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AGEING, PRODUCTIVITY AND EMPLOYMENT STATUS

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## ABSTRACT

The article analyses how labour market participation and the type of work performed change with age. Drawing on data from the OECD's Programme for the International Assessment of Adult Competencies (PIAAC), it is documented that as people age they gradually lose certain skills relating to their ability to do physical work or use new technologies, or their literacy and numeracy skills. By contrast, as they build up experience, older workers develop better planning skills and a greater ability to supervise the work of others and respond to setbacks. However, the transition between these tasks is not problem-free, especially in certain sectors, such as agriculture, small retail trade, hotels and restaurants and domestic help, which in Spain are more likely to have a higher concentration of older workers with a lower level of education than in the rest of the euro area. In this respect, larger firm size, flexible working environments, retirement schemes with certain specificities relating to skills required in different occupations and an increase in continuing training would all be conducive to a lower decline in productivity and a higher degree of employability of older workers. This is particularly important in Spain's current demographic context of a gradually ageing population.

**Keywords:** ageing, skills, tasks, PIAAC.

**JEL classification:** J24.

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### Introduction

Over a person's lifetime, physical, numeracy and literacy skills and the ability to use new technology all tend to deteriorate with age. This entails a decline in productivity and creates difficulties for the performance of certain tasks, with the consequent adverse impact on personal well-being. This skill loss may be delayed by a person's employment or by continuing lifetime training. Moreover, work experience over the years allows people to accumulate other kinds of skills – more related to planning or to the ability to assess the work of others – that are highly valuable in certain contexts. It is essential, therefore, to understand the relationship between ageing, skills, work tasks and training. Especially in a setting such as the present one, where people live longer and generally have longer working lives.

The article describes how people's numeracy and literacy skills change over their lifetime. It also examines the parallel changes that take place in labour market participation, in continuing training and in the type of work performed by the over-50s. To this end, the analysis considers the level of educational achievement of this group of workers, and the sector and size of firm in which they work, in Spain and the euro area.

To document the loss of cognitive skills and the change in work tasks performed with age, the article draws on data from the Programme for the International Assessment of Adult Competencies (PIAAC), a database developed by the OECD in 2013 to analyse the cognitive skills of adults (16-65 age group) in 24 countries.<sup>1</sup> The Eurostat Labour Force Survey is used to describe different aspects of the employment status of adults and their participation in continuing training.

The article is structured as follows. The next section describes how workers' numeracy and literacy skills change with age, in Spain and in the euro area countries. This is followed by a review of the employment status and work tasks of older workers, taking into account the sector of activity. Lastly, the article analyses training activities and their impact on tasks performed by workers according to their age.

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<sup>1</sup> Countries in the PIAAC database: Australia, Austria, Belgium (Flanders), Canada, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Ireland, Italy, Japan, Korea, Netherlands, Norway, Poland, Russia, Slovakia, Spain, Sweden, United Kingdom and United States.

## Ageing, numeracy and literacy skills

Numerous neuropsychology and neuroscience papers document an acceleration in the loss of cognitive skills (literacy, numeracy and problem solving) in the over-50s (Desjardins and Warnke (2012), Barrett and Riddell (2016)). Over the age of fifty, neuronal changes tend to reduce cognitive skills, although the effect differs according to the skill type.<sup>2</sup> In particular, skill depreciation occurs earlier in the case of fluid intelligence, which is generally more closely related to innate individual ability or certain cognitive investment made at an early age, i.e. the ability to pay attention, speed of processing, reasoning, the ability to memorise or spatial skills. But crystallised intelligence, which is related to knowledge acquired in the learning process and is partly affected by fluid intelligence, depreciates more slowly. Clearly, the rate of depreciation of crystallised intelligence will depend on numerous aspects, ranging from biological factors to personal experience and the external environment. It is thanks to this broad range of skills and experiences that a large proportion of the adult population is able to maintain reasonably good cognitive skills. Thus, some studies show that at least one-third of the over-50s suffer no skill depreciation until they are much older (Desjardins and Warnke, 2012). The factors that help people maintain their cognitive skills notably include, according to the authors, the absence of illness, an active lifestyle and continued physical and mental activity.

This section documents how cognitive skills decline with age, drawing on the PIAAC 2013 data, based on the findings of a test conducted by the OECD to assess adult literacy and numeracy skills.<sup>3</sup> In the case of literacy skills, the test analyses the ability to understand different types of written texts and use the information obtained. Numeracy skills refer to the ability to use, apply, interpret and communicate mathematical information and ideas (OECD, 2013). In general, both tests measure the ability to use these skills for everyday problem solving.<sup>4</sup>

Chart 1 shows that for Spain and for the average of the PIAAC sample countries, both numeracy and literacy skills are lower for the older population compared than for their younger peers, irrespective of the level of educational achievement.

These findings reflect skill depreciation not only in the groups with a lower education level but also in those with a medium or advanced education level. However, in the

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2 Specifically, as people age the brain undergoes structural changes, such as loss of volume, especially in the cortex which is closely linked to the ability to memorise, or functional changes, such as a decline in neuronal activation, which reduces neural specialisation and the transmission of information.

3 In some countries the test also included problem solving in technology-rich environments, but Spain chose not to include this aspect.

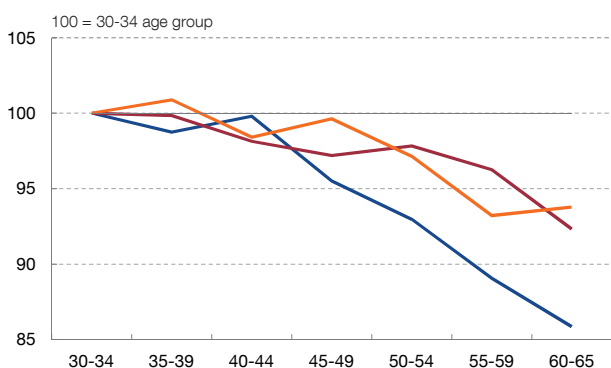
4 In the case of literacy skills, the aim is to measure the ability to understand a text which, for example, provides a list of pre-school rules, or to read a text where a choice has to be made between two words. In the case of numeracy skills, the respondents are asked to identify, for example, the period with fewest births from a chart depicting the number of births in the United States in several years, or to calculate a specific figure from a text that contains data on wind parks in Sweden.

Chart 1

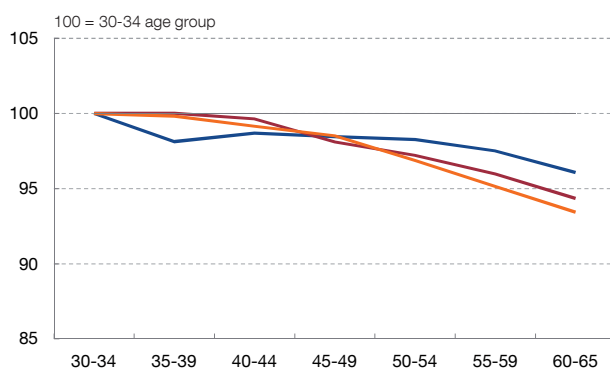
**MEASURING LIFETIME COGNITIVE SKILLS BY LEVEL OF EDUCATION (a). SPAIN AND AVERAGE OF PIAAC COUNTRIES (b)**

Cognitive skills decline with age, both in Spain and the euro area.

