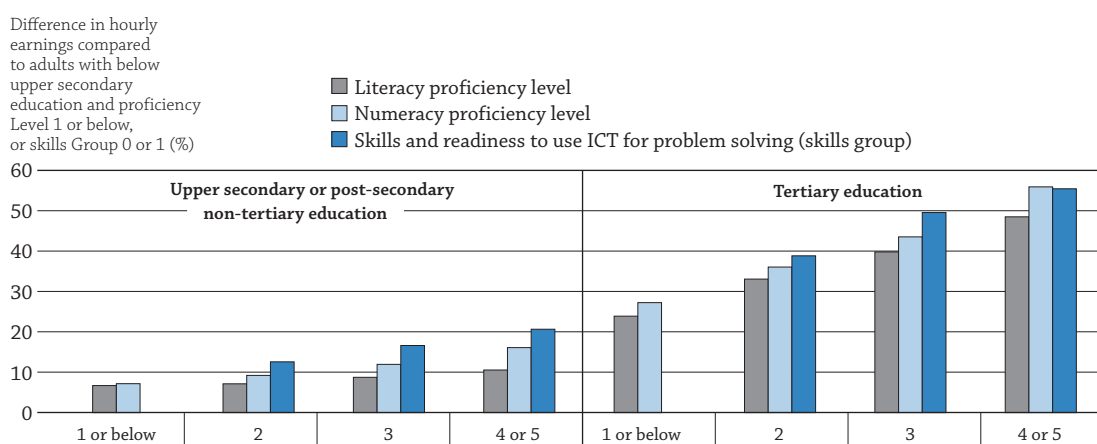


## WHAT IS THE IMPACT OF SKILLS ON EMPLOYMENT AND EARNINGS?

- On average across countries and sub-national entities that participated in the Survey of Adult Skills (PIAAC) (2012), employment rates and earnings increase with educational attainment and, to a lesser extent, with higher skills.
- The highest returns to greater skills proficiency accrue to individuals who have attained tertiary education.
- Among adults with tertiary education and those with upper secondary or post-secondary non-tertiary education, skills in using ICT for problem solving are associated with higher earnings compared to adults who are equally proficient in numeracy, and proficiency in numeracy yields higher returns than equivalent proficiency in literacy.

**Chart A9.1. Difference in hourly earnings, by educational attainment and skills (2012)**

*Survey of Adult Skills, 25-64 year-old non-students, average across OECD countries, reference category is below upper secondary education and proficiency Level 1 or below, or skills Group 0 or 1*



### How to read this chart

On average, tertiary-educated adults with literacy proficiency of Level 4 or 5 earn 48% more compared with adults with below upper secondary education and literacy proficiency of Level 1 or below.

The percentages represent the earnings outcomes compared to the reference category (reference category is below upper secondary education and proficiency Level 1 or below, or skills Group 0 or 1).

**Notes:** Literacy and numeracy are based on proficiency levels whereas skills and readiness to use ICT for problem solving is based on skill groups which follow a different approach. For skills and readiness to use ICT for problem solving “4 or 5” should be interpreted as Group 4. Values are not shown when there are too few observations to provide reliable estimates.

**Source:** OECD. Tables A9.2 (L), A9.2 (N) and A9.2 (P). See Annex 3 for notes ([www.oecd.org/education/education-at-a-glance-19991487.htm](http://www.oecd.org/education/education-at-a-glance-19991487.htm)).

**StatLink** <http://dx.doi.org/10.1787/888933283798>

### Context

Basic literacy, numeracy and problem-solving skills are usually acquired in formal schooling (Green and Riddell, 2012). But adults who have attained the same level of education can have different levels of proficiency in literacy and numeracy skills, and in skills related to using information and communication technology (ICT) to solve problems. To the extent that workers' productivity is related to the knowledge and skills they possess, and that wages reflect such productivity, albeit imperfectly, individuals with more skills should expect higher returns from labour market participation, and would thus be more likely to participate in it. Thus, improving the teaching of literacy and numeracy in schools and in programmes for adults with poor skills and limited familiarity with ICT may provide considerable economic and social returns for individuals and society as a whole (OECD, 2013).

**Other findings**

- Adults with upper secondary or post-secondary non-tertiary education and numeracy proficiency of Level 1 or below earn 7% more per hour than adults with below upper secondary education and numeracy proficiency of Level 1 or below, while adults with upper secondary or post-secondary non-tertiary education and numeracy proficiency of Level 4 or 5 earn 16% more per hour than adults with below upper secondary education and numeracy proficiency of Level 1 or below. High skills, combined with a tertiary education, are even more highly rewarded. Tertiary-educated adults with numeracy proficiency of Level 4 or 5 earn 56% more than adults with below upper secondary education and numeracy proficiency of Level 1 or below – a difference of 40 percentage points.
- The odds of being employed do not necessarily increase as literacy skills improve. For example, in Poland, the odds ratio of being employed for an adult with tertiary education and literacy proficiency of Level 1 or below is the highest (11.7), whereas the odds ratio for a tertiary-educated adult with literacy proficiency of Level 4 or 5 is 9.0.
- The greatest returns for individuals with tertiary education and numeracy proficiency of Level 4 or 5 are observed in the Slovak Republic. The hourly earnings of adults with those levels of education and skills are 108% higher than those of adults with below upper secondary education and Level 1 or below proficiency in numeracy – a much larger difference than the average (56%).

## Analysis

This indicator deepens the analyses discussed in Indicators A5 and A6 that show that employment rates and earnings increase as the level of education increases. More specifically, it evaluates the relative impact on employment rates and hourly earnings of higher levels of educational attainment and greater proficiency in literacy, numeracy and using ICT for problem solving. Findings are based on the Survey of Adult Skills, a product of the OECD Programme for the International Assessment of Adult Competencies (PIAAC) (2012).

Results show that employment rates and earnings increase with educational attainment and, to a lesser extent, with higher skills. This means that the labour market rewards educational attainment more highly than the skills measured by the Survey of Adult Skills.

### The impact of education and skills on employment

#### *Impact of education and literacy skills on employment*

Higher educational attainment and higher levels of skills have a positive impact on employment. On average across the OECD countries and sub-national entities that participated in the Survey of Adult Skills in 2012, 48% of adults with below upper secondary qualifications and literacy proficiency of Level 1 or below are employed (reference group). Individuals with upper secondary or post-secondary non-tertiary education as their highest level of attainment and with literacy proficiency of Level 4 or 5 are more likely to be employed compared with the reference group (odds ratio of 2.4 - see Box A9.1. for how to interpret odds ratios). The likelihood of being employed increases for adults with tertiary qualifications and literacy proficiency of Level 4 or 5 (odds ratio of 4.2) (Table A9.1 [L]).

The returns associated with greater literacy proficiency within education levels appear to be more limited. For individuals with below upper secondary education, there is a small difference between those with Level 2 or Level 3 in literacy (odds ratio of 1.3 and 1.2, respectively). For those with an upper secondary or post-secondary non-tertiary education, the odds ratio remains the same (2.0), regardless of whether an adult is proficient to Level 1 or below, Level 2 or Level 3 in literacy. When an adult at that level of education is proficient to Level 4 or 5, the odds of being employed are 2.4. For tertiary-educated adults, the odds of being employed increase as proficiency in literacy increases: odds ratio of 2.9 for Level 1 or below, 3.7 for Levels 2 and 3, and 4.2 for Level 4 or 5 (Table A9.1 [L]).

In all participating countries and sub-national entities, the odds of being employed are greater for individuals with tertiary education, regardless of their proficiency in literacy. Data also show that the odds of being employed do not necessarily increase as an individual improves in literacy. For example, in Poland, the odds ratio of being employed for an adult with tertiary education and literacy proficiency of Level 1 or below is the highest (11.7), whereas the odds ratio for an adult with similar educational attainment, but whose literacy proficiency is Level 4 or 5 is 9.0. In the Slovak Republic, tertiary-educated adults with literacy proficiency of Level 2 or 3 have an odds ratio of more than 5.0 of being employed while the odds ratio of those with similar educational attainment and with literacy proficiency of Level 4 or 5 is 3.4, another example where higher literacy skills are not necessarily associated with higher employment (Table A9.1 [L]).

#### *Impact of education and numeracy skills on employment*

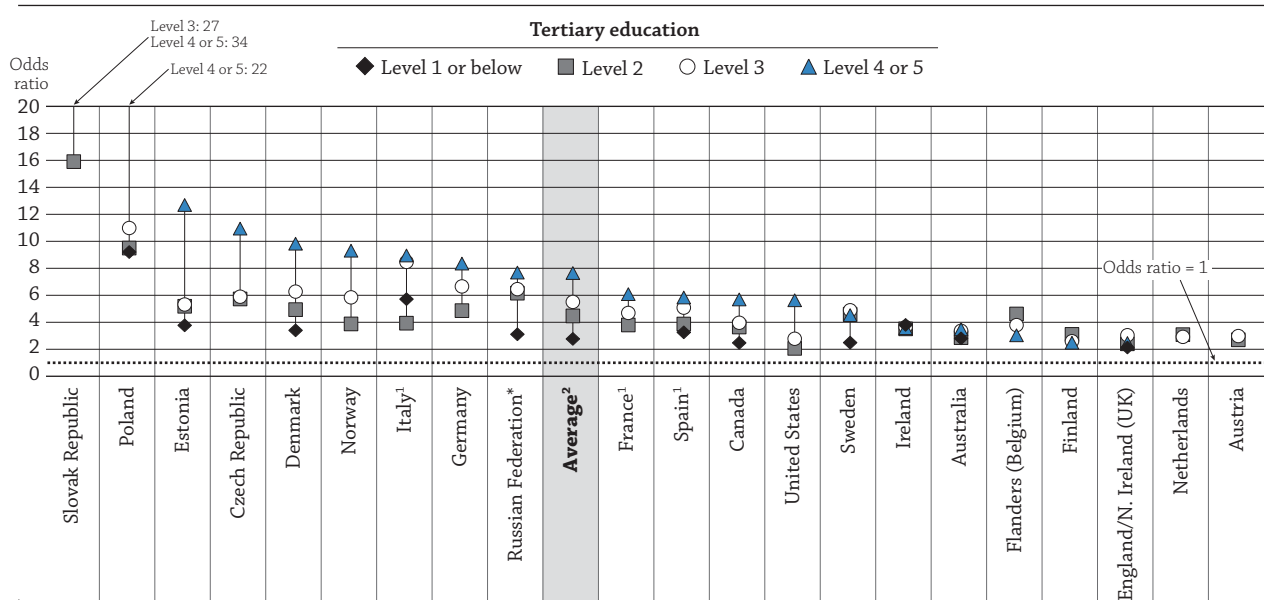
Compared to literacy skills, numeracy skills have a more significant impact on employment outcomes. On average across participating OECD countries and sub-national entities, 47% of individuals with below upper secondary education as their highest level of attainment and with numeracy proficiency of Level 1 or below are employed (reference group). For those individuals with below upper secondary education, an increase in numeracy proficiency from Level 1 or below to Level 2 improves the probability of being employed (odds ratio of 1.5). When such an individual improves in numeracy from Level 1 or below to Level 3, the odds of being employed increases to 1.8 (Table A9.1 [N]).

An adult with upper secondary or post-secondary non-tertiary education as his or her highest level of attainment and numeracy proficiency at or below Level 1 has an odds ratio of being employed of 1.9. If that person were to improve his or her numeracy skills to Level 2, the odds ratio would improve to 2.5; Level 3 proficiency would result in an odds ratio of 3.0, and a proficiency of Level 4 or 5 would yield a ratio of 3.8.

Similarly, improvements in numeracy proficiency for tertiary-educated adults increase the probability of being employed: the odds ratio is 2.8 for Level 1 or below; 4.5 for Level 2; 5.5 for Level 3; and 7.6 for Level 4 or 5 (Table A9.1 [N]).

**Chart A9.2. Likelihood of being employed, by educational attainment and numeracy proficiency (2012)**

*Survey of Adult Skills, 25-64 year-old non-students, reference category is below upper secondary education and numeracy proficiency of Level 1 or below*


**How to read this chart**

In the Slovak Republic, a person with tertiary education and a numeracy proficiency of Level 4 or 5 is 33.8 times as likely (in terms of odds ratio) of being employed as someone with below upper secondary education and a numeracy proficiency of Level 1 or below.

The “odds ratio” reflects the relative likelihood of being employed. The reference category is below upper secondary education and a numeracy proficiency of Level 1 or below and their odds ratio are set to equal 1 (thicker line).

**Notes:** The odds ratio are based on a logistic regression, after accounting for: age, gender, parents’ educational attainment, immigration background, parental status (have a child or not), cohabitation status (living with spouse/partner or not), literacy proficiency, skills and readiness to use ICT for problem solving. Differences between the groups are not shown when they are not statistically significant at 95%.

1. The coefficients for France, Italy and Spain have been estimated without accounting for skills and readiness to use ICT for problem solving since it was not tested in these countries. Since there is positive correlation between skills and readiness to use ICT for problem solving and numeracy, literacy and education, the effect of excluding skills and readiness to use ICT for problem solving is likely to be that the coefficients on the proficiency by education level are overestimated, relative to the results for other countries.

2. Average for the regression excludes France, Italy and Spain as a different model specification was used for these countries.

\* See note on data for the Russian Federation in the *Methodology* section.

Countries are ranked in descending order of the odds ratio of being employed for individuals with tertiary education and a numeracy proficiency of Level 4 or 5.

