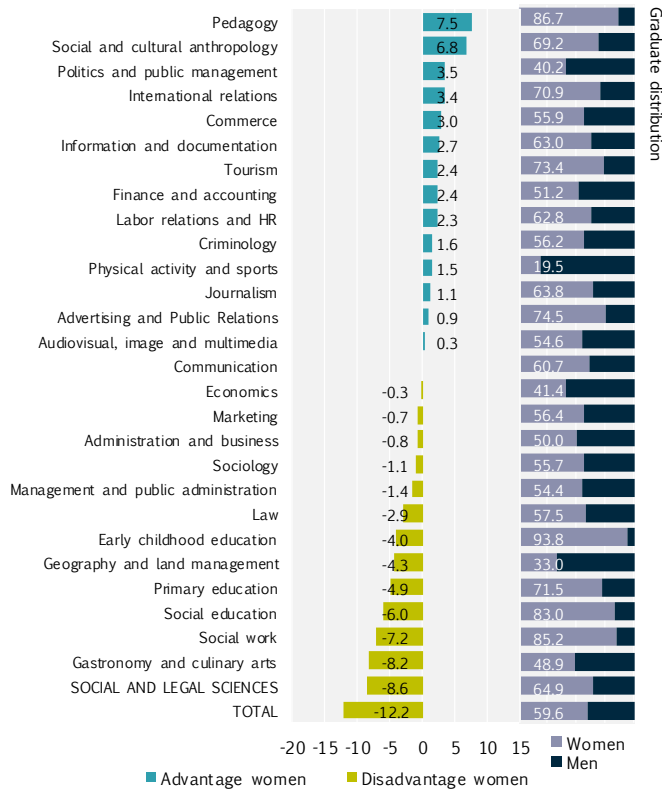
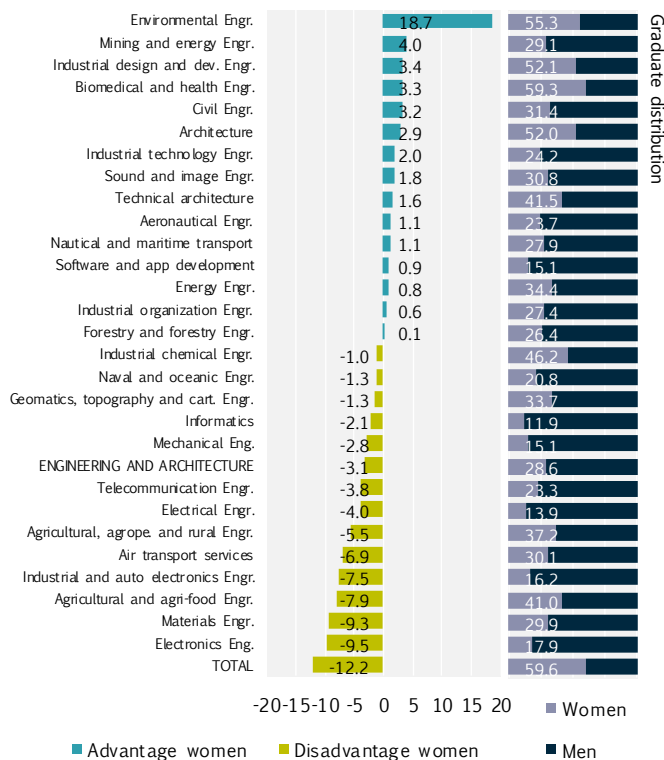


Figure 3.14. Advantages (+) and disadvantages (-) in percentage of open-ended contracts of women compared to men four years after graduation by field of study. Situation of the 2017-18 cohort in 2022. Women minus men (percentage points and percentages) (CONT.)

d) Social and Legal Sciences



e) Engineering and architecture



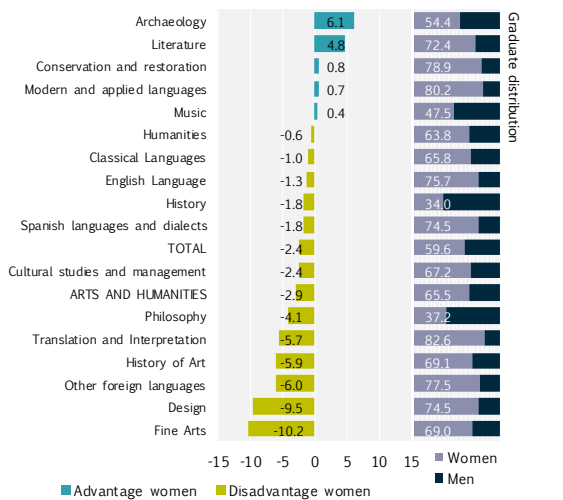
Source: Ministry of Science, Innovation and Universities (Indicadores de afiliación a la S.S. de los egresados universitarios).

