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Education as a driver for growth and reducing inequality. Future challenges*

FAD Juventud Conference
Madrid

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Governor

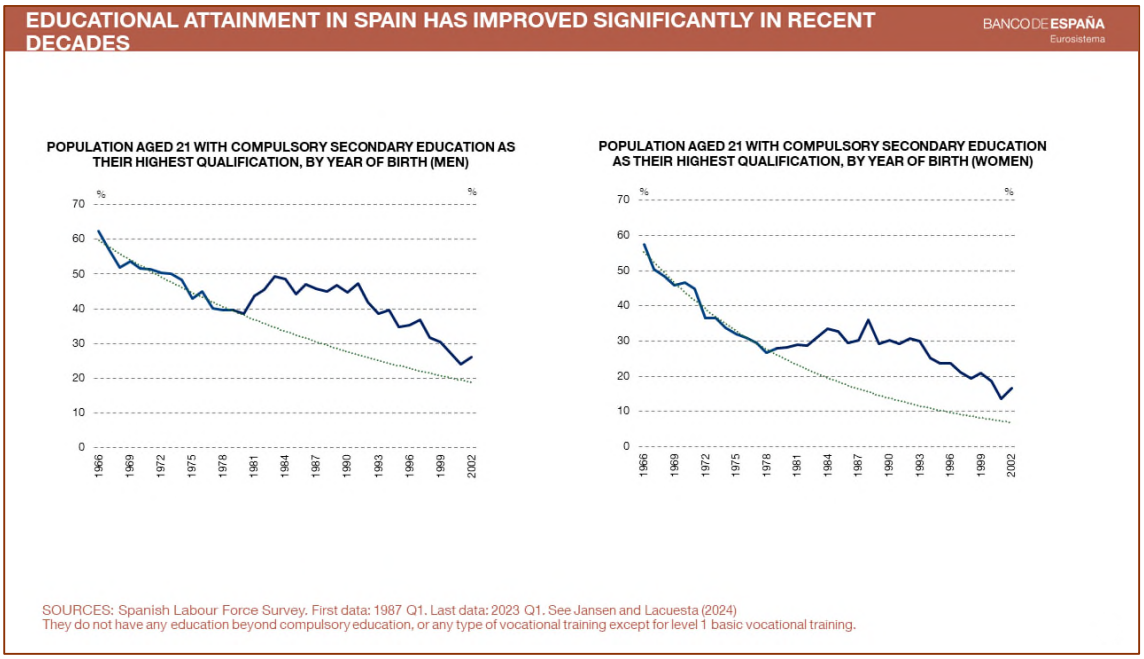
* English translation from the original in Spanish.

Dear Ignacio, Chair of FAD Juventud, authorities, ladies and gentlemen:

It is a pleasure to be here with you today, to discuss such an important topic as the education of young people. This is an issue to which the Banco de España has devoted considerable analytical effort, and I would like to take this opportunity to present the results of some of our work.

I will begin by explaining the importance of education for economic development and equality of opportunity, and then go on to outline some of the main challenges facing the Spanish education system.

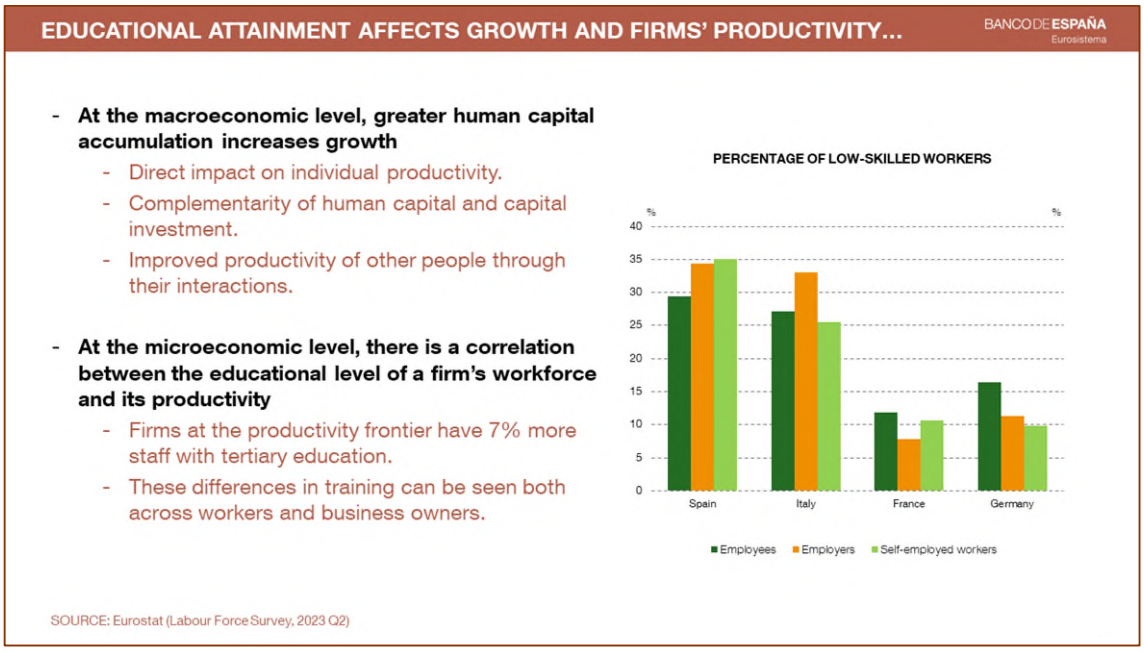
The importance of education



One of the most noteworthy aspects of Spain's socioeconomic development over the last few decades has been the progress made in the educational attainment of the population.