**Source:** OECD, Table A9.1 (N). See Annex 3 for notes ([www.oecd.org/education/education-at-a-glance-19991487.htm](http://www.oecd.org/education/education-at-a-glance-19991487.htm)).

**StatLink** <http://dx.doi.org/10.1787/888933283802>

Chart A9.2 shows the odds of being employed among adults with tertiary education and different levels of numeracy proficiency relative to the odds of being employed among adults with below upper secondary education with numeracy proficiency of Level 1 or below. As observed with literacy proficiency, adults with tertiary education have greater odds of being employed, regardless of their proficiency in numeracy. Results show that numeracy has a stronger impact on employment compared to literacy. For example, in Poland, the odds ratio of being employed for those with numeracy proficiency of Level 3 is 11.0 whereas it is 22.4 for adults with similar educational attainment and with numeracy proficiency of Level 4 or 5, the largest difference among participating countries and sub-national entities. On average, the odds ratio of being employed for individuals with numeracy proficiency of Level 4 or 5 (7.6) is higher than that of adults with similar educational attainment and with literacy proficiency of Level 4 or 5 (4.2) (Tables A9.1 [L] and A9.1 [N]).

**Impact of education and skills and readiness to use ICT for problem solving on employment**

On average, 38% of adults with ICT and problem-solving skills of Group 0 or 1 (see the *Definitions* section below for a description of skill groups) and below upper secondary education are employed (reference group). Adults with upper secondary or post-secondary non-tertiary education as their highest level of attainment and good ICT and problem-solving skills are more likely to be employed compared with the reference group (odds ratio of 2.8). The likelihood of being employed increases for individuals with tertiary qualifications and good ICT and problem-solving skills (odds ratio of 5.1) (Table A9.1 [P]).

As with literacy and numeracy, tertiary-educated adults have greater odds of being employed, regardless of their skills and readiness to use ICT for problem solving. The odds ratio of being employed for adults with tertiary education and good ICT and problem-solving skills are the highest in Norway and Poland (odds ratio of 9.8 and 11.7, respectively). In these two countries, the odds ratio of being employed increase as skills improve. This is not the case in Estonia and the Slovak Republic, where the odds of being employed are the fourth and third highest, respectively, among adults with a similar profile (odds ratio of 8.4 and 8.9, respectively). In these two countries, adults with lower skills have greater odds of being employed (Table A9.1 [P]).

### ***Employment returns to education and skills proficiency***

In most countries, improvements in skills proficiency for adults with below upper secondary as their highest level of education do not have a statistically significant effect on employment. At the upper secondary or post-secondary non-tertiary level, the strongest impact on employment related to changes in skills proficiency tend to be associated with numeracy proficiency, especially when moving from Level 3 to Level 4 or 5. For example, in Italy and the Slovak Republic, there is an increase of more than 4 points in the odds ratio between these two proficiency levels (Table A9.1 [N]).

Among tertiary-educated adults, the strongest impact on employment related to changes in skills proficiency also tend to be associated with numeracy proficiency, especially when moving from Level 3 to Level 4 or 5. In the Czech Republic, Estonia, Poland and the Slovak Republic, the odds ratio increases by more than 5 points between these two proficiency levels (Table A9.1 [N]).

### **The impact of education and skills on earnings**

Chart A9.1 shows the impact of educational attainment and skills on hourly earnings. Data for adults with below upper secondary as their highest level of education are not presented in this chart because differentials in hourly earnings are not statistically significant across proficiency levels and skills groups among adults with this level of education. However, pattern starts to take shape when comparing adults with upper secondary or post-secondary non-tertiary education with various levels of skills, and adults with below upper secondary education and the lowest level of skills (the reference category) (Tables A9.2 [L], A9.2 [N] and A9.2 [P]).

Results show that among adults with literacy or numeracy proficiency at Level 1 or below, adults with upper secondary or post-secondary non-tertiary education earn 7% more per hour than adults with below upper secondary education. For skills and readiness to use ICT for problem solving, this difference is not significant and thus not displayed in the chart (Tables A9.2 [L], A9.2 [N] and A9.2 [P]).

When moving to higher skills levels, results become significant for all skills measured, and show that literacy proficiency has less of an effect on earnings than numeracy proficiency, which, in turn, has less of an effect than ICT skills and the readiness to use ICT for problem solving. The differences in the effect on hourly earnings between these three skills tend to increase with proficiency, meaning that an adult with upper secondary or post-secondary non-tertiary education and with good ICT and problem-solving skills can expect greater returns compared with top performers in literacy and numeracy (Tables A9.2 [L], A9.2 [N] and A9.2 [P]).

The chart shows larger returns to adults with higher skills, but it also shows that attaining higher levels of education yields greater returns. For example, adults with upper secondary or post-secondary non-tertiary education and numeracy proficiency of Level 1 or below earn 7% more per hour than adults with below upper secondary education and numeracy proficiency of Level 1 or below, while adults with upper secondary or post-secondary non-tertiary education and numeracy proficiency of Level 4 or 5 earn 16% more per hour than adults with below upper secondary education and numeracy proficiency of Level 1 or below. High skills, combined with a tertiary education, are even more highly rewarded. Tertiary-educated adults with numeracy proficiency of Level 4 or 5 earn 56% more than adults with below upper secondary education and numeracy proficiency of Level 1 or below – a difference of 40 percentage points (Tables A9.2 [L], A9.2 [N] and A9.2 [P]).

### ***Impact of education and literacy skills on earnings***

In general, within each education level, there are positive returns to greater literacy proficiency; but the returns are even greater to higher educational attainment. In many countries, adults with upper secondary or post-secondary non-tertiary education and the highest skills in literacy earn less than adults with tertiary education and the lowest literacy skills (Table A9.2 [L]).

Individuals with upper secondary or post-secondary non-tertiary education and literacy proficiency of Level 1 or below earn 7% more than adults with below upper secondary education and literacy proficiency of Level 1 or below (reference category), while adults with upper secondary or post-secondary non-tertiary education and literacy

proficiency Level 4 or 5 earn 11% more per hour than adults in the reference category. A similar analysis among tertiary-educated adults reveals a 24% increase in hourly earnings for adults with literacy proficiency of Level 1 or below and a 48% increase for individual with literacy proficiency of Level 4 or 5 compared with adults in the reference category. (Table A9.2 [L]).

These estimates are averages; there is significant variation across national and sub-national entities. For instance, increases in hourly earnings are largest in the Slovak Republic for adults with tertiary education and literacy proficiency of Level 4 or 5 compared to the reference category. The hourly earnings of these adults are 87% higher than the earnings of adults with below upper secondary education and literacy proficiency of Level 1 or below – much larger than the average difference (48%) between these two groups. By contrast, this difference is less than 30% in Finland, Japan, Norway and Sweden (Table A9.2 [L]).

Korea shows the largest difference in returns, related to skills proficiency, among tertiary-educated adults. The hourly earnings of those with tertiary education and literacy proficiency of Level 1 or below are 42% higher than the earnings of those with below upper secondary education and literacy proficiency of Level 1 or below. The earnings of those with tertiary education and literacy proficiency of Level 4 or 5 are 83% higher (Table A9.2 [L]).

### ***Impact of education and numeracy skills on earnings***

On average across OECD countries and sub-national entities that participated in the Survey of Adult Skills, compared to an adult with below upper secondary education and with numeracy proficiency at Level 1 or below (reference group), an adult with upper secondary or post-secondary non-tertiary education with similar proficiency in numeracy earns 7% more per hour. Those with similar educational attainment but with numeracy proficiency at Level 4 or 5 see a 16% increase in their hourly earnings. For tertiary-educated adults, the earnings outcomes, compared to the reference group, range from an increase of 27% among those with proficiency Level 1 or below in numeracy to an increase of 56% among those with proficiency Level 4 or 5 in numeracy (Table A9.2 [N]).

As shown in Chart A9.3, the greatest returns for individuals with tertiary education and numeracy proficiency of Level 4 or 5, compared to the reference category, are observed in the Slovak Republic. These adults earn 108% more per hour than adults with below upper secondary education and numeracy proficiency of Level 1 or below – a much larger difference between the two groups than the average (56%). Estonia shows the largest difference in returns related to numeracy proficiency for tertiary-educated adults. Adults at this level of education who are proficient at Level 1 or below in numeracy earn 31% more than the reference group, while those with the same level of education but with numeracy proficiency at Level 4 or 5 earn 76% more (Table A9.2 [N]).

### ***Impact of education and skills and readiness to use ICT for problem solving on earnings***

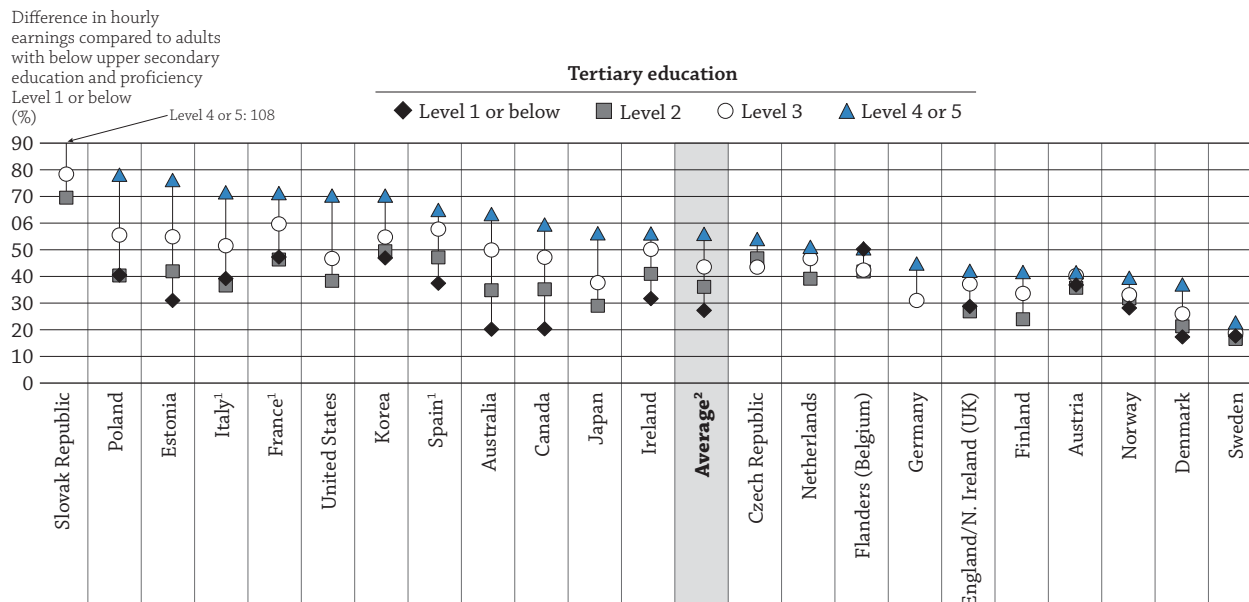
As shown in Chart A9.1, the advantage in having higher ICT and problem-solving skills is greatest among tertiary-educated adults. In Austria, the Czech Republic, England/Northern Ireland (UK), Korea and the United States, the relative hourly earnings advantage for tertiary-educated adults who have moderate ICT and problem-solving skills (Group 3) is at least 15 percentage points greater than for adults with minimal problem-solving skills in technology-rich environments and adults who failed the first stage of the computer-based assessment (Group 2). In England/Northern Ireland (UK) and Korea, adults with good ICT and problem-solving skills (Group 4) add 18 and 12 percentage points, respectively, to the relative hourly earnings of adults in Group 3. More generally, across OECD countries and sub-national entities, the relative hourly earnings advantage for tertiary-educated adults with moderate ICT and problem-solving skills is 11 percentage points greater than for tertiary-educated adults with minimal skills in problem solving using ICT and adults who failed the first stage of the computer-based assessment. The relative earnings is 5 percentage points greater for adults with good ICT and problem-solving skills compared to those with moderate ICT and problem-solving skills (Table A9.2 [P]).

### ***Earnings returns to education and skills proficiency***

The analysis shows the relative importance of each set of skills at different levels of educational attainment. For example, across countries and sub-national entities that participated in the survey, adults with upper secondary or post-secondary non-tertiary education, proficiency in using ICT for problem solving is associated with higher earnings compared to equivalent numeracy skills, which, in turn, yield larger returns than equivalent literacy skills. On average, adults with upper secondary or post-secondary non-tertiary education and good ICT and problem-solving skills (Group 4) earn 21% more per hour than adults with below upper secondary education and no computer experience or who refused the computer-based assessment (Group 0 or 1). Those at Level 4 or 5 in numeracy proficiency earn 16% more per hour and those at Level 4 or 5 in literacy earn 11% more compared to adults with below upper secondary education and proficiency Level 1 or below in these skills (Tables A9.2 [L], A9.2 [N] and A9.2 [P]).

**Chart A9.3. Difference in hourly earnings, by educational attainment and numeracy proficiency (2012)**

Survey of Adult Skills, 25-64 year-old non-students, reference category is below upper secondary education and numeracy proficiency of Level 1 or below


**How to read this chart**

In the Slovak Republic, tertiary-educated adults with numeracy proficiency of Level 4 or 5 earn 108% more compared with adults with below upper secondary education and numeracy proficiency of Level 1 or below.

The percentages represent the earnings outcomes compared to the reference category (below upper secondary education and a numeracy proficiency of Level 1 or below).