Lastly, **Figure 3.15** shows the differences between men and women in percentage of self-employment after graduation. As already noted, self-employment can be a path to entrepreneurship and can also be suited to professional practice in some occupations. Overall, the percentage of self-employment is higher in men than in women, except in Engineering and architecture, where the percentages are practically equal. Looking at the fields within each branch of knowledge, the differences in favor of men (higher percentage of self-employment) appear precisely in the degrees which we found earlier to have the highest proportion of self-employment, namely, those linked to private health centers (Dentistry, Pharmacy, Physiotherapy, Optics, Speech therapy

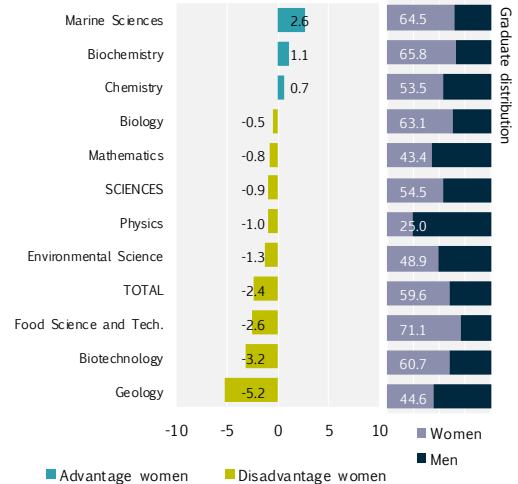
and Podiatry). In other words, the combination of men's greater entrepreneurial propensity and greater likelihood of self-employment in certain degrees accentuates the differences. In other branches, women are less likely to become self-employed than men in art-related degrees in the Arts and humanities branch (Art history, Design, Fine arts); in marketing and communication-related degrees in Social sciences and law (Marketing communication, Advertising and public relations, Audiovisual, image and multimedia); and in engineering degrees related to farming in the Engineering and architecture branch (Agricultural engineering, Agriculture and rural environment, Agricultural and agri-food engineering).

Figure 3.15. Advantages (+) and disadvantages (-) in percentage of self-employment of women compared to men four years after graduation by field of study. Situation of the 2017-18 cohort in 2022. Women minus men (percentage points and percentages)

a) Arts and Humanities



b) Sciences



c) Health Sciences

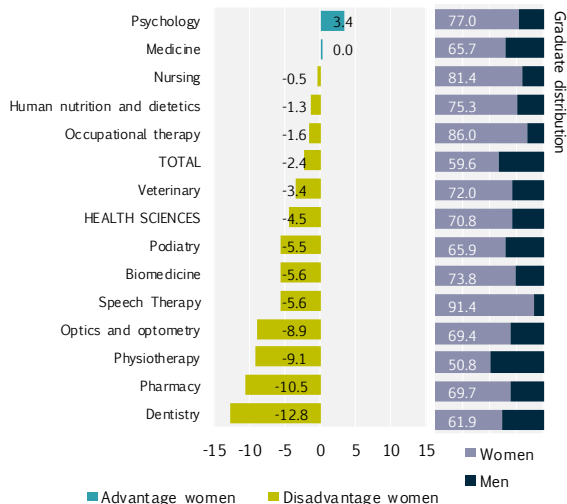
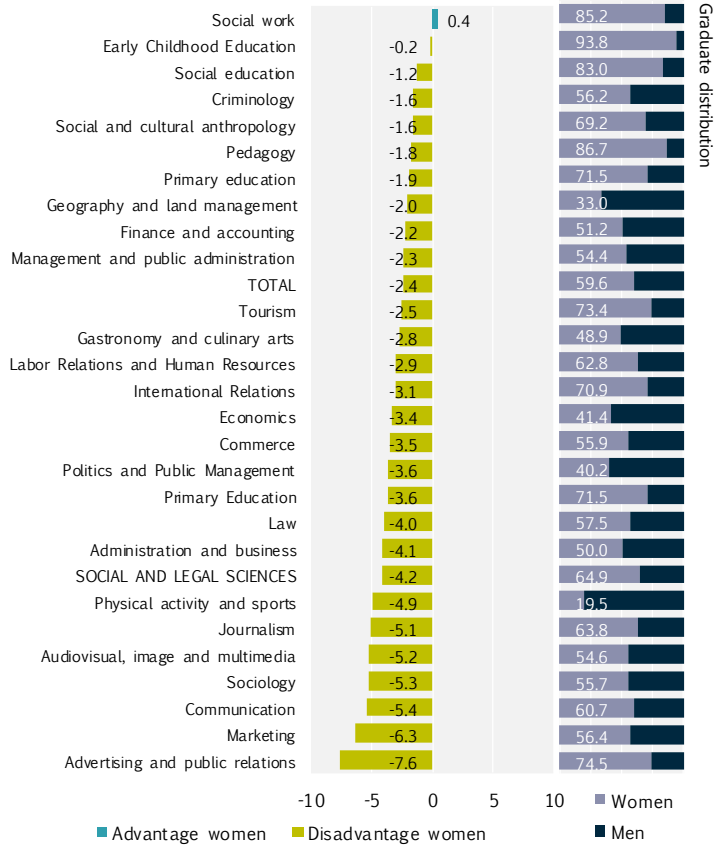
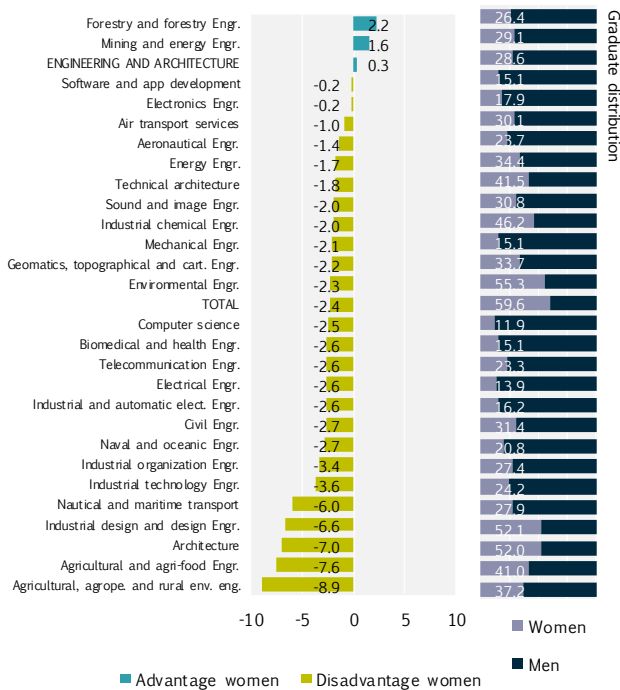