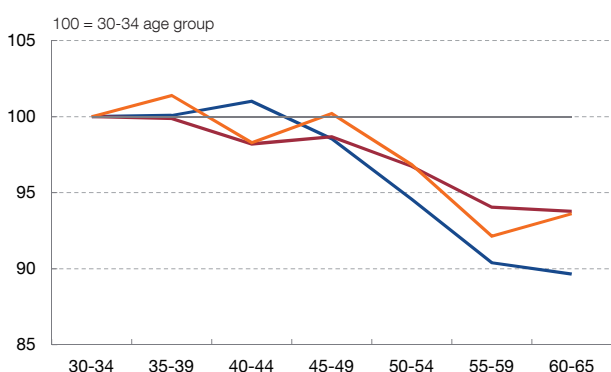
1 PIAAC NUMERACY SCORE BY LEVEL OF EDUCATION. SPAIN



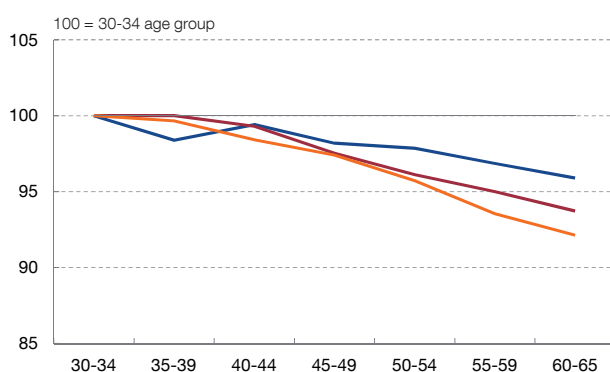
2 PIAAC NUMERACY SCORE BY LEVEL OF EDUCATION. AVERAGE OF ALL PIAAC SAMPLE COUNTRIES



3 PIAAC LITERACY SCORE BY LEVEL OF EDUCATION. SPAIN



4 PIAAC LITERACY SCORE BY LEVEL OF EDUCATION. AVERAGE OF ALL PIAAC SAMPLE COUNTRIES



— LOW — MEDIUM — HIGH

SOURCE: OECD (2013) (PIAAC).

- a Low level of education = lower secondary or less; medium level = upper secondary; high level = university or more.
- b The average of the PIAAC countries is the unweighted average of each country's average scores.



case of individuals with a lower level of educational achievement, the PIAAC database shows a much more marked decline in the score in Spain than in other countries.<sup>5</sup>

It is important to note, in any event, that the cognitive skill loss observed in Chart 1 is not necessarily attributable to a generation's lifetime skill losses. As these data refer to just one year (2013), each age group belongs to a different generation, so the

5 In any event, the differences between Spain and the average of the other countries in the PIAAC score for the 30-34 age group are minor for the low education level, especially in numeracy skills where the Spanish average is 230.6, compared with the overall average of 231.3 (in literacy skills the Spanish average is 233.8 compared with the overall average of 240.6). The differences are greater for the high education level: in numeracy skills the Spanish average is 281.8, compared with the overall PIAAC average of 300.7, and in literacy skills it is 285.1 compared with 302.6).

differences could also be attributable to the different lifetime experiences of each generation. Accordingly, an improvement in the quality of Spanish compulsory education would translate into higher results for the younger generations that would not necessarily be related to lifetime skill losses. Spain does not have earlier historical data available to track the changes in the same generation at different ages. There are, however, a good number of countries for which this is possible.<sup>6</sup> These data show that a significant portion of this decline remains when the same generation is analysed over time.<sup>7</sup>

## Ageing, employment status and work tasks

Below we analyse the data on labour-market participation, employment and training of the older population, drawing on Eurostat Labour Force Survey data. To explore in more detail the type of work done by workers, in each occupation, by age, a module of the PIAAC database that contains skill indicators is used. These indicators are constructed by accumulating the replies to several PIAAC test questions on how often different work tasks are performed, which are in turn related to skills<sup>8</sup> (OECD, 2013). Specifically this article uses the indicators that measure the use at work of reading comprehension, writing, numerical, ICT and planning skills and physical skills (physical work). Table 1 shows which type of tasks are included in each of the skill indicators, together with the average of these indicators by education level, in Spain and in the countries included in the PIAAC sample overall. The higher the indicator, the more often the respondents have to perform the tasks in their work.

### Employment status and distribution by sector of older workers

Drawing on Eurostat Labour Force Survey data, it is possible to analyse the employment status of the older population with different levels of education

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6 Sixteen countries have at least two databases that allow them to track the same cohort over time, through the International Adult Literacy Survey (IALS) 1994-1998, the Adult Literacy and Life Skills Survey (ALL) 2003-2007 and PIAAC 2013.

7 See Desjardins and Warnke (2012).

8 The test includes several questions on how often people perform different work tasks, for example: "How often does/did your current/last job involve planning your own activities/planning the activities of others...?". The response options are: (1) Never; (2) Less than once a month; (3) Less than once a week but at least once a month; (4) At least once a week but not every day; and (5) Every day. The OECD uses the Item Response Theory methodology (OECD, 2013) to combine different multiple response questions, aiming to obtain continuous variables that measure how often a person performs certain tasks at work (OECD, 2013). Moreover, to facilitate comparison, the indicators are standardised, with a mean equal to 2 and standard deviation equal to 1, in the sample of all persons and countries. Approximately 90% of the observations have values between 0 and 4: those close to 0 suggest that the response was "not very often", while those close to 4 suggest that it was "very often". Also, it should be borne in mind that persons who answer "Never" to all the questions relating to any of the indicators are excluded (see OECD (2013) for more details). The indicators in Table 1 represent this continuous variable created by the OECD, except for the physical work indicator which measures the direct responses to the question "How often does/did your job involve working physically for a long period?".

Table 1

**SKILL INDICATORS BY LEVEL OF EDUCATION. SPAIN AND ALL PIAAC COUNTRIES (a)**

In Spain, as in all the OECD countries in the PIAAC sample, there is a very high use of physical skills among workers with a low level of education, while the use of planning, numeracy, ICT and literacy skills is higher among those with a higher level of education.

Skills	Low		Medium		High		All		
	Spain	All (average)	Spain	All (average)	Spain	All (average)	Average	Min.	Max.
Planning	1.84	1.69	2.01	1.90	2.25	2.17	1.98	0.13	3.88
Reading	1.32	1.35	1.81	1.82	2.46	2.44	1.99	-1.16	6.19
Writing	1.51	1.49	1.99	1.86	2.34	2.29	2.00	-0.08	6.51
ICT	1.57	1.45	2.01	1.79	2.19	2.24	2.00	-0.34	6.29
Numeracy	1.71	1.59	2.10	1.88	2.27	2.22	1.98	-0.10	6.73
Physical work	3.87	3.96	3.19	3.44	2.43	2.25	3.12	1.00	5.00

## Tasks and associated skills

Skills	Tasks
Planning	Planning their own activities and those of others, organising their time
Reading	Reading documents (directions, instructions, letters, reports, emails, articles, books, manuals, invoices, diagrams, maps)
Writing	Writing documents (letters, reports, emails, articles, forms)
ICT	Using email, Internet, spreadsheets, word processing, programming languages; conducting online transactions; taking part in online conversations (conferences, chats)
Numeracy	Calculating prices, costs or budgets; using fractions, decimals or percentages; using calculators; preparing charts or tables; algebra or formulas; advanced maths or statistics (calculus, trigonometry, regressions)
Physical work	How often they work physically for a long period

**SOURCE:** OECD (2013) (PIAAC).

**a** Low level of education = lower secondary or less; medium level = upper secondary; high level = university or more.

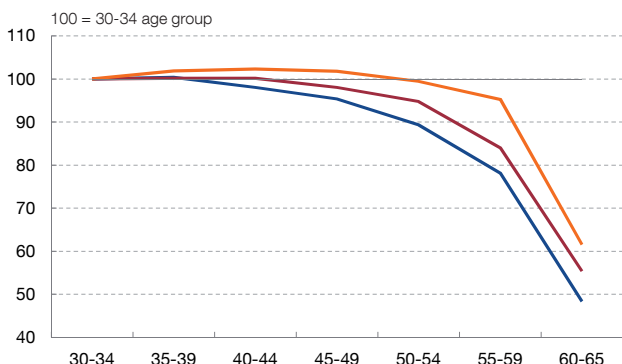
compared with that of the younger generations. For Spain it is observed that, irrespective of age, the higher the education level the higher the labour-market participation. In addition, irrespective of the level of educational achievement, the participation rate decreases with age, but this decline starts sooner and is faster, the lower the education level (see Chart 2). Thus, the over-50s with a lower education level have a participation rate below 80% (compared with 85% at 35 years of age), which falls by more than half, to 41%, when they reach the 60-64 age group. For the population with tertiary education, the participation rate does not drop below 90% until they reach 55 years of age, and then falls to 56% in the 60-64 age group. The pattern is the same in the euro area, although the decline in the participation rate for the older population with lower and medium education levels is considerably faster in Spain, becoming noticeable as from 50 years of age (in Spain, the participation rate for the 50-54 age group with a low education level is 75%, and 85% for those with a medium education level, while for the 55-59 age group with a low education level it is 66%, and 75% for those with a medium education level). This premature