**Notes:** The values are based on a linear regression, after accounting for: age, gender, parents' educational attainment, immigration background, parental status (have a child or not), cohabitation status (living with spouse/partner or not), literacy proficiency, skills and readiness to use ICT for problem solving. Differences between the groups are not shown when they are not statistically significant at 95%.

1. The coefficients for France, Italy and Spain have been estimated without accounting for skills and readiness to use ICT for problem solving since it was not tested in these countries. Since there is positive correlation between skills and readiness to use ICT for problem solving and numeracy, literacy and education, the effect of excluding skills and readiness to use ICT for problem solving is likely to be that the coefficients on the proficiency by education level are overestimated, relative to the results for other countries.

2. Average for the regression excludes France, Italy and Spain as a different model specification was used for these countries.

Countries are ranked in descending order of the percentage increase in earnings for individuals with tertiary education and a numeracy proficiency of Level 4 or 5.

**Source:** OECD, Table A9.2 (N). See Annex 3 for notes ([www.oecd.org/education/education-at-a-glance-19991487.htm](http://www.oecd.org/education/education-at-a-glance-19991487.htm)).

**StatLink** <http://dx.doi.org/10.1787/888933283811>

**Definitions**

**Adults** refer to 25-64 year-olds.

**Earnings** refer to hourly earnings excluding bonuses for wage and salary earners.

The **employment rate** refers to the number of persons in employment as a percentage of the working-age population (the number of employed people is divided by the number of all working-age people). Employment rates by gender, age, educational attainment, programme orientation and age groups are calculated within each of these categories; for example the employment rate among women is calculated by dividing the number of employed women by the total number of working-age women.

**Levels of education:** **Below upper secondary** corresponds to ISCED-97 Levels 0, 1, 2 and 3C short programmes; **upper secondary or post-secondary non-tertiary** corresponds to ISCED-97 Levels 3A, 3B, 3C long programmes, and Level 4; and **tertiary** corresponds to ISCED-97 Levels 5A, 5B and 6.

**Literacy** is the ability to understand, evaluate, use and engage with written texts to participate in society, to achieve one's goals, and to develop one's knowledge and potential. Literacy encompasses a range of skills from the decoding of written words and sentences to the comprehension, interpretation, and evaluation of complex texts. It does not, however, involve the production of text (writing). Information on the skills of adults with

low levels of proficiency is provided by an assessment of reading components that covers text vocabulary, sentence comprehension and passage fluency.

**Numeracy** is the ability to access, use, interpret and communicate mathematical information and ideas in order to engage in and manage the mathematical demands of a range of situations in adult life. To this end, numeracy involves managing a situation or solving a problem in a real context, by responding to mathematical content/information/ideas represented in multiple ways.

**Problem solving in technology-rich environments** is the ability to use digital technology, communication tools and networks to acquire and evaluate information, communicate with others and perform practical tasks. The assessment focuses on the abilities to solve problems for personal, work and civic purposes by setting up appropriate goals and plans, and accessing and making use of information through computers and computer networks.

**Proficiency levels** for literacy and numeracy are based on a 500-point scale. Each level has been defined by particular score-point ranges. Six levels are defined for literacy and numeracy (Below Level 1 and Levels 1 through 5) which are grouped in four proficiency levels in *Education at a Glance*: Level 1 or below – all scores below 226 points; Level 2 – scores from 226 points to less than 276 points; Level 3 – scores from 276 points to less than 326 points; Level 4 or 5 – scores from 326 points and higher.

**Skill groups** refer to skills and readiness to use information and communication technologies (ICT) for problem solving in technology-rich environments. Each group is described in terms of the characteristics of the types of tasks that can be successfully completed by adults and the related scores in the assessment of problem solving in technology-rich environments in the Survey of Adult Skills.

- Group 0 or 1 (no computer experience or refused the computer-based assessment)
- Group 2 (failed ICT core test or minimal problem-solving skills – scored below Level 1 in the problem solving in technology-rich environments assessment)
- Group 3 (moderate ICT and problem-solving skills – scored at Level 1 in the problem solving in technology-rich environments assessment)
- Group 4 (good ICT and problem-solving skills – scored at Level 2 or Level 3 in the problem solving in technology-rich environments assessment)

## Methodology

All data are based on the Survey of Adult Skills (PIAAC) (2012). PIAAC is the OECD Programme for the International Assessment of Adult Competencies. See Annex 3 ([www.oecd.org/education/education-at-a-glance-19991487.htm](http://www.oecd.org/education/education-at-a-glance-19991487.htm)) for additional information.

The sample under consideration is restricted to non-students, as including the employment status and reported earnings for students would likely obscure the impact of skills on labour market outcomes. There is no restriction based on age implying that the sample includes those aged between 25 and 64. When the impact of skills and education on earnings is undertaken, the self-employed are excluded.

### **Box A9.1. Description of logistic regression analysis and interpretation of odds ratio**

Logistic regression analysis enables an estimation of the relationship between one or more independent variables (predictors) on categorical dependent (predicted) variables with two categories (binary logistic regression) or more than two categories (multinomial logistic regression). Multinomial logistic regression compares multiple groups through a combination of binary logistic regressions. Logistic regression analyses were carried out to evaluate the likelihood of being employed for different levels of skills and education. When a logistic regression is calculated, the statistical software output generates the regression coefficient ( $\beta$ ), which is the estimated increase in the log odds of the outcome per unit increase in the value of the predictor variable. Odds ratio (OR) is obtained with the exponential function of the regression coefficient ( $\exp(\beta)$ ). The transformation of log odds ( $\beta$ ) into odds ratios ( $OR = \exp(\beta)$ ) makes the data more interpretable in terms of probability. Three types of outcomes are possible for the odds ratios:

- $OR = 1$  Predictor variable does not affect odds of outcome
- $OR > 1$  Predictor variable associated with higher odds of outcome
- $OR < 1$  Predictor variable associated with lower odds of outcome

...



In odds ratios, categories are compared with a predetermined reference category. For example, in Table A9.1 (L) the reference category is 25-64 year-olds with literacy proficiency of Level 1 or below and educational attainment of below upper secondary education. Odds ratios can be interpreted in such a way that for a unit change in the predictor variable (e.g. level of education changing from below upper secondary education to upper secondary or post-secondary non-tertiary education), the odds ratio of the outcome variable relative to the reference category is expected to change by a factor of the respective parameter estimate, given that the other variables in the model are held constant.

It is also important to note that the odds of being employed are not the same as the probability of employment although there is a correspondence between the measures:

$$\text{Odds} = \text{Probability} / (1 - \text{Probability}) \text{ and conversely, } \text{Probability} = \text{Odds} / (1 + \text{Odds})$$

The odds of being employed can be defined as the probability of employment over the probability of non-employment so, for example, a probability of 50% corresponds to odds of 1. As a further example, on average the probability of being employed stands at 48% for the reference category (i.e. below upper secondary education and literacy proficiency of Level 1 or below) corresponding to employment odds of 0.92 (= 0.48/(1.0 - 0.48)). To compare the employment outcomes of different groups of individuals, we estimate the odds ratio, which is the employment odds of the selected group divided by the employment odds of the reference category. Therefore, taking the previous example, if the employment odds of the reference category stands at 0.92 and the odds ratio is 4.2 for individuals with tertiary education and literacy proficiency of Level 4 or 5, then the odds of being employed for this selected group are 4.2 times the odds of being employed for the baseline group (i.e. 3.86 = 4.2 \* 0.92). Using this figure, we could convert back to probabilities and say that the employment rate for individuals with tertiary education and literacy proficiency of Level 4 or 5 is approximately 79% (= 3.86/(1+3.86)).

#### Note regarding data from the Russian Federation in the Survey of Adult Skills (PIAAC)

Readers should note that the sample for the Russian Federation does not include the population of the Moscow municipal area. The data published, therefore, do not represent the entire resident population aged 16-65 in Russia but rather the population of Russia *excluding* the population residing in the Moscow municipal area. More detailed information regarding the data from the Russian Federation as well as that of other countries can be found in the *Technical Report of the Survey of Adult Skills* (OECD, 2014).

#### References

Green, D.A., W.C. Riddell (2012), *Understanding Educational Impacts: The Role of Literacy and Numeracy Skills*, Department of Economics, University of British Columbia.

OECD (2014), *Technical Report of the Survey of Adult Skills*, [www.oecd.org/site/piaac/ Technical%20Report\\_17OCT13.pdf](http://www.oecd.org/site/piaac/Technical%20Report_17OCT13.pdf), pre-publication copy.

OECD (2013), *OECD Skills Outlook 2013: First Results from the Survey of Adult Skills*, OECD Publishing, Paris, <http://dx.doi.org/10.1787/9789264204256-en>.

#### Indicator A9 Tables


StatLink  <http://dx.doi.org/10.1787/888933285230>

Table A9.1 (L) Likelihood of being employed, by educational attainment and literacy proficiency (2012)

Table A9.1 (N) Likelihood of being employed, by educational attainment and numeracy proficiency (2012)

Table A9.1 (P) Likelihood of being employed, by educational attainment and skills and readiness to use information and communication technologies for problem solving (2012)

Table A9.2 (L) Difference in hourly earnings, by educational attainment and literacy proficiency (2012)

Table A9.2 (N) Difference in hourly earnings, by educational attainment and numeracy proficiency (2012)

Table A9.2 (P) Difference in hourly earnings, by educational attainment and skills and readiness to use information and communication technologies for problem solving (2012)

Table A9.1 (L). [1/2] **Likelihood of being employed, by educational attainment and literacy proficiency (2012)**

25-64 year-old non-students, below upper secondary education and proficiency Level 1 or below as reference category, odds ratio

Logistic regression is used to estimate the odds ratios and p-values; an odds ratio reflects the relative likelihood of being employed compared to someone with an education level of below upper secondary education and a literacy proficiency of Level 1 or below. The latter group is taken as the reference category for the interpretation of the relative likelihood and therefore their odds ratio are set to equal 1. Differences between the groups are statistically significant at 95% if the "p-value" associated with the odds ratio is below 0.05.

**How to read this table:** In Australia, a person with tertiary education and a literacy proficiency of Level 4 or 5 is 2.6 times as likely (in terms of odds ratio) of being employed as someone with below upper secondary education and a literacy proficiency of Level 1 or below.

	Percentage of employed adults among those who have below upper secondary education and literacy proficiency of Level 0/1		Likelihood of being employed compared to someone with below upper secondary education and a literacy proficiency of Level 0/1, dependent on:					
			Below upper secondary education					
			Literacy proficiency of Level 2		Literacy proficiency of Level 3		Literacy proficiency of Level 4/5	
			%	S.E.	Odds ratio	p-value	Odds ratio	p-value
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<b>OECD</b>								
<b>National entities</b>								
Australia	49	(3.2)	1.4	0.27	1.5	0.27	1.0	0.98
Austria	51	(3.4)	1.1	0.88	1.1	0.79	c	c
Canada	53	(2.3)	1.1	0.58	1.0	0.94	c	c
Czech Republic	37	(6.5)	1.5	0.59	1.3	0.75	c	c
Denmark	50	(2.7)	1.5	0.19	1.3	0.55	c	c
Estonia	48	(3.4)	0.9	0.75	1.1	0.78	c	c
Finland	38	(4.3)	1.4	0.38	1.5	0.41	c	c
France <sup>1</sup>	48	(1.7)	0.9	0.73	1.0	0.93	c	c
Germany	51	(3.8)	1.4	0.43	1.4	0.73	c	c
Ireland	40	(3.1)	1.5	0.12	1.6	0.12	c	c
Italy <sup>1</sup>	48	(2.4)	0.9	0.80	0.9	0.84	c	c
Japan	64	(5.5)	0.8	0.65	1.0	0.95	c	c
Korea	61	(2.5)	1.0	0.89	1.0	1.00	c	c
Netherlands	53	(3.3)	0.9	0.83	1.2	0.61	2.0	0.46
Norway	56	(4.4)	1.3	0.49	1.2	0.73	c	c
Poland	36	(3.8)	1.3	0.52	0.9	0.77	c	c
Slovak Republic	24	(3.4)	1.4	0.22	1.2	0.62	c	c
Spain <sup>1</sup>	42	(1.4)	1.1	0.55	1.2	0.46	c	c
Sweden	47	(4.1)	2.1	0.09	1.6	0.37	c	c
United States	61	(3.6)	0.7	0.31	0.4	0.15	c	c
<b>Sub-national entities</b>								
Flanders (Belgium)	43	(3.3)	1.9	0.05	1.6	0.22	c	c
England (UK)	50	(2.8)	1.2	0.70	0.9	0.68	c	c
Northern Ireland (UK)	46	(3.4)	1.2	0.51	0.9	0.77	c	c
England/N. Ireland (UK)	50	(2.7)	1.2	0.67	0.9	0.68	1.2	0.87
<b>Average<sup>2</sup></b>	48	(0.8)	1.3	0.01	1.2	0.13	c	c
<b>Partners</b>								
Russian Federation*	37	(11.0)	0.8	0.78	c	c	c	c

Note: Calculations for odds ratio are based on logistic regressions where the dependent variable is the likelihood of being employed and where the independent variables are educational attainment and proficiency levels, after accounting for: age, gender, parents' educational attainment, immigration background, parental status (have a child or not), cohabitation status (living with spouse/partner or not), numeracy proficiency, skills and readiness to use ICT for problem solving. The reference category is below upper secondary education and proficiency Level 1 or below.