Figure 3.15. Advantages (+) and disadvantages (-) in percentage of self-employment of women compared to men four years after graduation by field of study. Situation of the 2017-18 cohort in 2022. Women minus men (percentage points and percentages) (CONT.)

d) Social and Legal Sciences



e) Engineering and architecture



Source: Ministry of Science, Innovation and Universities (Indicadores de afiliación a la S.S. de los egresados universitarios).

The conclusions from our analysis are as follows:

- Women are currently the majority in bachelor's degrees in all branches of the university system except Engineering and architecture, and also in master's degrees, with the twofold exception of Engineering and architecture and Sciences. They enter university with equal or better qualifications and achieve better academic results than men.
- Although women have shared in the job opportunities available to young Spanish graduates over the last decade, their educational advantages within the university system do not always translate into employment advantages. Female graduates in all branches of knowledge have higher Social Security registration rates and better education-job match than men, but they also have disadvantages in earnings and in the percentage of part-time working and open-ended contracts.
- Women's share of the total number of graduates in the different branches varies widely (although in many cases women are the majority), as also do their relative advantages and disadvantages in employment outcomes. In general, women do not have better employment outcomes in the more female-dominated fields. In earnings and employment quality, women are very often at a disadvantage compared to men.
- Looking at the trends across successive cohorts, women share equally with men in the general improvements in job opportunities seen over the last decade. We find no differences in Social Security registration rates, education-job match or percentage of open-ended contracts.
- We do find gender gaps in employment outcomes such as earnings (Social Security contribution base) and full-time employment, although a slow convergence is observed. When we compare successive cohorts, we find that the differences in earnings between men and women are narrowing. Another important fact, however, is that when, in a given cohort, we compare the earnings of men and women one year and four years after graduation, we observe that career advancement widens the earnings gap between men and women, probably because women have less access—whether because it is not offered or because they do not seek it—to better paid managerial positions or positions of greater responsibility.

Conclusions

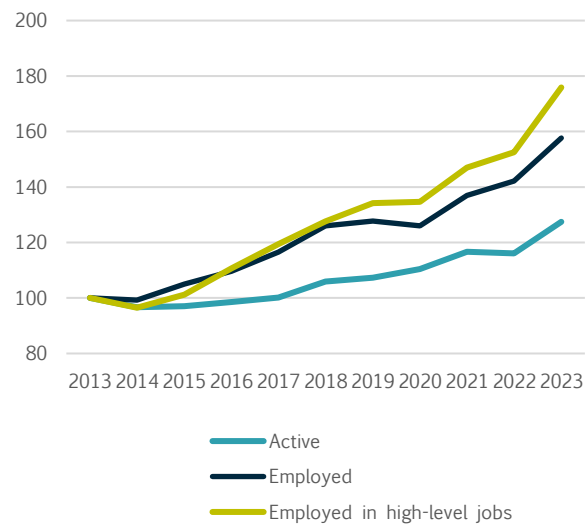
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Graduates in Spain have experienced major improvements in employment outcomes over the last decade that call for a thorough review of previous assessments of the problems of graduate employment. The improvements are the result not only of the sustained growth in production and employment since the Great Recession (with the severe but brief interruption of 2020) but also of the gradual rebuilding and reorientation of the Spanish economy towards more knowledge-intensive activities that require more human capital.