For instance, based on Spanish Labour Force Survey data, around 62% of men and 57% of women born in the mid-1960s had no qualifications beyond compulsory education at the age of 21. These percentages gradually decreased until 2000, to 40% for men and 28% for women. The improvement in educational attainment slowed down, and even reversed,[1] after 2000, but it subsequently resumed, such that in 2023 the percentage of men and women born in 2002 with no qualifications beyond compulsory education was 26% and 17%, respectively.

[1] For the generation born in 1990, 45% of men and 30% of women still had compulsory secondary education as their highest level of education at the age of 21 (i.e. in 2011).



This improvement in the population's education level has had very positive effects in various dimensions.

First, from the standpoint of economic growth, the following should be noted:

- Overall, higher levels of education increase economic growth,[2] as they improve individual productivity, generate complementarities with capital investment[3] and can even lead to productivity gains for people with lower levels of education through interaction with those who have higher levels.[4]

- There is a correlation between the skills of employees and employers and business productivity.[5] In this respect, the percentage of low-skilled employees, employers and self-employed workers is higher in Spain than in other European countries, which could at least partly explain the country's lower relative productivity growth. The empirical evidence finds that firms on the productivity frontier[6] have a better qualified workforce.[7] In particular, firms on the productivity frontier have 7% more employees with tertiary education than the median firm.

[2] Romer (1986) or Lucas (1988).

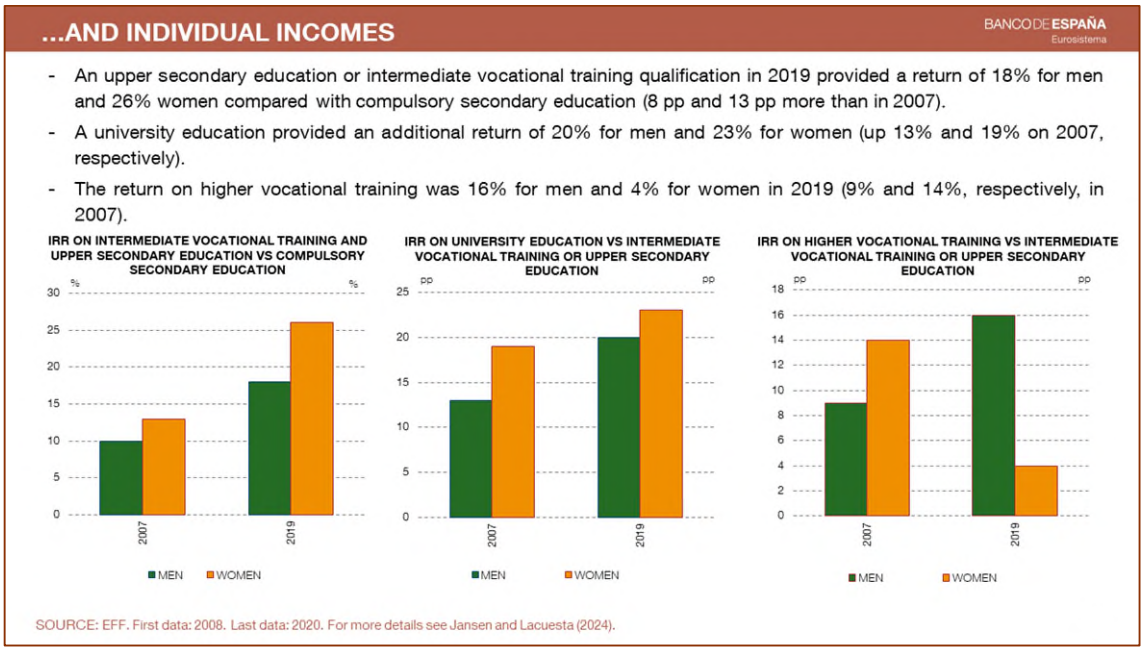
[3] Lucas (1990).

[4] Lucas (2015).

[5] Syverson (2011).

[6] Firms in the top 10% in terms of productivity, comparing firms in the same year, country and sector.

[7] OECD (2021). Although there are quantitative differences between countries and sectors, this pattern of frontier firms having a better educated workforce than the median can be seen across most types of firms.



- At individual level, a higher level of education is associated with higher labour income.[8] In Spain,[9] on 2019 data, a Spanish Baccalaureate or an intermediate vocational training qualification provided a return of 18% for men and 26% for women compared with compulsory secondary education alone (8 percentage points (pp) and 13 pp, respectively, more than in 2007).