1. The coefficients for France, Italy and Spain have been estimated without accounting for skills and readiness to use ICT for problem solving since it was not tested in these countries. Since there is positive correlation between skills and readiness to use ICT for problem solving and numeracy, literacy and education, the effect of excluding skills and readiness to use ICT for problem solving is likely to be that the coefficients on the proficiency by education level are overestimated, relative to the results for other countries.

2. Average for the regression excludes France, Italy and Spain as a different model specification was used for these countries.

\* See note on data for the Russian Federation in the *Methodology* section.

Source: OECD. Survey of Adult Skills (PIAAC) (2012). See Annex 3 for notes ([www.oecd.org/education/education-at-a-glance-19991487.htm](http://www.oecd.org/education/education-at-a-glance-19991487.htm)).

Please refer to the Reader's Guide for information concerning symbols for missing data and abbreviations.


StatLink  <http://dx.doi.org/10.1787/888933285244>

Table A9.1 (L). [2/2] **Likelihood of being employed, by educational attainment and literacy proficiency (2012)**

25-64 year-old non-students, below upper secondary education and proficiency Level 1 or below as reference category, odds ratio

Logistic regression is used to estimate the odds ratios and p-values; an odds ratio reflects the relative likelihood of being employed compared to someone with an education level of below upper secondary education and a literacy proficiency of Level 1 or below. The latter group is taken as the reference category for the interpretation of the relative likelihood and therefore their odds ratio are set to equal 1. Differences between the groups are statistically significant at 95% if the "p-value" associated with the odds ratio is below 0.05.

**How to read this table:** In Australia, a person with tertiary education and a literacy proficiency of Level 4 or 5 is 2.6 times as likely (in terms of odds ratio) of being employed as someone with below upper secondary education and a literacy proficiency of Level 1 or below.

		Likelihood of being employed compared to someone with below upper secondary education and a literacy proficiency of Level 0/1, dependent on:																
		Upper secondary or post-secondary non-tertiary education								Tertiary education								
		Literacy proficiency of Level 0/1		Literacy proficiency of Level 2		Literacy proficiency of Level 3		Literacy proficiency of Level 4/5		Literacy proficiency of Level 0/1		Literacy proficiency of Level 2		Literacy proficiency of Level 3		Literacy proficiency of Level 4/5		
		Odds ratio	p-value	Odds ratio	p-value	Odds ratio	p-value	Odds ratio	p-value	Odds ratio	p-value	Odds ratio	p-value	Odds ratio	p-value	Odds ratio	p-value	
		(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	
OECD	<b>National entities</b>																	
	Australia	1.5	0.25	1.6	0.13	1.4	0.37	1.5	0.42	2.4	0.07	2.6	0.00	2.7	0.00	2.6	0.03	
	Austria	1.6	0.13	1.8	0.04	2.2	0.02	2.7	0.23	1.1	0.85	2.7	0.01	3.0	0.01	2.4	0.13	
	Canada	2.0	0.00	2.0	0.00	1.9	0.00	1.6	0.24	2.2	0.00	2.7	0.00	2.7	0.00	2.4	0.00	
	Czech Republic	3.9	0.02	3.4	0.04	3.5	0.05	5.5	0.09	c	c	7.8	0.00	4.9	0.03	6.5	0.04	
	Denmark	1.7	0.02	1.9	0.01	1.5	0.18	1.9	0.40	2.7	0.00	3.8	0.00	3.5	0.00	3.9	0.02	
	Estonia	2.3	0.00	2.0	0.00	1.9	0.02	2.3	0.09	3.7	0.00	3.9	0.00	3.1	0.00	5.2	0.00	
	Finland	1.3	0.50	1.7	0.07	2.1	0.04	3.6	0.01	1.4	0.48	2.9	0.00	3.4	0.00	3.0	0.01	
	France <sup>1</sup>	1.5	0.04	1.7	0.00	1.3	0.30	1.1	0.84	1.3	0.46	2.6	0.00	2.9	0.00	2.6	0.02	
	Germany	2.6	0.00	2.3	0.00	2.2	0.03	2.3	0.17	2.7	0.04	3.4	0.00	4.1	0.00	3.6	0.03	
	Ireland	2.1	0.01	1.9	0.00	2.4	0.00	3.2	0.06	3.6	0.00	4.3	0.00	4.5	0.00	6.0	0.00	
	Italy <sup>1</sup>	2.2	0.01	1.3	0.34	1.7	0.15	3.3	0.19	3.8	0.00	2.6	0.00	3.6	0.00	3.2	0.18	
	Japan	1.1	0.93	0.8	0.62	0.7	0.48	0.6	0.46	c	c	1.0	0.96	0.7	0.51	0.5	0.22	
	Korea	1.1	0.71	1.0	0.99	0.9	0.85	0.7	0.62	2.0	0.22	0.9	0.68	0.8	0.64	0.7	0.53	
	Netherlands	1.9	0.08	1.7	0.04	1.5	0.19	1.2	0.70	2.7	0.22	2.4	0.02	2.7	0.01	2.1	0.08	
	Norway	1.9	0.04	1.9	0.07	1.4	0.51	1.5	0.63	1.8	0.16	2.4	0.03	3.5	0.01	2.9	0.10	
	Poland	2.2	0.00	2.3	0.00	2.0	0.03	1.8	0.24	11.7	0.00	6.9	0.00	6.4	0.00	9.0	0.00	
	Slovak Republic	4.4	0.00	3.8	0.00	2.7	0.00	1.6	0.32	c	c	7.6	0.00	5.5	0.00	3.4	0.04	
	Spain <sup>1</sup>	2.4	0.00	1.9	0.00	1.8	0.02	1.8	0.50	3.3	0.00	3.0	0.00	2.9	0.00	3.2	0.01	
	Sweden	2.1	0.06	3.6	0.00	4.1	0.00	7.8	0.03	2.3	0.07	6.6	0.00	9.9	0.00	15.0	0.00	
	United States	1.0	0.94	0.9	0.68	1.1	0.83	1.2	0.74	1.4	0.47	1.4	0.36	1.3	0.44	1.2	0.73	
	Sub-national entities	Flanders (Belgium)	1.8	0.03	2.6	0.00	2.5	0.01	3.4	0.04	3.2	0.04	4.6	0.00	5.4	0.00	7.0	0.00
		England (UK)	1.9	0.07	1.4	0.30	1.8	0.08	1.6	0.41	1.7	0.31	1.8	0.07	1.9	0.04	1.6	0.27
		Northern Ireland (UK)	1.8	0.09	1.7	0.09	1.6	0.22	1.4	0.48	1.3	0.62	2.4	0.01	2.1	0.09	2.0	0.28
		England/N. Ireland (UK)	1.9	0.06	1.4	0.26	1.8	0.07	1.6	0.39	1.7	0.30	1.9	0.05	1.9	0.03	1.6	0.24
		Average <sup>2</sup>	2.0	0.00	2.0	0.00	2.0	0.00	2.4	0.00	2.9	0.00	3.7	0.00	3.7	0.00	4.2	0.00
Partners		Russian Federation*	6.3	0.01	4.8	0.01	3.7	0.10	1.7	0.56	2.2	0.20	4.0	0.03	5.0	0.02	4.8	0.03

Note: Calculations for odds ratio are based on logistic regressions where the dependent variable is the likelihood of being employed and where the independent variables are educational attainment and proficiency levels, after accounting for: age, gender, parents' educational attainment, immigration background, parental status (have a child or not), cohabitation status (living with spouse/partner or not), numeracy proficiency, skills and readiness to use ICT for problem solving. The reference category is below upper secondary education and proficiency Level 1 or below.

1. The coefficients for France, Italy and Spain have been estimated without accounting for skills and readiness to use ICT for problem solving since it was not tested in these countries. Since there is positive correlation between skills and readiness to use ICT for problem solving and numeracy, literacy and education, the effect of excluding skills and readiness to use ICT for problem solving is likely to be that the coefficients on the proficiency by education level are overestimated, relative to the results for other countries.

2. Average for the regression excludes France, Italy and Spain as a different model specification was used for these countries.

\* See note on data for the Russian Federation in the *Methodology* section.

Source: OECD. Survey of Adult Skills (PIAAC) (2012). See Annex 3 for notes ([www.oecd.org/education/education-at-a-glance-19991487.htm](http://www.oecd.org/education/education-at-a-glance-19991487.htm)).

Please refer to the *Reader's Guide* for information concerning symbols for missing data and abbreviations.


StatLink  <http://dx.doi.org/10.1787/888933285244>

Table A9.1 (N). [1/2] **Likelihood of being employed, by educational attainment and numeracy proficiency (2012)**

25-64 year-old non-students, below upper secondary education and proficiency Level 1 or below as reference category, odds ratio

Logistic regression is used to estimate the odds ratios and p-values; an odds ratio reflects the relative likelihood of being employed compared to someone with an education level of below upper secondary education and a numeracy proficiency of Level 1 or below. The latter group is taken as the reference category for the interpretation of the relative likelihood and therefore their odds ratio are set to equal 1. Differences between the groups are statistically significant at 95% if the "p-value" associated with the odds ratio is below 0.05.

**How to read this table:** In Australia, a person with tertiary education and a numeracy proficiency of Level 4 or 5 is 3.5 times as likely (in terms of odds ratio) of being employed as someone with below upper secondary education and a numeracy proficiency of Level 1 or below.

	Percentage of employed adults among those who have below upper secondary education and numeracy proficiency of Level 0/1		Likelihood of being employed compared to someone with below upper secondary education and a numeracy proficiency of Level 0/1, dependent on:					
			Below upper secondary education					
			Numeracy proficiency of Level 2		Numeracy proficiency of Level 3		Numeracy proficiency of Level 4/5	
			%	S.E.	Odds ratio	p-value	Odds ratio	p-value
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<b>OECD</b>								
<b>National entities</b>								
Australia	49	(2.4)	1.8	0.04	1.6	0.21	2.3	0.47
Austria	51	(3.5)	1.1	0.71	0.9	0.91	c	c
Canada	51	(2.2)	1.6	0.09	1.9	0.18	c	c
Czech Republic	39	(6.2)	1.2	0.74	1.4	0.73	c	c
Denmark	49	(3.2)	2.0	0.06	2.6	0.01	2.7	0.36
Estonia	47	(3.2)	1.3	0.35	1.9	0.10	c	c
Finland	40	(4.1)	1.2	0.57	1.3	0.56	c	c
France <sup>1</sup>	49	(1.5)	1.3	0.26	2.0	0.05	c	c
Germany	49	(3.7)	1.9	0.19	1.6	0.57	c	c
Ireland	41	(3.0)	1.3	0.42	1.3	0.59	c	c
Italy <sup>1</sup>	44	(2.1)	1.6	0.03	2.6	0.01	c	c
Japan	63	(4.6)	1.1	0.84	1.6	0.33	c	c
Korea	60	(2.3)	1.3	0.40	1.7	0.30	c	c
Netherlands	51	(3.1)	1.1	0.66	1.3	0.46	2.9	0.44
Norway	54	(4.0)	1.8	0.09	2.5	0.04	3.6	0.14
Poland	36	(3.5)	1.6	0.18	1.8	0.29	c	c
Slovak Republic	22	(2.7)	3.2	0.00	5.4	0.00	c	c
Spain <sup>1</sup>	41	(1.6)	1.4	0.03	2.1	0.01	c	c
Sweden	50	(3.9)	1.2	0.69	1.1	0.87	c	c
United States	60	(3.1)	0.9	0.81	c	c	c	c
<b>Sub-national entities</b>								
Flanders (Belgium)	42	(3.4)	1.6	0.24	1.5	0.28	c	c
England (UK)	50	(2.2)	1.4	0.29	1.6	0.37	c	c
Northern Ireland (UK)	44	(2.6)	1.7	0.09	1.7	0.28	c	c
England/N. Ireland (UK)	50	(2.1)	1.5	0.25	1.6	0.34	c	c
Average <sup>2</sup>	47	(0.7)	1.5	0.00	1.8	0.00	c	c
<b>Partners</b>								
Russian Federation*	34	(8.7)	1.0	0.96	c	c	c	c

Note: Calculations for odds ratio are based on logistic regressions where the dependent variable is the likelihood of being employed and where the independent variables are educational attainment and proficiency levels, after accounting for: age, gender, parents' educational attainment, immigration background, parental status (have a child or not), cohabitation status (living with spouse/partner or not), literacy proficiency, skills and readiness to use ICT for problem solving. The reference category is below upper secondary education and proficiency Level 1 or below.

1. The coefficients for France, Italy and Spain have been estimated without accounting for skills and readiness to use ICT for problem solving since it was not tested in these countries. Since there is positive correlation between skills and readiness to use ICT for problem solving and numeracy, literacy and education, the effect of excluding skills and readiness to use ICT for problem solving is likely to be that the coefficients on the proficiency by education level are overestimated, relative to the results for other countries.

2. Average for the regression excludes France, Italy and Spain as a different model specification was used for these countries.

\* See note on data for the Russian Federation in the *Methodology* section.

Source: OECD. Survey of Adult Skills (PIAAC) (2012). See Annex 3 for notes ([www.oecd.org/education/education-at-a-glance-19991487.htm](http://www.oecd.org/education/education-at-a-glance-19991487.htm)).

Please refer to the Reader's Guide for information concerning symbols for missing data and abbreviations.