Between 2013 and 2023 a total of 345,800 net new jobs were created for young graduates, of which 315,000 were high-level jobs. Thanks to this substantial improvement in opportunities and the fact that the more recent cohorts of graduates entering the labor market have been smaller, the unemployment rate for graduates aged 22 to 29 fell by almost two-thirds, from 29.2% to 12.5%. The rate of underemployment, measured as the percentage of graduates working in other than managerial, scientific or professional positions, fell by more than a quarter, from 31% to 22%.

According to these data, the bachelor's and master's graduates aged 22 to 29 who entered the labor market in the last ten years have had markedly more abundant and better-quality job opportunities than those who did so in previous decades. In 2023, 58% more young graduates in this age group were employed than in 2013 and 76% more of them were employed in high-level positions.

Figure 4.1. Growth of graduate population aged 22 to 29 (2013=100)



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

The aforementioned changes are documented in the research carried out through a detailed review of the statistical sources for labor market analysis, including the Labor Force Survey (EPA) and education statistics, as well as other databases documenting the employment history of the youngest graduates during the four years immediately after graduation. The analysis of six cohorts of university students who graduated between 2013 and 2018 confirms improvements in three highly relevant dimensions of graduate employment: employment and unemployment rates, the fit between educational qualifications and occupation, and earnings. The percentage of employed graduates registered as self-employed is seen to decrease, owing to the growth in employment opportunities. On the other hand, no significant changes are observed in the

percentages of open-ended contracts or part-time contracts, which are dimensions in which employment outcomes remain deficient.

The analysis of graduate employment outcomes reported here explores whether the traits pointed out in the previous paragraphs apply equally to all graduates, regardless of field of study, gender or type of university. The following are the most general conclusions, followed by the conclusions in respect of each group of graduates.

Main differences between groups of graduates

To identify differences between groups, the information is broken down in four ways: bachelor's and master's graduates; graduates with degrees in different branches of knowledge and fields of study; graduates of public and private universities; and women and men graduates. The main conclusions, set out in detail below, can be summed up as follows:

- Throughout the study period, in terms of employment outcomes, master's graduates have advantages over bachelor's graduates, and graduates of private universities over graduates of public universities. In the more recent years, however, both advantages are more limited than at the beginning and are observed only in some aspects of employment outcomes.
- Degree choice, on the other hand, is a powerful differentiating factor in graduate employment outcomes that remains important throughout the period. The quantity and quality of employment differs substantially between branches (Health sciences, Engineering and architecture, Sciences, Social sciences and law, and Arts and humanities). In many cases, however, the differences between fields of study within each branch are even more significant.
- In some aspects of employment outcome (Social Security registration rate and education-job match) we find hardly any gender gaps. In

other aspects (earnings and percentages of full-time and open-ended contracts) there are gaps to the disadvantage of women graduates that persist throughout the study period, although the last cohorts show a reduction in the earnings gap and in part-time contracts.

Overall positive trends in employment outcomes for graduates

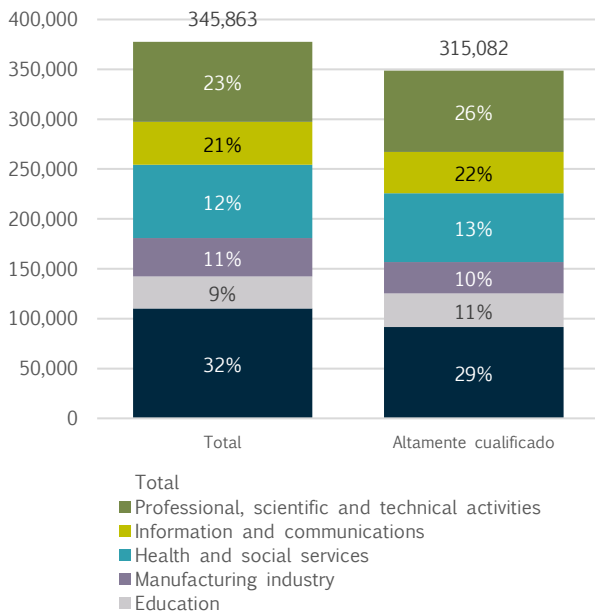
The graduate labor market in Spain over the last decade saw a number of positive general trends that are very relevant to the employment of recent graduates. The employment dynamic of recent graduates differs from that of the population as a whole, other age groups, and young people without a university education. Although young university graduates have traditionally enjoyed advantages in employment compared to young people as a whole, between 2013 and 2023 the advantages became more marked.

Opportunities for recent graduates have grown as a result of the combination of four factors, two quantitative and two qualitative, two on the demand side and two on the supply side.