- A university education provided an additional return of 20% for men and 23% for women. These returns appear to have increased since 2007, when they were 13% and 19%, respectively. This stands in contrast to the period 1995-2008, when the wage premium of education declined in Spain, unlike in other economies.[10]

- The additional return to higher vocational training compared with intermediate post-compulsory education also increased over these years for men (from 9% to 16%), but decreased for women from 14% in 2007 to 4% in 2019 (which is, nevertheless, still a positive return).

[8] Education can be analysed as an investment. The cost of the investment is the sum of the cost of the training (tuition fees, materials, etc.) and the income forgone by not working during the training period. The benefit is the positive labour income differential following education. Thus, the return to a few years of education may be defined as the discount rate that matches the sum of the present value of earnings over the working life to the costs, including both the opportunity cost – i.e. the present value of income without the education – and the monetary and non-monetary costs of the education. This return can be compared with the interest rate at which a person may borrow or the return on alternative investments.

[9] Drawing on data from various rounds of the Spanish Survey of Household Finances on individuals' employment earnings the year before the survey, including income in kind, and assuming zero monetary and non-monetary cost of staying in education. More details in Jansen and Lacuesta (2024), forthcoming.

[10] This decline in the wage differential by educational attainment level has been corroborated by various datasets (Pijoan-Mas and Sánchez-Marcos, 2010; Lacuesta and Izquierdo, 2012; and Bonhomme and Hospido, 2017) and contrasts with developments seen in other countries, such as the United States (Autor, Katz and Kearney, 2008), the United Kingdom (Gosling, Machin and Meghir, 2000), Canada (Fortin, Green, Lemieux and Milligan, 2012) and Germany (Dustmann, Ludsteck, and Schönberg, 2009).

EDUCATIONAL ATTAINMENT IMPROVES EQUALITY OF OPPORTUNITY

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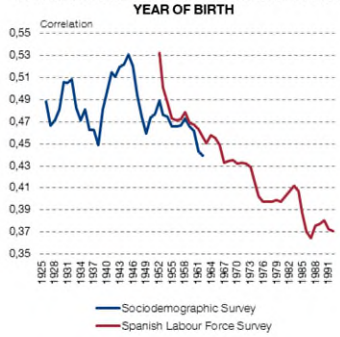
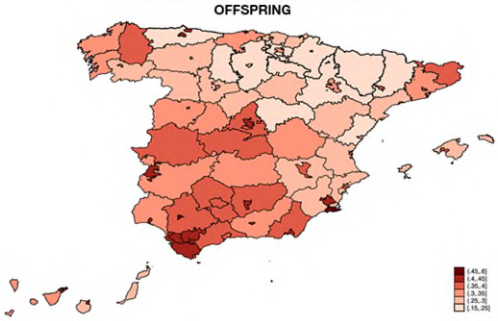
- The correlation between parents' education and that of their offspring has been falling for the generations born after 1960, to 0.38 for those born in 1990, indicating that intergenerational mobility has increased.
- But there is much cross-regional heterogeneity.

CORRELATION BETWEEN YEARS SPENT IN EDUCATION BY PARENTS AND OFFSPRING BY THE AGE OF 27. BY YEAR OF BIRTH



CORRELATION BETWEEN YEARS SPENT IN EDUCATION BY PARENTS AND THEIR OFFSPRING



SOURCE: Banco de España, drawing on data from the Sociodemographic Survey (1991) and the Spanish Labour Force Survey (1977-2020). 2011 census. See Grébol, Machelett, Stuhler and Villanueva (2023).

Second, education plays a crucial role in promoting equality of opportunity and social mobility:

- An intergenerational mobility indicator can be constructed by analysing the correlation between the educational attainment of parents and their offspring. The higher the correlation, the lower the intergenerational mobility, meaning that economic inequality will be determined more by differences in household wealth and less by individuals' decisions.[11]

- In Spain, the correlation between the years spent in education by parents and their offspring has declined over the last century. It was around 0.49 for the generations born between 1930 and 1960 and subsequently fell, to 0.38 for those born in 1990.[12] This decline coincided with the education reforms implemented around 1970, which affected those born after 1960.

- Compared with other countries, this level of intergenerational mobility places Spain midway between the Scandinavian countries, which have the highest levels of intergenerational mobility, and countries such as Italy and the United States, which have lower levels.[13]

- In any event, there are significant geographical differences that have, moreover, persisted over time.[14] Data from the 2011 census show that there

[11] Chetty, Hendren, Kline and Saez (2014) and Mogstad and Torsvik (2023).

[12] Grebol, Machelett, Stuhler and Ernesto Villanueva. (2024). "Educational inequality in Spain", forthcoming.

[13] Hertz, Jayasundera, Piraino, Selcuk, Smith and Verashchagina (2008). The correlation between the educational attainment level of parents and their offspring is 0.40 for those born in Western Europe and the United States between 1930 and 1978, while it is 0.43 for those born in Spain between 1961 and 1978. It is important to note that the population groups and period considered for Spain are different, but this is the most comparable figure available.

[14] Groups of municipalities are defined as the municipality of birth taken from the census, when this has a population of more than 100,000, and the group of municipalities of the province, when their population is less than 100,000.

are municipalities where the correlation between the education of individuals born in 1974 and that of their parents exceeds 0.45, while in others it is less than 0.25.