StatLink  <http://dx.doi.org/10.1787/888933285257>

Table A9.1 (N). [2/2] **Likelihood of being employed, by educational attainment and numeracy proficiency (2012)**  
 25-64 year-old non-students, below upper secondary education and proficiency Level 1 or below  
 as reference category, odds ratio

Logistic regression is used to estimate the odds ratios and p-values; an odds ratio reflects the relative likelihood of being employed compared to someone with an education level of below upper secondary education and a numeracy proficiency of Level 1 or below. The latter group is taken as the reference category for the interpretation of the relative likelihood and therefore their odds ratio are set to equal 1. Differences between the groups are statistically significant at 95% if the "p-value" associated with the odds ratio is below 0.05.

*How to read this table:* In Australia, a person with tertiary education and a numeracy proficiency of Level 4 or 5 is 3.5 times as likely (in terms of odds ratio) of being employed as someone with below upper secondary education and a numeracy proficiency of Level 1 or below.

		Likelihood of being employed compared to someone with below upper secondary education and a numeracy proficiency of Level 0/1, dependent on:																
		Upper secondary or post-secondary non-tertiary education								Tertiary education								
		Numeracy proficiency of Level 0/1		Numeracy proficiency of Level 2		Numeracy proficiency of Level 3		Numeracy proficiency of Level 4/5		Numeracy proficiency of Level 0/1		Numeracy proficiency of Level 2		Numeracy proficiency of Level 3		Numeracy proficiency of Level 4/5		
		Odds ratio	p-value	Odds ratio	p-value	Odds ratio	p-value	Odds ratio	p-value	Odds ratio	p-value	Odds ratio	p-value	Odds ratio	p-value	Odds ratio	p-value	
		(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	
OECD	<b>National entities</b>																	
	Australia	1.4	0.17	1.6	0.06	1.9	0.07	1.6	0.47	2.8	0.01	2.9	0.00	3.4	0.00	3.5	0.01	
	Austria	1.6	0.17	1.8	0.04	1.9	0.05	3.1	0.06	1.2	0.82	2.7	0.01	3.0	0.01	2.1	0.15	
	Canada	2.1	0.00	2.7	0.00	2.8	0.00	3.8	0.01	2.5	0.00	3.7	0.00	4.0	0.00	5.7	0.00	
	Czech Republic	2.5	0.07	3.5	0.01	4.0	0.01	5.9	0.04	c	c	5.7	0.01	5.9	0.00	10.9	0.00	
	Denmark	1.8	0.05	2.6	0.00	2.9	0.00	3.5	0.02	3.4	0.00	4.9	0.00	6.3	0.00	9.8	0.00	
	Estonia	2.2	0.00	2.7	0.00	3.2	0.00	4.3	0.01	3.8	0.00	5.2	0.00	5.3	0.00	12.7	0.00	
	Finland	1.1	0.78	1.7	0.07	1.7	0.15	2.6	0.05	1.3	0.53	3.1	0.00	2.6	0.01	2.5	0.04	
	France <sup>1</sup>	1.6	0.00	2.0	0.00	2.2	0.00	3.1	0.03	1.5	0.15	3.8	0.00	4.7	0.00	6.1	0.00	
	Germany	2.4	0.00	2.8	0.00	4.4	0.00	5.0	0.00	2.4	0.05	4.9	0.00	6.7	0.00	8.4	0.00	
	Ireland	1.7	0.01	1.7	0.04	1.9	0.06	1.9	0.28	3.8	0.00	3.5	0.00	3.6	0.00	3.6	0.01	
	Italy <sup>1</sup>	2.6	0.00	2.2	0.00	3.3	0.00	8.2	0.00	5.7	0.00	3.9	0.00	8.5	0.00	8.9	0.01	
	Japan	1.0	0.92	1.1	0.88	1.3	0.43	1.8	0.26	1.6	0.46	1.1	0.72	1.3	0.53	1.6	0.32	
	Korea	1.1	0.75	1.3	0.36	1.5	0.29	1.7	0.45	1.7	0.25	1.2	0.46	1.2	0.58	1.4	0.55	
	Netherlands	1.6	0.18	2.3	0.00	1.5	0.28	1.4	0.56	2.4	0.26	3.1	0.00	2.9	0.00	2.1	0.14	
	Norway	2.0	0.03	2.4	0.00	2.6	0.04	4.1	0.04	1.7	0.14	3.9	0.00	5.8	0.00	9.3	0.00	
	Poland	2.2	0.00	3.1	0.00	3.4	0.00	4.0	0.02	9.2	0.00	9.5	0.00	11.0	0.00	22.4	0.00	
	Slovak Republic	4.1	0.00	8.3	0.00	12.1	0.00	16.6	0.00	c	c	15.9	0.00	27.3	0.00	33.8	0.00	
	Spain <sup>1</sup>	2.7	0.00	2.3	0.00	3.0	0.00	5.3	0.07	3.3	0.00	3.9	0.00	5.1	0.00	5.8	0.00	
	Sweden	2.1	0.03	2.1	0.05	2.4	0.07	2.7	0.13	2.5	0.04	4.6	0.00	4.9	0.00	4.5	0.02	
	United States	1.1	0.72	1.5	0.15	2.5	0.01	3.4	0.07	1.5	0.20	2.1	0.01	2.8	0.01	5.6	0.00	
	Sub-national entities	Flanders (Belgium)	1.9	0.02	2.2	0.00	1.8	0.09	1.7	0.25	3.1	0.08	4.6	0.00	3.8	0.00	3.0	0.01
		England (UK)	1.7	0.05	2.0	0.01	2.9	0.02	2.4	0.15	2.1	0.02	2.4	0.00	3.0	0.00	2.4	0.06
Northern Ireland (UK)		2.1	0.04	2.0	0.02	3.3	0.00	2.5	0.18	1.5	0.34	3.7	0.00	3.5	0.00	3.7	0.06	
England/N. Ireland (UK)		1.7	0.04	2.0	0.01	2.9	0.01	2.5	0.13	2.1	0.01	2.4	0.00	3.0	0.00	2.5	0.05	
Average <sup>2</sup>		1.9	0.00	2.5	0.00	3.0	0.00	3.8	0.00	2.8	0.00	4.5	0.00	5.5	0.00	7.6	0.00	
Partners		Russian Federation*	6.4	0.00	6.6	0.00	5.0	0.02	2.0	0.50	3.1	0.05	6.2	0.00	6.5	0.00	7.7	0.00

Note: Calculations for odds ratio are based on logistic regressions where the dependent variable is the likelihood of being employed and where the independent variables are educational attainment and proficiency levels, after accounting for: age, gender, parents' educational attainment, immigration background, parental status (have a child or not), cohabitation status (living with spouse/partner or not), literacy proficiency, skills and readiness to use ICT for problem solving. The reference category is below upper secondary education and proficiency Level 1 or below.

1. The coefficients for France, Italy and Spain have been estimated without accounting for skills and readiness to use ICT for problem solving since it was not tested in these countries. Since there is positive correlation between skills and readiness to use ICT for problem solving and numeracy, literacy and education, the effect of excluding skills and readiness to use ICT for problem solving is likely to be that the coefficients on the proficiency by education level are overestimated, relative to the results for other countries.

2. Average for the regression excludes France, Italy and Spain as a different model specification was used for these countries.

\* See note on data for the Russian Federation in the *Methodology* section.

Source: OECD. Survey of Adult Skills (PIAAC) (2012). See Annex 3 for notes ([www.oecd.org/education/education-at-a-glance-19991487.htm](http://www.oecd.org/education/education-at-a-glance-19991487.htm)).

Please refer to the *Reader's Guide* for information concerning symbols for missing data and abbreviations.


StatLink  <http://dx.doi.org/10.1787/888933285257>

Table A9.1 (P). [1/2] **Likelihood of being employed, by educational attainment and skills and readiness to use information and communication technologies for problem solving (2012)**

25-64 year-olds, reference category, below upper secondary education and skills Group 0 or 1 as reference category, odds ratio

Logistic regression is used to estimate the odds ratios and p-values; an odds ratio reflects the relative likelihood of being employed compared to someone with a level of skills and readiness to use ICT for problem solving of Group 0 or 1. The latter group is taken as the reference category for the interpretation of the relative likelihood and therefore their odds ratio are set to equal 1. Differences between the groups are statistically significant at 95% if the "p-value" associated with the odds ratio is below 0.05.

**How to read this table:** In Australia, a person with tertiary education and among Group 4 of skills and readiness to use ICT for problem solving is 5.2 times as likely (in terms of odds ratio) of being employed as someone with below upper secondary education and among Group 0 or 1 of skills and readiness to use ICT for problem solving.


	Percentage of employed adults among those who have below upper secondary education and skills and readiness to use ICT for problem solving of Group 0/1		Likelihood of being employed compared to someone with below upper secondary education and a level of skills and readiness to use ICT for problem solving of Group 0/1, dependent on:					
			Below upper secondary education					
			Group 2 (Failed ICT core test or minimal problem-solving skills)		Group 3 (Moderate ICT and problem-solving skills)		Group 4 (Good ICT and problem-solving skills)	
			% (1)	S.E. (2)	Odds ratio (3)	p-value (4)	Odds ratio (5)	p-value (6)
<b>OECD</b>								
<b>National entities</b>								
Australia	31	(3.5)	1.5	0.15	2.5	0.00	2.7	0.01
Austria	40	(2.6)	0.9	0.82	1.0	0.98	0.7	0.67
Canada	41	(3.0)	1.0	0.84	1.2	0.43	1.0	0.94
Czech Republic	28	(5.2)	2.1	0.27	0.5	0.32	0.5	0.52
Denmark	31	(5.1)	1.8	0.01	2.0	0.02	1.1	0.87
Estonia	32	(2.7)	2.2	0.00	2.3	0.02	3.2	0.09
Finland	29	(4.1)	1.5	0.14	1.4	0.40	1.2	0.81
France	m	m	m	m	m	m	m	m
Germany	43	(5.5)	1.1	0.82	0.6	0.34	0.7	0.63
Ireland	40	(2.9)	1.4	0.17	1.7	0.07	2.2	0.45
Italy	m	m	m	m	m	m	m	m
Japan	62	(4.0)	0.6	0.16	1.0	0.99	1.3	0.75
Korea	60	(1.7)	1.1	0.72	2.2	0.23	0.6	0.67
Netherlands	39	(4.7)	1.2	0.47	2.0	0.01	3.9	0.00
Norway	22	(6.9)	2.5	0.01	2.7	0.00	3.3	0.04
Poland	31	(2.7)	1.4	0.49	0.6	0.46	c	c
Slovak Republic	27	(2.1)	1.1	0.75	2.1	0.06	2.9	0.08
Spain	m	m	m	m	m	m	m	m
Sweden	35	(9.1)	1.6	0.20	1.1	0.80	0.8	0.78
United States	61	(3.8)	0.9	0.85	0.7	0.55	0.3	0.13
<b>Sub-national entities</b>								
Flanders (Belgium)	31	(3.1)	1.7	0.05	1.4	0.30	1.9	0.40
England (UK)	32	(5.0)	2.0	0.05	2.2	0.03	2.1	0.19
Northern Ireland (UK)	40	(3.0)	1.7	0.04	1.9	0.07	2.2	0.22
England/N. Ireland (UK)	33	(4.6)	2.0	0.04	2.2	0.02	2.1	0.17
<b>Average</b>	38	(1.0)	1.5	0.00	1.5	0.00	1.7	0.00
<b>Partners</b>								
Russian Federation*	21	(5.6)	c	c	c	c	c	c

Note: Calculations for odds ratio are based on logistic regressions where the dependent variable is the likelihood of being employed and where the independent variables are educational attainment and skill groups, after accounting for: age, gender, parents' educational attainment, immigration background, parental status (have a child or not), cohabitation status (living with spouse/partner or not), literacy proficiency and numeracy proficiency. The reference category is below upper secondary education and Group 0 or 1.

\* See note on data for the Russian Federation in the *Methodology* section.

Source: OECD. Survey of Adult Skills (PIAAC) (2012). See Annex 3 for notes ([www.oecd.org/education/education-at-a-glance-19991487.htm](http://www.oecd.org/education/education-at-a-glance-19991487.htm)).

Please refer to the Reader's Guide for information concerning symbols for missing data and abbreviations.

StatLink  <http://dx.doi.org/10.1787/888933285268>

**Table A9.1 (P). [2/2] Likelihood of being employed, by educational attainment and skills and readiness to use information and communication technologies for problem solving (2012)**

25-64 year-olds, reference category, below upper secondary education and skills Group 0 or 1 as reference category, odds ratio

Logistic regression is used to estimate the odds ratios and p-values; an odds ratio reflects the relative likelihood of being employed compared to someone with a level of skills and readiness to use ICT for problem solving of Group 0 or 1. The latter group is taken as the reference category for the interpretation of the relative likelihood and therefore their odds ratio are set to equal 1. Differences between the groups are statistically significant at 95% if the "p-value" associated with the odds ratio is below 0.05.

*How to read this table:* In Australia, a person with tertiary education and among Group 4 of skills and readiness to use ICT for problem solving is 5.2 times as likely (in terms of odds ratio) of being employed as someone with below upper secondary education and among Group 0 or 1 of skills and readiness to use ICT for problem solving.