Chart 2

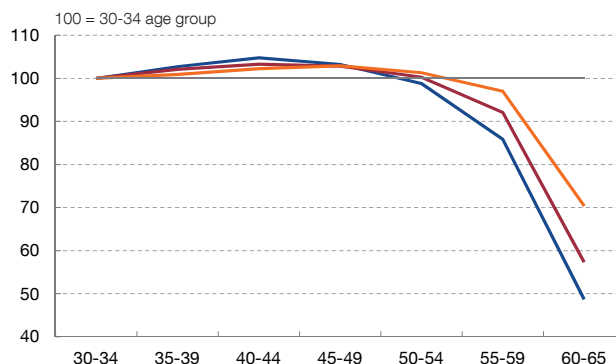
**MORE CHANGE IN LABOUR MARKET PARTICIPATION THAN IN EMPLOYMENT RATE OVER LIFE CYCLE (a)**

For the population with low and medium levels of education, labour market participation starts to decline earlier in Spain than in the euro area. The employment rate of older workers who remain in work is high.

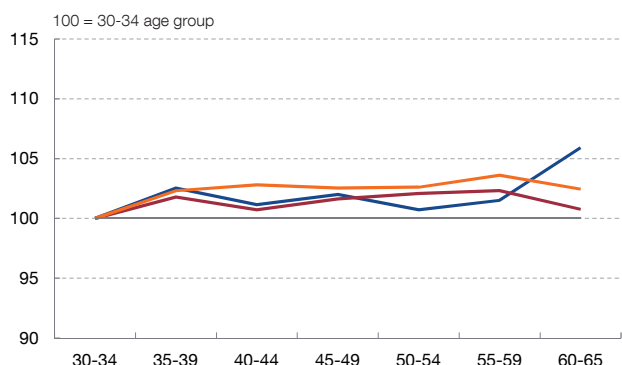
1 PARTICIPATION RATE BY LEVEL OF EDUCATION. SPAIN (b)



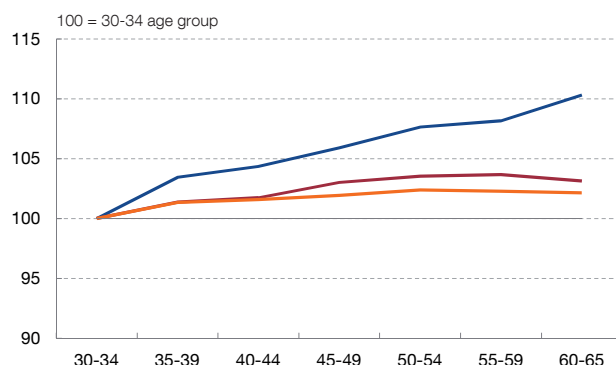
2 PARTICIPATION RATE BY LEVEL OF EDUCATION. EURO AREA (b)



3 EMPLOYMENT RATE BY LEVEL OF EDUCATION. SPAIN (c)



4 EMPLOYMENT RATE BY LEVEL OF EDUCATION. EURO AREA (c)



— LOW — MEDIUM — HIGH

SOURCE: Eurostat (Labour Force Survey).

- a Low level of education = lower secondary or less; medium level = upper secondary; high level = university or more.
- b Percentage of total population of each age group.
- c Percentage of active population of each age group.



exit from the labour market reduces the ability to continue to accumulate years of work experience and accelerates the process of skill depreciation (Börsch-Supan and Weiss, 2016).

However, among persons who remain in work, there are no major differences in the employment rate by age; indeed, it is even higher among the older population, both in Spain and in the euro area (see Charts 2.3 and 2.4). This is partly because the over-55s who remain in work are generally highly motivated and efficient in their work, as they have other alternatives, such as retirement, but they choose to work. In general, when older people stop working they become economically



inactive rather than unemployed, on account of the difficulties of finding new employment.

Individual workers' labour market experience and how this affects their cognitive skill loss depends on the sector in which they work. In addition, the sector of activity to which a firm belongs is one of the factors that determines the tasks that are required of workers throughout their working lives. Chart 3 depicts the distribution of the population over 55 by sector in Spain and in the euro area. Chart 3.1 shows the situation of the group with the lowest education level. This segment of the Spanish population is quite broadly spread across several economic sectors, notably including 21% in other services (among which domestic help and administrative and ancillary activities, each with 8%, stand out), 16% in small retail trade, 15% in industry and 13% in public administration, education and health care. Compared with the euro area countries, Spain has a higher proportion of workers in agriculture, small retail trade, hotels and restaurants and other services (especially domestic help). As Table 2 shows, for all countries in the PIAAC sample the tasks usually performed by workers in these sectors generally require more physical work. This could make it difficult for these workers to maintain their employment in these sectors.

Chart 3.2 shows the situation of the older population with a medium level of education. Approximately half work in two sectors: 30% in public administration, education and services and 21% in other services (among which professional activities, administrative activities and domestic help stand out). These sectors are also important in the euro area. However, compared with Spain, industry stands out, as in the euro area 18% of older workers with a medium level of education work in industry, as against less than 10% in Spain. The reason for this difference could be the low importance of the industrial sector in Spain compared with the euro area average. By contrast, in Spain the proportion of older workers employed in hotels and restaurants is higher, probably owing to the larger size of this sector in Spain. Once again, the tasks requiring greater physical work, inherent to work in hotels and restaurants, could prompt older workers to make an earlier exit from the labour market in Spain.

Lastly, Chart 3.3 depicts the distribution by sector of the older population with a high level of education. In this case, in Spain, 50% of older workers are employed in public administration, education and health care alone, and 21% in other services (among which, professional activities stand out). As the chart shows, there are only minor differences between Spain and the euro area in the distribution by sector of activity of the older population with higher education. Thus, in the euro area, 48% of older workers with higher education are employed in public administration, education and health care, and 26% in other services.

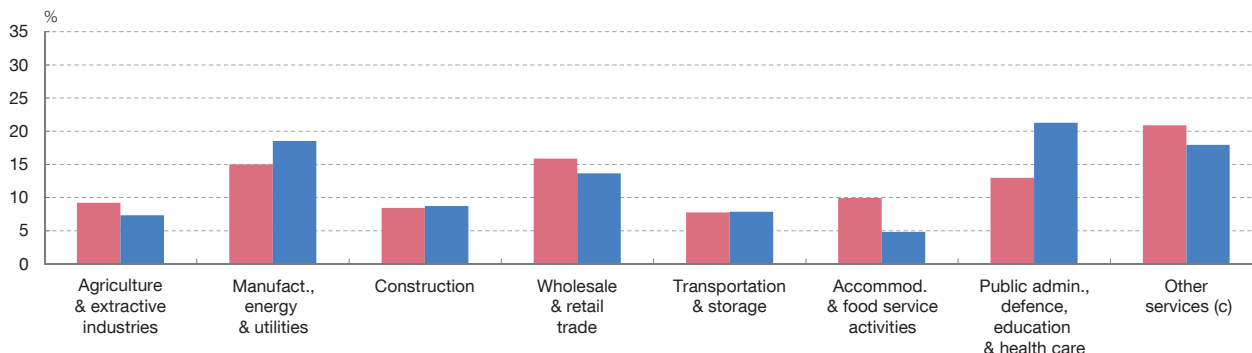
A large portion of the differences in the distribution by sector of older workers between Spain and the euro area, especially among the groups with medium, and