- On the demand side, the opportunities stem from strong job creation and an increase in the share of high-level occupations. Together, these two factors have prompted strong growth in the demand for highly qualified workers, as the positions classified as high-level under the Spanish National Occupational Classification, CNO-11 (i.e., those in levels 1, 2 and 3), have grown by 76%. Level 2 (scientific and knowledge professionals), comprising 80% of all high-level occupations and posting rapid growth (78.4%), accounts for most of the new opportunities. Graduate employment did not slow during the pandemic, and high-level occupations grew even faster afterwards. Between 2013 and 2023 the number of young graduates in work grew by 345,862. This growth has been driven by advanced tertiary activities, as three quarters of the new jobs are concentrated in five sectors: professional, scientific and technical activities (23%), health and social services (21%), information and communications (12%), manufac-

turing (11%) and education (9%). These are sectors that rely heavily on human capital and that have acted as the main reservoirs of quality employment for new graduates. These five sectors account for 82% of the 315,000 new high-level jobs for young graduates created between 2013 and 2023.

Figure 4.2. Sector distribution of job creation for graduates aged 22 to 29. 2013-2023

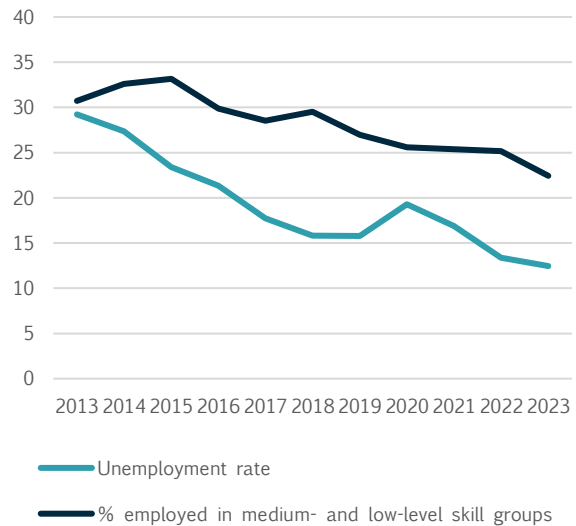


Source INE (EPA) and authors' own calculations.

- The opportunities associated with the rapid expansion of high-level employment have gone largely to new labor market entrants. At the same time, however, the supply of highly qualified human capital, i.e., the number of graduates entering the labor market, has increased at a good pace over the last decade, as indicated by the growth in the number of graduates aged 22 to 29 in employment. In this regard, it should be pointed out that the significant increase in number of new graduates (up 27% between 2013 and 2023) rests on the fact that a larger proportion of bachelor's graduates go on to pursue a master's degree, as there has been no increase in the number of bachelor's graduates. Even so, the number of highly qualified job seekers has grown less than the demand for human capital, and much less than the number of job openings for scientific and knowledge

professionals, thus allowing a substantial reduction in graduate unemployment and underemployment.

Figure 4.3. Unemployment and underemployment rate among graduates aged 22 to 29 (percentage)



Source INE (EPA) and authors' own calculations.

As a result of these different trends in the demand for and supply of human capital, the young graduate labor market underwent significant changes between 2013 and 2023 compared to previous periods. The new jobs for scientific and knowledge and professionals have been a major source of opportunities for young graduates, both because of the increasing volume of such jobs and the level of qualifications they require.

- The number of graduates aged between 22 and 29 in employment increased by almost 58% over the ten-year period, and those graduates increased as a proportion of young people in employment, since although total youth employment also improved, it did so less rapidly (20.4%). In 2023, 37% of the employed people in this age group are graduates. If we include people with higher VET qualifications, more than half (56%) of the young people currently employed have higher education.
- With young graduate employment increasing at a rate of 4.7% per year, well above the population of recent graduates entering the labor

force, the reduction in unemployment among young graduates has been substantial. The unemployment rate has fallen from 29.2% to 12.5% in ten years. If this rate were maintained over time, young graduates would eventually reach full employment.

- Unlike in other periods, the increase in the number of graduates and in the supply of university-educated human capital has not led to an increase in graduate underemployment. On the contrary, the percentage of employed young graduates doing non-high-level work (levels 4-9 in CNO-11) has fallen from 31% to 22%. As a result, the relative disadvantage in this respect suffered by young graduates compared to graduates as a whole has disappeared. There are three reasons for this change of scenario. The first is the strong growth in high-level occupations in the Spanish economy. As the structure of production has changed, more high-level jobs have been created, providing opportunities for the more highly qualified labor market entrants in particular. The second is the smaller size of the more recent cohorts due to demographic trends, despite high gross university enrolment rates among 18-year-old Spaniards (72%). The third is the rise in retirement among older graduates, creating opportunities for the younger ones.

Increase in the number of graduates and change in composition of the graduate population

The total number of graduates, both bachelor's and master's, increased by 24% over the 10-year study period but has remained stable in recent years at around 341,000 per year¹³.

¹³ This figure should not be interpreted as equivalent to the increase in the total number of graduates aged 22 to 29. The stock of graduates in this age group is the result of the entry of new graduates and the exit from the reference cohort of those who turn 30.