Challenges facing Spain's education system

CHALLENGES FACING SPAIN'S EDUCATION SYSTEM

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- Reducing the early school leavers' rate.
- Developing vocational training.
- Adapting the education system to technological changes.
- Improving financial literacy

Our education system faces a number of challenges, and today I would like to focus on four of them:

Reducing the high rate of early school leavers

THE EARLY SCHOOL LEAVERS' RATE REMAINS HIGH IN SPAIN BY INTERNATIONAL STANDARDS

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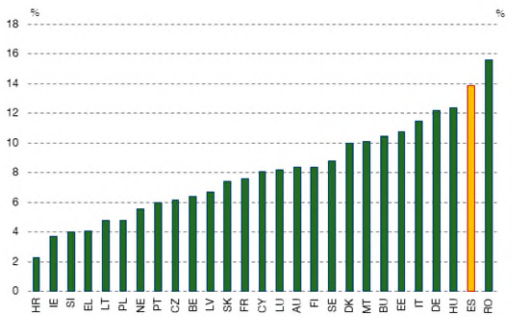
- Despite the recent improvement, Spain's early leavers' rate remains much higher than that of other European countries.
- There are remedial education programmes that have proven useful to increase student success.
- Families should also be provided with sufficient information by educational profile to inform their decisions.
- Improving economic and financial literacy is also important for reducing the early school leavers' rate, as is developing a high-quality vocational training system.

EARLY SCHOOL LEAVERS' RATE IN THE EU IN 2022



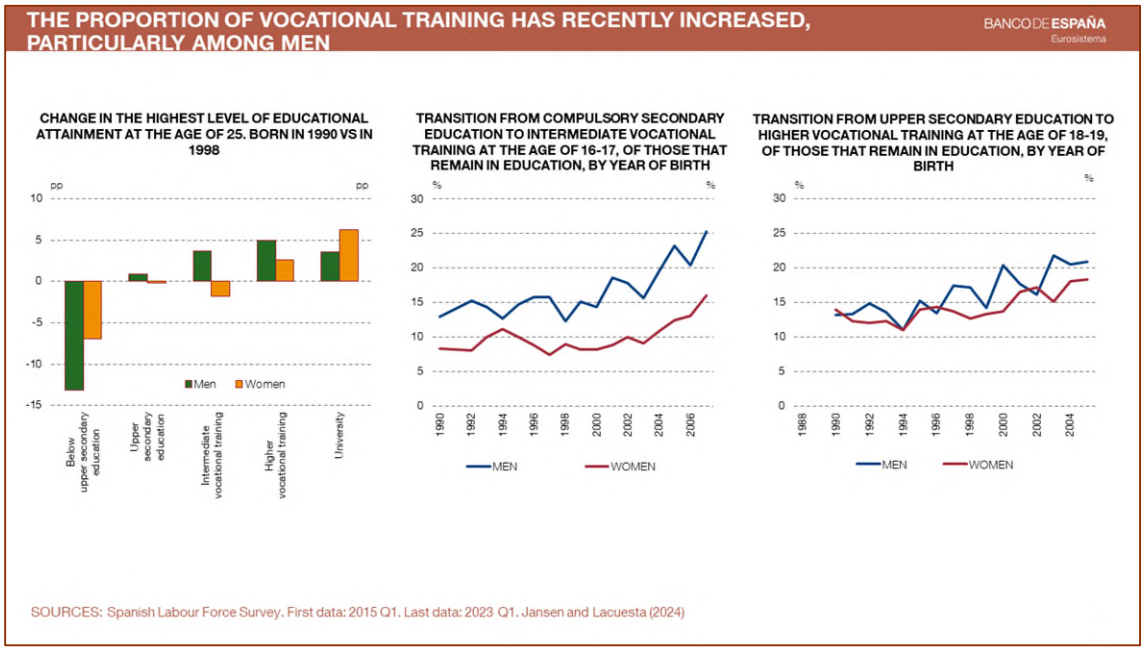
SOURCES: LFS. 18-24 year olds who had completed at most a lower secondary education and were not in education or training in the previous weeks.

Despite the progress made in the last few decades, underpinned by regulatory changes and the recent improvement in educational attainment levels, Spain has one of the highest early school leavers' rates in Europe.[15] This means that a high percentage of the population leaves school before or upon completing their compulsory secondary education or that, if they continue their studies, many drop out before attaining a higher level of education.

Specifically, in 2022 Spain was the second EU country (after Romania) with the highest percentage of 16-24 year-olds who had left school having completed, at most, a lower, compulsory secondary education. These rates stood at 13.9% in Spain and 9.6% in the EU.[16]

Public policies must therefore continue to encourage young people to remain in school. In this regard, certain remedial education programmes for specific groups of students have proven useful.[17] Also, given the greater employment returns associated with pursuing an education, it is important for families to be provided with sufficient information by educational profile to inform their decisions.[18] Improving the economic and financial literacy of the population at large and developing a high-quality vocational training system, issues that I shall discuss in a moment, are also important for reducing the early school leavers' rate.