		Likelihood of being employed compared to someone with below upper secondary education and a level of skills and readiness to use ICT for problem solving of Group 0/1, dependent on:																
		Upper secondary or post-secondary non-tertiary education								Tertiary education								
		Group 0/1 (No computer experience or refused the computer-based assessment)		Group 2 (Failed ICT core test or minimal problem-solving skills)		Group 3 (Moderate ICT and problem-solving skills)		Group 4 (Good ICT and problem-solving skills)		Group 0/1 (No computer experience or refused the computer-based assessment)		Group 2 (Failed ICT core test or minimal problem-solving skills)		Group 3 (Moderate ICT and problem-solving skills)		Group 4 (Good ICT and problem-solving skills)		
		Odds ratio	p-value	Odds ratio	p-value	Odds ratio	p-value	Odds ratio	p-value	Odds ratio	p-value	Odds ratio	p-value	Odds ratio	p-value	Odds ratio	p-value	
		(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	
<b>OECD</b>	<b>National entities</b>																	
	Australia	1.8	0.02	1.8	0.09	1.8	0.02	2.9	0.00	c	c	3.4	0.00	4.5	0.00	5.2	0.00	
	Austria	1.3	0.15	2.1	0.01	1.9	0.02	2.1	0.02	c	c	2.4	0.02	3.6	0.00	2.2	0.05	
	Canada	1.4	0.11	2.4	0.00	2.3	0.00	2.4	0.00	1.7	0.02	2.8	0.00	3.1	0.00	3.3	0.00	
	Czech Republic	1.9	0.06	3.6	0.00	2.5	0.00	2.8	0.02	c	c	5.3	0.02	2.6	0.07	4.4	0.00	
	Denmark	1.7	0.03	2.3	0.00	2.5	0.00	1.6	0.10	c	c	4.3	0.00	5.0	0.00	4.0	0.00	
	Estonia	2.2	0.00	4.4	0.00	3.8	0.00	4.7	0.00	3.3	0.00	9.4	0.00	7.8	0.00	8.4	0.00	
	Finland	1.2	0.39	1.8	0.02	2.3	0.00	2.3	0.02	c	c	2.2	0.01	3.9	0.00	3.2	0.00	
	France	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	
	Germany	1.4	0.27	2.2	0.01	2.0	0.02	2.2	0.07	1.4	0.44	3.9	0.00	3.5	0.00	3.0	0.00	
	Ireland	1.6	0.01	2.3	0.00	2.0	0.00	2.6	0.00	c	c	4.6	0.00	4.2	0.00	5.2	0.00	
	Italy	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	
	Japan	0.8	0.49	0.9	0.73	1.0	0.92	1.1	0.78	0.8	0.39	0.8	0.48	0.9	0.79	1.3	0.39	
	Korea	1.2	0.32	1.2	0.36	1.4	0.05	1.8	0.06	0.9	0.60	1.3	0.17	1.2	0.35	1.9	0.02	
	Netherlands	c	c	2.1	0.01	3.2	0.00	4.3	0.00	c	c	3.1	0.02	5.4	0.00	7.6	0.00	
	Norway	c	c	3.1	0.00	3.4	0.00	3.6	0.00	c	c	4.5	0.00	6.3	0.00	9.8	0.00	
	Poland	1.8	0.00	3.0	0.00	2.7	0.00	3.8	0.00	c	c	7.2	0.00	9.5	0.00	11.7	0.00	
	Slovak Republic	2.9	0.00	4.4	0.00	5.0	0.00	4.9	0.00	c	c	7.5	0.00	9.6	0.00	8.9	0.00	
	Spain	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	
	Sweden	c	c	2.1	0.02	3.1	0.00	3.2	0.01	c	c	4.1	0.00	3.9	0.00	7.1	0.00	
	United States	0.6	0.04	1.5	0.06	1.1	0.79	1.2	0.61	c	c	1.8	0.05	1.8	0.02	1.3	0.51	
		<b>Sub-national entities</b>																
		Flanders (Belgium)	1.5	0.05	2.6	0.00	2.2	0.00	2.2	0.02	c	c	4.7	0.00	4.6	0.00	4.0	0.00
		England (UK)	2.2	0.02	2.4	0.01	3.5	0.00	4.3	0.00	c	c	3.3	0.00	3.6	0.00	4.9	0.00
		Northern Ireland (UK)	2.3	0.04	c	c	2.9	0.00	3.4	0.00	c	c	c	c	3.5	0.00	4.5	0.00
		England/N. Ireland (UK)	2.2	0.01	2.4	0.01	3.4	0.00	4.3	0.00	c	c	3.3	0.00	3.6	0.00	4.9	0.00
	<b>Average</b>	1.6	0.00	2.4	0.00	2.5	0.00	2.8	0.00	c	c	4.0	0.00	4.5	0.00	5.1	0.00	
<b>Partners</b>	Russian Federation*	5.3	0.01	10.5	0.00	3.6	0.09	2.2	0.24	4.3	0.01	3.6	0.02	6.1	0.01	6.9	0.00	

Note: Calculations for odds ratio are based on logistic regressions where the dependent variable is the likelihood of being employed and where the independent variables are educational attainment and skill groups, after accounting for: age, gender, parents' educational attainment, immigration background, parental status (have a child or not), cohabitation status (living with spouse/partner or not), literacy proficiency and numeracy proficiency. The reference category is below upper secondary education and Group 0 or 1.

\* See note on data for the Russian Federation in the *Methodology* section.

Source: OECD. Survey of Adult Skills (PIAAC) (2012). See Annex 3 for notes ([www.oecd.org/education/education-at-a-glance-19991487.htm](http://www.oecd.org/education/education-at-a-glance-19991487.htm)).

Please refer to the *Reader's Guide* for information concerning symbols for missing data and abbreviations.


StatLink  <http://dx.doi.org/10.1787/888933285268>

Table A9.2 (L). [1/2] **Difference in hourly earnings, by educational attainment and literacy proficiency (2012)**

25-64 year-old non-students, below upper secondary and proficiency Level 1 or below as reference category

Ordinary least square regression, used to estimate percentage, reflects the change in hourly earnings compared to someone with below upper secondary education and a literacy proficiency of Level 1 or below. The latter group is taken as the reference category for the interpretation of the percentage difference.  
**How to read this table:** In Australia, a person with tertiary education and a literacy proficiency of Level 4 or 5 is earning 37% more, compared with someone with below upper secondary education and a literacy proficiency of Level 1 or below.

		Difference in hourly earnings compared to someone with below upper secondary and a literacy proficiency of Level 0/1, dependent on:													
		Below upper secondary education						Upper secondary or post-secondary non-tertiary education							
		Literacy proficiency of Level 2		Literacy proficiency of Level 3		Literacy proficiency of Level 4/5		Literacy proficiency of Level 0/1		Literacy proficiency of Level 2		Literacy proficiency of Level 3		Literacy proficiency of Level 4/5	
		%	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
OECD	<b>National entities</b>														
	Australia	-3	(0.1)	-6	(0.1)	-7	(0.1)	16	(0.1)	6	(0.1)	2	(0.1)	9	(0.1)
	Austria	0	(0.1)	7	(0.1)	c	c	7	(0.0)	15	(0.0)	22	(0.1)	29	(0.1)
	Canada	1	(0.1)	2	(0.1)	c	c	7	(0.0)	11	(0.0)	10	(0.0)	12	(0.1)
	Czech Republic	14	(0.1)	8	(0.2)	c	c	22	(0.1)	21	(0.1)	25	(0.1)	33	(0.1)
	Denmark	2	(0.0)	-2	(0.0)	c	c	12	(0.1)	7	(0.0)	5	(0.0)	9	(0.1)
	Estonia	-2	(0.1)	-8	(0.1)	c	c	12	(0.1)	1	(0.1)	-2	(0.1)	-3	(0.1)
	Finland	-2	(0.1)	-6	(0.1)	c	c	3	(0.1)	1	(0.0)	1	(0.1)	6	(0.1)
	France <sup>1</sup>	3	(0.0)	7	(0.1)	c	c	10	(0.0)	11	(0.0)	12	(0.0)	8	(0.1)
	Germany	-3	(0.3)	-10	(0.2)	c	c	-7	(0.2)	-6	(0.2)	0	(0.2)	2	(0.2)
	Ireland	3	(0.1)	7	(0.1)	c	c	8	(0.1)	7	(0.1)	11	(0.1)	10	(0.1)
	Italy <sup>1</sup>	-3	(0.1)	1	(0.1)	c	c	4	(0.1)	9	(0.1)	14	(0.1)	23	(0.1)
	Japan	9	(0.2)	11	(0.1)	c	c	14	(0.2)	13	(0.1)	10	(0.1)	9	(0.2)
	Korea	0	(0.1)	0	(0.1)	c	c	8	(0.1)	20	(0.1)	18	(0.1)	-3	(0.1)
	Netherlands	6	(0.1)	1	(0.1)	-1	(0.1)	2	(0.1)	10	(0.1)	13	(0.1)	14	(0.1)
	Norway	-4	(0.0)	-4	(0.0)	c	c	7	(0.1)	4	(0.0)	7	(0.0)	10	(0.1)
	Poland	-4	(0.2)	-16	(0.3)	c	c	-7	(0.1)	-7	(0.1)	-3	(0.1)	5	(0.2)
	Slovak Republic	3	(0.1)	5	(0.1)	c	c	13	(0.1)	25	(0.1)	22	(0.1)	15	(0.1)
	Spain <sup>1</sup>	-1	(0.0)	2	(0.1)	c	c	15	(0.1)	20	(0.1)	12	(0.1)	12	(0.2)
	Sweden	1	(0.0)	0	(0.0)	c	c	1	(0.0)	3	(0.0)	4	(0.0)	10	(0.1)
	United States	-20	(0.3)	-16	(0.3)	c	c	-4	(0.2)	-4	(0.2)	1	(0.2)	4	(0.3)
		<b>Sub-national entities</b>													
	Flanders (Belgium)	1	(0.1)	2	(0.1)	c	c	9	(0.1)	10	(0.0)	13	(0.0)	16	(0.1)
	England (UK)	-5	(0.1)	-3	(0.1)	c	c	0	(0.1)	-2	(0.1)	5	(0.1)	11	(0.1)
	Northern Ireland (UK)	2	(0.1)	-4	(0.1)	c	c	6	(0.1)	7	(0.1)	16	(0.1)	15	(0.1)
	England/N. Ireland (UK)	-2	(0.1)	0	(0.1)	30	(0.2)	3	(0.1)	1	(0.1)	8	(0.1)	15	(0.1)
	Average <sup>2</sup>	0	(0.0)	-1	(0.0)	c	c	7	(0.0)	7	(0.0)	9	(0.0)	11	(0.0)
Partners	Russian Federation*	7	(0.4)	c	c	c	c	3	(0.4)	1	(0.4)	-2	(0.4)	-3	(0.4)

Note: Calculations are based on ordinary least square regressions where the dependent variable is hourly earnings and where the independent variables are educational attainment and proficiency levels, after accounting for: age, gender, parents' educational attainment, immigration background, parental status (have a child or not), cohabitation status (living with spouse/partner or not), numeracy proficiency, skills and readiness to use ICT for problem solving. The reference category is below upper secondary education and proficiency Level 1 or below.

1. The coefficients for France, Italy and Spain have been estimated without accounting for skills and readiness to use ICT for problem solving since it was not tested in these countries. Since there is positive correlation between skills and readiness to use ICT for problem solving and numeracy, literacy and education, the effect of excluding skills and readiness to use ICT for problem solving is likely to be that the coefficients on the proficiency by education level are overestimated, relative to the results for other countries.

2. Average excludes France, Italy and Spain as a different model specification was used for these countries.

\* See note on data for the Russian Federation in the *Methodology* section.

Source: OECD. Survey of Adult Skills (PIAAC) (2012). See Annex 3 for notes ([www.oecd.org/education/education-at-a-glance-19991487.htm](http://www.oecd.org/education/education-at-a-glance-19991487.htm)).

Please refer to the Reader's Guide for information concerning symbols for missing data and abbreviations.


StatLink  <http://dx.doi.org/10.1787/888933285270>



Table A9.2 (L). [2/2] **Difference in hourly earnings, by educational attainment and literacy proficiency (2012)**

25-64 year-old non-students, below upper secondary and proficiency Level 1 or below as reference category

Ordinary least square regression, used to estimate percentage, reflects the change in hourly earnings compared to someone with below upper secondary education and a literacy proficiency of Level 1 or below. The latter group is taken as the reference category for the interpretation of the percentage difference.  
**How to read this table:** In Australia, a person with tertiary education and a literacy proficiency of Level 4 or 5 is earning 37% more, compared with someone with below upper secondary education and a literacy proficiency of Level 1 or below.