The total numbers of graduates show significant changes in composition, in various ways:

- While the number of bachelor's graduates remains stable, the number of master's graduates increases rapidly over the 10-year period, with a substantial increase in the percentage of bachelor's graduates who subsequently obtain a master's degree. Master's graduates have thus increased as a percentage of total graduates and currently account for 42% of the total. Given this circumstance, it becomes important to determine whether there are significant differences between the conditions under which bachelor's and master's graduates enter the workforce.
- The private universities have increased their share of total graduates but very unequally in bachelor's degrees (19% of graduates in 2022) and master's degrees (48.5%).
- The distribution of graduates across the branches of knowledge has changed, but not in the same way in bachelor's and master's degrees. At bachelor's level, the proportion of graduates has decreased in Social sciences and law and, above all, Engineering and architecture, but has increased in Health sciences. At master's level, by contrast, the proportion of graduates in Social sciences and law is high and growing.
- The number of graduates in the individual fields of study within each branch varies greatly and has also varied over time. It is striking, however, that the two branches that have the largest number of degrees with a declining number of graduates should be Arts and humanities and Engineering and architecture, since the job opportunities in these two sets of degrees are very different and, in the case of Engineering and architecture, very considerable.
- Women account for 60.5% of bachelor's graduates and 57.2% of master's graduates, but the ratio of women to men in the different branches and their fields of study varies widely around these averages. A majority of the

Health sciences degrees have an above-average proportion of women, and almost all the Engineering degrees a well below-average proportion. In the other three branches, in contrast, some degrees are more female-dominated, while others are more male-dominated.

Changes in the first few years of employment after graduation

By analyzing the Ministry of Science, Innovation and Universities and Social Security data on the employment of the graduates from the six cohorts between 2013 and 2018, we can trace their progress throughout the first four years of employment, that is, the four years immediately after graduation.

The data reflect the changes that took place between 2013 and 2022, separating the effects of the passage of time within each cohort from the effects of the shift from one cohort to the next, in six employment outcome indicators: Social Security registration rate, education-job match, contribution base, percentage of full-time employment, percentage of open-ended contracts and percentage of self-employment. The most noteworthy changes are as follows:

- All the indicators show a clear improvement in employment outcomes over time within each cohort. The biggest improvements are in Social Security registration rates, which increase by more than 20 pp between year 1 and year 4, and in education-job match, where the improvement is 15-20 pp. In the more recent cohorts, the improvement in percentage of open-ended contracts is also approaching those levels.
- We also observe improvements in employment outcomes in successive cohorts, especially in year 1 Social Security registration rates. The improvements in graduate employment opportunities thanks to general employment growth are confirmed, since the rate of employment among graduates increases, and the graduates find employment sooner after graduation.

- The trend in the employment outcome indicators four years after graduation is positive in all cases. The biggest improvements are in Social Security registration rate and percentage of open-ended contracts.
- The trend in self-employment is different: though hardly changing between the first and fourth year after graduation, it is decreasing over time. These two findings point to two different causes of the trend in this indicator. The first is that self-employment is an enduring feature of various professions in some fields belonging to different branches of knowledge (especially Health sciences), because work is organized through self-employment rather than employment. The second is that the percentage of self-employment is decreasing over time because more jobs are being created for graduates in companies and public-sector bodies, which hire graduates as employees.

Advantages in employment outcomes of master's graduates vs. bachelor's graduates

The increase in the share of master's graduates in the total number of graduates over the study period is substantial, from 22% in 2013 to 42% in 2022. By analyzing the employment outcomes of bachelor's and master's graduates we can assess the extent to which the growing demand for master's degrees is explained by the advantages they offer in terms of employability.

Overall, the patterns of improvement described in the previous section are observed in both types of graduates, but the employment outcomes are better among master's graduates in some indicators. On average, compared to a bachelor's graduate, a master's graduate finds employment more readily and sooner, achieves higher earnings sooner, has a better education-job match and is more likely to have a full-time job.

The biggest advantages for master's graduates are observed, above all, in education-job match and in contribution base, i.e., earnings. In education-job match, it should be borne in mind that the ad-

vantage may be partly because for a significant number of these graduates a master's qualifies them to exercise a profession (law, teaching, engineering), so it is to be expected that people with these degrees should have occupations that match their qualifications.

The advantages of master's graduates over bachelor's graduates in contribution base increased over the study period, both in the first year after graduation and in the fourth.

Differences in employment outcomes for graduates of public and private universities

Graduates of private universities enjoy certain advantages in employment after graduation compared to those of public universities and, in general, those advantages persist throughout the study period. The main advantages are in education-job match and in contribution base. Four years after graduation, graduates of private universities have an education-job match 12 pp higher than those of public universities in the case of bachelor's degrees and 7 pp higher in the case of master's degrees. In contribution base, private university graduates outperform public university graduates by 10% at both bachelor's and master's levels. Considering that private universities have gained considerable market share in master's programs over the last decade, these two dimensions of employment outcome may well be strengths in graduate employability that help attract students.

In the other indicators, in contrast, there is no advantage for graduates of private universities. There are currently hardly any differences in Social Security registration rate, full-time contracts or open-ended contracts in either bachelor's or master's degrees. There used to be differences in some cases, but outcomes for public university graduates have improved more rapidly, thus converging with those of private university graduates.