Developing vocational training



[15] The early leavers' rate is defined as the percentage of the population aged 18-24 who have completed at most a lower (compulsory) secondary education and who were not in education in the four weeks prior to the survey.

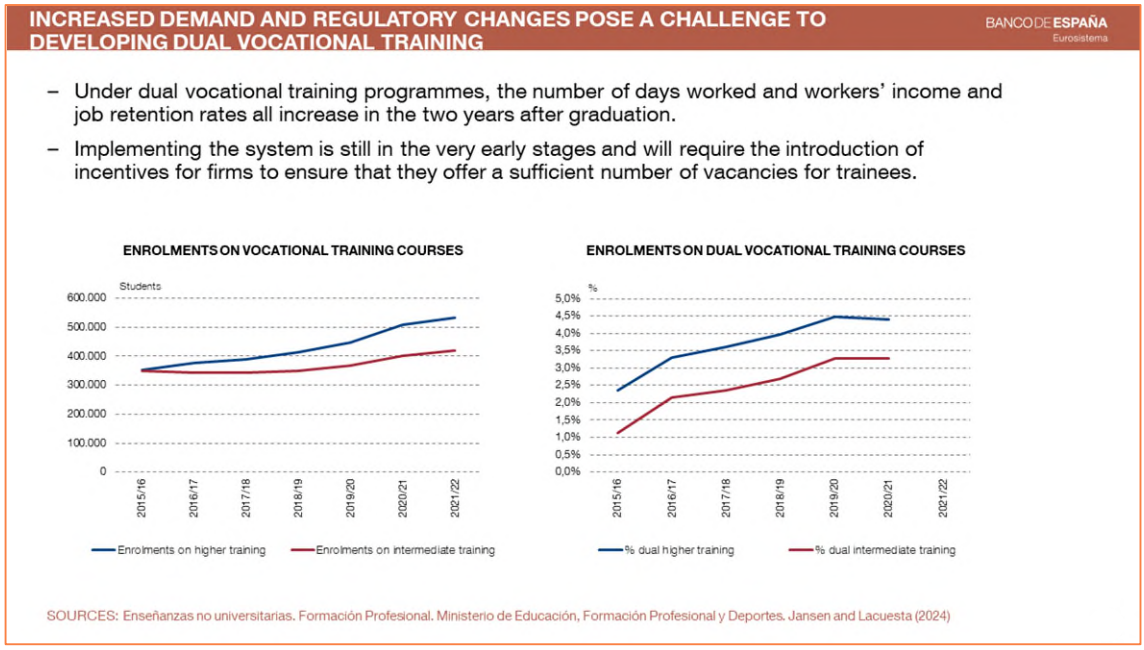
[16] In 2023, this rate was 13.6% in Spain. No early school leavers' figures for 2023 are yet available for other EU countries.

[17] Good examples are tutoring programmes in small groups or with teachers from the same ethnic background. See Gerherson, Hart, Hyman, Lindsay and Papageorge (2022) and Battaglia and Lebedinski (2014).

[18] McGuigan, McNally and Wyness (2016).

Intermediate and higher vocational training courses have traditionally been considered of lower value by Spanish students. However, the most recent period has seen an increase in the number of students enrolled in such programmes. Thus, for the generation born in 1998, the percentage of men who, at the age of 25, had a higher vocational training qualification was 5 pp higher than for those born eight years earlier. For reference, in this same period, the percentage of men with a university degree rose by 3.6 pp, a similar rise to that in intermediate vocational training. However, for women, the increase was concentrated mostly in university education (+6.2 pp in the same period), while that in higher vocational training was smaller (+2.6 pp).

Looking ahead, the number of students enrolling in higher vocational training can be expected to continue to grow. Since the 2015-2016 academic year, the number of such enrolments has increased by almost 50%, and those in intermediate vocational training by 20%.



Developing high-quality vocational training programmes could help ease the strains in the labour market stemming from the shortage of qualified workers. Despite the still-high unemployment rate in Spain, the proportion of unfilled job openings (the so-called vacancy rate) has increased in recent years. Thus, according to the latest Banco de España Business Activity Survey (EBAE), 43.8% of the firms surveyed in 2024 Q1 reported that labour shortages were negatively impacting their activity.[19]

These difficulties appear to arise from a mismatch between the skills needed by firms and those offered by the workforce, with more than half of the affected companies reporting a shortage of suitably qualified workers for the positions advertised. Moreover, this problem

[19] Cerezo and Izquierdo (2024).

is somewhat more marked in jobs requiring intermediate or higher vocational training and, by sector of activity, in industry, construction and transportation.

Against this backdrop, the Spanish Recovery, Transformation and Resilience Plan (RTRP) and the Organic Vocational Training Law passed in 2022 both seek to increase the number of vocational training places available.

Specifically, the Law focuses on the dual system introduced in 2012, whose key characteristic is the more prominent role of firms in the training process.[20] There is evidence that, compared with traditional training programmes, under the dual system the number of days worked and workers' income and job retention rates all increase in the two years after graduation.[21]

In any event, the number of students that enrolled in the dual system in the 2021-2022 academic year accounted for less than 5% of the total. Implementing this system will therefore require the introduction of incentive schemes to ensure that firms offer a sufficient number of vacancies for trainees.