		Difference in hourly earnings compared to someone with below upper secondary and a literacy proficiency of Level 0/1, dependent on:								
		Tertiary education								
		Literacy proficiency of Level 0/1		Literacy proficiency of Level 2		Literacy proficiency of Level 3		Literacy proficiency of Level 4/5		
		%	S.E.	%	S.E.	%	S.E.	%	S.E.	
		(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	
OECD	<b>National entities</b>									
	Australia	17	(0.1)	25	(0.1)	32	(0.1)	37	(0.1)	
	Austria	31	(0.1)	39	(0.1)	51	(0.1)	63	(0.1)	
	Canada	19	(0.1)	28	(0.0)	39	(0.0)	42	(0.1)	
	Czech Republic	c	c	46	(0.1)	58	(0.1)	75	(0.1)	
	Denmark	22	(0.1)	22	(0.0)	29	(0.0)	36	(0.1)	
	Estonia	17	(0.1)	22	(0.1)	24	(0.1)	37	(0.1)	
	Finland	22	(0.1)	22	(0.0)	26	(0.1)	28	(0.1)	
	France <sup>1</sup>	42	(0.1)	44	(0.0)	44	(0.0)	51	(0.1)	
	Germany	15	(0.2)	23	(0.2)	32	(0.2)	48	(0.2)	
	Ireland	32	(0.1)	38	(0.1)	44	(0.1)	43	(0.1)	
	Italy <sup>1</sup>	38	(0.1)	42	(0.1)	53	(0.1)	60	(0.1)	
	Japan	c	c	27	(0.1)	27	(0.1)	29	(0.2)	
	Korea	42	(0.1)	50	(0.1)	65	(0.1)	83	(0.1)	
	Netherlands	17	(0.1)	39	(0.1)	48	(0.1)	49	(0.1)	
	Norway	21	(0.1)	28	(0.1)	28	(0.0)	28	(0.1)	
	Poland	37	(0.2)	33	(0.1)	40	(0.1)	61	(0.2)	
	Slovak Republic	c	c	68	(0.1)	75	(0.1)	87	(0.1)	
	Spain <sup>1</sup>	35	(0.1)	40	(0.1)	43	(0.1)	51	(0.1)	
	Sweden	12	(0.1)	19	(0.0)	23	(0.0)	27	(0.1)	
	United States	10	(0.3)	28	(0.2)	34	(0.3)	51	(0.2)	
	Sub-national entities	Flanders (Belgium)	52	(0.1)	39	(0.1)	39	(0.0)	43	(0.1)
		England (UK)	12	(0.1)	31	(0.1)	38	(0.1)	49	(0.1)
Northern Ireland (UK)		31	(0.2)	35	(0.1)	38	(0.1)	41	(0.1)	
England/N. Ireland (UK)		16	(0.1)	35	(0.1)	42	(0.1)	54	(0.1)	
Average <sup>2</sup>		24	(0.0)	33	(0.0)	40	(0.0)	48	(0.0)	
Partners	Russian Federation*	0	(0.4)	4	(0.4)	5	(0.4)	19	(0.4)	

**Note:** Calculations are based on ordinary least square regressions where the dependent variable is hourly earnings and where the independent variables are educational attainment and proficiency levels, after accounting for: age, gender, parents' educational attainment, immigration background, parental status (have a child or not), cohabitation status (living with spouse/partner or not), numeracy proficiency, skills and readiness to use ICT for problem solving. The reference category is below upper secondary education and proficiency Level 1 or below.

1. The coefficients for France, Italy and Spain have been estimated without accounting for skills and readiness to use ICT for problem solving since it was not tested in these countries. Since there is positive correlation between skills and readiness to use ICT for problem solving and numeracy, literacy and education, the effect of excluding skills and readiness to use ICT for problem solving is likely to be that the coefficients on the proficiency by education level are overestimated, relative to the results for other countries.

2. Average excludes France, Italy and Spain as a different model specification was used for these countries.

\* See note on data for the Russian Federation in the *Methodology* section.

Source: OECD. Survey of Adult Skills (PIAAC) (2012). See Annex 3 for notes ([www.oecd.org/education/education-at-a-glance-19991487.htm](http://www.oecd.org/education/education-at-a-glance-19991487.htm)).

Please refer to the Reader's Guide for information concerning symbols for missing data and abbreviations.


StatLink  <http://dx.doi.org/10.1787/888933285270>

Table A9.2 (N). [1/2] **Difference in hourly earnings, by educational attainment and numeracy proficiency (2012)**

25-64 year-old non-students, below upper secondary and proficiency Level 1 or below as reference category

Ordinary least square regression, used to estimate percentage, reflects the change in hourly earnings compared to someone with below upper secondary education and a numeracy proficiency of Level 1 or below. The latter group is taken as the reference category for the interpretation of the percentage difference.  
**How to read this table:** In Australia, a person with tertiary education and a numeracy proficiency of Level 4 or 5 is earning 63% more, compared with someone with below upper secondary education and a numeracy proficiency of Level 1 or below.

		Difference in hourly earnings compared to someone with below upper secondary and a numeracy proficiency of Level 0/1, dependent on:													
		Below upper secondary education						Upper secondary or post-secondary non-tertiary education							
		Numeracy proficiency of Level 2		Numeracy proficiency of Level 3		Numeracy proficiency of Level 4/5		Numeracy proficiency of Level 0/1		Numeracy proficiency of Level 2		Numeracy proficiency of Level 3		Numeracy proficiency of Level 4/5	
		%	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
<b>OECD</b>	<b>National entities</b>														
	Australia	4	(0.1)	4	(0.1)	5	(0.1)	15	(0.0)	10	(0.0)	16	(0.1)	29	(0.1)
	Austria	-2	(0.1)	-1	(0.1)	c	c	10	(0.1)	12	(0.0)	12	(0.1)	15	(0.1)
	Canada	3	(0.1)	21	(0.1)	c	c	9	(0.0)	13	(0.0)	17	(0.0)	25	(0.1)
	Czech Republic	4	(0.1)	6	(0.1)	c	c	17	(0.1)	14	(0.1)	16	(0.1)	20	(0.1)
	Denmark	-2	(0.0)	1	(0.1)	0	(0.1)	7	(0.0)	6	(0.0)	6	(0.0)	7	(0.1)
	Estonia	17	(0.1)	14	(0.1)	c	c	17	(0.1)	17	(0.1)	22	(0.1)	35	(0.1)
	Finland	0	(0.1)	-3	(0.1)	c	c	0	(0.1)	3	(0.1)	7	(0.1)	14	(0.1)
	France <sup>1</sup>	7	(0.0)	18	(0.1)	c	c	10	(0.0)	15	(0.0)	24	(0.0)	26	(0.1)
	Germany	-1	(0.3)	-13	(0.2)	c	c	-5	(0.2)	-5	(0.1)	-2	(0.2)	4	(0.2)
	Ireland	4	(0.1)	15	(0.1)	c	c	8	(0.1)	11	(0.1)	13	(0.1)	23	(0.1)
	Italy <sup>1</sup>	-4	(0.1)	1	(0.1)	c	c	4	(0.1)	9	(0.1)	13	(0.1)	22	(0.1)
	Japan	13	(0.1)	20	(0.1)	c	c	10	(0.1)	17	(0.1)	18	(0.1)	28	(0.1)
	Korea	0	(0.1)	-9	(0.1)	c	c	13	(0.1)	18	(0.1)	10	(0.1)	-10	(0.2)
	Netherlands	6	(0.2)	0	(0.1)	1	(0.2)	6	(0.2)	9	(0.1)	13	(0.1)	13	(0.1)
	Norway	0	(0.0)	1	(0.1)	3	(0.1)	8	(0.0)	7	(0.0)	12	(0.1)	19	(0.1)
	Poland	10	(0.2)	-8	(0.2)	c	c	1	(0.1)	1	(0.1)	5	(0.1)	9	(0.2)
	Slovak Republic	5	(0.1)	8	(0.1)	c	c	10	(0.1)	27	(0.1)	29	(0.1)	24	(0.1)
	Spain <sup>1</sup>	3	(0.0)	10	(0.1)	c	c	14	(0.1)	21	(0.1)	29	(0.1)	43	(0.1)
	Sweden	0	(0.0)	0	(0.0)	c	c	2	(0.0)	2	(0.0)	1	(0.0)	4	(0.0)
United States	-18	(0.2)	c	c	c	c	-2	(0.2)	1	(0.2)	13	(0.2)	22	(0.2)	
	<b>Sub-national entities</b>														
	Flanders (Belgium)	5	(0.1)	5	(0.1)	c	c	10	(0.0)	13	(0.0)	15	(0.1)	22	(0.1)
	England (UK)	-8	(0.1)	-5	(0.1)	c	c	0	(0.1)	-3	(0.1)	2	(0.1)	2	(0.1)
	Northern Ireland (UK)	8	(0.1)	-3	(0.1)	c	c	7	(0.1)	11	(0.1)	22	(0.1)	26	(0.2)
	England/N. Ireland (UK)	-7	(0.1)	-4	(0.1)	c	c	2	(0.1)	-1	(0.1)	4	(0.1)	4	(0.1)
	Average <sup>2</sup>	2	(0.0)	3	(0.0)	c	c	7	(0.0)	9	(0.0)	12	(0.0)	16	(0.0)
<b>Partners</b>	Russian Federation*	-6	(0.3)	c	c	c	c	13	(0.2)	-3	(0.2)	-4	(0.2)	0	(0.3)

**Note:** Calculations are based on ordinary least square regressions where the dependent variable is hourly earnings and where the independent variables are educational attainment and proficiency levels, after accounting for: age, gender, parents' educational attainment, immigration background, parental status (have a child or not), cohabitation status (living with spouse/partner or not), literacy proficiency, skills and readiness to use ICT for problem solving. The reference category is below upper secondary education and proficiency Level 1 or below.

1. The coefficients for France, Italy and Spain have been estimated without accounting for skills and readiness to use ICT for problem solving since it was not tested in these countries. Since there is positive correlation between skills and readiness to use ICT for problem solving and numeracy, literacy and education, the effect of excluding skills and readiness to use ICT for problem solving is likely to be that the coefficients on the proficiency by education level are overestimated, relative to the results for other countries.

2. Average excludes France, Italy and Spain as a different model specification was used for these countries.

\* See note on data for the Russian Federation in the *Methodology* section.

**Source:** OECD. Survey of Adult Skills (PIAAC) (2012). See Annex 3 for notes ([www.oecd.org/education/education-at-a-glance-19991487.htm](http://www.oecd.org/education/education-at-a-glance-19991487.htm)).

Please refer to the Reader's Guide for information concerning symbols for missing data and abbreviations.


StatLink  <http://dx.doi.org/10.1787/888933285280>

Table A9.2 (N). [2/2] **Difference in hourly earnings, by educational attainment and numeracy proficiency (2012)**

25-64 year-old non-students, below upper secondary and proficiency Level 1 or below as reference category

Ordinary least square regression, used to estimate percentage, reflects the change in hourly earnings compared to someone with below upper secondary education and a numeracy proficiency of Level 1 or below. The latter group is taken as the reference category for the interpretation of the percentage difference.  
**How to read this table:** In Australia, a person with tertiary education and a numeracy proficiency of Level 4 or 5 is earning 63% more, compared with someone with below upper secondary education and a numeracy proficiency of Level 1 or below.

		Difference in hourly earnings compared to someone with below upper secondary and a numeracy proficiency of Level 0/1, dependent on:								
		Tertiary education								
		Numeracy proficiency of Level 0/1		Numeracy proficiency of Level 2		Numeracy proficiency of Level 3		Numeracy proficiency of Level 4/5		
		%	S.E.	%	S.E.	%	S.E.	%	S.E.	
		(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	
OECD	<b>National entities</b>									
	Australia	20	(0.1)	35	(0.1)	50	(0.1)	63	(0.1)	
	Austria	37	(0.1)	36	(0.1)	40	(0.1)	42	(0.1)	
	Canada	20	(0.0)	35	(0.0)	47	(0.0)	59	(0.1)	
	Czech Republic	c	c	47	(0.2)	43	(0.1)	54	(0.1)	
	Denmark	17	(0.1)	21	(0.0)	26	(0.0)	37	(0.1)	
	Estonia	31	(0.1)	42	(0.1)	55	(0.1)	76	(0.1)	
	Finland	15	(0.1)	24	(0.1)	34	(0.1)	42	(0.1)	
	France <sup>1</sup>	47	(0.1)	46	(0.0)	60	(0.0)	71	(0.1)	
	Germany	24	(0.2)	22	(0.2)	31	(0.2)	45	(0.2)	
	Ireland	32	(0.1)	41	(0.1)	50	(0.1)	56	(0.1)	
	Italy <sup>1</sup>	39	(0.1)	37	(0.1)	51	(0.1)	71	(0.1)	
	Japan	11	(0.1)	29	(0.1)	38	(0.1)	56	(0.1)	
	Korea	47	(0.1)	49	(0.1)	55	(0.1)	70	(0.1)	
	Netherlands	18	(0.2)	39	(0.1)	47	(0.1)	51	(0.2)	
	Norway	28	(0.1)	32	(0.1)	33	(0.1)	39	(0.1)	
	Poland	40	(0.1)	40	(0.1)	55	(0.1)	78	(0.1)	
	Slovak Republic	c	c	69	(0.1)	78	(0.1)	108	(0.1)	
	Spain <sup>1</sup>	37	(0.1)	47	(0.1)	58	(0.1)	65	(0.1)	
	Sweden	18	(0.1)	17	(0.0)	19	(0.0)	23	(0.0)	
	United States	26	(0.2)	38	(0.2)	47	(0.2)	70	(0.2)	
	Partners	<b>Sub-national entities</b>								
		Flanders (Belgium)	50	(0.2)	42	(0.1)	42	(0.1)	51	(0.1)
England (UK)		26	(0.1)	24	(0.1)	35	(0.1)	40	(0.1)	
Northern Ireland (UK)		35	(0.1)	39	(0.1)	44	(0.1)	54	(0.1)	
England/N. Ireland (UK)		29	(0.1)	27	(0.1)	37	(0.1)	42	(0.1)	
Average <sup>2</sup>		27	(0.0)	36	(0.0)	44	(0.0)	56	(0.0)	
Russian Federation*	-3	(0.3)	3	(0.2)	7	(0.2)	13	(0.3)		

Note: Calculations are based on ordinary least square regressions where the dependent variable is hourly earnings and where the independent variables are educational attainment and proficiency levels, after accounting for: age, gender, parents' educational attainment, immigration background, parental status (have a child or not), cohabitation status (living with spouse/partner or not), literacy proficiency, skills and readiness to use ICT for problem solving. The reference category is below upper secondary education and proficiency Level 1 or below.