Chart 3

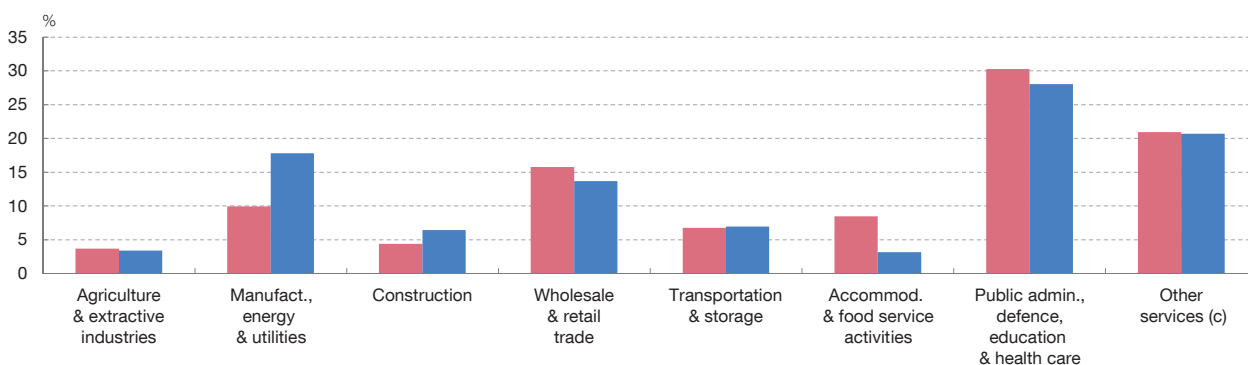
**SECTORAL DISTRIBUTION OF EMPLOYMENT OF WORKERS IN 55-64 AGE GROUP IN SPAIN AND THE EURO AREA IN 2018 BY LEVEL OF EDUCATION (a)**

In Spain, the proportion of older workers (55-64 age group) with a low level of education in sectors such as agriculture, extractive industries, retail trade and hotels and restaurants is above the euro area average. These are all sectors that require considerable physical skills. By contrast, the great majority of workers with a high level of education, both in Spain and the euro area, work in sectors such as public administration, education and health care.

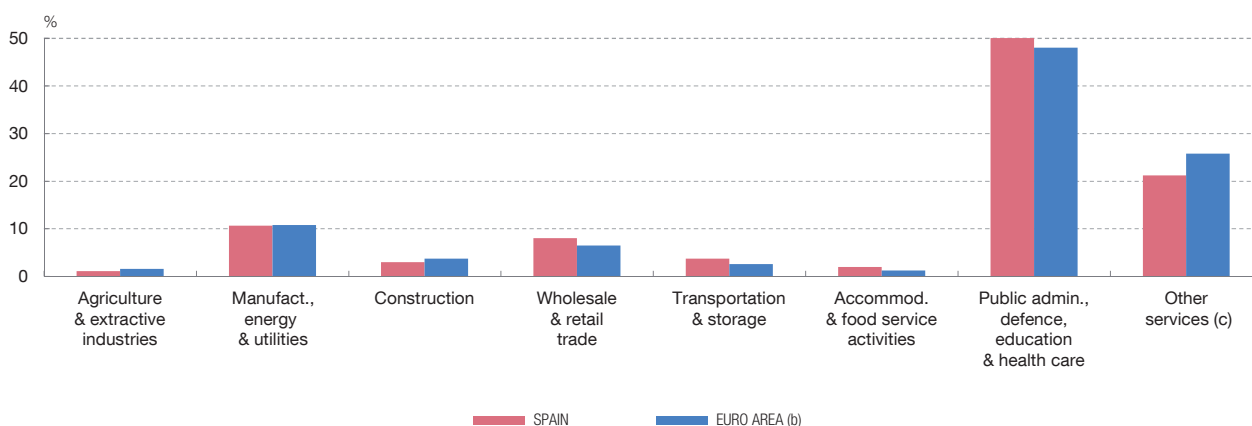
1 LOW EDUCATION LEVEL



2 MEDIUM EDUCATION LEVEL



3 HIGH EDUCATION LEVEL



SPAIN EURO AREA (b)

SOURCE: Eurostat (Labour Force Survey).

a Low level of education = lower secondary or less; medium level = upper secondary; high level = university or more.

b Euro area countries: Austria, Belgium, Cyprus, Estonia, Finland, France, Germany, Greece, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Portugal, Slovakia, Slovenia and Spain.

c "Other services" corresponds to Spanish National Classification of Economic Activities (CNAE 2009) codes J, K, L, M, N, R, S, T and U.



Table 2

**SKILL INDICATORS BY SECTOR OF ACTIVITY. AVERAGE AND STANDARD DEVIATION OF ALL PIAAC COUNTRIES (a)**

Work in sectors such as agriculture, construction, retail trade and hotels and restaurants involves more physical tasks. Conversely, work in public administration, defence, education, health care and other services involves more intensive use of planning, literacy, ICT and numeracy skills.

	Planning	Reading	Writing	ICT	Numeracy	Physical work
Agriculture and extractive industries	1.86 (0.96)	1.66 (1.06)	1.52 (1.01)	1.71 (0.98)	1.72 (0.91)	4.28 (1.33)
Manufacturing, energy and utilities	1.87 (1.00)	1.83 (1.01)	2.05 (1.02)	2.03 (1.06)	2.15 (1.04)	3.32 (1.76)
Construction	1.98 (1.07)	1.77 (1.06)	1.86 (1.03)	1.92 (1.03)	2.13 (1.06)	4.02 (1.50)
Wholesale and retail trade	1.90 (1.03)	1.88 (1.02)	1.85 (1.07)	1.74 (1.11)	2.13 (0.91)	3.49 (1.69)
Transportation and storage	1.76 (0.98)	1.75 (0.99)	1.95 (1.01)	1.68 (1.09)	1.84 (0.94)	3.49 (1.74)
Accommodation and food service activities	1.77 (1.08)	1.40 (1.04)	1.57 (1.07)	1.55 (1.07)	1.91 (0.91)	4.04 (1.50)
Public administration, defence, education and health care	2.05 (1.09)	2.28 (0.96)	2.31 (1.00)	1.88 (0.87)	1.84 (1.00)	2.89 (1.77)
Other services (b)	1.92 (0.97)	2.22 (1.02)	2.20 (0.99)	2.37 (1.14)	2.18 (1.07)	2.49 (1.71)

**SOURCE:** OECD (2013) (PIAAC).

**a** Standard deviation between brackets.

**b** "Other services" corresponds to Spanish National Classification of Economic Activities (CNAE 2009) codes J, K, L, M, N, R, S, T and U.

most particularly low, levels of education, are explained by the size of the different sectors in each economy. Chart 4 depicts the ratio of older workers to total workers by sector. Thus, a ratio over 1 indicates that the concentration of population over 50 years of age working in that sector is higher than for the total population in work. Irrespective of the level of educational achievement, public administration has the highest proportion of older workers. This sector not only provides greater job security but, as Table 2 shows, it also encompasses a very wide range of jobs that do not necessarily require intensive performance of tasks that entail, in relative terms, physical work or a command of new technologies. By contrast, there is a higher proportion of younger workers in industry, construction, small retail trade and hotels and restaurants, which generally include more jobs that require physical work, numeracy or literacy skills or a command of new technologies.