TECHNOLOGICAL DEVELOPMENT HAS A SIGNIFICANT IMPACT ON RETURNS TO EDUCATION

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- In the 1980s and 1990s, technological changes generally led to productivity gains for those with a higher educational attainment level (Katz and Murphy, 1992).
- More recent analyses have focused on the impact of automating routine tasks, which would have benefited low-skill caregiving services and high-skill abstract tasks (Autor and Dorn, 2013).
- Much uncertainty surrounds the impact of digitalisation and artificial intelligence:
  - They create markets that offer opportunities for workers with different qualifications. They also replace some non-routine manual and intellectual tasks.
  - At the moment, labour demand is increasing relatively more in those jobs that are potentially more exposed to developments in robotics and artificial intelligence (Albanesi et al., 2023)
  - The associated productivity gains could improve total employment income, but the risks of greater inequality and the displacement of certain employment groups are also high.
  - The impact of new technologies will hinge on the development of digital infrastructure, human capital and workers' digital skills, and the flexibility of the labour market.
  - According to an AI Preparedness Index combining these institutional factors, the Spanish economy is lagging slightly behind the most developed countries.

Adapting the education system to technological changes

The education system faces the challenge of adapting the number of places and courses available to a setting of profound technological change. The role of such advances has been the focus of the economic literature when explaining returns to education, but this role has evolved over time.

For instance, in the 1990s the literature underscored the complementarities between technological changes, particularly those associated with the information revolution, and education (skill-biased technological change) (Katz and Murphy, 1992). This generated productivity gains for those with a higher educational attainment level, and goes some way

[20] Traditional vocational training students spent 20% of total course hours in on-the-job training. Under the general dual vocational training model, they spend between 25% and 35% of total course hours on work placements at firms, which are responsible for at least 20% of all training activities. By contrast, under the intensive dual vocational training model, on-the-job training must exceed 35% of the course duration and firms must provide at least 30% of all training activities. In addition, firms are obliged to hire their trainees under a work experience contract.

[21] Bentolila et al. (2024). Forthcoming.

to explaining why the wage differential widened between more-skilled workers and less-skilled ones in the 1980s and 1990s.

Although this literature was consistent with the employment and wage dynamics observed at the higher end of the wage distribution towards the end of the 20th century, it did not explain the concurrent developments in the bottom income quartile. To that end, the more recent literature has incorporated greater heterogeneity; specifically, by distinguishing between workers depending on whether the tasks they perform are manual or intellectual and more or less routine.

This allows for a better assessment of the impact of automation (Autor and Dorn, 2013). Specifically, it finds that technology has enabled the automation of routine tasks and that the share in employment of workers that perform such tasks (who are generally in the middle of the wage distribution) has declined. By contrast, the weight of workers that perform non-routine manual tasks (lower end of the distribution) and non-routine intellectual tasks (higher end) has increased.

The most recent analyses focus on the impact of new developments in digitalisation, robotics and artificial intelligence (AI). These advances could create markets that offer employment opportunities to workers with different qualifications, such as occasional jobs that complement a main job, associated for instance with the proliferation of digital platforms (Gómez García and Hospido, 2022). They also open up the automation of certain non-routine manual and intellectual tasks (such as translation, editing, consulting and even caregiving), through advances in language processing, image and sound recognition and supervised and unsupervised machine learning.

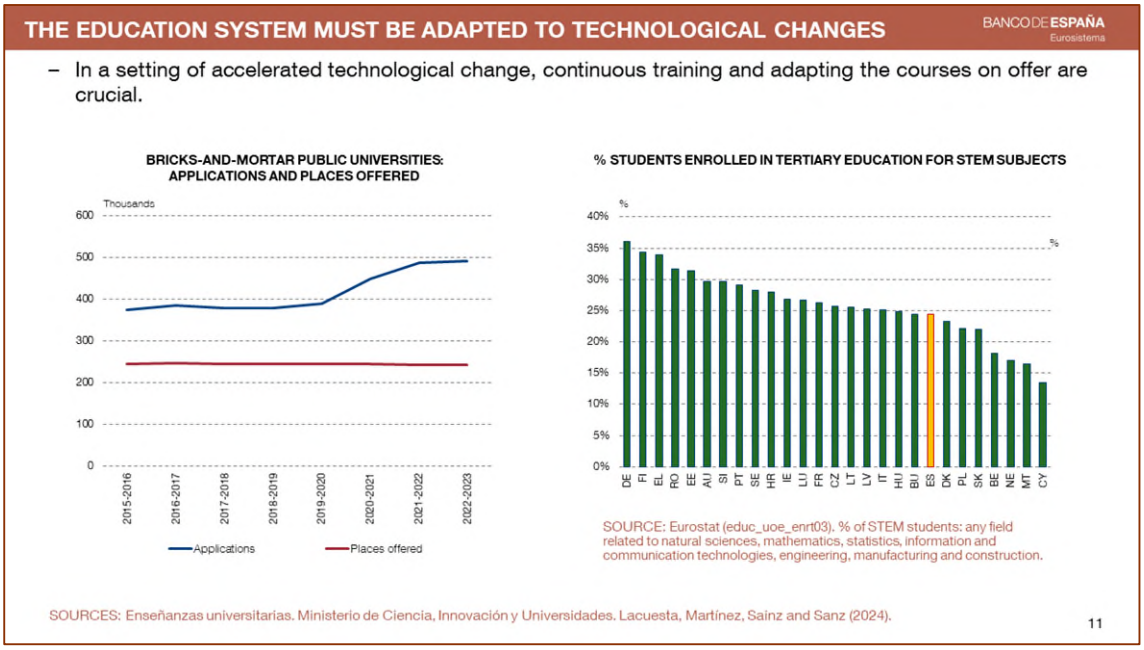
In this respect, some studies[22] show that such technological developments would not necessarily have an adverse effect on the jobs most exposed to them. Indeed, the relative share of employment in jobs involving the tasks where AI has progressed the most, particularly jobs with a higher proportion of young people and workers with a high educational attainment level, has increased. This evidence is consistent with the theory that technological change is biased towards highly skilled employment, reflecting its greater complementarity with technological capital.