1. The coefficients for France, Italy and Spain have been estimated without accounting for skills and readiness to use ICT for problem solving since it was not tested in these countries. Since there is positive correlation between skills and readiness to use ICT for problem solving and numeracy, literacy and education, the effect of excluding skills and readiness to use ICT for problem solving is likely to be that the coefficients on the proficiency by education level are overestimated, relative to the results for other countries.

2. Average excludes France, Italy and Spain as a different model specification was used for these countries.

\* See note on data for the Russian Federation in the *Methodology* section.

Source: OECD. Survey of Adult Skills (PIAAC) (2012). See Annex 3 for notes ([www.oecd.org/education/education-at-a-glance-19991487.htm](http://www.oecd.org/education/education-at-a-glance-19991487.htm)).

Please refer to the Reader's Guide for information concerning symbols for missing data and abbreviations.

StatLink  <http://dx.doi.org/10.1787/888933285280>

**Table A9.2 (P). [1/2] Difference in hourly earnings, by educational attainment and skills and readiness to use information and communication technologies for problem solving (2012)**  
 25-64 year-old non-students, below upper secondary and a level of skills and readiness to use ICT for problem solving of Group 0 or 1 as reference category

Ordinary least square regression, used to estimate the percentage, reflects the change in hourly earnings compared to someone with below upper secondary education and a level of skills and readiness to use ICT for problem solving of Group 0 or 1. The latter group is taken as the reference category for the interpretation of the percentage difference.

*How to read this table:* In Australia, a person with tertiary education and among Group 4 of skills and readiness to use ICT for problem solving is earning 48% more, compared with someone with below upper secondary education and among Group 0 or 1 of skills and readiness to use ICT for problem solving.


		Difference in hourly earnings compared to someone with below upper secondary and a level of skills and readiness to use ICT for problem solving of Group 0/1, dependent on:													
		Below upper secondary education						Upper secondary or post-secondary non-tertiary education							
		Group 2 (Failed ICT core test or minimal problem-solving skills)		Group 3 (Moderate ICT and problem-solving skills)		Group 4 (Good ICT and problem-solving skills)		Group 0/1 (No computer experience or refused the computer-based assessment)		Group 2 (Failed ICT core test or minimal problem-solving skills)		Group 3 (Moderate ICT and problem-solving skills)		Group 4 (Good ICT and problem-solving skills)	
		%	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
<b>OECD</b>	<b>National entities</b>														
	Australia	5	(0.1)	8	(0.1)	3	(0.1)	8	(0.1)	22	(0.1)	13	(0.0)	17	(0.0)
	Austria	8	(0.1)	7	(0.1)	17	(0.1)	9	(0.0)	20	(0.0)	25	(0.0)	33	(0.0)
	Canada	15	(0.0)	17	(0.1)	4	(0.1)	12	(0.1)	20	(0.0)	21	(0.0)	18	(0.0)
	Czech Republic	6	(0.1)	1	(0.1)	19	(0.1)	5	(0.1)	20	(0.1)	25	(0.1)	29	(0.1)
	Denmark	6	(0.0)	7	(0.0)	14	(0.1)	2	(0.0)	17	(0.0)	14	(0.0)	16	(0.0)
	Estonia	29	(0.1)	32	(0.1)	22	(0.2)	12	(0.1)	30	(0.1)	30	(0.1)	39	(0.1)
	Finland	3	(0.1)	4	(0.1)	8	(0.1)	1	(0.0)	7	(0.0)	12	(0.0)	17	(0.1)
	France	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Germany	-24	(0.3)	-24	(0.3)	-21	(0.3)	-31	(0.2)	-18	(0.2)	-15	(0.2)	-13	(0.3)
	Ireland	8	(0.1)	17	(0.1)	51	(0.3)	10	(0.1)	8	(0.1)	20	(0.1)	24	(0.1)
	Italy	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Japan	18	(0.1)	14	(0.1)	26	(0.1)	6	(0.1)	13	(0.1)	15	(0.1)	18	(0.1)
	Korea	-1	(0.1)	12	(0.1)	-16	(0.2)	11	(0.1)	20	(0.1)	27	(0.1)	19	(0.1)
	Netherlands	-7	(0.2)	-9	(0.2)	-7	(0.2)	c	c	-6	(0.2)	2	(0.2)	4	(0.2)
	Norway	2	(0.0)	6	(0.0)	10	(0.1)	c	c	9	(0.0)	16	(0.0)	24	(0.0)
	Poland	7	(0.1)	9	(0.2)	c	c	-4	(0.1)	6	(0.1)	7	(0.1)	11	(0.1)
	Slovak Republic	8	(0.1)	14	(0.1)	2	(0.1)	11	(0.0)	31	(0.1)	41	(0.1)	39	(0.1)
	Spain	m	m	m	m	m	m	m	m	m	m	m	m	m	m
	Sweden	5	(0.1)	7	(0.1)	21	(0.1)	c	c	9	(0.0)	11	(0.0)	18	(0.0)
	United States	-1	(0.3)	-2	(0.3)	-11	(0.3)	2	(0.3)	5	(0.3)	9	(0.3)	18	(0.3)
		<b>Sub-national entities</b>													
	Flanders (Belgium)	3	(0.0)	12	(0.1)	13	(0.1)	1	(0.0)	14	(0.0)	22	(0.0)	24	(0.0)
	England (UK)	13	(0.1)	17	(0.1)	37	(0.1)	5	(0.1)	11	(0.1)	22	(0.1)	40	(0.1)
	Northern Ireland (UK)	8	(0.1)	24	(0.1)	8	(0.1)	5	(0.1)	c	c	24	(0.1)	48	(0.1)
	England/N. Ireland (UK)	11	(0.1)	17	(0.1)	35	(0.1)	5	(0.1)	11	(0.1)	21	(0.1)	40	(0.1)
	<b>Average</b>	<b>5</b>	<b>(0.0)</b>	<b>8</b>	<b>(0.0)</b>	<b>11</b>	<b>(0.0)</b>	<b>4</b>	<b>(0.0)</b>	<b>13</b>	<b>(0.0)</b>	<b>17</b>	<b>(0.0)</b>	<b>21</b>	<b>(0.0)</b>
<b>Partners</b>	Russian Federation*	c	c	c	c	c	c	-21	(0.4)	-7	(0.4)	-15	(0.4)	5	(0.4)

Note: Calculations are based on ordinary least square regressions where the dependent variable is hourly earnings and where the independent variables are educational attainment and skill groups, after accounting for: age, gender, parents' educational attainment, immigration background, parental status (have a child or not), cohabitation status (living with spouse/partner or not), literacy proficiency and numeracy proficiency. The reference category is below upper secondary education and Group 0/1.

\* See note on data for the Russian Federation in the *Methodology* section.

Source: OECD, Survey of Adult Skills (PIAAC) (2012). See Annex 3 for notes ([www.oecd.org/education/education-at-a-glance-19991487.htm](http://www.oecd.org/education/education-at-a-glance-19991487.htm)).

Please refer to the Reader's Guide for information concerning symbols for missing data and abbreviations.

StatLink  <http://dx.doi.org/10.1787/888933285291>

**Table A9.2 (P). [2/2] Difference in hourly earnings, by educational attainment and skills and readiness to use information and communication technologies for problem solving (2012)**  
**25-64 year-old non-students, below upper secondary and a level of skills and readiness to use ICT for problem solving of Group 0 or 1 as reference category**

Ordinary least square regression, used to estimate the percentage, reflects the change in hourly earnings compared to someone with below upper secondary education and a level of skills and readiness to use ICT for problem solving of Group 0 or 1. The latter group is taken as the reference category for the interpretation of the percentage difference.

**How to read this table:** In Australia, a person with tertiary education and among Group 4 of skills and readiness to use ICT for problem solving is earning 48% more, compared with someone with below upper secondary education and among Group 0 or 1 of skills and readiness to use ICT for problem solving.


		Difference in hourly earnings compared to someone with below upper secondary and a level of skills and readiness to use ICT for problem solving of Group 0/1, dependent on:							
		Tertiary education							
		Group 0/1 (No computer experience or refused the computer-based assessment)		Group 2 (Failed ICT core test or minimal problem-solving skills)		Group 3 (Moderate ICT and problem- solving skills)		Group 4 (Good ICT and problem-solving skills)	
		% (15)	S.E. (16)	% (17)	S.E. (18)	% (19)	S.E. (20)	% (21)	S.E. (22)
OECD	<b>National entities</b>								
	Australia	c	c	39	(0,1)	46	(0,0)	48	(0,1)
	Austria	c	c	36	(0,1)	58	(0,0)	63	(0,0)
	Canada	20	(0,1)	36	(0,0)	47	(0,0)	49	(0,0)
	Czech Republic	c	c	50	(0,1)	67	(0,1)	63	(0,1)
	Denmark	c	c	30	(0,0)	36	(0,0)	43	(0,0)
	Estonia	46	(0,1)	50	(0,1)	63	(0,1)	74	(0,1)
	Finland	c	c	29	(0,1)	38	(0,0)	44	(0,0)
	France	m	m	m	m	m	m	m	m
	Germany	-8	(0,3)	10	(0,3)	11	(0,2)	17	(0,3)
	Ireland	c	c	51	(0,1)	53	(0,1)	60	(0,1)
	Italy	m	m	m	m	m	m	m	m
	Japan	14	(0,1)	26	(0,1)	37	(0,1)	41	(0,1)
	Korea	45	(0,2)	50	(0,1)	67	(0,1)	79	(0,1)
	Netherlands	c	c	15	(0,2)	30	(0,2)	36	(0,2)
	Norway	c	c	36	(0,1)	39	(0,0)	47	(0,0)
	Poland	c	c	45	(0,1)	54	(0,1)	60	(0,1)
	Slovak Republic	c	c	89	(0,1)	101	(0,1)	100	(0,1)
	Spain	m	m	m	m	m	m	m	m
	Sweden	c	c	23	(0,1)	31	(0,0)	38	(0,0)
	United States	c	c	33	(0,3)	50	(0,3)	59	(0,3)
	<b>Sub-national entities</b>								
	Flanders (Belgium)	c	c	52	(0,1)	49	(0,0)	52	(0,0)
	England (UK)	c	c	38	(0,1)	65	(0,1)	83	(0,1)
	Northern Ireland (UK)	c	c	c	c	58	(0,1)	69	(0,1)
	England/N. Ireland (UK)	c	c	38	(0,1)	64	(0,1)	81	(0,1)
	<b>Average</b>	c	c	39	(0,0)	50	(0,0)	55	(0,0)
Partners	Russian Federation*	-15	(0,4)	-8	(0,4)	-5	(0,4)	6	(0,4)

Note: Calculations are based on ordinary least square regressions where the dependent variable is hourly earnings and where the independent variables are educational attainment and skill groups, after accounting for: age, gender, parents' educational attainment, immigration background, parental status (have a child or not), cohabitation status (living with spouse/partner or not), literacy proficiency and numeracy proficiency. The reference category is below upper secondary education and Group 0/1.

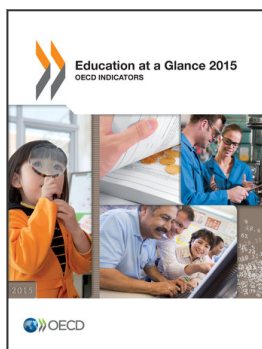
\* See note on data for the Russian Federation in the *Methodology* section.

Source: OECD. Survey of Adult Skills (PIAAC) (2012). See Annex 3 for notes ([www.oecd.org/education/education-at-a-glance-19991487.htm](http://www.oecd.org/education/education-at-a-glance-19991487.htm)).

Please refer to the Reader's Guide for information concerning symbols for missing data and abbreviations.

StatLink  <http://dx.doi.org/10.1787/888933285291>





**From:**  
**Education at a Glance 2015**  
OECD Indicators

**Access the complete publication at:**  
<https://doi.org/10.1787/eag-2015-en>

**Please cite this chapter as:**

OECD (2015), "Indicator A9 What is the Impact of Skills on Employment and Earnings?", in *Education at a Glance 2015: OECD Indicators*, OECD Publishing, Paris.

DOI: <https://doi.org/10.1787/eag-2015-15-en>

This work is published under the responsibility of the Secretary-General of the OECD. The opinions expressed and arguments employed herein do not necessarily reflect the official views of OECD member countries.

This document and any map included herein are without prejudice to the status of or sovereignty over any territory, to the delimitation of international frontiers and boundaries and to the name of any territory, city or area.

You can copy, download or print OECD content for your own use, and you can include excerpts from OECD publications, databases and multimedia products in your own documents, presentations, blogs, websites and teaching materials, provided that suitable acknowledgment of OECD as source and copyright owner is given. All requests for public or commercial use and translation rights should be submitted to [rights@oecd.org](mailto:rights@oecd.org). Requests for permission to photocopy portions of this material for public or commercial use shall be addressed directly to the Copyright Clearance Center (CCC) at [info@copyright.com](mailto:info@copyright.com) or the Centre français d'exploitation du droit de copie (CFC) at [contact@cfcopies.com](mailto:contact@cfcopies.com).