### Ageing and work tasks

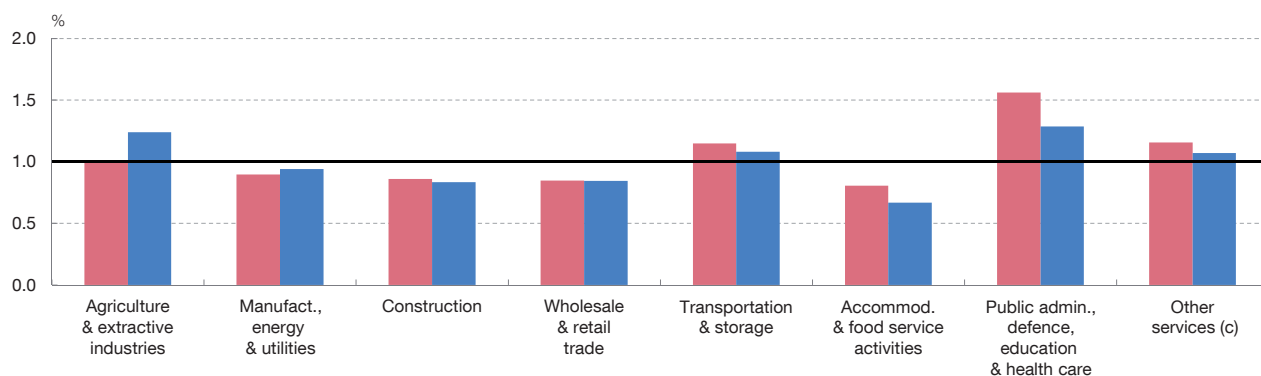
Aside of the effect of the sector in which workers are employed, the tasks they perform vary with age. For the case of Germany, Romeu Gordo and Skirbekk (2013) indicate that the older population are less likely to perform tasks that require physical

Chart 4

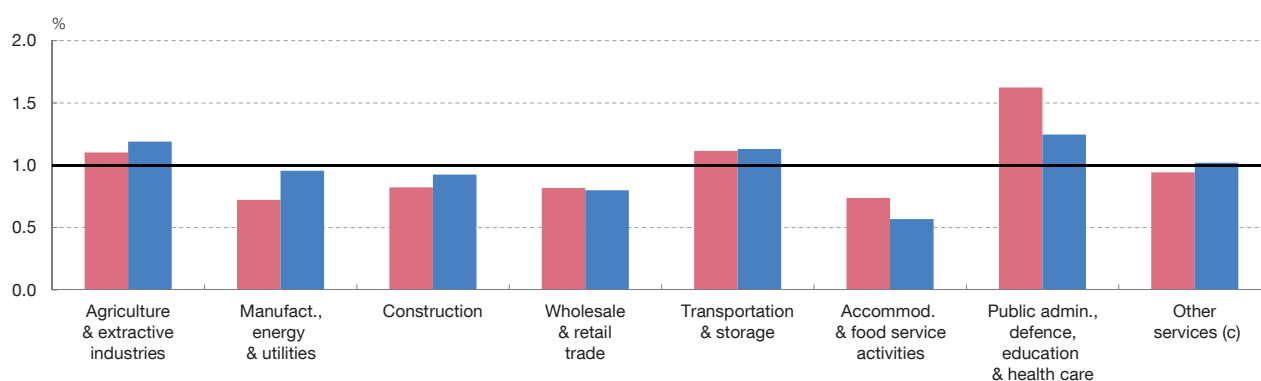
**PROPORTION OF WORKERS IN 55-64 AGE GROUP TO WORKERS IN 15-64 AGE GROUP, BY SECTOR AND LEVEL OF EDUCATION (a)**

Irrespective of the level of educational achievement, workers over 55 years of age are over-represented in public administration, education and health care, where they are required to perform a very wide range of tasks.

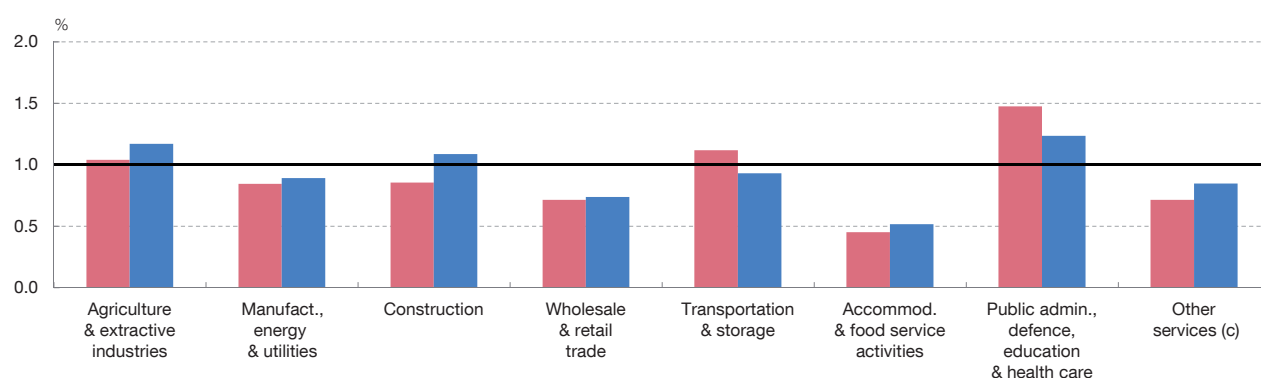
1 LOW EDUCATION LEVEL



2 MEDIUM EDUCATION LEVEL



3 HIGH EDUCATION LEVEL



SPAIN EURO AREA (b)

SOURCE: Eurostat (Labour Force Survey 2018).

a Low level of education = lower secondary or less; medium level = upper secondary; high level = university or more.

b Euro area countries: Austria, Belgium, Cyprus, Estonia, Finland, France, Germany, Greece, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Portugal, Slovakia, Slovenia and Spain.

c "Other services" corresponds to Spanish National Classification of Economic Activities (CNAE 2009) codes J, K, L, M, N, R, S, T and U.



work and are more likely to work in jobs that require knowledge accumulated over their working life.<sup>9</sup>

Drawing on the PIAAC data, the difference by age in skills used (through the differences in tasks performed) has been analysed within the same sector of activity and occupation. This analysis has been performed separately for three levels of educational achievement (low, medium and high), for Spain and for the PIAAC participating countries overall (as in some cases the number of observations for Spain is too small to take into account the variability by sector and occupation). Charts 5 and 6 show the differences in terms of the skills needed for the tasks performed by workers aged 30-34 and by workers over 50, for the same level of education and sector of activity.

In general, the estimates for Spain point to a significant increase in planning-related tasks in workers over 50 compared with workers aged 30-34, while reading-related tasks remain the same or increase with age, especially for the groups with a medium or high education level. In consequence, labour market experience seems to be more conducive to the development of skills relating to organisation, supervision of the work of others and planning. Accordingly, workers closer to retirement age are likely to be relatively better qualified to continue their working lives in jobs that require a greater use of skills of this kind. By contrast, in Spain there seems to be a decrease in tasks that require writing skills in workers over 50. A notable decline is also observed in the performance of tasks that require an intensive use of physical, numeracy and IT skills. In Spain, for workers with a low education level the decrease in physical skills with age is particularly pronounced, whereas for those with a high education level the decrease in tasks that require IT and numeracy skills is important in relative terms.

The findings for the countries overall that performed the PIAAC test are qualitatively similar, although in Spain a larger decrease is observed in tasks that require physical skills among the group with a low education level, and in tasks that require numeracy and IT skills among those with a high education level.

The fact that people's skills change with age suggests that it should be possible to reassign workers' tasks, to enable them to continue to pursue a productive career. Irrespective of the sector in which they work, this change in tasks within the same firm would require a greater degree of specialisation of the work of each individual. This is easier to achieve in firms of a certain size (Lallemand and Rycx, 2009).<sup>10</sup>

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9 The article goes further, indicating that in Germany, between 1986 and 2006, in response to the greater demand for crystallised intelligence as a result of technological change, older workers were able to adapt their tasks to a greater extent than younger workers, giving rise to relative wage improvements.

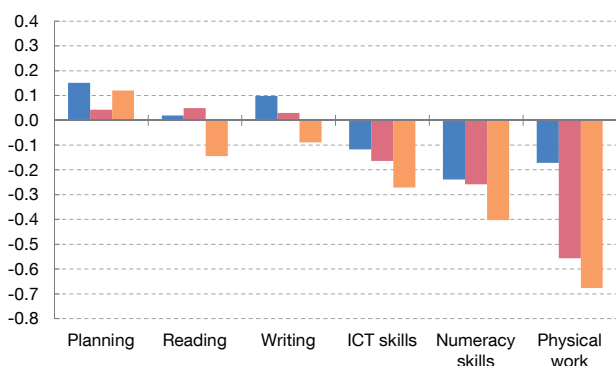
10 Estimates similar to those made in Chart 5 have been made, but drawing a distinction by education level and firm size. In firms with more than 50 workers, older employees, especially those with a higher level of education, perform fewer physical, numerical and ICT-related tasks than their younger peers (30-34 age group). By contrast, they do more planning and reading and writing. However, for employees in smaller firms, the decrease in tasks is much more broadly based.