The percentage of graduates registered as self-employed deserves attention. In both bachelor's and master's degrees, the percentage is declining for both types of university but is higher for private

universities, especially among bachelor's graduates. This difference may be due to the different composition of the programs offered, but also to the socioeconomic profile of the families of graduates of the two types of university. Greater economic support for students at private universities may be more conducive to entrepreneurship and afford the means for professional development of the self-employed.

The important influence of the choice of degree on employment outcomes

One of the areas in which the report delves deeper is in the analysis of differences in employment outcomes between graduates in different fields of study, comparing average outcomes in the five main branches of knowledge and 122 fields of study.

The two important features at branch of knowledge level are that all the branches reflect the same overall improvement in employment outcomes, but that each starts from a different level in the various indicators and the differences between branches are maintained over time. Generally speaking, graduates in Health sciences and Engineering and architecture have better employment outcomes, while Arts and humanities graduates encounter the greatest difficulties.

Health sciences and Engineering and architecture have similar advantages in two indicators, namely, Social Security registration rate and contribution base. Arts and humanities has the worst record in both indicators.

In all the other indicators, the branch with the greatest advantages varies: in education-job match it is Health sciences, whereas in full-time and open-ended contracts it is Engineering and architecture. In open-ended contracts, the peculiarities of some Health sciences degrees (where further study is combined with work) are reflected in their having the lowest levels in this indicator.

Once again, the percentage of self-employment follows a declining path in all the branches, but the differences between branches are considerable (with Health sciences well above the average and

Sciences well below) and persistent. The high percentage of self-employment in Health sciences reflects work patterns in some professions that are exercised largely outside the public health system (pharmacists, opticians, dentists, physiotherapists, podiatrists).

The breakdown of employment outcomes by field of study confirms the overall improvement: the trend is positive in almost all fields and all indicators, with the possible exception of the decline in self-employment, given that an increase in this indicator does not necessarily signify an improvement. In addition to the notable differences between branches, employment outcomes also vary significantly within each branch.

Social Security registration rate, education-job match, average contribution base and percentage of full-time contracts are highly correlated at the field of study level, so that we can say there is a significant relationship between some quantitative and qualitative dimensions of employment outcomes. However, the percentage of open-ended contracts and of self-employment do not correlate with the other indicators. We thus find heterogeneity also between indicators, since a given field's good results in one indicator (e.g., Social Security registration rate) do not predict good results in others (e.g., open-ended contracts).

Work patterns in some professions influence the employment outcome indicators. The way work activities are organized (public vs. private, self-employed professionals vs. companies) is relevant to explaining features of employment such as the relative frequency of full- vs. part-time contracts, fixed-term vs. open-ended contracts or the percentage of self-employment vs. employment.

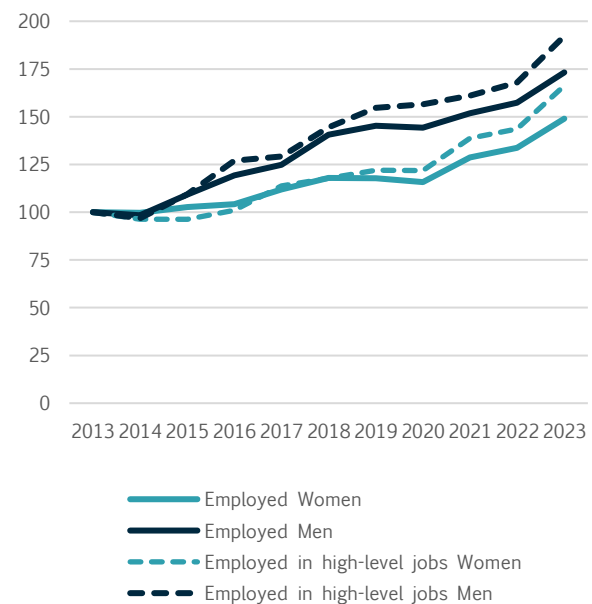
Gender differences in employment outcomes

Women currently enter university on a massive scale, accounting for 57% of total bachelor's and master's students. Female students are the majority of bachelor's students in all branches of knowledge except Engineering and architecture, where their presence is much lower (28%). In master's programs women are also the majority in

Health sciences, Social sciences and law and Arts and humanities, but not in Science or in Engineering and architecture. At the level of the individual field of study, although women are the majority in many cases, the ratio of women to men in the different fields is very diverse, with women accounting, in some cases, for more than 90% of total graduates and, in others, for less than 15%.

Women enter university with equal or better qualifications than men and achieve better grades, owing to their superior performance (fewer dropouts and a higher timely completion rate). For this reason the general predominance of women over men among graduates is clear (60%-40%) and is most pronounced in Health sciences (70%-30%); only in Engineering and architecture are the proportions reversed (28%-72%). These averages are the result of high ratios of women to men in most fields of study in Health sciences and high ratios of men to women in most fields of Engineering. Within the other branches, however, the ratio varies widely.