However, much uncertainty surrounds the impact of AI on the labour market. The productivity gains associated with these technologies could in principle improve total employment income, but the risks of greater inequality and the displacement of certain employment groups are also high. By country, the impact of new technologies will hinge on the development of digital infrastructure, human capital and workers' digital skills, and the flexibility of the labour market and employment policies.

According to an AI Preparedness Index[23] combining these institutional factors, the Spanish economy is lagging slightly behind the most developed countries.

[22] Albanesi, Dias da Silva, Jimeno, Lamo and Wabitsch (2023).

[23] International Monetary Fund (2024).



From an education system standpoint, an environment of accelerated technological change calls for both developing continuous training for workers and adapting the courses on offer to new needs.

In the case of continuous training, Spain once again presents some room for improvement. For instance, participation in training courses at any age is at least 2 pp lower than the euro area average.[24]

Continuous training can be particularly useful for workers whose formal education has been "vocational", as the evidence suggests that while academic education helps workers operate new production technologies, vocational training is more focused on learning with established technologies (Krueger and Kumar, 2004).[25]

Working experience can also be an effective way to increase certain skills. For example, Martínez-Matute and Villanueva (2023) find that, for individuals with only basic schooling, working in a job that requires numerical tasks increases their numeracy score in standardised tests.[26]

[24] Anghel and Lacuesta (2020).

[25] The authors use this idea to highlight how vocational training policies in Europe boosted economic growth relative to the United States during the 1960s and 1970s, when technology was stable. However, in today's more changeable environment, these same vocational training policies could be weakening European growth. In a different setting, Lamo et al. (2011) find that a higher percentage of vocational training in Poland led to much higher and persistent unemployment compared to Estonia following the period of EU enlargement.

[26] Quantitatively, the impact would be between 7% and 11% of one standard deviation, equivalent to between one-quarter and one-half of the impact of one year of formal education on numeracy scores.

As regards adapting the courses on offer, there appears to be in Spain a growing difficulty in finding workers with the skills needed, for example, to cover the jobs created as a result of the green and digital transition.[27]

In this case, it appears that there are demand dynamics that are not being met by a parallel increase in supply. For instance, in Spain there is a positive correlation between applications to public university courses and the wages earned by graduates of those courses.[28] Specifically, between 2015 and 2023 the number of applications to bricks-and-mortar public universities increased by 30%,[29] while applications to courses leading to jobs paying 10% more than other courses rose by 6%. However, the number of places offered to new students at bricks-and-mortar public universities declined slightly (2%) and course distribution did not show any correlation to wage variation.

While part of this demand may have been covered by private universities, we cannot ignore the impact that this lack of response from the public university system may have on equality of opportunity. Nor does this lack of response go any way to closing the gap between Spain and other European countries in terms of the number of students of STEM subjects (Science, Technology, Engineering & Mathematics).[30]

In the light of this evidence, it seems important to provide students with uniform information on the job opportunities of each course and to incorporate mechanisms to adjust the places offered at public universities – and across the rest of the education system – to demand for labour.