Chart 5

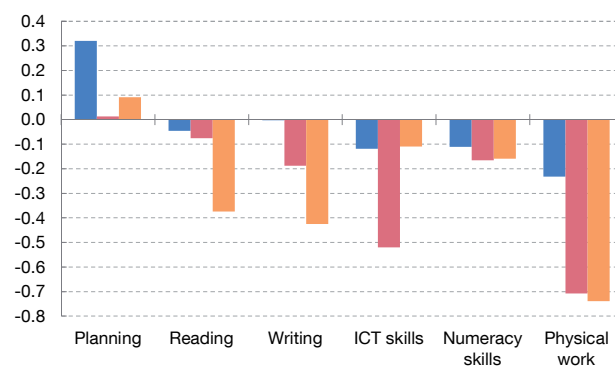
**CHANGE IN DIFFERENT SKILL USE OVER LIFE CYCLE. SPAIN (a)**

Tasks involving planning and reading skills increase with age, especially among groups with a medium or high education level, by contrast to those involving writing, numeracy and ICT skills and physical work which decrease.

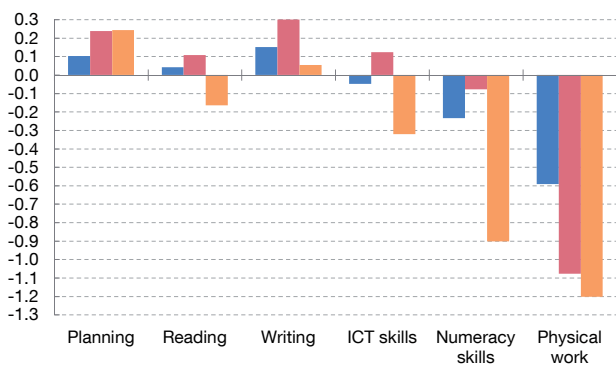
1 CHANGE IN SKILL INDICATORS COMPARED WITH 30-34 AGE GROUP



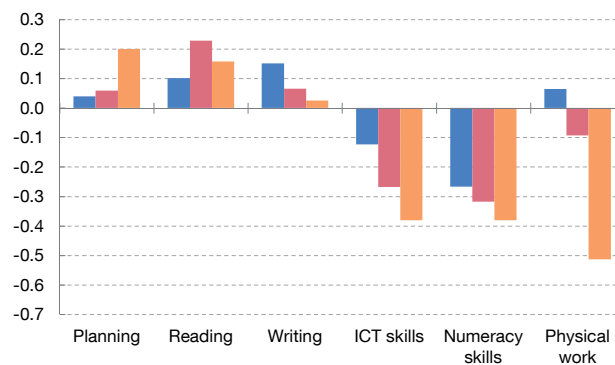
2 CHANGE IN SKILL INDICATORS COMPARED WITH 30-34 AGE GROUP. LOW LEVEL OF EDUCATION (b)



3 CHANGE IN SKILL INDICATORS COMPARED WITH 30-34 AGE GROUP. MEDIUM LEVEL OF EDUCATION (b)



4 CHANGE IN SKILL INDICATORS COMPARED WITH 30-34 AGE GROUP. HIGH LEVEL OF EDUCATION (b)



50-54 AGE GROUP      55-59 AGE GROUP      60-65 AGE GROUP

SOURCE: OECD (2013) (PIAAC).

a The bars in the charts denote the estimated coefficients for indicators for each age group — 50-54, 55-59 and 60-65 — in a regression that includes additional control variables. The dependent variable is the skill use at work indicator. The regression in Chart 5.1 includes sex, education level and dummy variables for the sector of activity, the occupation and each age group. The other regressions are similar, but restricted to the different education levels.

b Low level of education = lower secondary or less; medium level = upper secondary; high level = university or more.



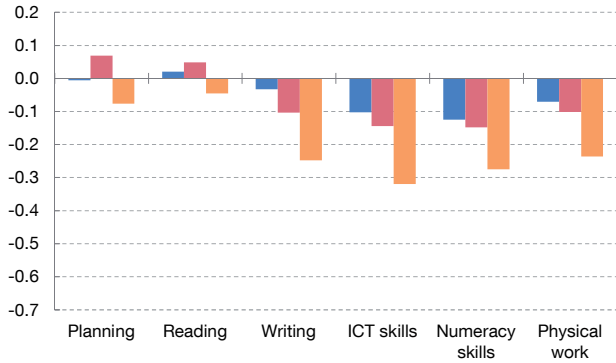
To analyse the extent to which this may be an impediment for older workers both in Spain and the euro area, Table 3 depicts their distribution by firm size, drawing on Eurostat Labour Force Survey data. In Spain, 42% of workers with a low education level in the 50-54 age group are employed in firms with fewer than 10 workers, compared with 28% in the euro area. In Spain, the proportion of older workers with medium/high education levels employed in firms with fewer than 10 workers is lower (36% of those aged 50-54 with medium education and 23% of those with high education), but this is still higher than the euro area average, which could suggest an added difficulty for older workers in Spain when it comes to changing tasks within a

Chart 6

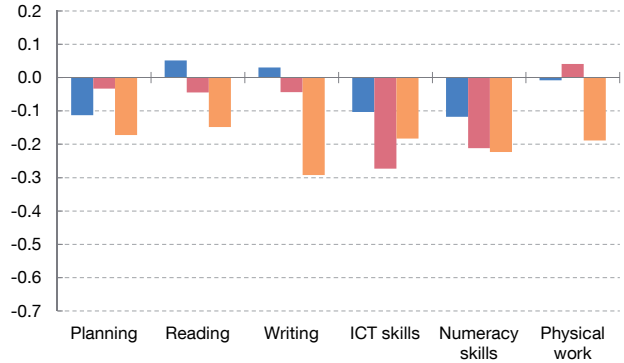
**CHANGE IN DIFFERENT SKILL USE OVER LIFE CYCLE. SAMPLE OF ALL PIAAC COUNTRIES (a)**

The time devoted to tasks related to planning and reading skills does not decrease with age, while the time devoted to tasks related to writing, numeracy and ICT skills and physical work does.

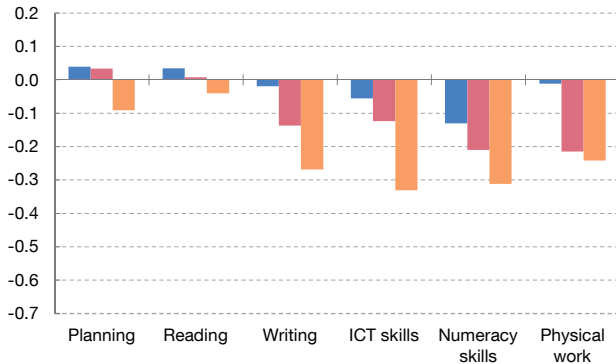
1 CHANGE IN SKILL INDICATORS COMPARED WITH 30-34 AGE GROUP



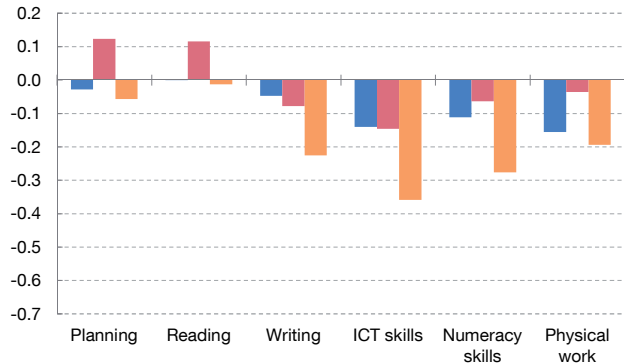
2 CHANGE IN SKILL INDICATORS COMPARED WITH 30-34 AGE GROUP. LOW LEVEL OF EDUCATION (b)