Figure 4.4. Employed graduates aged 22 to 29 by gender. 2013-2023 (2013=100)



Source INE (EPA) and authors' own calculations.

After graduation, women graduates have shared in the numerous job opportunities created during the last decade, representing a similar proportion of the employed population as of the population of students graduating from universi-

ty. Since the activity, employment and unemployment rates of female university graduates are already similar to those of male graduates (which is not the case at other levels of education), women account for 61% of employed graduates aged 22 to 29. Young female graduates' share of high-level jobs is 59%, somewhat below their share of total graduate employment, having seen slower cumulative growth over the period from 2013 to 2023 (92.2% in men and 66.3% in women). In any case, women's share of high-level employment opportunities has been substantial: of the total of 315,000 new high-level jobs, women have occupied 173,000 (55%), and their progress in this respect has accelerated since 2020.

The Ministry of Universities and Social Security data allow a more detailed analysis of this aspect, including any gender gaps during the first few years after graduation in the six indicators: employment rate, education-job match, earnings, full- vs. part-time working, open-ended contracts, and percentage of self-employment. These dimensions are assessed for each of the six cohorts included in the study to determine whether there are any identifiable trends in the indicators over time. In addition, given the significant and in some cases very marked differences between men and women in their choice of degree, we can also assess any relative advantages and disadvantages of men and women graduates in the same field of study.

The advantages of recent female graduates in university education are reflected, in many fields, in higher Social Security registration rates and better education-job match. The exceptions, as regards Social Security registration rate, is in the fields that make up the Engineering and architecture branch, and as regards education-job match, in the Sciences and Engineering and architecture branches.

However, the Social Security data for each branch of knowledge indicate that women are disadvantaged in other indicators, namely, contribution base (earnings gap), percentage of part-time working and percentage of open-ended contracts (except in Sciences and Arts and humanities). The disadvantages for women in earnings and employment quality are widespread among graduates within the

same field of study, reflected in a lower contribution base and a smaller percentage of full-time employment. Moreover, these gender gaps in employment outcomes are observed to be narrowing over time.

The lower average contribution base of women may be associated with lower work intensity, that is to say, women may choose to forgo, or may not be offered, senior management or more responsible middle management positions. The available data cannot tell us whether this lower work intensity reflects a personal choice of female graduates (particularly for childcare) or discrimination by employers. The same can be said of the lower work intensity implied by the higher percentage of part-time employment among women. Lastly, women have a lower percentage of self-employment in all branches (except Engineering and architecture) and, above all, in a large majority of the fields within each branch. To the extent that the level of self-employment is influenced by the way work is typically organized in each field, this finding is revealing, since it indicates that women are more likely to opt for employment rather than self-employment or entrepreneurship.

Final thoughts and recommendations

This report draws attention to the significant changes in graduate employment outcomes. Most of these changes have taken place in the last ten years and are positive, with substantial reductions in unemployment and underemployment, increases in contribution bases and improvements in employment contracts. In light of these changes, it is important that we review the validity of assessments based on data from previous periods and avoid prolonging a pessimism that may have been justified but no longer concords with reality.

Our first reflection is that it is important to know the causes of the changes. They include the recovery of economic growth and the gradual transformation of the production system through an expansion of human capital-intensive activities. This change in growth patterns calls into question the lack of employability of graduates in general: where there are large reservoirs of high-level work in certain activities, such as

those referred to earlier in this report, graduates find employment and the mismatch between their education and the type of work they do is reduced. Accordingly, the first recommendation to improve graduate employment outcomes is to implement policies that promote a transformation of the production model.

Along with the aforementioned improvements, the conclusions also highlight the persistence of significant differences in graduate employment in different branches and fields of study, with advantages in many Health sciences and Engineering degrees and disadvantages above all in Arts and humanities. The reflection in this respect is twofold: how much attention do universities pay to employability when designing their mix of programs, and what resources do education authorities make available to secondary schools to guide students in choosing paths that will lead to higher education and employability? The recommendation is to boost efforts in both directions, disseminating the valuable information on employment now available, so that students' choice of degree is free and fully informed.

The third reflection concerns the employment of women graduates, where there have been substantial improvements and some gender gaps have been reduced. Yet disadvantages remain, mainly in earnings and type of contract as graduate careers advance. In view of these hurdles, it is clear that although going to university is an important lever for leveling opportunities between women and men, much remains to be done. Our third recommendation is that governments and universities continue to work to ensure that young women have appropriate information about the job opportunities that remain untapped because of women's low presence in science and engineering programs. This should start with the promotion of positive role models for women as scientists and engineers at primary, secondary and baccalaureate level. Gradually balancing the share of women and men in these branches of knowledge, which are the ones that offer the highest earnings, would at the same time help reduce the gaps in earnings. The fourth recommendation is to continue to investigate the causes of earnings gaps and occupational differences between men and women with similar levels of education and the means of eliminating any found to be discriminatory.



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