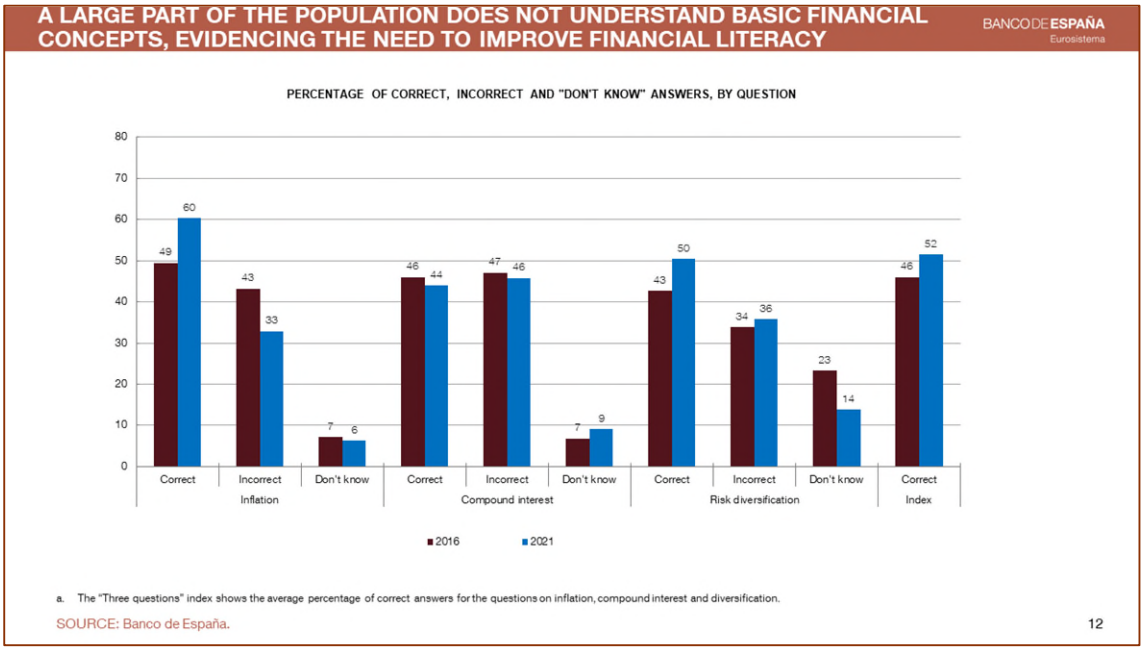
[27] Arpaia and Halasz (2023).

[28] On average, applications by course and centre are correlated to the graduates' contribution base four years after graduation.

[29] Added to this increased demand for vocational training stemming from the higher returns on training is a greater number of people aged 18-19. For more details, see Lacuesta, Martínez, Sainz and Sanz (2024), forthcoming.

[30] As regards the type of courses studied at university, according to Eurostat data for 2020, 24% of Spanish students in tertiary education are enrolled in a field related to the natural sciences, mathematics, statistics, information and communication technologies, engineering, manufacturing and construction, compared with 28% in the euro area, with Spain only ahead of Belgium, Cyprus, Malta, the Netherlands and Slovakia.

Improving financial literacy



Financial education is key if the general public are to take informed life decisions and be in a better position to evaluate public policies. But the reality is that, as in our fellow European countries, the Spanish population has a low level of financial literacy (OECD-INFE, 2023).

Specifically, according to the Banco de España's Survey of Financial Competences 2021, a large part of the population does not understand basic economic concepts:

- When asked a question on the concept of inflation, 60% of those aged 18-34 answered correctly, 33% gave an incorrect answer and 7% said they did not know.

- Less than half of the respondents (44%) answered the question on compound interest correctly, and half of those surveyed gave a correct response to the question on risk diversification.

- Among young people aged 18-34, the index of correct answers to all three questions stood at 52%, slightly below the national average (53%).

- Broadly speaking, there has been an improvement in the rate of correct answers since 2016.

In the light of these results, the general public's financial literacy needs to be improved, both through the education system and via action at key points in the life cycle, bearing in mind the needs of each group.

The Financial Education Plan, in which the Banco de España, the National Securities Market Commission and the Ministry of Economic Affairs, Trade and Enterprise participate, specifically proposes a set of measures aimed at increasing the general public's financial

literacy and improving their financial behaviour and habits. For the period 2022-2025, the Plan envisages action across all levels of education, as well as specific initiatives aimed at vulnerable groups and at new users of online financial services.

In tandem, it is essential that such initiatives are carefully assessed. The Banco de España's evaluations show that incorporating financial content into the education system increases financial literacy, including in the medium term, and that, albeit with some caveats, it improves the quality of financial decisions.[31]

We should also bear in mind the growing complexity of the economic and financial environment, with the emergence of new products, new technologies and new types of financial intermediaries and agents. The process of digitalisation is far reaching, particularly among the young. But an excessive use of their digital skills could lead them to trivialise the consequences of their legal and financial dealings. This is where the excellent work of FAD Juventud comes in, as it equips young adults with the tools they need to take decisions while navigating this complex environment. And, through the Financial Education Plan, the Banco de España will continue to make every effort to provide our young adults with the tools that enable them to take informed, responsible economic and financial decisions.

Thank you.

[31] Kaiser, Lusardi, Menkhoff and Urban (2022). The Banco de España has conducted a random experiment to assess the effect that financial education courses at secondary level have on financial literacy and preferences and attitudes towards saving a few months later. Students' scores in a financial literacy test improved and their patience in decisions regarding present and future consumption increased, with these positive effects being observed specifically among students from less well-off backgrounds. The improvement in their literacy may be quantified at around 17% of one standard deviation of the scores in a specifically designed test. By way of reference, in the context of the Survey of Financial Competences, this would be equivalent to 40% of the increase in the financial literacy of the 18-25 age bracket. Bover, Hospido and Villanueva, Journal of Human Resources, 2024 (published online before print).