3 CHANGE IN SKILL INDICATORS COMPARED WITH 30-34 AGE GROUP. MEDIUM LEVEL OF EDUCATION (b)



4 CHANGE IN SKILL INDICATORS COMPARED WITH 30-34 AGE GROUP. HIGH LEVEL OF EDUCATION (b)



50-54 AGE GROUP      55-59 AGE GROUP      60-65 AGE GROUP

SOURCE: OECD (2013) (PIAAC).

a The bars in the charts denote the estimated coefficients for indicators for each age group — 50-54, 55-59 and 60-65 — in a regression that includes additional control variables. The dependent variable is the skill use at work indicator. The regression in Chart 6.1 includes sex, education level and dummy variables for the sector of activity, the occupation and each age group. The other regressions are similar, but restricted to the different education levels.

b Low level of education = lower secondary or less; medium level = upper secondary; high level = university or more.



company. According to Eurostat, in 2018 only 1% of the employed population over 55 years of age changed jobs from one quarter to another, compared with 4% for those between 25 and 54 years of age and 16% for those under 25.<sup>11</sup> This illustrates, among other factors, how difficult it is for the over-55s to change jobs in the event that they cannot be reassigned in their firm, and explains why, if they lose their jobs, they are most likely to transition to economic inactivity.

11 See Eurostat labour market transitions.

Table 3

**DISTRIBUTION OF WORKERS BY FIRM SIZE, AGE GROUP AND LEVEL OF EDUCATION (a)**

In Spain, the proportion of older workers in small firms with fewer than 10 workers is above the euro area average, irrespective of education level. This could be a disadvantage for older workers in Spain, as it is more difficult to change tasks in small firms.

	Age (years)	Spain (%)			Euro area (%) (b)		
		1-10	11-49	Over 50	1-10	11-49	Over 50
Low education level	30-34	45.3	29.8	24.9	30.4	33.3	36.3
	35-39	44.8	32.1	23.1	30.1	33.1	36.8
	40-44	40.5	35.7	23.7	29.2	32.9	37.9
	45-49	41.7	33.9	24.4	28.9	32.4	38.7
	50-54	42.5	31.9	25.6	27.8	31.6	40.6
	55-59	43.5	32.0	24.5	27.6	31.1	41.3
	60-64	45.5	30.9	23.6	30.8	30.0	39.2
Medium education level	30-34	35.6	34.8	29.6	21.6	34.7	43.6
	35-39	39.0	29.3	31.7	21.5	33.8	44.6
	40-44	33.6	31.6	34.8	22.2	33.0	44.7
	45-49	36.6	28.6	34.8	20.2	32.2	47.6
	50-54	36.3	30.2	33.4	17.9	32.6	49.5
	55-59	30.7	29.1	40.2	16.9	32.1	50.9
	60-64	40.1	25.9	34.0	18.2	33.1	48.7
High education level	30-34	27.3	33.8	38.9	16.4	29.9	53.7
	35-39	23.1	32.6	44.3	15.9	28.9	55.2
	40-44	22.9	32.5	44.5	16.0	28.8	55.2
	45-49	26.6	31.7	41.7	15.8	28.4	55.7
	50-54	23.1	29.1	47.8	15.8	28.0	56.3
	55-59	21.6	31.4	47.0	15.3	28.7	56.0
	60-64	24.1	30.1	45.8	17.6	28.3	54.1

**SOURCE:** Eurostat (Labour Force Survey 2018).

**a** Low level of education = lower secondary or less; medium level = upper secondary; high level = university or more.

**b** Euro area countries: Austria, Belgium, Cyprus, Estonia, Finland, France, Germany, Greece, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Portugal, Slovakia, Slovenia and Spain.

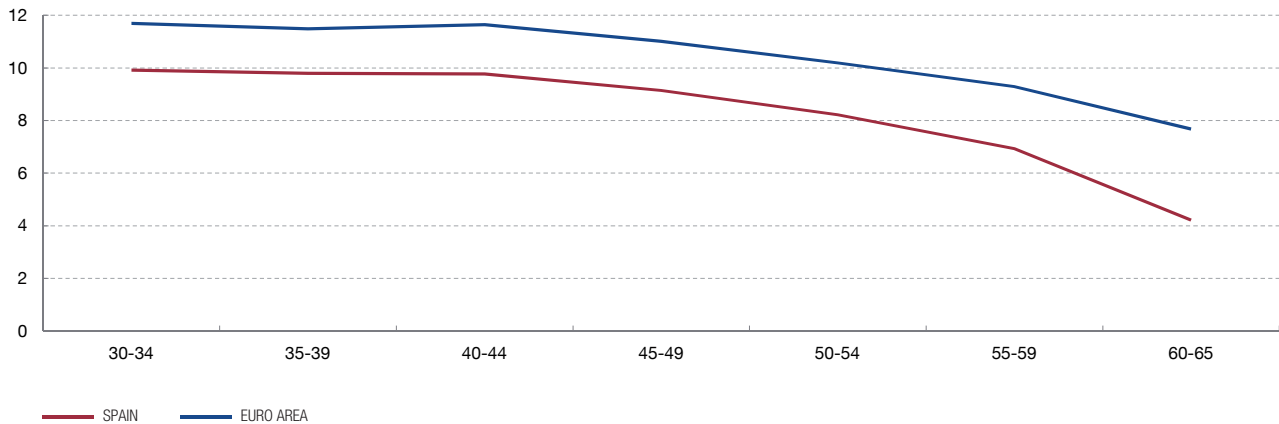
This difficulty in changing tasks is especially important in an economy such as the Spanish one which has a high proportion of small firms, specialising in certain service sectors that entail a considerable amount of physical work (such as agriculture, small retail trade, hotels and restaurants or domestic help). In consequence, firms would have to incorporate more internal flexibility to allow for adjustments to be made to the working conditions (wages or working hours) of certain groups of older workers. Possible changes in retirement systems could perhaps also be explored, to include certain specificities relating to the skills required in different sectors and occupations. In this respect, it is important to bear in mind the evidence of the positive relationship between the effective retirement age and the possibility of having a job that demands age-appropriate tasks, together with other factors such as access to a greater range of flexible working arrangements (Hudomiet et al., 2019).



Chart 7

**WORKERS UNDERTAKING TRAINING, BY AGE GROUP, IN SPAIN AND THE EURO AREA (2018) (%) (a)**

The proportion of workers undertaking some kind of training decreases with age, both in Spain and in the euro area average.



**SOURCE:** Eurostat (Labour Force Survey 2018).

**a** Euro area countries: Austria, Belgium, Cyprus, Estonia, Finland, France, Germany, Greece, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Portugal, Slovakia, Slovenia and Spain.



Table 4

**SKILL INDICATORS FOR WORKERS UNDERTAKING/NOT UNDERTAKING SOME KIND OF TRAINING, BY AGE GROUP (a)**

Irrespective of age, workers who are undertaking some kind of training perform more tasks that require planning, reading, writing, ICT or numeracy skills and less physical work.

Age (years)	Planning	Reading	Writing	ICT	Numeracy	Physical work
<b>Undertaking training</b>						
30-34	2.09	2.37	2.42	2.24	2.30	2.87
35-39	2.13	2.42	2.36	2.24	2.27	2.80
40-44	2.11	2.38	2.37	2.23	2.21	2.77
45-49	2.14	2.41	2.37	2.15	2.19	2.81
50-54	2.10	2.40	2.37	2.17	2.14	2.84
55-59	2.19	2.50	2.33	2.18	2.18	2.76
60-64	2.02	2.45	2.31	1.96	2.07	2.72
<b>Not undertaking training</b>						
30-34	1.84	1.68	1.85	1.89	1.97	3.31
35-39	1.86	1.78	1.89	1.86	1.93	3.34
40-44	1.90	1.76	1.83	1.86	1.92	3.45
45-49	1.91	1.71	1.79	1.77	1.86	3.42
50-54	1.82	1.67	1.82	1.78	1.84	3.46
55-59	1.87	1.66	1.78	1.71	1.83	3.38
60-64	1.78	1.70	1.65	1.69	1.70	3.12

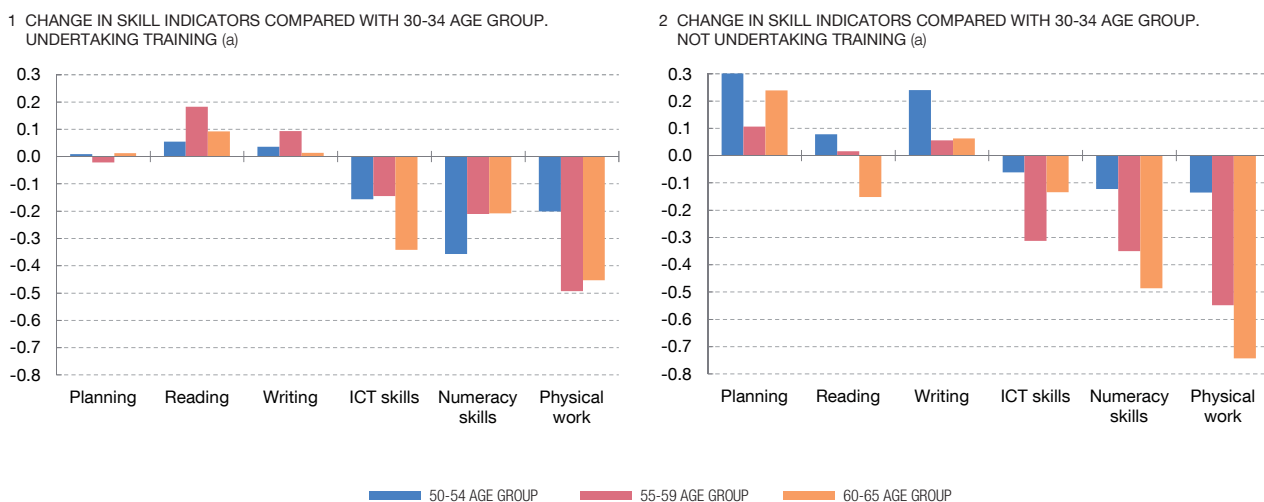
**SOURCE:** OECD (2013) (PIAAC).

**a** All PIAAC sample countries.

Chart 8

**THERE ARE GENERALLY FEWER DIFFERENCES BY AGE AMONG WORKERS UNDERTAKING SOME KIND OF TRAINING. SPAIN**

The differences in the use of writing, numeracy and physical skills over the life cycle are somewhat smaller for workers undertaking some kind of training. But this is not the case for ICT skills.



SOURCE: OECD (2013) (PIAAC).

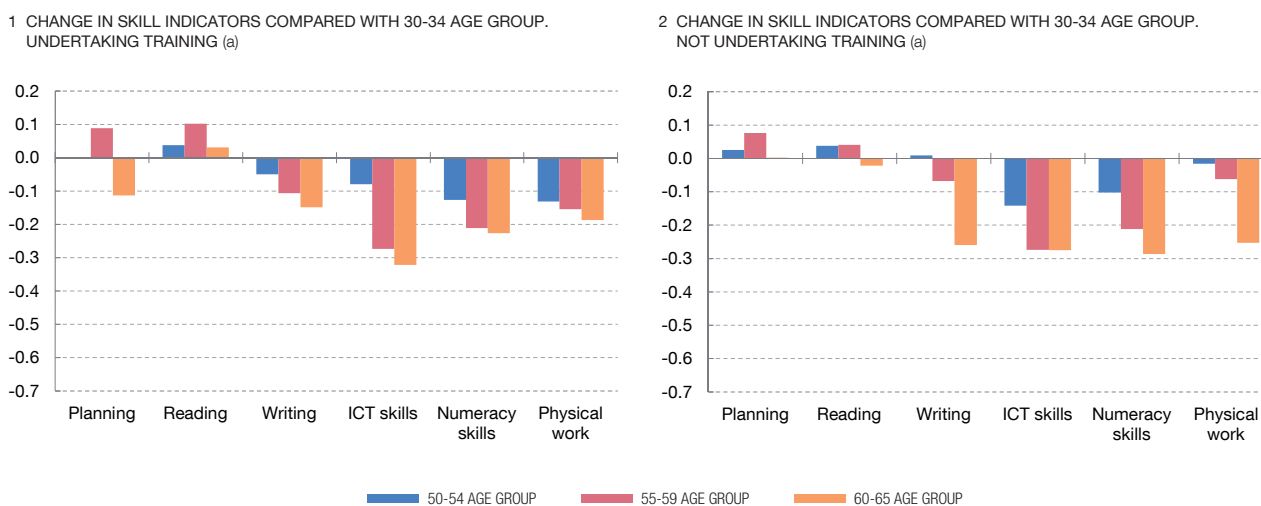
a The bars in the charts denote the estimated coefficients for indicators for each age group – 50-54, 55-59 and 60-65 – in a regression that includes additional control variables. The dependent variable is the skill use at work indicator. The regression includes sex, education level and dummy variables for the sector of activity, the occupation and each age group.



Chart 9

**THERE ARE GENERALLY FEWER DIFFERENCES BY AGE AMONG WORKERS UNDERTAKING SOME KIND OF TRAINING. ALL PIAAC COUNTRIES**

The differences in the use of writing, numeracy and physical skills are somewhat smaller for workers undertaking some kind of training. But this is not the case for ICT skills.



SOURCE: OECD (2013) (PIAAC).

a The bars in the charts denote the estimated coefficients for indicators for each age group – 50-54, 55-59 and 60-65 – in a regression that includes additional control variables. The dependent variable is the skill use at work indicator. The regression includes sex, education level and dummy variables for the sector of activity, the occupation and each age group.



## Ageing and on-the-job learning

Continuous on-the-job learning helps reduce or at least delay some skill depreciation. Accordingly, it should be aimed at curtailing the loss of certain skills and improving the adaptability of workers to perform other tasks, to allow them to maintain a high level of employability, performing some tasks that they would not otherwise be able to do. However, participation in training courses<sup>12</sup> at any age in Spain is at least 2 pp lower than the euro area average (see Chart 7), and it falls sharply with age. Thus, while 10% of Spanish workers aged 30-34 participate in training courses, the figure drops to 8% in the 50-54 age group and to 4.2% for the over-60s. The rate of participation also falls in the euro area, but it remains higher than the Spanish rate, with 7.7% of workers over 60 participating in training courses.

To assess the usefulness of courses of this kind, drawing on the PIAAC data it is possible to compare, in terms of tasks performed, the skills of persons participating in on-the-job or distance learning or who are attending seminars, workshops or specialist courses, with the skills of those who are not doing so. Table 4 shows that, at any age, persons who are participating in some kind of training perform more tasks that require planning, reading, writing, numeracy or ICT skills and less physical work. The differences are particularly marked in reading and writing skills, and less so in planning, ICT and numeracy skills. Those who take training courses tend to be highly motivated, so at least part of these differences will not necessarily be a result of the training, but rather of their individual starting point. In any event, an alternative question is if training delays the change in tasks with age. In this respect, Charts 8 and 9 illustrate the changes in tasks for workers of different ages who are and are not undertaking training courses. Indeed, both the Spanish and the international sample show a smaller decline in tasks that require numeracy, physical and writing skills among older workers who are undertaking some kind of training, although the improvement is limited.

In any event, it seems reasonable that in order for workers to reach their later years in an optimal manner, more continuous on-the-job learning should be provided earlier, so as to delay skill depreciation insofar as possible. As regards training for older workers, the design is crucial: according to the World Bank (2019), it must be flexible in terms of timing, as these workers generally have little free time (there is a high opportunity cost in terms of lost income and lost family time), and it must also have a broad practical content, to mitigate possible abstraction and lack of concentration.

6.2.2020.

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12 In the Eurostat Labour Force Survey, “training courses” are understood to be any kind of studies or training apart from official study plans carried out in the previous four weeks, including private academy courses, workplace courses, courses for the unemployed, seminars, conferences and private classes.

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